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EXPERIMENTAL REARING OF *CHAGASIA BATHANA* (DYAR) USING INDUCED MATING, AND DESCRIPTION OF THE EGG STAGE (DIPTERA: CULICIDAE)[1]

The genus *Chagasia*, comprised of 4 species in South America, is represented in Middle America solely by *C. bathana* (Stone et al., 1959, Thomas Say Found., Vol. VI, 358 p.; Stone, 1963, Proc. Ent. Soc. Wash. **65:** 117–40). In Panama, *C. bathana*, although not commonly obtained in biting collections, is predominantly an arboreal feeder and is attracted to humans (Galindo et al., 1950, Amer. J. Trop. Med. **30:** 533–74; Trapido & Galindo, 1957, Amer. J. Trop. Med. Hyg. **6:** 114–44). Laboratory observations on the biology of this anopheline (and other *Chagasia*) thus far have not been reported. Here we present our findings on the development and rearing of *C. bathana*, with induced copulation as a method to produce laboratory populations; the egg stage, previously unknown, is described and figured.

During related investigations in 1970–1972 with *Anopheles* (*Kerteszia*) *neivai* (Baerg & Boreham, 1974, J. Med. Ent. **11:** 629–30), *C. bathana* were collected from study areas in Panama (Altos de Pacora) and the Canal Zone (Mojinga Swamp). Few adults were captured at these field stations; however, large numbers of immatures were found seasonally in the forest streams of Mojinga Swamp and provided the primary source of our experimental material. Except where indicated, insectary techniques used were as given by Baerg & Boreham (1974, loc. cit.).

Observations. Adults characteristically were vigorous, with females living for as long as 65 days at room temperature (23°C). The mosquitoes were not pooled for cage colonization trials as only limited numbers were available, and since successful induced mating was accomplished with relative ease. This process was facilitated with blood-engorged and gravid specimens due to extension of their genitalia. Copulation with decapitated males persisted from 35 sec. to more than 8 min. (avg. 2 min.). Strong rhythmic contractions of the male claspers began soon after coupling and continued until the female was released. The number of contractions ranged from 4 to 510 (avg. 101) in 94 individuals. Several females were mated with each active male, and contraction intervals were longer with repeated matings. Sperm transfer was achieved in 75 of 100 females.

The initial blood meal was taken from a human source within 9 days after emergence. Christophers' Stages I and II were demonstrated in ovarian dissections of mated and unmated females after 1 or more feedings. Only 10–15% of the specimens produced eggs after the 1st engorgement, while complete oogenesis was stimulated in the majority (80%) of the remaining individuals after the 2nd. As many as 7 full blood meals were taken, with some females yielding eggs after each feeding. Christophers' Stage V was normally achieved in 4–5 days. Egg laying, voluntary or induced by dealation, occurred 4–7 days after taking blood. Resorption of mature follicles was common in those females that resisted oviposition. Some fecund specimens deposited 150 or more eggs per cycle whereas the average approximated 100. The incubation period for eggs on water was 6–7 days, with hatch varying from 24–100%. It was noted that a few embryos survived desiccation during incubation in eggs on filter paper that dried prior to flooding. Scattered hatching then was obtained through the 12th day by periodic water agitation.

Enameled pans containing tap water with emergent grasses were utilized for larval rearing. A powdered cereal-yeast preparation was added 1 or more times daily. The larvae closely aligned themselves at the meniscus along the sides of the pan and plant surfaces, characteristic of their behavior in the moving water of their natural habitat. There was high mortality of 1st and 2nd instars of *C. bathana* during the 2 weeks following hatch, although rearing conditions were closely monitored. Survival to 3rd instar, among the thousands of specimens reared, usually was less than 50%. Viability improved greatly thereafter. Completion of larval growth was achieved in 17–31 days, with peak pupal yields during the 4th week. Adults emerged 2 days after pupation.

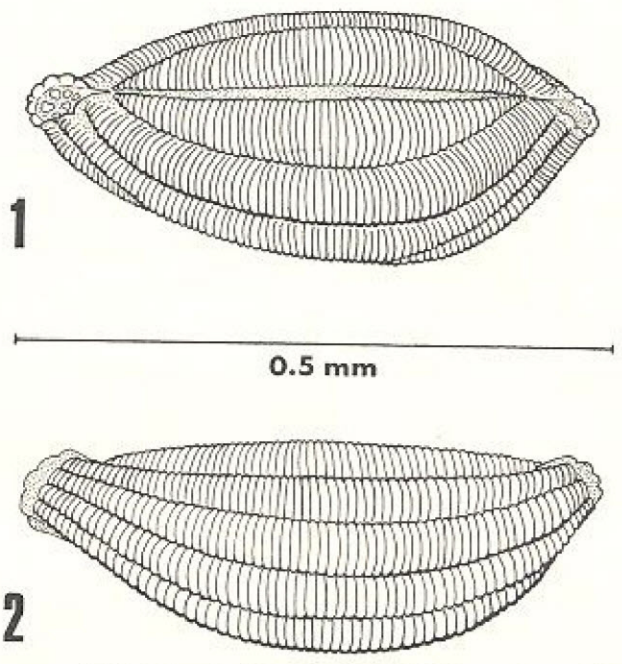

FIG. 1–2. *Chagasia bathana* egg. (1) Oblique view. (2) Lateral view.

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Description of egg stage. A taxonomic review of *C. bathana* (Dyar) can be found in Stone et al. (1959, loc. cit.). The following description is of ova deposited by adults reared from larvae collected at Mojinga Swamp, approximately 10 km NW of Gatun, Canal Zone, the type-locality for *C. bathana*.

(FIG. 1–2). Measurements based on 12 specimens. Egg convex dorsally, slightly convex ventrally; surrounded by 10 parallel longitudinal floats having numerous transverse ridges. Egg length 463–538 μ ($\bar{x} = 493$ μ); width, including floats, 175–213 μ ($\bar{x} = 195$ μ). Eight floats extending pole to pole, length 375–475 μ ($\bar{x} = 433$ μ), dorsomedially separated by narrow irregularly-surfaced band of exochorion; 2 shorter ventromedial floats, length 175–400 μ ($\bar{x} = 333$ μ), nearly contiguous. Poles prominent, rounded, enclosed by terminus of float tips forming distinct collar at larger anterior pole; cellular appearance in micropylar region, diameter of entire polar structure approximately 60 μ. Color grayish in fresh material, light brown in formalin-preserved specimens.

Comments. There is a general similarity of the egg of *C. bathana* to those of *C. fajardoi* and *C. rozeboomi* which also have multiple floats with numerous transverse ridges surrounding the egg in addition to the prominent polar features (Causey et al., 1945, J. Nat. Mal. Soc. **4**: 341–50).

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