NOTES ON THE BIOLOGY OF TWO SPECIES OF CRYPHULA (HEMIPTERA: LYGAEIDAE) IN TRINIDAD WITH THE DESCRIPTION OF A NEW SPECIES\textsuperscript{1,2}

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Abstract

* Cryphula * is 1st reported as occurring in Trinidad. Two species, * affinis* (Dist.) and * bennetti* Baranowski and Slater, n. sp., are found in Trinidad, both present as breeding populations under * Stachytiarpheuta jamaicensis* (L.) Vahl. * Cryphula bennetti* Baranowski and Slater, n. sp., is figured and nymphs of both species are described and figured. A discussion of wing polymorphism and habitat differentiation is included.

While collecting Lygaeidae in the West Indies in 1973, 2 species of * Cryphula * were found at Waller Field, Trinidad, under * Stachytiarpheuta jamaicensis* (L.) Vahl. Since 1 of these proved to be an undescribed species and as there appeared to be some habitat differentiation, subsequent trips were made to the same area to associate immature stages and ascertain more precisely the interspecific ecological relationships between the 2 species.

* Cryphula bennetti* Baranowski and Slater, NEW SPECIES

![Fig. 1](image)

Body stoutly elliptical. Coloration dark chocolate brown to black as follows: head, anterior pronotal lobe, mesal portion of posterior lobe, humeral angles, scutellum, marginal and median claval stripes coinciding with 3 rows of punctures, an irregular transverse fascia across corium at level of distal 1/2 of claval commissure which reaches mesal to media, longitudinal stripes on corium along rows of punctures. Almost entire pleural and sternal surfaces and tylus reddish brown. Corium ground color, mesal portion of anterior pronotal margin and a large triangular patch laterally on posterior pronotal lobe ivory white. Apex of scutellum faintly ivory white, hemelytra pale yellow to white with dark markings as noted above giving a striped appearance. Membrane translucent white with central area and base suffused with brown. Dorsal 1/2 of posterior lobe of propleuron and greater part of posterior lobe of metapleuron white and strongly contrasting with chocolate brown color of remainder of pleuron. All appendages yellowish brown with coxae, trochanters and fore femora darker. Body polished, nearly glabrous bearing only minute, inconspicuous, somewhat sericeous hairs. Anterior pronotal lobe nearly impunctate, rather coarsely punctate mesally.

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Fig. 1. *Cryphula bennetti* Baranowski and Slater, new species, dorsal view.

(in black area) on posterior lobe, scutellar punctures obsolete but with a distinct lateral row, those on clavus forming 3 distinct rows.

Body shape conventional for species of *Cryphula* with strongly convex vertex, narrowly explanate pronotal and strongly explanate corial lateral margins, obsolete transverse pronotal impression, straight apical corial margins, elongate nearly straight metathoracic scent gland auricle and a dorso-laterally truncate margin to evaporative area. Posterior pronotal margin distinctly concave. Scutellum completely flat; fore femora strongly incrassate armed below on distal 1/3 with 3 short sharp spines with 2 or 3 elongate "hair-spines" proximad. Length head 0.52 (all measurements are
in mm), width 0.72, interocular space 0.46; length pronotum 0.68, width 1.18; length scutellum 0.66, width 0.66; distance apex clavus-apex corium 0.58, distance apex corium-apex membrane 0.46; labium barely attaining anterior margin of metacoxae, 1st segment not reaching base of head, labial segments I 0.50, II 0.40, III 0.40, IV 0.30, long respectively. Antennae stout, yellowish brown with segments 3 and 4 darker, segments 2-3 slightly enlarged from proximal to distal ends, antennal segments I 0.28, II 0.50, III 0.48, IV 0.56 long respectively; total length 3.20.


PARATYPES: TRINIDAD: 5 δ, 8 ♀ same data as holotype; 11 δ, 14 ♀ Waller Field, 5 mi E Arima, 14-VI-1973 (R. M. Baranowski, V. Picchi, F. O'Rourke, J. A. Slater); 1 δ Blanchisseuse Rd. 2.5 mi N Arima 14-VI-1973 (R. M. Baranowski, V. Picchi, F. O'Rourke, J. A. Slater); 3 ♀ 3 mi E Arima (R. M. Baranowski, V. Picchi, F. O'Rourke, J. A. Slater); 5 δ, 4 ♀ Waller Field 22-III-1975 (R. M. Baranowski) 5 δ, 8 ♀ same 22-VI-1977. In National Museum of Natural History, Florida State Collection of Arthropods. American Museum Natural History, Commonwealth Institute of Biological Control, R. M. Baranowski and J. A. Slater collections.

We are pleased to name this species for Dr. F. D. Bennett, Director, Commonwealth Institute of Biological Control, Trinidad for his generous assistance on many collecting trips.

*Cryptola bennetti* will key in Scudder (1962) to *fasciata* (Distant) as it lacks pale spots on the scutellum and has a conspicuous dark transverse corial fascia. *Bennetti* is readily distinguishable from *fasciata* in having only 3 discrete rows of claval punctures (except on the anterior 1/4 of the clavus) whereas *fasciata* has 4 distinct rows, and by lacking a large distinct dark apical corial macula. In all of the specimens of *fasciata* that we have examined the posterior pronotal lobe is pale mesally with a dark stripe running to the posterior margin on either side of the median line, whereas in *bennetti* the entire mesal 1/3 of the pronotal lobe is dark, the area narrowing evenly from the transverse impression. *Fasciata* has the posterior lobe of the metapleuron castaneous and unicolorous with most of the rest of the pleural surface which is in striking contrast to the white posterior lobe of *bennetti*.

In *fasciata* the membrane ground color is gray or fumoso with pale veine whereas in *bennetti* only the mesal and basal areas are dark.

It is interesting that *C. affinis* which occurs with *bennetti* on Trinidad resembles the latter in many ways such as the lack of an apical dark corial macula and the presence of a white posterior metapleural lobe. However, *affinis* always has 3 prominent, pale, scutellar spots and surprisingly similar posterior pronotal lobe coloration to that of *fasciata*. One might expect this latter coloration to be variable, but it always shows pale coloration mesally along the posterior margin in *affinis* and never in *bennetti*. Furthermore, the degree, proportion, and nature of the membrane reduction differs considerably in the 2 Trinidad species (see below).

In *C. bennetti* 87% of the specimens are coleopteroid (Slater 1975) (20 of 22 males and 23 of 30 females). In these specimens the claval and corium are fused, the resultant sclerotized wings meet evenly along the midline, and the membrane is reduced to a narrow rim along the apical corial margin. The hind wings in these Coleopters are reduced to a minute flap.
In C. affinis most specimens of both sexes show a very slight shortening and narrowing of the membrane of the forewing (submacroperty of Slater 1975). The hind wing is large in both sexes but somewhat shorter and narrower in the males examined. It seems probable that all specimens of affinis are capable of flight.

Slater (1977) believes that the development of flightlessness in lygaeid bugs is primarily due to stability of the habitat and that in ground living (geophilic) lygaeids given a similar habitat, those taxa that have been in the area the longest will show the greatest degree of wing modification.

In the case of these 2 species of Cryptula living on the same host plant, in the same area, it is striking that bennetti which inhabits the more xeric habitat is predominantly flightless. This is at least indicative of it being the “older” species in the area. In as far as known, bennetti is endemic to Trinidad whereas affinis is widespread in the neotropics. Cryptula bennetti can be tentatively viewed as an old endemic element of the Arima savannah area of Trinidad and affinis as either a relatively recent introduction or more likely, a widespread species that is less well adapted than is bennetti to living in the most xeric parts of the Waller Field habitat.

**Description of bennetti nymphs**

Fifth instar nymph: (Waller Field, Trinidad) (in alcohol), Fig. 2.

Head, pronotum, propleuron, 4th antennal segment, medial portion of abdominal sternites 4-7 brown; wing pads yellowish with tip of prescutellum and inner margin of pads darker; abdomen orange brown with posterolateral margins of tergites, scent gland margins, and median portion of tergites 8, 9 darker; legs and antennae straw colored with median portion of femora slightly darker; head length 0.60, width 0.64, interocular space 0.44; pronotum length 0.52, width 0.84; wing pad length 0.80; abdomen length 1.20; labial segments I 0.44, II 0.40, III 0.28, IV 0.24 long respectively, antennal segments I 0.28, II 0.44, III 0.40, IV 0.52 long respectively; total length 2.88.

Fourth instar nymph (collecting site as above).

General form and color as in preceding; head length 0.42, width 0.56, interocular space 0.40; pronotum length 0.40, width 0.72; wing pad length 0.40; abdomen length 1.16; labial segments I 0.34, II 0.30, III 0.28, IV 0.26 long, respectively; antennal segments I 0.20, II 0.36, III 0.32, IV 0.44 long, respectively; total length 2.24.

Third instar nymph (as above).

General form and color as in preceding; pronotum somewhat darker than head; abdominal tergites 3, 4, 6, 7, 8, 9 reddish brown except for anterolateral pale areas, tergites 2, 5 pale except for reddish brown area just laterad of midline of 2 and laterad of scent gland opening on 5; 4th antennal segment, intersegmental areas reddish; head length 0.38, width 0.48, interocular space 0.36; pronotum length 0.30, width 0.56; wing pad length 0.20; abdomen length 0.94; labial segments I 0.26, II 0.26, III 0.22, IV 0.24 long, respectively; antennal segments I 0.18, II 0.26, III 0.24, IV 0.40 long, respectively; total length 1.76.
Fig. 2. _Cryptula bennetti_ Baranowski and Slater, new species, fifth instar nymph, dorsal view.

Second instar nymph (as above).

Similar in form and color to preceding; head length 0.36, width 0.38, interocular space 0.20; pronotum length 0.22, width 0.46; abdomen length 0.78; labial segments I 0.22, II 0.20, III 0.16, IV 0.18 long, respectively; total length 1.40.

First instar nymph (as above).

Considerably paler than 2nd instar, mostly straw colored, but reddish
brown areas on abdominal segments of 2nd instar pinkish here; head length 0.24, width 0.32, interocular space 0.22; pronotum length 0.20, width 0.40; abdomen length 0.52; labial segments I 0.16, II 0.14, III 0.12, IV 0.22 long, respectively; antennal segments I 0.10, II 0.12, III 0.14, IV 0.30 long, respectively; total length 1.20.

Egg (as above).

Elongate oval in shape with 4-6 short blunt micropylar processes arranged in a circle at the anterior end; pearl white in color; length 0.92, width 0.46.

Description of affinis nymphs

Fifth instar nymph (Waller Field, Trinidad) (in alcohol), Fig. 3.

Head light brown, pronotum brown with reddish rectangular outline within margins, 2 pale spots on either side of pale spot on midline of posterior margin; wing pads brownish with pale rays radiating from large anterior pale area; abdomen reddish brown with antero-lateral margin of tergites pale yellow, scent gland margins brown; legs, antennal segments 1,2, proximal 1/2 of 3 straw colored, distal 1/2 of antennal segment 3 and all of 4 brown; head length 0.52, width 0.64, interocular space 0.40; pronotum length 0.48, width 0.96; wing pad length 0.88; abdomen length 0.88; labial segments I 0.40, II 0.40, III 0.36, IV 0.32 long respectively; antennal segments I 0.28, II 0.36, III 0.36, IV 0.48 long, respectively; total length 3.52.

Fourth instar nymph (as above).

General form and color as in preceding; head brown, pronotum brownish except for pale postero-lateral corners, wing pads brown with 4 pale longitudinal rays; abdomen reddish brown with a pale central area on tergite 4 and pale antero-lateral margins on 5-8; only distal tip of antennal segment 3 and all of segment 4 brown; head length 0.40, width 0.58, interocular space 0.40; pronotum length 0.40, width 0.76; wing pad length 0.46; abdomen length 1.28; labial segments I 0.34, II 0.30, III 0.38, IV 0.26 long, respectively; antennal segments I 0.24, II 0.32, III 0.32, IV 0.46 long, respectively; total length 2.44.

Third instar nymph (as above).

General form and color as in preceding; pronotum brown, only postero-lateral margins pale; mesonotum with 3 pale rays on either side of midline; head length 0.32, width 0.46, interocular space 0.34; pronotum length 0.28, width 0.62; wing pad length 0.22; abdomen length 0.96; labial segments I 0.30, II 0.28, III 0.24, IV 0.20 long, respectively; antennal segments I 0.16, II 0.26, III 0.22, IV 0.38 long, respectively; total length 1.84.

Second instar nymph (as above).

Form as in preceding; head, thorax light brown; abdomen paler except for scent gland margins; legs, antennae straw colored; head length 0.30, width 0.40, interocular space 0.28; pronotum length 0.18, width 0.42; abdomen length 0.50; labial segments I 0.20, II 0.18, III 0.16, IV 0.16 long, re-
Fig. 3. Cryphula affinis (Dist.), fifth instar nymph, dorsal view.

respectively; antennal segments I 0.10, II 0.18, III 0.16, IV 0.30 long, respectively; total length 1.20.

First instar nymph (as above).

General color pale yellowish with head, thorax pale brown; head length 0.26, width 0.30, interocular space 0.22; pronotum length 0.16, width 0.36; abdomen length 0.50; labial segments I 0.16, II 0.14, III 0.14, IV 0.14 long, respectively; antennal segments I 0.08, II 0.10, III 0.10, IV 0.22 long, respectively; total length 1.19.
Egg (as above).

Similar in size and shape to that of *C. bennetti*.

**Biology**

Both *C. affinis* and *bennetti* have been collected only under *Stackytarphieta jamaicensis* (Linnaeus) Vahl, a common invader of disturbed habitats which flowers and produces seed the year round. We have observed and made collections of both species on collecting trips in 1973, 1975, and 1977. All of our material was collected at Waller Field, a former airfield. Here *S. jamaicensis* is found growing out of cracks in the concrete landing strips (where succession is certain to be extremely slow), along the edges and to a lesser degree into the surrounding fields between the actual strip and the marshy areas that begin a few yards from the airstrip.

The habitat under the plants growing out of the cracks is considerably drier than under the plants growing away from the concrete strips. Since the strips are somewhat elevated over the natural terrain, the habitat under the plants along the edge ranges from very dry to moist. We have collected only *bennetti* under the plants on the strips and under the plants along the edges in obviously dry conditions. *Cryphula affinis* is found under plants in relatively moist situations. In only 1 instance, and that was under a small group of plants growing at the edge where there was a considerable range in microhabitat, did we find both species together.

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**Literature Cited**


