

Bacteriology. — “*The splitting of lipoids by Bacteria.*” (First communication.) By G. M. KRAAY and L. K. WOLFF. (Communicated by Prof. C. EYKMAN.)

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The splitting of fats by bacteria has often been investigated and the behaviour of the lipases has properly been recorded. However no literature dealing with the splitting of lipoides by *bacteria* is known to us. Also in general physiological chemistry little information is given concerning the splitting of lipoids (lecithin) by enzymes, apart from the beautiful researches by DELEZENNE and FOURNEAU about the splitting of lecithin by serpent venom. In many respects we thought it of interest to investigate the action of bacteria on lipoids, the formation of strong blood poisons being possible, as DELEZENNE and FOURNEAU found as the result of the action of serpent venom on lecithin. We first tried to find out whether some fat-splitting bacteria are able to split lecithin and further if there exist among the non-fat-splitters some that will split lecithin.

Considering our working method this; we mostly used plates with lecithin agar obtained by shaking up a small quantity of lecithin and ordinary nutrient agar (about 0.5 gram per 100 gr.) at about 50° C. If the lecithin is affected an area is formed all around the streaks of inoculation.

It appears on microscopical examination that this area contains per surface unit more grains than are to be found anywhere else in the culture medium. Plates with yolk of egg cannot be used; the fat contents of yolk of egg cannot be used; the fat contents of yolk of egg makes one unable to distinguish lecithin-splitters from fat-splitters. Our results are summarized in the following table. Our conclusions based upon this table are: there exists fat-splitting bacteria unable to affect lecithin; lecithin-splitting bacteria unable to act upon fat, bacteria unable to act upon both fat and lecithin, and bacteria able to act upon both. (See table on p. 437).

The latter bacillus, a very strong lecithin splitter, but quite unable to split fat has been isolated by us from brackish water; this bacillus resembles much the *bac. piscium pyogenes* described by MATZUSCHITA.

	Splitting of	
	fat	lecithin
bact. typhi	—	—
„ coli	—	—
„ dysenteriae Shiga	—	—
„ prodigiosus	+	+
„ pyocyaneus	+	+
„ fluor. liquef.	+	+
„ proteus ¹⁾	—	—
staphylocc. pyogenes	+	—
spir. El Tor.	—	+
„ Dunbar	—	+
„ Cholerae	—	—
Bac. piscium pyogenes?	—	+

We have not yet resolved the question, how the lecithin is broken down; we can only say that as a result of the splitting by the here above mentioned bacteria no hemolysines are formed. We could not find a link between hemolysis by bacteria and lipolysis or lipoidolysis; we found a staphylocc. which had lost its hemolytic property but not its lipolytic character and on the other hand one of our colistrains behaved hemolytic but was inactive on fat or lecithin, our bac. piscium pyogenes splitted lecithin but had no hemolytic action.

No fatty acids could be titrated in broth containing splitted lecithin (B. piscium prog.). This result is in agreement with observations on the non-hemolytic action of the splitted lecithin, because if lecithin is splitted in such a manner that (unsaturated) fatty acids are formed, a hemolytic action must take place.

We still want to mention that the power of splitting of the bacteria in the table, has been tried on cholesterol and lanoline, the latter was affected only by a staph. pyog., the former only by B. pyocyaneus.

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¹⁾ One of our proteus strains affected fat.