

## BAETISCA ROGERSI, A NEW MAYFLY FROM NORTHERN FLORIDA\*

BY LEWIS BERNER,  
Gainesville, Florida

The remarkable nymphs of *Baetisca rogersi* were first found in the streams of northwest Florida in April, 1938. Several other nymphs were collected in June and one in November, but it was not until March of the following year that I was successful in securing adults. The nymphs are very hardy; those collected March 17 withstood an automobile trip of nearly three hundred miles and confinement in a small jar for almost three days with only a few casualties. In the laboratory at Gainesville, one male and two female imagoes were reared from the survivors.

The nymphs of *B. rogersi* usually inhabit the gravel beds in sand-bottom creeks. Dr. Traver's description of the habits of *B. thompsonae*† indicates that the immatures of the two species occupy similar habitats. The great development of the lateral spines in the nymphs of these two species is probably correlated with the ability to maintain themselves in moderately to swiftly flowing water. The *Baetisca* nymphs, with their short, rotund bodies, would certainly find it rather difficult to retain their position in the gravel, even though using their claws for clinging to the substratum without these long projections to act as balancers. Nymphs of *Baetisca* are not the only mayflies living in these riffles, but the other forms present are streamlined, clinging types; in shape, either flattened (*Stenonema*) or rounded and slender (*Baetis*).

The characteristic spines and tubercles are relatively more conspicuous in the younger nymphs, but in the last instar they become somewhat obscured by the formation of the adult structures. In general, however, the position and degree of projection of these spines remains quite constant throughout the nymphal period and varies little from one individual to another. *Baetisca rogersi* nymphs are unique among described forms in having serrations and double projections along the lateral borders of the mesonotum and in the presence of prominent abdominal processes.

On abdominal segment six, the last pair of gills lie in a depression on the anterior face of the mediodorsal prominence. These gills, in the living animal, fit together in such a way that they form a tube which is rhythmically exposed and covered by the mesonotal shield. The duct probably acts as a water guide, leading a current under the mesonotum to the well-tracheated, anterior gills.

The holotype emerged in the laboratory about 3:00 P. M., March 29; it molted between 9:30 and 10:00 A. M., March 30, after an interval of about eighteen and one-half hours. The allotype emerged at 2:45 P. M., March 31, and underwent its subimaginal molt at 8:45 A. M., April 1.

***Baetisca rogersi* n. sp.‡**

*Diagnosis:* Male with basal third of fore wing and basal three-fourths of hind wing reddish-brown; outer margin of fore wing strongly scalloped; legs greenish-yellow; genitalia of the *carolina* type§. Female similar to male.

Nymph with prominent frontal projections; genae not produced into spines; mesonotum covered with prominent tubercles; dorsal spines much reduced; lateral spines prominent; smaller lateral projections of mesonotum anterior to large spines; lateral margins of mesonotum crenulate to serrate; abdominal tergites 7-9 with strongly elevated, median processes.

\*Contribution from the Department of Biology, University of Florida.

†Traver, J. R. 1937. Notes on mayflies of the southeastern states (Ephemeroptera). J. Elisha Mitchell Sci. Soc. 53: 61-65, pl. 6.

‡I take pleasure in naming this species for Professor J. Speed Rogers of the Department of Biology, University of Florida, whose aid and advice has been invaluable.

§Needham, J. G., Traver, J. R., and Hsu, Y. 1935. The biology of mayflies. Pp. 556-562, text fig. 148. Comstock Publishing Co., Ithaca.

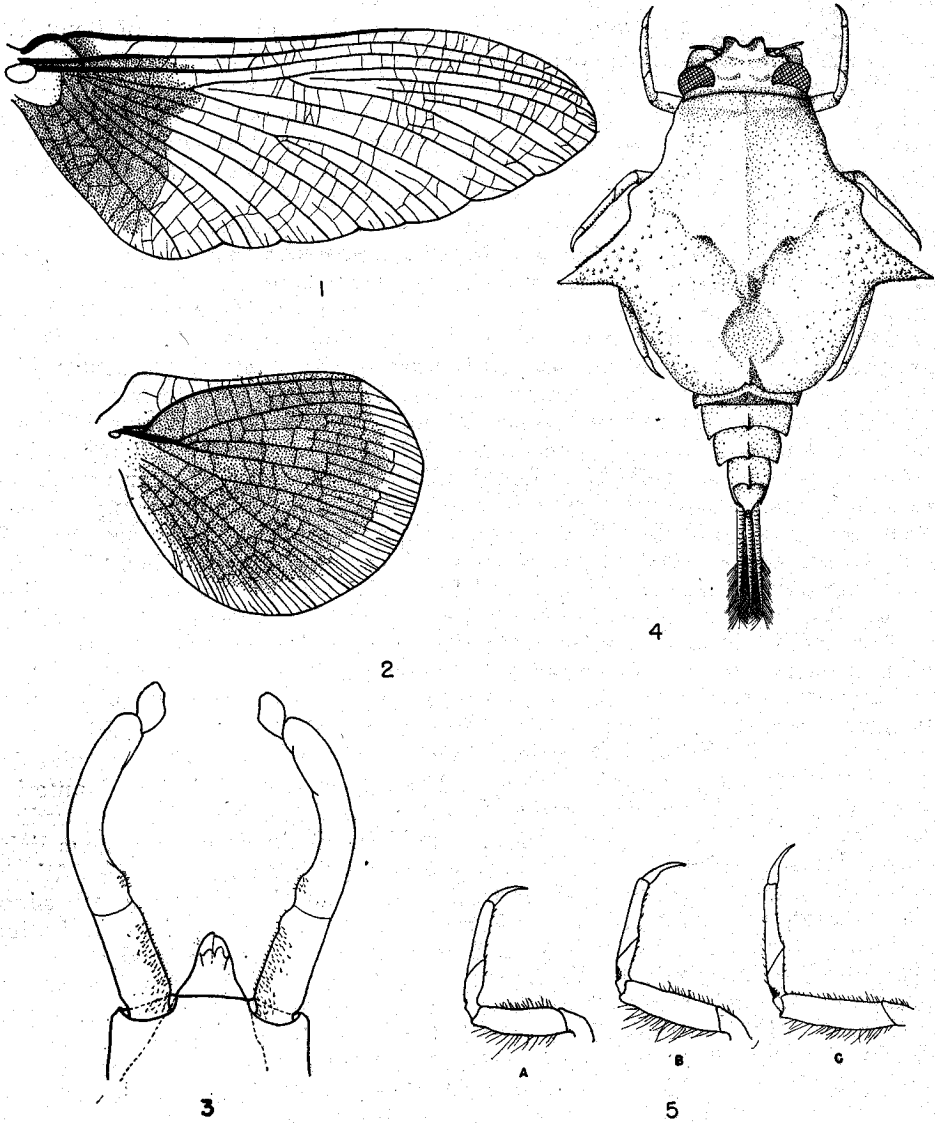
*Relationships:* *Baetisca rogersi*, from the standpoint both of nymph and adult, seems to be most closely related to *B. carolina* and *B. thompsonae*. The male genitalia and the coloration of the wings in the adult, the absence of dorsal spines on the mesonotum and similarity of mouthparts in the nymphs, all show that of the described Baetiscine species, *rogersi* is most closely related to these two.

*Description of Holotypic male Imago* (in alcohol): Length of body—7.8 mm.; caudal filaments—5.9 mm., fore wing—9.5 mm.

*Head:* Eyes grayish-yellow; separated only by the width of epicranial suture; distinctly oval in outline with the long axis extending laterad and slightly caudad. Vertex grayish-brown, becoming orange near base of ocelli. Frons grayish-brown. Antennal socket with reddish tinge. Basal antennal segments tinged with brown, flagellum pale. Ocelli yellowish-white. *Thorax:* Pronotum almost entirely concealed by eyes; grayish-brown. Mesonotum grayish-brown, covered with fine black penciling; margins of scutellum brown, median area pale. Metanotum grayish-brown. Prosternum brown; projection darker brown, extending well beyond fore coxae. Meso- and metasterna grayish-brown with black penciling. Pleura grayish-brown. *Legs:* Pale greenish-yellow. Fore leg slightly shorter than body. Each tarsal joint with narrow, light-brown ring. Under sides of tips of paired fore claws brown; on other legs, blunt claw, only, brown on under side. Measurements of legs: forefemur 2.1 mm., tibia 1.5 mm., tarsus 3.3 mm.; mid-femur 1.3 mm., tibia .65 mm., tarsus 1.2 mm.; hind-femur 1.3 mm., tibia .75 mm., tarsus 1.2 mm. *Wings:* Longitudinal veins amber. Outer margin of fore wing prominently scalloped; thickened. Basal third of fore wing reddish-brown. Costal angle of hind wing slightly obtuse. Reddish-brown area extending over basal three-fourths of metathoracic wing; outer fourth and costal border in angular portion clear. (Figs. 1 and 2). *Abdomen:* Dorsum light reddish-brown. Posterior margins of tergites 2-8, where they overlap the following segments, reddish-brown. Prominent median brown line on 7-10, fainter on 6. Tubercle on posterior half of tergite 6 prominent, strongly marked with black penciling; transverse black line across tubercle extending laterally about half way across the tergite. Tergites 2-6 predominantly darker than posterior ones; 6 with large, pale, triangular region covering mid area anterior to tubercle; base of triangle along anterior border. Lateral borders of 3-5 and anterior corners of 6 dark. At anterior border of 7-9, a prominent black band extending across tergite, becoming weak in region of mid-dorsal line; these segments light brown laterally. Whitish granulations scattered over segments 7-10. Weak, black reticulation on tergites 6-9; most prominent on 6. Postero-lateral spines very weak on 8, prominent on 9. Prominent spiracular openings indicating positions of nymphal gills on tergites 2-6; these openings pale and closest together on 6, progressively farther apart on anterior segments; a ridge extends laterad and obliquely caudad from these scars on segments 2-5. Sternites yellowish-white, no distinctive markings. *Genitalia:* Yellowish white; similar to those of *B. carolina* and *B. thompsonae*. (Fig. 3). *Caudal filaments:* Slightly darker than genitalia, and with a more brownish tinge. Light brown annulations at joints in proximal two-thirds. Stub of median filament reddish-brown; this coloration continuous with red-brown mid-dorsal line, consequently extending this line well beyond abdomen; stub pale ventrally.

*Description of Allotypic Female Imago* (in alcohol): Length of body—7.8 mm.; caudal filaments—5.3 mm.; fore wing—9.5 mm. *Head:* Large, black markings in median area of vertex; posterior border of head black. Remainder of head pale but covered with a network of fine black lines which, in places, almost conceals pale base color. Bases of ocelli dark but distally becoming reddish-brown. Basal antennal segments brownish, flagellum paler. Compound eyes grayish-yellow. *Thorax:* Color pattern as in male. Processes of prosternal

## PLATE X.



*Baetisca rogersi* n. sp.

Fig. 1. Fore wing of female imago.

Fig. 2. Hind wing of female imago (not drawn to same scale as fore wing).

Fig. 3. Male genitalia.

Fig. 4. Mature female nymph.

Fig. 5. Legs of nymph. A. 1st right leg; B. 2nd right leg; C. 3rd right leg.

projection more widely separated and shorter than in male. *Wings*: As in male. *Legs*: Femur of fore leg distinctly greenish-yellow; remainder of leg light brown, except for brown tarsal joinings. Middle and hind legs greenish yellow, tarsal joinings light brown. Blunt claws on all legs brown. *Abdomen*: Dorsum purplish-brown, marked with black; otherwise much as in male except that brown posterior borders much less extensive and pale area on tergite 6 less pronounced. Ventrally yellowish-white; covered with black reticulation. *Caudal filaments*: Tinged with reddish-brown proximally, pale in outer fourth; tinted portions annulate with brown.

*Description of Nymph* (in alcohol): Fig. 4. Length of body—7.5-10 mm.; greatest width of mesonotum—6.5-7.7 mm.; length of mesonotum—5-6.7 mm.; caudal filaments—2-2.2 mm. *Head*: Frontal process prominent; projections rounded; dorsally extending forward from head at approximately ninety degree angle with head. Genae moderately produced, corners rounded; lateral production of genae weakly crenulate. On female nymphs and young male nymphs, a pair of submedian, more or less rounded elevations between eyes. Head covered with blackish-brown tubercles; absent from frontal projection. Prominent black spot just ventral to compound eye and near lateral margin of head. Sharp ridges around upper side of antennal socket. Frons swollen below its projection; swelling ending in ridge on same level with genal projections. Nine antennal segments; basal antennal segments brownish; antennal socket ringed with brown. Mouth parts similar to those of *B. carolina*; brown spots scattered over labial palps, also a few on labrum. Ocelli inconspicuous; marked by absence of tubercles. *Thorax*: Width of mesothorax from tip of lateral spine to tip of opposite spine varying from 1-1½ mm. greater than length from anterior edge of mesonotum to posterior margin of wing pads. Lateral margins of mesonotum crenulate to serrate; serrations strongest along margins of lateral spines and becoming less prominent away from these spines. Lateral spines long, sharp pointed, brown at tip; anterior to these spines, another pair of lateral thoracic extensions but these not sharp tipped, much less prominent, and somewhat obtuse. Antero-lateral corners notched to receive head. Dorsal spines reduced to mere rounded elevations. Median carina most prominent on level with lateral spines; at posterior level of spines, carina elevated into a prominent hump; at posterior margin, again elevated into a prominent hump. These four elevations, to some extent, run together and enclose a median depressed area. In young specimens, anterior third of median carina of mesonotum raised into sharp elevation. At middle elevation of median carina, a pair of prominent ridges arise and run antero-laterally along the base of the wing pads. Near anterior margin of mesothorax, a prominent transverse ridge passing from one corner to the other; from each side, the chitin slopes away at a rather sharp angle. Entire mesothorax covered with prominent blackish tubercles; these quite large at the bases of the lateral spines, smaller dorsally and becoming sparser on wing pads. Anterior, transverse ridge formed of a line of these smaller tubercles set close together. Posterior elevation of median carina truncated and excavated to receive projection of segment 6. Posterior margin of wing pads fringed with long hairs. Sternum covered with small setae; in well-marked specimens, base of seta quite prominent and bearing a strong resemblance to the dorsal tubercles. Prosternum concave; indentation on lateral border, in posterior fourth, to receive median coxal spur. This indentation is a groove which locks fore coxa into place and in which spur moves dorso-ventrally. *Legs*: Hairy; bases of hairs prominent, giving, in dark specimens, a freckled appearance to the femora, coxae and throchantera. A large blackish-brown, outer, proximal area on tibia; broad, light-brown, median band on tarsus. (Figs. 5a, b, c). *Abdomen*: Segments 1-5 completely concealed; beneath gills, these segments quite pale. Tergites 7-10 yellowish-brown. Pyramidal structure on segment 6 very strong; posterior face

almost vertical and subequal to or longer than the greatest length of tergite 7; lateral and anterior face distinctly concave while posterior side more flattened; gills of segment 6 fit exactly into anterior concavity and act as a water guide; lateral borders of anterior face, in profile, sinuate; lateral concavities blackish-brown in well marked specimens except for pale streak at the bottom of concavity, in more poorly marked specimens, the blackish-brown less extensive to obsolescent. Postero-lateral portions of remainder of tergite 6 usual brown color, while remainder of lateral concavities, the portion into which the wing pads fit, are pale (the blackish-brown parts exposed). Prominent tubercles covering posterior face of raised portion of tergite 6. Tergites 7-10 covered with hairs; bases of these hairs superficially appearing tuberculate but much less prominent than tubercles on 6. A continuous blackish-brown, median line on tergites 7-10, may be interrupted posteriorly on 7-9, appears continuous with middle tail (this tail reddish-brown, at least basally). At anterior margins of 7-10, a pair of broad, brownish-black, transverse lines extending inward from lateral borders almost to median line. Tergites 7-10 pale yellowish-brown; 10 with a pair of light-reddish, submedian patches near posterior margin. Prominent elevations arising from the mid-posterior half of tergites 7-9. These elevations approximately equal in height to half the length of their respective tergites; erect on segments 7 and 8, while on 9 elevation bent caudad. Elevations keeled; these elevations, in poorly marked specimens, interrupt the mid-dorsal line. Lateral borders of segments 6-9 weakly crenulate; crenulations weakest on 6. Postero lateral angles of 5-9 produced; 10 in median area produced posteriorly into a pair of submedian spinous prolongations. Entire under-surface of abdomen covered with setae; the bases of setae prominent giving a freckled aspect to the abdomen. An inconspicuous pale spot near lateral borders of sternites 2-6. At anterior borders of sternites 7-9, a pair of large brownish-black spots placed about midway between median line and lateral margin. Gills completely concealed by mesonotum. Gills on tergite 2 form a protective covering for all others except those on segment 6.

*Caudal filaments:* All three filaments equal in length; heavily fringed with long hairs. Pale except for light-brownish tinge at base of laterals; proximal third of median tail reddish-brown. In distal half, tails with faintly annulate appearance; these annulations becoming distinct in region where outer hairs increase in prominence.

*Holotype*—Male imago, in alcohol. Reared from nymph. Sand-bottom creek,  $4\frac{1}{2}$  miles south of River Junction, Gadsden Co., Florida, March 17, 1939. In collection of Museum of Comparative Zoology.

*Allotype*—Female imago, in alcohol. Reared from nymph. Same data as for male. In collection of Museum of Comparative Zoology.

*Paratypes*—One female imago, in alcohol. Reared from nymph. Same data as for male. In author's collection.

Five nymphs in collection of Museum of Comparative Zoology. Same data as for male imago.

*Locality records:* (from nymphs) Freeport, Walton Co., April 2, 1938 (H. H. Hobbs and L. J. Marchand); Milton, Santa Rosa Co., April 4, 1938 (H. H. and L. J. M.); Niceville, Okaloosa Co., June 7 and Nov. 6, 1938 (L. Berner);  $4\frac{1}{2}$  miles south of River Junction, Gadsden Co., March 17, 1939 (J. S. Rogers, H. H. Hobbs, F. N. Young, L. Berner); Hosford, Liberty Co., March 17, 1939 (L. B.). All records from Florida.