Mosquito Eggs XXIV

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Genus *Deinocerites* Theobald

No eggs of this genus have been collected in nature. It has always been assumed that they are laid on the sides of the crabholes in which the various species breed. Laboratory observations suggest that this is correct. As against this suggestions that aestivation occurs in the egg stage [226, 325] are contradicted by laboratory studies. Available information derived from such studies is summarized below. In addition Mr. Charles Hansen has kindly sent me eggs of *Deinocerites cancer* for fuller description and Jim Haeger has supplemented these with further information on laboratory bionomics.

Deinocerites mathesoni Belkin & Hogue

Fisk[326] gives a brief description of the eggs and oviposition behaviour under the name *D. spanius* (Dyar & Knab). The species concerned was later recognized as distinct by Belkin & Hogue[327] (and see Adames[328]). Fisk found three submerged eggs, which failed to hatch, and others above the waterline. The latter when allowed to dry became desiccated and shrivelled. None hatched though a few larvae, presumably from other, undetected eggs, later appeared. The eggs are described as amber, light in colour, ovoid, about 0.4mm. in length and resembling hens' eggs in shape.

Deinocerites pseudes Dyar & Knab

This species was colonized by Galindo[329]. A plaster of paris cylinder with the bottom two inches immersed in water, intended to simulate a crabhole, was provided as oviposition site. Eggs were laid mainly on the inside but also to some extent on the outside. They are described as laid singly, black in colour, elliptical in shape and very similar in structure to those of *Culex*. They were laid 5-6 days after a bloodmeal, "loosely attached to the surface of the plaster, from a few millimeters to several inches above the surface of the water, most of them being concentrated within 2 inches of it." Hatching occurred, without immersion, from 48 to 60 hours after deposition, the larvae either dropping or sliding down to the water below. Further work, relating to the possibility of aestivation in the egg, was projected but the results have not been published. Peyton et al.[325] suggest that egg diapause occurs in Texas during the colder part of the year.

Deinocerites cancer Theobald

Haeger & Phinizee[330], working in Florida, flooded soil from the walls of crabholes to test for the presence of eggs of *Aedes taeniorhynchus*. The only larvae obtained were those of the present species which they then colonized. Females were found to lay autogenous egg batches with an average of 104 eggs in each. In some, but not all, cases a second batch was produced after feeding on human blood or crab haemolymph. The eggs are described as bullet shaped with the head at the blunt end. The inner and outer chorion are said to be grayish-brown and very transparent. Eggs 2-3 days old hatched two or three minutes after immersion but would also hatch without immersion on a moist substrate. Jim Haeger has since detailed (in litt.) some further observations made with the aid of an artificial crabhole constructed of plexiglass and lined with cheesecloth.

Under these conditions eggs are laid 2-15 cm. above the waterline with the majority at 12-15 cm. The anterior end did not always point downwards. On hatching the larvae immediately crawled down to the water employing an undulating, peristaltic movement resembling that of housefly maggots. *Aedes aegypti* larvae placed in a similar position were unable to reach the water. Gentry et al.[331] also colonized this species using a strain from Grand Cayman and substituting an inverted clay flower pot for the plexiglas cylinder. Eggs were laid both on the inside and on the outside of the pot. They were found to be killed by drying but to hatch when kept moist or submerged. Hatching took place 3 days after deposition at 80° F. The eggs are said to resemble superficially those of *Aedes* but on closer examination to be similar to individual *Culex* eggs. They were light in colour when first deposited but later turned dark brown or black. Autogeny seems to have been less pronounced than in the Florida strain.

The following description and figure (Fig. 1) are based on unhatched eggs sent me from Vero Beach. The shape is narrowly ovoid with the anterior end markedly broader and blunter than the posterior and the dorsal surface more strongly curved than the ventral. The ventral surface is, in some cases, distinctly concave and there is considerable variation in size (Fig. 1a). The inner chorion is pale brown in colour. The outer is colourless except for the "deck" (see below) which is pale brown. The anterior end bears a rudimentary corolla recalling that found in some *Culex* and *Culiseta*[332] but smaller (Fig. 1b). Associated with this is the usual sclerotized micropylar disc, very inconspicuous in side view. The general surface is covered with minute papillae of the same order of size as those seen in, e.g., *Culiseta annulata*[332]. Over parts of the surface these can be seen to assume a faint reticular pattern (Fig. 1c). The upper (ventral) surface is marked by two parallel longitudinal rows of enlarged papillae. The area of chorion enclosed by these is pale brown in colour. Some of the papillae with which the enclosed area is ornamented are enlarged, others not. They are reduced in number, compared to those of the general surface, to an extent which varies from egg to egg. In some cases they are linked by scattered strands of papillar material (Fig. 1d).

In my opinion this structure is most probably homologous with the deck and frill of floating eggs such as those of *Mimomyia*[219] and *Anopheles*[183,184]. Derivation of the present genus from a swamp-breeding ancestor with eggs of this type seems quite feasible. It is not difficult to see how the appropriate selection pressures could arise under conditions of intermediate flooding with crabholes at times the only available oviposition sites. Adames[328] speculates that *Deinocerites* may have separated at an early stage in evolution from the stock which gave rise to the genus *Culex*. There certainly appears to be no difficulty in deriving the egg of, e.g., *Culex pipiens* from those described here by further suppression of the "deck" and enlargement of the corolla. Very few *Culex* eggs have been described, however, and there is much variation within the genus[127]. I now have eggs of 8 different subgenera and shall hope to describe these in later papers in this series.

References

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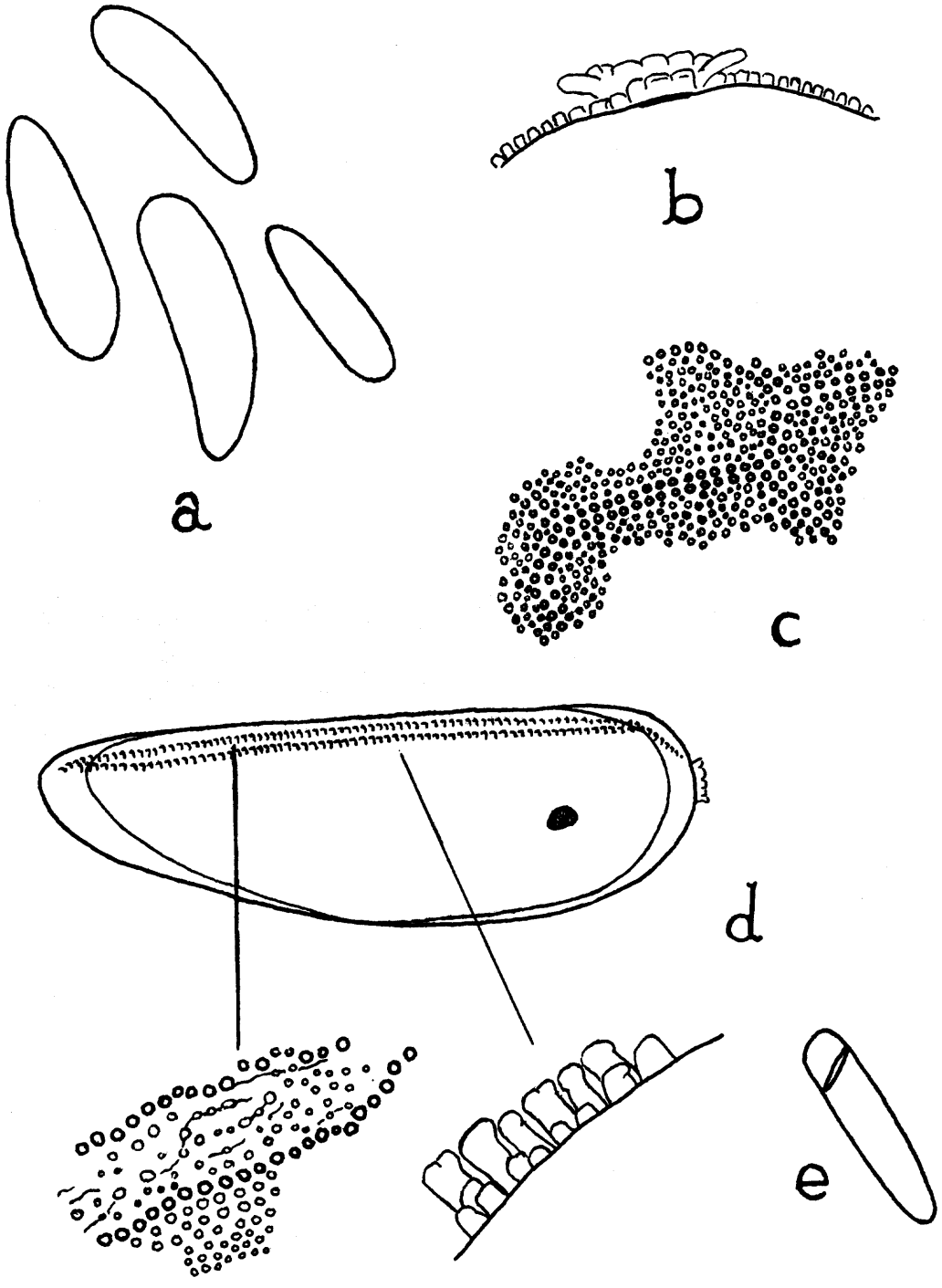

Fig. 1. *Deinocerites cancer*. a. Eggs in outline showing variations in size and shape, b. Apical corolla, c. Detail of outer chorionic ornamentation, d. Whole egg from side showing position of "deck" and details of its ornamentation in plane and lateral view, e. Mode of dehiscence (after Haeger).