

Citation:

Broek, A.J.P. van den, On the genital cords of *Phalangista vulpina*, in:
KNAW, Proceedings, 7, 1904-1905, Amsterdam, 1905, pp. 87-90

and take place in hyphae, growing out from the ascogonium and into which part of the contents of the ascogonium would be transformed.

In accordance with this representation I would place *Monascus* in a new order, that of the Endascineae.

Anatomy. — “*On the genital cords of Phalangista vulpina.*” By Mr. A. J. P. VAN DEN BROEK. (Communicated by Prof. L. BOLK).

(Communicated in the meeting of May 28, 1904.)

In the course of an investigation concerning the structure and development of the female genital organs of marsupials, the result of which will be more extensively published elsewhere, I had an opportunity of studying a series of transverse sections through a young female specimen taken from the marsupium of *Phalangista vulpina*, measuring 16.7 mm.

An examination of the genital cords and of the Wolffian and Mullerian ducts enclosed in them, revealed a relation differing from what is noticed in the genital cords and the above-mentioned ducts both in Monotremes and in monodelphic mammals and which appears to be connected with the peculiar anatomical details of the genital system of the marsupials.

In following up the genital cords, after they have issued from

the tissue of the primitive kidney, in a caudal direction, it is noticed that the cords from both sides approach each other, unite into a single cord along a short distance, then separate again and are continued in a caudo-lateral direction as far as the wall of the uro-genital sinus. In this manner a short bridge is formed, connecting the two genital cords. On reconstructing the successive cross-sections, we obtain what is schematically represented in fig. 1, where the genital apparatus is represented as seen from

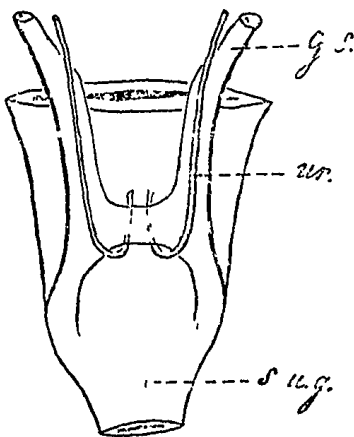


Fig. 1. Genital cords and ureters of a marsupial young one of *Phalangista vulpina*, seen from the dorsal side. The course of the ureters is very peculiar. After having passed behind the connecting bridge just-mentioned which connects the two genital cords, they bend round the caudal edge of this

and, continuing their course again in a cranial direction, pierce the posterior wall of the bladder in an oblique, caudo-cranial direction and open into this organ on two adjacent papillae with ostia, which are turned towards the fundus of the bladder. It is very remarkable that the course of the ureters at this stage already agrees completely with the adult condition. The question as to the cause of the hook-shaped bend in the ureters of marsupials, which has already long been known, and which, in my opinion, must exactly be sought in the above-mentioned bridge between the two genital cords, will be briefly discussed later on.

With regard to the mutual relation of the Wolffian and Mullerian ducts, we have to offer the following remarks. At the level of the caudal pole of the primitive kidney, the Mullerian duct lies ventrally and a little laterally of the Wolffian. In a caudal direction this relation is changed, the Mullerian duct being gradually shifted towards the ventro-medial side of the Wolffian duct. This topographical relation exists until near the place where they enter the uro-genital sinus. In their course they follow the genital cords and, in doing so, bend medially, then caudo-laterally and finally, in the last part of their course, show very peculiar characteristics.

The Mullerian duct suddenly bends ventrally and medially, describes a caudally slightly convex arc and then opens into the uro-genital sinus.

The Wolffian duct, at first situated dorso-laterally of that of MÜLLER, describes like this latter in its terminal portion a caudally convex arc and so becomes placed caudally of the Mullerian duct. Next it bends medially and lays itself against the medial wall of the Mullerian duct, after which it opens into the uro-genital sinus, cranially of the latter.

Hence it appears that the Wolffian duct in the last part of its course describes almost a complete spiral revolution round the Mullerian being successively dorso-lateral, caudal (dorsal), medial and cranial. This course I have schematically represented in figure 2, seen from the front and somewhat from above. The bladder has in the figure been imagined cut off exactly at the level where the Wolffian duct enters.

F. KEIBEL¹⁾ has suggested that in marsupials the ureters enter into communication with the bladder already at the stage in which they appear as sprouts of the dorso-medial wall of the Wolffian

¹⁾ F. KEIBEL. Zur Entwicklungsgeschichte des menschlichen Uro-genitalapparates Archiv für Anatomie und Entwicklungsgeschichte. 1896. p. 55.

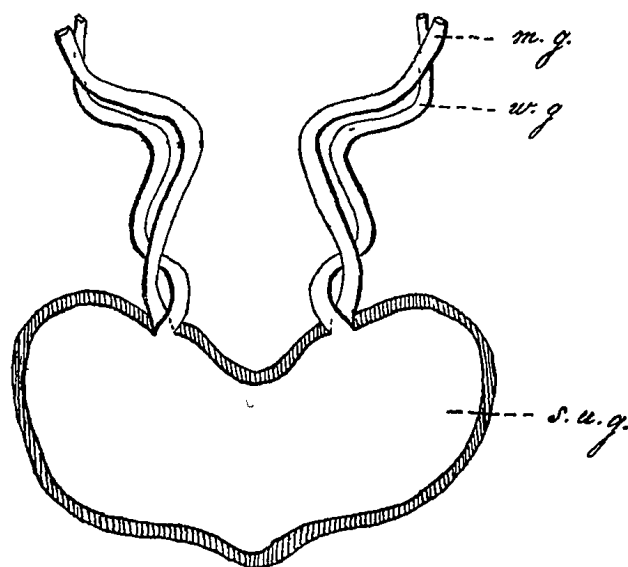


Fig. 2. Course of Wolffian and Müllerian ducts in a marsupial young one of *Phalangista vulpina*.

w. g. Wolffian duct. *m. g.* Müllerian duct. *s. u. g.* Sizus uro-genitalis.

duct i. e. at a stage, which occurs as a temporary condition in the monodelphic mammals, at any rate in so far as these have been examined, while in the latter they move, before the terminal piece of the Wolffian duct has been incorporated in the wall of the bladder, towards the dorso-lateral wall of that passage, so that in the adult condition they are found laterally of the Wolffian and the Müllerian duct. Although I have not been able to test this theoretical consideration by observations of my own, yet it seems to me that besides the cause, postulated by KEIBEL for the course of the ureters medially of the Müllerian duct, the spiral course of the Wolffian duct and the consequent torsion of this canal, must certainly have an influence and probably a not inconsiderable one on the origin of this course.

A notable fact in this respect is that in male marsupials a masculine uterus is absent, that no remnants have been found of the caudal terminals of the Müllerian ducts, as is expressly stated by WEBER¹⁾ and DISSELHORST²⁾. Only *Hypsiprymnus* would be an exception to this, according to OWEN.

At the stage, observed by me, the terminals of the Müllerian

¹⁾ M. WEBER. Die Säugetiere. Jena. G. FISCHER 1904.

²⁾ R. DISSELHORST. Ausführapparat und Anhangsdrüsen der männlichen Geschlechtsorganen in: Lehrbuch der vergleichend mikroskopischen Anatomie der Wirbeltiere, herausgegeben von A. OPPEL. 4er Teil.

ducts are lateral (and caudal) of the Wolffian. Now it is obvious that if my observation holds for marsupials generally, no masculine uterus can arise, because between the two Mullerian ducts those of WOLFF are found. Eventual remnants of Mullerian ducts will have to be sought for in the male sex laterally of the terminal opening of the vasa deferentia. I have not yet been able to make observations of my own concerning this point.

As I have already stated, the ureters, at the stage I observed, lie at the medial side of the genital cords. Only those parts of the female genital apparatus of the marsupials which lie at the lateral side of the ureters, can, as I shall try to prove more fully elsewhere, have their homologa in the female genital system of the monodelphic mammals. The vaginal caecal sac developing phylogenetically in the marsupial group, has no homologon in the female sexual organ of the Monodelphia.

Finally, I think, my observation contains an explanation of the peculiar hook-shaped course of the terminals of the ureters of marsupials.

Either as a consequence of the spiral course of the Wolffian ducts, or for some other cause, the ureters at a certain stage of development lie medially of the Wolffian ducts (and of the genital cords) in a dorso-cranial direction towards the primitive kidney.

Marsupials possess a milk-nutrition (intestinal) at such an early stage of development as is known of no other mammal. This milk-nutrition will have a great influence on the development of the bladder which I found as a very voluminous organ in the marsupial young one described, as well as in other specimens (*Didelphis*) examined by me. With the rapid growth of the bladder the orifices of the ureters are at the same time displaced cranially. The above-mentioned cross-connection between the two genital cords is an obstacle to the cranial displacement of the ureters, the natural consequence of which is that the ureters have always to go round the caudal end of this bridge, while their orifices are further displaced cranially, the result of which is the pronounced hook-shaped course.

Zoology. — “*An interesting Case of Reversion.*” By Dr. P. P. C. HOEK.

Pollicipes and *Scalpellum* are two nearly related genera of pedunculate Cirripedes mainly differing from one another, by the one having in its capitulum a restricted number of valves (*Scalpellum*) and by the other having a much larger number of such calcareous parts (*Pollicipes*).