
The Indo-Australian Agaoninae (pollinators of figs)

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J.T. WIEBES

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Florijn 13, 2353 TC Leiderdorp, The Netherlands

The photograph on the cover represents the female of *Ceratosolen* (*Rothropus*) *nugatorius* Grandi from *Ficus obpyramidata* King (Malaya), and the drawing that of *Liporrhopalum midotis* Hill from *F. midotis* Corner (Sabah)

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Introduction

The present volume is the counterpart of my treatment of the African Agaoninae (Wiebes in Berg & Wiebes, 1992: 195–274): together, the two form a revision of all Old World fig pollinators. In total, ca. 600 species of fig occur in the Old World, for ca. 255 of which the pollinator species are known (Africa, ca. 80, i.e. 75 %; Asia and Australasia, ca. 175, i.e., 35 %), over all almost 45 %. In comparison, the New World is simple, with only two main groups of figs (ca. 125–150 species), while the almost fifty species of wasp (half of this number associated with a fig-name) are not known to the extent of most Old World groups.

The study of the Indo-Australian fig wasps started when, in the Transactions of the entomological Society of London for the year 1883, Saunders and Westwood published descriptions of fig insects from India, Ceylon and Australia, including two Indo-Australian Agaoninae. Motschoulsky (1864) added one from Ceylon, but this remained unrecognized for more than a century. Mayr (1885), at one go, brought the knowledge of the Agaoninae to a higher plane, publishing a key to 13 Indo-Australian species. In 1904, Ashmead added one new species, and Mayr, in 1906, six: by now there were a little over twenty species known. In 1915 Girault named a number of species, as he would again do in later years: it took a long time before a few of these were recognized, and most had better been forgotten.

Grandi took the lead in 1916, and up to 1928 (when the first edition of his catalogue was published) described ca. forty Indo-Australian Agaoninae and Waterston two (Girault, 1925a & b, 1927, named five). Grandi (1928d) revised the Agaoninae described by Mayr, and he recognized the Indo-Australian genera *Blastophaga* (with subgenera *Blastophaga* – ca. 30 species – and *Waterstoniella* – 4 species), *Liporrhopalum* (one species), *Ceratosolen* (ca. 15 species), *Eupristina* (9 species) and *Pleistodontes* (3 species). For ca. forty species (i.e., ca. two-thirds of those named) a host fig name was known!

In the period between 1928 and the early fifties only a few species were added, viz., five by Grandi (1931, 1932, 1938, 1952), one by Hoffmeyer (1932) and one by Ishii (1934) (Girault, in 1929, 1932, 1933 and 1934, named four). Then, Joseph (1953b, 1954) started his series of studies in Indian fig insects: he described five species. In 1955, Grandi published the fifth edition of his catalogue which, except for a few additions, regarding the Indo-Australian groups did not differ significantly from the first. This is how I found the situation when I started fig wasp research in the early sixties.

In 1963 I revised *Ceratosolen* (adding ca. twenty species) and, comparing the fig wasp classification with that of *Ficus* (Corner, 1965), discussed the phylogenetic specificity of figs and wasps (Wiebes, 1963a). Other papers (Wiebes, 1963b–1968) added ten species. Hill (1967a & c) studied the figs and fig wasps of Hong Kong, and in 1969 revised the genus *Liporrhopalum* (a dozen new species). Abdurahiman & Joseph (1967a & b) described three new species from India. Ca. ten years later, for the taxonomy basing myself on Grandi (1963) and the additions mentioned, I gave a short history of fig wasp research (Wiebes, 1977a).

In 1975, Abdurahiman & Joseph and in 1981, Balakrishnan Nair c.s., each described one new species from India; Bouček (1988) added one from New Guinea. Further contributions by the author, for the greater part were revisions of genera (Wiebes, 1977b–1994; Wiebes & Abdurahiman, 1980) preliminary to the present synopsis. By now, there are ca. 190 species and subspecies known, classified in eleven genera (and four subgenera), not counting the dozen nominal species that remain incertae sedis: these are listed in table 1.

A comparison of the classification of Agaoninae and that of their host-*Ficus* is depicted in fig. 1 (also those from Africa and America are included); table 2 summarizes the host relations of the Indo-Australian Agaoninae. One can discuss the specificity of the relationship at various levels, as follows.

In working through the collections of fig insects, they were analysed by sections of host figs, thus those from section *Urostigma*, then those from section *Conosycea*, etc. Sure enough, within the last-mentioned more than one genus of

Table 1. List of (specifically) unrecognized Indo-Australian Agaoninae

<i>Blastophaga breviventris</i> Mayr (1885: 172) from 'Indische Feige' (Mayer, 1882: 569, no. 19): ? <i>Pleistodontes</i> spec.
<i>Blastophaga</i> (<i>Valisia</i>) <i>distinguenda</i> Grandi (1916a: 129, 1917: 9) from Java
<i>Blastophaga</i> (?) <i>mayeri</i> Mayr (1885: 182) from Bali
<i>Blastophaga</i> (<i>B.</i>) spec. from <i>F. ischnopoda</i> , Wiebes (1993b: 353) from Malaya
<i>Ceratosolen</i> (<i>Rothropus</i>) spec. from <i>F. stolonifera</i> , Wiebes (1963a: 84) from Sarawak
<i>Ceratosolen</i> (<i>Streptitus</i>) spec. from <i>Ficus microdictya</i> , Wiebes (1963a: 33) from Papua New Guinea
<i>Dolichoris</i> spec. from <i>F. otophoroides</i> , Wiebes (1979a: 196) from New Caledonia
<i>Eupristina poeta</i> Girault (1934: [3]) from Queensland
<i>Kradibia insularis</i> (Girault, 1915b: 310), later renamed <i>Blastophaga queenslandica</i> Hoffmeyer (1928: 334), from Queensland; by Bouček (1988: 197) reallocated in <i>Kradibia</i>
<i>Kradibia latipennis</i> Girault (1915b: 312) from Queensland, described in <i>Paraceratosolen</i> , but by Bouček (1988: 197) reallocated in <i>Kradibia</i> , as well as:
<i>Kradibia latipennis longiclavus</i> Girault (1915b: 312) from Queensland)
<i>Kradibia queenslandica</i> , see <i>K. insularis</i> , above
<i>Kradibia semiauriceps</i> (Girault, 1927: 338) from Queensland, described in <i>Blastophaga</i> , but by Bouček (1988: 197) reallocated in <i>Kradibia</i>
<i>Platyscapa frontalis</i> Motchoulsky (1864: 48) from Ceylon
<i>Pleistodontes liszti</i> Girault (1932: [2]) from Queensland

Table 2. The genera of the Indo-Australian Agaoninae and the groups of their host-figs

AGAONINAE		FICUS
	(sub-)sections	(sub)series
AGAONINI		
Pleistodontes	{ Malvanthera Stilpnophyllum	
BLASTOPHAGINI		
Dolichoris	Oreosycea	
Platyscapa ¹	Urostigma	
Deilagaon	Conosycea	Validae ¹
Waterstoniella	{ Conosycea Dictyoneuron	Zygotricheae & Crassirameae ²
E. (Eupristina)	Conosycea	Drupaceae & Indicae
E. (Parapristina)	{ Benjamina Leucogyne	Benjamineae ² & Callophyllae
B. (Blastophaga)	Ficus ³	
B. (Valisia)	Eriosycea	
Wiebesia ⁴	{ Rhizocladus Kalosyce	
C. (Streptitus)	{ Auriculisperma Dammaropsis Papuasyce ³	
	Sycomorus	
	Neomorphe	
C. (Ceratosolen) ³	Sycidium	Prostratae, Pungentes, & Phaeopilosae ⁵
	Varinga	Cyrtophylleae ⁶
	Sycocarpus	Hispidae & Fulvidulae ⁷ , & Tuberulifasciculatae
C. (Rothropus)	Sycocarpus ⁷	
Kradibia	{ Sycidium ^{4-6, 8} Varinga	Cyrtophylleae ⁸ & Exasperatae
Liporropalum	Palaeomorphe ⁸	

¹One species of *Platyscapa* is known from *Ficus arnottiana* (Conosycea, Validae)²Species of (*E.*) *Eupristina* are also known from *F. forstenii* (Conosycea, Crassirameae), *F. subcordata* and *F. emeryi* (both, Benjamina, Benjamineae)³The series *Rivulares* (*F. rivularis*) and *Pseudopalmeae* (*F. pseudopalma*) harbour species of *Ceratosolen* (*Streptitus*). One species of *Papuasyce*, i.e., *F. pritchardii*, has a species of (*C.*) *Ceratosolen*⁴One species of *Wiebesia* is known from *F. primaria* (*Sycidium*)⁵From the series *Phaeopilosae*, *F. conocephalifolia* harbours a species of *Kradibia*, and *F. complexa* one of *C. (Ceratosolen)*⁶From the series *Cyrtophylleae*, *F. asperiuscula* harbours a species of (*C.*) *Ceratosolen*, *F. leptogramma* one of *Kradibia*⁷Among the *Hispidae* and *Fulvidulae*, which normally harbour *Ceratosolen* (*Rothropus*), *F. hispida* and *F. ireubii* have a species of *C. (Ceratosolen)*⁸*F. montana* from *Sycidium* (*Copiosae*) harbours a species of *Liporropalum*, the remainder *Kradibia* (and one *Wiebesia*, see ⁴)

pollinator was recognized, but they were not, from the beginning, compared with all other pollinators. Nevertheless, one of the species from *Conosycea* was identified with a genus otherwise connected with *Urostigma*. The problem may be more obvious in the group of *Blastophaga*, *Liporrhopalum*, and *Wiebesia*, and this may be evident from their treatment, which is open to improvement.

Short ago, I discussed the problem of species recognition when the figs are different, vs. when they are classified into one botanical species (Wiebes, 1994: 128), but the classificatory problem at a higher level may be more important than this taxonomic difficulty.

There are only a few instances where more than one species of pollinator was recorded from one species (variety / subspecies / local form) of fig, e.g.,

Ficus benjamina with: (no. 22) *Eupristina* (*P.*) *koningsbergeri* (which also co-occurs in *F. benjamina* var. *nuda* with (no. 21) *E. (P.) cyclostigma*) and (no. 26) *E. (E.) emeryi*; and

F. stupenda with: (no. 36) *Waterstoniella errata* and (no. 39) *W. masii*.

In a larger number of instances, what looks like the same pollinator serves more than one species of *Ficus*, viz. (questionable records or identifications are not listed),

(no. 17) *Pleistodontes greenwoodi* and *F. obliqua* (var. *petiolaris*) and *F. platypoda*;

(no. 21) *Eupristina* (*P.*) *cyclostigma* and *F. stricta* and *F. benjamina*;

(no. 33) *Deilagaon chrysolepidis* and *F. chrysolepis* and *F. novoguineensis*;

(no. 72) *Blastophaga* (*B.*) *psenes* and *F. carica* and *F. palmata*;

(no. 73) *Blastophaga* (*B.*) *silvestriana* and *F. pyriformis*, *F. variolosa* and *F. erecta* (var. *beecheana*);

(no. 133) *Kradibia commuta* and *F. heteropoda* and *F. irisana*;

(no. 156) *Ceratosolen* (*C.*) *appendiculatus* and *F. variegata* and *F. viridicarpa*;

(no. 176) *Ceratosolen* (*R.*) *notus* and *F. nota* and *F. congesta*; and

(no. 181) *Ceratosolen* (*R.*) *humatus* and *F. beccarii* and *F. subterranea*.

Many of the species mentioned (e.g., *F. carica* and *F. palmata*, *F. variegata* and *F. viridicarpa*, *F. nota* and *F. congesta*) are very close. I expect that more research will resolve the difficulties listed (with the possible exclusion of *W. errata*, which may be a cuckoo) and the conclusion probably will be that every species (or other entity) of fig has its own species of pollinator wasp.

In general, (sub-)sections of *Ficus* have recognizable groups (mostly genera) of fig wasps: related figs have related pollinators, but exceptions occur. The main instances where the two classifications do not fit, are found in the fig-sections and -subsections listed within the rectangles in fig. 1. In *Conosycea*, there are four species of fig with a pollinator out of what seems to be the normal wasp-genus, viz.,

Ficus arnottiana (series *Validae*, normally with *Deilagaon*) with (no. 63) *Platyscapa arnottiana* (*Platyscapa* is characteristic for *Urostigma*, but see below under *F. amplissima*);

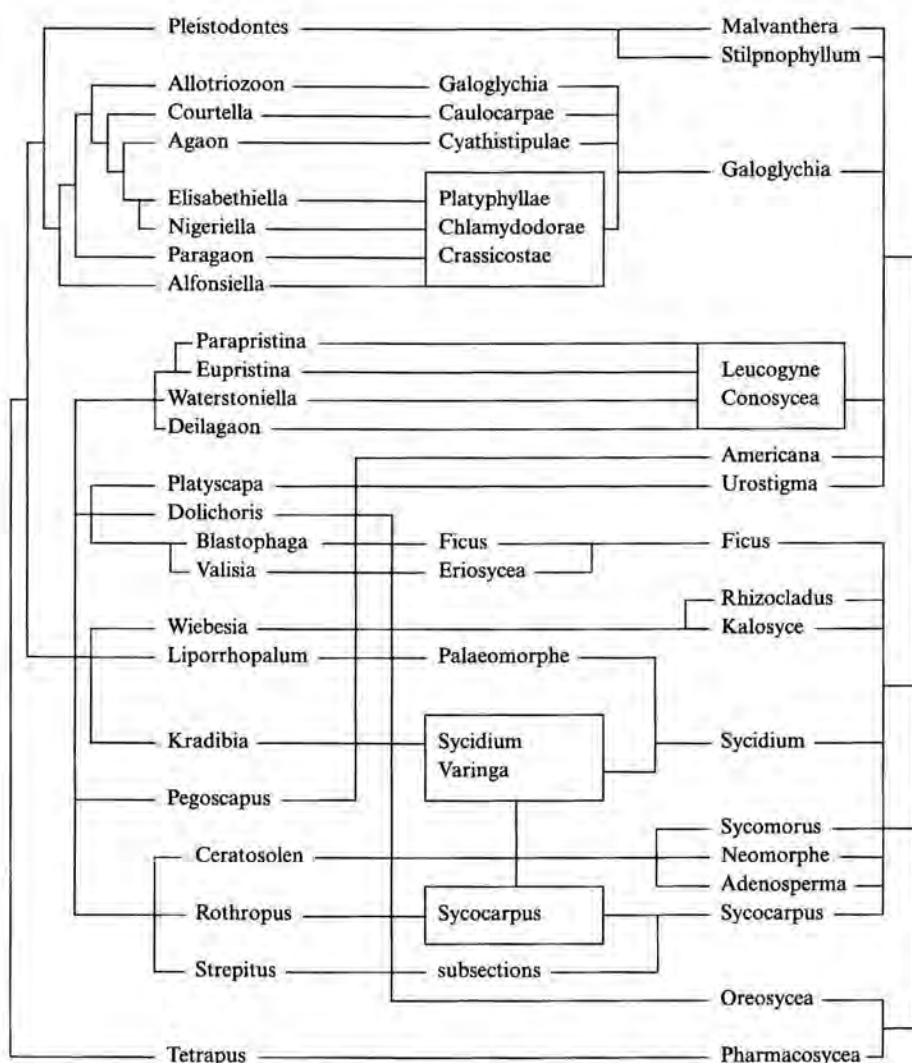


Fig. 1. The relationships of the genera of the Agaoninae (left) and the groups of their host-Ficus (right).

F. forstenii (series *Crassirameae*, normally with *Waterstoniella*) with (no. 31) *Eupristina* (*E.*) *aurivillii*;

F. subcordata (series *Benjamineae*, normally with species of the subgenus *Parapristina*) with (no. 25) *Eupristina* (*E.*) *philippinensis*, and

F. benamina (series *Benjamineae*) with (no. 26) *Eupristina* (*E.*) *emeryi* (and also no. 22, *E. (P.) koningsbergeri*). It should be noted that

F. amplissima (*Leucogyne*) also has a species of *Eupristina*, i.e. (no. 20) *E. (P.) delhiensis* as pollinator. From the Malagasy *F. menabeensis*, a species of *Platyscapa* is known as pollinator. Berg (in Berg & Wiebes, 1992: 95) classified *F.*

menabeensis with *Conosycea*. One could wonder whether separation of *Urostigma* and *Leucogyne* is justified (Berg, 1989: 608), but the pollinator of the Indo-Australian *F. amplissima* does suggest a connection with *Conosycea* instead.

I would classify the genera *Eupristina*, *Waterstoniella* and *Deilagaon* together: all are pollinators of (*Leucogyne* and) *Conosycea*. *Platyscapa* and *Dolichoris* are related to *Blastophaga*.

In section *Sycidium*, *Ficus primaria* (series *Copiosae*) has (no. 95) *Wiebesia partita* as pollinator (other *Wiebesia* pollinate species of sections *Rhizocladus* and *Kalosyce*), and

F. montana has (no. 122) *Liporrhopalum tentacularis*¹ (other *Liporrhopalum* pollinate species of subsection *Palaeomorphe*).

While most species of subsections *Sycidium* and *Varinga* have species of *Kradibia* as pollinator, a number have a species of subgenus *Ceratosolen*, viz.,

F. minahassae (series *Pungentes*) with (no. 144) *C. (C.) pygmaeus*,

F. pungens (series *Pungentes*) with (no. 146) *C. (C.) nanus*,

F. semicordata (series *Prostratae*) with (no. 148) *C. (C.) gravelyi*,

F. asperiuscula (series *Cyrtophylleae*) with (no. 149) *C. (C.) internatus*,

F. complexa (series *Phaeopilosae*) with (no. 150) *C. (C.) gressitti*.

From an entomological point of view, section *Sycidium* seems rather heterogeneous. Alternatively, the subgenus *Ceratosolen*, to which also belong

(no. 145) *C. (C.) marshalli* from *F. pritchardii* (subsection *Papuasyce*),

(no. 159) *C. (C.) solmsi* from *F. hispida* (*Sycocarpus*, series *Hispidae*),

(no. 160) *C. (C.) brongersmai* from *F. treubi* (series *Fulvidulae*),

(no. 161) *C. (C.) bisulcatus* from *F. septica* and

(no. 147) *C. (C.) constrictus* from *F. fistulosa* and *F. dimorpha* (all three figs, series *Tuberculifasciculatae*), may be a mixtum compositum: a more strict phylogenetic classification than that underlying the present grouping, should decide this.

There remains a fundamental misfit between the main botanical and entomological subdivisions, as shown in fig. 1. Even if *Sycomorus* is recognized as belonging to the other groups pollinated by *Ceratosolen* (viz., *Neomorphe*, etc.), the botanical unity of subsections *Pharmacosycea* and *Oreosycea*, and the entomological unity of *Pleistodontes* and *Agaon* etc., are not reflected in the opposite classification, neither is the botanical division in groups of monoecious and dioecious figs.

When I started the study of figs and fig-wasps, I suggested a phylogenetic specificity between the two groups. I expected a reconsideration of the botanical and entomological classifications to remove the few doubts remaining because the classifications did not fit exactly (Wiebes, 1963a: 106). Now, thirty years later, I am less positive, as the discrepancies remain, and I am inclined to agree

¹The generic allotment of this species is not without doubt (see pp. 116–117, 128).

with Berg (1989: 611), who suggested a predominance of functional traits, not represented in the taxonomic characters, over the morphological resemblance.

One possible, alternative explanation would be a host-shift, giving rise to situations such as, e.g., species of *Liporrhopalum* (characteristic for *Palaeomorphe*) and *Wiebesia* (characteristic for *Rhizocladus* and *Kalosyce*) in subsection *Sycidium*. The original pollinator, then, would have been lost. Much attention was given to the figs associated with more than one Agaonine wasp, but up to now to little avail.

The **Agaoninae** can be shortly characterized as follows.

The female mandibles are situated underneath the head or slightly in front of it; the mandible has an appendage bearing transverse lamellae, or rows of fine teeth or small crenulations. The face medially has a broad channel or depression, in which the antennal scapes may fit. The antennal scape is distinctly widened; the third antennal segment is produced apically into a point. In most species, the mesosternum has pollen pockets; the fore coxa may have a 'corbicula'. The fore tibia bears a dorso-apical comb of teeth; the hind tibia has axial and antiaxial teeth; all tarsi are pentamerous, although some oligomery may occur.

The male is apterous. The eyes are small or vestigial; ocelli are absent. The antennae are situated in separate grooves on either side of a medial prominence, or in a common groove in the frontal part of the head; the number of segments is reduced. The legs have shortened spiny tibiae; the tarsal segments are often reduced in number. The gaster ends in a tube with the genitalia, often bearing small claspers with claws. The colour is yellowish.

There are eleven genera known, in three of which subgenera were recognized. Unless some aberrant species are ignored, the genera are rather difficult to key out: the exceptions are discussed in the footnotes, below. There is a useful key by Bouček (1988: 160–161, 163–164), from which I took some couplets.

KEY TO THE GENERA (fig. 2)

1. The female head is slightly to strongly longer than wide (fig. 4, h). The third antennal segment is rather simple, in that the produced apex, if at all prominent, is not separate from the main part of the segment; the pedicel has no axial spines. The mandibular appendage is truly appended to the mandible; it has ventral lamellae, but mostly rows of small teeth. All male tarsi are pentamerous (and the pronotum does not have antero-lateral expansions as in fig. 2, c) *Pleistodontes*
- The female head is usually not distinctly elongate. The third antennal segment has a separation between the main part and the produced apex, which itself may be divided; the pedicel has axial spines. The mandibular appendage is fused with the body of the mandible; it bears ventral lamellae. The male fore tarsus is bimerous (exceptionally there are three or four distinct segments) – if the fore tarsi are pentamerous, the pronotum has characteristic antero-lateral expansions (fig. 2, c: *Waterstoniella*, couplet 6) 2

Fig. 2. Males of: a, *Pleistodontes rieki* Wiebes, after Wiebes (1963b, fig. 26); b, *Eupristina masoni* Saunders, after Grandi (1916c, fig. xiv, 1 & 5); c, *Waterstoniella masii* (Grandi), after Wiebes (1966b, fig. 6); d, *Platyscapa corneri* Wiebes, after Wiebes in Wiebes & Abdurahiman (1980, fig. 31); e, *Dolichoris boschmai* (Wiebes), after Wiebes (1964a, fig. 33); f, *Blastophaga auratae* Wiebes, after Wiebes (1993b, fig. 18); g, *Wiebesia vidua* (Wiebes), after Wiebes (1980, fig. 14); h–i, *Liporrhopalum giacomini* (Grandi); h, head, and i, thorax, after Grandi (1928d, figs. xii, 1 and 3, resp.); j, *Ceratosolen immanis* Wiebes, after Wiebes (1981a, fig. 2); k–l, males in lateral view, of: k, *Blastophaga psenes* (L.) (after Grandi, 1929a, fig. xxxi, 1), and l, *Ceratosolen dentifer* Wiebes (after Wiebes, 1979b, fig. 2); m, *Wiebesia partita* Bouček, female thorax, after Wiebes (1992a, fig. 20).

2. In the female, the spiracles of the eighth urotergite have large, elongate peritremata (fig. 23), and the wing-venation is complete. The male antennae are slender, placed in deep channels, which are anteriorly separated by a triangular raised area bearing usually three (rarely two) sharp frontal lobes, and the thorax (the pronotum in particular) is elongate (fig. 2, j); the mid tarsi are usually pentamerous *Ceratosolen*
 - The spiracles are smaller and mostly subcircular – if they are larger and oval, the wing-venation is obsolete beyond the marginal vein (*Eupristina*, couplet 4). The male antennae are usually shorter and more clavate – if they resemble those of *Ceratosolen*, the thorax is more robust (fig. 2, i) and the mid tarsi are oligomeric 3
3. The ovipositor-valves of the female are as long as the gaster, or longer. The antenna consists of eleven segments¹. The male genitalia are usually simple (not in *Dolichoris*, couplet 7) 4
 - The ovipositor-valves are shorter than the gaster, mostly half as long or shorter, but exceptionally three-quarters of the length of the gaster. Usually the male genitalia bear cerci with claws 8
4. The venation of the female fore wing is reduced: it is obsolete beyond the marginal vein². The male thorax is tapering caudad (fig. 2, b) *Eupristina*
 - The venation of the female fore wing is more complete, and the male thorax is not tapering caudad 5
5. The female antenna is strongly clavate (fig. 7, a) *Deilagaon*
 - The female antenna, if at all, is not that strongly clavate 6
6. The median ocellus of the female is reduced³. The maxilla is simple. All male tarsi are pentamerous⁴. The pronotum usually is expanded frontad (fig. 2, c) *Waterstoniella*
 - The female has all ocelli normally developed. The maxilla has a bacilliform process⁵. The male fore tarsi usually are bimerous⁵ 7

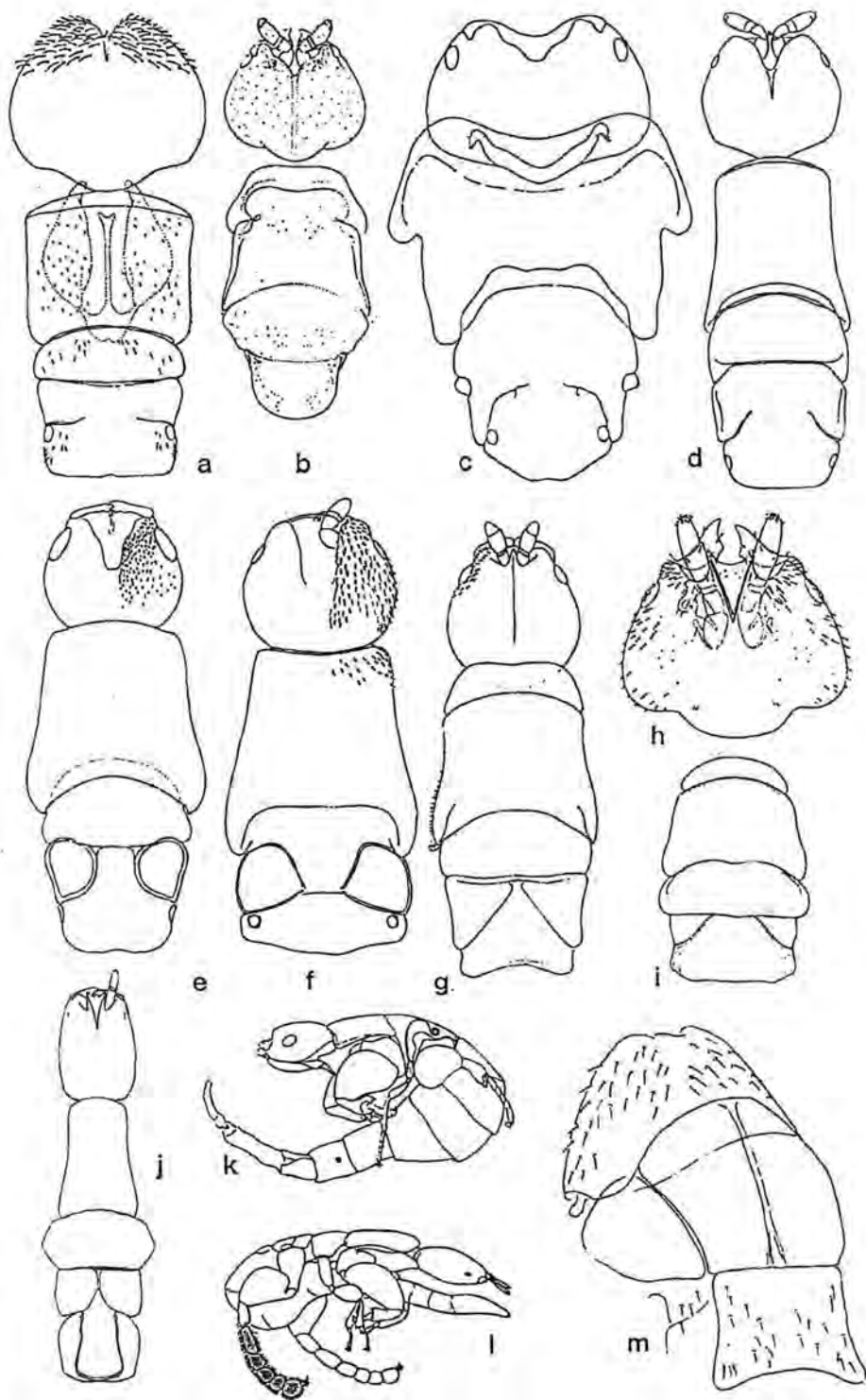
¹The female of no. 57, *Platyscapa corneri* has ten antennal segments. It is recognizable by the long ovipositor. See also no. 66, *Dolichoris vasculosae* (note 2, below).

²Also the female of no. 66, *Dolichoris vasculosae*, has a reduced wing-venation. The head is distinctly longer than wide, and the antenna has ten segments. The maxilla is simple. The spine of the hypopygium has no transverse row of hyaline setae.

³Some species of *Waterstoniella* have a well-developed median ocellus, but in all the maxilla is simple.

⁴Two species are aberrant, viz., the male of no. 38, *Waterstoniella williamsi*, has a bimerous fore tarsus, and that of no. 50, *W. calcaria*, may be oligomeric.

⁵In no. 70, *Dolichoris nervosae*, and no. 71, *D. boschmai*, the male fore tarsus is oligomeric.



7. The spine of the female hypopygium bears one or two row(s) of hyaline setae (fig. 12, f)⁶. The male metanotum is visible dorsally as two ear-like plates (fig. 2, e). The genitalia have (sometimes indistinct) claspers with claws *Dolichoris*
 - The spine of the female hypopygium does not have transverse row(s) of hyaline setae. The male metanotum and the propodeum are completely separated, or only laterally (fig. 2, d). The genitalia are simple *Platyscapa*
8. The female fore tibia bears four or more dorso-apical teeth⁷, and that of the male, seven or more⁸ *Kradibia*
 - The fore tibia of the female bears two or three dorso-apical teeth, and that of the male (two-) three or four (- five)⁹ 9
9. The female antenna has ten segments 10
 - The female antenna has eleven segments 11
10. The wing-venation is partly or quite indistinct – if it is distinct and complete, then the antennal segments are four or more times as long as wide. The male mid tarsus has two or three segments *Liporrhopalum*
 - The wing-venation is distinct, and the antennal segments are little longer than wide. The male mid tarsus is atrophied¹⁰ *Wiebesia* (pars)
11. The female mesoscutum has a longitudinal groove (fig. 2, m) – if this is not distinct, the fore tibia bears four dorso-apical teeth (no. 96, *W. nuda*) or three, but then the hypopygial spine does not bear a row of hyaline setae *Wiebesia* (pars)
 - The female mesoscutum is entire; if the fore tibia bears three dorso-apical teeth, the hypopygial spine bears a transverse row of hyaline setae *Blastophaga*

Pleistodontes Saunders (fig. 3)

Saunders, Trans. ent. Soc. London for 1883: 8 (1883a); Wiebes, Proc. Kon. Ned. Akad. Wet. 94: 137–152 (1991a). Synonyms: *Pleistodontes* Schulz, Spolia Hym.: 148 (1906, unnecessary emendation); *Neoceratosolens* Girault, Mem. Qd. Mus. 4: 312 (1915b); *Proceratosolens* Girault, 'Some beauties...': 3 (1933).

The female head is longer than wide, up to three times in one species, but as long as wide in another; the compound eyes are mostly distinctly shorter than the cheek (0.25–0.5), but in some species about equal to the length of the cheek. In a few species the temple is about as long as the eye, but mostly it is (almost) non-existent. There are three ocelli. The epistomal edge is mostly trilobate, but straight in some species. The antennal scape is mostly 2–3 (up to 5) times as long as wide, it is expanded laterally in most species, and widening apicad in some,

⁶The female of no. 66, *Dolichoris vasculosae* (see note 2), and no. 67, *D. inornata*, have no row(s) of hyaline setae.

⁷The females of two species of *Wiebesia* also bear four dorso-apical teeth, viz., no. 94, *W. macula*, recognizable by the dark wing-macula, and no. 95, *W. partita*, which has the characteristic mesoscutal suture.

⁸The males of three 'border-line' species, viz., no. 127, *Kradibia jacobsi*, no. 128, *K. copiosae*, and no. 129, *K. wassae*, have four or five dorso-apical tibial teeth.

⁹Without also having female specimens available, not all males of the genera *Blastophaga*, *Liporrhopalum* and *Wiebesia* can be identified with certainty.

¹⁰In no. 102, *Wiebesia isabella*, it is slender, but complete (pentamerous).

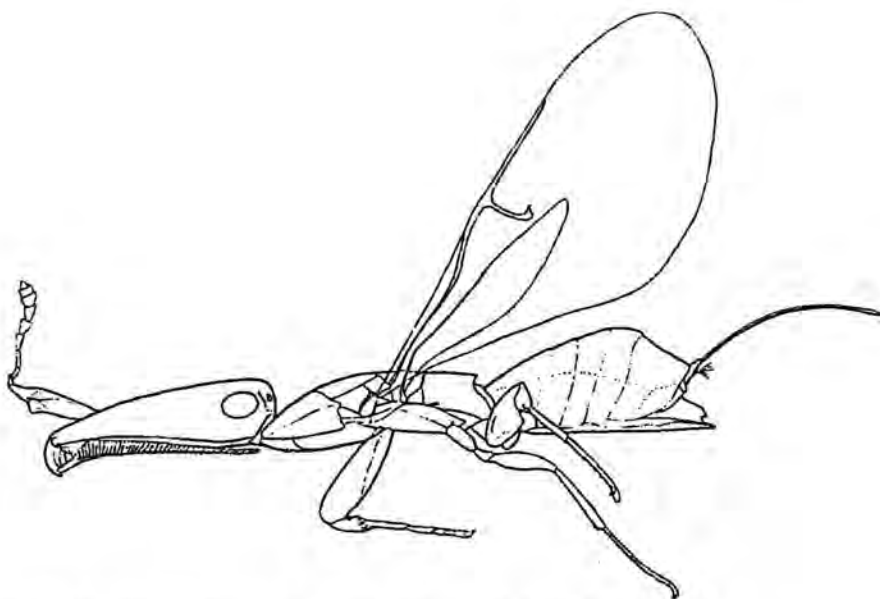


Fig. 3. *Pleistodontes froggatti* Mayr, female, after Bouček (1988, fig. 320).

so as to conceal the pedicel in one species, or – in another species – the third segment conceals the fourth. The mandible usually has an apical tooth (falcate in one species) and a subapical, and a number of ventral ridges may be extended in a tooth; the appendage is up to six times as long as wide, bearing up to eighty ventral ridges, but it may have much less.

There mostly are distinct pollen pockets, but they may be absent. The venation of the fore wing is complete; the postmarginal vein is mostly longer than the stigmal. The fore tibia bears two or three teeth in the dorso-apical comb, or only one, and it has four teeth in one species. The fore tarsus may bear conical spines (group of *P. froggatti*). The hind tibia has two teeth, the antiaxial one of which is bi- or tricuspidate, the axial simple or bifid.

The spine of the hypopygium is short, to two times as long as wide basally (four times in one species). The spiracular peritremata of the eighth urotergite usually are small, subcircular, but large and ovoid in one species. The ovipositor valves are about as long as the gaster (0.7–1.5), 0.5 in one species and 2 times in three. The total length is 1.5–4.5 mm.

The male head is almost as long as wide, or a bit longer (1.1–1.25); the antennal groove is 0.2–0.4 of the length of the head, the eye 0.1–0.3 and usually (much) longer than the cheek, but equal in some species and only half as long in two. The antenna usually has three segments (in one species: two) between the pedicel and the club – these segments are transverse (disk-like) or more (sub-)quadrangular; the club has two segments.

The mesonotum is usually free from the metanotum, but fused in two species; the metanotum usually is fused with the propodeum, or only laterally separate; in one species all terga are free. The tarsi of all legs are pentamerous. The propodeal spiracles are rather large in one species (i.e., about 0.5 of the length of the propodeum), but usually smaller (0.25–0.4). The claspers of the genitalia bear no claws (eight species), two claws (three species of the group of *P. imperialis*), or five (*P. rieki*). The total length is 0.75–2.2 mm.

There are eighteen species known and one unrecognized name (*Pleistodontes liszti* Girault, 1932: [2], from Queensland). Also the unrecognized *Blastophaga breviventris* Mayr (1885: 172) may belong here (see table 1). The host figs belong to the sections *Malvanthera* and *Stilpnophyllum*.

KEY TO THE SPECIES OF PLEISTODONTES (fig. 4)

1. Females. 2
 - Males (some of the groups of *P. rieki* and *P. rennensis* are not known) 19
2. Mesosternal pollen pockets are absent. 3
 - Mesosternal pollen pockets are present (not known for no. 18, *P. claviger*, couplet 10) 10
3. The head is two or more times as long as wide across the compound eyes. Group of *P. rieki* 4
 - The head is at most 1.5 times as long as wide across the compound eyes. Group of *P. rennensis* 8
4. The temple, i.e., the space proximad of the compound eyes, is almost non-existent 5
 - The temple is distinct, equal in length to the longitudinal diameter of the compound eye, or longer 7
5. The ovipositor is short, two-thirds of the length of the gaster. The antennal segments bear one row of sensilla. The ventral ridges on the mandibular appendage are rather strong and coarse, widely spaced. *Ficus xylosyca* Diels (Melanesia: Bougainville Isl., Papua New Guinea, Irian Jaya) 1. *Pleistodontes rieki* Wiebes
 - The ovipositor is twice as long as the gaster. The antennal segments bear two or three rows of sensilla. The ventral ridges on the mandibular appendage are finer, closer together 6
6. The longitudinal diameter of the compound eye is not quite half as long as the cheek. The mandibular appendage bears ca. fifty ventral ridges. The spine of the hypopygium is approximately twice as long as its basal width. Collected at light (Melanesia: Irian Jaya) 2. *Pleistodontes galbinus* Wiebes
 - The longitudinal diameter of the compound eye is one quarter of the length of the cheek. The mandibular appendage bears seventy to eighty ventral ridges. The spine of the hypopygium is approximately four times as long as its basal width. Collected at light (Melanesia: Irian Jaya, Papua New Guinea) 3. *Pleistodontes longicaudus* Wiebes
7. The temple is equal to the longitudinal diameter of the compound eye; the cheek is three times as long as the eye. The number of ridges on the mandibular appendage is ca. 35. The dorsal armature of the fore tibia consists of four teeth. *Ficus sterrocarpa* Diels (Melanesia: Papua New Guinea) 4. *Pleistodontes immaturus* Wiebes

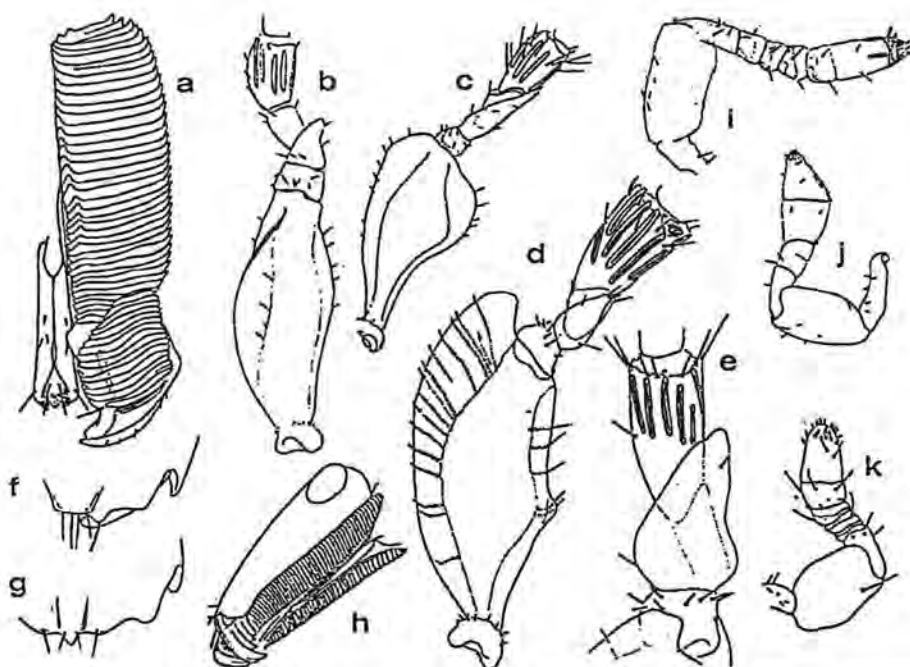


Fig. 4. Details of *Pleistodontes*. a, *P. rennelliensis* Wiebes, female mandible and its appendage, labium and maxillae, after Wiebes (1968, fig. 4); b–e, proximal five segments of female antenna, of: b, *P. cuneatus* Wiebes, after Wiebes (1990, fig. 7), c, *P. rennelliensis*, after Wiebes (1968, fig. 2), d, *P. rigisamos* Wiebes, and e, *P. addicotti* Wiebes, after Wiebes (1991a, figs. 3 and 6, respectively); f and g, female epistomal edge of: f, *P. proximus* Wiebes and g, *P. imperialis* Saunders, after Wiebes (1990, figs. 11 and 12, respectively); h, *P. froggatti*, female head in ventro-lateral view showing mandibular appendage, after Bouček (1988, fig. 321); i–k, male antenna of: i, *P. addicotti*, after Wiebes (1991a, fig. 10), j, *P. blandus* Wiebes, and k, *P. rieki* Wiebes, after Wiebes (1963b, figs. 8 and 19, respectively).

- The temple is about 1.3 times as long as the compound eye, which is two-fifths of the length of the cheek. The number of ridges on the mandibular appendage is ca. 75. The dorsal armature of the fore tibia consists of two large teeth. *Ficus hesperidiiformis* King (Melanesia: Papua New Guinea, Irian Jaya) 5. *Pleistodontes plebejus* Wiebes
- 8. The mandibular tooth is sharp, falcate, the ventral surface of the mandible is rather smooth. Collected at light (Melanesia: Irian Jaya) (remnants of a female specimen were found in herbarium-material of *F. glandifera*) . . . 6. *Pleistodontes mandibularis* Wiebes
- The mandible has a normal apical tooth, the ventral surface has distinct ridges 9
- 9. The longitudinal diameter of the compound eye is half as long as the cheek. The ventral ridges between the medial and lateral teeth of the mandibular appendage are finely crenulate. The postmarginal vein of the fore wing is approximately two times as long as the stigmal. The hypopygium is blunt at the apex. *Ficus glandifera* Summerh. (Melanesia: Solomon Isl.) 7. *Pleistodontes blandus* Wiebes

- The longitudinal diameter of the compound eye is about as long as the cheek. The ventral ridges of the mandibular appendage are almost straight (fig. a). The postmarginal vein of the fore wing is almost three times as long as the stigmal. The spine of the hypopygium is sharp. Collected at light (Melanesia: Rennell Isl. and other Solomon Isl., Bougainville Isl., New Ireland, Papua New Guinea, Irian Jaya) . 8. *Pleistodontes rennellensis* Wiebes
- 10. The segments of the antennal funicle bear long, flexible sensilla chaetica next to the sensilla linearia. *Ficus elastica* Roxb. ex Hornem. (Indonesia: Java) 18. *Pleistodontes claviger* (Mayr)
- The segments of the antennal funicle bear only sensilla linearia in one or more rows . 11
- 11. The mandibular appendage bears ventral rows of small teeth (fig. h). The fore tarsus has conical spines. Group of *P. froggatti* 12
- The mandibular appendage bears ventral lamellae. The fore tarsus has no conical spines 13
- 12. The mandibular appendage bears forty ventral rows of teeth. The fore tarsus has ca. twenty conical spines. *Ficus macrophylla* Desf. ex Pers. (Australia, introduced e.g., to Hawaii) 9. *Pleistodontes froggatti* Mayr
- The mandibular appendage bears seventy ventral rows of teeth. The fore tarsus has ca. forty conical spines. *Ficus pleurocarpa* F.v.M. (Australia: Queensland) 10. *Pleistodontes nitens* (Girault)
- 13. Large bicolorate wasps with a total length (head, thorax and gaster) of almost three mm or more. Group of *P. nigriventris* 14
- Smaller, at most two mm in total length; the colour mostly is uniform brownish. Group of *P. imperialis* 15
- 14. The third antennal segment is large and rather wide, concealing the fourth and the proximal half of the fifth in antiaxial view (fig. e). The antennal segments has two rows of sensilla. *Ficus crassipes* F.M.Bailey (Australia: Queensland) 11. *Pleistodontes addicotti* Wiebes
- The third antennal segment is smaller and more attenuated, its apex reaching the base of the fifth. The antennal segments have one row of sensilla. *Ficus watkinsiana* F.M.Bailey (Australia: New South Wales & Queensland) 12. *Pleistodontes nigriventris* (Girault)
- 15. The head is little longer than wide across the compound eyes (1.1); the eye is ca. four-fifths of the length of the cheek. The antennal scape is expanded apicad (fig. d). The valves of the ovipositor are only about half as long as the gaster. *Ficus destruens* F.v.M. ex C.White (Australia: Queensland) 13. *Pleistodontes rigisamos* Wiebes
- The head is ca. 1.5 times as long as wide across the compound eyes (1.2–1.8); the eye is not much longer than half the length of the cheek (0.35–0.55). The antennal scape is not expanded apicad. The valves of the ovipositor are about as long as the gaster (0.8–1.2) 16
- 16. The mandibular appendage bears ca. 15–20 ventral ridges 17
- The mandibular appendage bears ca. 25 ventral ridges (22–28). The epistomal edge has a pointed median prominence (fig. g). The fore tibia has two teeth in the dorso-apical row. *Ficus rubiginosa* Desf. ex Vent. (Australia: New South Wales, introduced into the other parts and e.g., to Hawaii and New Zealand); *Ficus platypoda* (Miq.) A.Cunn. ex Miq. (Australia: Queensland, northern part of the Northern Territory); and *Ficus obliqua* Forst.f. var. *petiolaris* (Benth.) Corner (Australia: Queensland, introduced e.g., into South Australia) 15. *Pleistodontes imperialis* Saunders

17. The fore tibia has two teeth in the dorso-apical comb. The epistomal edge has a pointed median prominence. *Ficus obliqua* Forst.f. var. *obliqua* (Polynesia: Fiji, Samoa; Australia: Queensland, New South Wales); and *Ficus platypoda* (Miq.) A.Cunn. ex Miq. (Australia: central Western Australia) 17. *Pleistodontes greenwoodi* (Grandi)
- The fore tibia has three teeth in the dorso-apical comb. The median part of the epistomal edge is straight (fig. f) 18
18. The antennal scape is slender (fig. b): length/width ca. 2.5. The head is more than 1.5 times as long as wide across the compound eyes, which are half as long as the cheek. *Ficus leucotricha* Miq. (Australia: W. Australia (Kimberley) and Northern Territory) 14. *Pleistodontes cuneatus* Wiebes
- The antennal scape is more robust (as in fig. c): length/width ca. 2. The head is relatively shorter: 1.25 times as long as wide across the compound eyes, which are two-thirds of the length of the cheek. *Ficus platypoda* (Miq.) A.Cunn. ex Miq. (Australia: W. Australia (Kimberley) and Northern Territory) 16. *Pleistodontes proximus* Wiebes
19. The antenna has two anelli. The meso-, metanotum and propodeum are fused (♀, couplet 9) 7. *Pleistodontes blandus* Wiebes
- The antenna has three anelli. Various combinations of fusion occur, but not between all terga mentioned 20
20. All thoracic terga are free. The head is $1\frac{1}{4}$ times its width; the antennal anelli are subquadrangular. The propodeal spiracles are small: less than one-fifth of the length of the propodeum (♀, couplet 12) 9. *Pleistodontes froggatti* Mayr
- At least some thoracic terga are fused. Mostly, the head is distinctly shorter. The propodeal spiracles are larger: at least one-quarter of the length of the propodeum 21
21. The metanotum and the propodeum are fused 22
- The metanotum and the propodeum are free, if only laterally 26
22. The antennal anelli are transverse, distinctly shorter than wide 23
- The antennal anelli are subquadrangular 25
23. The eye is short, as long as the cheek. The genital claspers have no claws (♀, couplet 15) 13. *Pleistodontes rigisamos* Wiebes
- The eye is longer: three times as long as the cheek 24
24. The propodeal spiracles are half as long as the propodeum. The genital claspers are devoid of claws (♀, couplet 12) 10. *Pleistodontes nitens* (Girault)
- The propodeal spiracles are one-quarter of the length of the propodeum. The genital claspers bear two claws (♀, couplet 18) 14. *Pleistodontes cuneatus* Wiebes
25. The eye is small: half as long as the cheek (♀, couplet 7) 5. *Pleistodontes plebejus* Wiebes
- The eye is larger: two times as long as the cheek. Two species that cannot be differentiated in the male sex (♀♀, couplet 14) 11. *Pleistodontes addicotti* Wiebes and 12. *Pleistodontes nigriventris* (Girault)
- The eye is larger still: three times as long as the cheek. Three species that cannot be differentiated in the male sex, viz. (♀, couplet 16) 15. *Pleistodontes imperialis* Saunders (♀, couplet 17) 17. *Pleistodontes greenwoodi* (Grandi) (♀, couplet 18) 16. *Pleistodontes proximus* Wiebes
26. The mesonotum and the metanotum are fused (♀, couplet 10) 18. *Pleistodontes claviger* (Mayr)
- The mesonotum and the metanotum are separate. The genital claspers bear five claws (♀, couplet 5) 1. *Pleistodontes riei* Wiebes

1. *Pleistodontes rieki* Wiebes

Wiebes, Zool. Meded. Leiden 38: 309–313 (1963b); Wiebes, Zool. Meded. Leiden 52: 149 (1977d).

The female head is slightly more than two times as long as wide across the compound eyes, which are ca. one-third of the length of the cheek. The epistomal margin is prominent, scarcely lobed. The antennal scape is four times as long as wide, not at all expanded; the funicular segments bear one row of sensilla. The mandible has five large, prominent ventral ridges; the appendage is 4.5 times as long as wide and it has ca. 30–35 rather strong ventral ridges, which are relatively widely spaced.

There are no pollen pockets. The fore tibia has two teeth in the dorso-apical comb; the hind tibia has two bidentate teeth.

The spine of the hypopygium is short, but sharp. The total length is 2.7–3.2 mm; the ovipositor valves are two-thirds of the length of the gaster. The colour is brown, but the head and the dorsal sclerites of the thorax are darker.

The male head is slightly wider than long; the antennal groove is one-third, the eye one-seventh of the length of the head: it is little longer than the cheek. The antenna (fig. k) has three transverse anelli. The pronotum is almost quadrangular; the metanotum is laterally separate from the propodeum; the spiracular peritremata are one-third of the length of the propodeum. The claspers of the genitalia bear five claws. The total length is ca. 1.2 mm. The colour is yellow-brown, but the head is darker.

The host fig is *Ficus xylosyca* Diels and its var. *cyclindrocarpa* (Diels) Corner (Melanesia: Bougainville Isl., Papua New Guinea, Irian Jaya).

2. *Pleistodontes galbinus* Wiebes

Wiebes, Zool. Meded. Leiden 52: 149–151 (1977d).

The female head is more than two times as long as wide across the compound eyes (2.2), which are two-fifths of the length of the cheek. The epistomal edge has three lobes. The antennal scape is three times as long as wide, a bit widening apicad; the funicular segments have up to two rows of sensilla (three in the eleventh segment). The mandible has six ventral lamellae, three of which are axially produced into a tooth; the appendage is five times as long as wide, and it has about fifty ventral ridges, produced into blunt teeth axially and antiaxially.

There are no pollen pockets. The fore tibia has two long dorsal teeth and a smaller one in between; the hind tibia ends in a hyaline edge and bears an armature consisting of two small teeth: the axial one long, forked at the tip, and the antiaxial one more robust, tricuspidate.

The spine of the hypopygium is two times as long as its basal width, sharp. The ovipositor valves are almost two times as long as the gaster. The total length

is ca. 3.5 mm. The colour is uniform light yellowish, the head is a trifle darker.

The male is not known.

The species was described from light catches (Melanesia: Irian Jaya).

3. *Pleistodontes longicaudus* Wiebes

Wiebes, Zool. Meded. Leiden **52**: 151 (1977d).

The female head is more than two times as long as wide across the compound eyes (2.2), which are one quarter of the length of the cheek. Most other characters of the head are much as in *P. galbinus*, but the mandibular appendage has 70–80 ventral ridges.

There are no pollen pockets. The fore tibia has one long, dorso-apical tooth; the hind tibia has two apical teeth, essentially similar to, but larger than those of *P. galbinus*.

The spine of the hypopygium is four times as long as its basal width, acute. The ovipositor valves are two times as long as the gaster. The total length is ca. 4.4 mm. The colour is yellowish brown, the dorsum is brown, the head even darker.

The male is not known.

The species was described from light catches (Melanesia: Irian Jaya, Papua New Guinea).

4. *Pleistodontes immaturus* Wiebes

Wiebes, Zool. Meded. Leiden **38**: 317–319 (1963b).

The female head is slightly more than two times as long as wide across the compound eyes, which are one-third of the length of the cheek and equal to the length of the temple. The epistomal edge is trilobate. The antennal scape is four times as long as wide; the funicular segments bear rather short sensilla in two or three rows. The mandible has three or four strong ridges produced into a tooth; the appendage is six times as long as wide, it has ca. 35 bidentate ventral ridges.

There are no pollen pockets. The fore tibia has a dorso-apical comb consisting of four teeth; the hind tibia has two bidentate teeth, the antiaxial one of which is almost one quarter of the length of the first tarsal segment.

The spine of the hypopygium is very long, but not very sharp. The ovipositor valves are two-thirds of the length of the gaster. The total length is ca. 4.7 mm. The colour is dark brown, the ventral surface and the extremities are lighter.

The male is not known.

The host fig is *Ficus sterrocarpa* Diels (Melanesia: Papua New Guinea).

5. *Pleistodontes plebejus* Wiebes

Wiebes, Zool. Meded. Leiden 38: 313–316 (1963b); Wiebes, Zool. Meded. Leiden 52: 151–153 (1977d).

The female head is three times as long as wide across the compound eyes, which are two-fifths of the length of the cheek and three quarters of that of the temple. The epistomal lobes are rounded. The antennal scape is $2\frac{1}{2}$ times as long as wide, widening apicad; the funicular segments have sensilla in two rows. The mandible resembles that of *P. rieki*, but it has eight ventral ridges; the appendage is seven times as long as wide and it has ca. 75 ventral, bidentate lamellae.

There are no pollen pockets. The fore tibia has two large dorsal teeth; the hind tibia is much as in *P. immaturus*, but the axial tooth is even longer: one-third of the length of the first tarsal segment.

The spine of the hypopygium is sharp, but not very long. The ovipositor valves are two-thirds of the length of the gaster. The total length is ca. 4.7 mm. The colour is dark brown, but the ventral surface and the extremities are lighter.

The male head is not much longer than its maximum width; the antennal groove is one-third, the eye one-tenth of the length of the head; it is one half of that of the cheek. The antennal anelli are subquadrangular. The pronotum is rounded anteriorly, elongate, the metanotum is fully fused with the propodeum; the spiracular peritremata are rather large: more than half as long as the propodeum. The claspers of the genitalia bear no claws. The total length is ca. 2.2 mm. The colour is brown, the mid legs and the hind femora are a trifle more yellowish.

The host fig is *Ficus hesperidiiformis* King (Melanesia: Irian Jaya, Papua New Guinea).

6. *Pleistodontes mandibularis* Wiebes

Wiebes, Zool. Meded. Leiden 52: 144–146 (1977d).

The female head is about as long as wide across the compound eyes, which are somewhat shorter than the cheek (0.8). The epistomal edge is rather large and prominent. The antennal scape is over three times as long as wide, not expanded; the funicular segments bear one row of long sensilla. The mandible is falcate, bearing a very long apical tooth; the appendage is 1.75 times as long as wide and it has about twenty ventral lamellae, medially produced into a tooth.

There are no pollen pockets. The fore tibia has three dorsal teeth: two large and a smaller one in between; the hind tibia has a bicuspidate antiaxial tooth and a slender axial.

The spine of the hypopygium is short. The ovipositor valves are somewhat longer than the gaster. The total length is ca. 1.8 mm. The colour is brownish.

The male is not known.

The species was described from light catches (Melanesia: Irian Jaya), and remnants of a female specimen were found in herbarium-material of *Ficus glandifera* Summerh.

7. *Pleistodontes blandus* Wiebes

Wiebes, Zool. Meded. Leiden 38: 303–307 (1963b); Wiebes, Zool. Meded. Leiden 52: 147 (1977d).

The female head is almost 1.35 times as long as wide across the compound eyes, which are about half as long as the cheek. The antennal scape is two times as long as wide, expanded apically; the segments of the funicle bear one row of long sensilla. The mandible bears about fifteen ventral ridges; the appendage is 2.75 times as long as wide and it bears 35 ventral ridges which, between the medial and lateral teeth, are finely crenulate.

There are no pollen pockets. The fore tibia has three teeth in the dorso-apical comb; the hind tibia has one antiaxial, tridentate tooth and an axial, bidentate one.

The spine of the hypopygium is very short and blunt. The ovipositor valves are $1\frac{1}{2}$ times as long as the gaster. The total length is ca. 2.4 mm. The colour is yellowish brown.

The male head is distinctly longer than its maximum width and nearly two times as long as wide anteriorly; the antennal groove is two-fifths of the length of the head, the eye one-tenth: it is half as long as the cheek. The antenna (fig. j) has only two, incompletely separate, subquadrangular anelli. The pronotum is elongate; the mesonotum, metanotum and propodeum are fused; the spiracular peritremata are about half as long as the margin of the propodeum posteriad to the spiracles. The claspers of the genitalia bear no claws. The total length is 1.1–1.3 mm. The colour is brown.

The host fig is *Ficus glandifera* Summerh. (Melanesia: Solomon Isl.).

8. *Pleistodontes rennellensis* Wiebes

Wiebes, Nat. Hist. Rennell Isl. 5: 115–117 (1968, *P. blandus rennellensis*); Wiebes, Zool. Meded. Leiden 52: 147–149 (1977d).

The species is much like *P. blandus*. The female head is one-fifth longer than wide across the compound eyes, which are subequal in length to the cheek. The antennal scape is expanded apically, even more so than in *P. blandus*; the funicular

segments bear long sensilla in one row. The mandible bears an appendage, the forty ventral ridges of which are straight between the medial and lateral teeth.

There are no pollen pockets. The dorso-apical armature of the fore tibia has only two distinct, widely spaced teeth; the axial tooth of the hind tibia is more slender than that of *P. blandus*, or even spur-like.

The spine of the hypopygium is two times as long as wide basally, sharp. The ovipositor valves are two times as long as the gaster. The total length is 1.8–2.0 mm. The colour is yellowish brown, the head light red-brown, the compound eyes black.

The male is not known.

The species was caught at light (Melanesia: Rennell Isl. and other Solomon Isl., Bougainville Isl., New Ireland, Papua New Guinea, Irian Jaya).

9. *Pleistodontes froggatti* Mayr

Mayr, Wien. ent. Ztg. 25: 157–160 (1906); Grandi, Boll. Lab. zool. Portici 11: 150–159 (1916b); Wiebes, Zool. Meded. Leiden 38: 307 (1963b, full bibliography); Bouček, Australasian Chalc.: 191 (1988). Synonyms: *Pleistodontes nigris* Girault, 'Some gem-like...': [2] (1925b); *P. semiruficeps* Girault, Trans. R. Soc. A. Austr. 53: 318 (1929); *P. mayri* Girault, Ohio J. Sci. 39: 325 (1939, unnecessary replacement name).

The female head is $2\frac{1}{2}$ times as long as wide across the compound eyes, which are one quarter of the length of the cheek. The epistomal edge is prominent, bearing three lobes. The antennal scape is four times as long as wide, little expanded; the funicular segments bear long sensilla in one row. The mandible is tridentate at its apex; the appendage is six times as long as wide and it bears ca. 40 well-spaced rows of small crenulations.

There are distinct pollen pockets. The fore tibia bears two dorso-apical teeth, the first tarsal segment bears ca. twenty conical spines; the hind tibia has a bidentate antiaxial tooth and a simple, slender axial.

The spine of the hypopygium is short and blunt. The ovipositor valves are as long as the gaster. The total length is ca. 2.2 mm. The colour is dark brown.

The male head is one quarter longer than wide across the compound eyes, which are one-tenth of the length of the head; approximately as long as the cheek. The antennal groove is almost a quarter of the length of the head. The antenna has three subquadrangular anelli. The pronotum is almost rectangular, distinctly longer (laterally) than wide (1.3); the mesonotum, metanotum and propodeum (these two indistinctly) are all free; the spiracular peritremata are very small, about one-sixth of the length of the propodeum. The claspers of the genitalia bear no claws. The total length is ca. 1.4 mm. The colour is light brown.

The host fig is *Ficus macrophylla* Desf. ex Pers. (widespread along the northeastern coast of Australia, but wasps introduced into Hawaii, and also recorded from Western Australia). Cook (1992) reported on the reproductive interactions of the Moreton Bay Fig and *P. froggatti*.

10. *Pleistodontes nitens* (Girault)

Girault, Mem. Qd. Mus. 4: 312–313 (1915b, *Neoceratosolens*); Bouček, Australasian Chalc.: 192 (1988). Synonym: *Pleistodontes regalis* Grandi, Boll. Ist. Ent. Univ. Bologna 19: 61–67 (1952).

The female head is $2\frac{1}{2}$ times as long as wide across the compound eyes, which are one quarter of the length of the cheek and two times as long as the temple. The epistomal edge is prominent, trilobate. The antennal scape is five times as long as wide, scarcely dilated; the funicular segments bear one row of long sensilla. The mandible is much like that of *P. froggatti*, but the appendage has over 70 rows of denticles, close together.

There are distinct pollen pockets. The fore tibia has two teeth in the dorso-apical comb, the first tarsal segment bears ca. forty conical spines; the hind tibia is much like that of *P. froggatti*.

The spine of the hypopygium is short, almost non-existent; the spiracular peritremata of the eighth urotergite are very large. The ovipositor valves are somewhat shorter than the gaster (0.8).

The total length is ca. 3.2 mm. The colour is dark brown.

The male head is about as long as wide (1.1); the eyes are one-tenth of the length of the head, and three times as long as the cheek. The antennal groove is one-fifth of the length of the head. The antenna has three transverse anelli. The pronotum is long, 1.75 times as long (laterally) as wide; the metanotum and the propodeum are fused; the spiracular peritremata are one half of the length of the margin of the propodeum. The claspers of the genitalia bear no claws. The total length is 1.8 mm. The colour is dark brown.

The host fig is *Ficus pleurocarpa* F.v.M. (Australia: Queensland, New South Wales).

11. *Pleistodontes addicotti* Wiebes

Wiebes, Proc. Kon. Ned. Akad. Wet. 94: 142–144 (1991a).

The female head is 1.7 times as long as wide across the compound eyes, which are 0.45 of the length of the cheek. The epistomal edge has moderate lobes. The antennal scape is twice as long as wide, expanded laterad, but not at all apicad; the third segment is large and rather wide, concealing the fourth and the proximal half of the fifth segment in antiaxial view; the fifth to eighth segments bear two rows of sensilla. The mandible has eleven ventral ridges, three of which are

extended into a tooth; the appendage is five times as long as wide, and it bears some 25 ventral ridges, none of which is particularly denticulate.

The thorax has large pollen pockets. The fore tibial spur is slender and rather short: 0.75 of the length of the first tarsal segment; the hind tibial armature consists of two teeth, the axial one bifid, the antiaxial one tricuspidate.

The hypopygium has as short, blunt spine. The spiracular peritremata of the eighth urotergite are large, ovoid in shape. The ovipositor valves are one-fifth shorter than the gaster. The total length is ca. 3.5 mm. The colour is dark brown dorsally, but the ventral parts, including the extremities, are yellowish.

The male head is subcircular in outline, and the antennal groove reaches to about one-third of its length; the eye is approximately one-seventh of the length of the head, and two times as long as the cheek. The three antennal anelli are rather long, the first even subquadrate (fig. i). The thorax is much like that of *P. froggatti*. The genitalia bear claspers without claws. The total length (head and thorax) is 1.6–1.9 mm. The colour is brown, but the proximal part of the pronotum may be blackish.

The host fig is *Ficus crassipes* F.M. Bailey (Australia: northern Queensland).

12. *Pleistodontes nigriventris* (Girault)

Girault, Canad. Ent. 47: 44–45 (1915a, *Agaon*); Girault, Mem. Qd. Mus. 4: 311 (1915b); Bouček, Australasian Chalc.: 192 (1988); Wiebes, Beaufortia 41: 220–222 (1990).

The female head is over 1.75 times as long as wide across the compound eyes, which are two-fifths of the length of the cheek. The epistomal edge is trilobate, not very prominent. The antennal scape is two times as long as wide, expanded laterally; the funicular segments bear one row of long sensilla. The mandible bears ten ventral ridges, five of which are extended into a tooth; the appendage is four times as long as wide, and it bears almost 25 ventral lamellae.

There are distinct pollen pockets. The fore tibia has two sharp dorso-apical teeth; the hind tibia bears a bidentate antiaxial tooth and a simple axial.

The hypopygium has a blunt spine, two times as long as wide basally. The ovipositor valves are about as long as the gaster. The total length is ca. 2.7 mm. The colour is yellowish, but there are blackish patches on various parts of the body.

The male is similar to that described above of *P. addicotti*. The total length is 1.3 mm, and the colour is uniform brown.

The host fig is *Ficus watkinsiana* F.M. Bailey (Australia: Queensland, New South Wales).

13. *Pleistodontes rigisamos* Wiebes

Wiebes, Proc. Kon. Ned. Akad. Wet. **94**: 145–147 (1991a).

The female head is longer than wide across the compound eyes (1.1), which are 0.8 of the length of the cheek. The epistomal edge is straight, with a distinct medial prominence. The antennal scape extends apicad a bit further, or as far as (but next to) the subquadrate pedicel, and also laterad: it is three times as long as wide; the funicular segments bear long sensilla in one row. The mandible has ten ventral ridges, three of which are extended into a tooth; the appendage is almost four times as long as wide (3.75), and it bears eleven or twelve ventral ridges, the proximal six or seven of which are distinctly denticulate.

The thorax has small mesosternal pollen pockets. The fore tibial armature consists of two dorso-apical teeth; the hind tibia has two teeth, viz., a robust, tricuspidate, antiaxial one, and a slender, bifid, axial.

The hypopygium has a short, sharp, spine. The spiracula of the eighth urotergite are small, subcircular in shape. The ovipositor valves are a little more than half as long as the gaster. The total length is ca. 1.75 mm. The colour is brown, but the extremities are yellowish.

The male head is as wide as it is long, and the antennal groove reaches to not quite a quarter of the length; the eye is 0.15 of the length of the head, approximately as long as the cheek. There are three transverse antennal anelli. The pronotum is distinctly longer (measured laterally) than wide (4 : 3); the mesonotum is 2.5 times as wide as long in the middle; the metanotum/propodeum is not quite as long as wide (0.8); the propodeal spiracles are two-fifths of the length of the propodeum. In the genitalia no claspers could be found. The total length is ca. 0.9 mm. The colour is uniform yellow-brown.

The host fig is *Ficus destruens* F.v.M. (Australia: Queensland).

14. *Pleistodontes cuneatus* Wiebes

Wiebes, Beaufortia **41**: 224 (1990); Wiebes, Proc. Kon. Ned. Akad. Wet. **94**: 151 (1991a).

The female head is 1.6 times as long as wide across the compound eyes, which are half as long as the cheek. The epistomal edge is rather prominent, but without lobes. The antennal scape is slender, $2\frac{1}{2}$ times as long as wide; the funicular segments bear long sensilla in one row. The mandible has six ventral ridges, three of which are extended into a tooth; the appendage is three times as long as wide, and it bears 16 ventral ridges and some (antiaxial) vestiges.

There are pollen pockets. The fore tibia has three dorso-apical teeth; the hind tibial armature is as in *P. nigriventris*.

The spine of the hypopygium is much as in *P. nigriventris*, but it is more slender. The ovipositor valves are as long as the gaster. The total length is ca. 2 mm. The colour is brown.

The male head is a bit longer than wide (1.1), and the antennal groove reaches to a quarter of the length; the eye is a quarter of the length of the head, three times as long as the cheek. There are three transverse antennal anelli. The pronotum is subquadrate; the mesonotum is 1.5 times as wide as long in the middle; the length of the metanotum/propodeum is three quarters of the width. The propodeal spiracles are a quarter of the length of the propodeum. The genital claspers bear two claws. The total length is ca. 0.9 mm. The colour is uniform yellow-brown.

The host fig is *Ficus leucotricha* Miq. (Australia: Western Australia (Kimberley), and Northern Territory).

15. *Pleistodontes imperialis* Saunders

Saunders, Trans. ent. Soc. London for 1883: 10 (1883a); Mayr, Wien. ent. Ztg. **25**: 159–160 (1906); Grandi, Boll. Lab. Ent. Bologna **1**: 200–203 (1928d); Wiebes, Zool. Meded. Leiden **38**: 307–309 (1963b); Wiebes, Beaufortia **41**: 222 (1990); Wiebes, Proc. Kon. Ned. Akad. Wet. **94**: 147–149 (1991a). Synonyms: *Pleistodontes nigricaput* Girault, Rec. S. Austr. Mus. **3**: (1927); *Proceratosolens medionigra* Girault, 'Some beauties': 3–4 (1933).

The female head is ca. $1\frac{1}{2}$ times as long as wide across the compound eyes (ca. 1.4 to ca. 1.75), which are ca. 0.45 (0.35–0.55) of the length of the cheek. The epistomal edge has moderate lobes, the median one of which is prominent. The antennal scape is two times as long as wide; the funicular segments bear one row of sensilla. The mandible bears seven ventral ridges, four of which are prolonged in teeth; the appendage is $5\frac{1}{2}$ times as long as wide, and it bears ca. 25 straight ventral ridges.

The mesosternal pollen pockets are distinct. The fore tibia has two teeth in the dorso-apical comb; the hind tibia has a bidentate antiaxial tooth and a simple axial.

The spine of the hypopygium is approximately twice as long as it is wide at the base, blunt at the tip. The ovipositor valves are about as long as the gaster. The total length is ca. 1.7 mm. The colour is uniform dark brown; the fore and mid tibiae and all tarsi are lighter.

The male head is about as long as wide; the antennal groove is one-fifth, and the eye one-sixth of the length of the head. The antenna has three short anelli. The pronotum is about as long as wide anteriorly; the metanotum and propodeum are fused; the spiracular peritremata are 0.3 of the length of the propodeum. The claspers of the genitalia bear two claws. The total length is ca. 0.9 mm. The colour is yellow-brown, and the head is much darker: sometimes chocolate-brown.

The host fig is *Ficus rubiginosa* Desf. ex Vent. (Australia: New South Wales and other places, where it was introduced: see McKey, 1989: 665 for a list). In

Queensland the host was identified with *F. platypoda* (Miq.) A. Cunn. ex Miq., as also in the northern part of the Northern Territory: this may be an argument in the dispute over the identity of these two figs. The var. *petiolaris* was originally described in *F. platypoda*, but later it was shifted to *F. obliqua* (Corner, 1960: 402; Chew, 1989: 45). The pollinator identity (Queensland, also in the Botanical Garden in Sydney) may point to the first-mentioned relation.

From *Ficus platypoda* in northern and central Australia two other species of *Pleistodontes* were recorded, see under *P. proximus* and *P. greenwoodi*.

16. *Pleistodontes proximus* Wiebes

Wiebes, *Beaufortia* 41: 223–224 (1990); Wiebes, *Proc. Kon. Ned. Akad. Wet.* 94: 151 (1991a).

The female head is 1.25 times as long as wide across the compound eyes, which are two-thirds of the length of the cheek. The epistomal edge is straight. The mandibular appendage bears 15 ventral ridges. The fore tibia has three teeth in the dorso-apical comb. Otherwise, the species is very much like *P. imperialis*. The total length is ca. 1.5 mm.

The male head is longer than wide (1.15); the antennal groove is one-third of the length; the eye is one-third of the length, three times as long as the cheek. The antennal anelli are subquadrangular. The pronotum is longer than wide (1.25); the mesonotum is almost two times as wide as long in the middle (1.9); the length of the metanotum/propodeum is three quarters of the length; the spiracles are one-third of the length of the propodeum. The genital claspers bear two claws. The total length is ca. 0.9 mm. The colour is uniform yellow-brown.

The host fig is *Ficus platypoda* (Miq.) A. Cunn. ex Miq. (Australia: Western Australia (Kimberley), and Northern Territory). From the same species of fig, *P. greenwoodi* was recorded.

17. *Pleistodontes greenwoodi* (Grandi)

Grandi, *Boll. Lab. Ent. Bologna* 1: 65–68 (1928b); Grandi, *Boll. Lab. Ent. Bologna* 4: 8 (1931) (both in *Blastophaga*); Wiebes, *Proc. Kon. Ned. Akad. Wet.* 94: 150–151 (1991a).

The female head is about $1\frac{1}{2}$ times as long as wide across the compound eyes, or a bit less. The eyes are 0.6 (0.5–0.7) of the length of the cheek. The epistomal edge has a pointed median prominence. The antennal scape is 1.7 times as long as wide; the funicular segments bear one row of long sensilla. The mandible has eight ventral ridges, but it has only one distinct, apical tooth; the appendage is four times as long as wide, and it bears 16 (15–21) ventral lamellae.

Pollen pockets are present. The fore tibia has two dorso-apical teeth; the hind tibia has a tricuspidate antiaxial tooth and a more slender, bifid axial.

The spine of the hypopygium is as in *P. imperialis*. The ovipositor valves are as long as the gaster. The total length is ca. 1.5 mm. The colour is brown.

The male is much like that of *P. imperialis*, but it seems more compact: the head is subquadrate in outline, and the antennal groove reaches to about one quarter of the length; the eye is approximately one quarter of the length of the head; the cheek is very short. The antennal anelli are subquadrangular. The pronotum is subquadrate; the combined lengths of the mesonotum (separate), metanotum and propodeum are approximately as long as the pronotum and a bit wider; the spiracles are 0.3 of the length of the propodeum. The genitalia bear claspers, which seem to have no claws. The total length is ca. 0.75 mm. The colour is yellowish, but the head is darker, sometimes opaque.

The host fig is *Ficus obliqua* Forst.f. (Polynesia: Fiji, Samoa; Australia: Queensland and New South Wales), but in central (southern part of the Northern Territory) and Western Australia the species is also recorded from *Ficus platypoda* (Miq.) A. Cunn. ex Miq.: see Wiebes (1990, fig. 11) for a distribution-map. Bouček (1993: 205) recorded the species from the introduced *Ficus obliqua* in Riverside (California, U.S.A.), where it occurs 'also in *F. archeri*'.

18. *Pleistodontes claviger* (Mayr)

Mayr, Verh. zool.-bot. Ges. Wien 35: 174–175 (1885); Grandi, Boll. Lab. Ent. Bologna 1: 126–130 (1928d) (both in *Blastophaga*); Wiebes, Proc. Kon. Ned. Akad. Wet. 97: 132–133 (1994).

The female head is 1.2 times as long as wide across the compound eyes, which are a bit longer than the cheek; the epistomal margin has a prominent median lobe. The antennal scape is about two times as long as wide, expanded apically to half the length of the pedicel; the funicular segments bear one row of long sensilla linearia, but also long sensilla chaetica (ca. two times as long as their segment). The mandible has a sharp apical tooth and a smaller subapical; the appendage bears 7–8 ventral lamellae.

It is not known whether or not there are pollen pockets. The fore tibia has three dorso-apical teeth; the hind tibia bears two bidentate teeth.

The ovipositor valves are as long as the gaster. The total length is ca. 1.5 mm. The colour is yellow-brown.

The male head is wider than long (1.2); the antennal groove is one quarter of the length of the head, the eye almost one-third, about as long as the cheek. The antenna has three subquadrangular anelli. The pronotum is 1.3 times as wide as long; the mesonotum and the metanotum are fused; the propodeum is only laterally separate from the metanotum; the subcircular spiracles are almost half as long as the propodeum. The gaster was not described. The total length is ca. 0.9 mm. The colour is yellow-brown.

The host fig is *Ficus elastica* Roxb. ex Hornem. (Indonesia: Java).

Eupristina Saunders (fig. 5)

Saunders, Trans. ent. Soc. London for 1883: 2 (1883a); Grandi, Boll. Lab. Zool. Portici 11: 207–218 (1916c); Hill, Zool. Verh. Leiden 89: 6 (1967a); Wiebes, Proc. Kon. Ned. Akad. Wet. (C) 85: 400, table 1 (1982a); Wiebes, Proc. Kon. Ned. Akad. Wet. 95: 109–125 (1992a). Synonyms: *Euprista* Ishii, Kontyû 8: 85 (1934) and *Grandiella* (Timberlake in litt.) Williams, Bull. Exp. Sta. Hawaii. Sugar Plant. Ass., Ent. Ser. 19: 13, 14 (1928).

For a description, see under the two subgenera, below.

KEY TO THE SPECIES OF EUPRISTINA S.L. (fig. 6)

- | | | |
|----|---|----|
| 1. | Females | 2 |
| | – Males (that of <i>E. (E.) leightoni</i> is not known) | 14 |
| 2. | The appendage of the third female antennal segment is long, attenuate (fig. b); the funicular segments are more or less cup-shaped, bearing long sensilla chaetica or linearia, distinctly projecting beyond the apical margin of their segment. The spiracular peritremata of the eighth urotergite are small and subcircular, or oval (<i>Parapristina</i>) | |
| | | 3 |

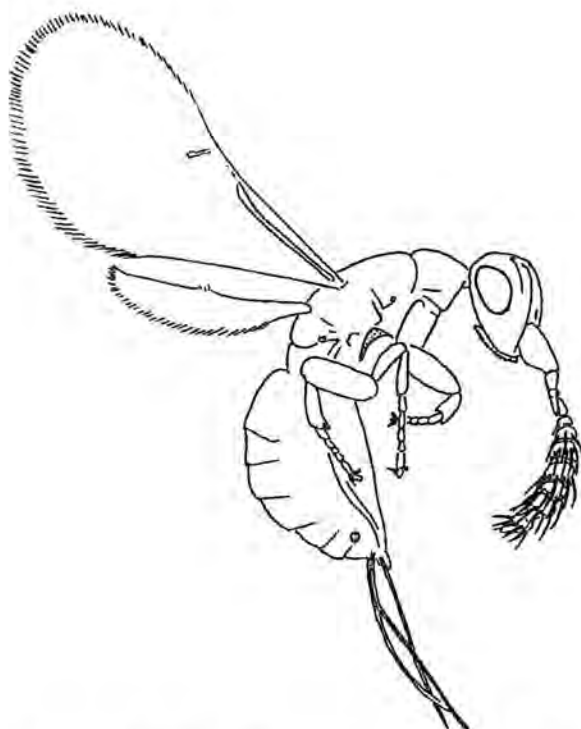


Fig. 5. *Eupristina (Parapristina) verticillata* (Waterston), female, after Berg & Wiebes (1992, fig. 56).

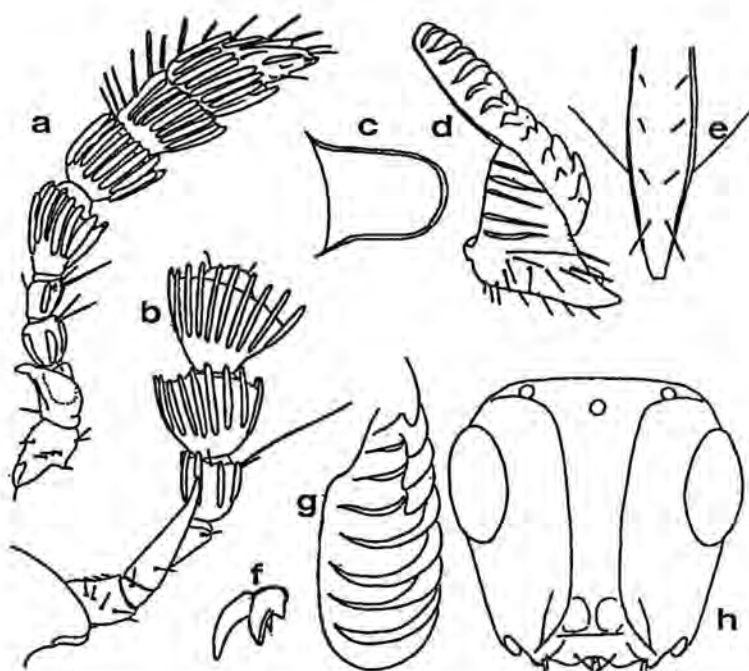


Fig. 6. Details of *Eupristina* (females). a, *Eupristina* (*E.*) *leightoni* Wiebes, antenna; b and d, *E. (Parapristina) cyclostigma* Wiebes: b, part of antenna, and d, mandible; c and e, *E. (E.) longispina* Wiebes: c, pollen pocket, and e, hypopygium; f-h, *E. (E.) belgaumensis* Joseph: f, teeth of hind tibia, g, mandibular appendage, and h, head; all after Wiebes (1992a, figs. 1-8).

- The appendage of the third female antennal segment is shorter (fig. a); the funicular segments are more cylindrical, bearing sensilla linearia, mostly not extending that much beyond the apical margin of their segment. The spiracular peritremata of the eighth urotergite are large, elongate (*Eupristina*) 6
- 3. The compound eye is two times as long as the cheek. *Ficus benjamina* L. (India: Uttar Pradesh; Malaysia: Selangor, Singapore; Philippines: Luzon; Indonesia: Kalimantan, Sumatra, Java; Australia: Queensland; Melanesia: Papua New Guinea, Solomon Isl.) 22. *Eupristina* (*P.*) *koningsbergeri* Grandi
- The compound eye is shorter, at most $1\frac{1}{2}$ times as long as the cheek 4
- 4. The compound eye is $1\frac{1}{2}$ times as long as the cheek. The ovipositor valves are a little shorter than the gaster. *Ficus amplissima* J.E.Sm. (India: Delhi) 20. *Eupristina* (*P.*) *delhiensis* (Abdurahiman & Joseph)
- The compound eye is $1-1\frac{1}{4}$ times as long as the cheek. The ovipositor valves are longer than the gaster ($1\frac{1}{4}-1.7$) 5
- 5. The compound eye is as long as the cheek. There are two teeth in the dorso-apical comb of the fore tibia. The ovipositor valves are $1\frac{1}{4}$ times as long as the gaster. *Ficus microcarpa* Linn.f. (Japan: Okinawa; China: Macao, Hong Kong; Malaysia: Penang, Perak, Sarawak; Philippines: Luzon; Indonesia: Kalimantan, Java; Australia: Queensland; Melanesia: Solomon Isl.) 19. *Eupristina* (*P.*) *verticillata* Waterston

- The compound eye is $1\frac{1}{4}$ times as long as the cheek. The fore tibia bears three teeth in the dorso-apical comb. The ovipositor valves are 1.7 times as long as the gaster. *Ficus stricta* Miq. (Malaysia: Negri Sembilan, Johor; Indonesia: Kalimantan) 21. *Eupristina* (*P.*) *cyclostigma* Wiebes
- 6. The compound eye is distinctly longer than the cheek ($1\frac{1}{4}$ times) 7
- The compound eye is shorter than the cheek (0.8), or little longer (1.1). 9
- 7. The seventh antennal segment is widening apicad, different from the eighth to tenth, and it bears many sensilla in more than one row 8
- The seventh antennal segment is essentially similar to the eighth to tenth, and it bears one row of sensilla. *Ficus kerkhovei* Val. (Indonesia: Kalimantan; Malaysia: Negri Sembilan) 30. *Eupristina* (*E.*) *leightoni* Wiebes
- 8. The valves of the ovipositor are two times as long as the gaster. The hypopygium is blunt at the apex, without a distinct spine. *Ficus benghalensis* L. (India: Kerala, Bihar; Ceylon) 29. *Eupristina* (*E.*) *masoni* Saunders
- The valves of the ovipositor are $1\frac{1}{2}$ times as long as the gaster. The hypopygial spine is as long as wide at the base. *Ficus forstenii* Miq. (Indonesia: Timor [*Ficus spec.*]; Philippines: Luzon) 31. *Eupristina* (*E.*) *aurivillii* Mayr
- 9. The fore tibia bears three teeth in the dorso-apical comb. The identity of the host *Ficus* is not clear (India: W. Bengal) 23. *Eupristina* (*E.*) *saundersi* Grandi
- The fore tibia bears four or five teeth in the dorso-apical comb. 10
- 10. The spine of the hypopygium is four times as long as wide at the base (fig. c). *Ficus cordatula* Merr. (Philippines: Luzon). 28. *Eupristina* (*E.*) *longispina* Wiebes
- The spine of the hypopygium is at most as long as wide at the base 11
- 11. The compound eye is as long as the cheek, or a little longer (1.0–1.1) 12
- The compound eye is distinctly shorter than the cheek (0.85–0.9) 13
- 12. The ovipositor valves are 1.7 times as long as the gaster. *Ficus drupacea* Thunb. (India: Bangalore, Belgaum; Indonesia: Java) 24. *Eupristina* (*E.*) *belgaumensis* Joseph
- The ovipositor valves are two times as long as the gaster. *Ficus subcordata* Bl. (Philippines: Luzon) 25. *Eupristina* (*E.*) *philippinensis* Wiebes
- 13. The head is distinctly longer than wide across the compound eyes (1.1). The apical teeth of the mandible are little developed. The ovipositor valves are two times as long as the gaster. *Ficus benjamina* L. (Indonesia: Java; Melanesia: Papua New Guinea) 26. *Eupristina* (*E.*) *emeryi* Grandi
- The head is as long as wide across the compound eyes. The apical teeth of the mandible are well developed. The ovipositor valves are 1.7 times as long as the gaster. *Ficus altissima* Bl. (India: Meghalaya State) 27. *Eupristina* (*E.*) *altissima* Bal., Joseph & Abd.
- 14. The antennal scrobes are separate 15
- The antennae are situated in a common groove 17
- 15. The mid and hind tarsi are trimerous (♀, couplet no. 4) 20. *Eupristina* (*P.*) *delhiensis* (Abdurahiman & Joseph)
- The mid and hind legs have four or five tarsi 16
- 16. The mid and hind tarsi are tetramerous. The propodeum is $2\frac{1}{2}$ times as wide as long (♀, couplet 5) 19. *Eupristina* (*P.*) *verticillata* Waterstoniella
- The mid and hind tarsi are pentamerous. The propodeum is $1\frac{1}{2}$ times as wide as long (♀, couplet 8) 31. *Eupristina* (*E.*) *aurivillii* Mayr

17. The propodeum has a straight posterior margin and it is (almost) $2\frac{1}{2}$ times as wide as long 18
 - The propodeum is narrower: distinctly less than 2 times as wide as long 19
18. The propodeal spiracles are anterior in position (♀, couplet 13) 27. *Eupristina* (*E.*) *altissima* Bal., Joseph & Abd.
 - The propodeal spiracles are situated half-way the lateral margins of the propodeum (♀, couplet 10) 28. *Eupristina* (*E.*) *longispina* Wiebes
19. The spiracles are situated (laterally) in the posterior half of the propodeum, or they are fully posterior in position 20
 - The propodeal spiracles are anterior in position 22
20. The propodeum is distinctly narrower than the other thoracic terga, as wide as long, and the spiracles are situated in the posterior half of the propodeum (♀, couplet 13) 26. *Eupristina* (*E.*) *emeryi* Grandi
 - The propodeum is more than $1\frac{1}{2}$ times as wide as long, and the spiracles are situated in the posterior corners 21
21. The head is almost as long as wide (0.97) (♀, couplet 12) 24. *Eupristina* (*E.*) *belgaumensis* Joseph
 - The head is distinctly shorter than wide (0.8) (♀, couplet 12) 25. *Eupristina* (*E.*) *philippinensis* Wiebes
22. The hind tarsi are tetramerous. The head is as long as wide; the antennal anellus is very narrow (♀, couplet 5) 21. *Eupristina* (*P.*) *cyclostigma* Wiebes
 - The hind tarsi are pentamerous. The antennal anellus is distinct 23
23. The head is distinctly shorter than wide (0.85) (♀, couplet 8) 29. *Eupristina* (*E.*) *masoni* Saunders
 - The head is approximately as long as wide (0.95–1.0) 24
24. The propodeum is almost two times as wide as long (1.8) (♀, couplet 3) 22. *Eupristina* (*P.*) *koningsbergeri* Grandi
 - The propodeum is approximately $1\frac{1}{2}$ times as wide as long (♀, couplet 9) 23. *Eupristina* (*E.*) *saundersi* Grandi

subgenus **Parapristina** Hill (fig. 5)

Hill, Zool. Verh. Leiden **89**: 31–32 (1967a, subgenus of *Blastophaga* Gravenhorst); Wiebes in Berg & Wiebes, Verh. Kon. Ned. Akad. Wet., Nat. (2) **89**: 218–220 (1992). Synonym: *Maniella* Abdurahiman & Joseph, Bull. Ent. (Loyola Coll.) **8**: 48–52 (1967b).

The appendage of the third antennal segment is long and attenuate (fig. 6b); the funicle bears long sensilla chaetica, or the sensilla linearia extend beyond the rim of the segment. The mandible has a sharp apical tooth and a smaller subapical; the appendage bears about ten ventral lamellae, the proximal three (or more) of which are produced into a tooth. The thorax has pollen pockets and the fore coxae have a corbicula. The venation of the fore wing is obsolete beyond the marginal. The spiracular peritremata of the eighth urotergite are oval or subcircular.

The male antennal scrobes are separate in two species, but fused in two other. There usually is a pronotal collar, and the meso- and metanotum are fully fused; the metanotum and the propodeum are separate, if only laterally. The fore tarsus is bi- or trimerous, the mid and hind tarsi have three, four, or five segments. The genitalia are simple.

Hill (1967a) described this subgenus (in *Blastophaga*); Wiebes in Berg & Wiebes (1992) treated it as a full genus.

There are now four species in *Parapristina*, associated with figs of section *Leucogyne* Corner and section *Conosycea* (Miq.) Corner, subsection *Benjamina* (Miq.) Corner.

19. *Eupristina* (*Parapristina*) *verticillata* Waterston

Waterston, Bull. ent. Res. 12: 38–40 (1921); Grandi, Treubia 8: 258 (1926); Grandi, Boll. Lab. Zool. Portici 20: 183–185 (1927c) (all in *Eupristina*); Hill, Zool. Verh. Leiden 89: 32–35 (1967a); McKey, Experientia 45, 665, table (1989). Synonym: *Euprista okinavensis* Ishii, Kontyû 8: 85–86 (1934).

The female compound eyes are as long as the cheek. The epistomal margin has a short median point. The fourth and fifth antennal segments (fig. 7, d) are slender, the sixth larger and more cup-shaped and with the sensilla in an apical whorl, also the seventh to eleventh with long apical sensilla.

The fore tibia bears two dorso-apical teeth. The hypopygium has a short, acute spine. The ovipositor valves are longer than the gaster (1.25). The total length is 1.0–1.2 mm. The colour is dark brown, the legs are yellowish.

The male head is wider than long (1.25); the eyes are quite large, positioned anteriorly, near the attachment of the mandibles. The antenna has one anellus. The spiracles of the propodeum (fig. 7, e) are dorsal in position, small and circular. The fore tibia has three dorso-apical teeth; the tarsus is (incompletely) trimerous. The mid and hind tarsi are tetramerous. The genitalia are simple. The total length is 0.5–0.6 mm. The colour is yellowish.

The host fig is *Ficus microcarpa* Linn.f. (Malaysia: Sarawak; Indonesia: Sumatra; Philippines: Luzon; China: Macao, Hong Kong). The fig was introduced (intentionally or accidentally) into many countries, with its pollinator and other symbionts (McKey, 1989). See also the record by Bouček (1993: 204) and the literature cited there (e.g., Nadel c.s., 1992).

20. *Eupristina* (*Parapristina*) *delhiensis* (Abdurahiman & Joseph)

Abdurahiman & Joseph, Bull. Ent. (Loyola Coll.) 8: 48–52 (1967b, *Maniella*).

The female compound eyes are $1\frac{1}{2}$ times as long as the cheek. The lateral ocelli are located posteriorly, a little behind the posterior rim of the compound eye. The antennal scape is a little over $1\frac{1}{2}$ times as long as wide; the appendage of

the third segment is long and attenuated, reaching the apical margin of the fifth segment.

The fore tibia has one long dorso-apical tooth and a short ventral spur; the hind tibia bears a tricuspidate antiaxial tooth and a bidentate axial. The ovipositor valves are a little shorter than the gaster. The total length is 1.5 mm. The colour is rusty red-brown.

The male head is 0.95 times as long as wide (measured from Abdurahiman & Joseph's figure 9, not 1.3 as they have it in the text). The eye is one-fifth of the length of the head, more than two times as long as the cheek (9 : 4). The antennal pedicel appears incompletely divided (or an anellus is coalescent with it?), the (free) anellus is about two times as wide as long, the club two times as long as wide.

Thorax (fig. 7f): the pronotum is as long as wide in the middle; the mesonotum is a bit more than half as long as wide (0.6); the metanotum and propodeum are fused, together half as long as wide, the spiracles are small, sub-ovoid. The fore tibia has three dorso-apical teeth and two ventral; the tarsi are bimerous. The tibial armature of the hind tibia was described as an antiaxial complex of two bidentate processes, and an axial bidentate process; the tarsi are trimerous. The total length is 0.9 mm. The colour is yellowish brown.

The host fig is *Ficus amplissima* J.E.Sm. (India: Delhi). See Grover & Chopra (1971) for biological data.

21. *Eupristina* (*Parapristina*) *cyclostigma* Wiebes

Wiebes, Proc. Kon. Ned. Akad. Wet. 95: 115–116 (1992a).

The female head is shorter than wide across the compound eyes (0.9), which are $1\frac{1}{4}$ times as long as the cheek. The epistomal edge is rather even, scarcely lobed, and it has two stiff setae at the middle. The antennal pedicel has some ten long setae at the axial surface; the appendage of the third segment (fig. 6, b) is long, attenuate; the sixth to tenth segments bear more than fifteen long sensilla in one row – for about one-third of their length, the sensilla extend beyond the apical rim – and the eighth to tenth are more or less cup-shaped. The mandible (fig. 6, d) is bidentate at the apex; the appendage has eleven ventral lamellae, the proximal seven of which are more or less bilobate, so as to show distinct teeth in the second to fourth.

There is a coxal corbicula; the dorso-apical comb of the fore tibia bears three teeth; the tarsal segments are approximately in ratio 2 : 1 : 1 : 1 : 2. The mid tarsus is a bit longer than the tibia (1.05). The hind tibia has two teeth, the antiaxial one of which is tricuspidate, the axial one bidentate; the tarsus is almost two times as long as the tibia (1.8); the tarsal segments are approximately in ratio 8 : 3 : 3 : 3 : 3.

The hypopygial spine is approximately as long as wide at the base. The spiracular peritremata of the eighth urotergite are of medium size, subcircular or oval in shape. The total length is ca. 1.6 mm; the ovipositor valves are 1.7 times as long as the gaster.

The male head is as long as wide; the eyes are positioned anteriorly, approximately one-sixth of the length of the head. The antennae are situated in a common groove; the anellus is very narrow. The propodeum is 1.8 times as wide as long; the spiracles are antero-lateral in position. The fore tarsi are bimerous, the mid tarsi pentamerous, the hind tarsi tetramerous. The total length is ca. 1.0 mm.

The host fig is *Ficus stricta* Miq. (Malaysia: Negri Sembilan, Johor; Indonesia: Kalimantan). For two samples the host was identified by Prof. Corner with *F. benjamina* var. *nuda* (Miq.) Barrett (Philippines: Palawan, Negros).

22. *Eupristina* (*Parapristina*) *koningsbergeri* Grandi

Grandi, Boll. Lab. Zool. Portici **10**: 217–218 (1916c); Grandi, Boll. Lab. Zool. Portici **12**: 52–56 (1917); Joseph, Agra Univ. J. Res. (Sci.) **3**: 415 (1954); Wiebes, Tijdschr. Ent. **106**: 99 (1963a); Wiebes, Proc. Kon. Ned. Akad. Wet. (C) **83**: 105–106 (1980). Synonyms: *Eupristina jacobsoni* Grandi, Treubia **8**: 358–359 (1926); Grandi, Boll. Lab. Zool. Portici **20**: 185–188 (1927c); Wiebes, Tijdschr. Ent. **106**: 98–99 (1963a); Wiebes, Proc. Kon. Ned. Akad. Wet. (C) **83**: 105 (1980); Bouček, Australasian Chalc.: 192 (1988). *E. adempta* Wiebes, Zool. Verh. Leiden **83**: 3 (1966a).

The female head is distinctly shorter than wide across the compound eyes (0.8), which are two times as long as the cheek. The antennal pedicel has some fifteen axial spines; the appendage of the third segment is long and attenuate; the seventh antennal segment is essentially similar to the eighth to tenth. The mandible has sharp apical teeth; the appendage has up to ten ventral lamellae, which may be produced into teeth, but it is without the axial piece present in the other species.

There is a coxal corbicula; the fore tibia bears three teeth in the dorso-apical comb; the tarsal segments are approximately in ratio 2 : 1 : 1 : 1 : 2, sometimes the second and third are (almost) fused. The mid tarsus is approximately as long as the tibia. The hind tibia has two teeth, viz., a tricuspidate antiaxial and a bidentate axial; the hind tarsus is approximately two times as long as the tibia; the tarsal segments are approximately in ratio 6 : 3 : 3 : 2 : 3.

The hypopygium is acute at the tip, but without a spine. The spiracula of the eighth urotergite are large, oval. The total length is ca. 1.4 mm; the valves of the ovipositor are approximately $1\frac{1}{3}$ to $1\frac{1}{2}$ times as long as the gaster.

The male head is as long as wide; the eyes are as long as the cheek, approximately one-ninth of the length of the head. The antennae are situated in a common groove; the anellus is distinct, half as long as wide. The propodeum is almost

1.8 times as wide as long; the spiracles are antero-lateral in position. The fore tarsi are bimerous, the mid and hind tarsi pentamerous. The total length is 1.1 mm.

The host fig is *Ficus benjamina* L. (India: Uttar Pradesh; Malaysia: Selangor; Philippines: Luzon; Indonesia: Kalimantan, Java; Australia: Queensland; Melanesia: Solomon Isl.). See also *E. emeryi* Grandi, below.

subgenus **Eupristina** Saunders

The female is characterized by the presence of three ocelli, the eleven-segmented, clavate antenna, the appendage of the third segment of which is short (fig. 6a); the funicular segments are subcylindrical (not cup-shaped as in some species of *Parapristina* Hill), bearing sensilla linearia (not chaetica), and by the reduced venation of the hyaline wings; the spiracula of the eighth urotergite are elongate (more oval in *Parapristina*). In the antenna of most species (as depicted by Grandi, 1916c, fig. xii, 2, for *E. masoni*, and 1917, fig. xvii, 1, for *E. emeryi*) the seventh segment is larger (especially wider), than the eighth to tenth, but in a one species it is not (see fig. a).

The colour is brown.

The male head is depressed. The antenna has one anellus. The thoracic tergites form a dorsal shield, consisting of the pronotum, with an anterior collar, the (mostly fused) mesonotum and metanotum, and the propodeum, which is characteristically narrower than the thoracic terga. The fore tarsi are bimerous, those of the mid and hind legs pentamerous, but some fusion may occur. The genitalia are simple. The colour is yellowish.

Saunders (1883a: 2–6) described *Eupristina* as a genus, and also Mayr (1906: 106) and Grandi (1916c: 207–228; 1917: 47–56) treated it as such, but Hill (1967a: 6) and Grandi (1963: 334) classified it as a subgenus of *Blastophaga* Gravenhorst. The group concerned is here considered a subgenus of *Eupristina* s.l.

There are ten species known, one of which (i.e., *E. poeta* Girault, 1934: [3], from Queensland) remains unrecognized. *Eupristina* is associated with figs of various subseries of the section *Conosycea* (Miq.) Corner. Some species (viz., *E. belgaumensis* and *E. philippinensis*, and also *E. emeryi*) are very similar and seem to form a species-group.

23. Eupristina (E.) saundersi Grandi

Grandi, Boll. Lab. Zool. Portici **11**: 225–228 (1916c); Wiebes, Tijdschr. Ent. **106**: 96 (1963a); Bouček, Australasian Chalc.: 192 (1988).

The female head is not much shorter than wide across the compound eyes (0.9), which are subequal to the cheek. The mandible has a strong and acute apical tooth, next to a smaller subapical; the appendage is large, bearing seven ventral lamellae (although Grandi, 1916c, fig. xv, 2, figured eight!), the proximal three of which are partially fused with the axial teeth.

The fore tibia bears three teeth in the dorso-apical comb; the tarsal segments are approximately in ratio 3 : 1 : 1 : 1 : 3. The mid tarsus is a bit shorter than the tibia (0.9). The hind tarsus is almost two times as long as the tibia; the tarsal segments are approximately in ratio 6 : 2 : 2 : 5.

The gaster was not described, and total measurements were not given.

The male head is shorter than wide (0.95); the eyes are one-seventh of the length of the head. The antennal anellus is half as long as wide. The propodeum is distinctly wider than long (1.5); the spiracles are anterior in position. The total length is ca. 1.3 mm.

I did not see any material of this species. Grandi (1916c: 228) recorded the females from *Ficus religiosa* L. (India: W. Bengal), but this is most probably wrong, as I noted earlier (Wiebes, 1963a: 96). The males (that may not belong to the same species as the females!) were recorded by Grandi from *Ficus microcarpa* Linn. f., and also Bouček (1988: 192) mentioned this host, but here again, I have doubts.

24. *Eupristina* (E.) *belgaumensis* Joseph

Joseph, Agra Univ. J. Res. (Sci.) 3: 409–415 (1954); Wiebes, Tijdschr. Ent. 106: 98 (1963a).

The female head (fig. h) is subequal in length to the width across the compound eyes, which are a bit longer than the cheek (1.1). The antennal pedicel has ca. 40 axial spines. The mandible has well-developed apical teeth; the appendage (fig. g) bears eight to ten ventral lamellae, the four or five proximal of which at the axial side are produced into a wide tooth.

There is a coxal corbícula, the dorso-apical comb of the fore tibia has five teeth (the fifth small); the tarsal segments are approximately in ratio 2 : 1 : 1 : 1 : 2. The mid tarsus is shorter than the tibia (0.9). The hind tibia has two apical teeth (fig. f), the antiaxial one of which is tricuspidate, the axial simple; the tarsus is almost $2\frac{1}{2}$ times as long as the tibia; the tarsal segments are approximately in ratio 3 : 1 : 1 : 1 : 1.

The hypopygium has a short spine (not much longer than wide at the base). The total length is ca. 1.6 mm; the ovipositor valves are 1.7 times the length of the gaster.

The male head is somewhat shorter than wide (0.97); the eyes are one-fifth of the length of the head. The antennal anellus is distinct. The propodeum is 1.8

times as wide as long; the rather large spiracles are situated posteriorly. The total length is ca. 1.4 mm.

The host fig is *Ficus drupacea* Thunb. (India: Bangalore, Belgaum; Indonesia: Java).

25. *Eupristina (E.) philippinensis* Wiebes

Wiebes, Proc. Kon. Ned. Akad. Wet. 95: 120 (1992a).

The female head is subequal in length to the width across the compound eyes, which are as long as the cheek. The antennal pedicel has ca. 40 axial spines. The mandible has well-developed teeth; the appendage bears nine ventral lamellae, and four strong axial teeth.

The fore coxa has a corbicula; the dorso-apical comb of the fore tibia bears five teeth; the tarsal segments are approximately in ratio 4 : 1 : 2 : 2 : 3. The mid tarsus is as long as the tibia. The hind tibia has a tricuspidate antiaxial tooth and a wide, but simple axial; the tarsus is almost $2\frac{1}{2}$ times as long as the tibia; the tarsal segments are approximately in ratio 11 : 4 : 4 : 4 : 5. The hypopygium has a spine, which is as long as wide at the base. The total length is ca. 1.8 mm; the ovipositor valves are two times as long as the gaster.

The male head is distinctly shorter than wide (0.8); the eyes are one-seventh of the length of the head. The antennal anellus is distinct. The propodeum is 1.7 times as wide as long; the spiracles are rather large, situated posteriorly. The total length is ca. 1.2 mm.

The host fig is *Ficus subcordata* Bl. (Philippines: Luzon). *E. philippinensis* is very close to *E. belgaumensis*, in the female sex distinct only by the longer ovipositor and in the male sex, by the relatively shorter head.

26. *Eupristina (E.) emeryi* Grandi

Grandi, Boll. Lab. Zool. Portici 11: 217–218 (1916c); Grandi, Boll. Lab. Zool. Portici 12: 47–52 (1917); Wiebes, Proc. Kon. Ned. Akad. Wet. (C) 83: 105–106 (1980).

The female head is distinctly longer than wide across the compound eyes (almost 1.1), which are approximately $1\frac{1}{4}$ times as long as the cheek. The antennal pedicel has ca. 40 axial spines. The mandibular teeth are little developed; the appendage has nine ventral lamellae, and four axial, tooth-like processus.

There is a coxal corbicula; the dorso-apical comb of the fore tibia has five teeth; the tarsal segments are approximately in ratio 3 : 2 : 1 : 2 : 3. The mid tibia is subequal in length to the tarsus. The hind tibia has two strong teeth, the antiaxial one of which is bidentate, the axial one simple; the tarsus is $2\frac{1}{2}$ times

as long as the tibia; the tarsal segments are approximately in ratio 8 : 3 : 3 : 3 : 3.

The hypopygium narrows to a sharp point. The total length is ca. 1.5 mm; the valves of the ovipositor are almost two times as long as the gaster.

The male head is somewhat shorter than wide (0.95); the eyes are one-sixth of the length of the head. The antennal anellus is distinct. The propodeum is as wide as long; the spiracles are situated in the posterior half of the propodeum. The total length is ca. 1.4 mm.

The host fig is *Ficus benjamina* L. var. *nuda* (Miq.) Corner (Melanesia: Papua New Guinea); see also *E. (P.) koningsbergeri*. There is some variation in the sensilla of the seventh female antennal segment, as noted by Wiebes (1980: 106), but this may not mean much taxonomically.

27. *Eupristina (E.) altissima* Bal., Joseph & Abd.

Balakrishnan, Joseph & Abdurahiman, Proc. Kon. Ned. Akad. Wet. (C) **84**: 145–149 (1981).

The female head is subequal in length to the width across the compound eyes, which are slightly shorter than the cheek (0.8). The antennal pedicel has fourteen axial spines. The mandible has well-developed apical teeth; the appendage bears twelve ventral lamellae.

The fore coxa has a corbicula; there are four teeth in the dorso-apical comb of the fore tibia; the tarsal segments are approximately in ratio 7 : 2 : 2 : 2 : 7. The hind tibia has an axial elongated hook and an antiaxial bicuspidate tooth; the tarsal segments are approximately in ratio 6 : 3 : 3 : 2 : 3.

The total length is 1.9 mm, the ovipositor valves are over $1\frac{2}{3}$ times the length of the gaster.

The male is distinctly shorter than wide (0.8); the eyes are one-sixth of the length of the head. The antennal anellus is distinct. The propodeum is very wide: 2.4 times as wide as long; the spiracles are antero-lateral in position. The total length is 1.9 mm.

I did not see any material of this species from the region – the description is borrowed from Balakrishnan, Joseph & Abdurahiman (1981). The host species is *Ficus altissima* Bl. (India: Meghalaya State). *E. altissima* was recorded from the introduced *Ficus altissima* in Florida, U.S.A. (Bouček, 1993: 204).

28. *Eupristina (E.) longispina* Wiebes

Wiebes, Proc. Kon. Ned. Akad. Wet. **95**: 122 (1992a).

The female head is subequal in length to the width across the compound eyes, which are distinctly shorter than the cheek (0.8). The antennal pedicel bears ca.

90 axial spines. The mandible has well-developed apical teeth; the appendage bears up to twelve ventral lamellae, and four strong axial tooth-like prominences.

The fore coxa has a corbicula; there are five teeth in the dorso-apical comb of the fore tibia; the tarsal segments are approximately in ratio 4 : 2 : 2 : 2 : 3. The mid tarsus is shorter than the tibia (0.85). The antiaxial tooth of the hind tibia is bidentate, the axial one simple; the tarsus is over $2\frac{1}{2}$ times as long as the tibia; the tarsal segments are approximately in ratio 10 : 4 : 4 : 4 : 5.

The hypopygium (fig. e) has a spine that is four times as long as it is wide at the base. The total length is ca. 1.9 mm; the ovipositor valves are $1\frac{1}{2}$ times the length of the gaster.

The male head is shorter than wide (0.85); the eyes are one-fifth of the length of the head. The antennal anellus is distinct. The propodeum is very wide: 2.4 times as wide as long; the spiracles are lateral in position. The total length is ca. 1.2 mm.

The host fig is *Ficus cordatula* Merr. (Philippines: Luzon).

29. *Eupristina* (E.) *masoni* Saunders

Saunders, Trans. ent. Soc. London for 1883: 6-7 (1883a); Wiebes, Tijdschr. Ent. **106**: 98 (1963a); Grandi, Bull. Soc. zool. Fr. **53**: 81 (1928a, *E. spec.*). Synonym: *Eupristina grassii* Grandi, Boll. Lab. Zool. Portici **11**: 218-225 (1916c); Joseph, Agra Univ. J. Res. (Sci.) **2**: 282-283 (1953b); Wiebes, Tijdschr. Ent. **106**: 98 (1963a).

The female head is as long as wide, or a little shorter than wide across the compound eyes, which are $1\frac{1}{3}$ times as long as the cheek. The antennal pedicel bears ca. 30 axial spines. The mandible has well-developed apical teeth; the appendage bears nine to ten ventral lamellae and up to eight tooth-like prominences (five according to Joseph (1953b: 283), but I also found seven in a specimen in the sample from South India).

The fore coxa has a corbicula; there are four teeth in the dorso-apical comb of the fore tibia; the tarsal segments are approximately in ratio 8 : 3 : 3 : 3 : 8. The mid tarsus is approximately as long as the tibia. The hind tibia has two apical teeth, the antiaxial of which is tricuspidate, the axial one bifurcate; the tarsus is two times as long as the tibia; the tarsal segments are approximately in ratio 8 : 4 : 4 : 3 : 4.

The hypopygium is blunt at the apex, without a distinct spine. The total length is ca. 1.8 mm; the ovipositor valves are approximately two times as long as the gaster.

The male head is shorter than wide (0.85); the eyes are one-sixth of the length of the head. The antennal anellus is distinct. The propodeum is 1.6 times as wide

as long; the spiracles are antero-lateral in position. The total length is ca. 1.3 mm.

The host fig is *Ficus benghalensis* L. (India: Kerala, Bihar; Ceylon). *E. masoni* was recorded from the introduced *Ficus benghalensis* in Florida, U.S.A. (Bouček, 1993: 204).

30. *Eupristina* (E.) *leightoni* Wiebes

Wiebes, Proc. Kon. Ned. Akad. Wet. 95: 123–124 (1992a).

The female head is subequal in length to the width across the compound eyes, which are distinctly longer than the cheek (1.25). The antennal pedicel bears ca. 40 axial spines; the seventh segment (fig. a) is subequal to the eighth to tenth, and it bears only one row of sensilla. The mandible has well-developed apical teeth; the appendage bears ten ventral lamellae, and eight strong axial tooth-like prominences.

The fore coxa does not have a corbicula; there are four teeth in the dorso-apical comb of the fore tibia; the tarsal segments are approximately in ratio 2 : 1 : 1 : 1 : 2. The mid tibia and tarsus are subequal in length. The hind tibia has a tricuspidate antiaxial tooth and a more simple, but wide axial; the tarsus is ca. two times the length of the tibia; the tarsal segments are approximately in ratio 8 : 3 : 3 : 2 : 3.

The hypopygium is blunt: there is no apical spine. The total length is ca. 1.4 mm; the ovipositor valves are $1\frac{1}{2}$ times the length of the gaster.

The male is not known.

The host fig is *Ficus kerkhoveni* Val. (Indonesia: Kalimantan; Malaysia: Negri Sembilan).

31. *Eupristina* (E.) *aurivillii* Mayr

Mayr, Wien. ent. Ztg. 25: 160–162 (1906); Grandi, Boll. Lab. Ent. Bologna 1: 193–196 (1928d).
Synonym: *Eupristina bakeri* Grandi, Philipp. J. Sci. 33: 323–325 (1927b).

The female head is subequal in length to the width across the compound eyes, which are a bit shorter than the cheek (0.9). The antennal pedicel has ca. 30 axial spines. The mandible has well-developed apical teeth; the appendage bears nine ventral lamellae, and five strong ventral prominences.

There is a coxal corbicula; the dorso-apical comb of the fore tibia has four teeth; the tarsal segments are approximately in ratio 8 : 2 : 2 : 2 : 5. The mid tarsus is a bit shorter than the tibia (0.9). The hind tibia has two apical teeth, the antiaxial one of which is tricuspidate, the axial one simple; the tarsal segments are approximately in ratio 3 : 1 : 1 : 1 : 1.

The hypopygium has a short spine (as long as wide at the base). The total length is ca. 1.7 mm; the ovipositor valves are almost 1½ times as long as the gaster.

The male head is wider than long (0.9); the eyes are one-fifth of the length of the head. From Grandi's figure (Grandi 1927b, fig. 94) the antennal sockets appear to be separate; the antennal anellus is distinct. The propodeum is almost 1½ times as wide as long; the spiracles are antero-lateral in position. The total length is ca. 1.5 mm.

The host species is *Ficus forstenii* Miq. (Philippines: Luzon). The species was described from an unnamed species of *Ficus* (Indonesia: Timor). I only saw a sample of females, and could not study the male. According to Grandi (1927b: 325) the male propodeum is more narrowing posteriad than in *E. masoni*, to which the species is close.

Deilagaon Wiebes

Wiebes, Bijdr. Dierk. Amst. 46: 291–292 (1977b); Wiebes, Proc. Kon. Ned. Akad. Wet. (C) 89, table 5 (1986a).

The female compound eye is large, protruding. The antenna is clubbed, notably the seventh to eleventh segments are transverse, bearing many sensilla. The mandible is bidentate; the mandibular appendage bears 7–14 ventral lamellae, which are medially produced into a tooth.

There are no pollen pockets. The venation of the fore wing is complete. The fore tibia has two dorso-apical teeth; the hind tibia has two bidentate processes.

The hypopygial spine is short. The spiracular peritremata of the eighth urotergite are rather large, oval (small and circular in one species).

The males, known for two species, differ considerably. The head is about as wide as long, the eyes are very small or absent. The antenna has one or two anelli; the club is (almost) as large as the scape.

The thorax is rather long or more robust. The number of free tarsal segments differ between the species. The genitalia are simple. The total length is ca. 1 mm.

There are four species, two of which are known in both sexes. For these two, the host figs are known: they belong to the series *Validae* Miq. of the section *Conosycea* (Miq.) Corner.

KEY TO THE SPECIES OF DEILAGAON (fig. 7)

- | | |
|------------------|---|
| 1. Females | 2 |
| - Males | 5 |

2. The ovipositor valves are $1\frac{1}{2}$ –2 times as long as the body, 3–4 times as long as the gaster. The longitudinal diameter of the compound eye is eight times as long as the cheek (fig. a). The fourth antennal segment (fig. a) is short, the fifth and sixth are shaped so as to form part of the club. *Ficus chrysolepis* Miq. (Philippines: Luzon) and *Ficus novoguineensis* Corner (Melanesia: Papua New Guinea); also collected at light (Vietnam; Philippines: Luzon, Busuanga, Culion, Leyte, Palawan, Balabac, Negros, Mindanao, Jolo, Tawi Tawi; Indonesia: Celebes; Melanesia: Irian Jaya, Papua New Guinea, D'Entrecasteaux Is., Woodlark, Louisiade Arch., Bismarck Arch., Solomon Isl.) 33. *Deilagaon chrysolepidis* Wiebes
- The ovipositor valves are equal to, or shorter than the body, $1-1\frac{1}{2}$ times as long as the gaster. The longitudinal diameter of the compound eye is up to four times as long as the cheek 3
3. The longitudinal diameter of the compound eye is 3–4 times as long as the cheek. The fourth antennal segment is slender, the fifth and sixth are shaped so as to form the prolonged stalk of the club. The postmarginal vein of the fore wing is only half as long as the stigmal. *Ficus annulata* Bl. (Malaysia: Sabah) and *Ficus depressa* Bl. (Malaysia: Selangor); also caught at light (Thailand; Indonesia: Sumatra, Kalimantan; Philippines: Luzon, Leyte, Mindanao, Palawan) 32. *Deilagaon annulatae* Wiebes
- The longitudinal diameter of the compound eye is two times as long as the cheek 4
4. The antenna is much as described above for *D. chrysolepidis*, only the funicular segments have only a single row of apical sensilla. The mandible has one very long apical tooth. The postmarginal vein is $1\frac{1}{2}$ times as long as the stigmal. The host is unknown (Malaysia: Sabah, Pahang) 35. *Deilagaon clavatum* (Wiebes)

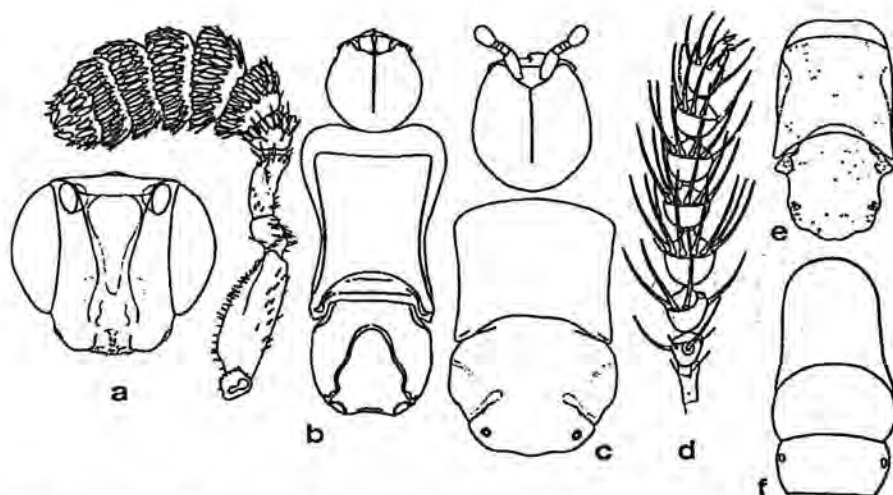


Fig. 7. Details of *Deilagaon* and *Parapristina*. a, *Deilagaon chrysolepidis* Wiebes, female head and antenna, after Wiebes (1977b, figs. 3–4); b–c, male head and thorax, of: b, *D. chrysolepidis*, and c, *D. annulatae* Wiebes, after Wiebes (1977b, figs. 19, and 34–35, respectively); d, *Eupristina* (*Parapristina*) *verticillata* (Waterston), female antennal funicle, after Waterston (1921, fig. 2b); e–f, male thorax of: e, *E. (P.) verticillata*, after Grandi (1927c, fig. vii, 6), and f, *E. (P.) delhiensis* Abdurahiman & Joseph, after Abdurahiman & Joseph (1967b, fig. ii, 12).

- The fourth to sixth antennal segments are shorter; the sixth a simple ring without sensilla. The mandible has normal teeth. The post-marginal vein is three times as long as the stigmal. The host is unknown (Thailand; Malaysia: Pahang; Indonesia: Sumatra, Java, Borneo) 34. *Deilagaon megarhopalum* (Grandi)
- 5. The body is slender (fig. b), the pronotum longer than wide (1.8). The mid and hind tarsi are reduced (♀, couplet 2) 33. *Deilagaon chrysolepidis* Wiebes
- The body is more robust (fig. c), the pronotum shorter than wide (0.8). The mid and hind tarsi are normal, pentamerous (♀, couplet 3) 32. *Deilagaon annulatae* Wiebes

32. *Deilagaon annulatae* Wiebes

Wiebes, Bijdr. Dierk. Amst. 46: 294–297 (1977b).

The female head is slightly shorter than wide across the compound eyes (0.95), which are three to four times as long as the cheek. There are two large, lateral ocelli – the median one is atrophied. The appendage of the the third antennal segment reaches to the distal half of the stalk-like fourth segment, the fifth and sixth are shaped so as to form part of this stalk, the seventh to eleventh segments form together a club, with a large number of sensilla per segment on the antiaxial surface, but only a few on the axial. The mandibular appendage bears ca. 15 ventral lamellae, most of which are produced medially.

The stigmal and postmarginal veins of the fore wing have a length-ratio of 2 : 1. The fore tibia has two dorso-apical teeth; the hind tibia has a robust, bidentate antiaxial tooth and a long and slender axial.

The spine of the hypopygium is sharp. The ovipositor valves are $1\frac{1}{2}$ times as long as the gaster. The total length is ca. 2 mm. The colour is yellowish, the head is somewhat darker.

The male head is a little longer than wide (1.05). The eyes are atrophied. The antennae are situated in a common groove; there are two short anelli.

The pronotum is robust, shorter than wide (0.8); the mesonotum and metanotum are fused, but dark lines can be seen that may be the boundary, the metanotum is only laterally separate from the propodeum; the spiracular peritremata are small, subcircular. The fore tibia is robust, with four dorso-apical teeth; the tarsus is tetramerous. The mid leg is slender, the tarsus is pentamerous. The hind tibia has an antiaxial crest of two apical teeth, a slender tooth at the dorsal angle, and a bicuspidate ventral tooth; the tarsus is pentamerous. The total length is ca. 1 mm. The colour is yellowish.

The host fig is *Ficus annulata* Bl. (Malaysia: Sabah) and the species was also reared from *Ficus depressa* Bl. (Malaysia: Selangor); the species was collected at light (Indonesia: Sumatra, Kalimantan; Philippines: Luzon, Leyte, Mindanao, Palawan).

33. *Deilagaon chrysolepidis* Wiebes

Wiebes, Bijdr. Dierk. Amst. 46: 292–294 (1977b); Wiebes, Monogr. Biol. 42: 739–740 (1981c).

The female head is shorter than wide across the compound eyes (0.85), which are about eight times as long as the cheek. There are two large lateral ocelli – the median one is atrophied. The (blunt) appendage of the third antennal segment reaches to the distal margin of the fourth segment; the fifth to eleventh segments are shaped so as to form together a large club, full of sensilla. The mandibular appendage bears seven ventral lamellae, drawn out medially.

The postmarginal vein of the fore wing is $1\frac{1}{2}$ times as long as the stigmal; distinct venae spuriae radiate from the stigma. The legs are much as described for *D. annulatae*, but the hind tibia shows a great variation in the size and shape of the axial tooth. The spine of the hypopygium is blunt. The ovipositor valves are four times as long as the gaster, but they may be much shorter in some samples. The total length is ca. 1 mm. The colour is light brown.

The male head is subcircular in outline; small eyes are situated laterally, in the frontal quarter of the head capsule. The antennae are situated in a common groove; there is only one anellus.

The thorax is slender, the pronotum is longer than wide (1.8); the mesonotum, metanotum and propodeum form one sclerite, in which the propodeum is differentiated dorsally by a dark, sinuate line; the spiracular peritremata are rather large. The fore tibia has five antiaxial teeth; the tarsus is bimerous. The mid leg is very slender, with four tarsal segments. The hind tibia is much as in *D. annulatae*; the tarsus is trimerous. The total length is ca. 1 mm. The colour is light brown.

The host figs are *Ficus chrysolepis* Miq. (Philippines: Luzon) and *Ficus novoguineensis* Corner (Melanesia: Papua New Guinea); there are many light catches (Vietnam; Philippines: Luzon, Busuanga, Culion, Leyte, Palawan, Balabac, Negros, Mindanao, Jolo, Tawi Tawi; Indonesia: Celebes; Melanesia: Irian Jaya, Papua New Guinea, D'Entrecasteaux, Woodlark, Louisiade Arch., Bismarck Arch., Solomon Isl.). There is some geographical variation in the size and shape of the axial, hind tibial tooth of the female and in the length of the ovipositor valves (Wiebes, 1977b: 294).

34. *Deilagaon megarhopalum* (Grandi)

Grandi, Ann. Mus. civ. Stor. nat. Genova 51: 103–104 (1923b); Grandi, Boll. Lab. Zool. Portici 18: 14–18 (1924) (both *Ceratosolen*); Wiebes, Bijdr. Dierk. Amst. 46: 298 (1977b).

The female head is 1.2 times as long as wide across the compound eyes, which are two times as long as the cheek. There are three ocelli. The appendage of the third antennal segment reaches to halfway the fifth segment, the fifth and sixth

prolong the stalk and are not integrated in the club – the sixth is small, anelli-form, the club is much like that of *D. annulatae*. The mandibular appendage has eleven ventral lamellae, the proximal six of which are produced medially.

The postmarginal vein of the fore wing is almost three times as long as the stigmal. The fore and hind tibial teeth, and also the gaster, are much as in *D. annulatae*. The ovipositor valves are longer than the gaster (1.1). The total length is ca. 2 mm. The colour is yellowish.

The male is not known.

The host fig is not known. The species was described from Indonesia (Sumatra) and it was caught at light (Thailand; Malaysia: Pahang; Indonesia: Sumatra, Java, Borneo).

35. *Deilagaon clavatum* (Wiebes)

Wiebes, Zool. Meded. Leiden **52**: 157–158 (1977d, *Waterstoniella*); Proc. Kon. Ned. Akad. Wet. **95**: 501 (1992b, in *Deilagaon*).

The female head is as long as wide across the compound eyes, which are two times as long as the cheek. There are two (lateral) ocelli. The antenna is almost indistinguishable from that of *D. chrysolepidis*, but the funicular segments have a single row of apical sensilla (vs. two). The mandible has one very long apical tooth; the appendage has seven ventral lamellae, most of which are produced into a medial tooth.

The postmarginal vein of the fore wing is $1\frac{1}{2}$ times as long as the stigmal. The fore tibia has two teeth in the dorso-apical comb; the hind tibia has two bidentate spurs, the axial one of which is shaped as a spatula. The ovipositor valves are ca. two times as long as the gaster. The total length is ca. 2 mm. The colour is yellowish brown.

The male is not known.

The host fig is not known. The species was collected at light (Malaysia: Sabah, Pahang).

Waterstoniella Grandi

Grandi, Ann. Mus. Stor. nat. Genova **49**: 305–306 (1921); Wiebes, Proc. Kon. Ned. Akad. Wet. (C) **85**: 400, table 1 (1982a); Wiebes, Proc. Kon. Ned. Akad. Wet. **95**: 499–514 (1992b).

The female head is shorter than wide across the compound eyes (0.85), but it may be as long as wide or, in one species, longer than wide; the compound eyes are large, mostly three or more times as long as the cheek, but in a few species only two times, or even equal to the length of the cheek and in one species,

shorter (0.7). The ocelli are in reduction: some species have three large ocelli, but several have two (laterals) or none, and in some the number is variable. In most species, the third segment of the antenna has a long attenuate appendage, but it may be short and wide; there are eleven segments (the ninth to eleventh forming a club), with oblong sensilla in one to three rows. The mandible has one apical tooth and in most species, a subapical, but in a few there is only one, cuspidate apical tooth; the appendage bears ventral lamellae. The labium has two apical, the maxilla two subapical setae.

The thorax has small pollen pockets, but the fore coxae have no corbicula. The wings are pubescent, they have a fringe of moderate length, and the venation of the fore wing is complete; the postmarginal vein mostly is well-developed. The fore tibia has a dorso-apical comb of two or three teeth.

The hypopygium has a long spine in most species, but a short one in some. The spiracular peritremata of the eighth urotergite are mostly small, subcircular. The ovipositor valves are as long to normally, two times as long as the gaster; exceptionally they are more than three times as long. The total length is ca. 1.3–3 mm. The colour is yellow-brown in most, but brown in some species.

The male is rather depress. The head is wider than long, and it has distinct eyes. The antennae are situated in a common groove, they have one (fig. 8, j), two, or three (fig. k) funicular segments.

The thorax has characteristic pronotal expansions, situated anteriorly or antero-laterally; in most species the propodeum is laterally separate from the metanotum, but fused in the middle. The propodeal spiracular peritremata are of medium size, situated antero-laterally in most species. The tarsi are pentamerous, but the fore tarsus is bimerous in one, and oligomerous in one other species. The genitalia are simple. The total length is 0.8–1.1 mm. The colour is yellowish.

There are 20 species, for 17 of which the host fig is known. These belong to the section *Conosycea*, subsections *Conosycea* (some (sub-)series excepted) and *Dictyoneuron*.

KEY TO THE SPECIES OF WATERSTONIELLA (fig. 8)

1. Females 2
 - Males (not known for *W. delicata*, *W. elisabethae*, *W. errata*, *W. modiglianii*, *W. solomonensis* and *W. straeleni*) 21
2. The compound eye is rather short, up to about equal to the length of the cheek. There are three ocelli. The number of lamellae on the mandibular appendage is large in two species (ca. 15), some ten in one 3
 - The compound eye is at least two times as long as the cheek. In most species there are two ocelli (one species has three, two have none). The number of lamellae on the mandibular appendage is ten or less 5
3. The antenna is more or less clubbed; from the seventh onwards, the segments bear oval sensilla in two rows 4

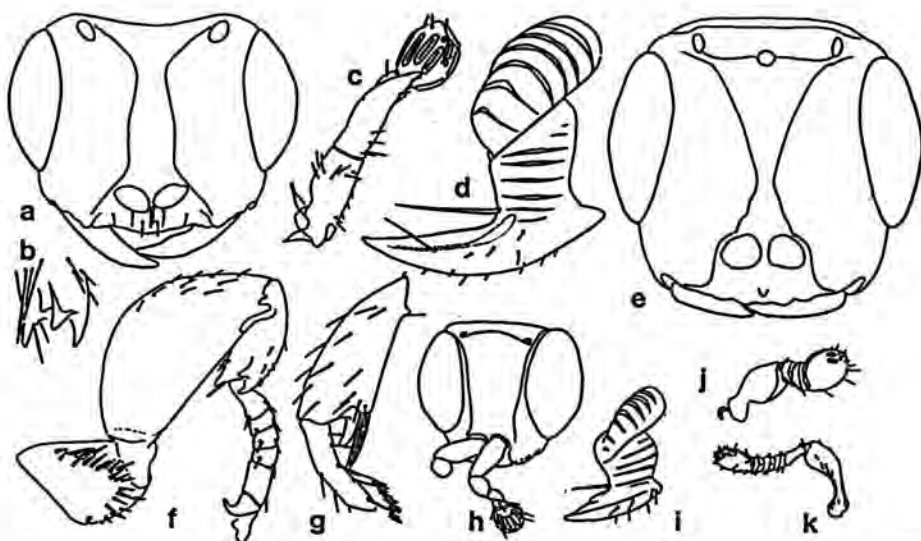


Fig. 8. Details of *Waterstoniella*. a–i, females, after Wiebes (1992b, figs. 1–9); j–k, males. a–d, *W. cuspidis* Wiebes: a, outline of head, b, apex of fore tibia, c, second to fifth antennal segments, d, mandible; e, *W. grandii* Wiebes, outline of head; f–g, *W. calcaria* Wiebes: f, fore leg, g, hind tibia and first tarsal segment; h, *W. brevigena* Wiebes, outline of head (oblique) and base of antennae; i, *W. delicata* Wiebes, mandible; j, *W. sundaica* Wiebes, antenna, after Wiebes (1966c, fig. 11); k, *W. masii* (Grandi), antenna, after Wiebes (1966b, fig. 5).

- The antennal segments bear one row of oblong sensilla. The (15) ventral lamellae of the mandibular appendage are shaped so as to form small teeth. *Ficus glaberrima* Bl. var. *bracteata* Corner (Philippines: Luzon) 38. *Waterstoniella williamsi* Wiebes
- 4. The compound eye is shorter than the cheek (0.7). The mandibular appendage has nine ventral lamellae. *Ficus stupenda* Miq. (Indonesia: Kalimantan) 36. *Waterstoniella errata* (Wiebes)
- The compound eye is longer than the cheek (1.2). The mandibular appendage has 16 or 17 ventral lamellae. Collected at light (Indonesia: Sumatra) 37. *Waterstoniella elisabethae* (Grandi)
- 5. The fore tibia has two teeth in the dorso-apical comb (fig. f) 6
- The fore tibia has three teeth in the dorso-apical comb (fig. b) 16
- 6. The antennal segments have only one row of long sensilla (sometimes irregular: do count those on the segments of the club) 7
- The antennal segments have two or three rows of sensilla 10
- 7. The spine of the hypopygium is short and wide 8
- The spine of the hypopygium is long and acute 9
- 8. The compound eye is $2\text{--}2\frac{1}{2}$ times as long as the cheek. The axial tooth of the hind tibia is not longer than the antiaxial. *Ficus sumatrana* Miq. (Philippines: Luzon) 49. *Waterstoniella sumatrana* Wiebes
- The compound eye is ca. $4\frac{1}{2}$ times as long as the cheek. The axial tooth of the hind tibia is spur-like (fig. g). *Ficus sumatrana* Miq. var. *microsyce* Corner (Indonesia: Kalimantan) 50. *Waterstoniella calcaria* Wiebes

9. The compound eye is nine times as long as the cheek (fig. h). The appendage of the third antennal segment is short and blunt. *Ficus pellucidopunctata* Griffith (Indonesia: Kalimantan) 55. *Waterstoniella brevigena* Wiebes
- The compound eye is shorter, four or five times as long as the cheek. The appendage of the third antennal segment is long and acute. *Ficus delosyce* Corner var. *obtusa* Corner (Indonesia: Kalimantan) 53. *Waterstoniella delicata* Wiebes
10. The appendage of the third antennal segment is short and wide (as in fig. h). *Ficus binnendijkii* Miq. (Malaysia: Sarawak; Indonesia: Kalimantan) 52. *Waterstoniella borneana* Wiebes
- The appendage of the third antennal segment is long and acute (fig. c) 11
11. The ovipositor valves are $4\frac{1}{2}$ times as long as the gaster. *Ficus consociata* Bl. (Malaysia: Selangor; Indonesia: Kalimantan) 46. *Waterstoniella malayana* Wiebes
- The ovipositor valves are two times as long as the gaster 12
12. The compound eye is short (not much over two times as long as the cheek). *Ficus sundaica* Bl. (Malaysia: Sarawak; Indonesia: Kalimantan) 51. *Waterstoniella sundaica* (Wiebes)
- The compound eye is 3–4 times as long as the cheek 13
13. The ovipositor valves are longer (two times or a bit more) than the gaster. The postmarginal vein of the fore wing is ca. two times as long as the stigmal 14
- The ovipositor valves are not much longer than the gaster (ca. 1.2–1.4 times). The postmarginal vein of the fore wing is ca. $1\frac{1}{4}$ times as long as the stigmal 15
14. The hypopygium has a very short and blunt spine; heavy ridges form a ventral chiasma. The compound eye is four times as long as the cheek. *Ficus retusa* L. (Indonesia: Java) 54. *Waterstoniella javana* Wiebes
- The spine of the hypopygium is longer. The compound eye is $2\frac{1}{2}$ – $3\frac{1}{2}$ times as long as the cheek. *Ficus crassiramea* Miq. (Indonesia: Java) 45. *Waterstoniella jacobsoni* (Grandi)
15. There are three ocelli (fig. e). *Ficus xylophylla* Wall. (Indonesia: Kalimantan) 47. *Waterstoniella grandii* Wiebes
- There are two ocelli (as in fig. a). *Ficus acamptophylla* Miq. (Indonesia: Kalimantan) 48. *Waterstoniella obvenata* Wiebes
16. The antennal segments bear one row of sensilla. *Ficus crassiramea* Miq. var. *patellifera* (Warb.) Corner (Melanesia: Solomon Isl., Papua New Guinea) 44. *Waterstoniella solomonensis* Wiebes
- The antennal segments bear two rows of sensilla 17
17. The apical tooth of the mandible is very long and falcate (fig. d) 18
- The apical tooth of the mandible is not very long and it bears a subapical tooth 19
18. The compound eye is ca. three times as long as the cheek. The ovipositor valves are ca. two times as long as the gaster. Collected at light (Indonesia: Sumatra) 42. *Waterstoniella modiglianii* (Grandi)
- The compound eye is ca. five times as long as the cheek (fig. a). The ovipositor valves are ca. three times as long as the gaster. *Ficus crassiramea* Miq. (Indonesia: Kalimantan) 43. *Waterstoniella cuspidis* Wiebes
19. The compound eye is ca. two times as long as the cheek. Collected at light (Indonesia: Sumatra); *Ficus crassiramea* Miq. var. *clementis* (Merr.) Corner (Phillipines: Luzon) 41. *Waterstoniella fiorii* Grandi
- The compound eye is longer: ca. three times as long as the cheek 20

20. The head is shorter than wide across the compound eyes (0.85) and these are not quite three times as long as the cheek (2.9). *Ficus stupenda* Miq. (Indonesia, Sumatra, Kalimantan) 39. *Waterstoniella masii* (Grandi)
 - The head is as long as wide across the compound eyes and these are a bit over three times as long as the cheek (3.2). This form is not well differentiated from *W. masii*. Collected at light (Indonesia: Kalimantan) 40. *Waterstoniella straeleni* Grandi
21. The antennal funicle has three segments 22
 - The antennal funicle has two segments. The head is rather short (0.9 times its width) and the eye is as long as the cheek (♀, couplet 3) . . . 38. *Waterstoniella williamsi* Wiebes
 - The antenna has one funicular segment 29
22. The eye is ca. ten times as long as the cheek, which is virtually non-existent. The head is no more than 1.3 times as wide as long. Two species that cannot be differentiated in the male sex, viz.,
 - (♀, couplet 14) 45. *Waterstoniella jacobsoni* (Grandi)
 - (♀, couplet 15) 48. *Waterstoniella obvenata* Wiebes
 - The eye is at most five times as long as the cheek 23
23. The head is ca. two times as wide as long 24
 - The head is at most 1.7 times as wide as long, but mostly narrower 26
24. The eye is $1\frac{1}{4}$ times as long as the cheek (♀, couplet 20)
 - 39. *Waterstoniella masii* (Grandi)
 - The eye is three to five times as long as the cheek 25
25. The eye is three times as long as the cheek (♀, couplet 19)
 - 41. *Waterstoniella fiorii* Grandi
 - The eye is five times as long as the cheek (♀, couplet 18)
 - 43. *Waterstoniella cuspidis* Wiebes
26. The eye is two times as long as the cheek (♀, couplet 14)
 - 54. *Waterstoniella javana* Wiebes
 - The eye is shorter relative to the length of the cheek (0.85–1.25) 27
27. The eye is shorter than the cheek (0.85). The head is $1\frac{1}{4}$ times as wide as long (♀, couplet 8) 50. *Waterstoniella calcaria* Wiebes
 - The eye is as long as the cheek, or one quarter longer 28
28. The head is 1.7 times as wide as long (♀, couplet 11)
 - 46. *Waterstoniella malayana* Wiebes
 - The head is $1\frac{1}{4}$ times as long as the cheek (♀, couplet 15)
 - 47. *Waterstoniella grandii* Wiebes
29. The eye is ca. ten times as long as the cheek, which is virtually non-existent (♀, couplet 12) 51. *Waterstoniella sundaica* Wiebes
 - The eye is at most four times as long as the cheek 30
30. The eye is four times as long as the cheek. The head is $1\frac{1}{2}$ times as wide as long (♀, couplet 9) 55. *Waterstoniella brevigena* Wiebes
 - The eye is two times as long as the cheek. The head is 1.7 times as wide as long (♀, couplet 10) 52. *Waterstoniella borneana* Wiebes
 - The eye is as long as the cheek. The head is 1.6 times as wide as long (♀, couplet 8) 49. *Waterstoniella sumatrana* Wiebes

36. *Waterstoniella errata* (Wiebes)

Wiebes, Tijdschr. Ent. **109**: 168–170 (1966b, *Blastophaga*).

The female head is about as long as wide across the compound eyes, which are shorter than the cheek (0.7). There are three ocelli. The appendage of the third antennal segment is short and blunt, reaching just over the proximal margin of the fifth antennal segment; the segments bear oblong sensilla, in the segments beyond the sixth in two rows. The mandibular appendage bears nine ventral lamellae.

The postmarginal vein of the fore wing is ca. $1\frac{1}{2}$ times as long as the stigmal. The fore tibia has a dorso-apical comb consisting of three teeth. The hypopygium is rather variable: either short and blunt (with the ovipositor valves little longer than the gaster), or long and attenuate (with the ovipositor valves ca. $1\frac{1}{2}$ times as long as the gaster). The spiracular peritremata of the eighth urotergite are of medium size, subcircular. The total length is ca. 1.7 mm. The colour is brown.

The male is not known.

The species was collected from *Ficus stupenda* Miq. (Indonesia: Kalimantan), together with *W. masii* (no. 39). One wonders whether the unusual variation in the gaster has to do with an existence in a strange host. It is only after considerable reflection that I classify the species with *Waterstoniella*, where it seems to fit better than in any other genus.

37. *Waterstoniella elisabethae* (Grandi)

Grandi, Ann. Mus. Stor. nat. Genova **51**: 104–105 (1923b); Grandi, Boll. Lab. Zool. Portici **18**: 18–23 (1924) (both in *Ceratosolen*); Wiebes, Proc. Kon. Ned. Akad. Wet. **95**: 501 (1992b, in *Waterstoniella*).

The female head is longer than wide across the compound eyes ($1\frac{1}{4}$), which are a bit longer than the cheek (1.2). There are three ocelli. The appendage of the third antennal segment is long and acute, reaching to the distal margin of the fifth segment; the segments bear oval sensilla, in the segments beyond the sixth in two to three rows. The appendage of the mandible has 16–17 ventral lamellae.

The postmarginal vein of the fore wing is two times as long as the stigmal. The fore tibia has a dorso-apical comb consisting of two teeth. The hypopygium has a long, acute spine. The ovipositor valves are two times as long as the gaster. The total length is 2.4 mm. The colour is yellowish.

The male is not known.

The species was collected at light (Indonesia: Sumatra).

38. *Waterstoniella williamsi* Wiebes

Wiebes, Proc. Kon. Ned. Akad. Wet. (C) **85**: 403–405 (1982a).

The female head is slightly longer than wide across the compound eyes (0.9), which are slightly shorter than the cheek. There are three ocelli. The appendage of the third antennal segment is produced into a sharp apex reaching beyond the basis of the fifth segment; the segments bear one row of long sensilla. The appendage of the mandible has fifteen ventral lamellae, which are shaped so as to form small teeth (as in the *Agaonini*).

The postmarginal vein of the fore wing is shorter than the stigmal (0.6). The fore tibia has two dorsal teeth. The hypopygium is rather blunt at the apex. The ovipositor valves are two times as long as the gaster. The total length is ca. 1.3 mm. The colour is brownish.

The male head is almost as long as wide (0.9); the eyes are one-fifth of the length of the head, and as long as the cheek. The antennal funicle has two segments. The thorax does not have an anterior expansion. The fore tarsus is bimerous, the other tarsi are pentamerous. The total length is 0.9 mm.

The host fig is *Ficus glaberrima* Bl. var. *bracteata* Corner (Philippines: Luzon).

39. *Waterstoniella masii* (Grandi)

Grandi, Ann. Mus. Stor. nat. Genova **49**: 306 (1921); Grandi, Boll. Lab. Zool. Portici **15**: 213–215 (1922) (both in *Blastophaga*); Grandi, Boll. Lab. Zool. Portici **18**: 11–12 (1924); Grandi, Mém. Mus. Roy. Hist. nat. Belg. (hors série) **4** (5): 5 (1932); Wiebes, Tijdschr. Ent. **109**: 165–168 (1966b); Wiebes, Proc. Kon. Ned. Akad. Wet. **95**: 505 (1992b).

The female eyes are almost three times as long as the cheek (2.9). There are two lateral ocelli. The appendage of the third antennal segment is long, reaching the distal margin of the fourth segment; the segments bear long sensilla in two rows. The mandible has a subapical tooth next to the apical; the appendage has nine ventral lamellae.

The postmarginal vein of the fore wing is only little longer than the stigmal ($1\frac{1}{4}$). The fore tibia bears a dorso-apical comb of three teeth. The ovipositor valves are a bit longer than the gaster (1.3). The total length is ca. 2 mm. The colour is brownish.

The male head is almost two times as long as wide; the eye is one-fifth of the length of the head, and a bit longer than the cheek ($1\frac{1}{4}$). The antennal funicle has three segments. The pronotum has a wide antero-lateral expansion. The total length is ca. 1.5 mm.

The host fig is *Ficus stupenda* Miq. (Indonesia: Kalimantan, Sumatra). *W. errata* (no. 36) was collected from the same host.

40. *Waterstoniella straeleni* Grandi

Grandi, Mém. Mus. Roy. Hist. nat. Belg. (hors série) 4 (5): 1–3 (1932).

The female is much as that of *W. masii*, but the head is as long as wide across the compound eyes, which are a bit over three times as long as the cheek (3.2). I did not see the (one) specimen used for Grandi's description. It was collected at light (Indonesia: Kalimantan).

41. *Waterstoniella fiorii* Grandi

Grandi, Ann. Mus. Stor. nat. Genova 51: 102–103 (1923b); Grandi, Boll. Lab. Zool. Portici 18: 12–13 (1924); Wiebes, Proc. Kon. Ned. Akad. Wet. 95: 505 (1922b).

The female eyes are ca. two times as long as the cheek. There are two lateral ocelli. The appendage of the third antennal segment is long and acute, reaching half-way the fifth segment; the segments have two to three rows of long sensilla. The mandible has a subapical tooth next to the apical; the appendage bears seven ventral lamellae.

The postmarginal vein of the fore wing is $3\frac{1}{2}$ times as long as the stigmal. The fore tibia has three dorso-apical teeth. The ovipositor valves are $1\frac{1}{2}$ times as long as the gaster. The total length is ca. 3 mm. The colour is brownish.

The male is much like that of *W. masii*: the eye is one-quarter of the length of the head, and three times as long as the cheek. The total length is ca. 1.1 mm.

The species was described from light-collections (Indonesia: Sumatra), but later collected from *Ficus crassiramea* Miq. var. *clementis* (Merr.) Corner (Philippines: Luzon).

42. *Waterstoniella modiglianii* (Grandi)

Grandi, Ann. Mus. Stor. nat. Genova 49: 306 (1921); Grandi, Boll. Lab. Zool. Portici 15: 216–217 (1922) (both in *Blastophaga*); Grandi, Boll. Lab. Zool. Portici 18: 11 (1924).

The female eyes are three times as long as the cheek. There are two lateral ocelli. The appendage of the third antennal segment is long and acute, reaching the base of the fifth segment; the segments have two rows of long sensilla. The mandible has one long and falcate tooth; the appendage has seven ventral lamellae.

The postmarginal vein of the fore wing is three times as long as the stigmal. The fore tibia has three teeth in the dorso-apical comb. The ovipositor valves are almost two times as long as the gaster. The total length is ca. $2\frac{1}{2}$ mm. The colour is brownish.

The male is unknown.

The species was collected at light (Indonesia: Sumatra).

43. *Waterstoniella cuspidis* Wiebes

Wiebes, Proc. Kon. Ned. Akad. Wet. **95**: 505–506 (1992b).

The female head is much shorter than wide across the compound eyes (0.75), which are ca. five times as long as the cheek. There are two lateral ocelli. The appendage of the third antennal segment is attenuated, reaching up to the basal third of the fifth segment; the segments bear rather wide sensilla in two rows. The mandible has a cuspidate apical tooth; the appendage bears six ventral lamellae.

The postmarginal vein of the fore wing is two times as long as the stigmal. The fore tibia has a dorso-apical comb of three teeth. The ovipositor valves are almost three times as long as the gaster. The total length is ca. 1.8 mm. The colour is yellowish.

The male is much like that of *W. fiorii*, described above, but the eye is larger, i.e., one-third of the length of the head, and five times as long as the cheek. The spiracular peritremata are situated at half length of the propodeum. The total length is ca. 0.9 mm.

The host fig is *Ficus crassiramea* Miq. (Indonesia: Kalimantan) – from this species of fig also *W. fiorii*, *W. jacobsoni* and *W. solomonensis* were recorded.

44. *Waterstoniella solomonensis* Wiebes

Wiebes, Proc. Kon. Ned. Akad. Wet. (C) **83**: 106–107 (1980); Bouček, Australasian Chalc.: 194 (1988).

The female head is much shorter than wide across the compound eyes (0.8), which are four times as long as the cheek. The appendage of the third antennal segment is attenuated, reaching half-way the fifth segment; the segments have an irregular row of long sensilla. The mandible has a long apical tooth and a subapical; the appendage bears seven ventral lamellae.

The postmarginal vein of the fore wing is $2\frac{1}{2}$ times as long as the stigmal. The fore tibia bears a dorso-apical comb of three teeth. The ovipositor valves are almost two times as long as the gaster (1.75). The total length is ca. 2 mm. The colour is yellow-brown.

The male is unknown.

The host fig is *Ficus crassiramea* Miq. var. *patellifera* (Warb.) Corner (Melanesia: Solomon Isl., Papua New Guinea).

45. *Waterstoniella jacobsoni* (Grandi)

Grandi, Boll. Lab. Zool. Portici **10**: 126 (1916a); Grandi, Boll. Lab. Zool. Portici **12**: 21–32 (1917); Grandi, Ann. Mus. Stor. nat. Genova **49**: 304–306 (1921); Grandi, Boll. Lab. Zool. Portici **15**: 212–213 (1922) (all in *Blastophaga*); Wiebes, Tijdschr. Ent. **109**: 167, fig. 8–11 (1966b); Wiebes, Proc. Kon. Ned. Akad. Wet. **95**: 506 (1992b).

The female eyes are three times as long as the cheek. There are two lateral ocelli. The appendage of the third antennal segment is attenuate, reaching half-way the fifth segment; the segments have long sensilla in 2–3 rows. The mandible has an apical as well as a subapical tooth; the appendage bears 10–12 ventral lamellae.

The postmarginal vein of the fore wing is almost two times as long as the stigmal (1.8). The fore tibia has two dorso-apical teeth. The ovipositor valves are ca. two times as long as the gaster. The total length is ca. 2 mm. The colour is yellow-brown.

The male head is almost two times as long as wide (1.9); the eyes are two-fifths of the length of the head; the cheek is almost non-existent. The antennal funicle has three segments. The pronotum has an anterior expansion. The total length is ca. 1.5 mm.

The host fig is *Ficus crassiramea* Miq. (Malaysia: Sarawak; Indonesia: Java). *W. jacobsoni* does not fit in what was named the group of *W. masii*, to which the other symbionts of *F. crassiramea* and its varieties belong.

46. *Waterstoniella malayana* Wiebes

Wiebes, Proc. Kon. Ned. Akad. Wet. (C) **85**: 400–403 (1982a); Wiebes, Proc. Kon. Ned. Akad. Wet. **95**: 506–507 (1992b).

The female eyes are four times as long as the cheek. There are no ocelli in the original sample from Malaysia, but two small laterals in that from Kalimantan. The appendage of the third antennal segment is long and acute, it reaches to the base of the fifth segment; the segments bear two to three rows of oval sensilla. The apical tooth of the mandible is not very prominent, the subapical is slight; the appendage bears nine ventral lamellae.

The postmarginal vein of the fore wing is two times as long as the stigmal. The fore tibia bear two dorso-apical teeth. The hypopygial spine is very long and acute. The ovipositor valves are $3\frac{1}{2}$ times as long as the gaster. The colour is yellowish brown.

The male head is wider than long (1.7); the eyes are two-fifths of the length of the head, and $1\frac{1}{4}$ times as long as the cheek. The antennal funicle has three segments. The pronotum has no expansions. The total length is ca. 1 mm.

The host fig is *Ficus consociata* Bl. var. *murtoni* King (Malaysia: Selangor) and it was also recorded from the nominate variety (Indonesia: Kalimantan).

47. *Waterstoniella grandii* Wiebes

Wiebes, Proc. Kon. Ned. Akad. Wet. 95: 507 (1992b).

The female eyes are three times as long as the cheek. There are three ocelli. The appendage of the third antennal segment is long and attenuate, reaching the basal quarter of the fifth segment; the segments bear two or three rows of oblong sensilla. The mandible has a long apical tooth and a small subapical; the appendage bears eight ventral lamellae.

The postmarginal vein of the fore wing is only little longer than the stigmal ($1\frac{1}{4}$). The fore tibia has two dorso-apical teeth. The ovipositor valves are almost $1\frac{1}{2}$ times as long as the gaster. The total length is ca. 2.1 mm. The colour is yellowish, but the head is a bit darker.

The male is 1.4 times as wide as long; the eye is one-quarter of the length of the head, and as long as the cheek. The antennal funicle has three segments. The pronotum has a short anterior expansion. The total length is ca. 1.1 mm.

The host fig is *Ficus xylophylla* Wall. ex Miq. (Malaysia: Pahang). In Kalimantan two samples were reared from this species of fig, which differ from *W. grandii* and more resemble *W. borneana* – they were not named.

48. *Waterstoniella obvenata* Wiebes

Wiebes, Proc. Kon. Ned. Akad. Wet. 95: 508 (1992b).

The female eyes are $3\frac{1}{4}$ times as long as the cheek. There are two lateral ocelli. The appendage of the third antennal segment is very long and acute, reaching the distal margin of the fifth segment; the segments have two (or indistinctly three) rows of rather wide sensilla. The mandible has a subapical tooth next to the apical one; the appendage bears ten ventral lamellae.

The postmarginal vein of the fore wing is little longer than the stigmal (1.3). The fore tibia has a dorso-apical comb of two teeth. The ovipositor valves are a bit longer than the gaster (1.15). The total length is ca. 1.6 mm. The colour is yellowish.

The male head is 1.3 times as wide as long; the eye is one-quarter of the length of the head; the cheek is almost non-existent. The antennal funicle has three segments. The pronotum is slightly expanded frontad. The total length is ca. 0.9 mm.

The host fig is *Ficus acamptophylla* Miq. (Indonesia: Kalimantan).

49. *Waterstoniella sumatrana* Wiebes

Wiebes, Proc. Kon. Ned. Akad. Wet. (C) 85: 409–411 (1982a).

The female eyes are $2\text{--}2\frac{1}{2}$ times as long as the cheek. There are remnants of lateral ocelli. The appendage of the third antennal segment is attenuate, reaching to the base of the fifth segment; the segments bear long sensilla in one row. The mandible has a rather long apical tooth; the appendage bears six ventral lamellae.

The postmarginal vein of the fore wing is two-thirds of the length of the stigmal – its distal portion is obsolete. The fore tibia bears two dorso-apical teeth. The spine of the hypopygium is rather short and wide. The ovipositor valves are two times as long as the gaster. The total length is ca. 1.2 mm. The colour is yellow-brown.

The male head is 1.6 times as wide as long; the eye is one-fifth of the length of the head, as long as the cheek. The antennal funicle has only one segment. The pronotum has a short attenuated expansion in front. The total length is ca. 0.8 mm.

The host fig is *Ficus sumatrana* Miq. (Philippines: Luzon). See also *W. calcaria*, recorded from the same species of fig.

50. *Waterstoniella calcaria* Wiebes

Wiebes, Proc. Kon. Ned. Akad. Wet. 95: 510 (1992b).

The female eyes are bulging, $4\frac{1}{2}$ times as long as the cheek. There are two very small lateral ocelli. The appendage of the third antennal segment reaches half-way the fifth; the segments bear one row of rather wide sensilla. The mandible has an acute apical tooth; the appendage bears six ventral lamellae.

The postmarginal vein of the fore wing is shorter than the stigmal (0.7). The fore coxa bears a patch of stout antiaxial setae; the tibia has two teeth in the dorso-apical comb. The hind tibia has a long axial spur. The hypopygium has a short, blunt spine. The ovipositor valves are over two times as long as the gaster (2.2). The total length is ca. 1.2 mm. The colour is yellowish.

The male is very small and squat. The head is $1\frac{1}{4}$ times as wide as long; the eye is one-sixth of the length of the head, shorter than the cheek (0.85). The antennal funicle has three segments. The pronotum is slightly expanded frontad. The fore tarsus is oligomorous. The total length is ca. 0.8 mm.

The host fig is *Ficus sumatrana* Miq. var. *microsyce* Corner (Indonesia: Kalimantan). From the nominate variety of this fig in Sumatra, *W. sumatrana* was recorded.

51. *Waterstoniella sundaica* (Wiebes)

Wiebes, Ent. Ber. Amst. **26**: 166–170 (1966c, *Blastophaga*); Waterston, Bull. ent. Res. **12**: 35 (1921, *Blastophaga jacobsoni*); Wiebes, Proc. Kon. Ned. Akad. Wet. **95**: 510–511 (1992b).

The female eyes are only ca. two times as long as the cheek. There were no ocelli observed in the original sample from Sarawak, but in that from E. Kalimantan there are two. The appendage of the third antennal segment is long and attenuate, reaching beyond the proximal third of the fifth segment; the segments have two rows of rather wide sensilla. The mandible has an apical tooth and a subapical; the appendage bears ten ventral lamellae.

The postmarginal vein of the fore wing is two times as long as the stigmal. The fore tibia has two dorso-apical teeth. The ovipositor valves are three times as long as the gaster. The total length is ca. 1.4 mm. The colour is yellow-brown.

The male head is $1\frac{1}{2}$ times as wide as long; the eye is one-third of the length of the head; the cheek is non-existent. The antennal funicle consists of one segment. The pronotum has an anterior expansion, tapering frontad. The total length is ca. 0.9 mm.

The host fig is *Ficus sundaica* Bl. (Malaysia: Sarawak), but it was also recorded from *F. sundaica* var. *beccariana* (King) Corner (Indonesia: Kalimantan).

52. *Waterstoniella borneana* Wiebes

Wiebes, Proc. Kon. Ned. Akad. Wet. (C) **85**: 407–409 (1982a); Wiebes, Proc. Kon. Ned. Akad. Wet. **95**: 511 (1992b).

The female eyes are $3\frac{1}{2}$ times as long as the cheek. There are no ocelli. The appendage of the third antennal segment is very short and blunt; the segments bear oval sensilla in two rows. The mandible has the apical tooth not very prominent and the subapical is slight; the appendage bears nine ventral lamellae.

The postmarginal vein is only half as long as the stigmal. The fore tibia has two dorsal teeth. The hypopygium has a very long and acute spine. The ovipositor valves are two times as long as the body.

The male head is 1.7 times as wide as long; the eye is one-quarter of the length of the head, and two times as long as the cheek. The antennal funicle has a single segment. The pronotum has a large anterior expansion. The propodeum is completely separate from the metanotum. The total length is ca. 0.7 mm.

The host fig is *Ficus binnendijkii* Miq. (Malaysia: Sarawak; Indonesia: Kalimantan).

53. *Waterstoniella delicata* Wiebes

Wiebes, Proc. Kon. Ned. Akad. Wet. **95**: 512 (1992b).

The female eyes are almost five times as long as the cheek. There are no ocelli. The appendage of the third antennal segment is long and attenuate, reaching over the basal third of the fifth segment; the segments bear one row of long sensilla. The mandible has a long apical tooth and a smaller subapical; the appendage bears six ventral lamellae.

The postmarginal vein of the fore wing is fading out indistinctly – it is about as long as the stigmal. The fore tibia bears an dorso-apical comb of two teeth. The ovipositor valves are subequal to the length of the gaster. The total length is ca. 1.3 mm. The colour is yellowish.

The male is not known.

The host fig is *Ficus delosyae* Corner var. *obtusa* Corner (Indonesia: Kalimantan).

54. *Waterstoniella javana* Wiebes

Wiebes, Proc. Kon. Ned. Akad. Wet. (C) **85**: 405–407 (1982a).

The female eyes are four times as long as the cheek. There are two lateral ocelli. The appendage of the third antennal segment reaches half-way the fifth segment; the segments have long sensilla in two to three rows. The mandible has prominent apical and subapical teeth; the appendage bears six ventral lamellae.

The postmarginal vein of the fore wing is two times as long as the stigmal. The fore tibia bears two teeth in the dorso-apical comb. The hypopygium has a very short spine; heavy chitinized ridges form a central chiasma. The ovipositor valves are $2\frac{1}{2}$ times as long as the gaster. The total length is ca. 1.6 mm. The colour is yellow-brown.

The male is 1.3 times as wide as long; the eye is one-quarter of the length of the head, and two times as long as the cheek. The antennal funicle has three segments. The pronotum has an anterior expansion. The total length is ca. 1 mm.

The host fig is *Ficus retusa* L. (Indonesia: Java).

55. *Waterstoniella brevigena* Wiebes

Wiebes, Proc. Kon. Ned. Akad. Wet. **95**: 512–513 (1992b).

The female eyes are nine times as long as the cheeks, which are very short. There are two lateral ocelli. The appendage of the third antennal segment is very short; the segments bear rather wide sensilla in one row, but those on the the fifth to

seventh are placed rather irregularly, at places almost forming two rows. The mandible has a subapical tooth next to the subapical; the appendage bears six ventral lamellae.

The postmarginal vein of the fore wing is very short, one-quarter of the length of the stigmal. The fore tibia bears a dorso-apical comb of two teeth. The hypopygium has a very long and acute spine. The ovipositor valves are 1.2 times as long as the gaster. The total length is ca. 1.2 mm. The colour is yellowish.

The male is much like that of *W. sundaca*, but the cheek is more distinct: one-quarter of the length of the eye. The pronotal expansion is short, not tapering in front. The total length is ca. 0.9 mm.

The host fig is *Ficus pellucidopunctata* Griffith (Indonesia: Kalimantan).

Platyscapa Motschoulsky (fig. 9)

Motschoulsky, Bull. Soc. Natural. Moscou 36: 48 (1864); Wiebes, Neth. J. Zool. 27: 209–223 (1977c); Wiebes & Abdurahiman, Proc. Kon. Ned. Akad. Wet. (C) 83: 195–207 (1980); Wiebes, Proc. Kon. Ned. Akad. Wet. (C) 89: table 5 (1986a); Wiebes in Berg & Wiebes, Verh. Ned. Akad. Wet., Nat. (2) 89: 220–221 (1992).

The female head is about as long as wide (0.85–1.05); the longitudinal diameter of the compound eye is (sometimes much) longer than the cheek (shorter in one species). There are three ocelli. The antenna has eleven segments, but one species has ten; the fifth to (tenth or) eleventh segments have the sensilla, which in some species project beyond the edge of the segment, usually in one row (some exceptions). The mandible is bidentate at the apex; the appendage has six to ten ventral lamellae, the proximal one of which may be medially produced into a tooth. The labium and maxillae are simple.

The thorax has pollen pockets and the fore coxae have a corbicula. The venation of the fore wing is complete; the postmarginal vein is about equal to the stigmal in two species, but mostly (much) shorter. The fore tibia has two or three dorso-apical teeth. The hind femur has a ventral concavity, in which fits the tibia.

The hypopygium usually has a (sometimes very) short, blunt spine. The stigmal peritremata of the eighth urotergite are small, subcircular. The ovipositor valves are slightly longer than the gaster, to 1.5 times as long. The total length is ca. 0.9–1.5 mm. The colour is dark.

The length of the male head varies from somewhat shorter to longer (0.9–1.5) than the width; the length of the eye is one-sixth to one-third of the length of the head. The antennal groove usually reaches to about one-third of the head, but it may reach to about one-half. The antenna has only one anellus, or two short anelli of unequal length, or three larger, subquadrangular anelli.

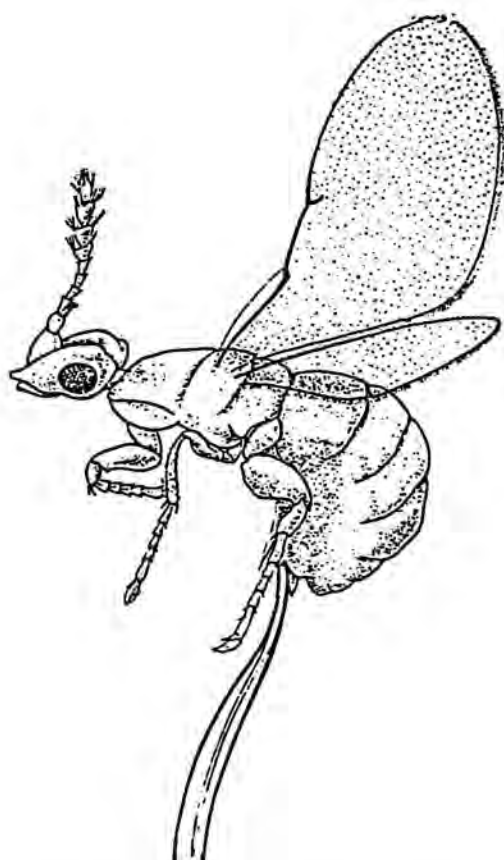


Fig. 9. *Platyscapa quadraticeps* (Mayr), female, after Galil & Eisikowitch (1969, fig. 1).

The pronotum is transverse. The meso- and metanotum are completely separate, or fused (one species); the metanotum and the propodeum are completely separate, or only laterally. The spiracular peritremata of the propodeum are small, subcircular. The fore tibia usually has two teeth in the dorso-apical comb (three in one species); the fore tarsi are bimerous, the mid and hind tarsi pentamerous. The armature of the hind tibia consists of two bidentate teeth, but the antiaxial tooth may be tricuspidate. The genitalia are simple. The total length is 0.75–1.15 mm. The colour is yellowish.

There are eight Indo-Australian species known (the type-species *P. frontalis* Motschoulsky, 1864: 48, from Ceylon, is not recognized as a species) and six African. The host figs belong to the section *Urostigma* (and one to the section *Conosycea*) of the subgenus *Urostigma*.

KEY TO THE SPECIES OF PLATYSCAPA (fig. 10)

1. Females 2
- Males (that of *P. innumerabilis* is unknown) 9
2. The compound eye is about as long as the cheek. The antennal sensilla of the distal segments are strongly projecting (fig. e). *Ficus religiosa* L. (Ceylon; India: Kerala; Malaysia: Singapore; also in Israel) 56. *Platyscapa quadraticeps* (Mayr)
- The compound eye longer is than the cheek (at least 1.15, but mostly 1.3–2). The antennal sensilla, if at all, are not projecting to that extent 3
3. The antenna has ten segments, the seventh to tenth of which bear three or four rows of small sensilla (fig. d). *Ficus superba* Miq. var. *superba* (Malaysia: Perlis) 57. *Platyscapa corneri* Wiebes
- The antenna has eleven segments, with usually one (but at most two) row(s) of (then relatively long) sensilla 4
4. The antennal segments have sensilla chaetica (in two rows) or sensilla linearia (one row) distinctly projecting beyond their segment 5
- The antennal segments have rather wide sensilla linearia (mostly in one row), which not or only slightly project beyond their segment 6
5. The antennal segments have sensilla chaetica in two rows (fig. b). The compound eye is one-third longer than the cheek (1.3). The epistomal margin has a wide median prominence. The ovipositor valves are shorter than the gaster (0.9). *Ficus superba* Miq. var. *japonica* Miq. (Japan: Kyushu; Hong Kong) 58. *Platyscapa ishiiana* (Grandi)

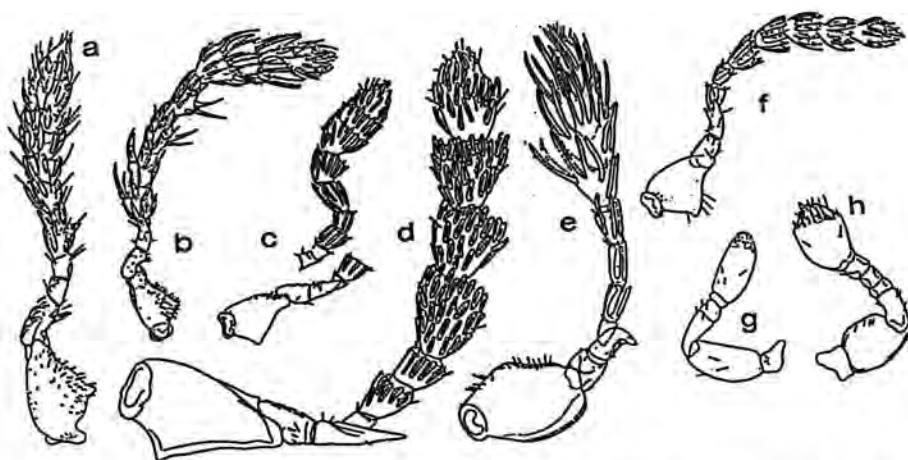


Fig. 10. Details of *Platyscapa*. a–f, female antenna of: a, *P. innumerabilis* (Fullaway), after Grandi (1938, fig. 1), b, *P. ishiiana* (Grandi), after Grandi (1924, fig. II, 1), c, *P. fischeri* Wiebes, after Wiebes (1977c, fig. 30), d, *P. corneri* Wiebes, after Wiebes & Abdurahiman (1980, fig. 29), e, *P. quadraticeps* (Mayr), after Grandi (1923a, fig. 2), and f, *P. coronata* (Grandi), after Grandi (1928c, fig. III, 2); g–h, male antenna of: g, *P. quadraticeps*, after Grandi (1928d, fig. VIII, 2), and h, *P. arnottiana* Abdurahiman, after Wiebes & Abdurahiman (1980, fig. 8).

- The antennal segments have one row of long sensilla linearia (fig. f). The compound eye is three quarters longer than the cheek (1.75). The epistomal margin is distinctly trilobed. The ovipositor valves are a little longer than the gaster. *Ficus virens* Ait. (several varieties) (Indonesia: Sumatra; India: Uttar Pradesh and Delhi; Hong Kong; Australia: Queensland) 59. *Platyscapa coronata* (Grandi)
- 6. The (rather long) antennal sensilla on the distal segments are arranged in two (indistinct) rows (fig. c). The compound eye is two times as long as the cheek. *Ficus caulocarpa* Miq. (Philippines: Luzon, Mindanao) 60. *Platyscapa fischeri* Wiebes
- The (shorter) antennal sensilla are arranged in one row (fig. a). The compound eye is at most 1.67 of the length of the cheek 7
- 7. The compound eye is 1.67 of the length of the cheek. The mandibular appendage bears six ventral lamellae. The postmarginal vein is as long as the stigmal. *Ficus tsjahela* Burm.f. (India: Kerala) 61. *Platyscapa tsjahela* (Abdurahiman & Joseph)
- The compound eye is distinctly shorter than 1½ times as long as the cheek. The mandibular appendage bears 8–10 ventral lamellae 8
- 8. The compound eye is less than one-fifth longer than the cheek (1.15). *Ficus prolixa* Forst.f. var. *subcordata* Corner (Polynesia: Marquesas Is.; Micronesia: Marianne Is.) 62. *Platyscapa innumerabilis* (Fullaway).
- The compound eye is one-third longer than the cheek (1.3). The postmarginal vein is a bit shorter than the stigmal (0.8). *Ficus arnottiana* Miq. (India: Kerala) 63. *Platyscapa arnottiana* Abdurahiman
- 9. The antenna has three, subquadrangular anelli (fig. h). The meso- and metanotum are fused, the metanotum and propodeum separate (♀, couplet 8) 63. *Platyscapa arnottiana* Abdurahiman
- The antenna has one or two anelli. The meso- and metanotum are separate 10
- 10. The antenna has two large anelli of different length (fig. g). The metanotum and propodeum are separate laterally 11
- The antenna has two short anelli, or only one 12
- 11. The lateral margins of the head are almost parallel. The antennal groove reaches to one-third of the length of the head, just about to an imaginary line connecting the posterior margins of the eyes (♀, couplet 2) . . . 56. *Platyscapa quadraticeps* (Mayr)
- The lateral margins of the head converge anteriorly. The antennal groove reaches one half of the length of the head, far beyond the posterior margins of the eyes (♀, couplet 7) 61. *Platyscapa tsjahela* (Abdurahiman & Joseph)
- 12. The metanotum and propodeum are separate only laterally 13
- The metanotum and propodeum are fully separate 14
- 13. The eye is one-sixth of the length of the head. The fore tibia bears three dorsal teeth (♀, couplet 3) 57. *Platyscapa corneri* Wiebes
- The eye is one quarter of the length of the head. The fore tibia bears two dorsal teeth (♀, couplet 5) 58. *Platyscapa ishiiana* (Grandi)
- 14. The eye is one-third of the length of the head. The armature of the hind tibia consists of a bicuspidate antiaxial tooth and a bidentate axial (♀, couplet 5) 59. *Platyscapa coronata* (Grandi)
- The eye is one-sixth of the length of the head. The armature of the hind tibia consists of a tricuspidate antiaxial tooth and a bidentate axial (♀, couplet 6) 60. *Platyscapa fischeri* Wiebes

56. *Platyscapa quadraticeps* (Mayr)

Mayr, Verh. zool.-bot. Ges. Wien **35**: 176–177 (1885); Grandi, Bull. ent. Res. **13**: 295–297 (1923a); Grandi, Boll. Lab. Ent. Bologna **1**: 123–126 (1928d) (all in *Blastophaga*); Wiebes, Neth. J. Zool. **27**: 214–215 (1977c; also full bibliography); Wiebes in Berg & Wiebes, Verh. Ned. Akad. Wet., Nat. (2) **89**: 225 (1992). Synonym: *Blastophaga arnottiana* Joseph, Agra Univ. J. Res. (Sci) **2**: 270–277 (1953b).

The female compound eye is shorter than the cheek (0.9). The epistomal margin shows a feeble angular median prominence and two rounded lateral projections. The antenna has eleven segments, the fifth to seventh of which bear long sensilla, and those of the eighth to eleventh are longer still, projecting to a distance equal to one or two times the length of the segment. The mandibular appendage bears seven ventral lamellae, the first of which has a tooth-like appearance. The post-marginal vein of the fore wing is a bit shorter than the stigmal, but not much. The fore tibia has three teeth in the dorso-apical comb. The ovipositor valves are almost $1\frac{1}{2}$ times as long as the gaster. The total length is 1.7 mm.

The male head is subquadrate; the length of the eye is one-third, the depth of the anterior groove about one-third of the length of the head. The antenna has two unequal anelli. The meso- and metanotum are separate, the metanotum and propodeum only laterally. The hind tibia has two bidentate teeth. The total length is ca. 1 mm.

The host fig is *Ficus religiosa* L. (Ceylon; India: Kerala; Malaysia: Singapore). The species was introduced, e.g., in Israel. Pollination was studied by several authors, e.g., Galil & Eisikowitch (1969) and Galil & Snitzer-Pasternak (1970) – see Wiebes (1977a: 221) for a summary.

57. *Platyscapa corneri* Wiebes

Wiebes in Wiebes & Abdurahiman, Proc. Kon. Ned. Akad. Wet. (C) **83**: 202–205 (1980).

The female compound eye is longer than the cheek (1.15). The epistomal margin has three distinct lobes. The antenna has ten segments, the seventh to tenth of which have three or four rows of short sensilla. The mandibular appendage bears nine ventral lamellae, the proximal two of which are produced medially. The postmarginal vein of the fore wing has one quarter of the length of the stigmal. The fore tibia has two dorso-apical teeth. The ovipositor valves are a bit longer than the gaster. The total length is 1.4 mm.

The male head is slightly shorter than wide; the length of the eye is one-sixth, the depth of the antennal groove not quite one-third of the length of the head. The antenna has one, subquadangular anellus. The meso- and metanotum are separate, the metanotum and propodeum only laterally. The fore tibia has three dorso-apical teeth; the hind tibia has a tricuspidate antiaxial tooth and a bifurcate axial. The total length is 1.1 mm.

The host fig is *Ficus superba* Miq. var. *superba* (Malaysia: Perlis). Note that another variety of this fig harbours *P. ishiiana* (Grandi).

58. *Platyscapa ishiiana* (Grandi)

Grandi, Ann. Mus. civ. Stor. nat. Genova **61**: 101–102 (1923b); Grandi, Boll. Lab. Zool. Portici **18**: 4–10 (1924); Hill, Zool. Verh. Leiden **89**: 11–15 (1967a) (all in *Blastophaga*); Wiebes, Neth. J. Zool. **27**: 214–215 (1977c).

The female head is shorter than wide (0.85), the compound eye is longer than the cheek (1.3). The epistomal margin has a wide median prominence. The antenna has eleven segments, the fifth to tenth of which bear about ten sensilla chaetica in an apical whorl and about another ten shorter ones in an irregular median whorl. The mandibular appendage bears nine lamellae, the proximal two of which are produced medially. The postmarginal vein of the fore wing has three quarters of the length of the stigmal. The fore tibia has three dorso-apical teeth. The ovipositor valves are shorter than the gaster (0.9). The total length is 1.5 mm.

The male head is slightly longer than wide; the length of the eye is one quarter, the depth of the antennal groove one-third of the length of the head. The antenna has one anellus. The meso- and metanotum are separate; the metanotum and propodeum only laterally. The fore tibia bears two dorso-apical teeth; the hind tibia has a tricuspidate antiaxial tooth and a bidentate axial. The total length is 1.1 mm.

The host fig is *Ficus superba* Miq. var. *japonica* Miq. (Japan: Kyushu; Hong Kong). Another subspecies of this fig has *P. corneri*.

59. *Platyscapa coronata* (Grandi)

Grandi, Boll. Lab. Ent. Bologna **1**: 75–80 (1928c); Hill, Zool. Verh. Leiden **89**: 15–17 (1967a) (both in *Blastophaga*); Wiebes, Neth. J. Zool. **27**: 213–214 (1977c). Synonyms: *Blastophaga constabularis* Joseph, Agra Univ. J. Res. (Sci.) **2**: 267–270 (1953b) and *B. glabellae* Hoffmeyer, Ent. Meddr. **18**: 192–197 (1932).

The female compound eye is 1.75 times as long as the cheek. The epistomal margin has three distinct lobes. The antenna has eleven segments, the fifth to tenth of which have long stave-like sensilla (linearia) arranged evenly round the segment, and slightly projecting. The mandibular appendage bear six to ten ventral lamellae. The postmarginal vein of the fore wing is about half as long as the stigmal. The fore tibia has three dorso-apical teeth. The ovipositor valves are a bit longer than the gaster. The total length is 0.9–1.0 mm.

The male head is as long as wide; the length of the eye is one-third, the depth of the antennal groove two-sevenths of the length of the head. The antenna has

one distinct, large anellus. The meso- and metanotum are fully separate, as also are the metanotum and propodeum. The hind tibia has a bicuspidate antiaxial crest and a bidentate axial tooth. The total length is 1.15 mm.

The host fig is *Ficus virens* Ait., the several varieties of which may harbour different forms of the wasp species (Hill, 1967a: 17). Grandi's original material probably came from *F. virens* var. *virens* (Indonesia: Sumatra), as did the material recorded by Hill from India (Delhi); Hoffmeyer described *B. glabellae* from *F. virens* var. *glabella* (Bl.) Corner (Sumatra). Hill suggested that Joseph's (1953b) material of *B. constabularis* originated from *F. virens* var. *lanceolata* (Miq.) Corner (India: Uttar Pradesh), as did Hill's material from Hong Kong and that recorded here for the first time from Australia (Queensland). See Grover & Chopra (1971) for biological data.

60. *Platyscapa fischeri* Wiebes

Wiebes, Neth. J. Zool. 27: 220, 222 (1977c).

The female compound eye is two times as long as the cheek. The epistomal margin has a feeble angular median prominence and two rounded submedian projections. The antenna has eleven segments, the fifth, sixth and tenth of which have one row of sensilla, the seventh to ninth $1\frac{1}{2}$, the eleventh two. The mandibular appendage bears eight ventral lamellae, the proximal two of which are produced medially. The postmarginal vein of the fore wing has one-third of the length of the stigmal. The fore tibia has two dorso-apical teeth. The ovipositor valves are a bit longer than the gaster. The total length is ca. 1 mm.

The male head is longer than wide (1.1); the length of the eye is one-sixth, the depth of the antennal groove one-third of the length of the head. The antenna has two very short, almost indistinguishable anelli, partly fused. The meso- and metanotum, as also the metanotum and the propodeum, are completely separate. The hind tibia has a tricuspidate antiaxial tooth and a bidentate axial. The total length is ca. 0.75 mm.

The host fig is *Ficus caulocarpa* Miq. (Philippines: Luzon, Mindanao).

61. *Platyscapa tjahela* (Abdurahiman & Joseph)

Abdurahiman & Joseph, Oriental Insects 9: 106–109 (*Blastophaga*, 1975); Wiebes, Neth. J. Zool. 27: 213–214 (1977c).

The female compound eye is 1.65 times as long as the cheek. The epistomal margin is faintly trilobate. The antenna has eleven segments, the fifth to tenth of which have one row of rather wide sensilla, the eleventh two. The mandibular appendage bears six ventral lamellae. The postmarginal vein of the fore wing

is as long as the stigmal. The fore tibia has two dorso-apical teeth. The ovipositor valves are longer than the gaster (1.2). The total length is 1.4 mm.

The male head is shorter than wide (0.9); the length of the eye is one-sixth, the depth of the antennal groove one half of the length of the head. The antenna has two large, unequal anelli. The meso- and metanotum are completely separate, the metanotum and propodeum only laterally. The propodeal spiracles are rather large, compared with the other species. The hind tibia has two bidentate teeth. The total length is 0.95 mm.

The host fig is *Ficus tsjahela* Burm.f. (India: Kerala).

62. *Platyscapa innumerabilis* (Fullaway)

Fullaway, Proc. Hawaii ent. Soc. 2: 286 (1913, *Blastophaga*). Synonym: *Blastophaga mumfordi* Grandi, Bull. Bishop Mus. 142: 199–201 (1938).

The female compound eye is longer than the cheek (1.15). The epistomal margin has a distinct median prominence, but lacks lateral lobes. The antenna has eleven segments, the fifth to tenth of which have one row of rather wide, plate-like sensilla, distinctly projecting, the eleventh has two rows. The mandibular appendage bears eight to ten ventral lamellae. The postmarginal vein of the fore wing is as long as the postmarginal, or shorter (as described for *B. mumfordi*), and shorter than the length of the stigmal.

The ovipositor valves are a bit longer than the gaster. The total length is 1.4 mm.

The male was not described.

The species was described from the Marianne Isl., off Guam, Micronesia; the host fig is *Ficus prolixa* Forst.f. var. *subcordata* Corner (Polynesia: Marquesas Is.).

63. *Platyscapa arnottiana* Abdurahiman

Abdurahiman in Wiebes & Abdurahiman, Proc. Kon. Ned. Akad. Wet. (C) 83: 196–199 (1980).

The female compound eye is one-third longer than the cheek. The epistomal margin has a weak median angular prominence. The antenna has eleven segments, the sixth to tenth of which have one row of sensilla, the eleventh two. The mandibular appendage bears nine ventral lamellae. The postmarginal vein of the fore wing is one-fifth shorter than the stigmal. The fore tibia has two dorso-apical teeth. The ovipositor valves are as long as the gaster. The total length is 1.5 mm.

The male head is a bit shorter than wide; the length of the eye is one-fifth, the depth of the antennal groove one quarter of the length of the head. The antenna has three rather large, subquadrangular anelli. The meso- and metanotum are completely fused, the metanotum and the propodeum completely separate. The hind tibia has a tricuspidate antiaxial tooth and an indistinctly bifurcate axial. The total length is ca. 0.9 mm.

The host fig is *Ficus arnottiana* Miq. (India: Kerala). This is not the species that Joseph (1953b) described from *F. arnottiana*, which is a synonym of *P. quadraticeps* – the fig later proved probably to have been *F. religiosa* (see Wiebes, 1977c: 215, Wiebes & Abdurahiman, 1980: 196).

Dolichoris Hill (fig. 11)

Hill, Zool. Verh. Leiden **89**: 38–39 (1967a); Wiebes, Proc. Kon. Ned. Akad. Wet. (C) **82**: 181–196 (1979a); Wiebes, Proc. Kon. Ned. Akad. Wet. (C) **89**: table 4 (1986a); Wiebes in Berg & Wiebes, Verh. Kon. Ned. Akad. Wet., Nat. (2) **89**: 217 (1992).

The female¹ head is about as long as wide across the compound eyes. There are three ocelli. The antenna usually is eleven*-segmented; the appendage of the third segment is long and sharp; the funicular segments have sensilla linearia*,

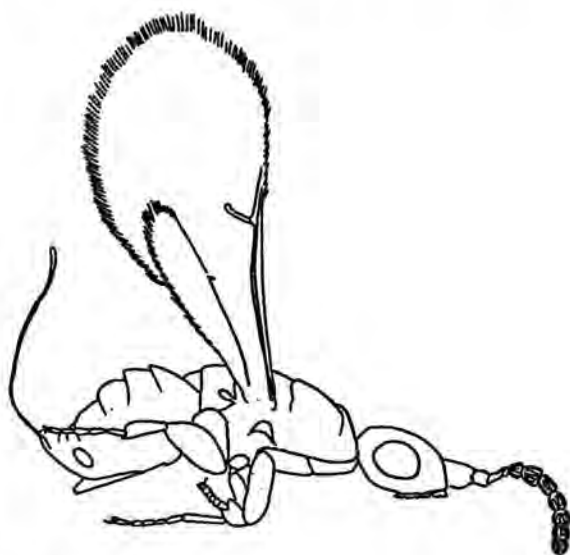


Fig. 11. *Dolichoris n. nervosae* Hill, female.

¹In a number of female characters (indicated with an asterisk) there are two exceptions, viz., no. 64, *D. cristata* (incompletely known) and no. 66, *D. vasculosae* (the type-species!); see below under the specific headings.

usually in one row (sometimes two). The mandible has two* apical teeth, the appendage has 5–10* lamellae, at least the first of which is produced into a tooth; the maxilla bears a bacilliform process*.

The mesosternum has pollen pockets*. The venation of the fore wing is complete*. The fore tibia has 2–5 dorso-apical teeth and a ventral spur; the antiaxial tooth of the hind tibia is bi- or tricuspidate, the axial one is simple, more slender.

The spiracles of the eighth urotergite are large, ovoid in shape (rounded and small in some species), the hypopygium bears hyaline spines in one or two rows (lacking in one species). The ovipositor valves are equal in length to the gaster, or up to 1.7 times as long. The total length is 1.2–2.2 mm.

The male head is subcircular in outline (longer than wide in one species); the eyes are rather large, the antennal groove rather wide; the dorsal surface bears many small spines. The antenna has two anelli, or only one; the club usually is indistinctly divided. The pronotum is transverse in most species (elongate in one), in most species the mesonotum is visible in dorsal view as two ear-like plates; the propodeal spiracles are lateral in position. The fore tibia has a dorsal crest of usually three, or four or five teeth; the tarsus is bimerous or the disk-like second to fourth segments are indistinctly separate (oligomerous). The hind tibia has two bicuspidate teeth (one tricuspidate in one species). The genitalia bear indistinct digiti with small denticles along the outer margin. The total length is 0.8–2.6 mm. The colour is yellowish.

There are eight Indo-Australian species and one occurring in Africa. One species was caught at light, all others are known as pollinators of figs of the section *Oreosycea* (Miq.) Corner. One unidentified species was recorded by Wiebes (1979a: 196) from *Ficus otophoroides* Corner.

KEY TO THE SPECIES OF DOLICHORIS (fig. 12)

1. Females 2
 - Males (those of *D. cristata* and *D. umbilicata* are unknown) 11
2. The antennal segments, from the fourth onwards, have long sensilla chaetica (fig. b). The host fig is unknown (Indonesia: Sumatra) 64. *Dolichoris cristata* (Grandi)
 - The antennal segments have sensilla linearia only (fig. c) 3
3. The fore tibia has five dorso-apical teeth. The apex of the stigmal vein in the fore wing is obsolete. The ovipositor is shorter than the gaster. *Ficus callosa* Willd. (India: Kerala; Indonesia: Java; Philippines: Luzon) 65. *Dolichoris malabarensis* (Abdurahiman & Joseph)
 - The fore tibia has two or three dorso-apical teeth. The venation of the fore wing is greatly reduced in one species, complete in the others. The ovipositor is longer than the gaster 4

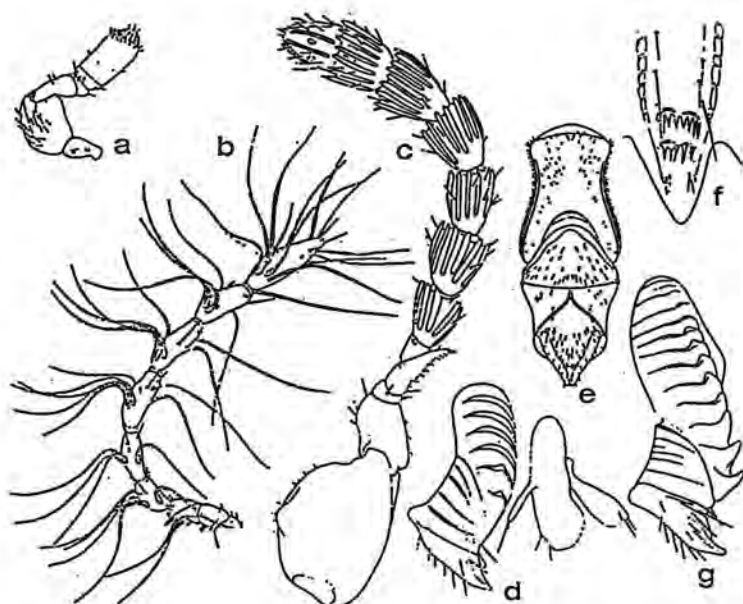


Fig. 12. Details of *Dolichoris*. a, *D. boschmai* (Wiebes), male antenna, after Wiebes (1964a, fig. 22); b–c, female antenna of: b, *D. cristata* (Grandi), without the scape, after Grandi (1928c, fig. 1), and c, *D. nervosae philippinensis* Wiebes, after Wiebes (1979a, fig. 52); d, female mouthparts of *D. n. philippinensis*, after Wiebes (1979a, fig. 56); e, *D. valentinae* (Grandi), male thorax, after Grandi (1917, fig. v, 5); f, *D. boschmai*, hypopygium, after Wiebes (1979a, fig. 58); g, *D. vasculosae* Hill, female mandible, after Wiebes (1979a, fig. 20).

4. The head distinctly is longer than wide, and rather high. The antenna is ten-segmented. The maxilla does not have a bacilliform process; the mandibular appendage (fig. g) has up to 15 ventral lamellae. The venation of the fore wing, beyond the apex of the submarginal vein, is reduced. *Ficus vasculosa* Wall. (Hong Kong; Malaysia; Singapore; Indonesia; Java) 66. *Dolichoris vasculosae* Hill
- The head is about as long as wide, more flat. The antenna is eleven-segmented. The maxilla has a bacilliform process (fig. d); the mandibular appendage has at most ten lamellae. The venation of the fore wing is complete 5
5. The fore tibia has three dorso-apical teeth 6
- The fore tibia has two dorso-apical teeth 9
6. The hypopygium has long setae, but no row of hyaline setae. The antiaxial tooth of the hind tibia is bicuspidate 7
- The hypopygium has two, sometimes incomplete, rows of hyaline setae (fig. f). The antiaxial tooth of the hind tibia is tricuspidate 8
7. There are no mesosternal pollen pockets. The mandibular appendage bears ten ventral lamellae. *Ficus edelfeltii* King (Melanesia: Solomon Isl.) 67a. *Dolichoris i. inornata* Wiebes
- There are small pollen pockets. The mandibular appendage bears six or seven ventral lamellae. *Ficus cristobalensis* Corner (Melanesia: Solomon Isl.) 67b. *Dolichoris i. oblita* Wiebes

8. The sclerotized parts of the head and body have setae in umbiliform pits. The longitudinal diameter of the eye is longer than the cheek. The antennal segments have $1\frac{1}{2}$ rows of sensilla. *Ficus polyantha* Warb. (Melanesia; Papua New Guinea) 68. *Dolichoris umbilicata* Wiebes
- The setae on the head and body are not placed in conspicuous pits. The longitudinal diameter of the eye is twice as long as the cheek. The antennal segments have one row of sensilla. *Ficus pubinervis* Bl. (Indonesia: Timor; Philippines: Negros) 69. *Dolichoris valentinae* (Grandi)
9. The antennal sensilla are arranged contiguously around their segment, extending the full length with some anterior overlap; the pedicel has 25 dorsal spines, or less. The postmarginal vein of the fore wing is subequal in length to the stigmal. The total length is little more than one mm 10
- The antennal sensilla are more irregularly placed, some being shorter than the others, not extending beyond the apex of their segment; the pedicel has forty dorsal spines. The postmarginal vein of the fore wing is twice as long as the stigmal. The total length is more than two mm. *Ficus dzumacensis* Guillaum. (Melanesia: New Caledonia) 71. *Dolichoris boschmai* (Wiebes).
10. The compound eye is more than two times as long as the cheek. The bacilliform process is half as long as the maxilla. The hypopygium bears two full rows of seven to nine hyaline spines. *Ficus nervosa* Heyne ex Roth (Hong Kong) 70a. *Dolichoris n. nervosae* Hill
- The compound eye is less than two times as long as the cheek. The bacilliform process is a bit more than one-third of the length of the maxilla. The hypopygium bears less hyaline spines, the proximal row consisting of three elements only. *Ficus magnoliifolia* Bl. (Philippines: Luzon, Palawan) 70b. *Dolichoris n. philippinensis* Wiebes
11. The fore tibia has four or five dorso-apical teeth 12
- The fore tibia has three dorso-apical teeth 14
12. The fore tibia has five dorso-apical teeth. The mesonotum is dorsally separate from the propodeum. The antiaxial crest of the hind tibia is tridentate; the segments of the hind tarsus are normal (♀, couplet 3) 65. *Dolichoris malabarensis* (Abdurahiman & Joseph)
- The fore tibia has four dorsal teeth 13
13. The mesonotum is dorsally fused with the propodeum. The antiaxial crest of the hind tibia is bidentate; the segments of the hind tarsus are elongate (♀, couplet 4) 66. *Dolichoris vasculosae* Hill
- The mesonotum and propodeum are separate (♀, couplet 7) 67b. *Dolichoris inornata oblita* Wiebes
14. The antenna has one anellus. The fore tarsus consists of two segments, without an indication of a further subdivision 15
- The antenna has two anelli (fig. a). The fore tarsus consists of two segments, the second of which is dorsally subdivided 17
15. The anellus is distinct, its length is approximately one quarter of its width. The caudal margin of the propodeum is straight 16
- The anellus is reduced to a very narrow disk, five times as wide as long. The thorax is elongate (fig. e); the pronotum is distinctly longer than wide and the propodeum is attenuated caudally (♀, couplet 8) 69. *Dolichoris valentinae* (Grandi)
16. The fore tibia has three dorso-apical teeth (♀, couplet 7) 67a. *Dolichoris i. inornata* Wiebes

- The fore tibia has four dorso-apical teeth (♀, couplet 7) 67b. *Dolichoris i. oblita* Wiebes
- 17. The mesonotum is rather long relative to its width (3 : 5), the separation with the propodeum is situated between the metapleura 18
- The mesonotum is shorter (1 : 2), the separation with the propodeum is situated anterior of the metapleura (♀, couplet 9) 71. *Dolichoris boschmai* (Wiebes)
- 18. The metapleura are longer i.e., half as long as the propodeum (♀, couplet 10) 70a. *Dolichoris n. nervosae* Hill
- The metapleura are shorter i.e., one-third of the length of the propodeum (♀, couplet 10) 70b. *Dolichoris n. philippinensis* Wiebes

64. *Dolichoris cristata* (Grandi)

Grandi, Boll. Lab. Ent. Bologna 1: 71–75 (1928c, *Blastophaga*); Wiebes, Proc. Kon. Ned. Akad. Wet. (C) 82: 186 (1979a).

The female head is about as long as wide across the compound eyes, which are two times as long as the cheek. The antennal segments (there are ten) have long sensilla chaetica. The mandibular appendage bears five ventral lamellae; the bacilliform process is half as long as the maxilla.

Pollen pockets were not described. The marginal, stigmal and postmarginal veins of the fore wing have a length-ratio of 5 : 4 : 1. The fore tibia has three dorso-apical teeth; the hind tibia has an indistinctly tricuspidate antiaxial tooth.

The hypopygium was not described. The spiracles of the ninth urotergite are small, subcircular in outline. The ovipositor valves are 1.67 times as long as the gaster.

The total length is ca. 1.3 mm. The colour is brown.

The male was not described.

The host fig is not known (Indonesia: Sumatra). The species reminds one of the African *D. flabellata* Wiebes (1979a: 184–185).

65. *Dolichoris malabarensis* (Abdurahiman & Joseph)

Abdurahiman & Joseph, Oriental Insects 1: 8–13 (1967a, *Blastophaga*); Wiebes, Proc. Kon. Ned. Akad. Wet. (C) 82: 188 (1979a).

The female head is longer than wide across the compound eyes (1.1), which are 1.67 of the length of the cheek. The sensilla on the fifth to seventh segments are situated in one row, those of the eighth to tenth, two; the eleventh has one row. The mandibular appendage bears six or seven ventral lamellae; the bacilliform process is one-fifth of the length of the maxilla.

There are pollen pockets. The marginal, stigmal and postmarginal veins of the fore wing have a length-ratio of 7 : 3 : 5. The fore tibia has five dorso-apical teeth; the antiaxial tooth of the hind tibia is tricuspidate.

The hypopygium has two full rows of hyaline spines. The spiracles of the eighth urotergite are large, oval in shape. The ovipositor valves are a little longer than the gaster.

The total length is 1.9 mm. The colour is smoky-brown.

The male head is a little longer than wide; the antennal groove is approximately one-fifth of the length of the head, also the eye one-fifth, as long as the cheek. There are two antennal anelli. Dorsally, the mesonotum is separate from the propodeum; the propodeal spiracles are 1.25 of the length of the propodeum. The fore tibia has five teeth in the dorsal crest; the tarsus is oligomeric. The hind tibia has a tridentate antiaxial crest and a bidentate flattened axial tooth. The total length is 2.6 mm.

The host fig is *Ficus callosa* Willd. (India: Kerala; Indonesia: Java; Philippines: Luzon).

66. *Dolichoris vasculosae* Hill

Hill, Zool. Verh. Leiden **89**: 39–41 (1967a); Wiebes, Proc. Kon. Ned. Akad. Wet. (C) **82**: 188–189 (1979a).

The female has some characters in which it distinctly differs from the other species of *Dolichoris*. The head is longer than wide across the compound eyes (1.05), which are half as long as the cheek. The antenna consists of ten segments, which have two rows of sensilla linearia. The mandible has one sharp apical tooth; the appendage bears 13–15 ventral lamellae, the first two of which are completely tooth-like and nearly all of which are produced into a median tooth; there is no maxillar bacilliform process.

There are pollen pockets. The veins of the fore wing are obsolete beyond the submarginal. The fore tibia has two dorso-apical teeth; the antiaxial tooth of the hind tibia is bicuspidate.

The hypopygium has one row of hyaline spines. The spiracles of the eighth urotergite are small and slightly oval. The ovipositor valves are 1.67 times as long as the gaster.

The total length is 1.2–1.3 mm. The colour is dark brown.

The male head is as long as wide; the antennal groove is one quarter of the length of the head, the eye one-fifth, about as long as the cheek. The antenna has one anellus and an indistinct basal constriction of the club. Dorsally, the mesonotum and the propodeum are fused; the propodeal spiracles are one-sixth of the length of the propodeum. The fore tibia has four dorsal teeth; the tarsus is oligomeric. The mid and hind tarsi are rather long, e.g., the hind tarsus is more than two times as long as the tibia (2.4). The genitalia bear 12–15 indistinct denticles along the outer edge of the claspers. The total length is 0.8–0.9 mm.

The host fig is *Ficus vasculosa* Wall. ex Miq. (Hong Kong; Malaysia; Singapore; Indonesia: Java). This species, which is the type-species of the genus, in some female characters (the number of antennal segments, the single mandibular tooth and the lamellae of the mandibular appendage, the lack of a bacilliform process on the maxilla, and the obsolete venation of the fore wing) distinctly differs from the other species.

67a. *Dolichoris i. inornata* Wiebes

Wiebes, Proc. Kon. Ned. Akad. Wet. (C) **82**: 189–191 (1979a).

The female head is slightly shorter than wide across the compound eyes (0.9), which are two times as long as the cheek. The antennal segments have one row of sensilla, extending the full length of the segment, and a row of shorter apical sensilla in between. The mandibular appendage bears about ten ventral lamellae; the bacilliform process is half as long as the maxilla.

There are no pollen pockets. The marginal, stigmal and postmarginal veins of the fore wing have a length-ratio of 2 : 2 : 3. The fore tibia has three dorso-apical teeth; the antiaxial tooth of the hind tibia is bicuspidate.

The spine of the hypopygium has no hyaline spines. The spiracles of the eighth urotergite are large and oval. The ovipositor valves are a quarter longer than the gaster.

The total length is 1.6 mm. The colour is brown.

The male head is as long as wide; the antennal groove is one-third of the length of the head, also the eye one-third, two times as long as the cheek. There is one antennal anellus. Dorsally, the mesonotum is separate from the propodeum; the propodeal spiracles are almost half as long as the propodeum. The fore tibia has three dorsal teeth; the tarsus is bimerous. The total length is 1.3 mm.

The host fig is *Ficus edelfeltii* King (Melanesia: Solomon Isl.).

67b. *Dolichoris inornata oblita* Wiebes

Wiebes, Proc. Kon. Ned. Akad. Wet. **97**: 133 (1994).

The female is similar to *D. i. inornata*, but for the following differences. The number of ventral lamellae on the mandibular appendage is six or seven. The mesosternum has small pollen pockets (absent in *D. i. inornata*). The marginal, stigmal, and postmarginal veins of the fore wing are approximately in ratio 5 : 5 : 9. The hind metatarsus is longer relative to the length of the tibia than in *D. i. inornata*, i.e., the ratio is 1. The length (head, thorax and gaster) is ca. 1.9 mm.

The male is more slender than that of *D. i. inornata*, especially the pronotum, which is longer than it is wide anteriorly (1.2), vs. about equal in length and

anterior width or a bit shorter. The fore tibia has a dorso-apical comb consisting of four teeth (or three?). The (hyaline) claspers of the genitalia do not bear claws, nor do those of *D. i. inornata*. The length (head and thorax) is ca. 1.1 mm.

The host fig is *Ficus cristobalensis* Corner (Melanesia: Solomon Isl.).

68. *Dolichoris umbilicata* Wiebes

Wiebes, Proc. Kon. Ned. Akad. Wet. (C) **82**: 191 (1979a).

The female head is about as long as wide across the compound eyes, which are 1.25 times as long as the cheek. The sclerotized parts, as also those of the thorax, bear setae situated in pits.

The antennal segments have one row of long sensilla linearia, but for the seventh, which is much longer than the other segments and has more, irregularly placed, sensilla. The mandibular appendage bears eight or nine ventral lamellae; the bacilliform process is half as long as the maxilla.

There are pollen pockets. The marginal, stigmal and postmarginal veins of the fore wing have a length-ratio of 3 : 2 : 3. The fore tibia has three dorso-apical teeth; the antiaxial tooth of the hind tibia is indistinctly tricuspidate.

The hypopygium has the hyaline spines in two rows, the basal one of which is incomplete. The spiracles of the eighth urotergite are small, subcircular. The ovipositor valves are much longer than the gaster (1.7).

The total length is 1.7 mm. The colour is brown.

The male is not known.

The host fig is *Ficus polyantha* Warb. (Melanesia: Papua New Guinea).

69. *Dolichoris valentinae* (Grandi)

Grandi, Boll. Lab. Zool. Portici **10**: 127 (1916a, *Blastophaga*), and Ibid. **12**: 14–21 (description, 1917); Wiebes, Proc. Kon. Ned. Akad. Wet. (C) **82**: 191–192 (1979a).

The female head is shorter than wide across the compound eyes (0.86), which are two times as long as the cheek. The antennal segments have one row of long sensilla linearia. The mandibular appendage bears six or seven ventral lamellae; the bacilliform process is more than half as long as the maxilla (0.6).

There are pollen pockets. The marginal, stigmal and postmarginal veins of the fore wing have a length-ratio of 5 : 3 : 5. The fore tibia has three dorso-apical teeth; the antiaxial tooth of the hind tibia is tricuspidate.

The hypopygium bears two complete rows of hyaline spines. The spiracular peritremata of the eighth urotergite are large, oval. The ovipositor valves are twice as long as the gaster.

The total length is 1.3 mm. The colour is dark brown.

The male head is longer than wide (1.25); the antennal groove is one quarter of the length of the head, the eye one-eighth, as long as the cheek. The antenna has one, narrow anellus. the thorax is peculiar in shape, elongate, the mesonotum is separate, the metanotal parts triangular, the propodeal spiracles are very large, the propodeum is attenuated caudally. The fore tibia has three dorsal teeth. The total length is 1.5 mm.

The host fig is *Ficus pubinervis* Bl. (Indonesia: Java, Timor; Philippines: Negros). Grandi originally recorded the species from *Ficus cuspidata* Reinw. (= *F. sinuata* Thunb. subsp. *cuspidata* (Reinw.) Corner), but this is almost certainly wrong; it is known as the host of *Liporhopalum* species (Hill, 1969).

70a. *Dolichoris n. nervosae* Hill

Hill, Zool. Verh. Leiden **89**: 17–20 (1967a, *Blastophaga*); Wiebes, Proc. Kon. Ned. Akad. Wet. (C) **82**: 193 (1979a).

The female head is slightly shorter than wide across the compound eyes (0.9), which are more than two times as long as the cheek. The antennal segments have long sensilla linearia in one row. The mandibular appendage bears five ventral lamellae; the bacilliform process is half as long as the maxilla.

There are pollen pockets. The marginal, stigmal and postmarginal veins of the fore wing have a length-ratio of 6 : 6 : 7. The fore tibia has two dorso-apical teeth; the antiaxial tooth of the hind tibia is bicuspidate.

The hypopygium has two complete rows of hyaline spines. The spiracular peritremata of the eighth urotergite are large, oval. The ovipositor valves are 1.3 times as long as the gaster.

The total length is 1.2–1.3 mm. The colour is dark brown.

The male head is as long as wide; the antennal groove is one quarter of the length of the head, the eye one-fifth, longer than the cheek (1.3). The antenna has two anelli. The mesonotum is dorsally separate from the propodeum; the metapleura are half as long as the propodeum, as are also the propodeal spiracles. The fore tibia has three dorsal teeth; the tarsus is oligomeric. The claspers of the genitalia bear four small claws. Total length is 0.8–0.9 mm.

The host fig is *Ficus nervosa* Heyne ex Roth (Hong Kong).

70b. *Dolichoris nervosae philippinensis* Wiebes

Wiebes, Proc. Kon. Ned. Akad. Wet. (C) **82**: 195 (1979a).

The female differs from that of the nominate subspecies in the longitudinal diameter of the compound eye, which is not quite two times as long as the cheek. The

bacilliform process is slightly over one-third of the length of the maxilla. The basal row of hyaline spines on the hypopygium consists of only two elements.

The male metapleura are smaller than in *D. n. nervosae*, i.e., one-third of the length of the propodeum, and less distinctly margined. Otherwise the two subspecies are identical.

The host fig is *Ficus magnoliifolia* Bl. (Philippines: Luzon, Palawan).

71. *Dolichoris boschmai* (Wiebes)

Wiebes, Zool. Meded. Leiden 39: 25–28 (1964a, *Blastophaga*); Wiebes, Proc. Kon. Ned. Akad. Wet. (C) 82: 196 (1979a).

The female head is not quite as long as wide across the compound eyes, which are $1\frac{1}{2}$ times as long as the cheek. The antennal segments have one irregular row of sensilla linearia. The mandibular appendage bears five lamellae; the bacilliform process is half as long as the maxilla.

There are pollen pockets. The marginal, stigmal and postmarginal veins of the fore wing have a length-ratio of approximately 1 : 1 : 2. The fore tibia has two dorso-apical teeth; the antiaxial tooth of the hind tibia is bicuspidate.

The hypopygium has two complete rows of hyaline spines. The spiracles of the eighth urotergite are large, oval. The ovipositor valvs are 1.3 times as long as the gaster.

The total length is 2.2 mm. The colour is brown.

The male head is as long as wide; the antennal groove is one-third of the length of the head, also the eye one-third, three times as long as the cheek. There are two anelli in the antenna. Dorsally, the mesonotum is separate from the propodeum; the propodeal spiracles are two-fifths of the length of the propodeum. The fore tibia has three dorsal teeth; the tarsus is oligomeric. The genital claspers bear five small claws. The total length is 1.5 mm.

The host fig is *Ficus dzumacensis* Guillaum. (Melanesia: New Caledonia).

Blastophaga Gravenhorst (fig. 13)

Gravenhorst, Beitr. Ent. Schles. 1: 27 (1829); Wiebes, Kon. Ned. Akad. Wet. 96: 347–367 (1993b).

The female head is approximately as long as wide across the compound eyes (0.8–1.2), which are ca. two times as long as the cheek (1.7–2.5). There are three large ocelli. In most species, the epistomal margin has lateral lobes and a setose median prominence. The antenna has eleven segments. The mandible has an apical tooth and a subapical one. The labium and maxillae are simple, bearing only some setae.

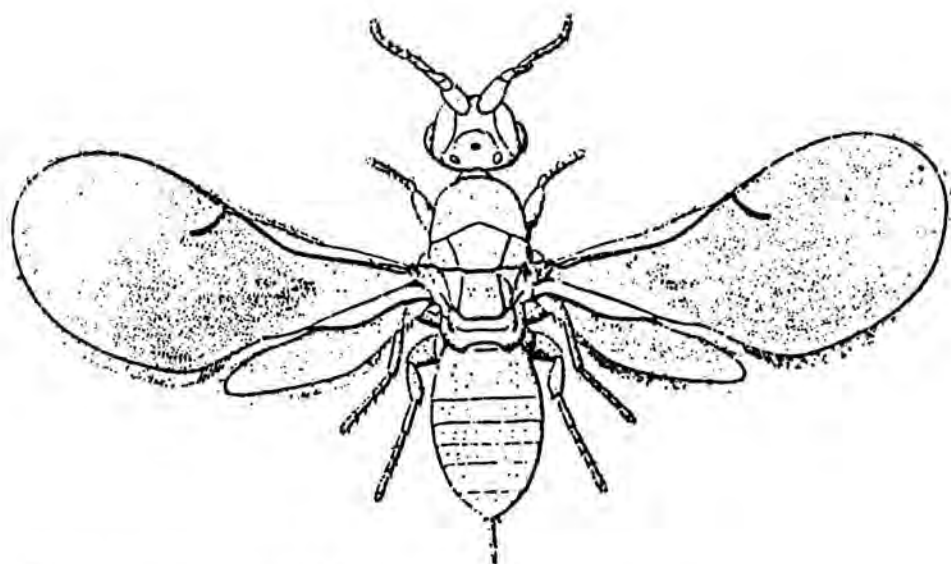


Fig. 13. *Blastophaga psenes* (L.), female, after Grandi (1929a, fig. 1).

The fore wing usually has well-developed veins, but in a few species those beyond the marginal are vague; the disk is hirsute and the fringe is of normal length. The hind tibia bears two spines, viz., a more or less widely bifurcate antiaxial (in one species it is rotundate) and a slender axial. The spiracular peritremata of the eighth urotergite are small, subcircular, but in one species they are larger, ovoid in shape.

The total length (head, thorax and gaster) is ca. 1.5 mm (1.2–1.7); the valves of the ovipositor scarcely project beyond the apex of the gaster.

The male head is approximately as long as wide, or a bit longer or shorter. The eye is one to two times as long as the cheek, but it may be (much) longer or shorter. The head bears dorsal spines. There is an antennal groove; in most species the antenna has an anellus, and the club is divided.

The thorax shows metanotal plates, which are spaced for a varying distance; the mesonotum mostly is fused with the propodeum, which has spiracular peritremata of small or medium size (large in the group of *B. nipponica*). The fore tibia has a dorso-apical crest consisting of (2-) 3–4 (-5) teeth; the two tarsal segments are subequal in length. The mid tarsus may be oligomorous, as in some species is the hind tarsus. The hind tibia has a bidentate antiaxial crest and some dorsal and ventral axial teeth.

The genitalia have claspers, which normally bear claws. The total length (head and thorax) is ca. 0.7–1 mm. The colour is yellowish.

There are 19 species known and one subspecies. One nominal species from Java remains incertae sedis, i.e. *B. distinguenda* Grandi (1916a: 129; 1917: 9); also *Blastophaga mayeri* Mayr (1885: 182) remains unrecognized. There are two main groups of species, viz., those with pollen pockets (pollinators of figs of subsection *Eriosyceae*) and those without (subsection *Ficus*), differentiated as two subgenera. There was a *Blastophaga*-species recorded from *Ficus ischnopoda* Miq. by Wiebes (1993b: 353).

KEY TO THE SPECIES OF BLASTOPHAGA S.L. (fig. 14)

1. Females 2
- Males (not known for *B. sensillata* & *B. macilentae*) 20
2. There are no pollen pockets. The hypopygial spine does not bear (a) row(s) of hyaline setae (*Blastophaga*) 3
- Mesosternal pollen pockets are present. The hypopygial spine bears one or two rows of hyaline setae (*Valisia*) 6
3. The compound eye is $1\frac{1}{2}$ to 2 times as long as the cheek (1.4). The antennal segments bear one row of long sensilla. *Ficus carica* L. & *F. palmata* Forssk. (India and widely introduced) 72. *Blastophaga* (*B.*) *pseudes* (L.)

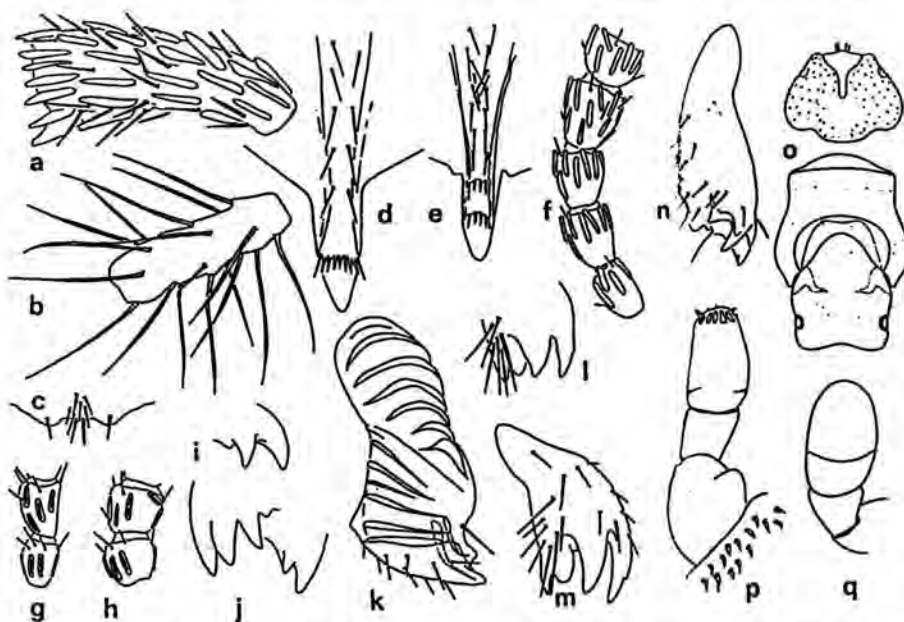


Fig. 14. Details of *Blastophaga* (a–m, females; n, o, p, q, males; after Wiebes (1993b, figs. 1–13, 15, 16–17, 19, 20, resp.). a, b, ninth antennal segment of: a, *B. confusa* Wiebes, and b, *B. medusa* Wiebes; c, epistomal margin of *B. medusa*; d–e, hypopygium of: d, *B. intermedia* Grandi, e, *B. sensillata* Wiebes; f, fifth to tenth, and g–h, fifth and sixth antennal segments of: f, *B. compacta* Wiebes, g, *B. macilentae* Wiebes, and h, *B. auratae* Wiebes; i–j, l–m, apex of fore tibia of: i, *B. malayana* Wiebes, and j, *B. filippina* Wiebes, l, *B. borneana* Wiebes, and m, *B. auratae*; k, mandible of *B. filippina*; n, *B. malayana*, hind tibia; o, *B. quadrupes* Grandi, head and thorax; p–q, left antenna of: p, *B. filippina*, and q, *B. silvestriana* Grandi.

- The compound eye is ca. two times as long as the cheek. The antennal segments, at least those beyond the sixth, bear two or more rows of sensilla 4
4. The antennal segments (not very long, except for the eleventh) bear no more than two rows of sensilla (prostrate, attached over the basal four-fifths). The fore tibia bears a characteristic spatulate dorso-apical tooth and the antiaxial tooth of the hind tibia is rounded and plate-like. *Ficus deltoidea* Jack (Indonesia: Java, Kalimantan, Sumatra; Malaysia: Selangor) 75. *Blastophaga* (*B.*) *quadrupes* Mayr
- The fifth to tenth antennal segments bear three to four irregular rows of oval-elongate sensilla (hook-like, only attached over the basal half). The teeth of the fore and hind tibiae are more normal, not spatulate or plate-like 5
5. The antennal segments 5–10 are three times as long as wide. *Ficus erecta* Thunb. (Japan: Kyushu, Shizuoka, RyuKyu; Taiwan) 74. *Blastophaga* (*B.*) *nipponica* Grandi
- The fifth to tenth antennal segments are no more than two times as long as wide. *Ficus pyriformis* Hook. & Arn., *F. variolosa* Lindl. ex Benth. & *F. erecta* Thunb. var. *beecheana* (Hook. & Arn.) King (China: Kwantung; Hong Kong) 73. *Blastophaga* (*B.*) *silvestriana* Grandi
6. The antennal segments, from the seventh onwards, are long: ca. three times as long as wide 7
- The antennal segments are shorter: at most ca. two times as long as wide 9
7. The antennal segments bear long sensilla chaetica (fig. b); the pedicel has ca. 35 axial spines. *Ficus chartacea* Wall. (Malaysia: Singapore) 86. *Blastophaga* (*V.*) *medusa* Wiebes
- The antennal segments bear sensilla linearia (fig. a); the pedicel has ca. fifty axial spines 8
8. The mandibular appendage has eight ventral lamellae. The hypopygium bears one transverse row of hyaline spines. *Ficus grossularioides* Burm.f. var. *stenoloba* Corner (Indonesia: Sumatra) 79. *Blastophaga* (*V.*) *confusa* Wiebes
- The mandibular appendage has only five ventral lamellae. The hypopygium bears two rows of hyaline spines. *Ficus setiflora* Stapf. (Indonesia: Kalimantan) 87. *Blastophaga* (*V.*) *borneana* Wiebes
9. The compound eye is only a quarter longer than the cheek (1.25). The antennal segments bear one row of long sensilla. *Ficus padana* Burm. (Indonesia: Sumatra & Java) 76. *Blastophaga* (*V.*) *intermedia* Grandi
- The compound eye is more than ca. $1\frac{1}{2}$ times as long as the cheek 10
10. The seventh to tenth antennal segments are short (fig. f): at most as long as wide. [The head is approximately as long as wide across the compound eyes, which are distinctly less than two times as long as the cheek (1.7)]. *Ficus fulva* Reinw. ex Bl. (Indonesia: Kalimantan; Malaysia: Pahang, Selangor) 83. *Blastophaga* (*V.*) *compacta* Wiebes
- The antennal segments are longer: $1\frac{1}{2}$ –2 times as long as wide 11
11. The fifth and sixth antennal segments bear two (to three) rows of sensilla 12
- The fifth antennal segment and mostly also the sixth bear only one row of sensilla 16
12. The head is longer than wide across the compound eyes (1.05). The seventh to ninth antennal segments bear only two rows of sensilla. *Ficus fulva* Reinw. [?] (Indonesia: Java, Sumatra) 84. *Blastophaga* (*V.*) *inopinata* Grandi
- The head is shorter than wide across the compound eyes (0.85–0.9). The seventh to ninth antennal segments bear at least three rows of sensilla 13
13. The seventh to tenth antennal segments bear relatively long sensilla, in three (to four) rows. The compound eye is only 1.7 times as long as the cheek 14

- These antennal segments have rather short, almost oval sensilla, in up to six rows. The compound eye is 2–2½ times as long as the cheek 15
- 14. The hypopygial spine bears one row of hyaline setae. *Ficus hirta* Vahl. (Indonesia: Java; Malaysia: Pahang; Hong Kong) 85a. *Blastophaga* (*V.*) *j. javana* Mayr
- The hypopygial spine bears two rows of hyaline setae. *Ficus hirta* Vahl (Hong Kong) 85b. *Blastophaga* (*V.*) *j. hilli* Wiebes
- 15. The compound eye is 2½ times as long as the cheek. The hypopygial spine bears two rows of hyaline setae. *Ficus glandulifera* (Wall. ex Miq.) King (Malaysia: Singapore) 81. *Blastophaga* (*V.*) *sensillata* Wiebes
- The compound eye is two times as long as the cheek. The hypopygial spine bears one row of hyaline setae. *Ficus tricolor* Miq. (Indonesia: Java) 82. *Blastophaga* (*V.*) *modesta* Wiebes
- 16. The fore tibia bears three large dorso-apical teeth (fig. j). The wing veins beyond the marginal are indistinct. *Ficus ruficaulis* Merr. (Philippines: Luzon) 80. *Blastophaga* (*V.*) *filippina* Wiebes
- The fore tibia bears two large teeth (sometimes with an auxilliary: fig. i). All wing veins are distinct 17
- 17. The hypopygial spine bears one row of hyaline setae 18
- The hypopygial spine bears two rows of hyaline setae. Two rather uniform species, which are only with difficulty differentiated 19
- 18. The mandibular appendage bears four ventral lamellae. The fore tibia has two teeth in the dorso-apical row. *Ficus spec.* (Indonesia: Norsa Kembangan, off Java) 78. *Blastophaga* (*V.*) *puncticeps* Mayr
- The mandibular appendage bears seven ventral lamellae. The fore tibia has an auxilliary tooth next to the two large dorso-apical teeth. *Ficus grossularioides* Burm.f. (Malaysia: Selangor) 77. *Blastophaga* (*V.*) *malayana* Wiebes
- 19. The fifth and sixth antennal segments (fig. h) are approximately as long as wide, and both bear only one row of sensilla. *Ficus aurata* Miq. (Indonesia: Kalimantan) 89. *Blastophaga* (*V.*) *auratae* Wiebes
- Especially the sixth segment is longer than wide (1½), with almost fully two rows of sensilla (fig. g). *Ficus macilenta* King (Indonesia: Kalimantan) 88. *Blastophaga* (*V.*) *macilenta* Wiebes
- 20. The antenna has no ring-segment, the basal segment of the divided antennal club is ca. one-third of the length of the distal part (fig. q) (♀, couplet 5) *Blastophaga* (*B.*) *silvestriana* Grandi and *B. (B.) nipponica* Grandi
- The antenna has a ring-segment and/or the basal part of the club is shorter relative to the basal part 21
- 21. The thorax consists of two distinct parts, viz., the pronotum and one posterior sclerite (fig. o) (♀, couplet 4) 75. *Blastophaga* (*B.*) *quadrupes* Grandi
- The thorax consists of a pronotum, a more or less clearly separate mesonotum, lateral sclerites representing the metanotum, and the propodeum (fig. 2, f) 22
- 22. The compound eye is very large, i.e. ca. seven times as long as the cheek, and ca. one-third of the length of the head. (♀, couplet 9) 76. *Blastophaga* (*V.*) *intermedia* Grandi
- The compound eye is shorter, no more than 2½ times as long as the cheek and at most one-fifth of the length of the head 23

23. The fore tibia bears five dorso-apical teeth. The eye is $2\frac{1}{2}$ times as long as the cheek (♀, couplet 16) 80. *B. (V.) filippina* Wiebes
- The fore tibia bears four dorso-apical teeth 24
- The fore tibia bears three dorso-apical teeth 28
- The fore tibia bears one dorso-apical tooth (♀, couplet 18)
 78. *Blastophaga (V.) puncticeps* Mayr
24. The eye is shorter than the cheek (0.7). The space between the metanotal plates is distinctly shorter than their width (0.6) (♀, couplet 19)
 89. *Blastophaga (V.) auratae* Wiebes
- The eye is as long as the cheek, or longer (1.2–1.7) 25
25. The space between the metanotal plates is 1.8 times their width. The eye is as long as the cheek. The genital claspers bear five claws (♀, couplet 8)
 87. *Blastophaga (V.) borneana* Wiebes
- The space between the metanotal plates is equal to their width or longer ($1\frac{1}{4}$). The genital claspers bear three or four claws 26
26. The space between the metanotal plates is equal to their width. The eye is 1.7 times as long as the cheek. The genital claspers bear three claws (♀, couplet 7)
 86. *Blastophaga (V.) medusa* Wiebes
- The space between the metanotal plates is $1\frac{1}{4}$ times their width. The eye is 1.2–1.5 times as long as the cheek. The genital claspers bear four claws 27
27. The space between the metanotal plates is $1\frac{1}{2}$ times as long as their width (♀, couplet 14) 85a. *Blastophaga (V.) j. javana* Mayr
- The space between the metanotal plates is 1.2 times as long as their width (♀, couplet 14) 85b. *Blastophaga (V.) j. hilli* Wiebes
28. The metanotal plates are spaced over a distance equal to $3\frac{1}{2}$ times their width (♀, couplet 18) 77. *Blastophaga (V.) malayana* Wiebes
- The metanotal plates are closer: at most spaced over a distance two times their width 29
29. The eye is $1\frac{1}{2}$ times as long as the cheek 30
- The eye is subequal to the length of the cheek 31
30. The metanotal plates are spaced over a distance equal to two times their width. The genital claspers bear three claws (♀, couplet 15) 82. *Blastophaga (V.) modesta* Wiebes
- The metanotal plates are spaced over a distance equal to 1.8 times their width. The genital claspers bear two claws (♀, couplet 10)
 83. *Blastophaga (V.) compacta* Wiebes
- The metanotal plates are spaced over a distance equal to $1\frac{1}{4}$ times their width. The genital claspers bear four claws (♀, couplet 12)
 84. *Blastophaga (V.) inopinata* Grandi
31. The space between the metanotal plates is ca. two times their width 32
- The space between the metanotal plates is ca. $1\frac{1}{2}$ times their width. The genital claspers bear no claws (♀, couplet 3) 72. *Blastophaga (B.) psenes* (L.)
32. The genital claspers bear three claws (♀, couplet 8)
 79. *Blastophaga (V.) confusa* Wiebes
- The genital claspers bear five claws (see also: ♂, couplet 25 and ♀, couplet 8)
 87. *Blastophaga (V.) borneana* Wiebes

Subgenus **Blastophaga**

The female has no pollen pockets. The hypopygium has a rather wide spine, in the fold of which pollen may be transported (Okamoto & Tashiro, 1981a, fig. 2); there are no rows of hyaline setae.

The male may lack an antennal anellus (group of *B. nipponica*). In *B. quadrupes* the thorax is characteristic (fig. o).

The host-*Ficus* belong to the subsection *Ficus*.

72. Blastophaga (B.) psenes (L.)

Linnaeus, Syst. Nat., ed. 10a, 1: 554, no. 13 (*Cynips psenes*, 1758); further see synonymy and lists of references in Grandi, Boll. Ist. Ent. Univ. Bologna **26**: 325–326 (1963), Wiebes & Compton, 1990, Proc. Kon. Ned. Akad. Wet. **93**: 206 (1990), and Wiebes in Berg & Wiebes, Verh. Kon. Ned. Akad. Wet., Nat. (2) **89**: 201–202 (1992). Synonyms: *Blastophagus grossorum* Gravenhorst, Uebers. Arb. Veränd. Schles. Ges. vaterl. Cult. i.J. 1826: 23–24 (1827); *Blastophaga vaidi* Joseph, Agra Univ. J. Res. 3 (2): 401–408 (1954).

The female head is a bit shorter than wide across the compound eyes, which are $1\frac{1}{2}$ –2 times as long as the cheek. The antennal segments, which are a bit longer than wide, bear one row of sensilla linearia, about five per facies, and the eleventh bears oval sensilla in two to three rows. The mandibular appendage bears five or six ventral lamellae.

The marginal, stigmal, and postmarginal veins of the fore wing are approximately in ratio 4 : 4 : 3. The fore tibia bears two dorso-apical teeth. The hypopygium is much as depicted in fig d. The total length (head, thorax and gaster) is ca. 1.8 mm.

The male head is as long as wide; the eye is approximately as long as the cheek, and one-quarter of the length of the head. Also the antennal groove is one-quarter of the length of the head. The antenna has a short anellus and the club is divided at one-quarter of its length.

The pronotum is shorter than the posterior sclerite (6 : 7), which has the mesonotum separate and the metanotal plates are spaced over a distance of ca. $1\frac{1}{2}$ times their width; the spiracular peritremata of the propodeum are situated just posteriad of the metanotal plates, and their length is ca. one-third of the lateral length of the propodeum. The fore tibia bears three dorso-apical teeth. All tarsi are normally developed. The claspers of the genitalia bear no claws. The total length (head and thorax) is ca. 1 mm.

The species must originally have come from India, and it was introduced with *Ficus carica* Linn. all over the world. In India and Africa it also pollinates *Ficus palmata* Forsk. The pollination of *Ficus carica* was described by Galil & Neeman (1977). See also Grover & Chopra (1971). There is, of course, a large literature on the edible fig and its pollinator, and its parasites (e.g., Vovlas c.s., 1992).

73. *Blastophaga* (B.) *silvestriana* Grandi

Grandi, Boll. Lab. Ent. Bologna 2: 190 (1929b), new name for *Blastophaga silvestrii* Grandi, Boll. Lab. Zool. Portici 20: 179–183 (1927c), nôt *B. silvestrii* Grandi, Boll. Lab. Zool. Portici 13: 39–44 (1919); Hill, Zool. Verh. Leiden 89: 21–24 (1967a).

The female is about as long as wide across the compound eyes, which are two times as long as the cheek. The fifth to tenth antennal segments are two times as long as wide, and they bear (two to) three rows of oval-elongate, spine-like sensilla. The mandibular appendage bears five ventral lamellae.

The marginal, stigmal (brown pigmentation only), and postmarginal veins are approximately in ratio 4 : 4 : 7. The fore tibia bears two dorso-apical teeth. The total length (head, thorax and gaster) is 1.3–1.5 mm.

The male head is wider than long (6 : 5); the eye is two-thirds of the length of the cheek, and one-sixth of the length of the head. The antennal groove is short and narrow, ca. one-sixth to one-fifth of the length of the head. The antenna has no anellus, and the club is divided at one-third of its length.

The pronotum, mesonotum and propodeum are subequal in length, measured dorsally; the metanotal plates are spaced for a distance equal to half of their width; the spiracular peritremata are situated half-way of the propodeum, and their length is ca. one half of it. The fore tibia bears three dorso-apical teeth. All tarsi are normally developed. The claspers of the genitalia bear two or three claws. The total length (head and thorax) is 0.8–0.9 mm.

The species was described from China (Kwantung, from an unknown species of fig), and Hill (1967a: 23–24) recorded it from *Ficus pyriformis* Hook. et Arn., *F. variolosa* Lindl. ex Benth. and *F. erecta* Thunb. var. *beeheyana* (Hook. et Arn.) King in Hong Kong.

74. *Blastophaga* (B.) *nipponica* Grandi

Grandi, Ann. Mus. Stor. nat. Genova 49: 304–305 (1921); Grandi, Boll. Lab. Zool. Portici 15: 205–212 (1922); Ishii, Kontyû 8: 84 (1934); Hill, Zool. Verh. Leiden 89: 23–24 (1967a).

The species is much as *B. silvestriana*, but the female head is shorter than wide across the compound eyes (0.8), which are more than two times as long as the cheek. The fifth to tenth antennal segments are three times as long as wide. The mandibular appendage bears seven to eight ventral lamellae.

The male mid tarsus was described as being tetramerous.

The host fig is *Ficus erecta* Thunb. (Japan: Kyushu, Shizuoka, RyuKyu; Taiwan). The biology of *B. nipponica* and the pollination of *F. erecta* were studied by Okamoto & Tashiro (1981a, b).

75. *Blastophaga (B.) quadripes* Mayr

Mayr, Verh. zool.-bot. Ges. Wien **35**: 182–184 (1885); Grandi, Treubia **8**: 353 (1926); Grandi, Boll. Lab. Ent. Bologna **1**: 119–123 (1928d).

The female head is shorter than wide across the compound eyes (0.8), which are two times as long as the cheek. The fifth to tenth antennal segments are two times as long as wide, and they bear two rows of rather long sensilla. The mandibular appendage bears five ventral lamellae.

The marginal, stigmal, and postmarginal veins of the fore wing are approximately in ratio 2 : 2 : 3. The fore tibia bears a spatulate dorsal tooth, and there may be a smaller, more axial tooth, or the tibia is more evenly bidentate. Also the hind tibia may have a spatulate antiaxial tooth, or it is less clearly rounded and plate-like. The hypopygium has a spine that is two times as long as wide at its base. The total length (head, thorax and gaster) is ca. 1.5 mm.

The male head is rather wide relative to its length (4 : 3), especially posteriorly; the eye is about as long as the cheek, and one-sixth of the length of the head. The narrow antennal groove is one-third of the length of the head. The antenna has no anellus, and the club is divided at one-tenth of its length.

The pronotum is wide posteriorly, and the meso- and metanotum and the propodeum are fused; the spiracular peritremata are one-fifth of the lateral length of the posterior sclerite. The fore tibia bears three dorso-apical teeth. The mid leg is reduced. The hind tarsus may be oligomeric. The hyaline claspers of the genitalia bear no claws. The total length (head and thorax) is ca. 0.7 mm.

The host fig is *Ficus deltoidea* Jack. (several varieties; Indonesia: Java, Kalimantan, Sumatra; Malaysia: Selangor, Kemaman).

Subgenus *Valisia* Wiebes

Wiebes, Proc. Kon. Ned. Akad. Wet. **96**: 354 (1993b).

The female has pollen pockets. The hypopygial spine bears one or two rows of hyaline setae.

The male may have a large eye (*B. intermedia*). There are three or four dorsal teeth in the fore tibia, exceptionally five (*B. filippina*) or only two (*B. puncticeps*).

All host figs of *Valisia* belong to the subsection *Eriosycea*.

76. *Blastophaga (V.) intermedia* Grandi

Grandi, Treubia **8**: 357 (1926); Grandi, Boll. Lab. Ent. Bologna **1**: 150–155 (1928d).

The female head is longer than wide across the compound eyes (1.2), which are only a quarter longer than the cheek (1.25). The fifth to eleventh antennal seg-

ments bear one row of (rather few) long sensilla. The mandibular appendage bears four large ventral lamellae.

The marginal, stigmal, and postmarginal veins of the fore wing are approximately in ratio 5 : 4 : 8. The fore tibia bears one long dorso-apical tooth and a large, wide and rounded subapical. The hypopygium has a long spine, with one row of hyaline setae. The spiracular peritremata of the eighth urotergite are rather large, ovoid in shape. The total length (head, thorax and gaster) is ca. 1.5 mm.

The male head is as long as wide; the eye is large: seven times as long as the cheek, and one-third of the length of the head. The antennal groove is one-sixth of the length of the head. The antenna has an anellus, and the club is divided at one-quarter of its length.

The pronotum is as long as the posterior sclerite, which shows two lozenge-shaped metanotal plates; the spiracular peritremata are half as long as the lateral length of the sclerite posteriad of the spiracles. The fore tibia bears three dorso-apical teeth. All tarsi are normally developed. The hyaline claspers of the genitalia bear no claws. The total length is ca. 0.9 mm.

The host fig is *Ficus padana* Burm.f. (Indonesia: Sumatra, Java).

77. *Blastophaga* (V.) *malayana* Wiebes

Wiebes, Proc. Kon. Ned. Akad. Wet. 96: 354, 356 (1993b).

The female head is as long as wide across the compound eyes, which are two times as long as the cheek. The antennal pedicel bears ca. 25 axial spines; the third and following segments are much as described for *B. confusa*, but they are shorter, e.g., the seventh is two times as long as wide, the ninth $1\frac{1}{2}$ times (both three times in *B. confusa*); they bear three rows of sensilla. The mandibular appendage bears seven ventral lamellae.

The fore wing (2 : 1) is ca. 1.2 mm long; the marginal, stigmal, and postmarginal veins are approximately in ratio 3 : 4 : 6; the hind wing (5 : 1) is ca. 0.6 mm long. The fore tibia bears two large dorso-apical teeth, and it may have an auxilliary (fig. i). The hypopygium is much as depicted for *B. intermedia* (fig. d). The total length (head, thorax and gaster) is ca. 1.3 mm. The colour is brown.

The male head is approximately as long as wide; the eye is as long as the cheek, and one-sixth of the length of the head. Dorsally, the head bears ca. 120 slender spines (vs. ca. 200 for *B. puncticeps*). The antennal groove is wide, and one-fifth of the length of the head. The antenna has a short anellus, as in *B. puncticeps* (Grandi, 1928d, fig. ii, 2), but the club has a faint division at one-quarter of its length.

The pronotum is shorter than the posterior sclerite (14 : 17), which shows rather angular metanotal plates, spaced over $3\frac{1}{2}$ times their width; the spiracular peritremata of the propodeum are rather large, ca. one-half of the length of the propodeum and two-thirds of its length posteriad of the spiracles. The fore tibia has a dorso-apical comb consisting of three teeth; the hind tibia (fig. n) bears a bidentate antiaxial crest with a smaller tooth at the apex, and a bifurcate axial tooth: it is much like that described by Grandi (1917: 8, figs. i, 8–9, sub *B. ? puncticeps*) for *B. inopinata*. All tarsi are normally developed. The claspers of the genitalia bear three small claws. The total length (head and thorax) is ca. 0.7 mm.

The host fig is *Ficus grossularioides* Burm.f. (Malaysia: Selangor). From *F. grossularioides* var. *stenoloba*, *B. (V.) confusa* is known.

78. *Blastophaga (V.) puncticeps* Mayr

Mayr, Wien. ent. Ztg. 25: 156–157 (1906); Grandi, Boll. Lab. Ent. Bologna 1: 108–112 (1928d).

The female head is longer than wide across the compound eyes (1.05), which are two times as long as the cheek. The fifth and sixth antennal segments bear one row of sensilla, the seventh to eleventh are $1\frac{1}{2}$ times as long as wide, and they bear 2–3 rows of sensilla. The mandibular appendage bears four ventral lamellae.

The marginal, stigmal, and postmarginal veins of the fore wing are approximately in ratio 5 : 5 : 8. The fore tibia bears two dorso-apical teeth. The hypopygium was not described. The total length (head, thorax and gaster) is ca. 1.8 mm.

The male head is about as long as wide (1.05); the eye is almost as long as the cheek, and about one-quarter of the length of the head. Also the antennal groove is about one-quarter of the length of the head. The antenna has an anellus, and the club seems undivided.

The pronotum is about as long as the posterior sclerite, which shows the two metanotal plates spaced for a distance equal to $1\frac{1}{2}$ times their width. The spiracular peritremata are small, ca. one-fifth of the lateral length of the sclerite posteriad of the metanotal plates. The fore tibia bears two dorso-apical teeth. All tarsi are normally developed. The genitalia were not described. The total length (head and thorax) is ca. 1 mm.

The species of host fig is not known. *B. puncticeps* was described from Norsa Kembangan, a small islet off Java (Indonesia).

79. *Blastophaga (V.) confusa* Wiebes

Wiebes, Proc. Kon. Ned. Akad. Wet. 96: 356–357 (1993b).

The female head is shorter than wide across the compound eyes (0.95), which are almost $2\frac{1}{2}$ times as long as the cheek. The epistomal margin is almost straight. The antennal pedicel bears ca. fifty axial spines; the appendage of the third segment is long (reaching almost to the distal margin of the fifth segment) and attenuate; the fourth is small, the fifth and sixth are a bit longer than wide and they bear one row of long sensilla; from the seventh onwards the segments, up to over three times as long as wide, are approximately in ratio 6 : 4 : 5 : 4 : 5, and they bear five to seven rows of sensilla (see fig. a). The mandibular appendage bears eight ventral lamellae.

The fore wing (2 : 1) is ca. 1.8 mm long; the marginal, stigmal, and postmarginal veins are approximately in ratio 1 : 1 : 2; the hind wing (5 : 1) is 0.9 mm long. The fore tibia has a dorso-apical comb consisting of two sharp teeth and one blunt, rounded tooth. The hypopygium is much like that of *B. intermedia* (fig. d), it bears one row of hyaline setae. The total length (head, thorax and gaster) is ca. 1.4–1.5 mm. The colour is light brown.

The male head and antenna are much like those of *B. malayana*, but the antennal groove is narrower and ca. one-quarter of the length of the head.

The pronotum is shorter than the posterior sclerite (4 : 5) and the metanotal plates are spaced over two times their width; the spiracular peritremata of the propodeum are ca. one-third of the length of the propodeum and three-quarters of its length posteriad of the spiracles. The fore tibia bears three dorsal antiaxial teeth; the hind tibia is much like that of *B. malayana*. All tarsi are normally developed. The claspers of the genitalia bear three claws. The total length (head and thorax) is ca. 0.75 mm.

The host fig is *Ficus grossularioides* Burm.f. var. *stenoloba* Corner (Indonesia: Sumatra). From the nominate variety of *F. grossularioides*, *B. (V.) malayana* is known.

80. *Blastophaga* (V.) *filippina* Wiebes

Wiebes, Proc. Kon. Ned. Akad. Wet. 96: 357–359 (1993b).

The female head is distinctly shorter than wide across the compound eyes (0.8), which are ca. two times as long as the cheek (2.2). The antennal pedicel bears ca. twenty axial spines; the funicular segments are $1\frac{1}{4}$ to $1\frac{3}{4}$, or $2\frac{1}{4}$ (the eleventh segment) times as long as wide; the fifth and sixth segments have one row of sensilla, the seventh two to three, the eighth to tenth two irregular rows, the eleventh three to four. The mandibular appendage (fig. k) bears six ventral lamellae.

The fore wing (9 : 4) is ca. 1.3 mm long; the submarginal and marginal veins are distinct, but the stigmal and postmarginal veins are very vague, they are approximately in ratio 4 : 1 : 1 : 2; the hind wing (9 : 2) is ca. 0.7 mm long. The

fore tibia (fig. j) has a dorso-apical comb of three large teeth. The hypopygium has a relatively long spine: two times as long as wide at the base; it bears one row of hyaline spines in the distal half. The total length (head, thorax and gaster) is ca. 1.4 mm. The colour is brown.

The male head is approximately as long as wide; the eye is $2\frac{1}{2}$ times as long as the cheek, and one-quarter of the length of the head. The antennal groove is wide, and one-fifth of the length of the head. The antenna (fig. p) has no anellus and a short (and faint) division of the club at one-eighth of its length.

The pronotum is approximately two times as long as the mesonotum, which is separate; the metanotal plates are spaced over $1\frac{1}{4}$ their width; the spiracular peritremata of the propodeum are lateral in position, one-third of the length of the propodeum and two-thirds of its length posteriad of the spiracles. The fore tibia bears five dorsal teeth, the proximal one of which is wide. The mid and hind tarsi are trimerous. The claspers of the genitalia bear two claws. The total length (head and thorax) is ca. 0.9 mm.

The host fig is *Ficus ruficaulis* Merr. (Philippines: Luzon).

81. *Blastophaga* (V.) *sensillata* Wiebes

Wiebes, Proc. Kon. Ned. Akad. Wet. **96**: 359 (1993b).

The female head is shorter than wide across the compound eyes (0.9), which are $2\frac{1}{2}$ times as long as the cheek. The antennal pedicel bears ca. 20 axial spines; the segments, from the fifth onwards, bear oval sensilla in two to three rows (the fifth and sixth segments), four to five (the seventh to tenth), or six rows (the eleventh segment); the segments are $1\frac{1}{2}$ – $2\frac{1}{2}$ times as long as wide. The mandibular appendage bears seven ventral lamellae.

The fore wing (9 : 4) is ca. 1.4 mm long; the marginal, especially the stigmal, and postmarginal veins are indistinct, they are approximately in ratio 2 : 3 : 4; the hind wing (4 : 1) is 0.7 mm long. The fore tibia bears a dorso-apical row of two, relatively small teeth. The hypopygial spine (fig. e) is $2\frac{1}{2}$ times as long as wide at the base, it bears long setae in between the arms of the V, and there are two rows of hyaline spines. The total length (head, thorax and gaster) is ca. 1.6 mm. The colour is light brown.

The male is not known.

The host fig is *Ficus glandulifera* (Wall. ex Miq.) King (Malaysia: Singapore).

82. *Blastophaga* (V.) *modesta* Wiebes

Wiebes, Proc. Kon. Ned. Akad. Wet. **96**: 359–360 (1993b).

The female head is shorter than wide across the compound eyes (0.85), which are two times as long as the cheek. The antennal pedicel bears ca. forty axial spines; the fifth and sixth antennal segments bear two (to three) rows of sensilla, the seventh to tenth three (to four) and the eleventh, fully four rows of oval sensilla. The mandibular appendage bears six ventral lamellae.

The fore wing (2 : 1) is ca. 1.3 mm long; the marginal, stigmal, and postmarginal veins are approximately in ratio 2 : 2 : 3; the hind wing (4 : 1) is ca. 0.7 mm long. The fore tibia has two large dorso-apical teeth, and a bidentate ventral one. The hypopygial spine is two times as long as wide at its base and it bears one row of hyaline setae. The total length (head, thorax and gaster) is ca. 1.6 mm. The colour is brown.

The male head is approximately as long as wide; the eye is $1\frac{1}{2}$ times as long as the cheek, and one-quarter of the length of the head. The antennal groove is one-quarter of the length of the head. The antenna has an anellus and the club is divided at one-sixth of its length.

The pronotum is longer than the posterior sclerite (6 : 5), which has the metonotal plates spaced over two times their width; the spiracular peritremata are two-fifths of the length of the propodeum and two-thirds of its length posteriad of the spiracles. The fore tibia has a wide dorsal comb consisting of three teeth. All tarsi are normally developed. The claspers of the genitalia bear three claws. The total length (head and thorax) is ca. 0.9 mm.

The host fig is *Ficus tricolor* Miq. (Indonesia: Java).

83. *Blastophaga* (V.) *compacta* Wiebes

Proc. Kon. Ned. Akad. Wet. 96: 360–361 (1993b).

The female head is a bit shorter than wide across the compound eyes (0.95), which are distinctly less than two times as long as the cheek (1.7). The antennal pedicel has ca. 35 axial spines; the fifth to ninth segments have one (to two) row(s) of oblong sensilla (fig. f), the tenth more fully two, and the eleventh two to three; the seventh to tenth are approximately as long as wide, which makes the antenna rather compact, and the eleventh is $1\frac{1}{2}$ times as long as wide. The mandibular appendage bears five ventral lamellae.

The fore wing (2 : 1) is ca. 1.4 mm long; only the marginal vein is distinct; the hind wing (4 : 1) is ca. 0.7 mm long. The fore tibia has two large teeth in the dorso-apical comb, and a bidentate ventral. The hypopygial spine is two times as long as wide at the base, and it bears one row of hyaline setae at half length. The total length (head, thorax and gaster) is ca. 1.6 mm. The colour is brown.

The male head is approximately as long as wide; the eye is $1\frac{1}{2}$ as long as the cheek and one-fifth of the length of the head. The antennal groove is wide,

one-quarter of the length of the head. The antenna has an anellus, and the club is divided at one-fifth of its length.

The pronotum is about as long as the posterior sclerite; the metanotal plates are spaced over almost two times their width (1.8); the spiracular peritremata are one-third of the length of the propodeum and two-thirds of the length posterioriad of the spiracles. The fore tibia bears three wide dorsal teeth. All tarsi are normally developed. The claspers of the genitalia bear two claws. The total length (head and thorax) is ca. 0.8 mm.

The host fig is *Ficus fulva* Reinw. ex Bl. (Indonesia: Kalimantan, Sumatra; Malaysia: Pahang, Selangor).

84. *Blastophaga* (V.) *inopinata* Grandi

Grandi, Treubia 8: 355 (1926); Grandi, Boll. Lab. Ent. Bologna 1: 116–119 (1928d). Synonym: *B. puncticeps*, Grandi, Boll. Lab. Zool. Portici 10: 129 (1916a) and Ibid. 12: 4–8 (1917) (not *B. puncticeps* Mayr, Wien. Ent. Ztg. 25: 156–157, 1906).

The female head is a bit longer than wide across the compound eyes (1.05), which are almost $2\frac{1}{2}$ times as long as the cheek. The antennal segments bear two rows of sensilla. The mandibular appendage bears five ventral lamellae.

The marginal, stigmal, and postmarginal veins of the fore wing are subequal in length. The fore tibia bears two dorso-apical teeth. The hypopygium was not described. The total length (head, thorax and gaster) is ca. 1.8 mm.

The male head is about as long as wide; the eye is ca. $1\frac{1}{2}$ times as long as the cheek, and one-quarter of the length of the head. Also the antennal groove is about one-quarter of the length of the head. The antenna has an anellus, and the club is divided at one-fifth of its length.

The pronotum is about as long as the posterior sclerite, the metanotal plates of which are spaced over a distance equal to 1.25 of their width; the spiracular peritremata of the propodeum are situated half-way the lateral margin posterioriad of the metanotal plates, and they are approximately one-third of the length of this margin. The fore tibia bears three dorso-apical teeth. The claspers of the genitalia bear four claws. All tarsi are normally developed. The total length (head and thorax) is ca. 1 mm.

The host fig was given as *Ficus fulva* Reinw. (Indonesia: Java, Sumatra), but from this fig also *B. compacta* was described.

85a. *Blastophaga* (V.) *j. javana* Mayr

Mayr, Verh. zool.-bot. Ges. Wien 35: 179–180 (1885); Grandi, Boll. Lab. Ent. Bologna 1: 113–116 (1928d).

The female head is about as long as wide across the compound eyes, which are ca. $1\frac{3}{4}$ times as long as the cheek. The fifth and sixth antennal segments bear two rows of sensilla, the seventh to tenth three (to four). The mandibular appendage bears four ventral lamellae.

The marginal, stigmal, and postmarginal veins of the fore wing are approximately in ratio 3 : 3 : 5. The fore tibia bears two dorso-apical teeth. The hypopygium has one row of hyaline setae. The total length (head, thorax and gaster) is ca. 1.5 mm.

The male head is about as long as wide; the eye is $1\frac{1}{2}$ times as long as the cheek, and almost one-quarter of the length of the head. The antennal groove is about one-third of the length of the head. The antenna has an anellus, and the club is divided at one-sixth of its length.

The (dorsal) length-ratio of the pronotum, mesonotum, and propodeum is ca. 6 : 5 : 4; the metanotal plates are spaced over 1.25 of their width. The fore tibia bears four dorso-apical teeth. All tarsi are normally developed. The genital claspers bear four claws. The total length (head and thorax) is ca. 1 mm.

The host fig is *Ficus hirta* Vahl ((Indonesia: Java).

85b. *Blastophaga* (V.) *javana hilli* Wiebes

Hill, 1967b, Zool. Verh. Leiden **89**: 24–27 (1967a, *B. javana*); Wiebes, Proc. Kon. Ned. Akad. Wet. **96**: 362 (1993b).

The female is much like that of *B. j. javana*, but differs in the number of rows of hyaline setae on the hypopygium: two, instead of one. The fore tibia bears an auxilliary tooth next to the two larger dorso-apical teeth. The male is as in *B. j. javana*.

The host species is *Ficus hirta* Vahl (Hong Kong).

86. *Blastophaga* (V.) *medusa* Wiebes

Wiebes, Proc. Kon. Ned. Akad. Wet. **96**: 362–363 (1993b).

The female head is a bit shorter than wide across the compound eyes (0.9), which are almost $2\frac{1}{2}$ times as long as the cheek (2.4). For the epistomal margin see fig. c. The antennal pedicel bears ca. 35 axial spines; the segments, from the fifth onwards, are approximately in ratio 2 : 2 : 11 : 7 : 10 : 8 : 8; from the seventh onwards, they are (over) three times as long as wide and bear long sensilla (fig. b); the tenth and eleventh are stalked. The mandibular appendage bears eight ventral lamellae.

The fore wing (2 : 1) is ca. 1.4 mm long; the marginal, stigmal, and postmarginal veins are approximately in ratio 1 : 1 : 2; the hind wing (4 : 1) is ca. 0.5 mm

long. The fore tibia bears a dorso-apical comb consisting of three distinct teeth, and long setae. The hypopgium has a spine that is $2\frac{1}{2}$ times as long as wide at the base, and it bears two rows of hyaline spines. The total length (head, thorax and gaster) is ca. 1.4 mm. The colour is light brown.

The male head is a bit longer than wide (1.1); the eye is more than $1\frac{1}{2}$ times the length of the cheek (1.7), and one-sixth of the length of the head. Also the (wide) antennal groove is one-sixth of the length of the head. The antenna has an anellus and the club is divided at one-seventh of its length.

The pronotum is shorter than the posterior sclerite (9 : 10); the metanotal plates are spaced for a length about equal to their width; the propodeal spiracular peritremata are 0.4 of the length of the propodeum, and two-thirds of its length posteriad to the spiracles. The fore tibia bears four dorsal teeth. All tarsi are normally developed. The claspers of the genitalia bear three claws. The total length (head and thorax) is 0.7–0.8 mm.

The host fig is *Ficus chartacea* Wall. (Malaysia: Singapore). It is this sample that made me suggest (Wiebes, 1963a: 97) that the record of (no. 147b) *Ceratosolen* (*C.*) *constrictus hewitti* Waterston from *F. chartacea* probably is incorrect.

87. *Blastophaga* (V.) *borneana* Wiebes

Wiebes, Proc. Kon. Ned. Akad. Wet. 96: 363–364 (1993b).

The female head is as long as wide across the compound eyes, which are $2\frac{1}{3}$ times as long as the cheek. The antennal pedicel bears ca. 55–60 axial spines; the seventh to tenth segments are three or more times as long as wide; from the seventh onwards, they are approximately in ratio 7 : 6 : 7 : 6 : 6, and they bear two to three (the fifth and sixth segments), or five (the eighth segment) to eight rows of oblong sensilla (the seventh and ninth). The mandibular appendage bears five ventral lamellae.

The fore wing (2 : 1) is ca. 1.8 mm long; the marginal, stigmal, and postmarginal veins are approximately in ratio 1 : 1 : 2; the hind wing (5 : 1) is ca. 0.9 mm long. The fore tibia bears two wide teeth in the dorso-apical comb (fig. 1); also the ventral teeth are wide and large, and there are long ventral setae. The hypopygial spine is $2\frac{1}{2}$ times as long as wide at the base; it bears two rows of hyaline setae. The total length (head, thorax and gaster) is ca. 1.7 mm. The colour is brown.

The male head is approximately as long as wide; the eye is as long as the cheek, and one-fifth of the length of the head. The antennal groove is wide, its end is vague; it is approximately two-fifths of the length of the head. The antenna has an anellus and the club is divided at one-fifth of its length.

The pronotum is a bit shorter than the posterior sclerite (17 : 19), which has a distinct mesonotum; the metanotal plates are spaced for a distance equal to 1.8 times their width; the spiracular peritremata of the propodeum are one-quarter of the total length of the propodeum, and one-half of its length posteriad of the spiracles – the lateral margins of the propodeum are lobed and the posterior margin is straight. The fore tibia bears three dorsal teeth, but in one sample this number is four. All tarsi are normally developed. The claspers of the genitalia bear five claws. The total length (head and thorax) is ca. 0.8 mm.

The host fig is *Ficus setiflora* Stapf. (Indonesia: Kalimantan).

88. *Blastophaga* (V.) *macilentae* Wiebes

Wiebes, Proc. Kon. Ned. Akad. Wet. **96**: 364–365 (1993b).

The female head is as long as wide across the compound eyes, which are a bit longer than the cheek (2.1). The antennal pedicel bears 35 – 40 axial spines; the fifth segment (fig. g) bears one row of sensilla and the sixth ($1\frac{1}{2}$ times as long as wide) almost fully two, the seventh to tenth three and the eleventh four to five; the length ratio's are much as in *B. borneana*. The mandibular appendage bears six ventral lamellae.

The fore wing (2 : 1) is ca. 1.5 mm long; the marginal, stigmal, and postmarginal veins are approximately in ratio 1 : 1 : 2; the hind wing (5 : 1) is ca. 0.7 mm long. The fore tibia resembles that of *B. borneana*, having two large teeth in the dorso-apical comb and two ventrals next to long setae. The hypopygial spine is two times as long as wide at the base, and it bears two rows of hyaline setae. The total length (head, thorax and gaster) is ca. 1.5 mm. The colour is brown.

The male is not known.

The host fig is *Ficus macilenta* King (Indonesia: Kalimantan).

89. *Blastophaga* (V.) *auratae* Wiebes

Wiebes, Proc. Kon. Ned. Akad. Wet. **96**: 365–366 (1993b).

The female head is shorter than wide across the compound eyes (0.9), which are two times as long as the cheek. The antennal pedicel bears 35 axial spines; the fifth and sixth segments (approximately as long as wide) bear one row of sensilla (fig. h), moreover, the sixth has one transverse sensillum; the seventh to tenth segments bear two to three rows, or fully three (the seventh) and the eleventh five, the seventh to tenth segments are subequal in length, ca. $1\frac{1}{2}$ times as long as wide, and the eleventh is $1\frac{1}{2}$ times as long as the others. The mandibular appendage bears five ventral lamellae.

The fore wing (2 : 1) is ca. 1.4 mm long; the marginal, stigmal, and postmarginal veins are approximately in ratio 1 : 1 : 2; the hind wing (4 : 1) is ca. 0.7 mm long. The fore tibia (fig. m) has the dorsal and ventral spines much as in *B. macilentae*. The hypopygial spine is $2\frac{1}{2}$ times as long as wide at the base and it bears two rows of hyaline stae. The total length (head, thorax and gaster) is ca. 1.6 mm. The colour is brown.

The male head has robust dorsal spines, it is a bit shorter than wide (0.95); the eye is two-thirds of the length of the cheek, one-sixth of the length of the head. The antennal groove is two-fifths of the length of the head; the antenna has an anellus, and the club is divided at one-quarter of its length.

The pronotum is a bit longer than the posterior sclerite (1.05); the metanotal plates are close together: their distance is 0.6 of their width; the spiracular peritremata of the propodeum are one-quarter of the length of the propodeum, and as long as its length posteriad of the spiracles. The fore tibia bears four dorsal teeth. All tarsi are fully developed, but those of the mid and hind legs are filiform (more so than in some other species). The claspers of the genitalia bear two claws. The total length (head and thorax) is ca. 0.9 mm.

The host fig is *Ficus aurata* Miq. (Indonesia: Kalimantan).

Wiebesia Bouček (fig. 15)

Bouček, Australasian Chalc.: 198, 209 (1988); Wiebes, Kon. Ned. Akad. Wet. **96**: 91–114 (1993a).

The female head is in most species shorter than wide across the compound eyes, but it may be as long or even longer (in two species). The compound eye is about two times as long as the cheek, but in two species it is four times as long. There are three large ocelli. The epistomal margin has weak lobes and a median prominence. The antenna has ten or eleven segments. The mandible usually has only one distinct apical tooth and one gland; the maxillae are simple.

The pronotum may be long and villose, but in some species it is shorter and (almost) bare. The mesoscutum has a longitudinal suture, but not in all species. In most species, a pollen pocket is present (but it is not in all species clear how it opens). The fore wing is pilose in most species, (sub-)hyaline in some. The fore tibia bears a large, plate-like dorso-apical tooth, or two or three dorso-apical teeth, in some species there is one, or there are four.

The hypopygium has a short spine, if any. The spiracular peritremata of the eighth urotergite are small and subcircular, but exceptionally they may be oval or very large and elongate.

The total length is $1\frac{1}{2}$ –3 mm, but it may be $1\frac{1}{2}$ – $2\frac{1}{2}$, or only 1– $1\frac{1}{2}$ mm.

The male head usually is as long as wide, or a bit longer or shorter; the eye is one-tenth to one-quarter of the length of the head. The antennae are situated

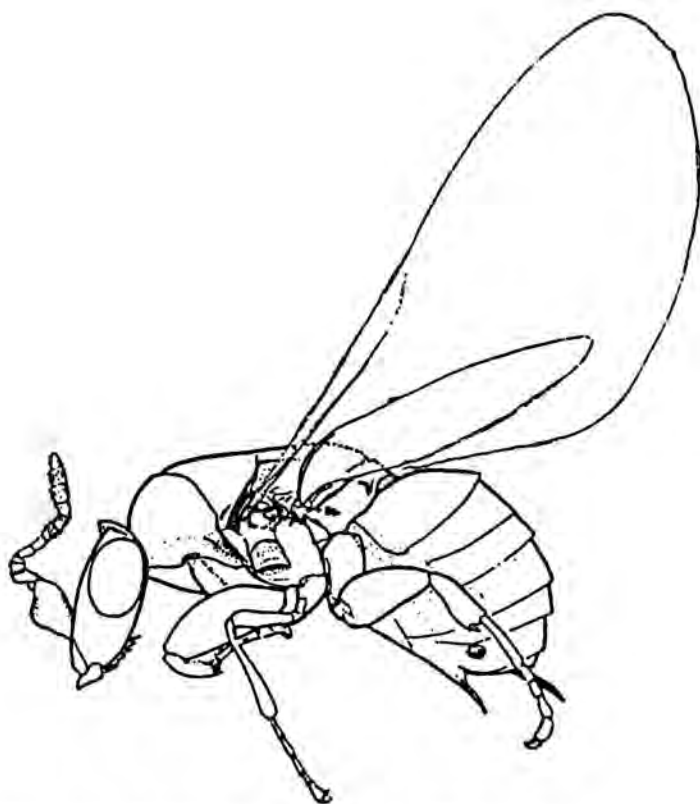


Fig. 15. *Wiebesia partita* Bouček, female, after Bouček (1988, fig. 345).

in one or two antennal grooves, one-seventh to one-quarter of the length of the head, exceptionally half as long. The antenna has five segments, the third being anuliform, but the anellus may be absent; the funicle and club may consist of one or two segments, or even three.

The thorax has a pro- and mesonotum, and metanotal plates placed latero-anteriorly to the propodeum. The fore tibia may have a plate-like expansion or dorso-apical teeth, sometimes arranged in a crest; the tarsus is bimerous (tetramerous in one species). The mid leg usually is atrophied, but it may be completely developed (but slender). The hind tibia has an apical crest, or the normal antiaxial and axial teeth; the tarsus is pentamerous in most species. The genitalia have claspers, which bear claws.

The total length (head and thorax) is ca. 0.7–1.2 mm, but it may be 1.5–1.7 mm. The colour is yellow or brown.

There are 18 species, several of which are (well) known in the female or male sex only. The host figs are known for all species: they belong to the sections *Kalosyce* and *Rhizocladus*, but the type-species (*W. partita*) was described from a *Sycidium*-fig (*F. primaria*).

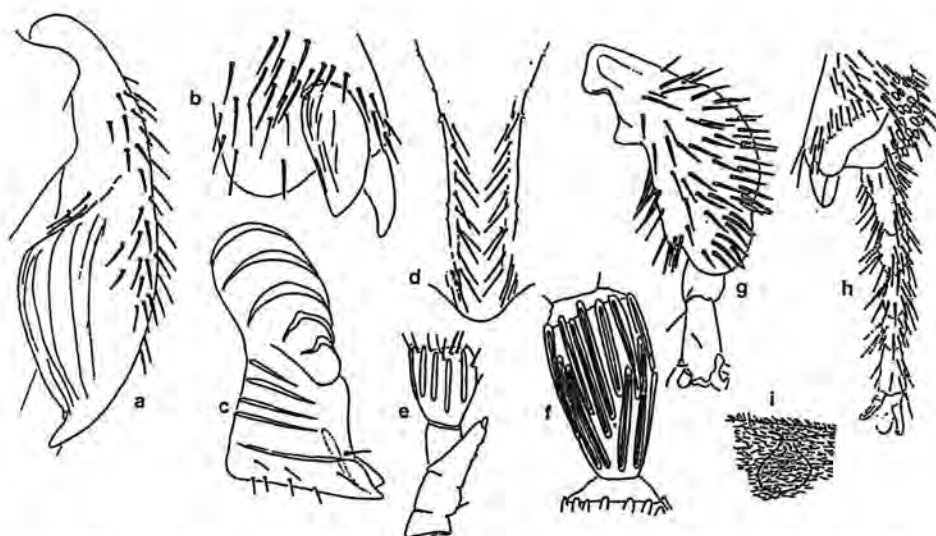


Fig. 16. Details of *Wiebesia*. a–f, i, females, after Wiebes (1993a, figs. 1–3, 6–7, 10, 17); g–h, males, after Wiebes (1980, figs. 12–13). a–b, *W. planocrea* Wiebes: a, fore tibia, b, apex of hind tibia; c and e, *W. nuda* Wiebes: c, mandible, e, antennal segments 3–5; d, *W. punctatae* Wiebes, hypopygium; f, *W. sensillata* Wiebes, seventh antennal segment; g–h, *W. vidua* Wiebes: g, fore tibia and tarsus, h, apex of hind tibia, and tarsus; i, *W. macula* Wiebes, wing macula.

KEY TO THE SPECIES OF WIEBESIA (fig. 16)

1. Females (not or incompletely known for *W. boldinghi*, *W. clavata*, *W. corneri* and *W. vidua*) 2
 - Males (not or incompletely known for *W. flava*, *W. macula* and *W. sensillata*) 14
2. The fore tibia has a large, plate-like dorso-apical tooth (fig. a) (also the hind tibia has a plate-like antiaxial tooth, fig. b). The spiracular peritremata of the eighth urotergite are very large and elongate. *Ficus aurantiacea* Griff. (Indonesia: Sumatra) 90. *Wiebesia planocrea* Wiebes
 - The fore tibia has two to four sharp dorso-apical teeth. In most species, the spiracular peritremata are small and subcircular; they may be larger and oval, but not elongate 3
3. The fore wing has a dark macula (fig. i). The spiracular peritremata of the eighth urotergite are large and oval. [The fore tibia has four dorso-apical teeth]. *Ficus carri* Corner (Malaysia: Sabah) 94. *Wiebesia macula* Wiebes
 - The fore wing has no macula, The spiracular peritremata, even if relatively large, are subcircular 4
4. The fore tibia has two or three dorso-apical teeth. Notauli are present 5
 - The fore tibia has four dorso-apical teeth. Notauli are absent. *Ficus primaria* Corner (Melanesia: Papua New Guinea) 95. *Wiebesia partita* Bouček
5. The fore tibia has two dorso-apical teeth 6
 - The fore tibia has three dorso-apical teeth 9
6. The appendage of the third antennal segment is very short. The pronotum is villose. *Ficus peninsula* Elm. (Philippines: Basilan) 102. *Wiebesia isabella* Wiebes

- The appendage of the third antennal segment is longer (reaching the fifth segment). The pronotum is (almost) bare 7
- 7. The compound eye is four times as long as the cheek. The mandibular appendage bears 10–15 ventral lamellae. The colour is yellowish. *Ficus sagittifolia* Vahl (Indonesia: Kalimantan) 103. *Wiebesia flava* Wiebes
- The compound eye is less than two times as long as the cheek. The mandibular appendage bears less than ten ventral lamellae. The colour is brownish 8
- 8. The fifth to ninth antennal segments bear sensilla in one row. *Ficus villosa* Bl. (Malaysia: Sabah) 104. *Wiebesia minuta* Wiebes
- The fifth to ninth antennal segments bear sensilla in $1\frac{1}{2}$ (the fifth and sixth) to two rows (the seventh to ninth) (fig. f). *Ficus urnigera* Miq. (Indonesia: Kalimantan) 105. *Wiebesia sensillata* Wiebes
- 9. The head is distinctly longer than wide across the compound eyes (1.2–1.25) 10
- The head is shorter, at most the length is subequal to the width 11
- 10. The antenna is eleven-segmented. The seventh to eleventh antennal segments have three rows of sensilla. *Ficus laevis* Bl. (India: Pulneys) . . . 99. *Wiebesia gomberti* (Grandi)
- The antenna has ten segments. The seventh to tenth segments have only one row of sensilla. *Ficus trichocarpa* Bl. (Indonesia: Java & Kalimantan) 98. *Wiebesia vechti* Wiebes
- 11. The compound eye is four times as long as the cheek. [The mesoscutum has a distinct suture]. *Ficus punctata* Thunb. (Indonesia: Java) . . . 92. *Wiebesia punctatae* Wiebes
- The compound eye is at most $2\frac{1}{2}$ times as long as the cheek 12
- 12. The mesoscutum has a distinct longitudinal suture (as in *W. partita*, fig. 2, m). *Ficus aurantiacea* Griff. var. *parviflora* Corner (Philippines: Luzon; Malaysia: Sabah) . . . 93. *Wiebesia contubernalis* (Grandi)¹
- The mesoscutum has no distinct (open) longitudinal suture 13
- 13. The fore wing is hyaline and there is no postmarginal vein. *Ficus apiocarpa* Miq. (Malaysia: Selangor) 96. *Wiebesia nuda* Wiebes
- The fore wing is pilose; the postmarginal vein is $1\frac{1}{2}$ –2 times as long as the stigmal. Two species that, except by size, cannot easily be differentiated, compare:
from *Ficus sarmentosa* Buch.Ham. ex J.E.Sm. (Japan: Kyushu; Taiwan) 100. *Wiebesia callida* (Grandi)
from *Ficus pumila* L. (Hong Kong; Taiwan) 101. *Wiebesia pumilae* (Hill)
- 14. The fore tibia has a plate-like expansion (fig. g); the hind tibia an antiaxial crest (fig. h) 15
- The fore and hind tibiae bear teeth² 20
- 15. The pronotum has a distinct longitudinal suture³ 16
- The pronotum does not have a distinct suture 18

¹Here also keys out the female of no. 91, *W. clavata*, incompletely known from some remains only (♂, couplet 16).

²The male of no. 103, *W. flava* fits here, but the only specimen available is too badly preserved to be keyed out further (♀, couplet 7).

³no. 94, *W. macula* fits here, but the only male available is too badly preserved to be keyed out further (♀, couplet 3).

16. The antenna is distinctly clavate. The head is rather short (0.85). The genital claspers bear three claws. *Ficus cataupi* Elmer (Philippines: Mindanao) 91. *Wiebesia clavata* Wiebes
- The antenna is not clavate. The head is longer (> 1). The genital claspers bear five claws. Two species that are very close 17
17. The head is relatively long (1.10), the antennal groove is rather short (0.2) (♀, couplet 11) 92. *Wiebesia punctatae* Wiebes
- The head is shorter relative to the width (1.05), the antennal groove is even shorter (0.15) (♀, couplet 2) 90. *Wiebesia planocrea* Wiebes
18. The pronotum is two times as wide as long, and it does not have a distinct collar (♀, couplet 12) 93. *Wiebesia contubernalis* (Grandi)
- The pronotum is about as wide as long, and it does have a collar. Two species that resemble each other very much 19
19. The eye is long relative to the length of the head (0.2) (♀, couplet 13) 96. *Wiebesia nuda* Wiebes
- The eye is shorter (0.15; fig. 2, g). *Ficus sphaerocarpa* Corner (Melanesia: Papua New Guinea) 97. *Wiebesia vidua* (Wiebes)
20. The hind tarsus is (indistinctly) tetramerous 21
- The hind tarsus has five distinct segments 22
21. The fore tibia has four dorso-apical teeth (♀, couplet 4) 95. *Wiebesia partita* Bouček
- The fore tibia has a dorsal crest consisting of five or six teeth (♀, couplet 10) 98. *Wiebesia vechti* Wiebes
22. The mid leg is completely developed 23
- The mid leg is atrophied 26
23. The antenna has five distinct segments (♀, couplet 10) 99. *Wiebesia gomberti* (Grandi)
- The antenna has only four segments 24
24. The pronotum has a distinct dorsal suture (♀, couplet 6) 102. *Wiebesia isabella* Wiebes
- The pronotum does not have a dorsal suture 25
25. The fore tarsus is bimerous. The genital claspers have six claws (♀, couplet 13) 100. *Wiebesia callida* (Grandi)
- The fore tarsus is tetramerous. The genital claspers have 11 or 12 claws (♀, couplet 13) 101. *Wiebesia pumilae* (Hill)
26. The antenna has four segments 27
- The antenna has five segments (♀, couplet 8) 104. *Wiebesia minuta* Wiebes
27. The eye is short, one-ninth of the length of the head. The head bears ca. fifteen long spines in either half. *Ficus disticha* Bl. (Malaysia: Sabah) 106. *Wiebesia corneri* Wiebes
- The eye is longer, one-sixth of the length of the head. There are more, shorter spines on the head: ca. fifty in either half. *Ficus lanata* Bl. (Indonesia: Java) 107. *Wiebesia boldinghi* (Grandi)

90. *Wiebesia planocrea* Wiebes

Wiebes, Proc. Kon. Ned. Akad. Wet. 96: 96–98 (1993a).

The female head is shorter than wide across the compound eyes (0.85), which are $2\frac{1}{2}$ times as long as the cheek. The epistomal margin has a rather setose median prominence. The antenna has ten segments, bearing relatively short sensilla (about fifteen per facies) in 2–3 rows; the eighth to tenth are shaped so as to form a club. The mandible has one apical tooth and one gland; the appendage bears some twelve ventral lamellae, the proximal three of which are situated very close together.

The pronotum has scattered setae; the mesoscutum has a fine longitudinal suture. The submarginal, marginal, stigmal, and postmarginal veins of the fore wing are approximately in ratio 25 : 9 : 8 : 11; the disk is pilose, the fringe is of moderate length. The fore tibia has one plate-like dorso-apical tooth. The hind tibia bears an antiaxial tooth in the shape of a plate, and a more slender axial, a bit hooked.

The hypopygium has a short spine, with a large number of long setae, placed closely together in the distal part. The spiracular peritremata of the eighth urotergite are very large and elongate.

The total length is ca. 2.9 mm; the valves of the ovipositor are one-tenth of the length of the gaster. The colour is rather dark brown.

The male head is distinctly longer than wide (1.1); the longitudinal diameter of the eye is 0.3 times the length of the head. The antennal groove is one-seventh of the length of the head. The antenna has five segments; the third is anuliform, the fourth and fifth are in ratio 3 : 5.

The pronotum has a longitudinal suture; the pronotum, mesonotum and propodeum, measured dorsally, are approximately in ratio 2 : 1 : 2; the lateral lobes representing the metanotum do not meet in the middle. The spiracular peritremata are large, as long as the lateral margin of the propodeum; they are ventral in position. The fore tibia bears a plate-like expansion, full of (small) spines. The claspers of the genitalia have five claws. The total length is ca. 1.5 mm. The colour is brown.

The host fig is *Ficus aurantiacea* Griff. (Indonesia: Sumatra). This is the same species as the host of *W. contubernalis*, but that species was recorded from var. *parviflora*.

91. *Wiebesia clavata* Wiebes

Wiebes, Proc. Kon. Ned. Akad. Wet. 96: 98 (1993a).

The female is incompletely known. The head is shorter than wide across the compound eyes (0.9), which are almost $2\frac{1}{2}$ times as long as the cheek (2.4). The

mesoscutum has a fine longitudinal suture. The fore leg bears three dorso-apical teeth. The spiracular peritremata of the eighth urotergite are small, subcircular.

The male head is shorter than wide (1.15); the longitudinal diameter of the eye, and also the antennal groove, is one-quarter of the length of the head. The antenna has five segments: the scape, pedicel, and a globular three-segmented club (3 : 5 : 4).

The pronotum has a fine longitudinal suture; the pronotum, mesonotum and propodeum, measured dorsally, are approximately in ratio 4 : 2 : 3: the lateral lobes representing the metanotum do not meet in the middle. The propodeal spiracular peritremata are large, mostly dorsal in position, covering the whole length of the propodeum. The fore tibia bears a plate-like expansion. The mid leg is atrophied. The hind tibia is much like that of *W. vidua*. The genital claspers bear three claws. The total length is ca. 1.1 mm. The colour is brownish.

The host fig is *Ficus cataupi* Elmer (Philippines: Mindanao).

92. *Wiebesia punctatae* Wiebes

Wiebes, Proc. Kon. Ned. Akad. Wet. 96: 99 (1993a).

The female head is shorter than wide across the compound eyes (0.85), which are ca. four times as long as the cheek. The antenna is much like that of *W. contubernalis*, and also the mandible is conform.

The pronotum is villose; the mesoscutum has a distinct median suture. The submarginal, marginal, stigmal, and postmarginal veins are approximately in ratio 12 : 3 : 2 : 2; the disk is pilose and the fringe is of moderate length. The fore tibia has a dorso-apical comb consisting of three teeth. The hind tibia has a tricuspidate antiaxial tooth and a bifurcate axial.

The hypopygium is blunt and rather wide. The spiracular peritremata of the eighth urotergite are small, subcircular. The total length is ca. 2.5 mm; the valves of the ovipositor are one-fifth of the length of the gaster. The colour is light brown.

The male head is longer than wide (1.05); the longitudinal diameter of the eye is one-fifth of the length of the head. Also in the other characters the male is similar to that of *W. contubernalis*, but *W. punctatae* has a distinct pronotal suture, which is lacking in *W. contubernalis*: in this *W. punctatae* resembles *W. planocrea*, which has a slightly longer head (1.12 vs. 1.05) and a shorter antennal groove (0.15 vs. 0.2). The genital claspers have five claws. The total length is ca. 1.2 mm. The colour is brown.

The host fig is *Ficus punctata* Thunb. (Indonesia: Java).

93. *Wiebesia contubernalis* (Grandi)

Grandi, Philipp. J. Sci. 33: 309–312 (1927b, *Blastophaga*); Bouček, Australasian Chalc.: 209 (1988).

The female head is shorter than wide across the compound eyes (0.8), which are $2-2\frac{1}{2}$ times as long as the cheek. The antennal sensilla have a moderate length – there are two rows per segment; the club is formed by the tenth and eleventh segments. The mandible has two apical teeth, one gland; the appendage bears six ventral lamellae.

The pronotum is villose; the mesoscutum has a distinct median suture. The fore wing has the submarginal, marginal, stigmal, and postmarginal veins approximately in ratio 18 : 4 : 4 : 3; the disk is pilose and the fringe is of moderate length. The fore tibia has a dorso-apical comb consisting of three teeth. The hind tibia has a tricuspidate antiaxial tooth and a bifurcate axial.

The hypopygium has a short and blunt spine, much as that of *W. muda*; there are rows of stout setae between the arms of the V. The spiracular peritremata of the eighth urotergite are medium-sized, subcircular. The total length is ca. 2.1 mm; the valves of the ovipositor are one-fifth of the length of the gaster. The colour is brown.

The male head is a bit longer than wide (1.05); the longitudinal diameter of the eye, and also the antennal groove, is one-quarter of the length of the head. There are five antennal segments; the third is anuliform and the fourth and fifth are in ratio 3 : 5.

The pronotum, mesonotum and propodeum, measured dorsally, are approximately in ratio 10 : 7 : 7; the lateral lobes representing the metanotum do not meet in the middle. The spiracular peritremata are half as long as the propodeum is laterally. The fore and hind tibiae are much as in *W. vidua*, the mid leg is atrophied. The genital claspers have three or four claws. The total length is ca. 1.7 mm.

The host fig is *Ficus aurantiacea* Griff. var. *parviflora* Corner (Philippines: Luzon; Malaysia: Sabah).

94. *Wiebesia macula* Wiebes

Wiebes, Proc. Kon. Ned. Akad. Wet. 96: 100–101 (1993a).

The female head is about as long as wide across the compound eyes, which are two times as long as the cheek. There are eleven antennal segments; the sensilla are much like those of *W. contubernalis*, the segments ten and eleven are shaped so as to form a (loose) club. The mandibular appendage bears seven ventral lamellae.

The pronotum is villose; the mesoscutum is entire. The fore wing has the submarginal, marginal, stigmal, and postmarginal veins approximately in ratio

14 : 4 : 3 : 1, the stigmal (fig. i) is a large yellow-brown macula; the disk is pilose and the fringe is of moderate length. The fore tibia has a dorso-apical comb consisting of four sharp teeth. The hind tibia has a tricuspidate antiaxial tooth and a bifurcate axial.

The hypopygium has a short spine. The spiracular peritremata of the eighth urotergite are relatively large, oval in shape. The total length (head, thorax and gaster) is ca. 2.4 mm; the valves of the ovipositor are one-third of the length of the gaster. The colour is brown.

The male is incompletely known. The pronotum has a fine longitudinal suture, much as in *W. clavata*.

The host fig is *Ficus carri* Corner (Malaysia: Sabah).

95. *Wiebesia partita* Bouček

Bouček, Australasian Chalc.: 209 (1988).

The female head is as long as wide across the compound eyes, which are ca. $1\frac{1}{2}$ times as long as the cheek. The antenna has eleven segments; the appendage of the third segment is moderate, the flagellum is subclavate. The mandible is bidentate, and bears four slightly radiating lamellae; the appendage is short and wide, and it bears five crescentic, gradually longer lamellae, the first of which is extremely short.

The thorax is smooth and shiny, with very short pilosity mostly confined to the anterior sloping part of the pronotum. The mesoscutum is smooth and bare, without traces of nautuli, but with an evident median suture. The mesopleuron has a large pollen pocket below the fore wing, opening downwards. The fore wing has the venation bleached beyond the submarginal vein, especially the stigmal vein is hyaline and indistinct. The fore tibia has four sharp externo-apical teeth.

The gaster is short. The spiracular peritremata of the eighth urotergite are round and rather small. The total length is 1.2–1.5 mm; the valves of the ovipositor are very shortly produced. The colour is generally black, but some parts are reddish brown.

The male head is about as long as wide; the dorsal surface (as also the anterior part of the pronotum and the anterior half of the fore femur) has a dense puncturation and an extremely short spinulose pilosity. The antennal scrobes are divided by a high median septum, each half is slightly elongate. The antenna is short, clavate.

The pronotum is evidently elongate, with subconcave and slightly converging sides, separated from the dorsal part by a subrectangular edge. The fore tibia is greatly widened, subtriangular, and has four broad teeth on the outer edge.

The mid legs are reduced to stumps. The hind tarsus is indistinctly four-segmented. The total length is 1.1–1.2 mm.

The host is *Ficus primaria* Corner (Melanesia: Papua New Guinea). In my opinion this record requires confirmation.

96. *Wiebesia nuda* Wiebes

Wiebes, Proc. Kon. Ned. Akad. Wet. 96: 102–103 (1993a).

The female head is shorter than wide across the compound eyes (0.9), which are $2\frac{1}{2}$ times as long as the cheek. The antenna has eleven segments; the sensilla (fig. e) are longer than those of *W. contubernalis* and the ninth to eleventh segments are more shaped so as to form one club. The mandible has two apical teeth, one gland; the appendage bears five ventral lamellae.

The pronotum is almost bare; the mesoscutum has a faint longitudinal suture shining through the cuticle. The submarginal, marginal, and stigmal veins of the fore wing are approximately in ratio 9 : 1 : 2, the postmarginal vein is non-existent; the disk is hyaline and the fringe is short. The fore tibia has a dorso-apical comb consisting of three sharp teeth. The hind tibia has a bicuspidate antiaxial tooth and a slender, curved axial.

The hypopygium has a blunt apex. The spiracular peritremata of the eighth urotergite are very small, subcircular. The total length is ca. 1.8 mm; the ovipositor valves are hardly one-fifth of the length of the gaster (0.19). The colour is brown.

The male head is almost as wide as long (0.9); the longitudinal diameter of the eye is one-fifth of the length of the head. The antennal groove is one-fifth of the length of the head. The antenna has five segments; the third segment is anuli-form, the fourth and fifth are subequal in length.

The length-ratio of the pronotum, mesonotum and propodeum, measured dorsally, is approximately 9 : 2 : 4; the lateral lobes representing the metanotum are narrowly fused in the middle (: 1). The spiracular peritremata of the propodeum are lateral in position, covering about half of the length of the propodeum. The fore tibia bears a plate-like expansion, much as in *W. vidua*. The mid leg is atrophied. Also the hind tibia is much like that of *W. vidua*. The genital claspers have four small claws. The total length is ca. 0.85–0.9 mm. The colour is yellowish brown.

The host fig is *Ficus apiocarpa* Miq. (Malaysia: Selangor).

97. *Wiebesia vidua* (Wiebes)

Wiebes, Proc. Kon. Ned. Akad. Wet. (C) 83: 94, 96 (1980, *Blastophaga*); Bouček, Australasian Chalc.: 196 (1988 – may belong to *Wiebesia*).

The female is not known.

The male head is a bit longer than wide (1.05); the longitudinal diameter of the eye is one-seventh of the length of the head. The antennal grooves are one-tenth of the length of the head. The antenna has five segments, the third of which is anuliform, and the fourth is longer than the fifth (6 : 5).

The pronotum, mesonotum, and propodeum, measured dorsally, are approximately in ratio 17 : 9 : 12; the metanotal plates do not meet in the middle. The spiracular peritremata are latero-ventral and posterior in position and cover half of the length of the propodeum. The fore tibia bears an axial plate-like expansion, full of stout setae. The hind tibia is rather heavily armed with an antiaxial crest and a ventral, shovel-shaped tooth. The genital claspers bear three claws. The total length is ca. 1.3 mm. The colour is yellowish.

The host fig is *Ficus sphaerocarpa* Corner (Melanesia: Papua New Guinea).

98. *Wiebesia vechti* Wiebes

Wiebes, Proc. Kon. Ned. Akad. Wet. 96: 104–105 (1993a).

The female head is $1\frac{1}{4}$ times as long as wide across the compound eyes, which are more than $1\frac{1}{2}$ times as long as the cheek (1.65). The antenna has ten segments, the ninth and tenth of which form a club; all segments have one row of relatively long sensilla, and setae; the pedicel has less than ten ventral spines; the appendage of the third segment is short and scarcely reaches the distal end of the fourth segment. The mandible has two teeth, but one gland; the appendage bears six ventral lamellae, the proximal four of which are produced.

The pronotum has a few setae; the mesoscutum is entire. The submarginal, marginal, stigmal, and postmarginal veins of the fore wing are approximately in ratio 12 : 2 : 2 : 1; the disk is subhyaline and the fringe is short. The fore tibia has three sharp dorso-apical teeth; the tarsal segments are approximately in ratio 13 : 3 : 4 : 9. The hind tibia has a bicuspidate antiaxial and a more slender, bifurcate axial tooth.

The hypopygial spine is $1\frac{1}{2}$ times as long as it is wide at its base, and there are only two setae of medium length. The spiracular peritremata of the eighth urotergite are of medium size, subcircular. The total length is ca. 1.5 mm; the valves of the ovipositor are less than half as long as the gaster (0.4). The colour is brown.

The male head is as long as wide; the eye is not well visible from above, one-ninth of the length of the head. The antennal groove is one-sixth of the length of the head. On either side of the antennal groove there are some thirty small spines, directed backwards. The antenna has five segments; the third is anuliform, the fourth and fifth are in length-ratio 7 : 5.

The pronotum, mesonotum and propodeum, measured dorsally, are approximately in ratio 10 : 9 : 5; the plates representing the metanotum are large, meeting in the middle and reaching almost to the caudal end of the propodeum laterally, where the relatively small (short) stigmatal peritremata cover the whole (lateral) length (one fifth of the total length). The fore tibia has a dorsal crest consisting of 5–6 teeth. The hind tibia has antiaxial and axial teeth; the tarsus has only four segments, in ratio 4 : 3 : 3 : 5. The genital claspers bear two claws. The total length is ca. 0.9–1.0 mm. The colour is yellowish.

The host fig is *Ficus trichocarpa* Bl. (Indonesia: Java, Kalimantan).

99. *Wiebesia gomberti* (Grandi)

Grandi, Bull. Soc. Zool. France 53: 70–74 (1928a, *Blastophaga*).

The female head is longer than wide across the compound eyes (1.2), which are more than $1\frac{1}{2}$ times as long as the cheek (1.6). The antenna has eleven segments, the seventh to eleventh of which bear three to four rows of oblong sensilla; the fifth and sixth segments are shorter and narrower, and bear only one or two irregular rows of sensilla. The mandible has two teeth and two glands; the appendage has only three ventral lamellae.

The pronotum has only a few setae. The fore wing has the marginal, stigmal, and postmarginal veins approximately in ratio 3 : 3 : 5; the disk is pilose. The fore tibia has three sharp, dorso-apical teeth. The hind tibia has a bidentate antiaxial tooth and a more slender, simple axial. The total length is ca. 2.9 mm; the valves of the ovipositor are one-ninth of the length of the gaster. The colour is castaneous brown.

The male head is longer than wide (1.15); the longitudinal diameter of the eye is one-sixth of the length of the head. The antennal grooves are one-sixth of the length of the head. The antenna has five segments, the third of which is anuli-form and the fourth and fifth are in ratio 8 : 5.

The length-ratio of the pronotum, mesonotum, and propodeum, measured dorsally, is approximately 11 : 4 : 6; the metanotal plates do not meet in the middle. The spiracular peritremata are dorsal in position and they cover almost the whole (lateral) length of the propodeum. The fore tibia has two sharp dorso-apical teeth. The mid leg is fully developed. The hind tibia has a bidentate antiaxial tooth and a simple axial. The total length is ca. 1.5 mm. The colour is yellow.

The host fig is *Ficus laevis* Bl. (India: Pulneys).

100. *Wiebesia callida* (Grandi)

Grandi, Boll. Soc. ent. Ital. 59: 18–24 (1927a); Grandi, Boll. Lab. Zool. Portici 20: 183 (1927c); Ishii, Kontyû 8: 85 (1934) (all in *Blastophaga*).

The female head is a bit shorter than wide across the compound eyes (0.95), which are $2\frac{1}{2}$ times as long as the cheek. The antenna has eleven segments, the fifth to tenth of which bear oblong sensilla in two rows, the longer eleventh has five rows. The mandibular appendage bears five wide ventral lamellae.

The pronotum has many long setae. The fore wing has the submarginal, marginal, stigmal, and postmarginal veins approximately in ratio 10 : 3 : 2 : 5; the disk is rather pilose and the fringe has a moderate length. The fore tibia has three sharp, dorso-apical teeth. The hind tibia has a tricuspidate antiaxial tooth and a more slender, bifurcate axial.

The total length is ca. 2 mm; the ovipositor valves are one-tenth of the length of the gaster. The colour is brown.

The male head is as long as wide; the longitudinal diameter of the eye is one-fifth of the length of the head. The antennal groove is about half as long as the head. At either side of the groove there are some fifty long spines. The antenna has four segments, the third of which is anuliform.

The length-ratio of the pronotum, mesonotum and propodeum, measured dorsally, is approximately 8 : 4 : 5; the mesonotum and propodeum are almost completely fused in between the lateral lobes representing the metanotum. The spiracular peritremata are situated dorsally and anteriorly: they are one-third of the length of the propodeum. The fore tibia has two (?) dorsal teeth. The mid leg is completely developed, but it may be tetramerous, with the second and third segments fused. The hind tibia bears a bidentate antiaxial tooth and a more slender, bifurcate axial. The genital claspers bear half a dozen claws. The total length is ca. 1.1 mm. The colour is yellowish.

The host fig is *Ficus sarmentosa* Buch. Ham. ex J.E.Sm. (Japan: Kuyushu; Taiwan).

101. *Wiebesia pumilae* (Hill)

Hill, Zool. Verh. Leiden 89: 27-31 (1967a, *Blastophaga*).

The female head is subcircular in outline; the cheek is shorter than the compound eye (0.6). The antenna has eleven segments, the fifth to tenth of which have 2-3 rows of relatively long sensilla; the appendage of the third segment reaches up to one-third of the length of the fifth; the eleventh segment is much longer than the other segments and it bears six rows of elongate sensilla and one or two patches of circular sensilla. The mandibular appendage has four or five ventral lamellae.

The mesoscutum is entire; there are no pollen-pockets. The marginal and stigmal veins of the fore wing are subequal, and half the length of the postmarginal; the greater part of the disk is densely pubescent. The fore tibia has three

dorso-apical teeth. The mid tibia bears a spur. The hind tibia bears a bidentate antiaxial tooth and a slender axial.

The hypopygium has a short spine. The spiracular peritremata are fairly large. The total length is ca. 2.0–2.8 mm; the valves of the ovipositor are scarcely protruding. The colour is dark brown.

The male head is distinctly wider than long (17 : 14); the eye is small: half as long as the cheek, and one-seventh of the length of the head. The two antennal grooves are ca. one-third of the length of the head. The antenna has four distinct segments; the third is anuliform.

The pronotum, mesonotum and propodeum, measured dorsally, are approximately in ratio 8 : 6 : 7; the plates representing the metanotum are far apart. The stigmal peritremata are situated dorsally and rather anteriorly and they are one-third of the lateral length of the propodeum. The fore tibia has three large dorso-apical teeth; the tarsus is tetramerous. The mid leg is complete. The hind tibia has two large bifid teeth on the ventral apex. The genital claspers bear a dozen claws. The total length is ca. 1.3 mm. The colour is yellow-brown.

The host fig is *Ficus pumila* L. (Hong Kong; Taiwan). The biology was described by Ma & Wu (1989).

102. *Wiebesia isabella* Wiebes

Wiebes, Proc. Kon. Ned. Akad. Wet. 96: 108–109 (1993a).

The female head is shorter than wide across the compound eyes (0.9), which are 1.75 times as long as the cheek. The head is tapering towards the (almost straight) epistomal margin, which is not quite half as wide as the head across the eyes. The antenna has ten segments: the third has a very short appendage, the fifth to tenth are subequal, bearing oblong sensilla in two full rows. The mandible has one apical tooth and one gland; the appendage is rather wide and it bears some eight ventral lamellae, the proximal four of which are a bit produced.

The pronotum is villose; the mesoscutum is entire. The submarginal, marginal, stigmal, and postmarginal veins of the fore wing are approximately in ratio 4 : 1 : 1 : 1; the disk is pilose and the fringe is of moderate length. The fore tibia has two sharp dorso-apical teeth. The hind tibia has a deeply bifurcate antiaxial tooth and a simple axial.

The hypopygium has a distinct spine, which is $1\frac{1}{2}$ times as long as wide at its basis. The spiracular peritremata of the eighth urotergite are very small, subcircular. The total length is ca. 1.6 mm; the valves of the ovipositor are one-quarter of the length of the gaster. The colour is brown. At places the head has a striate sculpture.

The male head is longer than wide (1.2); the longitudinal diameter of the eye is a bit over one-eighth of the length of the head. The antennal grooves, one for either antenna, are one-sixth of the length of the head. The antenna has four segments, the third of which is anuliform, the fourth is elongate (3 : 1).

The length-ratio of the pronotum, mesonotum, metanotum and propodeum, measured dorsally, is approximately 9 : 5 : 2 : 6; the configuration is much as in *W. vidua*, but the metanotal sclerites, just touching, are longer in the middle. The spiracular peritremata are dorsal in position, covering almost the whole length of the propodeum beyond the metanotal sclerites (it is longer in the middle, about $2\frac{1}{2}$ times as long as the spiracular peritremata). The fore tibia bears three sharp dorso-apical teeth and two ventrals. The mid leg is slender, but complete. The hind tibia has a bidentate antiaxial crest, one dorsal and one ventral tooth. The genital claspers have four distinct claws. The total length is ca. 1–1.1 mm. The colour is yellowish.

The host fig is *Ficus peninsula* Elmer (Philippines: Basilan).

103. *Wiebesia flava* Wiebes

Wiebes, Proc. Kon. Ned. Akad. Wet. 96: 110 (1993a).

The female head is almost as long as wide across the compound eyes (0.95), which are large: four times as long as the cheek. The antenna is incomplete in both specimens available; there is one row of long sensilla, about five per facies, and there are long setae; the pedicel bears some twenty antiaxial spines; the appendage of the third segment reaches up to one-quarter of the fifth segment. The mandible has one apical tooth and one gland; the appendage bears fifteen straight ventral lamellae (ten in the other specimen).

The pronotum is bare; the mesoscutum has a fine longitudinal suture. The fore wing has the submarginal, marginal, stigmal, and postmarginal veins approximately in ratio 22 : 7 : 6 : 7; the disk is pilose and the fringe is short. The fore tibia bears two dorso-apical teeth. The hind tibia has two bidentate teeth.

The hypopygium has a short spine and there are four or five long setae along either arm of the V. The spiracular peritremata of the eighth urotergite are small, subcircular. The total length is ca. 1 mm; the valves of the ovipositor are one-fifth of the length of the gaster. The colour is yellowish.

The male is incompletely known.

The host fig is *Ficus sagittata* Vahl var. *oligosperma* (Miq.) Corner (Indonesia: Kalimantan).

104. *Wiebesia minuta* Wiebes

Wiebes, Proc. Kon. Ned. Akad. Wet. 96: 110–111 (1993a).

The female head is shorter than wide across the compound eyes (0.9), which are almost two times as long as the cheek (1.85). The antenna has ten segments, subequal in length, the fifth to ninth of which bear one row of relatively long sensilla (ca. four per facies; the tenth has $1\frac{1}{2}$ –2 rows) and long setae; the pedicel bears some 25 ventral spines; the appendage of the third segment reaches the fifth segment. The mandible has one tooth, one gland; the appendage bears nine ventral lamellae, the proximal four or five of which are produced.

The pronotum is not very long; it bears setae, but is not villose; the meso-scutum has a distinct suture. The submarginal, marginal, stigmal, and postmarginal veins of the fore wing are approximately in ratio 13 : 5 : 3 : 1; the subhyaline disk bears microtrichiae and the fringe is of moderate length. The fore tibia has two dorso-apical teeth. The hind tibia has a tricuspidate antiaxial tooth and a bifurcate axial.

The hypopygium has a few long setae, and a sharp spine, which is as long as it is wide at the base. The spiracular peritremata of the eighth urotergite are small, subcircular. The total length is ca. 1.3 mm; the valves of the ovipositor are one quarter of the length of the gaster. The colour is brown.

The male head is as long as wide; the longitudinal diameter of the eye is one-tenth of the length of the head. The antennal groove is one-seventh of the length of the head. On either side of the antennal groove there are long spines, as in *W. corneri*, but two times as many. The antenna has five segments; the third is anuliform, very narrow, and the fourth and fifth are subequal in length.

The pronotum, mesonotum and propodeum, measured dorsally, are approximately in ratio 5 : 5 : 6, the parts representing the metanotum do meet in the middle. The spiracular peritremata, situated anteriorly, are two-fifths of the lateral length of the propodeum, which is two-fifths of the total length. The fore tibia bears three dorso-apical teeth and two ventrals. The hind tibia has a bidentate antiaxial tooth and a more simple axial.

The genital claspers could not be found. The total length is ca. 0.7–0.9 mm. The colour is yellowish.

The host fig is *Ficus villosa* Bl. var. *subglobosa* Corner (Malaysia: Sabah). Also *F. ? excavata* King was recorded as a host.

105. *Wiebesia sensillata* Wiebes

Wiebes, Proc. Kon. Ned. Akad. Wet. 96: 112 (1993a).

The female head is almost as long as wide across the compound eyes (0.95), which are not quite two times as long as the cheek (1.85). The antenna has ten segments, which are more elongate than in *W. minuta* and full of many long sensilla in one row (the fifth and sixth segments), $1\frac{1}{2}$ –2 (the seventh and eighth, a bit longer) and fully two (the ninth, longer still) up to three rows (the tenth);

the pedicel bears some 20–25 antiaxial spines; the appendage of the third segment reaches over the proximal margin of the fifth segment. The mandible has one apical tooth, one gland; the appendage bears eight ventral lamellae, the proximal four of which are produced.

The pronotum has a few setae; the mesoscutum has a distinct suture. The submarginal, marginal, stigmal, and postmarginal veins of the fore wing are approximately in ratio 9 : 3 : 2 : 1; the subhyaline disk bears some microtrichiae and the fringe is of moderate length. The fore tibia has two dorso-apical teeth. The hind tibia has a bicuspidate antiaxial tooth and a bifurcate axial.

The hypopygium has a few long setae, much as in *W. minuta*, and the spine is as long as it is wide at the base. The spiracular peritremata of the eighth urotergite are small, subcircular. The total length is ca. 1.1 mm; the ovipositor valves are one-fifth of the length of the gaster. The colour is brown.

The male is unknown.

The host species is *Ficus urnigera* Miq. (Indonesia: Kalimantan).

106. *Wiebesia corneri* Wiebes

Wiebes, Proc. Kon. Ned. Akad. Wet. **96**: 112–113 (1993a).

Only the male is known. The head is as long as wide; the longitudinal diameter of the eye is one-ninth of the length of the head. The antennal groove is one-sixth of the length of the head. On either side of the antennal groove there are some fifteen long spines, directed backwards. The antenna consists of four free segments, viz., the scape, pedicel, and two subequal funicular segments.

The pronotum, mesonotum and propodeum are approximately in ratio 3 : 2 : 2; the parts representing the metanotum do not meet in the middle. The length of the spiracular peritremata is about three-quarters of that of the propodeum. The fore tibia has four teeth in a dorsal crest and two ventrals. The hind tibia bears two teeth, viz., one bidentate antiaxial and a more simple axial. The genital claspers bear two claws. The total length is ca. 0.7 mm. The colour is yellow.

The host fig is *Ficus disticha* Bl. (Malaysia: Sabah).

107. *Wiebesia boldinghi* (Grandi)

Grandi, Boll. Lab. Zool. Portici **10**: 128 (1916a), and Ibid. **12**: 10–14 (1917) (both in *Blastophaga*).

Only the male is known. The head is as long as wide; the longitudinal diameter of the eye is one-seventh of the length of the head. The antennal grooves are one-fifth of the length of the head. The antenna consists of three free segments, the distal one of which is divided – so, actually there are four segments and there is no anellus.

The length-ratio of the pronotum, mesonotum, and propodeum, measured dorsally, is approximately 5 : 5 : 4, the metanotal parts appear broadly fused in the middle (: 1). The spiracular peritremata are lateral in position, covering the whole (lateral) length of the propodeum (which is about one-third of the total length). The fore tibia has three dorsal teeth. The hind tibia has a bidentate antiaxial tooth and a bifurcate axial. The genital claspers bear three claws. The total length is ca. 1 mm. The colour is yellowish.

The host fig is *Ficus lanata* Bl. (Indonesia: Java).

Liporrhopalum Waterston (fig. 17)

Waterston, Trans. ent. Soc. London for 1920: 130 (1920); Hill, Zool. Verh. Leiden **100**: 3–36 (1969); Bouček, Australasian Chalc.: 197–198 (1988).

The following treatment mainly follows Hill (1969). The female head has three ocelli. The antenna consists of ten segments; the fifth segment is usually small and subquadrate, the fifth rounded and short, with sensilla linearia, the sixth to tenth segments are usually elongate and often bear long and flexible sensilla chaetica, but only sensilla linearia in some species. The mouth-parts are simple (one exception: no. 122, *L. tentacularis*).

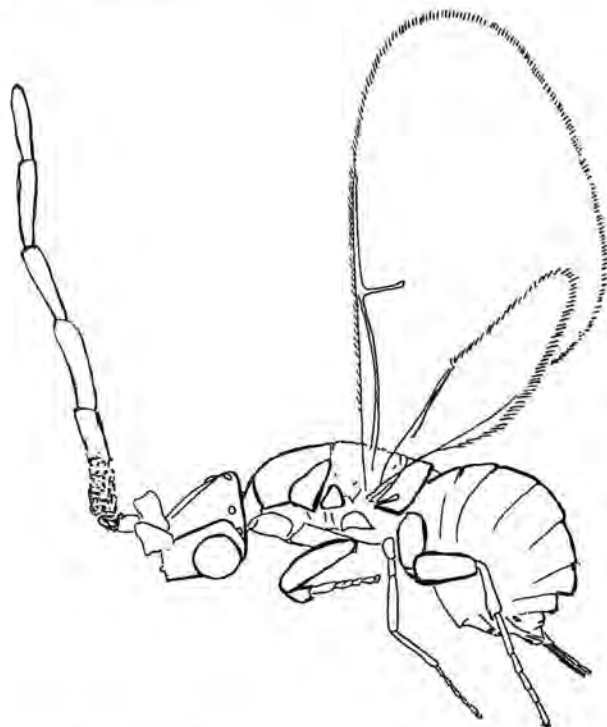


Fig. 17. *Liporrhopalum midotis* Hill, female.

The venation of the fore wing is distinct, faint, or obsolete. The eighth urotergite shows various degrees of separation off of small posterior plates by the small spiracles. The hypopygium has a distinct spine, bearing one (sometimes incomplete) row of hyaline setae. The spiracular peritremata of the eighth urotergite are small, circular, but there is one exception (*L. tentacularis*). The ovipositor valves are one-fifth to nearly one half of the length of the gaster.

In the male head a clypeus is present (two- or three-pointed) or absent; the head usually has a distinct occipital lobe, and often is trilobed posteriorly owing to the development of lateral posterior lobes; the antenna is basically five-segmented, but the anellus may be absent, the fourth and fifth segments are elongate, cylindrical.

A pronotal collar is present. The fore tibia bears three or four dorso-apical teeth; the mid and hind legs may be oligomeric. The genitalia are simple.

There are eighteen species known. The host figs belong to the subsection *Palaeomorphe* of section *Sycidium*, and one species of subsection *Sycidium*, series *Copiosae* (this one species of fig is host to *L. tentacularis*, the exception mentioned in the description of the female, above).

KEY TO THE SPECIES OF LIPORRHOPALUM (fig. 18)

1. Females (that of *L. virgatae* is not known) 2
 - Males (that of *L. r. rutherfordi* is not known) 19
2. The sixth to tenth antennal segments are elongate, and bear long flexible sensilla (fig. a); the fifth segment bears three to five sensilla linearia 3
 - These antennal segments, short (fig. c) or long (fig. b), bear sensilla linearia; there are more than five short sensilla on segment five 7
3. The eighth urotergite has separated posterior plates (fig. d). The fore tibia bears three dorso-apical teeth and the spur is large and distinct 4
 - The eighth urotergite has half separated plates (fig. e). The fore tibia bears two dorso-apical teeth and the spur is seta-like and indistinct. The mandible has two glands; the mandibular appendage bears nine or ten ventral lamellae. The wing-venation is distinct. *Ficus uniglandulosa* Wall. ex Miw. ? var. *uniglandulosa* (Indonesia: Sumatra) 125. *Liporrhopalum uniglandulosae* Hill
4. The wing-venation is distinct. The fore tibia bears a tiny ventral tooth (fig. h). The mandible has two glands; the appendage bears five ventral lamellae. *Ficus virgata* Reinw. ex Bl. var. *philippinensis* (Miq.) Corner (Philippines: Luzon) 108. *Liporrhopalum philippinensis* Hill
 - The wing-venation is faint or obsolete. The fore tibia bears a larger ventral tooth. There is only one mandibular gland 5
5. The wing-venation is obsolete. The mandibular appendage bears five or six ventral lamellae. *Ficus tinctoria* Forst.f. subsp. *gibbosa* (Bl.) Corner var. *gibbosa* (Hong Kong: Malaysia: Sarawak) 109. *Liporrhopalum gibbosae* Hill
 - The wing-venation is faint (obsolescent); there is no stigmal vein 6

6. The mandibular appendage bears four ventral lamellae. The host fig is not known (Ceylon) 110a. *Liporrhopalum r. rutherfordi* Waterston
 - The mandibular appendage bears six ventral lamellae. *Ficus tinctoria* Forst.f. subsp. *parasitica* (Willd.) Corner (India: Kerala) 110b. *Liporrhopalum r. indicum* Abdurahiman & Joseph
7. The maxilla bears a bacilliform process. *Ficus montana* Burm.f. (Indonesia: Java & Sumatra) 122. *Liporrhopalum tentacularis* (Grandi)
 - The maxilla does not bear a bacilliform process 8
8. The ninth antennal segment is long: more than two times its median width, or longer. The spur on the fore tibia is usually indistinct 9
 - The ninth antennal segment is shorter: up to two times its median width. The fore tibial spur is seta-like. There is one mandibular gland 16

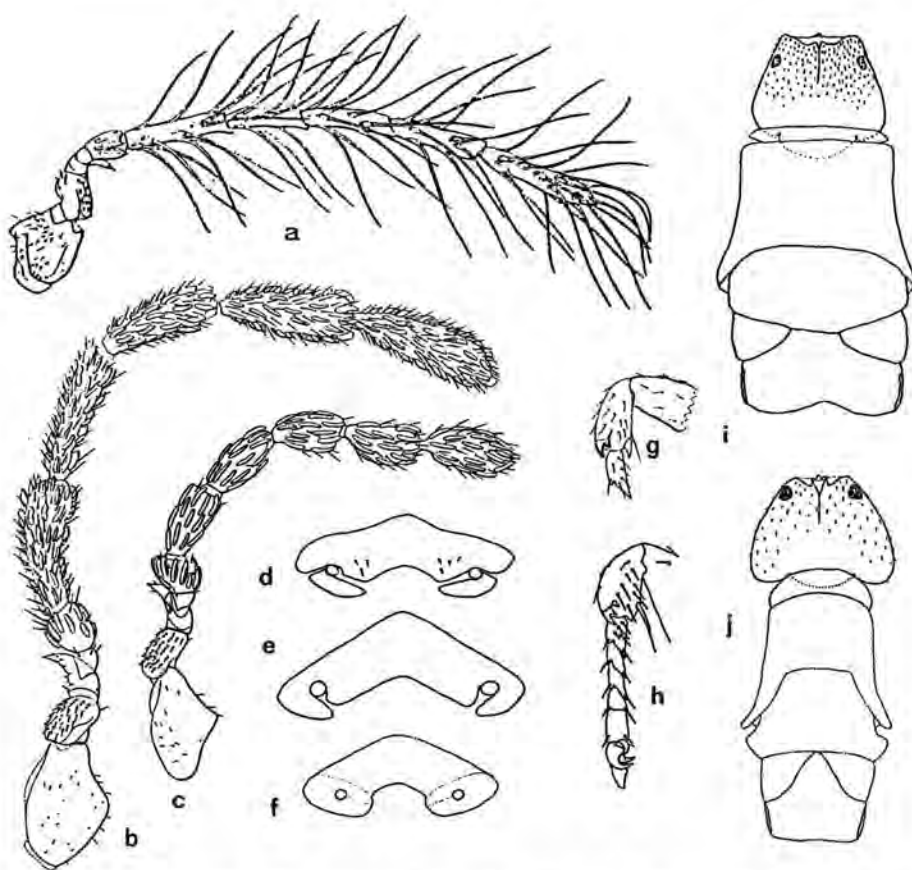


Fig. 18. Details of *Liporrhopalum* (a-f, females; g-j, males). a-c, antenna of: a, *L. rutherfordi* Waterston, b, *L. longicornis* (Grandi), and c, *L. dubium* (Grandi); d-f, eighth urotergite with spiracular peritremata of: d, *L. gibbosae* Hill, e, *L. midotis* Hill, and f, *L. subulatae* Hill; g-h, fore tibia of: g, *L. subulatae*, and h, *L. philippinensis* Hill; i-j, dorsal aspect of: i, *L. gibbosae*, and j, *L. subulatae* (a, after Waterston, 1920, fig. 1a; b-c, after Grandi, 1928d, figs. xv, 3 and xiii, 2, resp.; d-j, after Hill, 1969, figs. 27, 65, 42, 41, 6, 28, and 43, resp.).

9. The sixth antennal segment is distinctly longer than the succeeding ones 10
- The sixth antennal segment is subequal to the seventh, or distinctly shorter 12
10. The seventh to ninth antennal segments are subequal, about three-quarters of the length of the sixth. The posterior parts of the eighth urotergite are demarcated by a line of weakness only (fig. f). The spur of the fore tibia is thin 11
- The seventh antennal segment is distinctly shorter than the eighth and ninth, which are progressively longer. The eighth urotergite has completely separated posterior plates. The fore tibia bears three large dorso-apical teeth and a tiny ventral tooth. The mandibular appendage bears five or six ventral lamellae. The wing-venation is distinct. *Ficus virgata* Reinw. ex Bl. var. *sessilis* (Bur.) Corner (Melanesia: Irian Jaya, Papua New Guinea, Solomon Isl.) 112. *Liporrhopalum sessilis* Hill
11. The stigmal vein is faint. The mandibular appendage bears seven or eight ventral lamellae. The ventral tooth of the fore tibia is small. *Ficus subulata* Bl. var. *subulata* (Melanesia: Irian Jaya) 114. *Liporrhopalum erythropareiae* Hill
- The stigmal vein is distinct. The mandibular appendage bears eight or nine ventral lamellae. The ventral tooth of the fore tibia is large (fig. g). *Ficus subulata* Bl. var. *subulata* (Philippines: Luzon; Indonesia: Java) 113. *Liporrhopalum subulatae* Hill
12. The fore tibia bears three dorso-apical teeth. The wing-venation is distinct. The antennal segments are very long. There are two mandibular glands; the appendage bears seven ventral lamellae. *Ficus hemsleyana* King (Malaysia: Sarawak) 123. *Liporrhopalum hemsleyanae* Hill
- The fore tibia bears two dorso-apical teeth 13
13. The antenna is very long: when reflexed, longer than the body. The wing-venation is faint. There is one mandibular gland; the appendage bears seven or eight ventral lamellae. *Ficus midotis* Corner (Malaysia: Sabah) 121. *Liporrhopalum midotis* Hill
- The antenna is considerably shorter than the body 14
14. The sixth to tenth antennal segments are subequal. The wing-venation is faint. There is one mandibular gland. *Ficus sinuata* Thunb. subsp. *sinuata* var. *sinuata* (Indonesia: Sumatra) 115. *Liporrhopalum longicornis* (Grandi)
- The seventh to tenth antennal segments gradually shorten 15
15. The wing-venation is faint. The mandible has one gland; the appendage bears seven or eight ventral lamellae. *Ficus obscura* Bl. var. *angustata* Corner (Indonesia: Java) 120. *Liporrhopalum angustatae* Hill
- The wing-venation is distinct. The mandible has two glands; the appendage bears ten to twelve ventral lamellae. *Ficus uniglandulosa* Wall. ex Miq. ? var. *parvifolia* Miq. (Malaysia: Sabah) 124. *Liporrhopalum parvifoliae* Hill
16. The fore tibia bears three large dorso-apical teeth. The wing-venation is quite distinct. The mandibular appendage bears eighth ventral lamellae. *Ficus obscura* Bl. (Indonesia: Sumatra) 119. *Liporrhopalum giacomini* (Grandi)
- The fore tibia bears two dorso-apical teeth. The wing-venation is faint or obsolete 17
17. The dorso-apical teeth of the fore tibia are large. The wing-venation is faint. The mandibular appendage bears six or seven ventral lamellae. *Ficus sinuata* Thunb. subsp. *cuspidata* (Reinw.) Corner (Indonesia: Java) 116. *Liporrhopalum cuspidatae* Hill
- The dorso-apical teeth of the fore tibia are small, flattened. The wing-venation is obsolete 18
18. The mandibular appendage bears eight to eleven ventral lamellae. *Ficus heteropleura* Bl. var. *heteropleura* (Indonesia: Java; Philippines: Luzon) 117. *Liporrhopalum dubium* (Grandi)

- The mandibular appendage bears ca. fifteen ventral lamellae. <i>Ficus heteropleura</i> Bl. var. <i>mindanaensis</i> (Warb.) Corner (Philippines: Negros)	118. <i>Liporrhopalum mindanaensis</i> Hill
19. The hind tarsus has five or four segments; the fore tibia bears three or four large dorso-apical teeth	20
- The hind tarsus has three or two segments; the fore tibia bears three large dorso-apical teeth	27
20. There is no clypeus (fig. i). The antennal scrobes are covered	22
- There is a three-pointed clypeus (fig. j). The antennal scrobes are open anteriorly	21
21. The head is almost triangular in outline. The pronotal collar is large and curved. The metanotal plates touch medially, but they are separate (♀, couplet 11)	113. <i>Liporrhopalum subulatae</i> Hill
- The head has an oblong shape. The pronotal collar is short. The metanotal plates are distinctly contiguous (♀, couplet 7)	122. <i>Liporrhopalum tentacularis</i> (Grandi)
22. The hind tarsus has four segments. The mandible has two glands. The antennal anellus is disk-like. The fore tibia bears four dorsal teeth. The pronotal collar is straight, with free extremities. The apex of the aedeagus is dilated and rounded. <i>Ficus virgata</i> Reinw. ex Bl. var. <i>virgata</i> (Melanesia: Solomon Isl.)	111. <i>Liporrhopalum virgatae</i> Hill
- The hind tarsus is pentamerous	23
23. The fore tibia bears three dorsal teeth. The mandible has two glands	24
- The fore tibia bears four dorsal teeth. The mandible has one or two glands	25
24. The occipital lobe is large; the pronotal collar is straight, with free extremities. The aedeagus is apically dilated and rounded (♀, couplet 4)	108. <i>Liporrhopalum philippinensis</i> Hill
- The occipital lobe is small; the pronotal collar is crescentic and fused to the pronotum. The aedeagus is straight-sided, with a rounded apex (♀, couplet 11)	114. <i>Liporrhopalum erythropareiae</i> Hill
25. The head is about as long as wide (♀, couplet 6)	110b. <i>Liporrhopalum rutherfordi indicum</i> Abdurahiman & Joseph
- The head is shorter than wide	26
26. The mandible has one gland. The pronotal collar is straight, with free extremities (♀, couplet 5)	109. <i>Liporrhopalum gibbosae</i> Hill
- The mandible has two glands. The pronotal collar is curved and closely affixed to the pronotum (♀, couplet 10)	112. <i>Liporrhopalum sessilis</i> Hill
27. The hind tarsus is bimerous. The clypeus has three points. The mandible is bidentate: the subapical tooth is characteristically hooked. The pronotal collar is small and slightly curved. The aedeagus is apically pointed (♀, couplet 3)	125. <i>Liporrhopalum uniglandulosae</i> Hill
- The hind tarsus is trimerous	28
28. The clypeus is three-pointed. The antennal anellus is ca. half as long as wide. The aedeagus has a slight medial expansion, the apex has four finger-like lobes (♀, couplet 12)	123. <i>Liporrhopalum hemsleyanae</i> Hill
- The clypeus is two-pointed (as in fig. 2h)	29
29. The antennal anellus is tiny or absent). The mandible is bi- or tridentate	30
- The antennal anellus is about a quarter as long as wide. The mandible is bidentate	32
- The antennal anellus is ca. half as long as wide. The mandible is bidentate or slightly tridentate	33

30. The aedeagus has an apical dilatation. The mandible is probably bidentate (♀, couplet 14) 115. *Liporrhopalum longicornis* (Grandi)
- The aedeagus is apically straight-sided. The mandible is tridentate 31
31. The total length is 0.6–0.7 mm (♀, couplet 18) 117. *Liporrhopalum dubium* (Grandi)
- The total length is 0.9–1.0 mm (♀, couplet 18) 118. *Liporrhopalum mindananensis* Hill
32. The mandible has one gland. The head is lobed posteriorly (fig. 2h), the length is ca. 0.75 of the width (♀, couplet 16) 120. *Liporrhopalum giacomini* (Grandi)
- The mandible has two glands. The pronotal collar is narrow and crescentic (♀ couplet 15) 124. *Liporrhopalum parvifoliae* Hill
33. The pronotal collar is elongate trapezoidal (transverse) in shape. The metanotal plates are spaced for a distance equal to their width, or smaller 34
- The pronotal collar is thinner and more crescentic in shape. The metanotal plates are spaced for a distance distinctly larger than their width (♀, couplet 15) 120. *Liporrhopalum angustatae* Hill
34. The pronotal collar is tiny and inconspicuous. The aedeagus has a slight dilatation, the apex is rounded (♀, couplet 17) 116. *Liporrhopalum cuspidatae* Hill
- The pronotal collar is large and distinct. The aedeagus has a median expansion and four finger-like lobes (♀, couplet 13) 121. *Liporrhopalum midotis* Hill

108. *Liporrhopalum philippinensis* Hill

Hill, Zool. Verh. Leiden **100**: 7–11 (1969).

The female head is shorter than wide across the compound eyes (0.8), which are ca. two times as long as the cheek. The epistomal margin has an acute median prominence. The fifth antennal segment bears three elongate sensilla linearia, the sixth to tenth are three to five times as long as wide, and bear long flexible sensilla chaetica in 2–3 rows. The mandible is bidentate, and has two glands; the appendage bears five ventral lamellae.

The venation of the fore wing is quite distinct; the marginal, stigmal, and postmarginal veins are subequal in length. The fore tibia bears two large dorso-apical teeth plus a third, smaller one; there is one ventral tooth and a long tapering spur. Also the mid leg has a (shorter) spur. The hind tibia bears a bicuspidate antiaxial tooth and a simple, slender axial. All tarsi are pentamerous.

The hypopygium has a long spine, with one row of hyaline setae just before the apex. The eighth urotergite is elongate crescentic in shape; two small posterior plates are separated off by the small circular spiracular peritremata. The total length is 0.8–0.9 mm; the ovipositor valves are one-third of the length of the gaster. The colour is medium brown, the tibiae and tarsi are yellowish.

The male head is a bit shorter than wide (0.95); the eye is small: as long as the cheek, and less than one-tenth of the length of the head. The antennal anellus

is very short; the fourth and fifth segments are subequal in length. The mandible is bidentate, and there are two glands.

The pronotum is large and it bears a small straightish anterior collar; the mesonotum is transverse; the metanotal plates are spaced for a distance a bit shorter than their width (0.85); the propodeal spiracles are elongate and occupy three-fifths of the lateral length of the propodeum. The fore tibia bears three large dorso-apical teeth and two ventral. The mid tarsus has three segments. The hind tibia bears a large ventral tooth and two more, antiaxial teeth, and a dorsal, conical tooth; the tarsus is pentamerous. The aedeagus has an apical expansion, and the apex is rounded; the claspers bear three unpigmented claws. The total length is 0.6–0.7 mm. The colour is yellow-brown.

The host fig is *Ficus virgata* Reinw. ex Bl. var. *philippinensis* (Miq.) Corner (Philippines: Luzon).

109. *Liporrhopalum gibbosae* Hill

Hill, Zool. Verh. Leiden **89**: 35–38 (1967a).

The female head is shorter than wide across the compound eyes (0.85), which are three times as long as the cheek. The epistomal margin has an acute median prominence. The fifth antennal segment bears five faint sensilla linearia, the sixth to ninth segments are three to five times as long as wide and they bear ten to twelve long flexible sensilla chaetica arranged roughly in two rows, the tenth segment has fifteen sensilla in three rows. The mandible is bidentate and has one gland; the appendage bears five or six ventral lamellae.

The veins of the fore wing are obsolete, with the exception of the basal part of the submarginal vein; the wings are typically pubescent. The fore tibia bears three large dorso-apical teeth, one ventral tooth and a long tapering spur. The tarsus of the mid leg is trimerous, that of the hind leg pentamerous.

The hypopygium is short and narrow; the spine bears one row of hyaline setae. The eighth urotergite is similar to that of *L. philippinensis*. The total length is 1.2–1.3 mm; the valves of the ovipositor are one-third of the length of the gaster. The colour is dark brown.

The male is as in *L. philippinensis*, but the mandible has one gland; the pronotal collar is larger and more evident; the fore tibia bears four dorso-apical teeth. The total length is 0.8–0.9 mm.

The host fig is *Ficus tinctoria* Forst.f. subsp. *gibbosa* (Bl.) Corner (Hong Kong; Malaysia: Sabah).

110a. *Liporrhopalum r. rutherfordi* Waterston

Waterston, Trans. ent. Soc. London for 1920: 130–133 (1920); Hill, Zool. Verh. Leiden **100**: 15 (1969).

The female head is shorter than wide (0.8–0.85) across the compound eyes, which are half as long as the head. There are four ventral lamellae on the mandibular appendage. The total length is 'over 1.5 mm'.

The only specimen was collected from 'a laboratory table' in Ceylon. Hill suggested the species to be associated with *Ficus tinctoria* Forst.f. subsp. *parasitica* (Willd.) Corner var. *parasitica*.

110b. *Liporrhopalum rutherfordi indicum* Abdurahiman & Joseph

Abdurahiman & Joseph, Oriental Insects **1**: 1–5 (1967a).

The female head is a little longer than wide between the compound eyes; the cheek is equal to less than half the longitudinal diameter of the eye. The mandibular appendage bears six ventral lamellae. The total length is 1.25 mm.

The male head is about as long as wide; the eye is about as long as the cheek, and ca. one-fifth of the length of the head. The antennal anellus is short. The mandible has two teeth.

The pronotum is wider than its median length, from the figure by Abdurahiman & Joseph (1967a) no pronotal collar is apparent. The remainder of the thorax and the legs are much as in *L. gibbosae*. The total length was given as 1.95 mm (which seems rather long).

The host fig is *Ficus tinctoria* Forst.f. subsp. *parasitica* (Willd.) Corner (India: Kerala).

111. *Liporrhopalum virgatae* Hill

Hill, Zool. Verh. Leiden **100**: 15 (1969); Bouček, Australasian Chalc.: 198 (1988).

The female is unknown. The male is indistinguishable from *L. gibbosae*, except in that the hind tarsus is tetramerous (vs. pentamerous) and there are two glands in the mandible.

The host fig is *Ficus virgata* Reinw. ex Bl. var. *virgata* (Melanesia: Solomon Isl.). Bouček (1988: 198) noted that specimens he studied from this fig in Papua New Guinea did not agree with Hill's description.

112. *Liporrhopalum sessilis* Hill

Hill, Zool. Verh. Leiden **100**: 15–16 (1969); Bouček, Australasian Chalc.: 198 (1988).

The female is very similar to *L. philippinensis*, but the anterior borders of the facial groove are more concave, the sensilla of the distal antennal segments are short, prostrate, with only the anterior quarter projecting. The mandibular appendage bears five or six ventral lamellae. The total length is 1.2–1.3 mm.

The male is as in *L. gibbosae*, but the mandible has two glands and the pronotal collar is more curved and closely affixed to the pronotum. The total length is 0.8–0.9 mm.

The host fig is *Ficus virgata* Reinw. ex Bl. var. *sessilis* (Bur.) Corner (Melanesia: Irian Jaya, Papua New Guinea, Solomon Isl.).

113. *Liporrhopalum subulatae* Hill

Hill, Zool. Verh. Leiden **100**: 17–18 (1969).

The female head is shorter than wide across the compound eyes (0.85), which are $2\frac{1}{2}$ times as long as the cheek. The epistomal margin has a median prominence. The fifth antennal segment bears two rows of sensilla linearia; the sixth to tenth segments are 2–3 times as long as wide, and they bear three rows of sensilla linearia. The mandible is bidentate, and it has two glands; the appendage bears eight or nine ventral lamellae.

The venation of the fore wing is complete. The fore tibia bears two dorso-apical teeth, a large ventral tooth and a long, thin and inconspicuous spur. The eighth urotergite is not really divided apically by the spiracles, but lines of weakness are evident. The total length is 1.2–1.3 mm; the valves of the ovipositor are one-fifth of the length of the gaster.

The male head is almost triangular in outline, because it is rather wide posteriorly: $1\frac{1}{2}$ times as wide as it is long; the eyes are quite large, equal in length to the cheek, and ca. one-seventh of the length of the head. The antennal scrobes are slightly exposed anteriorly and separated by a narrow, three-pointed clypeus; the anellus is short, disk-like. The mandible is tridentate, and it has two glands.

The pronotum has a large, strongly curved collar, and the posterior corners are tapering; the metanotum is large; the metanotal plates are almost contiguous; the spiracular peritremata are elongate and occupy most of the lateral length of the propodeum. The fore tibia bears three large dorso-apical teeth and two ventrals. The hind tarsus may have four or five segments. The genitalia are much as in *L. philippinensis*, but the aedeagus is apically dilated. The total length is ca. 0.7 mm.

The host fig is *Ficus subulata* Bl. (Philippines, Luzon; Indonesia: Java).

114. *Liporrhopalum erythropareiae* Hill

Hill, Zool. Verh. Leiden **100**: 19–20 (1969); Bouček, Australasian Chalc.: 198 (1988).

The female is very similar to *L. subulatae*, but the sixth antennal segment is longer relative to the seventh (8 : 5, vs. 7 : 5) and the sensilla are more distinct. The mandibular appendage bears seven or eight ventral lamellae (the basal one is tiny). The stigmal vein is absent, but the location is indicated by a fumose stripe. The ventral tooth of the fore tibia is very small and flattened. The total length is 1.0–1.1 mm; the ovipositor valves are one-fifth of the length of the gaster.

The male is also similar to that of *L. subulatae*, but the head is elliptical ovate: $1\frac{1}{4}$ times as wide as long, with only a small occipital lobe; the epistomal margin is three-pointed. The mandible is bidentate. The pronotal collar is narrow. The hind tarsus is always pentamerous; the mid tarsi show a trace of the original pentamerous segmentation and vestigial claws are present. The total length is ca. 0.5 mm.

The host fig is the small-leaved form of *Ficus subulata* Bl., formerly indicated as *F. erythropareia* K. Schum. ex Warb. (Melanesia: Irian Jaya).

115. *Liporrhopalum longicornis* (Grandi)

Grandi, Treubia **8**: 354 (1926); Grandi, Boll. Lab. Ent. Bologna **1**: 141–146 (1928d) (both in *Blastophaga*); Hill, Zool. Verh. Leiden **100**: 20–21 (1969).

The female is similar to *L. subulatae*, but the frontal groove of the face is wider, and the compound eyes are positioned more posteriorly: the cheek is nearly equal to the length of the eye. The antennal segments are long and covered with small hooked sensilla and setae: two rows of ca. ten sensilla occur on the fifth segment. The mandible has one gland; the appendage bears seven ventral lamellae. The wing-venation is faint. The fore tibial spur is seta-like. The total length is ca. 1.2 mm; the valves of the ovipositor are one-quarter of the length of the gaster.

The male is similar to that of *L. philippinensis*, but it has a definite two-pointed clypeus separating the antennal scrobes. The hind tarsus is trimerous. The total length is ca. 0.6 mm.

The host fig is *Ficus sinuata* Thunb., probably subsp. *sinuata* (Indonesia: Sumatra).

116. *Liporrhopalum cuspidatae* Hill

Hill, Zool. Verh. Leiden **100**: 21–22 (1969).

The female is similar to *L. subulatae*, but the compound eyes are more posterior: the length of the cheek is two-thirds of that of the eye. The antenna is short, with the distal segments barely longer than wide; the fourth segment is distinctly longer than wide, the fifth is asymmetrically subglobose and slightly wider than the following segments. The mandible has one gland; the appendage bears six or seven ventral lamellae.

The wing-venation is indistinct, evident as fumose lines and faint venae spuriae. The fore tibial spur is seta-like. The lateral lobes of the hypopygium are shaped like a flattened semicircle. The eighth urotergite has a partial separation of the posterior plates. The total length is 1.1–1.2 mm; the valves of the ovipositor are one-quarter of the length of the gaster.

The male head is rounded; the eye is large, more than two times as long as the cheek. The antennal scrobes are slightly exposed anteriorly, separated by a two-pointed clypeus. The antennal anellus is nearly half as long as wide. The mandible is bidentate and it has one gland; but in some specimens a vestigial second gland may occur.

The posterior arms of the pronotum are very small; the pronotal collar is narrow and not obvious. The hind tibia has a straight dorsal edge and the tarsus is trimerous. The genitalia show a slight apical dilatation of the aedeagus. The total length is 0.7–0.8 mm.

The host fig is *Ficus sinuata* Thunb. subsp. *cuspidata* (Reinw.) Corner (Indonesia: Java).

117. *Liporhopalum dubium* (Grandi)

Grandi, Treubia 8: 256–357 (1926); Grandi, Boll. Lab. Ent. Bologna 1: 137–141 (1928d) (both in *Blastophaga*); Hill, Zool. Verh. Leiden 100: 23–24 (1989).

The female is very similar to that of *L. cuspidatae*, but the head and the antennae are more like those of *L. subulatae*: the sixth to ninth antennal segments are distinctly longer than wide. The mandible has one tooth (but a slight subapical swelling); the appendage bears eight or nine (type-specimens from Java) to ten or eleven ventral lamellae (other specimens from Java, and those from Luzon). The fore tibia has no ventral tooth, and the spur is seta-like and indistinct. The total length is 1.2–1.3 mm; the valves of the ovipositor are one-third of the length of the gaster.

The male is as that of *L. cuspidatae*, but the eyes are smaller, and the antennal anellus is tiny or non-existent. The mandible is tridentate, and it has one gland. The pronotal collar is large and curved. The aedeagus has a small terminal projection. The total length is 0.6–0.7 mm.

The host fig is *Ficus heteropleura* Bl. var. *heteropleura* (Indonesia: Java; Philippines: Luzon).

118. *Liporrhopalum mindanaensis* Hill

Hill, Zool. Verh. Leiden **100**: 24–25 (1969).

The species is very similar to *L. dubium*. The female differs only in the mandible bearing fifteen or sixteen ventral lamellae (vs. eight to eleven). The total length is 1.2–1.3 mm; the valves of the ovipositor are one-quarter of the length of the gaster. The male differs only in being larger (length 0.9–1.0 mm).

The host fig is *Ficus heteropleura* Bl. var. *mindanaensis* (Warb.) Corner (Philippines: Negros).

119. *Liporrhopalum giacomini* (Grandi)

Grandi, Treubia **8**: 353–354 (1926); Grandi, Boll. Lab. Ent. Bologna **1**: 132–137 (1928d) (both in *Blastophaga*); Hill, Zool. Verh. Leiden **100**: 25–26 (1969).

The species is much like *L. midotis*. The female mandible is bidentate, and it has one gland; the appendage bears eight ventral lamellae. The wing-venation is complete, but rather faint. The fore tibia bears three large dorso-apical teeth, one large ventral tooth, and a seta-like spur. The total length is 1.2–1.3 mm; the valves of the ovipositor are almost half the length of the gaster.

The male head is lobed postero-laterally. The third antennal segment is anuli-form. The mandible is elongate, bidentate, and it has one gland. The fore tibia is more elongate than in *L. midotis*; the mid tarsus has two or three segments. The hind tibia differs from all the previous species in that the dorso-apical tooth is very small. The total length is ca. 0.8 mm.

The host fig is *Ficus obscura* Bl. (Indonesia: Sumatra).

120. *Liporrhopalum angustatae* Hill

Hill, Zool. Verh. Leiden **100**: 26–7 (1969).

The species is very similar to *L. giacomini*, but differs in the following characters. The female antennal segments are longer (more like *L. longicornis*). The mandible has one gland; the appendage bears seven or eight ventral lamellae. The wing-venation is very faint, only marked by fumes patches. The fore tibia bears two large dorso-apical teeth. In the male the pronotal collar is thinner. The metanotal plates are further apart.

The host fig is *Ficus obscura* Bl. var. *angustata* (Miq.) Corner (Indonesia: Java).

121. *Liporrhopalum midotis* Hill

Hill, Zool. Verh. Leiden **100**: 27–28 (1969).

The female head is subquadrate, with protruding eyes; the cheek is nearly equal to the length of the eye. The antenna is very long: when reflexed over the body the apical segment projects posterior to the gaster; the numerous sensilla are very short and hooked, interspersed with many setae. The mandible is bidentate, and it has one gland; the appendage bears seven or eight ventral lamellae.

The fore wing has a distinct venation, and faint venae spuriae; the postmarginal vein appears longer than in the other species owing to a marginal vena spuria. The fore tibia bears three dorso-apical teeth; the ventral tooth is hooked. The eighth urotergite has the posterior plates partially separated. The total length is 1.4–1.5 mm; the valves of the ovipositor are one-quarter of the length of the gaster.

The male head has large eyes: longer than the cheek (4 : 3) and ca. one-fifth of the length of the head; the clypeus is two-pointed. The mandible has one large gland and a vestigial second. The fore tibia bears large apical teeth: three dorsal and two ventral, and the tarsal segments are rather elongate. The mid tarsus has two or three segments. The hind tibia bears a small but definite dorso-apical tooth. The total length is 0.9–1.1 mm.

The host fig is *Ficus midotis* Corner (Malaysia: Sabah).

122. *Liporrhopalum tentacularis* (Grandi)

Grandi, Treubia **8**: 355–356 (1926); Grandi, Boll. Lab. Ent. Bologna **1**: 155–159 (1928d) (both in *Blastophaga*); Ware & Compton, Proc. Kon. Ned. Akad. Wet. **95**: 289 (1992, *Ceratosolen*); Wiebes, Proc. Kon. Ned. Akad. Wet. **97**: 134 (1994).

The female is much like that of *L. midotis*. The mandibular appendage bears four or five ventral lamellae; the maxilla has a distinct bacilliform process. The fore tibia bears a dorso-apical comb of four teeth. The total length is 1.4–1.5 mm; the valves of the ovipositor are one-quarter to one-third of the length of the gaster.

The male is more like *L. subulatae*: it has a three-pointed clypeus. The metanotal plates are distinctly contiguous. The fore tibia bears three dorso-apical teeth. The total length is ca. 0.8 mm.

The host fig is *Ficus montana* Burm.f. (Indonesia: Java, Sumatra).

123. *Liporrhopalum hemsleyanae* Hill

Hill, Zool. Verh. Leiden **100**: 29–30 (1969).

The species is very similar to *L. midotis*, but slightly smaller in size. The female eyes are not so much protruding. The mandible has two glands; the appendage bears seven ventral lamellae. The fore tibia bears three dorso-apical teeth, and the ventral tooth is straight. The total length is 1.3–1.4 mm.

The male clypeus has a small, but definite median point. The mandible has two glands. The posterior lateral arms of the pronotum are less pronounced than in *L. cuspidatae*, which the male otherwise resembles.

The host fig is *Ficus hemsleyana* King (Malaysia: Sarawak).

124. *Liporrhopalum parvifoliae* Hill

Hill, Zool. Verh. Leiden **100**: 30 (1969).

The female is basically similar to the previous species, but it is smaller in size; the antennal segments are shorter and more tapering anteriorly: from the sixth onwards, they are almost petiolate. The mandible is bidentate, and there are two glands; the appendage bears ten to twelve ventral lamellae. The fore tibia bears only two dorso-apical teeth. The total length is 1.0–1.2 mm; the valves of the ovipositor are nearly half as long as the gaster.

The male clypeus has only two points; the third antennal segment is anuliform; the subapical mandibular tooth is not so hooked as in *L. midotis*.

The host fig is *Ficus uniglandulosa* Wall. ex Miq. (Malaysia: Sabah). Hill suggested that the variety of the host fig could have been *parvifolia* Miq.

125. *Liporrhopalum uniglandulosae* Hill

Hill, Zool. Verh. Leiden **100**: 30–2 (1969).

The species is very similar to the previous species, but it differs conspicuously in having long thin flexible sensilla on the sixth to tenth segments of the female antenna. The mandible is virtually bidentate, as the subapical tooth barely (if at all) projects beyond the wide base; the appendage bears nine or ten ventral lamellae. The wing-venation is less distinct: the veins are indicated by fumose areas, but the stigmal is fainter.

The male has a large three-pointed clypeus. The subapical tooth of the mandible is very hooked. The fourth antennal segment appears divided by an internal septum. The pronotal collar is thinner and less conspicuous. The hind tarsus is bimerous. The aedeagus is thinly ovate, ending in a pair of tiny protuberances.

The host fig is *Ficus uniglandulosa* Wall. ex Miq. (Indonesia: Sumatra). Hill suggested the variety of the host fig to be var. *uniglandulosa*.

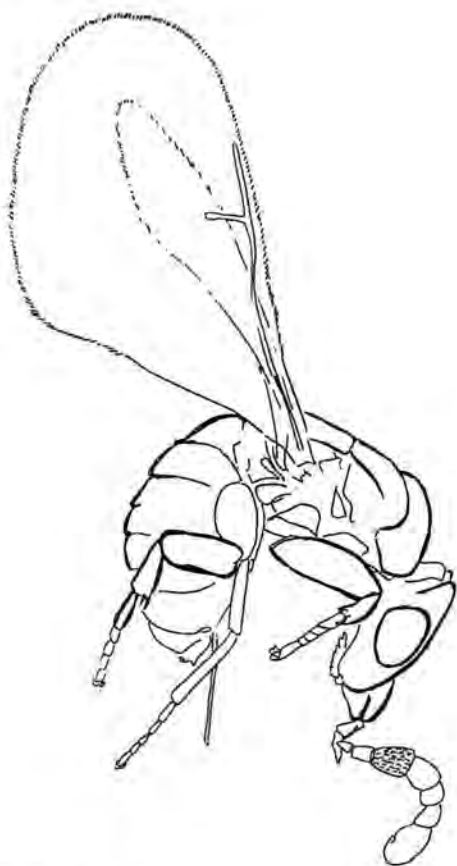


Fig. 19. *Kradibia browni* Ashmead, female.

Kradibia Saunders (fig. 19)

Saunders, 1883, Trans. ent. Soc. London for 1883: 20 (1883a); Wiebes, Zool. Meded. Leiden **53**: 166–180 (1978); Wiebes, Proc. Kon. Ned. Akad. Wet. **96**: 481–501 (1993c). Synonyms: *Kradibiella* Girault, Mem. Qd. Mus. **4**: 313 (1915b), and ? *Paraceratosolen* Girault, Mem. Qd. Mus. **4**: 312 (1915b).

The female head in most species is a bit shorter than wide across the compound eyes, which are $2-2\frac{1}{2}$ (exceptionally 3 to more than 4) times as long as the cheek. There are three large ocelli. The antenna has ten or eleven segments, with one or two (to three in some species), or three to five rows of sensilla. The mandible has two teeth, two glands, and the appendage bears four to six ventral lamellae (seven or eight in some species); the maxillae are simple (one species has a bacilli-form process).

There are large pollen pockets. The veins of the fore wing are distinct; the disk is full of microtrichiae. The fore tibia has a dorso-apical comb consisting of four

or five subequal, or six alternately long and short, teeth. The hind tibia has a mostly bicuspidate antiaxial tooth and a simple axial. All tarsi are pentamerous.

The hypopygium has an acute spine, with a row of (six or seven) hyaline setae approximately at half length. The spiracles of the eighth urotergite are small and circular, but in one species they are large and oval.

The ovipositor is half as long as the gaster or only one-third or one-quarter. The colour is dark brown.

The male head is about as long as wide, in a few species a bit shorter, but in others a bit longer. The eye is one to two times as long as the cheek. There is a median groove, reaching to at most half the length of the head. The antennae are borne in a common groove (in separate pockets in two species) and consist of a scape, a pedicel, an anellus or none, and two funicular segments.

The thorax has the terga free, but the dorso-lateral plates representing the metanotum may be fully or almost fused in the middle (indicated in the key as 'contiguous'), or the two plates are distinct and widely spaced, or not fully separate from the propodeum ('open'); the spiracular peritremata, mostly lateral in position, in most species occupy the full (lateral) length of the propodeum. The fore tibia bears a dorso-apical comb of seven or more teeth, but some species have only four or five; the tarsus is bimerous. The mid leg is atrophied, but complete (although slender, with an oligomerous tarsus) in a few species (one of which is a border-line species). The hind tibia has an armature consisting of ventral and antiaxial, and some dorsal teeth; the tarsus is pentamerous in most species, but tetramerous in some.

The genitalia bear claspers (not in all species), with two to five claws. The colour is yellowish.

There are 18 (Indo-Australian) species known (and five African). A few are incertae sedis, viz., *Blastophaga insularis* Girault (1915b: 310; later renamed *B. queenslandica* Hoffmeyer, 1928: 334, because of *B. insularis* Ashmead, 1900: 250–251), *Blastophaga semiauriceps* Girault (1927: 338), and *Paracera-tosolen latipennis* Girault (1915b: 312). The species *K. copiosae*, *jacobsi*, *wassae*, and to some extent *K. setigera*, are not quite typical in all characters (e.g., the number of rows of female antennal sensilla; the position of the male antennae, and the number of teeth in the dorso-apical comb of the fore tibia).

The host *Ficus* are all classified with section *Sycidium* Miq., subsections *Sycidium* and *Varinga* (Miq.) Corner, but not all species of these groups have a species of *Kradibia* as pollinator.

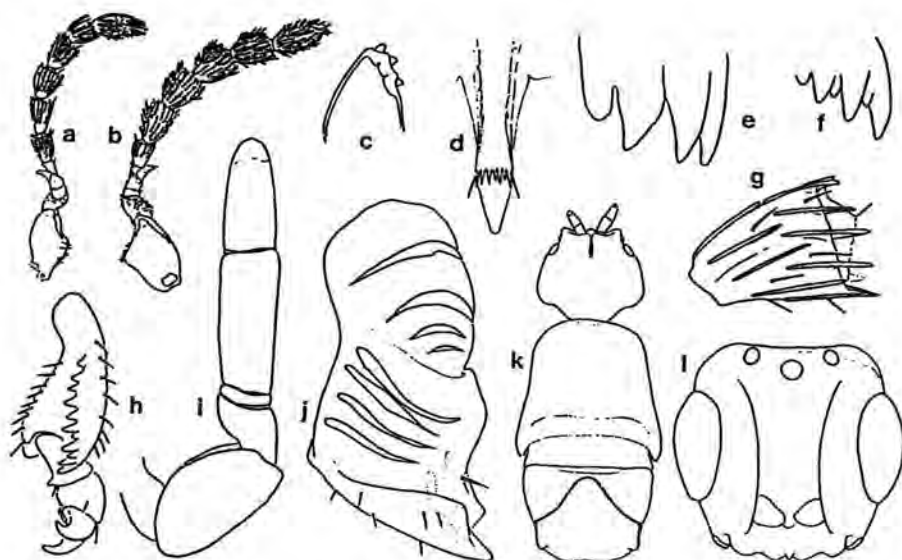


Fig. 20. Details of *Kradibia*. a–b, female antenna of: a, *K. sumatrana* (Grandi), and b, *K. gestroi* (Grandi) (after Grandi, 1928d, fig. xvii, 2, and 1916c, fig. 1, 2, resp.); c, *K. williamsi* Wiebes, clasper of male genitalia; d, *K. nigricorpus* (Girault), spine of female hypopygium; e–f, dorso-apical comb of female fore tibia, of: e, *K. tetamba* Wiebes, and f, *K. clarae* Wiebes; g, eighth antennal segment of *K. clarae*; h, male fore tibia and tarsus of *K. wakefieldi* Wiebes; i, *K. corneri* Wiebes, male antenna; j, female mandible of *K. nigricorpus*; k, *K. brownii* Ashmead, dorsal outline of male, after Wiebes (1978, fig. 1); l, outline of female head of *K. panchoi* Wiebes. Most figs. after Wiebes (1993c, figs. 1, 3–6, 9–12, 13).

KEY TO THE SPECIES OF KRADIBIA (fig. 20)

- | | | |
|----|---|---|
| 1. | Females (not known for <i>K. ghigii</i>) | 2 |
| - | Males (not known for <i>K. setigera</i>) | 18 |
| 2. | The mandibular appendage bears eight ventral lamellae. The head, body and legs have long setae. <i>Ficus leptogramma</i> Corner (Malaysia: Sabah) | 126. <i>Kradibia setigera</i> Wiebes |
| - | The mandibular appendage bears at most six ventral lamellae. There are no such long setae | 3 |
| 3. | The antennal segments, from the sixth onwards, bear one or two rows of long sensilla (if in doubt, take this alternative) | 4 |
| - | The antennal segments bear a larger number of rows of small sensilla | 14 |
| 4. | There is only one row of sensilla (fig. a) | 5 |
| - | There are two rows of sensilla (fig. b) | 6 |
| 5. | The antennal sensilla are relatively short and occupy only the apical half of their segment; the antenna has ten segments. <i>Ficus coronata</i> Spin. (Australia: New South Wales and Victoria) | 132. <i>Kradibia wakefieldi</i> Wiebes |
| - | The antennal sensilla are longer and occupy the whole length of the segment: they even project beyond the apical rim; mostly there are eleven segments. <i>Ficus ampelas</i> Burm.f. (Indonesia: Sumatra, Java) | 131. <i>Kradibia sumatrana</i> (Grandi) |

6. The apical sensilla distinctly project beyond the rim of their segment (fig. g); the antenna has eleven segments. *Ficus guyeri* Elm. (Philippines: Luzon) 130. *Kradibia clarae* Wiebes
- The sensilla do not or scarcely project; the antenna has ten segments 7
7. The fore tibia bears six, alternately long and short, dorso-apical teeth (as in fig. f) . . 8
- The fore tibia bears four or five teeth, most of which are subequal (as in fig. c, but mostly narrower) 9
8. The mandibular appendage bears six ventral lamellae. The pedicel has ca. twenty axial spines. *Ficus irisana* Corner (Philippines: Luzon) and *Ficus heteropoda* Miq. (Philippines: Luzon, Mindanao and Mindoro) 133. *Kradibia commuta* Wiebes
- The mandibular appendage bears four ventral lamellae. The pedicel has ca. thirty axial spines. *Ficus opposita* Miq. (Australia: Queensland) 134. *Kradibia nigricorpus* (Girault)
9. The dorso-apical teeth of the fore tibia are rather wide (fig. e) and the spiracula of the eighth urotergite are relatively large. *Ficus gryllus* Corner (Melanesia: Solomon Isl.) 135. *Kradibia tetamba* Wiebes
- The dorso-apical teeth of the fore tibia are more slender (as in fig. f) 10
10. The maxilla has a bacilliform process. The spiracular peritremata of the eighth urotergite are distinct and large. *Ficus conocephalifolia* Ridley (Melanesia: Papua New Guinea) 127. *Kradibia jacobsi* (Wiebes)
- The maxilla does not have a bacilliform process. The spiracular peritremata of the eighth urotergite are less distinct, and smaller 11
11. The mandibular appendage bears six ventral lamellae. The compound eye is only two times as long as the cheek. *Ficus odorata* (Blanco) Merr. (Philippines: Negros, Mindanao) 136. *Kradibia williamsi* Wiebes
- The mandibular appendage bears four ventral lamellae 12
12. The sixth to eighth antennal segments really have only two rows of sensilla. The compound eye is 2.4 times as long as the cheek. *Ficus exasperata* Vahl (Ceylon, and India: Pulneys and Travancore) 137. *Kradibia gestroi* (Grandi)
- The sixth to eighth antennal segments have two to three, or even fully three rows of sensilla 13
13. The compound eye is two times as long as the cheek. The epistomal margin does not have a distinct median prominence. *Ficus copiosa* Steud. (Melanesia: Papua New Guinea, Solomon Isl.) 128. *Kradibia copiosae* (Wiebes)
- The compound eye is 2.3 times as long as the cheek. The epistomal margin has a distinct median prominence. *Ficus wassa* Roxb. (Melanesia: Papua New Guinea, Solomon Isl.) 129. *Kradibia wassae* (Wiebes)
14. The compound eye is $3\frac{1}{2}$ to more than four times as long as the cheek 15
- The compound eye is $2-2\frac{1}{2}$ times as long as the cheek 16
15. The compound eye is $3\frac{1}{2}$ times as long as the cheek. The pedicel bears ca. 35 axial spines and the appendage of the third antennal segment reaches up to half-way the fifth. The valves of the ovipositor are two-fifths of the length of the gaster. *Ficus pseudowassae* Corner (Melanesia: Solomon Isl.) 138. *Kradibia corneri* Wiebes
- The compound eye is 4.3 times as long as the cheek. The pedicel bears ca. 25 axial spines and the appendage of the third segment reaches the basal quarter of the fifth. The valves of the ovipositor are one-quarter of the length of the gaster. *Ficus fiskei* Elm. (Philippines: Negros) 139. *Kradibia calorai* Wiebes

16. The mandibular appendage bears four ventral lamellae. The sixth antennal segment has four to five rows of sensilla (this is mentioned for comparison with *K. copiosae* and *K. wassae*, which have at most three rows – see couplet 13). *Ficus chrysochaete* Corner (Melanesia: Solomon Isl.) 140. *Kradibia ordinata* Wiebes
 - The mandibular appendage bears six ventral lamellae 17
17. The antenna has ten segments. The ovipositor valves are two-thirds of the length of the gaster. *Ficus ulmifolia* Lam. (Philippines: Luzon) 141. *Kradibia brownii* Ashmead
 - The antenna has eleven segments. The ovipositor valves are one-third of the length of the gaster. *Ficus cumingii* Miq. (Philippines: Luzon, Negros, Palawan) 143. *Kradibia panchoi* Wiebes
18. The fore tibia bears four or five dorso-apical teeth 19
 - The fore tibia bears seven or more dorso-apical teeth 21
19. The antennae are situated in a common groove. The mid leg is slender, but complete (♀ couplet 10) 127. *Kradibia jacobsi* (Wiebes)
 - The antennae are situated in separate pockets. The mid leg is atrophied 20
20. The antenna has a short ring-segment. The fore tibia has four dorsal teeth (♀ couplet 13) 128. *Kradibia copiosae* (Wiebes)
 - The antenna does not have a ring-segment. The fore tibia has five dorsal teeth (♀ couplet 13) 129. *Kradibia wassae* (Wiebes)
21. The hind tarsus is tetramerous 22
 - The hind tarsus is pentamerous 23
22. The fore tibia has eight dorso-apical teeth (♀ couplet 6) 130. *Kradibia clarae* Wiebes
 - The fore tibia has ten dorso-apical teeth (♀ couplet 5) 131. *Kradibia sumatrana* (Grandi)
23. The mid leg is slender, but complete 24
 - The mid leg is atrophied 25
24. The antennal anellus is rather large: half as long as wide (♀ couplet 17) 143. *Kradibia panchoi* Wiebes
 - The antennal anellus is disk-like (♀ couplet 12) 137. *Kradibia gestroi* (Grandi)
25. The fore tibia has twelve dorso-apical teeth (fig. h). The antenna has no anellus (♀ couplet 5) 132. *Kradibia wakefieldi* Wiebes
 - The fore tibia has seven to ten dorso-apical teeth 26
26. The antenna has no anellus. The fore tibia has eight to ten dorso-apical teeth. *Ficus fraseri* Miq. (Australia: New South Wales) 142. *Kradibia ghigii* (Grandi)
 - The antenna has a distinct, disk-like anellus (fig. i) 27
27. The metanotal plates are fully contiguous (as in fig. k) or almost so 28
 - The metanotal plates are not contiguous 32
28. The metanotal plates are almost contiguous (♀ couplet 11) 136. *Kradibia williamsi* Wiebes
 - The metanotal plates are fully contiguous 29
29. The fore tibia has nine subequal dorso-apical teeth (♀ couplet 16) 140. *Kradibia ordinata* Wiebes
 - The fore tibia has seven or eight unequal dorso-apical teeth 30

30. The male is slender: the pronotum is longer than wide posteriorly (♀ couplet 15) 139. *Kradibia calorai* Wiebes
 - The male is more robust (fig. k): the pronotum is shorter than wide posteriorly 31
31. The median metanotal band is relatively long: one-fifth of the length of the pronotum (♀ couplet 15) 138. *Kradibia corneri* Wiebes
 - The median metanotal band is shorter: one-tenth of the length of the pronotum. Two species that I cannot very well differentiate in the male sex:
 141. *Kradibia brownii* Ashmead (♀ couplet 17)
 135. *Kradibia tetamba* Wiebes (♀ couplet 9)
32. The metanotal plates are well defined, and they are spaced over a distance equal to their width (♀ couplet 8) 133. *Kradibia commuta* Wiebes
 - The metanotal plates are open in the middle, and they are spaced over a distance $1\frac{1}{2}$ times their width (♀ couplet 8) 134. *Kradibia nigricorpus* (Girault)

126. *Kradibia setigera* Wiebes

Wiebes, Zool. Meded. Leiden 53: 179–180 (1978).

The female head is slightly shorter than wide across the compound eyes (0.9), which are $2\frac{1}{2}$ times as long as the cheek. The face has many long setae. The antenna (incompletely known) has oblong sensilla in two rows on the fifth segment. The mandibular appendage bears eight ventral lamellae.

The thorax and legs bear long setae. The marginal, stigmal, and postmarginal veins of the fore wing are approximately in ratio 8 : 9 : 15. The dorso-apical comb of the fore tibia consists of four teeth (the second smaller).

The spiracular peritremata of the eighth urotergite are small, subcircular. The total length is ca. 2.4 mm; the valves of the ovipositor are ca. half as long as the gaster.

The male is not known.

The host fig is *Ficus leptogramma* Corner (Malaysia: Sabah).

127. *Kradibia jacobsi* (Wiebes)

Wiebes, Nova Guinea, Zool. 27: 75–79 (1964b, *Blastophaga*); Bouček, Australasian Chalc.: 196 (1988).

The female head is as long as wide across the compound eyes, which are two times as long as the cheek. The antenna has ten free segments; the pedicel bears some fifty axial spines. The sixth to ninth antennal segments bear two rows (or three overlapping rows) of oblong sensilla; the tenth segment is about two times as long as the fifth. The mandibular appendage bears seven ventral lamellae.

The marginal, stigmal, and postmarginal veins of the fore wing are approximately in ratio 3 : 3 : 4. The dorso-apical comb of the fore tibia bears five, alternately long and short, teeth.

The stigmatal peritremata of the eighth urotergite are large, ovoid in shape. The total length is ca. 2.7 mm; the valves of the ovipositor are one-sixth of the length of the gaster.

The male head is almost circular in outline; the eyes are as long as the cheek. The median groove is short. The antenna has a disk-like anellus; the funicular segments are subequal in length.

The pronotum is rather short; the metanotal plates are indistinctly defined in the middle, where they do not meet. The fore tibia has a dorso-apical row of four subequal teeth. The mid leg is slender, but complete.

The genitalia do not bear claspers. The total length is ca. 1.4 mm.

The host fig is *Ficus conocephalifolia* Ridley (Melanesia: Papua New Guinea).

128. *Kradibia copiosae* (Wiebes)

Wiebes, Proc. Kon. Ned. Akad. Wet. (C) 83: 90–92 (1980, *Blastophaga*); Bouček, Australasian Chalc.: 196 (1988).

The female head is shorter than wide across the compound eyes (0.9), which are two times as long as the cheek. The epistomal margin has two (lateral) lobes. The antenna has ten free segments, the fifth and ninth of which bear long sensilla in two rows, the sixth to eighth have two to three, or fully three rows of sensilla, the tenth nine overlapping rows. The mandibular appendage bears four ventral lamellae.

The marginal, stigmal, and postmarginal veins of the fore wing are approximately in ratio 1 : 1 : 2. The dorso-apical comb of the fore tibia bears four unequal teeth.

The hypopygium has a long spine, with a row of hyaline setae at half length. The stigmatal peritremata of the eighth urotergite are small, subcircular. The total length is ca. 1.8 mm; the valves of the ovipositor are two-fifths of the length of the gaster.

The male head is distinctly longer than its maximum width (1.2); the eyes are as long as the cheek. The antennae are situated in separate pockets; they have a disk-like anellus, and the funicular segments are subequal in length.

The pronotum is long; the metanotal plates are fully contiguous. The fore tibia has a dorso-apical row of four large teeth. The mid leg is completely atrophied. The hind tarsi may be oligomeric.

The genitalia do not bear claspers. The total length is ca. 1.4 mm.

The host fig is *Ficus copiosa* Steud. (Melanesia: Papua New Guinea, Solomon Isl.).

129. *Kradibia wassae* (Wiebes)

Wiebes, Kon. Ned. Akad. Wet. (C) **83**: 92–94 (1980, *Blastophaga*); Bouček, Australasian Chalc.: 197 (1988).

The female head is shorter than wide across the compound eyes (0.9), which are over two times as long as the cheek (2.3). The epistomal margin has a distinct median projection in between the two lateral lobes. The antenna has ten free segments, the fifth, eighth and ninth of which have about two rows of long sensilla, the sixth and seventh three, and the tenth about six. The mandibular appendage bears four ventral lamellae.

The marginal, stigmal, and postmarginal veins of the fore wing are approximately in ratio 1 : 2 : 4. The dorso-apical comb of the fore tibia bears four unequal teeth.

The hypopygium has the spine caudad of the row of hyaline setae, half as long as in *K. copiosae*, truncate. The stigmalal peritremata of the eighth urotergite are small, subcircular. The total length is ca. 1.5 mm; the valves of the ovipositor are two-fifths of the length of the gaster.

The male is similar to that of *K. copiosae* in most details, but the antenna does not have a distinct anellus, the subapical antennal segment is longer than the apical (1.4); the fore tibia has five teeth in the dorso-apical comb.

The host fig is *Ficus wassae* Roxb. (Melanesia: Papua New Guinea, Solomon Isl.).

130. *Kradibia clarae* Wiebes

Wiebes, Proc. Kon. Ned. Akad. Wet. **96**: 489 (1993c).

The female head is much shorter than wide across the compound eyes (0.8), which are 2.75 times as long as the cheek. The antenna has eleven free segments; the pedicel bears ca. 25 axial spines; the funicular segments from the fifth onwards, have (not always fully) two rows of long sensilla, the distal of which extend beyond the apical rim of the segment (fig. g). The mandibular appendage bears six ventral lamellae.

The marginal, stigmal, and postmarginal veins of the fore wing are approximately in ratio 5 : 5 : 7. The fore tibia has a dorso-apical comb of six, alternately long and short, teeth (fig. f).

The hypopygial spine is ca. three times as long as wide at the base; the transverse row of hyaline setae is situated at three-fifths of the length. The total length is ca. 1.1 mm; the valves of the ovipositor are ca. half as long as the gaster.

The male head is distinctly longer than wide (1.1); the eyes are two times as long as the cheek. The median groove is half as long as the head and it widens an-

teriad. The antenna has two funicular segments (in ratio 6 : 7); there is no distinct anellus.

The metanotal plates are rather wide, indistinctly defined in the middle, where they do not meet. The fore tibia has a dorso-apical comb consisting of ten unequal teeth. The mid leg is atrophied. The hind leg has four tarsal segments.

The claspers of the genitalia bear two claws. The total length is ca. 0.9 mm.

The host fig is *Ficus guyeri* Elm. (Philippines: Luzon).

131. *Kradibia sumatrana* (Grandi)

Grandi, Treubia 8: 352–353 (1926, *Blastophaga*); Grandi, Boll. Lab. Ent. Bologna 1: 146–150 (1928d, *Blastophaga*); Wiebes, Zool. Meded. Leiden 53: 173 (1978).

The female head is longer than wide across the compound eyes (1.1), which are two times as long as the cheek. The antenna has eleven free segments, but the penultimate and ultimate segments may be more or less fused to an extent that there seem to be only ten; the pedicel bears ca. twenty axial spines; the fifth to ninth segments bear one row of long sensilla, which project beyond the apical rim of their segment. The mandibular appendage bears five ventral lamellae.

The marginal, stigmal, and postmarginal veins of the fore wing are approximately in ratio 5 : 3 : 5. The fore tibia bears four subequal teeth in the dorso-apical comb.

The hypopygial spine has the transverse row of hyaline setae approximately at half length. The total length is ca. 1.3 mm; the valves of the ovipositor are three-fifths of the length of the gaster.

The male is much like that of *K. clarae*, but the median groove is distinctly shorter: one-fifth of the length of the head. The fore tibia has eight teeth in the dorso-apical comb. The hind tarsus is tetramerous. The genitalia bear small claspers, with two hyaline claws. The total length is ca. 0.9 mm.

The host fig is *Ficus ampelas* Burm.f. (Indonesia: Sumatra, Java).

132. *Kradibia wakefieldi* Wiebes

Wakefield, Vict. Nat. 76, 257–259 (1960, *Kradibiella* spec.); Wiebes, Proc. Kon. Ned. Akad. Wet. 96: 490–491 (1993c).

The female head is distinctly shorter than wide across the compound eyes (0.9), which are more than $2\frac{1}{2}$ times as long as the cheek (2.7). The antenna consists of ten free segments; the pedicel bears ca. 35 axial spines; the fifth to ninth segments bear one apical row of a few, oblong sensilla, the tenth two. The mandibular appendage bears five ventral lamellae.

The marginal, stigmal (not very distinct), and postmarginal veins of the fore wing are approximately in ratio 5 : 4 : 8. The fore tibia bears a dorso-apical row of four subequal teeth.

The spine of the hypopygium is ca. $2\frac{1}{2}$ times as long as wide at the base; it has a transverse row of hyaline setae at half length. The total length is ca. 1.4 mm; the valves of the ovipositor are two-fifths of the length of the gaster.

The male head is as long as wide; the eye is two times as long as the cheek. The median groove reaches to about one-quarter of the length of the head. The antennae are rather robust; there is no anellus, and the penultimate and ultimate segments are approximately in ratio 3 : 5.

The thorax is rather robust; the metanotal plates are narrowly contiguous in the middle. The dorso-apical comb of the fore tibia (fig. h) bears twelve teeth. The claspers of the genitalia bear three claws. The total length is ca. 1.2 mm.

The host fig is *Ficus coronata* Spin. (Australia: New South Wales, Victoria).

133. *Kradibia commuta* Wiebes

Wiebes, Proc. Kon. Ned. Akad. Wet. 96: 491–492 (1993c).

The female head is much shorter than wide across the compound eyes (0.85), which are $2\frac{1}{2}$ times as long as the cheek. The antenna consists of ten free segments; the pedicel bears ca. twenty axial spines; the fifth, eighth to ninth segments bear two rows of long sensilla, the distal of which extend beyond their segment for at most one-third of their length; the tenth segment bears three rows of sensilla. The mandibular appendage bears six ventral lamellae.

The marginal, stigmal, and postmarginal veins of the fore wing are approximately in ratio 3 : 4 : 7. The fore tibia bears a dorso-apical comb of six, alternately long and short teeth.

The hypopygial spine is three times as long as it is wide at the base; the hyaline setae are situated at three-fifths of the length. The total length is ca. 1.4 mm; the valves of the ovipositor are three-fifths of the length of the gaster.

The male head is about as long as wide; the eye is two times as long as the cheek. The narrow median groove is one-third of the length of the head. There is a disk-like antennal anellus; the two funicular segments are subequal in length.

The metanotal plates are well-defined and they are spaced over a distance approximately equal to their width. The fore tibia has seven teeth in the dorso-apical comb.

The genital claspers bear three claws. The total length is ca. 0.9 mm.

K. commuta is recorded from two species of fig, viz., *Ficus irisana* Elm. (Philippines: Luzon) and *F. heteropoda* Miq. (Philippines: Luzon, Mindoro, Mindanao).

134. *Kradibia nigricorpus* (Girault)

Girault, Mem. Qd. Mus. 4: 313 (1915b, *Kradibiella*); Bouček, Australasian Chalc.: 197 (1988); Henderson, Proc. Roy. Soc. Qd. 93: 21–29 (1982, *Blastophaga* spec.).

The female head is much shorter than wide across the compound eyes (0.85), which are three times as long as the cheek. The antenna has ten free segments; the pedicel bears ca. thirty axial spines; the fifth to ninth segments bear two rows of long sensilla, the tenth, three. The epistomal margin is gently lobed, the lateral lobes appear seamed. The mandibular appendage (fig. j) has four ventral lamellae.

The marginal, stigmal, and postmarginal veins of the fore wing are approximately in ratio 4 : 5 : 8. The fore tibia has a dorso-apical comb of three large teeth and two smaller in between.

The hypopygial spine (fig. d) is $2\frac{1}{2}$ times as long as wide basally and the row of (seven) hyaline setae is situated at three-fifths of the length. The total length is ca. 1.8 mm; the valves of the ovipositor are one-third of the length of the gaster.

The male head is about as long as wide posteriorly, and not quite two times as long as wide anteriorly (1.75); the eyes are as long as the cheek. The median groove is narrow and one-third of the length of the head. The antenna has a disk-like anellus, and the two, rather wide funicular segments are in ratio 1 : 2.

The thorax is robust; the metanotal plates are open in the middle, where by far they do not meet: the distance is $1\frac{1}{2}$ times as long as their width. The fore leg has eight teeth in the tibial comb.

The claspers of the genitalia bear two very small claws, which are scarcely visible. The total length is ca. 1.2 mm.

The host fig is *Ficus opposita* Miq. (Australia (Queensland)).

Henderson (1977, 1982) described the pollen transfer by the female wasps.

135. *Kradibia tetamba* Wiebes

Wiebes, Proc. Kon. Ned. Akad. Wet. 96: 493–494 (1993c).

The female head is as long as wide across the compound eyes, which are two times as long as the cheek. The antenna has ten free segments: the pedicel bears ca. 45 axial spines; the fifth segment has one row of long sensilla, the sixth to ninth bear two irregular rows of long sensilla, the tenth three. The epistomal

margin has a blunt median prominence, which is shorter than the lateral lobes. The mandibular appendage bears five ventral lamellae.

The marginal, stigmal, and postmarginal veins of the fore wing are approximately in ratio 4 : 5 : 8; the disk is full of microtrichiae, giving the wing a dark hue. The fore tibia has a dorso-apical comb of four, rather wide teeth (fig. e).

The hypopygial spine is almost $2\frac{1}{2}$ times as long as it is wide at the base, and the row of hyaline setae is situated at three-quarters of the length. The spiracular peritremata of the eighth urotergite are of moderate size, ovoid in shape: the long axis is ca. 0.1 mm, the short axis ca. 0.08 mm. The total length is ca. 1.75 mm; the valves of the ovipositor are one-third of the length of the the gaster.

The male head is a bit longer than wide (1.05); the eye is a quarter longer than the cheek. The median groove is one-third of the length of the head. The antenna has a distinct anellus; the funicular segments are approximately in ratio 6 : 5.

The metanotum (measured dorsally, in the middle) is one-quarter of the length of the pronotum. The dorso-apical comb of the fore tibia has seven, alternately long and short teeth.

The claspers of the genitalia bear four small claws. The total length is ca. 1.2 mm.

The host fig is *Ficus gryllus* Corner (Melanesia: Solomon Isl.).

136. *Kradibia williamsi* Wiebes

Wiebes, Proc. Kon. Ned. Akad. Wet. 96: 494–495 (1993c).

The female head is shorter than wide across the compound eyes (0.9), which are two times as long as the cheek. The antenna has ten free segments; the pedicel bears ca. forty axial spines, the fifth segment has a row of long sensilla, the sixth to ninth bear two irregular rows of long sensilla, the tenth three irregular rows. The mandibular appendage bears six ventral lamellae.

The marginal, stigmal, and postmarginal veins of the fore wing are approximately in ratio 4 : 6 : 7. The fore tibia bears four large dorso-apical teeth.

The hypopygial spine is almost three times as long as wide at the base (2.9), and the row of hyaline setae is situated at three-fifths of the length. The total length is ca. 1.8 mm; the valves of the ovipositor are two-fifths of the length of the gaster.

The male head is distinctly longer than wide (1.1); the eyes are longer than the cheek (1.4). The median groove is two-fifths of the length of the head. The antenna has a short, disk-like anellus; the funicular segments are subequal in length.

The metanotal plates of the thorax are almost contiguous. The fore tibia bears a dorso-apical comb of eight teeth.

The claspers (fig. c) of the genitalia bear three claws. The total length is ca. 1.1 mm.

The host fig is *Ficus odorata* Blanco (Philippines: Negros, Mindanao).

137. *Kradibia gestroi* (Grandi)

Grandi, Boll. Lab. Zool. Portici 10: 126–128 (1916a), and Ibid. 11: 184–193 (1916c) (both in *Blasitophaga*); Wiebes, Zool. Meded. Leiden 53: 176–177 (1978); Wiebes in Berg & Wiebes, Verh. Kon. Ned. Akad. Wet., afd. Nat. (2) 89: 205–206 (1992).

The female head is shorter than wide across the compound eyes (0.9), which are almost $2\frac{1}{2}$ times as long as the cheek. The antenna has ten free segments, the sixth to ninth of which have two rows of long sensilla, the tenth three. The mandibular appendage bears four ventral lamellae.

The marginal, stigmal, and postmarginal veins of the fore wing are approximately in ratio 5 : 5 : 7. The dorso-apical comb of the fore tibia has five subequal teeth.

The spine of the hypopygium is $2\frac{1}{2}$ times as long as wide at the base, and the row of hyaline setae is situated at four-sevenths of the length. The total length is ca. 1.8 mm; the valves of the ovipositor are one-third of the length of the gaster.

The male head is as long as wide; the eyes are two times as long as the cheek. The median groove reaches to half-way the length of the head. The antenna has a disk-like anellus; the funicular segments are subequal in length.

The metanotal plates are widely contiguous in the middle. The fore tibia bears seven teeth in the dorso-apical comb. The mid leg is slender, but fully developed, although the tarsus is oligomeric.

The claspers of the genitalia bear four claws. The total length is ca. 1.2 mm.

The host fig is *Ficus exasperata* Vahl (Ceylon; India: Pulneys, Travancore). Another subspecies is known from Africa (Wiebes in Berg & Wiebes, 1992: 205–206).

138. *Kradibia corneri* Wiebes

Wiebes, Proc. Kon. Ned. Akad. Wet. 96: 496–497 (1993c).

The female head is a bit shorter than wide across the compound eyes (0.95), which are $3\frac{1}{2}$ times as long as the cheek. The antenna has ten free segments: the pedicel bears ca. 35 axial spines, the fifth segment bears one row of oblong sensilla, the sixth three to four irregular rows of oblong sensilla, the seventh to ninth three, the tenth four to five rows. The mandibular appendage bears five ventral lamellae.

The marginal, stigmal, and postmarginal veins of the fore wing are approximately in ratio 4 : 5 : 9. The fore tibia bears a dorso-apical row of six, alternately long and short teeth.

The hypopygial spine is $3\frac{1}{2}$ times as long as it is wide at the base, and the row of hyaline setae is situated at two-thirds of the length. The total length is ca. 1.4 mm; the valves of the ovipositor are two-fifths of the length of the gaster.

The male head is as long as wide; the eye is longer than the cheek (1.7). The median groove is almost half as long as the head (0.4). The antennal anellus is disk-like (fig. i); the two funicular segments are approximately in ratio 5 : 4.

In the middle, the lateral parts of the metanotum are widely fused. The fore tibia has a dorso-apical comb of seven, alternately long and short teeth.

The claspers of the genitalia bear four claws. The total length is ca. 1.1 mm.

The host fig is *Ficus pseudowassa* Corner (Melanesia: Solomon Isl.).

139. *Kradibia calorai* Wiebes

Wiebes, Proc. Kon. Ned. Akad. Wet. 96: 497-498 (1993c).

The female head is distinctly shorter than wide across the compound eyes (0.9), which are more than four times as long as the cheek (4.3). The antenna consists of ten free segments: the pedicel bears ca. 25 axial spines; the fifth segment has two to three rows of sensilla, the sixth has five to six rows, the seventh to ninth segments bear four to five irregular rows of rather short sensilla, the tenth segment has seven to eight irregular rows of sensilla. The mandibular appendage bears six ventral lamellae.

The marginal, stigmal, and postmarginal veins of the fore wing are approximately in ratio 5 : 8 : 10. The fore tibia has five teeth in the dorso-apical comb, which are subequal, but the second is smaller.

The hypopygial spine is two times as long as it is wide at the base and the transverse row of six hyaline setae is situated at two-fifths of the length. The total length is ca. 1.8 mm; the valves of the ovipositor are one-quarter of the length of the gaster.

The male head is distinctly longer than wide (1.1); the eyes are a bit longer than the cheek (1.15). The median groove reaches to about one-fifth of the length of the head. The antenna has a short, disk-like anellus; the two funicular segments are subequal in length.

The lateral parts of the metanotum are contiguous in the middle, one-seventh of the length of the pronotum (medially); the spiracular peritremata occupy five-eighths of the lateral length. The fore tibia bears a dorso-apical comb of eight unequal teeth.

The claspers of the genitalia bear three claws. The total length is ca. 1.5 mm. The colour is yellowish.

The host fig is *Ficus fiskei* Elm. (Philippines: Negros).

140. *Kradibia ordinata* Wiebes

Wiebes, Proc. Kon. Ned. Akad. Wet. **96**: 498–499 (1993c).

The female head is slightly shorter than wide across the compound eyes (0.95), which are $2\frac{1}{4}$ times as long as the cheek. The antenna consists of ten free segments; the pedicel bears ca. forty axial spines; the seventh to ninth segments bear three to four irregular rows of oblong sensilla, the sixth segment four to five rows, the tenth five to six irregular rows. The mandibular appendage bears four ventral lamellae.

The marginal, stigmal, and postmarginal veins of the fore wing are approximately in ratio 4 : 5 : 6. The dorso-apical comb of the fore tibia consists of four teeth.

The spine of the hypopygium is $3\frac{1}{2}$ times as long as it is wide at the base; the row of hyaline setae is situated at approximately half length. The total length is ca. 1.4 mm; the valves of the ovipositor are one-third of the length of the gaster.

The male head is as long as wide; the eye is two times as long as the cheek. The median groove is not quite half as long as the head (0.4). The antenna has a disk-like anellus; the two funicular segments are approximately in ratio 9 : 8.

The metanotal plates are (narrowly) contiguous in the middle. The fore tibia has dorso-apical comb of nine subequal teeth in a rather regular row.

The claspers of the genitalia bear three claws. The total length is ca. 1 mm.

The host fig is *Ficus chrysochaete* Corner (Melanesia: Solomon Isl.).

141. *Kradibia brownii* Ashmead

Ashmead, Ent. News Philad. **15**: 342 (1904); Grandi, Philipp. J. Sci. **33**: 326 (1927b); Wiebes, Zool. Meded. Leiden **53**: 170–173 (1978).

The female head is as wide as long across the compound eyes, which are $2\frac{1}{2}$ times as long as the cheek. The antenna has ten free segments, which bear many small sensilla. The mandibular appendage bears four ventral lamellae.

The marginal, stigmal, and postmarginal veins of the fore wing are approximately in ratio 4 : 3 : 5. The fore tibia has five (the second smaller) teeth in the dorso-apical comb.

The spine of the hypopygium is long, with the row of hyaline setae about at half length. The total length is ca. 1.7 mm; the valves of the ovipositor are two-thirds of the length of the gaster.

The male is depicted in fig. k; the head is as long as wide, and the eye is as long as the cheek; the median groove is one-third of the length of the head. The antenna has a disk-like anellus; the funicular segments are approximately in ratio 2 : 3.

The metanotal plates are contiguous in the middle. The dorso-apical comb of the fore tibia has eight teeth, alternately long and short.

The claspers of the genitalia bear four or five claws. The total length is ca. 1.1 mm.

The host fig is *Ficus ulmifolia* Lam. (Philippines: Luzon).

142. *Kradibia ghigii* (Grandi)

Grandi, Boll. Lab. Zool. Portici **10**: 128 (1916a) and Ibid. **11**: 145–149 (1916b) (both in *Blastophaga*); Wiebes, Zool. Meded. Leiden **53**: 173 (1978).

Only the male was described. The head is as long as wide, and the median groove reaches to half-way the length. The antenna has no anellus; the funicular segments are approximately in ratio 7 : 10.

The metanotal plates are narrowly contiguous. The fore tibia bears eight to ten teeth in the dorso-apical row.

The total length is ca. 1.2 mm.

The host is *Ficus fraseri* Miq. (Australia: New South Wales).

143. *Kradibia panchoi* Wiebes

Wiebes, Proc. Kon. Ned. Akad. Wet. **96**: 499–500 (1993c).

The female head is slightly shorter than wide across the compound eyes (0.95), which are $2\frac{1}{2}$ times as long as the cheek. The antenna consists of eleven free segments: the pedicel bears ca. thirty axial spines; the fifth segment has two rows of sensilla, the seventh to tenth bear two to three rows of sensilla, the sixth and eleventh have three to four rows. The mandibular appendage bears six ventral lamellae.

The marginal, stigmal, and postmarginal veins of the fore wing are approximately in ratio 4 : 5 : 11. The fore tibia has a dorso-apical comb of five subequal teeth.

The hypopygium has a distinct spine, which is a bit over two times as long as it is wide at the base (9 : 4) and the transverse row of (six) hyaline setae is situated at five-ninths of the length. The total length is ca. 1.6 mm; the valves of the ovipositor are one-third of the length of the gaster.

The length-width ratio of the head is 0.95; the eye is $1\frac{1}{2}$ times as long as the cheek; the median groove is one-quarter of the length of the head. The antennal

anellus is half as long as wide; the two funicular segments are subequal in length, approximately three-fifths as wide as long.

The thorax is rather robust; the metanotal plates are narrowly contiguous; the length of the spiracular peritremata is one-third of the length of the propodeum, half as long as the lateral length. The dorso-apical comb of the fore tibia bears seven subequal teeth. The mid leg is slender, but well-developed; the tarsus is tetramerous.

The claspers of the genitalia bear three claws. The total length is ca. 1 mm.

The host fig is *Ficus cumingii* Miq. (Philippines: Luzon, Palawan, Negros).

Ceratosolen Mayr

Mayr, Verh. zool.-bot. Ges. Wien 35: 160, 164 (1885, subgenus of *Blastophaga* Gravenhorst); Mayr, Wien. ent. Ztg. 25: 153 (1906); Grandi, Boll. Lab. Zool. Portici 10: 133–153 (1916a); Wiebes, Tijdschr. Ent. 106: 3–4 (1963a, synonymy); Wiebes, Proc. Kon. Ned. Akad. Wet. 97: 123–132 (1994).
Synonym: *Ceratosolensia* Girault, Mem. Qd. Mus. 4: 311 (1915b).

The female has large spiracular peritremata of the eighth urotergite. Large pollen pockets are present. The male is long and slender, with a mostly tridentate epistomal margin.

There are three subgenera, which can be differentiated by the following key. For a certain identification, both sexes should be available.

KEY TO THE SUBGENERA OF CERATOSOLEN (figs. 22, 24, 26)

1. The male hind feet are enlarged (fig. 2, l); the antennal grooves are open (figs. 22, h, 26, e). The female fore tibia bears four dorso-apical teeth (to six in a few species) *Rothropus* Wiebes
- The male hind feet are not enlarged; the antennal grooves are half closed (figs. 2, j, 22, g) (three exceptions!) 2
2. The male propodeal peritremata are very large (fig. 2, j) and the female fore tibia bears (four or) five to ten dorso-apical teeth (fig. 26, a); the antiaxial tooth of the female hind tibia in most species is tricuspidate (fig. 26, b) *Streptitus* Wiebes
- The male propodeal peritremata are much smaller, and the female fore tibia bears (two to) four dorso-apical teeth; the antiaxial tooth of the female hind tibia is bicuspidate (three exceptions!) *Ceratosolen* Mayr

Subgenus **Ceratosolen** (fig. 21)

The female head is approximately as long as wide across the compound eyes, or a bit longer or shorter. The antenna has eleven segments, but in one species there are only ten segments. The mandibular appendage bears four or five ventral lamellae, up to ten in a number of species; a bacilliform process may occur or not.

The postmarginal vein usually is 1–2 times as long as the stigmal, but it is shorter in three species. The fore tibia bears four dorso-apical teeth, but one species has only two, and five have three. The antiaxial tooth of the hind tibia is bifurcate, but in three species it is tricuspidate. The ovipositor valves are half as long as the gaster, or shorter, but in two species (pollinators of monoecious figs) they are longer. The total length is ca. 1–2 mm.

The male head is ca. 1.3–1.5 times as long as wide, but in two species each, shorter (1–1.2) or longer (1.7–2). An eye is present or not. The antennal grooves are half closed, but in three species they are open; the antenna has four or five segments, one of which may be anuliform. In many species the labium and maxillae are atrophied, in others they form a trilobed complex.

The fore tibia bears two dorso-apical teeth (in one species, the same as in the female), or three or four. The mid and hind tarsi are oligomerous in three species. In most species, the genitalia bear claspers, with claws, but they may be absent or hyaline. The total length is ca. 1–1½ (- 1.7) mm.

There are 19 Indo-Australian species, three of which are divided into subspecies, and twelve species from Africa and Malagasy (see Wiebes in Berg & Wiebes, 1992: 207–217). Many species, including the type-species (no. 156, *C. appendiculatus*), are associated with figs of section *Neomorphe* King and subgenus *Sycomor* Miq., three with figs of section *Adenosperma* Corner, a few with figs of section *Sycidium* Miq. (series *Prostratae* Corner & *Pungentes* Corner of subsection *Sycidium*, and series *Cyrtophylleae* Corner of subsection *Varinga* (Miq.) Corner), a few with figs of subsection *Sycocarpus* Miq., and one with a fig that Corner classified with the *Sycocarpus*-subsection *Papuasyce* Corner.

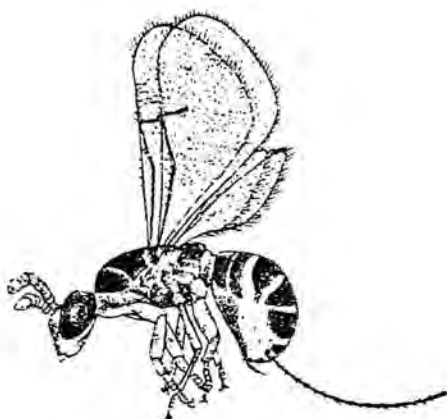


Fig. 21. *Ceratosolen* (*C.*) *fusciceps* (Mayr), female, after Grover & Chopra (1971, fig. A)

KEY TO THE INDO-AUSTRALIAN (SUB-)SPECIES OF CERATOSOLEN S.STR. (fig. 22)

1. Females 2
- Males 23
2. The valves of the ovipositor are longer than the gaster 3
- The valves of the ovipositor are distinctly shorter than the gaster 4
3. The valves of the ovipositor are $1\frac{1}{2}$ times as long as the gaster. The head is shorter than wide across the compound eyes (0.95). The hypopygium bears long setae (fig. a), but no transverse row of hyaline setae. *Ficus racemosa* L. (India: Delhi, Maharashtra, Karnataka, Kerala, Bihar; Ceylon; Malaysia: Kelantan, Negri Sembilan, Sabah; Indonesia: Java, Bali, Timor; Australia: New Territories, Queensland) 155. *Ceratosolen* (C.) *fusciceps* (Mayr)
- The valves of the ovipositor are a bit longer than the gaster (1.1). The head is longer than wide across the compound eyes (1.25). The hypopygium bears a transverse row of hyaline setae (as in figs. b, c). *Ficus pritchardii* Seem. (Polynesia: Fiji) 145. *Ceratosolen* (C.) *marshalli* Grandi
4. The head is distinctly longer than wide across the compound eyes (1.35). The hypopygium bears long setae, but no transverse row of hyaline setae 5
- The head may be longer than wide across the compound eyes, but not so much (at most 1.2). The hypopygium bears a transverse row of hyaline setae 6
5. The eleventh antennal segment is longer than the tenth (1.6). The bacilliform process is one-quarter of the length of the maxilla itself. *Ficus hispida* Linn.f. (Indonesia: Java; Malaysia: Langkawi Is.; S. Vietnam) 159a. *Ceratosolen* (C.) *s. solmsi* (Mayr)

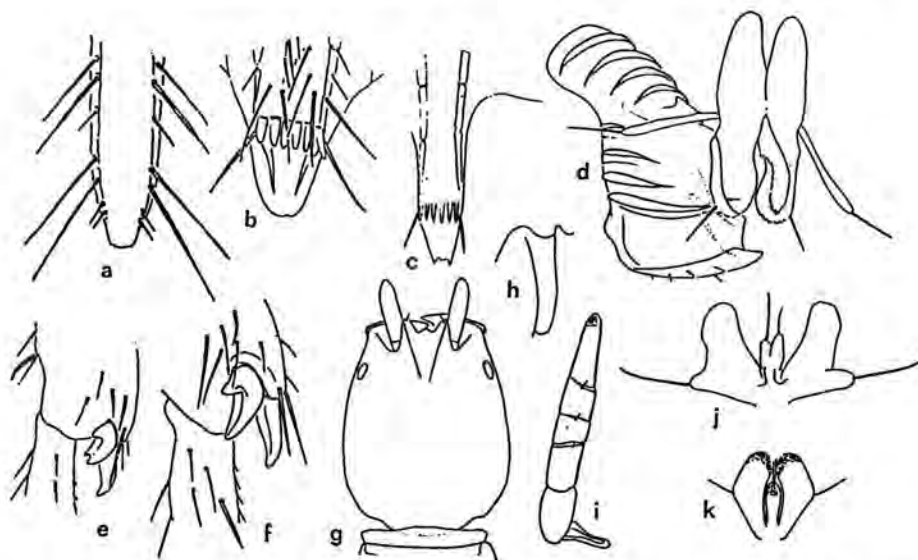


Fig. 22. Details of *Ceratosolen*. a, female hypopygium of *C. fusciceps*, and of: b, *C. nexilis* Wiebes, and c, *C. gressitti* Wiebes; d, female mouth-parts of *C. solitarius* Wiebes; e-f, apical armature of female hind tibia, of: e, *C. medlerianus* Wiebes, and f, *C. gressitti*; g, male head of *C. nexilis*; h, antennal groove of *C. s. solmsi* (Mayr); i, male antenna of *C. nanus* Wiebes; j-k, male labium and maxillae, of: j, *C. brongersmai* Wiebes, and k, *C. s. solmsi*. Figs. b-g, after Wiebes (1980, figs. 36, 19, 44, 29, 18, and 39, resp.) and h-k, after Wiebes (1963a, figs. 255, 14, 177, and 264, resp.).

- The eleventh antennal segment is shorter than the tenth (0.7). The bacilliform process is half as long as the maxilla itself (as in fig. d). *Ficus hispida* Linn.f. (India: Bengal, Travancore; Ceylon; N. Vietnam; Hong Kong; Malaysia: Selangor; Australia: Queensland) 159b. *Ceratosolen* (C.) *s. marchali* Grandi
- 6. There is no clearly differentiated antennal club. The antiaxial tooth of the hind tibia is tricuspidate 7
- The tenth and eleventh, or the ninth to eleventh, antennal segments are shaped so as to form a club 8
- 7. The antenna has ten segments, the sixth to tenth of which are three or more times as long as wide, and they bear three to four rows of oblong sensilla. *Ficus asperiuscula* Kunth. & Bouch. (Indonesia: Java & Sumatra) 149. *Ceratosolen* (C.) *internatus* Wiebes
- The antenna has eleven segments, the fifth to eleventh of which are at most $1\frac{1}{2}$ times as long as wide and bear one row of long sensilla. *Ficus mollior* Benth. (Melanesia: Papua New Guinea) 151. *Ceratosolen* (C.) *medlerianus* Wiebes
- 8. The antennal segments bear one row of sensilla 9
- The antennal segments bear more than one, to three rows of sensilla 18
- 9. The mandibular appendage bears eight or nine ventral lamellae 10
- The mandibular appendage bears six ventral lamellae, or less 12
- 10. The postmarginal vein is very short, ca. one-quarter of the length of the stigmal. *Ficus minahassae* Miq. (Philippines: Luzon & Mindanao) 144. *Ceratosolen* (C.) *pygmaeus* Grandi
- The postmarginal vein is distinctly longer than the stigmal 11
- 11. The postmarginal vein is ca. $1\frac{1}{2}$ times as long as the stigmal. *Ficus verticillaris* Corner (Melanesia: Solomon Isl.) 152. *Ceratosolen* (C.) *bimerus* Wiebes
- The postmarginal vein is two times as long as the stigmal. *Ficus adenosperma* Miq. (Melanesia: Papua New Guinea) 153. *Ceratosolen* (C.) *adenospermae* Wiebes
- 12. The fore tibia bears two dorso-apical teeth. *Ficus pungens* Reinw. (Melanesia: Papua New Guinea) 146. *Ceratosolen* (C.) *nanus* Wiebes
- The fore tibia bears four dorso-apical teeth 13
- 13. The mandibular appendage bears four ventral lamellae. The valves of the ovipositor are half as long as the gaster. *Ficus semivestita* Corner (Melanesia: Papua New Guinea) 158. *Ceratosolen* (C.) *grandii* Wiebes
- The mandibular appendage bears five or six ventral lamellae. The valves of the ovipositor are one-third of the length of the gaster, or shorter 14
- 14. The head is distinctly longer than wide across the compound eyes (1.2). The valves of the ovipositor are one-sixth of the length of the gaster 15
- The head is approximately as long as wide across the compound eyes (0.95-1.1). The valves of the ovipositor are at least one-quarter of the length of the gaster 16
- 15. The maxilla is simple. *Ficus septica* Burm.f. (Indonesia: Java, Krakatau, Bali; Melanesia: Papua New Guinea) 161a. *Ceratosolen* (C.) *b. bisulcatus* (Mayr)
- The maxilla has a (short) bacilliform process, or at least a small protuberance instead. *Ficus septica* Burm.f. (Philippines; Luzon, Mindanao; Taiwan; Malaysia: Sabah) 161b. *Ceratosolen* (C.) *b. jucundus* Grandi

16. The head is a bit shorter than wide across the compound eyes (0.95). The tenth and eleventh antennal segments are shaped so as to form a club. The mandibular appendage bears six ventral lamellae; the bacilliform process is one-fifth of the length of the maxilla itself. *Ficus complexa* Corner (Melanesia: Papua New Guinea) 150. *Ceratosolen* (C.) *gressitti* Wiebes
- The head is a bit longer than wide across the compound eyes (1.05–1.1). The ninth to eleventh antennal segments are shaped so as to form a club. The mandibular appendage bears five ventral lamellae; the bacilliform process is approximately half as long as the maxilla itself 17
17. The compound eye is two times as long as the cheek. The postmarginal vein is two times as long as the stigmal. *Ficus auriculata* Lour. (India: Uttar Pradesh; Vietnam); and *Ficus oligodon* Miq. (Malaysia: Sarawak) 154. *Ceratosolen* (C.) *emarginatus* Mayr
- The compound eye is ca. $1\frac{1}{2}$ times as long as the cheek. The postmarginal vein is ca. $1\frac{1}{2}$ times as long as the stigmal. *Ficus semicordata* Ham. ex Smith (India: Uttar Pradesh, Chotanagpur) 148. *Ceratosolen* (C.) *gravelyi* Grandi
18. The antennal segments bear two to three rows of sensilla. The maxilla is simple . . . 19
- The antennal segments bear one to two rows of sensilla 20
19. The sixth antennal segment is as long as the seventh, approximately $1\frac{1}{2}$ times as long as wide, with three rows of short sensilla. The tenth segment is approximately as long as the eleventh. *Ficus fistulosa* Reinw. (Indonesia: Java; Malaysia: Sabah; Hong Kong); and *Ficus dimorpha* King (Indonesia: Sumatra) 147a. *Ceratosolen* (C.) *c. constrictus* (Mayr)
- The sixth antennal segment is longer than the eleventh, approximately 1.75 times as long as wide, with two irregular rows of longer sensilla. The tenth segment is approximately $1\frac{1}{2}$ times as long as the eleventh. *Ficus fistulosa* Reinw. (Malaysia: Sarawak & Singapore) 147b. *Ceratosolen* (C.) *c. hewitti* Waterston
20. The maxilla bears a bacilliform process (fig. d). The valves of the ovipositor scarcely project beyond the apex of the gaster 21
- The maxilla is simple. The valves of the ovipositor are approximately half as long as the gaster 22
21. The compound eye is almost $1\frac{1}{2}$ times as long as the cheek. The mandibular appendage bears 6–7 ventral lamellae. The fore tibia bears four dorso-apical teeth. *Ficus treubii* King (Malaysia: Sabah) 160. *Ceratosolen* (C.) *brongersmai* Wiebes
- The compound eye is shorter than the cheek (0.8). The mandibular appendage bears five ventral lamellae. The fore tibia bears three dorso-apical teeth. *Ficus arfakensis* King (Melanesia: Papua New Guinea) 162. *Ceratosolen* (C.) *solitarius* Wiebes
22. The antenna has ten segments. The mandibular appendage bears six ventral lamellae. The antiaxial tooth of the hind tibia is tricuspidate (as in fig. e). The spine of the hypopygium is short and blunt. *Ficus nodosa* Teysm. et Binn. (Melanesia: Papua New Guinea) 157. *Ceratosolen* (C.) *nexilis* Wiebes
- The antenna has eleven segments. The mandibular appendage bears four ventral lamellae. The antiaxial tooth of the hind tibia is bidentate (as in fig. f). The spine of the hypopygium is long and sharp. *Ficus variegata* Bl. (Indonesia: Java; Philippines; Luzon; Hong Kong; Australia; Queensland; Melanesia: Papua New Guinea); and *Ficus viridicarpa* Corner (Malaysia: Trengganu, Negri Sembilan) 156. *Ceratosolen* (C.) *appendiculatus* (Mayr)
23. The antennal grooves are half closed (fig. g) 24
- The antennal grooves are open (fig. h) 38

24.	The mid and mostly also the hind tibiae have many scattered spines on the disk . . .	25
-	The mid and hind tibiae are without such spines on the disk	29
25.	The hind tibia does not have spines on the disk. The antenna consists of five segments (♀, couplet 17)	154. <i>Ceratosolen (C.) emarginatus</i> Mayr
-	The mid and hind tibiae bear spines or protuberances on the disk	26
26.	The antenna consists of five segments. The labium and maxillae are atrophied (♀, couplet 22)	156. <i>Ceratosolen (C.) appendiculatus</i> (Mayr)
-	The antenna consist of four segments (there is no ring-segment). The labium and maxillae form a bi- or trilobed complex	27
27.	The genitalia bear claspers with 4–5 claws (♀, couplet 3)	155. <i>Ceratosolen (C.) fusciceps</i> (Mayr)
-	The genitalia do not bear claspers	28
28.	The eyes are of medium size, half as long as the cheek (fig. g). The (two) segments of the fore tarsus are fully separate (♀, couplet 22)	157. <i>Ceratosolen (C.) nexilis</i> Wiebes
-	The eyes are very small, one-third of the length of the cheek. The segments of the fore tarsus are incompletely separate (♀, couplet 13)	158. <i>Ceratosolen (C.) grandii</i> Wiebes
29.	The antenna consists of four segments (there is no ring-segment)	30
-	The antenna consists of five segments	33
30.	The mid and hind tarsi are pentamerous	31
-	The mid and hind tarsi are trimerous (♀, couplet 10)	144. <i>Ceratosolen (C.) pygmaeus</i> Grandi
-	The mid and hind tarsi are bimerous (♀, couplet 11)	152. <i>Ceratosolen (C.) bimerus</i> Wiebes
31.	The fore tibia bears three dorso-apical teeth. The genitalia have claspers with three robust claws (♀, couplet 3)	145. <i>Ceratosolen (C.) marshalli</i> Grandi
-	The fore tibia bears four dorso-apical teeth. The genitalia do not bear claspers	32
32.	The head is 1½ times as long as wide. The eye is as long as the cheek (♀, couplet 7)	151. <i>Ceratosolen (C.) medlerianus</i> Wiebes
-	The head is approximately as long as wide. The eye is very small, rather close to the insertion of the mandibles (♀, couplet 11) . 153. <i>Ceratosolen (C.) adenospermae</i> Wiebes	
33.	The eye is large, as long as the cheek	34
-	The eye is much smaller, no more than one-third of the length of the cheek	35
34.	The third antennal segment is little smaller than the fourth (fig. i). The fore tibia bears two dorso-apical teeth (♀, couplet 12)	146. <i>Ceratosolen (C.) nanus</i> Wiebes
-	The third antennal segment is very short and disk-like, and the fourth is ca. 25 times as long. The fore tibia bears four dorso-apical teeth (♀, couplet 7)	149. <i>Ceratosolen (C.) internatus</i> Wiebes
35.	The third antennal segment is subquadrate or triangular in profile. The metanotum forms an entire, transverse band	36
-	The third antennal segment is anuliform, disk-like. The metanotum is divided into two lateral parts	37
36.	The head and thorax are rather short, robust, ca. two times as long as wide (♀, couplet 19)	147a. <i>Ceratosolen (C.) c. constrictus</i> (Mayr)

- The head and thorax are more slender, ca. $2\frac{1}{2}$ times as long as wide (♀, couplet 19) 147b. *Ceratosolen* (C.) c. *hewitti* Waterston
- 37. The fore tibia bears three dorso-apical teeth. The genitalia bear clasper with three claws (♀, couplet 17) 148. *Ceratosolen* (C.) *graveyi* Grandi
- The fore tibia bears four dorso-apical teeth. The genitalia bears small hyaline claspers, without distinct claws (♀, couplet 16) 150. *Ceratosolen* (C.) *gressitti* Wiebes
- 38. The epistomal margin is bidentate 39
- The epistomal margin is tridentate 40
- 39. The head is $1\frac{1}{2}$ times as long as wide; small eyes are present (♀ couplet 15)
- 161a. *Ceratosolen* (C.) b. *bisulcatus* (Mayr)
- The head is relatively shorter: the length is not more than four-thirds of the width; eyes are absent (♀, couplet 15) 161b. *Ceratosolen* (C.) b. *jucundus* Grandi
- 40. The maxillae bear lateral expansions (fig. j). The fore tibia bears four dorso-apical teeth (♀, couplet 21) 160. *Ceratosolen* (C.) *brongersmai* Wiebes
- The maxillae do not bear lateral expansions (fig. k). The fore tibia bears three dorso-apical teeth 41
- 41. The antennal groove is narrow behind; the fourth antennal segment is $1\frac{1}{2}$ times as long as the third (♀, couplet 5) 159a. *Ceratosolen* (C.) s. *solmsi* Mayr
- The antennal groove is wide behind; the fourth antennal segment is 2–4 times as long as the third (♀, couplet 5) 159b. *Ceratosolen* (C.) s. *marchali* Grandi

144. *Ceratosolen* (C.) *pygmaeus* Grandi

Grandi, Philipp. J. Sci. 33: 317–320 (1927b); Wiebes, Tijdschr. Ent. 106: 8 (1963a).

The female head is longer than wide across the compound eyes (1.1), which are $1\frac{1}{2}$ times as long as the cheek. The funicular segments of the antenna bear one row of oblong sensilla; the ninth to eleventh segments are shaped so as to form a club. The mandibular appendage bears eleven ventral lamellae; the maxilla is simple.

The marginal, stigmal, and postmarginal veins of the fore wing are approximately in ratio 3 : 4 : 1. The fore tibia has a tridentate dorso-apical row of teeth; the tarsus is heteromerous (as is the mid tarsus). The antiaxial tooth of the hind tibia is bicuspidate, the axial one simple. The hypopygium has the spine ca. three times as long as wide at the base, the hyaline setae (at half length) are short. The valves of the ovipositor are ca. one-third of the length of the gaster. The total length is ca. 1.1 mm.

The male head is 1.2 times as long as wide; the eyes are as long as the cheek. The antennal grooves are half open; the antenna is four-segmented. The labium and maxillae are atrophied.

The thorax is rather robust (small as it is!); the peritremata of the propodeal spiracles occupy almost the total length. The fore tarsus has three dorso-apical teeth. The hind tarsus bears three short apical teeth; the tarsus (as that of the mid leg) is trimerous. The genitalia bear hyaline claspers, which have one claws. The total length is ca. 0.9 mm.

The host fig is *Ficus minahassae* Miq. (Philippines: Luzon & Mindanao).

145. *Ceratosolen (C.) marshalli* Grandi

Grandi, Boll. Lab. Ent. Bologna 4: 8-11 (1931); Wiebes, Tijdschr. Ent. 106: 8-9 (1963a).

The female head is almost $1\frac{1}{4}$ times as long as wide across the compound eyes, which are more than $1\frac{1}{2}$ times as long as the cheek (1.7). The funicular segments of the antenna bear one row of oblong sensilla; the ninth to eleventh segments are shaped so as to form a club. The mandibular appendage bears four or five ventral lamellae; the maxilla is simple.

The marginal, stigmal, and postmarginal veins of the fore wing are approximately in ratio 5 : 5 : 4. The fore tibia bears three teeth in the dorso-apical row. The antiaxial tooth of the hind tibia is bicuspidate, the axial one simple. The hypopygium is much as in *C. pygmaeus*, but the spine is rather slender. The valves of the ovipositor are a bit longer than the gaster (1.1). The total length is ca. 1.4 mm.

The male head is 1.7 times as long as wide; there are no eyes. The antennal grooves are half closed; the antenna is four-segmented. The labium and maxillae are atrophied.

The thorax is more slender than in *C. pygmaeus*; the peritremata of the propodeal spiracles are half as long as the propodeum. The fore tarsus is tridentate dorsally. The hind tibia bears three axial teeth; the tarsus is pentamerous (as also that of the mid leg). The claspers of the genitalia bear three rather robust claws. The total length is ca. 1.1-1.3 mm.

The host fig was identified with *Ficus pritchardii* Seem. (Polynesia: Fiji), which Corner (1970: 400) classified with the subsection *Papuasyce* of section *Sycocarpus*. *C. marshalli* is certainly not closely related to the species of subgenus *Strepiatus*, which one would expect in figs of subsection *Papuasyce*. The female does have (a) long ovipositor(-valves), as expected in the pollinator of a monoecious fig.

146. *Ceratosolen (C.) nanus* Wiebes

Wiebes, Tijdschr. Ent. 106: 9-12 (1963a).

The female head is as long as wide across the compound eyes, which are distinctly longer than the cheek (1.4). The funicular segments of the antenna bear few oblong sensilla, in one incomplete row; the five apical segments are shaped so as to form a club. The mandibular appendage bears six ventral lamellae; the maxilla is simple.

The marginal, stigmal, and postmarginal veins of the fore wing are approximately in ratio 5 : 4 : 2. The fore tibia bears two dorso-apical teeth; the tarsus

is tetramerous (as is also that of the mid leg). The hind tibia bears a bicuspidate antiaxial tooth. The hypopygium is much as described for *C. pygmaeus*. The valves of the ovipositor scarcely project beyond the apex of the gaster. The total length is ca. 1.2 mm.

The male head is slightly over two times as long as wide; the eyes are large, as long as the cheek. The antennal grooves are half open; the antenna is five-segmented: the third and fourth segments are subequal in length. The labium and maxillae are atrophied.

The thorax is relatively slender; the metanotum is fully separate from the propodeum, which has spiracular peritremata occupying the whole (rounded) lateral edges. The tibia bears two dorso-apical teeth. The hind tibia bears three apical teeth; the tarsus (as that of the mid leg) is trimerous. The genitalia have no claspers. The total length is ca. 0.95–1.0 mm.

The host fig is *Ficus pungens* Reinw. (Melanesia: Papua New Guinea).

147a. *Ceratosolen (C.) c. constrictus* (Mayr)

Mayr, Verh. zool.-bot. Ges. Wien **35**: 169–170 (1885, *Blastophaga*); Grandi, Boll. Lab. Ent. Bologna **1**: 184–188 (1928d); Wiebes, Tijdschr. Ent. **106**: 12–14 (1963a); Hill, Zool. Verh. Leiden **89**: 49–52 (1967a).

The female head is longer than wide across the compound eyes (1.15), which are one quarter longer than the cheek. The funicular segments of the antenna bear two (the fifth) to three rows of oblong sensilla; the tenth and eleventh segments are shaped so as to form a club. The mandibular appendage bears five or six ventral lamellae; the maxilla is simple.

The marginal, stigmal, and postmarginal veins of the fore wing are approximately in ratio 7 : 6 : 8. The fore tibia bears four dorso-apical teeth, alternately long and short. The hind tibia has a bicuspidate antiaxial tooth and a simple axial. The hypopygium has a rather long spine: four times as long as wide at the base; the row of hyaline setae is almost terminal in position. The ovipositor-valves scarcely project beyond the gaster. The total length is ca. 1.4–1.5 mm.

The male head is 1.3 times as long as wide; there are small eyes, which are much shorter than the cheek (ca. one-third). The antennal grooves are half closed; the antenna has five segments: the third is ca. two-thirds of the length of the fourth. The mouth-parts consist of two lobes, with some lateral setae.

The thorax is relatively robust; the metanotum is completely separate from the propodeum, which has large spiracular peritremata, occupying the greater part of the lateral edges. The fore tibia bears two or three dorso-apical teeth. The hind tibia bears three dorso-apical teeth. The genitalia bear claspers with two teeth (Hill recorded four in Hong Kong material). The total length is ca. 1.2–1.4 mm.

The host fig is *Ficus fistulosa* Reinw. (Indonesia: Java; Malaysia: Sabah; and Hong Kong), and the subspecies was also recorded from *Ficus dimorpha* King (Indonesia: Sumatra).

147b. *Ceratosolen* (C.) *constrictus* hewitti Waterston

Waterston, Bull. ent. Res. 12: 35–38 (1921); Wiebes, Tijdschr. Ent. 106: 14 (1963a). Synonym: *Ceratosolen imbecillus* Grandi, Philipp. J. Sci. 33: 315–317 (1927b).

This subspecies differs little from the nominate form, but the female antennal segments are a bit more slender (e.g., the length/width ratio of the sixth segment is ca. 1.75, vs. 1.5 in *C. c. constrictus*) and the sensilla are longer; the male is more slender (e.g., the length of the thorax relative to the width of the mesonotum, is 2.5, vs. 2 in *C. c. constrictus*).

The host fig is *Ficus fistulosa* Reinw. (Malaysia: Sarawak & Singapore). Galil (1973) noted upon the pollination of *F. fistulosa* by *C. c. hewitti*, and Corlett (1987) discussed the phenology of *F. fistulosa*, in Singapore. The record of *C. c. hewitti* from *Ficus chartacea* Wall (Malaysia: Singapore) by Grandi (1927b: 317; 1928d: 223) is probably incorrect (Wiebes, 1963a: 97); see no. 86, *Blastophaga* (*V.*) *medusa*.

148. *Ceratosolen* (C.) *gravelyi* Grandi

Grandi, Boll. Lab. Zool. Portici 10: 150, 152 (1916a) and Ibid. 11: 201–207 (1916c); Joseph, Agra Univ. J. Res. 3: 409 (1954).

The female head is slightly longer than wide across the compound eyes, which are over $1\frac{1}{2}$ times as long as the cheek. The segments of the antennal funicle bear one row of oblong sensilla, and the ninth to eleventh segments are shaped so as to form a club. The mandibular appendage bears 5 ventral lamellae; the maxilla has an bacilliform process, which is two-fifths of the length of the maxilla.

The marginal, stigmal, and postmarginal veins of the fore wing are approximately in ratio 5 : 5 : 7. The fore tibia bears a dorso-apical comb of four teeth, alternately large and small. The hind tibia has two apical teeth, one of which is bicuspidate. The hypopygium was not described. The valves of the ovipositor are one-quarter of the length of the gaster. The total length is ca. 2 mm.

The male head is longer than wide (1.15); there are no eyes. The antennal grooves are half closed; the antenna has five segments, the third of which is an extremely reduced ring. The mouth-parts consist of two maxillae, each with a basal lobe, and a short labium.

The thorax is robust; the propodeum is triangular in shape, truncate behind, with long lateral spiracular peritremata. The fore tibia is tridentate dorso-api-

cally. The hind tibia bears a tridentate apical crest. The genitalia bear claspers with two claws. The total length is ca. 1.5 mm.

The host fig is *Ficus semicordata* Ham. ex Smith (India: Uttar Pradesh, Chotanagpur).

149. *Ceratosolen (C.) internatus* Wiebes

Wiebes, Zool. Meded. Leiden 53: 180, 182–183 (1978).

The female head is shorter than wide across the compound eyes (0.9), which are over $1\frac{1}{2}$ times as long as the cheek (1.6). The antenna has ten segments, the sixth to tenth of which are three or more times as long as wide, and they bear four irregular rows of oblong sensilla and many setae; there is no club. The mandibular appendage bears ten ventral lamellae; the maxilla has a bacilliform process, which is one-third of the length of the maxilla itself.

The marginal, stigmal, and postmarginal veins of the fore wing are approximately in ratio 4 : 4 : 7. The fore tibia bears a dorso-apical comb of four sharp teeth. The hind tibia bears a tricuspidate antiaxial tooth and a bicuspidate axial. The hypopygium has a long spine, four times as long as wide at the base. The spiracular peritremata of the eighth urotergite are large, ovoid in shape. The valves of the ovipositor are half as long as the gaster. The total length is ca. 1.8 mm.

The male head is $1\frac{1}{2}$ times as long as wide; the eye is large, as long as the cheek. The antennal grooves are half closed; the antenna has five segments, among which a very short third segment. The mouth-parts consist of two maxillae, with two setae, and a labium with an apical seta.

The metanotal plates are fully contiguous, separate from the propodeum, which has long spiracular peritremata, occupying the full lateral length. The fore tibia bears a comb of four dorsal teeth. The mid and hind tarsi are tetramerous; the hind tibia bears a large, bicuspidate antiaxial crest, one tooth of which has an auxilliary, and a bidentate axial tooth. The genitalia bear claspers, which have four claws. The total length is ca. 1.5 mm.

The host fig is *Ficus asperiuscula* Kunth. & Bouch. (Indonesia: Java & Sumatra).

150. *Ceratosolen (C.) gressitti* Wiebes

Wiebes, Proc. Kon. Ned. Akad. Wet. (C) 83: 96–98 (1980).

The female head is slightly shorter than wide across the compound eyes (0.95), which are not quite half as long as the cheek (0.45). The antennal funicular segments have one row of long sensilla; the tenth and eleventh segments are shaped so as to form a club. The mandibular appendage bears six ventral lamel-

lae; the maxillar bacilliform process is ca. one-fifth of the length of the maxilla itself.

The marginal, stigmal, and postmarginal veins of the fore wing are approximately in ratio 1 : 1 : 2. The fore tibia has a dorso-apical comb of four teeth. The armature of the hind tibia consist of a bidentate antiaxial and a simple axial tooth. The hypopygial spine is $2\frac{1}{2}$ times as long as wide at the base. The valves of the ovipositor are ca. one-quarter of the length of the gaster. The total length is ca. 2 mm.

The male head is about as long as wide; the eye is small, half as long as the cheek. The antennal groove is half closed; the antenna has a very short anellus, and the two funicular segments are indistinctly separate. The labium is short; the maxillae bear two setae.

The two parts of the metanotum are just contiguous, fully separate from the propodeum, the spiracular peritremata of which occupy almost the whole lateral length. The fore tibia bears four dorso-apical teeth. The hind tibia has an antiaxial crest, consisting of a dorsal tooth and a bidentate ventral tooth. The genitalia bear very small, hyaline claspers, without distinct claws. The total length is ca. 1.6 mm.

The host fig is *Ficus complexa* Corner (Melanesia: Papua New Guinea).

151. *Ceratosolen (C.) medlerianus* Wiebes

Wiebes, Proc. Kon. Ned. Akad. Wet. (C) **83**: 98–99 (1980).

The female head is as long as wide across the compound eyes, which are distinctly longer than the cheek (1.3). The funicular segments of the antenna bear one row of long sensilla; there is no clearly differentiated club. The mandibular appendage bears eight ventral lamellae; the maxilla is simple.

The marginal, stigmal, and postmarginal veins are approximately equal in length. The fore tibia has a dorso-apical comb of four teeth. The hind tibia bears a tricuspidate antiaxial tooth and a simple axial. The hypopygium has a long spine, which is four times as long as wide at the base. The valves of the ovipositor are one-third of the length of the gaster. The total length is ca. 1.4 mm.

The male head is $1\frac{1}{2}$ times as long as wide; the medium-sized eye is as long as the cheek. The antennal grooves are half closed; the antenna has four segments: there is no anellus. The labium and maxillae are atrophied.

The metanotum has straight anterior and posterior borders, which gives it the shape of a broad band; the spiracular peritremata of the propodeum are large and wide. The fore tibia bears four dorsal teeth. The armature of the hind tibia consists of some small, mainly ventral teeth: one axial, tridentate, the other

antiaxial, bidentate, and one tooth at the antiaxial disk. The genitalia seem to have no claspers. The total length is ca. 1.2 mm.

The host fig is *Ficus mollior* Benth. (Melanesia: Papua New Guinea).

152. *Ceratosolen* (C.) *bimerus* Wiebes

Wiebes, Zool. Meded. Leiden 40: 229–232 (1965).

The female was not fully described. The funicular segments of the antenna bear one row of sensilla; the tenth and eleventh segments are shaped so as to form a club. The mandibular appendage bears eight ventral lamellae; the maxilla is simple.

The marginal, stigmal, and postmarginal veins of the fore wing are approximately in ratio 2 : 2 : 3. The fore tibia has a dorso-apical armature of four teeth. The hind tibia bears two ventro-apical teeth: one bidentate and the other simple. The spine of the hypopygium is three times as long as wide at the base. The valves of the ovipositor are half as long as the gaster.

The male head is slightly wider than two-thirds of the length; the small eyes are as long as the cheek. The antennal grooves are half closed; the antenna has four segments, without an anellus. The labium and maxillae are atrophied.

The lateral parts of the metanotum are contiguous in the middle; the spiracular peritremata are large, as long as the lateral length of the propodeum. The fore tibia bears three dorsal teeth. All tarsi are bimerous. The hind tibia bears two antiaxial teeth and one axial. The genitalia bear claspers with two claws. The total length is ca. 1.3 mm.

The host fig is *Ficus verticillaris* Corner (Melanesia: Solomon Isl.).

153. *Ceratosolen* (C.) *adenospermae* Wiebes

Wiebes, Zool. Meded. Leiden 40: 225–229 (1965).

The female head is approximately as long as wide across the compound eyes, which are $1\frac{1}{2}$ times as long as the cheek. The antennal funicular segments bear one row of sensilla; the ninth segment more or less fits with the tenth and eleventh, which are shaped so as to form a club. The mandibular appendage bears eight ventral lamellae; the maxilla is simple.

The marginal, stigmal, and postmarginal veins of the fore wing are approximately in ratio 2 : 1 : 2. The fore tibia bears four dorso-apical teeth. The hind tibia has a bidentate antiaxial tooth and a gently curved, simple axial. The spine of the hypopygium is $3\frac{1}{2}$ times as long as wide at the base. The valves of the ovipositor are half as long as the gaster. The total length is ca. 1.2 mm.

The male head is as long as wide; the very small eyes are situated close to the insertion of the mandibles. The antennal grooves are half closed; the antenna has four segments; there is no anellus. The labium and maxillae are atrophied.

The metanotum forms a wide band; the very large spiracular peritremata occupy the whole length of the propodeum. The fore tibia bears four dorso-apical teeth. The mid and hind tarsi are pentamerous. The ventral armature of the hind tibia consists of four antiaxial teeth and one motile, bicuspidate axial tooth. The genitalia do not have claspers. The total length is ca. 1 mm.

The host fig is *Ficus adenosperma* Miq. (Melanesia: Papua New Guinea).

154. *Ceratosolen* (C.) *emarginatus* Mayr

Mayr, Wien. ent. Ztg. 25: 153–154 (1906); Grandi, Boll. Lab. Ent. Bologna 1: 189–190 (1928d); Joseph, Agra Univ. J. Res. (Sci) 3: 409 (1954). Synonym: *Ceratosolen effractarius* Grandi, Boll. Lab. Zool. Portici 20: 169–174 (1927c).

The female head is longer than wide across the compound eyes (1.1), which are ca. two times as long as the cheek. The funicular segments of the antenna bear one row of long sensilla; the ninth to eleventh segments are shaped so as to form a club. The mandibular appendage bears five ventral lamellae; the maxilla has a bacilliform process, which is half as long as the maxilla itself.

The marginal, stigmal, and postmarginal veins of the fore wing are approximately in ratio 5 : 4 : 8. The fore tibia bears a dorso-apical comb of four teeth. The hind tibia bears a bicuspidate antiaxial tooth and a simple axial. The spine of the hypopygium is three times as long as wide at the base. The valves of the ovipositor are ca. one-third of the length of the gaster. The total length is ca. 2 mm.

The male head is ca. 1.3 times as long as wide; the eyes are ca. two-fifths of the length of the cheek. The antennal grooves are half closed; the antenna has five segments, the third of which is anuliform. The labium is a long lobe in between the wide maxillar lobes.

The metanotum is undivided; the propodeum is triangular in outline, with a truncate apex, and the spiracular peritremata are long, occupying almost the whole lateral length. The fore tibia bears a dorso-apical comb of three teeth. The mid tibia bears small spines, but not the hind tibia, which has a bidentate antiaxial tooth and a simple axial. The genitalia bear claspers with three claws. The total length is ca. 1.2 mm.

The host fig is *Ficus auriculata* Lour. (Vietnam; India: Uttar Pradesh). The species was also recorded by Wiebes (1963a: 16) from *Ficus oligodon* Miq. (Malaysia: Selangor).

155. *Ceratosolen (C.) fusciceps* (Mayr)

Mayr, Verh. zool.-bot. Ges. Wien **35**: 167–168 (1885, *Blastophaga*); Grandi, Boll. Lab. Zool. Portici **11**: 194–205 (1916c, *C. fuscipes*); Wiebes, Tijdschr. Ent. **106**: 16–19 (1963a, synonymy). Synonyms: *Ceratosolen mysorensis* Joseph, Agra Univ. J. Res. (Sci) **2**: 277–282 (1953b) and ? *Blastophaga nivelpes* Girault, Rec. S. Aust. Mus. **3**: 338 (1927).

The female head is almost as long as wide across the compound eyes (0.95), which are two times as long as the cheek. The funicular segments of the antenna bear one row of long sensilla; the tenth and eleventh segments are shaped so as to form a club. The mandibular appendage bears five ventral lamellae; the maxilla is simple.

The marginal, stigmal, and postmarginal veins are approximately equal in length. The fore tibia has four teeth in the dorso-apical comb. The hind tibia has a bidentate antiaxial tooth and a simple axial. The spine of the hypopygium is ca. $2\frac{1}{2}$ times as long as wide at the base; it has long setae, but it does not have a transverse row of hyaline setae. The valves of the ovipositor are $1\frac{1}{2}$ times as long as the gaster. The total length is ca. 2 mm.

The male head is almost $1\frac{1}{2}$ times as long as wide; the eye is large, two times as long as the cheek. The antennal grooves are half closed; the antenna is four-segmented: there is no anellus. The labium is a short lobe, in between the larger maxillae.

The metanotal plates are not fully separate from the propodeum, which has a rounded posterior border; the spiracular peritremata are half as long as the lateral length. The fore tibia bears three teeth in the dorso-apical comb. The mid and hind tibiae bear spines; the armature of the hind tibia consists of a bidentate antiaxial tooth and a simple axial. The claspers of the genitalia bear four or five claws. The total length is ca. 1.5 mm.

The host fig is *Ficus racemosa* L. (India: Delhi, Maharashtra, Karnatak, Kerala, Bihar); Ceylon; Malaysia: Kelantan, Negri Sembilan, Sabah; Indonesia: Java, Bali, Timor; Australia: Northern Territory, Queensland). Biological notes were published by Grover & Chopra (1971) and Joseph & Abdurahiman (1981).

156. *Ceratosolen (C.) appendiculatus* (Mayr)

Mayr, Verh. zool.-bot. Ges. Wien **35**: 164–166 (1885, *Blastophaga*); Wiebes, Tijdschr. Ent. **106**: 19–21 (1963a, synonymy); Bouček, Australasian Chalc.: 194 (1988). Synonyms: *Ceratosolen striatus* Mayr, Wien. ent. Ztg. **35**: 153 (1906); Grandi, Boll. Lab. Zool. Portici **10**: 151, 153 (1916a, also *C. striatus notandus* Grandi) and Ibid. **12**: 32–40 (1917), and ? *Ceratosolensia ficophaga* Girault, Mem. Qd. Mus. **4**: 311, 312 (1915b).

The female head is shorter than wide across the compound eyes (0.9), which are two times as long as the cheek. The funicular segments of the antenna bear 1–2 irregular rows of sensilla; the ninth to eleventh segments are shaped so as to form

a club. The mandibular appendage bears four ventral lamellae; the maxilla is simple.

The marginal, stigmal, and postmarginal veins of the fore wing are approximately in ratio 1 : 2 : 2. The fore tibia bears a dorso-apical comb of four teeth. The hind tibia bears a bidentate antiaxial tooth and a simple axial. The spine of the hypopygium is four times as long as wide at the base, and it does have the usual row of hyaline setae. The valves of the ovipositor are four-sevenths of the length of the gaster. The total length is ca. 2 mm.

The male head is 1.35 times as long as wide; the eye is as long as the cheek. The antennal grooves are half closed; the antenna consists of five segments, the third of which is a long ring. The labium and maxillae are atrophied.

The thorax is much as described for *C. fusciceps*, but the propodeum is much longer, attenuate. The fore tibia bears a dorso-apical comb of three teeth. The mid and hind tibiae bear spines; the apical armature of the hind tibia consists of three small teeth. The genitalia do not have claspers. The total length is ca. 1.5 mm.

The host figs are *Ficus variegata* Bl. (Indonesia: Java; Philippines: Luzon; Australia: Queensland; Melanesia: Papua New Guinea) and *Ficus viridicarpa* Corner (Malaysia: Trengganu, Negri Sembilan).

157. *Ceratosolen (C.) nexilis* Wiebes

Wiebes, Proc. Kon. Ned. Akad. Wet. (C) 83: 100-102 (1980).

The female head is shorter than wide across the compound eyes (0.9), which are longer than the cheek (1.3). The antenna has ten segments which, from the sixth onwards, bear two rows of sensilla; the ninth and tenth segments are shaped so as to form a club. The mandibular appendage bears six ventral lamellae; the maxilla is simple.

The marginal, stigmal, and postmarginal veins of the fore wing are approximately in ratio 3 : 4 : 6. The fore tibia has four teeth in the dorso-apical comb. The hind tibia is armed with a tricuspidate antiaxial tooth and a simple axial. The spine of the hypopygium is short and blunt, as long as wide at the base. The valves of the ovipositor are not quite half as long as the gaster. The total length is ca. 1.6 mm.

The male head is one third longer than wide; the eye is half as long as the cheek. The antennal grooves are half closed; the antenna has four segments: there is no anellus. The labio-maxillar complex consists of two large lobes, each with a subbasal seta.

The lateral parts of the metanotum are widely contiguous in the middle; the propodeum has large, mostly lateral spiracular peritremata. The fore tibia bears

three dorso-apical teeth. The hind tibia bears spines, but less than the mid tibia, and indistinct anti-axial and axial, apical teeth. The genitalia are simple. The total length is ca. 1.2 mm.

The host fig is *Ficus nodosa* Teysm. et Binn. (Melanesia: Papua New Guinea).

158. *Ceratosolen* (C.) *grandii* Wiebes

Wiebes, Tijdschr. Ent. 106: 21–23 (1963a).

The female head is approximately as long as wide across the compound eyes, which are $1\frac{1}{2}$ times as long as the cheek. The funicular segments of the antenna bear one row of sensilla; the ninth to eleventh segments are shaped so as to form a club. The mandibular appendage bears four ventral lamellae; the maxilla is simple.

The wings and the hypopygium were not described. The fore tibia bears a dorso-apical comb of four teeth. The hind tibia bears two teeth, both bidentate (the anti-axial one) or bifurcate (the axial). The valves of the ovipositor are half as long as the gaster. The total length is ca. 1.6 mm.

The male head is 1.3 times as long as wide; the eyes are very small: one-third of the length of the cheek. The antennal grooves are half closed; the antenna is four-segmented: there is no anellus. The labium is a short lobe, in between the larger lobes of the maxillae. The metanotal plates are separate; the propodeum has a straight posterior margin; the spiracular peritremata are half as long as the lateral length of the propodeum. The fore tibia bears three dorso-apical teeth; the two tarsal segments are incompletely separate. The mid and hind tibiae bear spines; apically, the hind tibia has some seven indistinct teeth. The genitalia do not have claspers. The total length is ca. 1.6 mm.

The host fig is *Ficus semivestita* Corner (Melanesia: Papua New Guinea).

159a. *Ceratosolen* (C.) *s. solmsi* (Mayr)

Mayr, Verh. zool.-bot. Ges. Wien 35: 168–169 (1885, *Blastophaga*); Grandi, Treubia 8: 357–358 (1926, *C. solmsi* ? *marchali*); Grandi, Boll. Lab. Zool. Portici 20: 174–178 (1927c, *C. solmsi* ? *marchali*); Grandi, Boll. Lab. Ent. Bologna 1: 173–176 (1928d); Wiebes, Tijdschr. Ent. 106: 65–67 (1963a).

The female head is 1.35 times as long as wide across the compound eyes, and also the eye is 1.35 times as long as the cheek. The funicular segments of the antenna bear two rows of long sensilla; there is no club. The mandibular appendage bears six to eight ventral lamellae. The maxilla has a short bacilliform process: one-quarter of the length of the maxilla itself.

The marginal, stigmal, and postmarginal veins of the fore wing are approximately in ratio 4 : 4 : 5. The fore tibia has three large teeth in the dorso-apical comb, but there may also be two smaller in between. The hind tibia bears a

bidentate antiaxial tooth and a simple axial. The hypopygium has the spine three times as long as wide at the base; there are long setae, but no transverse row of hyaline setae. The valves of the ovipositor are one-seventh of the length of the gaster. The total length is ca. 2 mm.

The male head is $1\frac{1}{2}$ times as long as wide; there are no eyes. The antennal grooves are open, sharp behind. The antenna has five segments, the fourth of which is $1\frac{1}{2}$ times as long as the third. The labium is a short lobe in between the larger maxillae.

The metanotal plates are open in the middle; the propodeum is transverse, with the spiracular peritremata as long as the lateral length of the propodeum. The fore tibia has three dorso-apical teeth. The armature of the hind tibia is rather indistinct. The genitalia bear hyaline claspers. The total length is ca. 1.5 mm.

The host fig is *Ficus hispida* Linn.f. (Indonesia: Java; Malaysia: Langkawi Is.; S.Vietnam).

159b. *Ceratosolen* (C.) *solmsi* marchali Mayr

Mayr, Wien. ent. Ztg. 25: 155–156 (1906); Grandi, Boll. Lab. Ent. Bologna 1: 173–175 (1928d); Joseph, Agra Univ. J. Res. (Sci.) 2: 282 (1953b); Wiebes, Tijdschr. Ent. 106: 68 (1963a); Boucek, Australasian Chalc.: 195 (1988). Synonym: *Ceratosolen berlandi* Grandi, Bull. Soc. zool. Fr. 53: 74–79 (1928a).

The female is much like *C. s. solmsi*, but the eleventh antennal segment is much shorter than the tenth, with which it forms a club (longer in *C. s. solmsi*, the segments are free); the bacilliform process is half as long as the maxilla itself (one-quarter in *C. s. solmsi*); and the fore wing has dark striae radiating from the stigmal vein (hyaline in *C. s. solmsi*).

The male antennal groove is wide behind (narrow in *C. s. solmsi*); the fourth antennal segment is 2–4 times as long as the third (ca. $1\frac{1}{2}$ in *C. s. solmsi*); and the genital claspers are more clearly visible, and bear three claws.

The host fig is *Ficus hispida* Linn.f. (India: Bengal, Travancore; Ceylon; N.Vietnam; Hong Kong; Malaysia: Selangor; Australia: Queensland).

160. *Ceratosolen* (C.) *brongersmai* Wiebes

Wiebes, Tijdschr. Ent. 106: 68–71 (1963a).

The female head is as long as wide across the compound eyes, which are 1.4 times as long as the cheek. The funicular segments of the antenna bear two rows of long sensilla; the tenth and eleventh segments are shaped so as to form a club.

The mandibular appendage bears 6–7 ventral lamellae; the maxilla has a bacilli-form process, which is half as long as the maxilla itself.

The marginal, stigmal, and postmarginal veins of the fore wing are approximately in ratio 3 : 3 : 4. The fore tibia bears four teeth in the dorso-apical comb. The hind tibia has a bidentate antiaxial tooth and a simple axial. The hypopygium has the spine two times as long as wide at the base. The valves of the ovipositor are one-tenth of the length of the gaster. The total length is ca. 2 mm.

The male head is 1.3 times as long as wide; there are no eyes. The antennal grooves are open, and wide behind; the antenna is five-segmented, with a distinct anellus. The maxillae bear a lateral lobe, with an apical seta, and the labium is bilobate, with an apical seta on each.

The metanotal plates are widely spaced, incompletely separate from the propodeum, which has a straight posterior margin; the spiracular peritremata occupy the whole lateral length of the propodeum. The fore tibia bears four dorso-apical teeth. The armature of the hind tibia consists of a wide, bidentate antiaxial tooth and a simple axial. The genitalia bear claspers with three claws. The total length is ca. 1.7 mm.

The host fig is *Ficus treubii* King (Malaysia: Sabah).

161a. *Ceratosolen* (C.) b. *bisulcatus* (Mayr)

Mayr, Verh. zool.-bot. Ges. Wien **35**: 170–171 (1885, *Blastophaga*); Grandi, Boll. Lab. Ent. Bologna **1**: 180–184 (1928d); Wiebes, Tijdschr. Ent. **106**: 81, 83 (1963a); Wiebes, Proc. Kon. Ned. Akad. Wet. (C) **83**: 103 (1980); Compton, Thornton, New & Underhill, Phil. Trans. R. Soc. Lond. B **322**: 462 (1988).

The female head is distinctly longer than wide across the compound eyes (1.2), which are as long as the cheek. The funicular segments of the antenna bear one row of long sensilla; the tenth and eleventh segments form a (not very distinct) club. The mandibular appendage bears five ventral lamellae; the maxilla is simple.

The marginal, stigmal, and postmarginal veins of the fore wing are approximately in ratio 2 : 2 : 3. The fore tibia bears four dorso-apical teeth. The apical armature of the hind tibia consists of a bidentate antiaxial tooth and a simple axial. The spine of the hypopygium is three times as long as wide at the base. The valves of the ovipositor are one-sixth of the length of the gaster. The total length is ca. 2 mm.

The male head is $1\frac{1}{2}$ times as long as wide; there are small eyes. The epistomal margin is bidentate. The antennal grooves are open, but rather narrow; the antenna has five segments, with a long ring. The mouth-parts are reduced to a trilobed complex.

The metanotum is a transverse band; the propodeum is subquadrate, with long spiracular peritremata occupying the whole lateral length. The fore tibia has two dorso-apical teeth. The mid and hind tarsi are oligomeric; the hind tibia has indistinct apical teeth. The genitalia bear claspers with two claws. The total length is ca. 1.7 mm.

The host fig is *Ficus septica* Burm.f. (Indonesia: Java, Krakatau, Bali; Melanesia: Papua New Guinea). Compton c.s. (1988) recorded *C. b. bisulcatus* from Krakatau.

161b. *Ceratosolen (C.) bisulcatus jucundus* Grandi

Grandi, Philipp. J. Sci. **331**: 320–323 (1927b); Grandi, Boll. Lab. Zool. Portici **20**: 178–179 (1927c); Wiebes, Tijdschr. Ent. **106**: 83 (1963a).

In most characters, *C. b. jucundus* is similar to *C. b. bisulcatus*, but the female maxilla has a short bacilliform process (one-sixth of the length of the maxilla itself), or at least a small protuberance instead, which is not found in the nominate race. The male head is relatively shorter than in *C. b. bisulcatus*, i.e. the length is four-thirds of the width, vs. $1\frac{1}{2}$, and eyes are absent (small eyes are present in *C. b. bisulcatus*).

The host fig is *Ficus septica* Burm.f. (Philippines: Luzon, Mindanao; Taiwan; Malaysia: Sabah).

162. *Ceratosolen (C.) solitarius* Wiebes

Wiebes, Proc. Kon. Ned. Akad. Wet. (C) **83**: 103–105 (1980).

The female head is longer than wide across the compound eyes (1.1), which are shorter than the cheek (0.8). The funicular segments of the antenna bear two rows of long sensilla; the tenth and eleventh segments are shaped so as to form a club. The maxilla bears a long bacilliform process (half as long as the maxilla itself).

The marginal, stigmal, and postmarginal veins of the fore wing are approximately in ratio 3 : 4 : 8. The fore tibia bears three dorso-apical teeth. The hind tibia has a bidentate antiaxial tooth and a simple axial. The spine of the hypopygium is two times as long as wide at its base. The valves of the ovipositor are one-tenth of the length of the gaster. The total length is ca. 1.8 mm.

The male is not known. Its morphology may reveal the affinity of the species, better than that of the female, which is close to *C. bisulcatus*, but even more so to *C. solmsi*.

The host fig is *Ficus arfakensis* King (Melanesia: Papua New Guinea).

Subgenus **Rothropus** Wiebes (figs. 23, 25)

Wiebes, Proc. Kon. Ned. Akad. Wet. 97: 126 (1994).

The female head is approximately as long as wide across the compound eyes, which normally are a bit longer than the cheek, but distinctly shorter in two species, to more than $1\frac{1}{2}$ to 2 times as long as the cheek. The funicular segments of the antenna have two rows of oblong sensilla, but in a few species there is only one row, and in five there are up to three or four rows. The mandibular appendage bears (4-) 5 (-6) lamellae, to 7, or even 9-11 in a few species; the maxilla bears a short bacilliform process in most species, but there are three without.

The postmarginal vein of the fore wing is (1-) $1\frac{1}{4}$ (-2) times as long as the stigmal vein. The fore tibia bears a dorso-apical row of four teeth, but in the group of *C. pilipes* there are five or six. The hind tibia bears a bicuspidate antiaxial tooth and a simple axial. The hypopygial spine is ca. two times as long as wide at the base, and it bears a row of hyaline setae in the apical half: in the group of *C. notus* the precise length relative to the basal width, and the position of the row are used as differential characters. The ovipositor valves are very short, barely projecting beyond the apex of the gaster, to almost one-quarter of the length of the gaster. The total length is (1.3)-2 (-3) mm.

The male head is $1\frac{1}{2}$ -2 times as long as wide, but a bit shorter in a few species; eyes are absent or (very) small. The antennal grooves are open. The antenna has

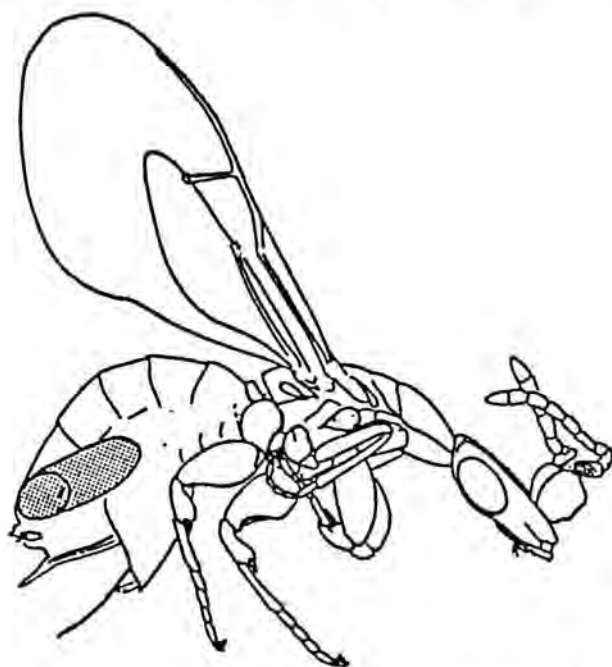


Fig. 23. *Ceratosolen (Rothropus) dentifer* Wiebes, female, after Wiebes (1979b, fig. 2).

five segments, the third of which in most species is anuliform. The maxillae are slender, or they are laterally widely expanded.

The pronotum is slender in most species. The propodeum is half as long (measured laterally, posteriad to the metanotal lobes) as wide, but subquadrate in two species; the stigmal peritremata in most species occupy the whole (lateral) length, but they may be considerably shorter (0.5–0.8). The fore tibia bears 3–4 dorsal teeth, but six or nine in two species. The hind tarsus is enlarged; the tibia is as long as the first tarsal segment, to two times as long; there may be a long spur.

The genitalia have claspers, which in most species bear two to four claws, but there may be up to six. The total length is (1.1–) 1.5 (–2.4) mm.

There are 19 species known (one subdivided into subspecies), all associated with figs of subsection *Sycocarpus* (a few species of this group have *Ceratosolen* s.str. as pollinators). One unidentified species was recorded (Wiebes, 1963a: 84) from *F. stolonifera* King (Malaysia: Sarawak).

KEY TO THE (SUB-)SPECIES OF ROTHROPUS (fig. 24)

1. Females 2
- Males 20
2. The dorso-apical comb of the fore tibia consists of four teeth. The mandibular appendage bears at most six ventral lamellae 3
- The dorso-apical comb of the fore tibia consists of five or six teeth. The mandibular appendage bears seven to eleven ventral lamellae (group of *Ceratosolen pilipes*) . . . 17
3. The maxilla is simple (there is no bacilliform process) 4
- The maxilla bears a bacilliform process (as in fig. 22, d) 6
4. The head is a bit longer than wide across the compound eyes (1.1), which are a little longer than the cheek (1.2). *Ficus obpyramidata* King (Malaysia: Selangor, Kelantan, Trengganu, Sembilan) 166. *Ceratosolen (Rothropus) nugatorius* Grandi
- The head is shorter than wide across the compound eyes (0.92–0.93), which are almost 1½ times as long as the cheek, or longer 5
5. The compound eye is 1.45 times as long as the cheek. *Ficus botryocarpa* Miq. (Philippines: Luzon, Mindoro) 177. *Ceratosolen (Rothropus) corneri* Wiebes
- The compound eye is ca. 1.6–5 times as long as the cheek. *Ficus ribes* Reinw. var. *cuneata* (Miq.) Corner (Philippines: Luzon)
. 163b. *Ceratosolen (Rothropus) crassitarsus gracilis* Wiebes
6. The mandibular appendage bears only four ventral lamellae 7
- The mandibular appendage bears five or six ventral lamellae 8
7. The compound eye is 1.4 times as long as the cheek. *Ficus ribes* Reinw. (Indonesia: Java) 163a. *Ceratosolen (Rothropus) c. crassitarsus* (Mayr)
- The compound eye is about as long as the cheek. *Ficus iodotrichae* Diels (Melanesia: Papua New Guinea) 170. *Ceratosolen (Rothropus) iodotrichae* Wiebes

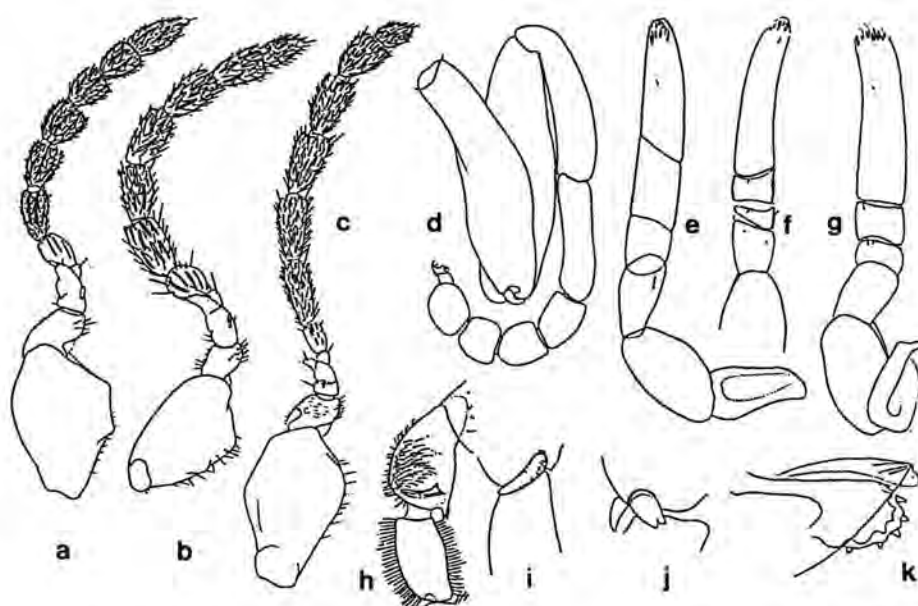


Fig. 24. Details of *Rothropus*. a-c, female antenna, of: a, *C. dentifer* Wiebes, b, *C. moderatus* Wiebes, and c, *C. pilipes* Wiebes; d, male hind leg of *C. corneri* Wiebes; e-g, male antenna, of: e, *C. nugatorius* Grandi, f, *C. dentifer*, and g, *C. iodotrichae* Wiebes; h-j, (apex of) male hind tibia, of: h, *C. nugatorius*, i, *C. dentifer*, and j, *C. albulus* Wiebes; and k, clasper of tenth urite, and paramere, of *C. albulus*. All figs. after Wiebes (1963a, figs. 154, 167, and 283; 254; 147, 161, and 196; 144, 158, and 308; and 309, resp.).

8. The sensilla on the antennal funicle are very long, and they are placed in one regular row (fig. a). *Ficus hispidioides* S. Moore (Melanesia: Papua New Guinea) 167. *Ceratosolen (Rothropus) dentifer* Wiebes
- The sensilla are shorter, and they occupy two (to three) irregular rows (figs. b, c) 9
9. The bacilliform process is short: one-fifth of the length of the maxilla itself. *Ficus praestans* Corner (Melanesia: New Britain). 169. *Ceratosolen (Rothropus) praestans* Wiebes
- The bacilliform process is about two-fifths of the length of the maxilla itself, to half as long 10
10. The compound eye is about as long as the cheek 11
- The compound eye is distinctly longer than the cheek: 1.2 to 1.45 times (group of *Ceratosolen notus*) 13
11. The mandibular appendage bears six ventral lamellae; the bacilliform process is one-third of the length of the maxilla itself. *Ficus lepicarpa* Bl. (Indonesia: Java, Sumatra; Malaysia: Sabah) 165. *Ceratosolen (Rothropus) vechti* Wiebes
- The mandibular appendage bears five ventral lamellae; the bacilliform process is about half as long as the maxilla itself 12
12. The postmarginal vein is two times as long as the stigmal. The total length is 1.7-1.8 mm. *Ficus moderata* Corner (Malaysia: Sabah) 168. *Ceratosolen (Rothropus) moderatus* Wiebes

- The postmarginal vein is $1\frac{1}{2}$ times as long as the stigmal. The total length is ca. 1.4 mm. *Ficus bernaysii* King (Melanesia: Papua New Guinea) 164. *Ceratosolen (Rothropus) hooglandi* Wiebes
- 13. The sixth to ninth antennal segments are 1.7–1.9 times as long as the fifth. *Ficus ben-guetensis* Merr. (Philippines: Luzon, Basilan Isl.) 171. *Ceratosolen (Rothropus) cornutus* Wiebes
- The sixth to ninth antennal segments are (except possibly the seventh) $1\frac{1}{2}$ times as long as the fifth 14
- 14. The lateral lobes of the epistomal margin extend as far as the median prominence. The maxilla is two times as long as its bacilliform process 15
- The lateral lobes of the epistomal margin project two times as far as the median prominence. The maxilla is $2\frac{1}{2}$ times as long as its bacilliform process 16
- 15. The spine of the hypopygium is ca. 3 times as long as wide at the base. *Ficus macrothyrsa* Corner (Melanesia: Solomon Isl.) 172. *Ceratosolen (Rothropus) solomonensis* Wiebes
- The spine of the hypopygium is ca. $1\frac{1}{2}$ times as long as wide at the base. *Ficus subcongesta* Corner (Melanesia: New Britain, Solomon Isl.) 173. *Ceratosolen (Rothropus) orientalis* Wiebes
- 16. The spine of the hypopygium is ca. 3 times as long as wide at the base. *Ficus calopilina* Diels (Melanesia: Papua New Guinea) 174. *Ceratosolen (Rothropus) calopilinae* Wiebes
- The spine of the hypopygium is ca. $1\frac{1}{2}$ times as long as wide at the base. *Ficus schwarzii* Koord. (Malaysia: Penang) 175. *Ceratosolen (Rothropus) vetustus* Wiebes
- The spine of the hypopygium is ca. 2 times as long as wide at the base. *Ficus nota* (Blanco) Merr. (Philippines: Luzon, Mindanao, Palawan) & *Ficus congesta* Roxb. (Philippines: Luzon, Basilan Isl.) 176. *Ceratosolen (Rothropus) notus* (Baker)
- 17. The mandibular appendage bears seven ventral lamellae. The compound eye is shorter than the cheek. The sixth to ninth antennal segments bear 3–4 rows of sensilla (fig. c). The fore tibia has four sharp teeth in the dorso-apical comb and one blunt 18
- The mandibular appendage bears nine to eleven ventral lamellae. The compound eye is longer than the cheek. The sixth to ninth antennal segments bear less rows of sensilla. The fore tibia has five sharp teeth in the dorso-apical comb and one blunt 19
- 18. The pedicel of the antenna bears several hundreds of small axial spines. *Ficus cereicarpa* Corner (Malaysia: Sabah) 178. *Ceratosolen (Rothropus) pilipes* Wiebes
- The pedicel of the antenna bears ca. 150 axial spines. *Ficus francisci* Winkler (Malaysia: Sabah) 179. *Ceratosolen (Rothropus) josephi* Wiebes
- 19. The compound eye is $1\frac{2}{3}$ times as long as the cheek. The mandibular appendage bears 9–11 ventral lamellae. The bacilliform process is half as long as the maxilla itself. *Ficus uncinata* Becc. (Malaysia: Sabah) 180. *Ceratosolen (Rothropus) albulus* Wiebes
- The compound eye is two times as long as the cheek. The mandibular appendage bears nine ventral lamellae. The bacilliform process has 0.6 times the length of the maxilla itself. *Ficus beccarii* King & *F. subterranea* Corner (Malaysia: Sabah) 181. *Ceratosolen (Rothropus) humatus* Wiebes
- 20. The hind leg is very long (fig. d: the coxa and femur each are about as long as the pronotum). Small eyes are present (♀, couplet 5) 177. *Ceratosolen (Rothropus) corneri* Wiebes
- The hind leg is not very long – if it seems rather long, the coxa and femur are distinctly shorter than the pronotum 21

21.	The hind tibia has a large, dark spur	22
-	The hind tibia has only the normal, short armature	23
22.	The spur on the hind tibia is situated apically (fig. i). The antennal anellus is disk-like (fig. f; the length is ca. one-third of the width) (♀, couplet 8)	
	. . . . . 167. <i>Ceratosolen (Rothropus) dentifer</i> Wiebes	
-	The spur is situated more proximally, on the disk (fig. h). The third antennal segment is a bit longer than wide (fig. e) (♀, couplet 4)	
	. . . . . 166. <i>Ceratosolen (Rothropus) nugatorius</i> Grandi	
23.	The head is rather long: two times as long as wide	24
-	The head is shorter: not over 1.75 times as long as wide	26
24.	The apical segment of the antenna is not much longer than the subapical (♀, couplet 5)	
	. . . . . 163b. <i>Ceratosolen (Rothropus) crassitarsus gracilis</i> Wiebes	
-	The apical antennal segment is more than two times as long as the subapical	25
25.	The apical antennal segment is $2\frac{1}{2}$ times as long as the subapical. The hind tibia is one-third longer than the first tarsal segment (♀, couplet 12)	
	. . . . . 164. <i>Ceratosolen (Rothropus) hooglandi</i> Wiebes	
-	The apical antennal segment is six times as long as the subapical (fig. g). The hind tibia is subequal in length to the first tarsal segment (♀ couplet 7)	
	. . . . . 170. <i>Ceratosolen (Rothropus) iodotrichae</i> Wiebes	
26.	The hind tibia is at most $1\frac{1}{2}$ times as long as the first tarsal segment	27
-	The hind tibia is 1.75–2 times as long as the first tarsal segment	31
27.	The apical antennal segment is $1\frac{1}{2}$ times as long as the subapical (♀, couplet 12)	
	. . . . . 168. <i>Ceratosolen (Rothropus) moderatus</i> Wiebes	
-	The apical antennal segment is $2\frac{1}{2}$ times as long as the subapical, or longer	28
28.	The propodeum is subquadrate (♀, couplet 18)	
	. . . . . 178. <i>Ceratosolen (Rothropus) pilipes</i> Wiebes	
-	The propodeum is $1\frac{1}{2}$ times as long as wide	29
29.	The pronotum is two times as long as wide (♀, couplet 11)	
	. . . . . 165. <i>Ceratosolen (Rothropus) vechti</i> Wiebes	
-	The pronotum is 1.2–1.3 times as long as wide	30
30.	Small eyes are present. The claspers of the genitalia bear 3–4 claws (♀, couplet 15)	
	. . . . . 173. <i>Ceratosolen (Rothropus) orientalis</i> Wiebes	
-	There are no eyes. The claspers of the genitalia bear seven claws (♀, couplet 9)	
	. . . . . 169. <i>Ceratosolen (Rothropus) praestans</i> Wiebes	
31.	The genital claspers do not bear claws	32
-	The genital claspers bear two claws (♀, couplet 7)	
	. . . . . 163a. <i>Ceratosolen (Rothropus) c. crassitarsus</i> (Mayr)	
-	The genital claspers bear three or more claws (fig. k)	33
32.	The antennal grooves are half as long as the head. The hind tibia is a bit over two times as long as the first tarsal segment (♀, couplet 13)	
	. . . . . 171. <i>Ceratosolen (Rothropus) cornutus</i> Wiebes	
-	The antennal grooves are two-fifths of the length of the head. The hind tibia is 1.75 times as long as the first tarsal segment (♀, couplet 15)	
	. . . . . 172. <i>Ceratosolen (Rothropus) solomonensis</i> Wiebes	
33.	The propodeum is subquadrate [the fore tibia (six dorso-apical teeth) and the armature of the hind tibia (fig. j) are much like those of (no. 181) <i>C. (R.) humatus</i> , couplet 34]	
	. . . . . 180. <i>Ceratosolen (Rothropus) albulus</i> Wiebes	

- The propodeum is distinctly shorter than wide 34
- 34. The fore tibia bears a series of nine dorso-apical teeth. The armature of the hind tibia consists of a bidentate antiaxial tooth and a simple axial (♀, couplet 19) 181. *Ceratosolen (Rothropus) humatus* Wiebes
- The fore tibia bears three or four dorso-apical teeth. The armature of the hind tibia is more simple 35
- 35. The hind tibia is 1.7 times as long as the first tarsal segment. The stigmal peritremata of the propodeum occupy the whole (lateral) length (♀, couplet 18) 179. *Ceratosolen (Rothropus) josephi* Wiebes
- The hind tibia is ca. two times as long as the first tarsal segment. The stigmal peritremata of the propodeum occupy ca. two-thirds of the (lateral) length 36
- 36. The male is much as that of (no. 176) *C. (R.) notus*, but the length of the hind tibia relative to that of the first tarsal segment is a bit less. There are no eyes (♀, couplet 16) 174. *Ceratosolen (Rothropus) calopilinae* Wiebes
- The hind tibia is two times as long as the first tarsal segment. Small eyes are present (♀, couplet 16) 175. *Ceratosolen (Rothropus) vetustus* Wiebes
- The hind tibia is two times as long as the first tarsal segment. There are no eyes (♀, couplet 16) 176. *Ceratosolen (Rothropus) notus* (Baker)

163a. *Ceratosolen (Rothropus) c. crassitarsus* (Mayr)

Mayr, Verh. zool.-bot. Ges. Wien 35: 171-172 (1885, *Blastophaga*); Grandi, Boll. Lab. Zool. Portici 12: 40-46 (1917).

The female head is shorter than wide across the compound eyes (0.9), which are almost $1\frac{1}{2}$ times as long as the cheek (1.4). The sixth to eleventh antennal segments bear two irregular rows of sensilla. The mandibular appendage bears only four ventral lamellae; the maxilla has a bacilliform process, which is half as long as the maxilla itself.

The postmarginal vein is $1\frac{1}{4}$ times as long as the stigmal. The valves of the ovipositor distinctly project beyond the apex of the gaster. The total length is ca. 1.5 mm.

The male head is 1.4 times as long as wide; the eyes are of medium size, half as long as the cheek. The antennal anellus is wider than long (1.3), 0.6 times as long as the fourth segment, which is half as long as the fifth. The maxillae are slender, with straight lateral edges.

The pronotum is $1\frac{1}{2}$ times as long as wide anteriorly; the propodeum is two times as wide as long. The fore tibia bears a dorso-apical comb of three large teeth and a very small one. The hind tibia is ca. two times as long as the first tarsal segment, and it has small teeth in the ventro-apical corner. The genitalia bear claspers, with two claws. The total length is ca. 1.2 mm.

The host fig is *Ficus ribes* Reinw. (Indonesia: Java).

163b. *Ceratosolen (Rothropus) crassitarsus gracilis* Wiebes

Wiebes, Tijdschr. Ent. **106**: 35–36, 38 (1963a).

The female differs from that of the nominate form in the compound eye being larger relative to the cheek (1.67 vs. 1.4), and in the number of ventral lamellae on the mandibular appendage (5 vs. 4); the maxillae are simple. The postmarginal vein is $1\frac{1}{2}$ times as long as the stigmal. The total length is ca. 1.3–1.4 mm.

The male is distinct in that it has the head more than two times as long as wide; the eyes are distinct, but very small: one-third of the length of the cheek. The length of the antennal anellus is two-fifths of its width, and ca. one-fifth of the length of the fourth segment, which is three-quarters of the length of the fifth.

The pronotum is more than $2\frac{1}{2}$ times as long as wide anteriorly; the propodeum is subquadrate. The hind tibia is as long as the first tarsal segment. The total length is ca. 1.1 mm.

The host fig is *Ficus ribes* Reinw. var. *cuneata* (Miq.) Corner (Philippines: Luzon).

164. *Ceratosolen (Rothropus) hooglandi* Wiebes

Wiebes, Tijdschr. Ent. **106**: 38–39 (1963a).

The female head is a bit longer than wide across the compound eyes (1.1), which are little shorter than the cheek (0.95). The sixth to eleventh antennal segments bear two rows of long sensilla. The mandibular appendage bears five ventral lamellae; the bacilliform process is half as long as the maxilla itself.

The postmarginal vein is $1\frac{1}{2}$ times as long as the stigmal. The valves of the ovipositor scarcely project beyond the apex of the gaster. The total length is ca. 1.4 mm.

The male head is two times as long as wide; eyes are wanting. The antennal anellus is wider than long (1.6), half as long as the fourth segment, which is two-fifths of the length of the fifth. The maxillae are slender.

The pronotum is two times as long as wide; the propodeum is half as long as wide. The fore tibia bears three large dorsal teeth and a smaller one. The hind tibia is one-third longer than the first tarsal segment. The claspers of the genitalia bear three claws. The total length is ca. 1.4 mm.

The host fig is *Ficus bernaysii* King (Melanesia: Papua New Guinea).

165. *Ceratosolen (Rothropus) vechti* Wiebes

Wiebes, Tijdschr. Ent. **106**: 39–42 (1963a).

The female head is as long as wide across the compound eyes, which are as long as the cheek. The sixth to eleventh antennal segments have two rows of sensilla, but most are situated in the distal part. The mandibular appendage bears six ventral lamellae; the maxilla has a bacilliform process, which is one-third of the length of the maxilla itself.

The postmarginal vein is 1.75 times as long as the stigmal. The valves of the ovipositor scarcely project beyond the apex of the gaster. The total length is ca. 2.2 mm.

The male head is $1\frac{1}{2}$ times as long as wide; the eyes are small: one-fifth of the length of the cheek. The length of the antennal anellus is two-fifths of its width, and one-quarter of that of the fourth segment, which is four-sevenths of the length of the fifth. The maxillae are slender.

The pronotum is two times as long as wide; the propodeum is half as long as wide. The fore tibia bears four dorso-apical teeth. The hind tibia is $1\frac{1}{2}$ times as long as the first tarsal segment. The claspers of the genitalia bear two claws, but sometimes three or four. The total length is ca. 1.7 mm.

The host fig is *Ficus lepicarpa* Bl. (Indonesia: Java, Sumatra; Malaysia: Sabah).

166. *Ceratosolen (Rothropus) nugatorius* Grandi

Grandi, Boll. Ist. Ent. Univ. Bologna **19**: 55–57 (1952); Wiebes, Tijdschr. Ent. **106**: 42, 44 (1963a).

The female head is a bit longer than wide across the compound eyes (1.1), which are distinctly longer than the cheek (1.2). There is one (to two) row(s) of sensilla on the fifth to eleventh antennal segments, the tenth and eleventh of which are shaped so as to form a club. The mandibular appendage bears five ventral lamellae; the maxilla is simple.

The postmarginal vein is as long as the stigmal. The fore tibia bears four dorso-apical teeth. The valves of the ovipositor barely project beyond the apex of the gaster. The total length is ca. 2 mm.

The male head is $1\frac{1}{2}$ times as long as wide; the eyes are half as long as the cheek. The antennal anellus is not much shorter than wide (0.85), and it is three-fifths of the length of the fourth segment, which is half as long as the fifth. The maxillae are slender.

The pronotum is as long as wide; the propodeum is half as long as wide. The fore tibia bears four dorso-apical teeth. The hind tibia is only little longer than the first tarsal segment, and it bears a large motile spur on the disk. The claspers of the genitalia bear four short claws. The total length is ca. 1.3 mm.

The host fig is *Ficus obpyramidata* King (Malaysia: Selangor, Kelantan, Trengganu, Negri Sembilan).

167. *Ceratosolen (Rothropus) dentifer* Wiebes

Wiebes, Tijdschr. Ent. 106: 44–45, 47 (1963a).

The female head is as long as wide across the compound eyes, which are as long as the cheek. The sixth to eleventh antennal segments bear one row of long sensilla. The mandibular appendage bears five ventral lamellae; the maxilla has a bacilliform process, which is two-fifths of the length of the maxilla itself.

The postmarginal vein is almost $2\frac{1}{2}$ times as long as the stigmal. The valves of the ovipositor slightly project beyond the apex of the gaster. The total length is 2.2–2.4 mm.

The male head is $1\frac{1}{2}$ times as long as wide; the eyes are one-third of the length of the cheek. The third antennal segment is distinctly anuliform, half as long as the fourth segment, which is one-sixth of the fifth. The maxillae are slender.

The pronotum is $1\frac{1}{2}$ times as long as wide; the propodeum is half as long as wide, and the stigmalal peritremata occupy two-thirds of the length. The fore tibia bears four dorso-apical teeth. The hind tibia is as long as the first tarsal segment, and bears a motile apical spur. The claspers of the genitalia bear three or four claws. The total length is ca. 1.6 mm, but very small specimens measure only 1.2–1.3 mm.

The host fig is *Ficus hispidioides* S.Moore (Melanesia: Papua New Guinea). The biology was studied by Godfray (1988).

168. *Ceratosolen (Rothropus) moderatus* Wiebes

Wiebes, Tijdschr. Ent. 106: 47–49 (1963a).

The female head is as long as wide across the compound eyes, which are as long as the cheek. The sixth to eleventh antennal segments bear two rows of long sensilla. The mandibular appendage bears five ventral lamellae; the bacilliform process is half as long as the maxilla itself.

The postmarginal vein is over two times as long as the stigmal. The valves of the ovipositor slightly project beyond the apex of the gaster. The total length is 1.7–1.8 mm.

The male head is $1\frac{1}{2}$ times as long as wide; the eyes are one-fifth of the length of the cheek. The third antennal segment is anuliform, and the fourth and fifth segments are almost seven and ten times as long, respectively. The maxillae have a short lateral expansion.

The pronotum is one-third longer than wide; the propodeum is half as long as wide, and the stigmalal peritremata occupy half the length. The fore tibia bears three dorso-apical teeth. The hind tibia is one-fifth longer than the first

tarsal segment; the tarsus may be oligomeric. The claspers of the genitalia bear five small claws. The total length is 1.2–1.3 mm.

The host fig is *Ficus moderata* Corner (Malaysia: Sabah).

169. *Ceratosolen (Rothropus) praestans* Wiebes

Wiebes, Tijdschr. Ent. **106**: 49–51 (1963a).

The female head is slightly longer than wide across the compound eyes, which are longer than the cheek (1.2). The fifth to eleventh segments have two rows of sensilla. The mandibular appendage bears five ventral lamellae; there is a short bacilliform process, one-fifth of the maxillar length.

The postmarginal vein is $2\frac{1}{2}$ times as long as the stigmal. The valves of the ovipositor scarcely project beyond the apex of the gaster. The total length is 2.4–2.6 mm.

The male head is one-third longer than wide; eyes are wanting. The third antennal segment is anuliform, and the fourth and fifth segments are three and $4\frac{1}{2}$ times as long, respectively. The maxillae are rather wide.

The pronotum is longer than wide (1.2); the propodeum is half as long as wide; the stigmal peritremata occupy half of the length. The fore tibia bears four teeth. The hind tibia is $1\frac{1}{2}$ times as long as the first tarsal segment. The claspers of the genitalia bear seven claws. The total length is ca. 1.6 mm.

The host fig is *Ficus praestans* Corner (Melanesia: New Britain).

170. *Ceratosolen (Rothropus) iodotrichae* Wiebes

Wiebes, Tijdschr. Ent. **106**: 51–53 (1963a).

The female head is as long as wide across the compound eyes, which are protruding – they are as long as the cheek. The fifth to eleventh antennal segments bear two rows of sensilla. The mandibular appendage bears four ventral lamellae; the maxilla has a bacilliform process, which is between one-third and one-half of the length of the maxilla itself.

The postmarginal vein is two times as long as the stigmal. The valves of the ovipositor distinctly project beyond the apex of the gaster. The total length is 2.6 mm.

The male head is two times as long as wide; eyes are wanting. The antennal anellus, half as long as wide, is three-quarters of the length of the fourth segment, which is one-sixth of the fifth. The maxillae are rather wide.

The pronotum is 1.7 times as long as wide; the length of the propodeum is two-thirds of its width; the stigmal peritremata occupy ca. two-thirds of the

length. The fore tibia bears four dorso-apical teeth. The hind tibia is about as long as the first tarsal segment. The claspers of the genitalia bear four or five claws. The total length is 1.7–1.8 mm.

The host fig is *Ficus iodotricha* Diels (Melanesia: Papua New Guinea).

The species-group of *C. (R.) notus* (fig. 25)

The nos. 171–176, viz., *Ceratosolen (Rothropus) cornutus*, *solomonensis*, *orientalis*, *calopilinae*, *vetustus* and *notus*, form a group of closely related species.

171. *Ceratosolen (Rothropus) cornutus* Wiebes

Wiebes, Proc. Kon. Ned. Akad. Wet. 97: 129–130 (1994).

The female head is shorter than wide (0.9) across the compound eyes, which are one-third longer than the cheek. The sixth to eleventh antennal segments bear two to three rows of sensilla. The mandibular appendage bears six ventral lamellae; the maxilla has a bacilliform process, which is two-fifths of the length of the maxilla itself.

The postmarginal vein is two times as long as the stigmal. The spine of the hypopygium is 2.4 times as long as wide at the base. The valves of the ovipositor scarcely project beyond the apex of the gaster. The total length is 1.9 mm.

The male head is $1\frac{1}{2}$ times as long as wide; the eyes are very small. The antennal anellus is one-third of the length of the fourth antennal segment, which is half as long as the fifth. The maxilla has a short lateral expansion.

The pronotum is $1\frac{1}{2}$ times as long as wide; the length of the propodeum is two-thirds of its width; the stigmalal peritremata occupy ca. two-thirds of the

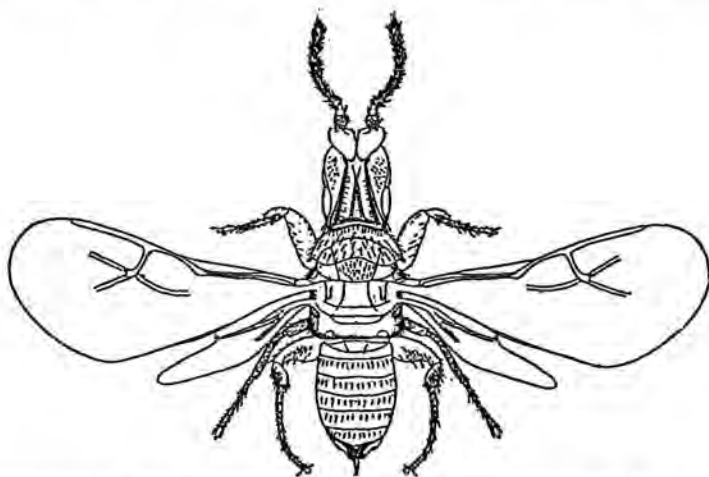


Fig. 25. *Ceratosolen (Rothropus) notus* (Baker), female, after Baker (1913, fig. 2).

length. There are no claspers on the genitalia. The total length is ca. 1.4 mm.

The host fig is *Ficus benguetensis* Merr. (Philippines; Luzon, Basilan).

172. *Ceratosolen (Rothropus) solomonensis* Wiebes

Wiebes, Proc. Kon. Ned. Akad. Wet. **97**: 130 (1994).

The female is much like that of *C. (R.) cornutus*, described above, but the mandibular appendage bears five ventral lamellae. The postmarginal vein is 1.75 times as long as the stigmal. The spine of the ovipositor is three times as long as wide at its base. The total length is 0.95 mm.

The male also resembles *C. (R.) cornutus*: the head is 1.7 times as long as wide; there are no eyes. The antennal anellus is three-sevenths of the fourth segment, which is half as long as the fifth. The pronotum is 1.7 times as long as wide. The hind tibia is 1.75 times as long as the first tarsal segment. The total length is 1.2 mm.

The host fig is *Ficus macrothyrsa* Corner (Melanesia: Solomon Isl.).

173. *Ceratosolen (Rothropus) orientalis* Wiebes

Wiebes, Tijdschr. Ent. **106**: 57–59 (1963a).

The female head is shorter than wide across the compound eyes (0.95), which are 1.2 times as long as the cheek. The sixth to eleventh antennal segments bear two irregular rows of sensilla. The mandibular appendage bears five ventral lamellae; the bacilliform process is half as long as the maxilla itself.

The postmarginal vein is two times as long as the stigmal. The valves of the ovipositor slightly project beyond the apex of the gaster. The total length is 1.9 mm.

The male head is $1\frac{1}{2}$ times as long as wide; the eyes are one-fifth of the cheek. The length of the antennal anellus is two-fifths of its width, and it is 0.375 of the length of the fourth, which is half as long as the fifth. The maxillae are not very wide.

The pronotum is $1\frac{1}{2}$ times as long as wide; the propodeum is half as long as wide, and the stigmalal peritremata occupy four-fifths of the length. The fore tibia bears four dorsal teeth. The hind tibia is $1\frac{1}{2}$ times as long as the first tarsal segment. The claspers of the genitalia three or four claws. The total length is ca. 1.5 mm.

The host fig is *Ficus subcongesta* Corner (Melanesia: New Britain, Solomon Isl.).

174. *Ceratosolen (Rothropus) calopilinae* Wiebes

Wiebes, Tijdschr. Ent. **106**: 59–62 (1963a).

The female head is slightly shorter than wide across the compound eyes, which are longer than the cheek (1.15). The fifth to tenth antennal segments have two irregular rows of long sensilla; the tenth and eleventh are shaped so as to form a club. The mandibular appendage bears six ventral lamellae. The maxilla has a bacilliform process, which is not quite half as long as the maxilla itself (0.45).

The postmarginal vein is 1.85 times as long as the stigmal. The valves of the ovipositor distinctly project beyond the apex of the gaster. The total length is 1.8 mm.

The male head is $1\frac{1}{2}$ times as long as wide; eyes are absent. The length of the antennal anellus is one-third of its width, one-third of the length of the fourth segment, which is shorter than half the length of the fifth (0.45). The maxillae are very wide.

The pronotum is 1.6 times as long as wide; the propodeum is half as long as wide, and the stigmalal peritremata occupy ca. four-sevenths of its length. The fore tibia bears three dorso-apical teeth. The hind tibia is 1.85 times the length of the first tarsal segment. The claspers of the genitalia bear three claws. The total length is 1.3 mm.

The host fig is *Ficus calopilina* Diels (Melanesia: Papua New Guinea).

175. *Ceratosolen (Rothropus) vetustus* Wiebes

Wiebes, Proc. Kon. Ned. Akad. Wet. **97**: 131–132 (1994).

The female head is slightly shorter than wide across the compound eyes (0.95), which are 1.3 times as long as the cheek. The fifth to eleventh antennal segments bear one or two, to three rows of oblong sensilla. The mandibular appendage bears five ventral lamellae. The maxilla has a bacilliform process, which is two-fifths of the length of the maxilla itself.

The postmarginal vein is two times as long as the stigmal. The spine of the hypopygium is longer than wide at the base (1.4). The valves of the ovipositor are one-tenth of the length of the gaster. The total length is 1.6 mm.

The male is much like that of *C. (R.) calopilinae*; the eye is one-fifth of the length of the cheek. The antennal anellus is two-thirds of the length of the fourth segment, which is two-fifths of the length of the fifth. The pronotum is 1.3 times as long as wide. The claspers of the genitalia bear 3–4 claws. The total length is 1.3 mm.

The host fig is *Ficus schwarzii* Koord. (Malayasia: Penang).

176. *Ceratosolen (Rothropus) notus* (Baker)

Baker, Philipp. J. Sci. 8: 65–72 (1913, *Blastophaga*); Wiebes, Tijdschr. Ent. 106: 54–57 (1963a); Wiebes, Proc. Kon. Akad. Wet. 97: 132 (1994).

The female head is almost as long as wide across the compound eyes (0.95), which are 1.45 times as long as the cheek. The fifth to eleventh antennal segments have two irregular rows (some have even three) of short, wide sensilla. The mandibular appendage bears five or six ventral lamellae; the maxilla has a baciliform process, which is two-fifths of the length of the maxilla itself.

The postmarginal vein is two times as long as the stigmal. The spine of the hypopygium is two times as long as wide at its base. The valves of the ovipositor are one-tenth of the length of the gaster. The total length is 1.8–2 mm.

The male head is 1.3 times as long as wide; there are no eyes. The length of the antennal anellus is two-fifths of its width, and also two-fifths of the length of the fourth segment, which is one-third of the fifth. The maxillae are wide.

The pronotum is $1\frac{1}{2}$ times as long as wide. The propodeum is 0.6 times as long as wide, and the stigmal peritremata occupy ca. two-thirds of the length. The claspers of the genitalia bear three claws. The total length is 1.6 mm.

The host figs are *Ficus nota* (Blanco) Merr. (Philippines: Luzon) and *Ficus congesta* Roxb. (Philippines: Luzon, Basilan).

177. *Ceratosolen (Rothropus) corneri* Wiebes

Wiebes, Tijdschr. 106: 62–64 (1963a).

The length of the female head is 0.95 of the width across the compound eyes, which are 1.45 times as long as the cheek. The fifth to eleventh antennal segments have one or two rows of long sensilla. The mandibular appendage bears five ventral lamellae; the maxilla has no process.

The postmarginal vein is two times as long as the stigmal. The valves of the ovipositor project over a length equal to almost one-quarter of the length of the gaster. The total length is 1.4–1.6 mm.

The male head is 1.7 times as long as wide; the eye is one-third of the length of the cheek. The length of the antennal anellus is two-fifths of its width, and one-quarter of the length of the fourth segment, which is half as long as the fifth. The maxillae are wide.

The pronotum is 1.7 times as long as wide. The length of the propodeum is three-quarters of its width, and the stigmal peritremata occupy ca. four-fifths of the length. The fore tibia bears four dorso-apical teeth. The hind leg is very long: the coxa and femur are each about as long as the pronotum, the tibia is

1.4 times as long as the first tarsal segment. The claspers of the genitalia bear three claws. The total length is 1.5 mm.

The host fig is *Ficus botryocarpa* Miq. (Philippines: Luzon).

178. *Ceratosolen (Rothropus) pilipes* Wiebes

Wiebes, Tijdschr. Ent. **106**: 71–73 (1963a).

The female head is longer than wide across the compound eyes (1.1), which are three-quarters of the length of the cheek. The sixth to ninth antennal segments are rather long (ca. three times as long as wide) and bear three to four rows of sensilla. The mandibular appendage bears seven ventral lamellae; the maxilla has a bacilliform process, which is nearly half as long as the maxilla itself.

The postmarginal vein is a bit over two times as long as the stigmal. The valves of the ovipositor are one-tenth of the length of the gaster. The total length is 1.5 mm.

The male head is $1\frac{1}{2}$ times as long as wide; the eyes are one-fifth of the length of the cheek. The length of the antennal anellus is one-fifth of the width; the fourth segment is three times as long as the third, and the fifth is again three times as long as the fourth. The maxillae are widely expanded laterally.

The pronotum is 1.7 times as long as wide. The propodeum is subquadrate, and the stigmalal peritremata occupy the whole length. The fore tibia bears four dorso-apical teeth. The hind tibia is 1.4 times as long as the first tarsal segment. The claspers of the genitalia bear five to six claws. The total length is 3.2–2.4 mm.

The host fig is *Ficus cereicarpa* Corner (Malaysia: Sabah).

179. *Ceratosolen (Rothropus) josephi* Wiebes

Wiebes, Tijdschr. Ent. **106**: 74–75 (1963a).

The female head is as long as wide across the compound eyes, which are four-fifths of the cheek. The sixth to ninth antennal segments are three times as long as wide, and they bear three to four rows of sensilla. The mandibular appendage bears seven ventral lamellae; the bacilliform process is half as long as the maxilla itself.

The postmarginal vein is almost two times as long as the stigmal. The valves of the ovipositor distinctly project beyond the gaster. The total length is 2.5–2.7 mm.

The male head is $1\frac{1}{2}$ times as wide as long; the eye is one-quarter of the length of the cheek. The length of the antennal anellus is one-fifth of its width, and

one-third of the fourth segment, which is almost one-third of the fifth. The maxillae are expanded laterally.

The pronotum is 1.7 times as long as wide. The length of the propodeum is three-quarters of the length, and the stigmatal peritremata occupy the whole length. The fore tibia bears four dorso-apical teeth. The hind tibia is 1.7 times as long as the first tarsal segment. The claspers of the genitalia bear three short claws. The total length is 2.0–2.2 mm.

The host fig is *Ficus francisci* Winkler (Malaysia: Sabah).

180. *Ceratosolen (Rothropus) albulus* Wiebes

Wiebes, Tijdschr. Ent. **106**: 75–77 (1963a).

The female head is slightly shorter than wide across the compound eyes (0.95), which are distinctly longer than the cheek (1.65). The fifth to eleventh antennal segments bear (two to) three rows of long sensilla. The mandibular appendage bears eleven ventral lamellae; the maxillar bacilliform process is half as long as the maxilla itself.

The postmarginal vein is one-fifth longer than the stigmal. The valves of the ovipositor distinctly project beyond the apex of the gaster. The total length is 2.3–3.0 mm.

The male head is one-quarter longer than wide; there are no eyes. The length of the antennal anellus is one-fifth of its width, and one-third of the fourth, which is three-sevenths of the length of the fifth. The maxillae are widely expanded laterally.

The pronotum is 1.3 times as long as wide. The propodeum is subquadrate, and the stigmatal peritremata occupy the whole length. The fore tibia bears six dorso-apical teeth. The hind tibia is two times as long as the first tarsal segment, and it bears a bidentate apical antiaxial tooth and a simple axial. The claspers of the genitalia bear six claws. The total length is 2.2–2.3 mm.

The host fig is *Ficus uncinata* Becc. (Malaysia: Sabah).

183. *Ceratosolen (Rothropus) humatus* Wiebes

Wiebes, Tijdschr. Ent. **106**: 78, 80–81 (1963a).

The female head is not quite as long as wide across the compound eyes (0.95), which are two times as long as the cheek. The sixth to tenth antennal segments have two (to three) irregular rows of long sensilla. The mandibular appendage bears nine ventral lamellae; the maxilla has a bacilliform process, which is 0.6 of the length of the maxilla itself.

The postmarginal vein is 1.65 times as long as the stigmal. The valves of the ovipositor scarcely project beyond the apex of the gaster. The total length is 2.2 mm.

The male head is 1.2 times as long as wide; there are no eyes. The length of the antennal anellus is one-third of its width; the fourth segment is $2\frac{1}{2}$ times as long, and the fifth is three times as long as the fourth. The maxillae are widely expanded laterally.

The pronotum is as long as wide. The propodeum is longer than wide (1.25), and the stigmalal peritremata occupy the whole length. The fore tibia bears a series of nine dorso-apical teeth. The hind tibia is almost two times as long as the first tarsal segment, and it has a pair of apical teeth, as described for *C. (R.) albulus*: the antiaxial bidentate, the axial simple. The claspers of the genitalia bear four claws. The total length is 1.5–1.9 mm.

The host figs are *Ficus beccarii* King (Malaysia: Sabah) and *Ficus subterranea* Corner (Malaysia: Sabah).

Subgenus **Streptitus** Wiebes

Wiebes, Proc. Kon. Ned. Akad. Wet. 97: 127 (1994).

The female head is about as long as wide across the compound eyes, but distinctly longer in one species; the cheek is equal in length to the eye, or longer, in most species, but distinctly shorter in some. The funicular segments of the antenna bear one row of oblong sensilla in four species, two (to three) in three, three to four in three other species. The mandibular appendage bears five or six ventral lamellae in most species, seven or eight in three, and ten in one; the maxilla may have a (short) bacilliform process.

The postmarginal vein of the fore wing is equal in length to the stigmal in one species, but longer (1.2–2, or even 3 times) in most. The fore tibia bears four dorso-apical teeth (in two species), or five (in five), six or seven (in one each), or eight to ten (in one species). The hind tibia has a bicuspidate antiaxial tooth (in three species), or it is tricuspidate (in five), which may be spade- or shovel-shaped. The hypopygial spine is rather short (even shorter than the lateral lobes in one species), but very long in two species. The ovipositor valves are short: one-tenth to one-third of the length of the gaster, but three-quarters of this length in one species. The total length is ca. 2–3 mm (a bit shorter in two species).

The male head is almost to fully $1\frac{1}{2}$ times as long as wide, but two times in one species; eyes are absent or (very) small. The antennal grooves are half closed, but open in three species. The antenna normally has five segments, with one anellus, but it may be only four-segmented.

The propodeum is rather long dorsally in most species, about quadrangular in a few, and in all species bears (very) large spiracular peritremata. The fore tibia, as well as the hind tibia, bears three or four teeth; the tarsus usually is bimerous, but it may be tri- or tetramerous; the hind tarsus is pentamerous. The genitalia have claspers in five species, bearing 2–4 claws, or claspers are absent; in one species there are large parameres. The total length is ca. 1–2 mm.

There are ten species known, associated with figs of several subsections but the nominate one, of section *Sycocarpus* Miq., and two figs that Corner classified with the *Ficus*-series *Rivulares* Corner and *Pseudopalmeae* Corner. One unidentified species was recorded (Wiebes, 1963a: 83) from *Ficus microdictya* Diels (Melanesia: Papua New Guinea).

KEY TO THE SPECIES OF STREPITUS (fig. 26)

1. Females 2
- Males 9
2. The fore tibia has eight to ten sharp teeth in the dorso-apical comb, the hind tibia has a large antiaxial structure bearing four teeth (fig. g). *Ficus dammaropsis* Diels (Melanesia: Irian Jaya, Papua New Guinea) 190. *Ceratosolen* (*Streptus*) *abnormis* Wiebes
- The fore tibia has six or seven teeth in the comb (fig. a), the hind tibia has a smaller, tricuspidate antiaxial tooth (fig. b) 3

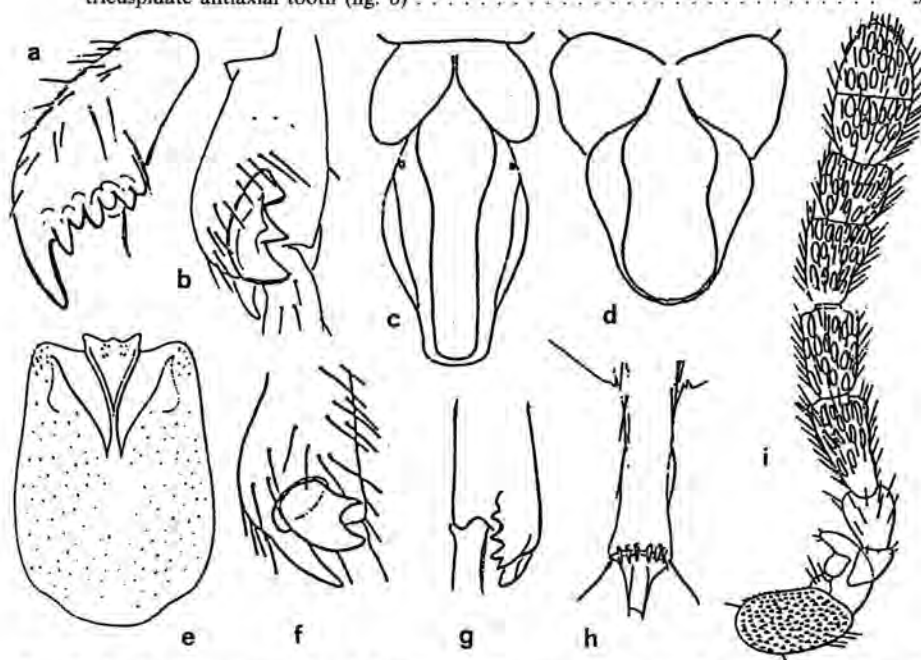


Fig. 26. details of *Streptus*. a, female fore tibia of *C. immanis* Wiebes; b, f, g, female hind tibia of: b, *C. immanis*, f, *C. boschmai* Wiebes, and g, *C. abnormis* Wiebes; c, d, male propodeum of: c, *C. boschmai*, and d, *C. sordidus* Wiebes; e, male head of *C. bakeri* Grandi; h, female hypopygium of *C. indigenus* Wiebes; i, female antenna of *C. bakeri*. Figs. a, b, h, after Wiebes (1981a, figs. 3, 10, 34); c, d, f, g, after Wiebes (1963a, figs. 42, 87, 41, 96); e, i, after Grandi (1927b, figs. 19, 27).

- The fore tibia has four or five teeth in the dorso-apical comb, the antiaxial tooth of the hind tibia is bi- (fig. f) or tricuspidate 4
- 3. The head is as long as wide across the compound eyes, the cheek is as long as the eye. The fore tibia has six teeth in the dorso-apical comb. *Ficus cynaroides* Corner (Melanesia: Solomon Isl.) 182. *Ceratosolen (Strepitus) sordidus* Wiebes
- The head is distinctly longer than wide, and also the cheek is longer than the eye. The fore tibia has seven teeth in the dorso-apical comb. *Ficus immanis* Corner (Melanesia: Solomon Isl.) 183. *Ceratosolen (Strepitus) immanis* Wiebes
- 4. The funicular segments of the antenna bear only one row of sensilla 5
- The funicular segments of the antenna bear two or more rows of sensilla 6
- 5. The eye is distinctly shorter than the cheek (0.8). The maxilla bears a bacilliform process. *Ficus solomonensis* Rech. (Melanesia: Solomon Isl.) 184. *Ceratosolen (Strepitus) boschmai* Wiebes
- The eye is distinctly longer than the cheek (1.2). The maxilla does not have a bacilliform process. *Ficus indigofera* Rech. (Melanesia: Solomon Isl.) 188. *Ceratosolen (Strepitus) indigenus* Wiebes
- 6. The mandibular appendage bears ten ventral lamellae. The eye is distinctly shorter than the cheek (0.8). ? *Ficus vitiensis* Seem. (Micronesia: Fiji) 189. *Ceratosolen (Strepitus) bianchii* Wiebes
- The mandibular appendage bears eight ventral lamellae. The eye is almost as long as the cheek. *Ficus itoana* Diels (Melanesia: Papua New Guinea) 191. *Ceratosolen (Strepitus) armipes* Wiebes
- The mandibular appendage bears seven ventral lamellae. The eye is 1-1½ times as long as the cheek 7
- 7. The eye is as long as the cheek. The sixth antennal segment is 2½ times as long as wide. *Ficus theophrastoides* Seem. (Melanesia: Solomon Isl.) 185. *Ceratosolen (Strepitus) vissali* Wiebes
- The eye is 1½ or more times as long as the cheek 8
- 8. The sixth antennal segment is approximately two times as long as wide, bearing three rows of sensilla (fig. i). *Ficus pseudopalma* Baker (Philippines: Luzon) 186. *Ceratosolen (Strepitus) bakeri* Grandi
- The sixth antennal segment is approximately three times as long as wide, bearing four rows of oblong sensilla. *Ficus rivularis* Merr. (Philippines: Luzon) 187. *Ceratosolen (Strepitus) ramirezi* Wiebes
- 9. The propodeum is as wide as long (♀, couplet 2) 190. *Ceratosolen (Strepitus) abnormis* Wiebes
- The propodeum is longer than wide 10
- 10. The antennal grooves are open (fig. e). The fore tarsus is tri-(or tetra-)merous 11
- The antennal grooves are half closed. The fore tarsus is bimerous 13
- 11. The fore tibia has three teeth in the dorso-apical comb 12
- The fore tibia has four teeth in the dorso-apical comb (♀, couplet 8) 186. *Ceratosolen (Strepitus) bakeri* Grandi
- 12. The hind tibia bears a bicuspidate antiaxial tooth (♀, couplet 7) 185. *Ceratosolen (Strepitus) vissali* Wiebes
- The hind tibia bears a tricuspidate antiaxial tooth (♀, couplet 8) 187. *Ceratosolen (Strepitus) ramirezi* Wiebes
- 13. The antenna consists of four segments 14
- The antenna consists of five segments 15

14. The head is almost two times as long as wide, longer than the pronotum (♀, couplet 5) 188. *Ceratosolen (Strepitus) indigenus* Wiebes
 - The head is little longer than wide, shorter than the pronotum (♀, couplet 6) 191. *Ceratosolen (Strepitus) armipes* Wiebes
15. The propodeum is rather slender dorsally (fig. c) 16
 - The propodeum is wider dorsally, relative to its length (fig. d) 17
16. The genitalia bear claspers with small claws. There is only one antiaxial tooth on the hind tibia (♀, couplet 5) 184. *Ceratosolen (Strepitus) boschmai* Wiebes
 - The genitalia do not have claspers. Next to the antiaxial tooth on the hind tibia there is an auxiliary one (♀, couplet 6) 189. *Ceratosolen (Strepitus) bianchii* Wiebes
17. Eyes are absent. The fore tibia bears four dorso-apical teeth. The genitalia do not have claspers (♀, couplet 3) 182. *Ceratosolen (Strepitus) sordidus* Wiebes
 - Small eyes are present (fig. 2j). The fore tibia bears three teeth in the dorso-apical comb. Genital claspers are present (♀, couplet 3). 183. *Ceratosolen (Strepitus) immanis* Wiebes

182. *Ceratosolen (Strepitus) sordidus* Wiebes

Wiebes, Tijdschr. Ent. **106**: 30–31 (1963a).

The female head is as long as wide across the compound eyes, which are as long as the cheek. The funicular segments of the antenna, from the seventh onwards, are about as long as wide, or even shorter, and they bear one row of oblong sensilla. The mandibular appendage bears six ventral lamellae; the maxilla is simple.

The postmarginal vein of the fore wing is little longer than the stigmal (1.25). The fore tibia bears a heavy dorso-apical comb, consisting of six teeth. The antiaxial tooth of the hind tibia is large, tricuspidate. The hypopygium has a very short spine. The total length is ca. 2 mm.

The width of the male head is three-quarters of the length; eyes are absent. The antennal grooves are half closed; the antenna consists of five segments, the third of which is anuliform.

The propodeum is more than two times as long as wide, approximately as wide anteriorly as it is wide posteriorly (not measuring the spiracular peritremata). The fore tibia bears four dorso-apical teeth. The hind tibia has four apical teeth and bears spines along the dorsal edge. The genitalia do not seem to bear claspers. The total length is ca. 1.0–1.1 mm.

The host fig is *Ficus cynaroides* Corner (Melanesia: Solomon Isl.).

183. *Ceratosolen (Strepitus) immanis* Wiebes

Wiebes, Proc. Kon. Ned. Akad. Wet. (C) **84**: 368–370 (1981a).

The female head is distinctly longer than wide across the compound eyes (1.2), which are two-thirds of the length of the cheek. The funicular segments of the

antenna, from the seventh onwards are ca. two times as long as wide, and they bear one row of very long sensilla in the apical half. The mandibular appendage bears six ventral lamellae; the maxilla is simple.

The postmarginal vein of the fore wing is little longer than the stigmal (1.2). The fore tibia bears a dorso-apical row of seven teeth, alternately blunt and sharp. The antiaxial tooth of the hind tibia is large, tricuspidate. The hypopygium has the lateral lobes longer than the spine. The total length is ca. 2.4 mm.

The male head is $1\frac{1}{2}$ times as long as wide; the eyes are small. The antennal grooves are half closed; the antenna is five-segmented, including an incompletely separate ring-segment.

The propodeum is rather wide, expanding caudad; with the mostly lateral spiracular peritremata, it appears almost quadrangular.

The fore tibia bears three dorso-apical teeth. The hind tibia has four apical teeth. The genitalia have claspers, bearing four large claws. The total length is ca. 1.8 mm.

The host fig is *Ficus immanis* Corner (Melanesia: Solomon Isl.).

184. *Ceratosolen (Strepitus) boschmai* Wiebes

Wiebes, Tijdschr. Ent. 106: 23–24, 25 (1963a); Wiebes, Proc. Kon. Ned. Akad. Wet. (C) 84: 370 (1981a).

The female head is approximately as long as wide across the compound eyes, which are four-fifths of the length of the cheek. The funicular segments of the antenna, from the seventh onwards, are about as long as wide, and they bear one row of oblong sensilla in the apical half; the ninth to eleventh segments are united in a loose club. The mandibular appendage bears five ventral lamellae; the maxilla has a bacilliform appendage, which is about half as long as the maxilla.

The postmarginal vein of the fore wing is ca. $1\frac{1}{2}$ times as long as the stigmal. The fore tibia bears a dorso-apical comb of five teeth, the first of which is blunt. The antiaxial tooth of the hind tibia is bicuspidate. The hypopygium has a short spine. The total length is ca. 1.7–2.1 mm.

The width of the male head is two-thirds of the length; eyes are absent. The antennal grooves are half closed, but rather deeply so; the antenna has five segments, the third of which (distinct in most specimens) is anuliform.

The lateral edges of the propodeum are folded ventrally, leaving a very long and narrow dorsal surface. The fore tibia bears four dorso-apical teeth. The hind tibia bears three apical teeth. The genitalia have claspers with four claws. The total length is ca. 1.5–1.9 mm.

The host fig is *Ficus solomonensis* Rech. (Melanesia: Solomon Isl.).

185. *Ceratosolen (Strepitus) vissali* Wiebes

Wiebes, Proc. Kon. Ned. Akad. Wet. (C) **384**: 370–374 (1981a).

The female head is a little shorter than wide across the compound eyes (0.95), which are as long as the cheek. The sixth antennal segment is two times as long as wide, and it bears three to four rows of oblong sensilla; from the seventh onwards the segments are shorter (0.85), and the tenth and eleventh form a club. The mandibular appendage bears seven ventral lamellae; the bacilliform process is half as long as the maxilla.

The postmarginal vein of the fore wing is $1\frac{1}{2}$ times as long as the stigmal. The fore tibia bears a dorso-apical comb of four teeth (one more axial in position than the others). The antiaxial tooth of the hind tibia is bicuspidate. The hypopygium has a long spine. The total length is ca. 3 mm.

The male head is $1\frac{1}{2}$ times as long as wide; the eyes are very small. The antennal grooves are open, narrowing posteriad, two-fifths as long as the head; the antenna is four-segmented in most specimens, but the first funicular segment is (indistinctly) divided in some.

The propodeum is about ovoid dorsally, with the spiracular peritremata largely lateral. The fore tibia bears three large dorso-apical teeth. The hind tibia has an antiaxial, bicuspidate tooth and an axial, shovel-like tooth. The genitalia bear claspers with three claws. The total length is ca. 2.2 mm.

The host fig is *Ficus theophrastoides* Seem. (Melanesia: Solomon Isl.).

186. *Ceratosolen (Strepitus) bakeri* Grandi

Grandi, Philipp. J. Res. **33**: 312–314 (1927b); Wiebes, Tijdschr. Ent. **106**: 32 (1963a).

The female head is almost as long as wide across the compound eyes (0.98), which are two times as long as the cheek. The sixth antennal segment is two times as long as wide, and it bears three rows of oval sensilla; also the other funicular segments, a bit shorter than the sixth, bear three rows of oval sensilla. The mandibular appendage bears six ventral lamellae; the maxilla has a short bacilliform process.

The postmarginal vein of the fore wing is two times as long as the stigmal. The fore tibia bears a dorso-apical comb of five teeth. The antiaxial tooth of the hind tibia is tricuspidate. The hypopygium has a rather long spine, without long lateral setae. The total length is ca. 3.8 mm.

The male head is ca. $1\frac{1}{2}$ times as long as wide; there are no eyes. The antennal grooves are open, narrowing posteriad; the antenna has six segments, as there is a short segment next to the ring-segment.

The dorsal part of the propodeum is two times as long as wide; the spiracular peritremata are very large. The fore tibia bears four dorso-apical teeth. The hind tibia has a tridentate apical crest. The genitalia are simple. The total length is ca. 1.75 mm.

The host fig is *Ficus pseudopalma* Blanco (Philippines: Luzon).

187. *Ceratosolen (Strepitus) ramirezi* Wiebes

Wiebes, Ent. Ber. Amst. 51: 108–111 (1991b).

The female head is shorter than wide across the compound eyes (0.85), which are $1\frac{1}{2}$ times as long as the cheek. The sixth antennal segment is three times as long as wide, bearing four rows of oblong sensilla. The mandibular appendage bears seven ventral lamellae; the bacilliform process is one-fifth of the length of the maxilla.

The postmarginal vein of the fore wing is $1\frac{3}{4}$ times as long as the stigmal. The fore tibia bears a dorso-apical comb of five teeth. The antiaxial tooth of the hind tibia is tricuspidate. The hypopygium has a short, blunt spine, bearing a pair of long lateral setae. The total length is ca. 2.4 mm.

The male head is ca. 1.3 times as long as wide; the eyes are very small. The antennal grooves are open and rather wide; the antenna has five segments, the third of which is anuliform.

The propodeum is rather wide, $1\frac{1}{2}$ times as long as wide. The fore tibia has a dorso-apical comb of three teeth. The hind tibia has a tridentate apical crest. The genitalia are simple. The total length is ca. 1.7 mm.

The host fig is *Ficus rivularis* Merr. (Philippines: Luzon).

188. *Ceratosolen (Strepitus) indigenus* Wiebes

Wiebes, Proc. Kon. Ned. Akad. Wet. (C) 84: 374–376 (1981a).

The female head is a little shorter than wide across the compound eyes (0.95), which are longer than the cheek (1.2). The funicular segments of the antenna are little longer than wide, and they bear one row of long sensilla. The mandibular appendage bears six ventral lamellae; the maxilla is simple.

The postmarginal vein of the fore wing is as long as the stigmal. The fore tibia bears a dorso-apical comb of four teeth. The hind tibia has an essentially bicuspidate antiaxial tooth, although the larger tooth appears to be bifid. The hypopygium (fig. h) has a very long spine (four times as long as wide at its base). The

ovipositor valves are two-fifths of the length of the gaster. The total length is ca. 1.4 mm.

The male head is very long (longer than the pronotum), almost two times as wide as long; eyes are absent. The antennal grooves are half closed; the antenna is four-segmented, as there is no anellus.

The propodeum is long, the large spiracular peritremata are mainly lateral. The fore tibia bears four dorso-apical teeth. The hind tibia has an antiaxial tooth next to the bicuspidate one, and one simple axial. The genitalia bear very small claspers bearing three claws. The total length is ca. 1.3 mm.

The host fig is *Ficus indigofera* Rech. (Melanesia: Solomon Isl.).

189. *Ceratosolen (Strepitus) bianchii* Wiebes

Wiebes, Tijdschr. Ent. **106**: 26–27 (1963a).

The female head is about as long as wide across the compound eyes, which are distinctly shorter than the cheek (0.75). The sixth antennal segment is two times as long as wide, the seventh to eleventh are a bit shorter, and all bear two irregular rows of oblong sensilla. The mandibular appendage bears ten ventral lamellae; the bacilliform process is one-third of the length of the maxilla.

The postmarginal vein of the fore wing is $1\frac{1}{2}$ times as long as the stigmal. The fore tibia bears a dorso-apical row of five teeth. The antiaxial tooth of the hind tibia is tricuspidate. The hypopygium has a short spine. The total length is ca. 2.3 mm.

The width of the male head is two-thirds of its length; eyes are present. The antennal grooves are half closed; the antenna is five-segmented, with an anuli-form third segment.

The propodeum is ca. three times as long as wide, and it has wide spiracular peritremata. The fore tibia bears four dorso-apical teeth. The hind tibia has four ventro-apical teeth. The genitalia are simple. The total length is ca. 2.0–2.1 mm.

Judging from the locality (Wiebes, 1981a: 366), the host fig probably is *Ficus vitiensis* Seem. (Micronesia: Fiji).

190. *Ceratosolen (Strepitus) abnormis* Wiebes

Wiebes, Tijdschr. Ent. **106**: 32–33, 35 (1963a).

The female head is about as long as wide across the compound eyes, which are as long as the cheek, or slightly shorter. The antenna is rather compact, the seventh segment bears one oblong sensilla, the eighth and ninth two incomplete, irregular rows of sensilla; the apical two segments are shaped so as to form a

club, and they bear irregular rows of sensilla. The mandibular appendage bears six ventral lamellae; the maxilla is simple.

The postmarginal vein of the fore wing is two times as long as the stigmal. The fore tibia bears a dorso-apical comb of eight to ten teeth, the dorsal one of which is particularly long. The hind tibia bears a spade-shaped axial tooth and a quadri-dentate antiaxial. The hypopygium has a very long spine. The ovipositor-valves are three-quarters of the length of the gaster. The total length is ca. 2.35 mm.

The male head is one-third longer than its maximum width; eyes are absent. The antennal grooves are half closed; the antenna is five-segmented, with a narrow ring-segment.

The propodeum is rather small, approximately as long as wide, with large spiracular peritremata. The fore tibia bears four dorso-apical teeth. The hind tibia has three teeth at the ventro-apical edge. The genitalia are different from the normal type by having very large parameres. The total length is ca. 2.2 mm.

The host fig is *Ficus dammaropsis* Diels (Melanesia: Irian Jaya, Papua New Guinea).

191. *Ceratosolen (Streptus) armipes* Wiebes

Wiebes, Tijdschr. Ent. **106**: 27-, 29-30 (1963a); Wiebes, Proc. Kon. Ned. Akad. Wet. (C) **84**: 102 (1981a).

The female head is about as long as wide across the compound eyes, which are not quite as long as the cheek (0.95). The sixth to eleventh antennal segments bear two to three irregular rows of small sensilla, and they are heavily pubescent; the tenth and eleventh are united into a club. The mandibular appendage bears eight ventral lamellae; the maxilla is simple.

The postmarginal vein of the fore wing is three times as long as the stigmal. The fore tibia bears a dorso-apical comb of five teeth. The hind tibia has a shovel-shaped axial tooth and a tricuspidate antiaxial. The spine of the hypopygium is of medium length. The ovipositor valves are three-quarters of the length of the gaster. The total length is ca. 2.0-2.3 mm.

The male head is nearly rectangular, longer than wide (1.2); eyes are absent. The antennal grooves are half closed; the antenna is four-segmented.

The propodeum is rectangular, longer than wide (1.4); the large spiracular peritremata protrude laterally. The fore tibia has three dorso-apical teeth. The hind tibia bears three ventro-apical teeth. The genitalia has very small, hyaline claspers, which seem to bear two claws. The total length is 2.2-2.3 mm.

The host fig is *Ficus itoana* Diels (Melanesia: Papua New Guinea).

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Host catalogue

(varieties of *Ficus* are only mentioned if they are, or seem to be, differential as to pollinator species)

- F. acamptophylla* Miq. – *Waterstoniella obvenata* Wiebes
F. adenosperma Miq. – *Ceratosolen* (C.) *adenospermae* Wiebes
F. altissima Bl. – *Eupristina* (E.) *altissima* Bal., Jos. & Abd.
F. ampelas Burm.f. – *Kradibia sumatrana* (Grandi)
F. amplissima J.E.Sm. – *Eupristina* (P.) *delhiensis* (Abd. & Jos.)
F. annulata Bl. – *Deilagaon annulatae* Wiebes
F. apiocarpa Miq. – *Wiebesia nuda* Wiebes
F. arfakensis King – *Ceratosolen* (C.) *solitarius* Wiebes
F. arnottiana Miq. – *Platyscapha arnottiana* Abdurahiman
F. asperiuscula Kunth. et Bouch. – *Ceratosolen* (C.) *internatus* Wiebes
F. aurantiacea Griff. – *Wiebesia planocrea* Wiebes
F. aurantiacea Griff. var. *parviflora* Corner – *Wiebesia contubernalis* (Grandi)
F. aurata Miq. – *Blastophaga* (V.) *auratae* Wiebes
F. auriculata Lour. – *Ceratosolen* (C.) *emarginatus* Mayr
F. beccarii King – *Ceratosolen* (R.) *humatus* Wiebes
F. benghalensis L. – *Eupristina* (E.) *masoni* Saunders
F. benguetensis Merr. – *Ceratosolen* (R.) *cornutus* Wiebes
F. benjamina L. var. *benjamina* – *Eupristina* (P.) *koningsbergeri* Grandi
F. benjamina L. var. *nuda* (Miq.) Barrett – *Eupristina* (E.) *emeryi* Grandi (? and also E. (P.) *cyclostigma* Wiebes: see also *F. stricta*)
F. bernaysii King – *Ceratosolen* (R.) *hooglandi* Wiebes
F. binnendijkii Miq. – *Waterstoniella borneana* Wiebes
F. botryocarpa Mq. – *Ceratosolen* (R.) *corneri* Wiebes
F. callosa Willd. – *Dolichoris malabarensis* (Abd. & Jos.)
F. calopilina Diels – *Ceratosolen* (R.) *calopilinae* Wiebes
F. carica L. – *Blastophaga* (B.) *psenes* (L.)
F. carri Corner – *Wiebesia macula* Wiebes
F. cataupi Elm. – *Wiebesia clavata* Wiebes
F. caulocarpa Miq. – *Platyscapha fischeri* Wiebes
F. cereicarpa Corner – *Ceratosolen* (R.) *pilipes* Wiebes
F. chartacea Wall. ex Miq. – *Blastophaga* (V.) *medusa* Wiebes
F. chrysochaete Corner – *Kradibia ordinata* Wiebes
F. chrysolepis Miq. – *Deilagaon chrysolepidis* Wiebes
F. complexa Corner – *Ceratosolen* (C.) *gressitti* Wiebes
F. congesta Roxb. – *Ceratosolen* (R.) *notus* (Baker)
F. conocephalifolia Ridley – *Kradibia jacobsi* (Wiebes)
F. consociata Bl. – *Waterstoniella malayana* Wiebes
F. copiosa Steud. – *Kradibia copiosae* (Wiebes)
F. cordatula Merr. – *Eupristina* (E.) *longispina* Wiebes

F. coronata Spin. – *Kradibia wakefieldi* Wiebes
F. crassipes F.M. Bailey – *Pleistodontes addicotti* Wiebes
F. crassiramea Miq. var. *clementis* (Merr.) Corner – *Waterstoniella fiorii* Grandi
F. crassiramea Miq. var. *crassiramea*, from Java – *Waterstoniella jacobsoni* (Grandi)
F. crassiramea Miq. var. *crassiramea*, from Kalimantan – *Waterstoniella cuspidis* Wiebes
F. crassiramea Miq. var. *patellifera* (Warb.) Corner – *Waterstoniella solomonensis* Wiebes
F. cristobalensis Corner – *Dolichoris inornata oblita* Wiebes
F. cumingii Miq. – *Kradibia panchoi* Wiebes
F. cynaroides Corner – *Ceratosolen* (S.) *sordidus* Wiebes
F. dammaropsis Diels – *Ceratosolen* (S.) *abnormis* Wiebes
F. delosyce Corner – *Waterstoniella delicata* Wiebes
F. deltoidea Jack – *Blastophaga* (B.) *quadrupes* Mayr
F. depressa Bl. – *Deilagaon annulatae* Wiebes
F. destruens F.v.M. – *Pleistodontes rigisamos* Wiebes
F. dimorpha King – *Ceratosolen* (C.) *c. constrictus* (Mayr)
F. disticha Bl. – *Wiebesia corneri* Wiebes
F. drupacea Thunb. – *Eupristina* (E.) *belgaumensis* Joseph
F. dzumacensis Guillaum. – *Dolichoris boschmai* (Wiebes)
F. edelfeltii King – *Dolichoris i. inornata* Wiebes
F. elastica Roxb. ex Hornem. – *Pleistodontes claviger* (Mayr)
F. erecta Thunb. – *Blastophaga* (B.) *nipponica* Grandi
F. erecta Thunb. var. *beeheyana* (Hook. et Arn.) King – *Blastophaga* (B.) *silvestriana* Grandi
F. exasperata Vahl – *Kradibia gestroi* (Grandi)
F. excavata King – *Wiebesia* ? *minuta* Wiebes
F. fiskei Elm. – *Kradibia calorai* Wiebes
F. fistulosa Reinw. ex Bl. – *Ceratosolen* (C.) *c. constrictus* (Mayr) & C. (C.) *c. hewitti* Waterston
F. forstenii Miq. – *Eupristina* (E.) *aurivillii* Mayr
F. francisci Winkler – *Ceratosolen* (R.) *josephi* Wiebes
F. fraseri Miq. – *Kradibia ghigii* (Grandi)
F. fulva Reinw. ex Bl. – *Blastophaga* (V.) *compacta* Wiebes & B. (V.) *inopinata* Grandi
F. glaberrima Bl. – *Waterstoniella williamsi* Wiebes
F. glandifera Summerh. – *Pleistodontes blandus* Wiebes (& *P. mandibularis* Wiebes ?)
F. glandulifera (Wall. ex Miq.) King – *Blastophaga* (V.) *sensillata* Wiebes
F. grossularioides Burm.f. – *Blastophaga* (V.) *malayana* Wiebes
F. grossularioides Burm.f. var. *stenoloba* Corner – *Blastophaga* (V.) *confusa* Wiebes
F. gryllus Corner – *Kradibia tetamba* Wiebes
F. guyeri Elm. – *Kradibia clarae* Wiebes
F. hemsleyana King – *Liporrhopalum hemsleyanae* Hill
F. hesperidiiformis King – *Pleistodontes plebejus* Wiebes
F. heteropleura Bl. var. *heteropleura* – *Liporrhopalum dubium* (Grandi)
F. heteropleura Bl. var. *mindanaensis* (Warb.) Corner – *Liporrhopalum mindanaensis* Hill
F. heteropoda Miq. – *Kradibia commuta* Wiebes
F. hirta Vahl – *Blastophaga* (V.) *j. javana* Mayr
F. hirta Vahl from Hong Kong – B. (V.) *javana hilli* Wiebes
F. hispida Linn.f. – *Ceratosolen* (C.) *s. solmsi* (Mayr) & C. (C.) *s. marchali* Mayr
F. hispidioides S. Moore – *Ceratosolen* (R.) *dentifer* Wiebes
F. immanis Corner – *Ceratosolen* (S.) *immanis* Wiebes
F. indigofera Rechner – *Ceratosolen* (S.) *indigenus* Wiebes
F. iodotricha Diels – *Ceratosolen* (R.) *iodotrichae* Wiebes
F. irisana Elm. – *Kradibia commuta* Wiebes
F. ischnopoda Miq. – *Blastophaga* (B.) *spec.*
F. itoana Diels – *Ceratosolen* (S.) *armipes* Wiebes

F. kerkhoveni Val. – *Eupristina* (E.) *leightoni* Wiebes
F. laevis Bl. – *Wiebesia gomberti* (Grandi)
F. lanata Bl. – *Wiebesia boldinghi* (Grandi)
F. lepicaarpa Bl. – *Ceratosolen* (R.) *vechti*
F. leptogramma Corner – *Kradibia setigera* Wiebes
F. leucotricha Miq. – *Pleistodontes cuneatus* Wiebes
F. macilenta King – *Blastophaga* (V.) *macilentae* Wiebes
F. macrophylla Desf. ex Pers. – *Pleistodontes froggatti* Mayr
F. macrothyrsa Corner – *Ceratosolen* (R.) *solomonensis* Wiebes
F. magnoliifolia Bl. – *Dolichoris nervosae philippinensis* Wiebes
F. microcarpa Linn.f. – *Eupristina* (P.) *verticillata* Waterston
F. microdyctia Diels – *Ceratosolen* (S.) *spec.*
F. midotis Corner – *Liporrhopalum midotis* Hill
F. minahassae (Teyss. et Vr.) Miq. – *Ceratosolen* (C.) *pygmaeus* Grandi
F. moderata Corner – *Ceratosolen* (R.) *moderatus* Wiebes
F. mollior Benth. – *Ceratosolen* (C.) *medlerianus* Wiebes
F. montana Burm.f. – *Liporrhopalum tentacularis* (Grandi)
F. nervosa Heyne ex Roth – *Dolichoris n. nervosae* Hill
F. nodosa Teyss. et Binn. – *Ceratosolen* (C.) *nexilis* Wiebes
F. nota (Blanco) Merr. – *Ceratosolen* (R.) *notus* (Baker)
F. novoguineensis Corner – *Deilagaon chrysolepidis* Wiebes
F. obliqua Forst.f. – *Pleistodontes greenwoodi* (Grandi)
F. obpyramidata King – *Ceratosolen* (R.) *nugatorius* Grandi
F. obscura Bl. – *Liporrhopalum giacomini* (Grandi)
F. obscura Bl. var. *angustata* (Miq.) Corner – *Liporrhopalum angustatae* Hill
F. odorata (Blanco) Merr. – *Kradibia williamsi* Wiebes
F. oligodon Miq. – *Ceratosolen* (C.) *emarginatus* Mayr
F. opposita Miq. – *Kradibia nigricarpus* (Girault)
F. otophoroides Corner – *Dolichoris spec.*
F. padana Burm.f. – *Blastophaga* (V.) *intermedia* Grandi
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F. pellucidopunctata Griff. – *Waterstoniella brevigena* Wiebes
F. peninsula Elm. – *Wiebesia isabella* Wiebes
F. platypoda (Miq.) A.Cunn. ex Miq. – *Pleistodontes imperialis* Saunders & P. *proximus* Wiebes, also *P. greenwoodi* (Grandi)
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F. ribes Reinw. ex Bl. var. *cuneata* (Miq.) Corner – *Ceratosolen* (R.) *crassitarsus gracilis* Wiebes
F. rivularis Merr. – *Ceratosolen* (S.) *ramirezi* Wiebes
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lisztii Girault, 1932 (Pleistodontes) = incertae sedis (see table 1)
longicaudus Wiebes, 1977d (Pleistodontes) = 3. *Pleistodontes longicaudus*
longiclavus Girault, 1915b (Paraceratosolen) = incertae sedis in *Kradibia* (see table 1)
longicornis Grandi, 1926 (Blastophaga) = 115. *Liporrhopalum longicornis*
longispina Wiebes, 1992a (Eupristina) = 28. *Eupristina* (E.) *longispina*

macilentae Wiebes, 1993b (Blastophaga) = 88. *Blastophaga* (V.) *macilentae*
macula Wiebes, 1993a (Wiebesia) = 94. *Wiebesia macula*
malabarensis Abdurahiman & Joseph, 1967a (Blastophaga) = 65. *Dolichoris malabarensis*
malayana Wiebes, 1993b (Blastophaga) = 77. *Blastophaga* (V.) *malayana*
malayana Wiebes, 1982a (Waterstoniella) = 46. *Waterstoniella malayana*
mandibularis Wiebes, 1977d (Pleistodontes) = 6. *Pleistodontes mandibularis*
Maniella Abdurahiman & Joseph, 1967b, type-species *Maniella delhiensis* = 20. *Eupristina* (P.)
delhiensis

marchali Mayr, 1906 (Ceratosolen) = 159b. *Ceratosolen* (C.) *solmsi marchali*
marshalli Grandi, 1931 (Ceratosolen) = 145. *Ceratosolen* (C.) *marshalli*
masii Grandi, 1921 (Blastophaga) = 39. *Waterstoniella masii*
masoni Saunders, 1883a (Eupristina) = 29. *Eupristina* (E.) *masoni*
mayeri Mayr, 1885 (Blastophaga) = incertae sedis (see table 1)
mayri Girault, 1939 (Pleistodontes) = 9. *Pleistodontes froggatti*
medionigra Girault, 1933 (Proceratosolen) = 15. *Pleistodontes imperialis*
medlerianus Wiebes, 1980 (Ceratosolen) = 151. *Ceratosolen* (C.) *medlerianus*
medusa Wiebes, 1993b (Blastophaga) = 86. *Blastophaga* (V.) *medusa*
megarhopalus Grandi, 1923b (Ceratosolen) = 34. *Deilagaon megarhopalum*
midotis Hill, 1969 (Liporrhopalum) = 121. *Liporrhopalum midotis*
mindanaensis Hill, 1969 (Liporrhopalum) = 118. *Liporrhopalum mindanaensis*
minuta Wiebes, 1993a (Wiebesia) = 104. *Wiebesia minuta*
moderatus Wiebes, 1963a (Ceratosolen) = 168. *Ceratosolen* (R.) *moderatus*
modesta Wiebes, 1993b (Blastophaga) = 82. *Blastophaga* (V.) *modesta*
modiglianii Grandi, 1921 (Blastophaga) = 42. *Waterstoniella modiglianii*
mumfordi Grandi, 1938 (Blastophaga) = 62. *Platyscapa innumerabilis*
mysorensis Joseph, 1953b (Ceratosolen) = 155. *Ceratosolen* (C.) *fusciceps*

nanus Wiebes, 1963a (Ceratosolen) = 146. *Ceratosolen* (C.) *nanus*
Neoceratosolens Girault, 1915b, type-species *Neoceratosolens nitens* Girault = 10. *Pleistodontes*
nitens

nervosae Hill, 1967a (Dolichoris) = 70. *Dolichoris n. nervosae*
nexilis Wiebes, 1980 (Ceratosolen) = 157. *Ceratosolen* (C.) *nexilis*
nigricaput Girault, 1927 (Pleistodontes) = 15. *Pleistodontes imperialis*
nigricorpus Girault, 1915b (*Kradibiella*) = 134. *Kradibia nigricorpus*
nigris Girault, 1925b (Pleistodontes) = 9. *Pleistodontes froggatti*
nigriscapus Girault, 1925a (Blastophaga) = ? 155. *Ceratosolen* (C.) *fusciceps*
nigriventris Girault, 1915a (Agaon) = 12. *Pleistodontes nigriventris*
nipponica Grandi, 1921 (Blastophaga) = 74. *Blastophaga* (B.) *nipponica*
nitens Girault, 1915b (*Neoceratosolens*) = 10. *Pleistodontes nitens*

niveipes Girault, 1927 (*Blastophaga*) = ? 155. *Ceratosolen* (C.) *fusciceps*
 notandus Grandi, 1917 (*Ceratosolen*) = 156. *Ceratosolen* (C.) *appendiculatus*
 notus Baker, 1913 (*Ceratosolen*) = 176. *Ceratosolen* (R.) *notus*
 nuda Wiebes, 1993a (*Wiebesia*) = 96. *Wiebesia nuda*
 nugatorius Grandi, 1952 (*Ceratosolen*) = 166. *Ceratosolen* (R.) *nugatorius*

oblita Wiebes, 1994 (*Dolichoris*) = 67b. *Dolichoris inornata oblita*
 obvenata Wiebes, 1992b (*Waterstoniella*) = 48. *Waterstoniella obvenata*
 okinawensis Ishii, 1934 (*Euprista*) = 19. *Eupristina* (*Parapristina*) *verticillata*
 ordinata Wiebes, 1993c (*Kradibia*) = 140. *Kradibia ordinata*
 orientalis Wiebes, 1963a (*Ceratosolen*) = 173. *Ceratosolen* (R.) *orientalis*

panchoi Wiebes, 1993c (*Kradibia*) = 143. *Kradibia panchoi*
Paraceratosolen Girault, 1915, type-species *Paraceratosolen latipennis* Girault = *incertae sedis* in
Kradibia (see table 1)

Parapristina Hill, 1967a, type-species *Eupristina verticillata* Waterston = 19. *Eupristina* (*Parapristina*) *verticillata*

partita Bouček, 1988 (*Wiebesia*) = 95. *Wiebesia partita*

parvifoliae Hill, 1969 (*Liporrhopalum*) = 124. *Liporrhopalum parvifoliae*

philippinensis Hill, 1969 (*Liporrhopalum*) = 108. *Liporrhopalum philippinensis*

philippinensis Wiebes, 1979a (*Dolichoris*) = 70b. *Dolichoris nervosae philippinensis*

philippinensis Wiebes, 1992a (*Eupristina*) = 25. *Eupristina* (E.) *philippinensis*

pilipes Wiebes, 1963a (*Ceratosolen*) = 178. *Ceratosolen* (R.) *pilipes*

planocrea Wiebes, 1993a (*Wiebesia*) = 90. *Wiebesia planocrea*

Platyscapha Motschoulsky, 1864, type-species *Platyscapha frontalis* = *incertae sedis* (see table 1)

plebejus Wiebes, 1963b (*Pleistodontes*) = 5. *Pleistodontes plebejus*

Pleistodontes Saunders, 1883a, type-species *Pleistodontes imperialis* = 15. *Pleistodontes imperialis*

Pleistodontes Schulz, 1906, unnecessary emendation of *Pleistodontes*

poeta Girault, 1934 (*Eupristina*) = *incertae sedis* (see table 1)

praestans Wiebes, 1963a (*Ceratosolen*) = 169. *Ceratosolen* (R.) *praestans*

Proceratosolen Girault, 1933, type-species *Proceratosolen medionigra* Girault = 15. *Pleistodontes*
imperialis

proximus Wiebes, 1990 (*Pleistodontes*) = 16. *Pleistodontes proximus*

psenes Linnaeus, 1758 (*Cynips*) = 72. *Blastophaga* (B.) *psenes*

pumilae Hill, 1967a (*Blastophaga*) = 101. *Wiebesia pumilae*

punctatae Wiebes, 1993a (*Wiebesia*) = 92. *Wiebesia punctatae*

puncticeps Mayr, 1906 (*Blastophaga*) = 78. *Blastophaga* (V.) *puncticeps*

pygmaeus Grandi, 1927b (*Ceratosolen*) = 144. *Ceratosolen* (C.) *pygmaeus*

quadriceps Mayr, 1885 (*Blastophaga*) = 56. *Platyscapha quadriceps*

quadrupes Mayr, 1885 (*Blastophaga*) = 75. *Blastophaga* (B.) *quadrupes*

queenslandica Hoffmeyer, 1928 (*Blastophaga*) = *incertae sedis* in *Kradibia* (see table 1)

ramirezi Wiebes, 1991b (*Ceratosolen*) = 187. *Ceratosolen* (S.) *ramirezi*

regalis Grandi, 1952 (*Pleistodontes*) = 10. *Pleistodontes nitens*

rennensis Wiebes, 1968 (*Pleistodontes*) = 8. *Pleistodontes rennensis*

rieki Wiebes, 1963b (*Pleistodontes*) = 1. *Pleistodontes rieki*

rigisamos Wiebes, 1991a (*Pleistodontes*) = 13. *Pleistodontes rigisamos*

Rothropus Wiebes, 1994, type-species *Ceratosolen crassitarsus* (Mayr) = 163a. *Ceratosolen* (C.) c.
crassitarsus

rutherfordi Waterston, 1920 (*Liporrhopalum*) = 110a. *Liporrhopalum* r. *rutherfordi*

saundersi Grandi, 1916c (Eupristina) = 23. *Eupristina* (E.) *saundersi*
semiauriceps Girault, 1927 (Blastophaga) = incertae sedis in *Kradibia* (see table 1)
semiruficeps Girault, 1929 (Pleistodontes) = 9. *Pleistodontes froggatti*
sensillata Wiebes, 1993b (Blastophaga) = 81. *Blastophaga* (V.) *sensillata*
sensillata Wiebes, 1993a (Wiebesia) = 105. *Wiebesia sensillata*
sessilis Hill, 1969 (Liporrhopalum) = 112. *Liporrhopalum sessilis*
setigera Wiebes, 1978 (Kradibia) = 126. *Kradibia setigera*
silvestriana Grandi, 1929b (Blastophaga) = 73. *Blastophaga* (B.) *silvestriana*
silvestrii Grandi, 1927c (Blastophaga) = 73. *Blastophaga* (B.) *silvestriana*
solitarius Wiebes, 1980 (Ceratosolen) = 162. *Ceratosolen* (C.) *solitarius*
solmsi Mayr, 1885 (Blastophaga) = 159a. *Ceratosolen* (C.) s. *solmsi*
solomonensis Wiebes, 1994 (Ceratosolen) = 172. *Ceratosolen* (R.) *solomonensis*
solomonensis Wiebes, 1980 (Waterstoniella) = 44. *Waterstoniella solomonensis*
sordidus Wiebes, 1963a (Ceratosolen) = 182. *Ceratosolen* (S.) *sordidus*
straeleni Grandi, 1932 (Blastophaga) = 40. *Waterstoniella straeleni*
Streptitus Wiebes, 1994, type-species *Ceratosolen armipes* Wiebes = 191. *Ceratosolen* (S.) *armipes*
striatus Mayr, 1906 (Ceratosolen) = 156. *Ceratosolen* (C.) *appendiculatus*
subulatae Hill, 1969 (Liporrhopalum) = 113. *Liporrhopalum subulatae*
sumatrana Grandi, 1926 (Blastophaga) = 131. *Kradibia sumatrana*
sumatrana Wiebes, 1982a (Waterstoniella) = 49. *Waterstoniella sumatrana*
sundaica Wiebes, 1966c (Blastophaga) = 51. *Waterstoniella sundaica*

tentacularis Grandi, 1926 (Blastophaga) = 122. *Liporrhopalum tentacularis*
tetamba Wiebes, 1993c (Kradibia) = 135. *Kradibia tetamba*
tjahela Abdurahiman & Joseph, 1975 (Blastophaga) = 61. *Platyscapa tjahela*

umbilicata Wiebes, 1979a (Dolichoris) = 68. *Dolichoris umbilicata*
uniglandulosae Hill, 1969 (Liporrhopalum) = 125. *Liporrhopalum uniglandulosae*

vaidi Joseph, 1954 (Blastophaga) = 72. *Blastophaga* (B.) *psenes*
valentinae Grandi, 1916a (Blastophaga) = 69. *Dolichoris valentinae*
Valisia Wiebes, 1993b, type-species *Blastophaga javana* Mayr = 85a. *Blastophaga* (V.) j. *javana*
vasculosae Hill, 1967a (Dolichoris) = 66. *Dolichoris vasculosae*
vechti Wiebes, 1963a (Ceratosolen) = 165. *Ceratosolen* (R.) *vechti*
vechti Wiebes, 1993a (Wiebesia) = 98. *Wiebesia vechti*
verticillata Waterston, 1921 (Eupristina) = 19. *Eupristina* (P.) *verticillata*
vetustus Wiebes, 1994 (Ceratosolen) = 175. *Ceratosolen* (R.) *vetustus*
vidua Wiebes, 1980 (Blastophaga) = 97. *Wiebesia vidua*
virgatae Hill, 1969 (Liporrhopalum) = 111. *Liporrhopalum virgatae*
vissali Wiebes, 1981a (Ceratosolen) = 185. *Ceratosolen* (S.) *vissali*

wakefieldi Wiebes, 1993c (Kradibia) = 132. *Kradibia wakefieldi*
wassae Wiebes, 1980 (Blastophaga) = 129. *Kradibia wassae*
Waterstoniella Grandi, 1921, type-species *Blastophaga jacobsoni* Grandi = 45. *Waterstoniella jacobsoni*

Wiebesia Bouček, 1988, type-species *Wiebesia partita* Bouček = 95. *Wiebesia partita*
williamsi Wiebes, 1993c (Kradibia) = 136. *Kradibia williamsi*
williamsi Wiebes, 1982a (Waterstoniella) = 38. *Waterstoniella williamsi*