

A REVISION OF THE GENUS *EPHEMERELLA* (Ephemeroptera: Ephemerellidae) IV. THE SUBGENUS *DANNELLA*¹

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INTRODUCTION

Part I of this revision, The subgenus *Timpanoga*, appeared in The Canadian Entomologist (1959). Part II, The subgenus *Caudatella*, was published in the Annals of the Entomological Society of America (1961). Part III, The subgenus *Attenuatella*, appeared in the Journal of the Kansas Entomological Society (1961).

In the following species accounts, collections made by the authors are indicated by initials, GFE and/or RKA. Abbreviations for collections in which specimens are deposited are as follows: Canadian National Collection (CNC); Cornell University (CU); Illinois Natural History Survey (INHS); J. R. Traver Collection (JRT). Specimens without designation are deposited in the collection of the University of Utah.

Subgenus *Dannella* Edmunds

(*Ephemerella*) *simplex*-group, McDunnough 1930: 57; Traver 1932: 145; Traver 1935: 565; Berner 1946: 70; Burks 1949: 235; Berner 1950: 153.

(*Ephemerella*) *bicolor*-group, Burks 1953: 72 (in part).

Dannella Edmunds 1959: 546 (as subgenus); type by original designation *simplex* McDunnough.

Edmunds (1959) named the subgenus *Dannella* in honor of Benjamin Dann Walsh, the author of the genus *Ephemerella*. It contains only the species *Ephemerella simplex* McDunnough and *E. lita* Burks. These two species show a relationship to the other species of the genus *Ephemerella* that possess gills on abdominal segments 4-7, but there has been much confusion as to their relationships. McDunnough (1930) considered *E. simplex*, *E. margarita* Needham and *E. attenuata* McDunnough, as an aberrant group of species "which appear to connect up the *fuscata* [= *walkeri*] with the *bicolor*-group." Traver (1932) placed three species from the southeastern United States in the *simplex*-group, *E. attenuata*, *E. simplex*, and *E. lita* Burks (as *Ephemerella* sp?, No. 1). In 1935, she placed the nymphs of *E. simplex*, *E. attenuata* and *E. margarita* in the *simplex*-group, but placed the adults of these same species in two groups, separating *E. attenuata* as sole member of the *attenuata*-group. Berner (1946) in naming *E. hirsuta* placed it with *E. simplex* and *E. attenuata*. Burks (1953) grouped this assemblage of species with the species of the *bicolor*-group (= *Eurylophella*). We have placed *E. margarita* and *E. attenuata* (= *E. hirsuta*) in the subgenus *Attenuatella*.

The subgenus *Dannella* is characterized in the male adult by having (1) the third segment of the genital forceps scarcely longer than wide

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(Fig. 2), (2) second segment of genital forceps thin, (3) the penes swollen apically and without subapical projections or dorsal or ventral spines (Fig. 2), and (4) tibiae of foreleg shorter than tarsi and third tarsal segment longer than second. The nymphal stages (Fig. 1) are characterized by having (1) semi-operculate gills on segments 4-7, with a rudimentary gill on segment one, (2) no denticles on the tarsal claws, and (3) no paired tubercles on the abdominal terga.

The following key will serve to separate the species of this subgenus in the nymphal stage. The adults of *E. lita* are undescribed.

Key to the Nymphs

1. Lateral margins on segments 2 and 3 produced into well developed postero-lateral projections (Fig. 13); maxillary palpi with three distinct segments and a long apical spine (Fig. 12) *lita*
- Lateral margins of segments 2 and 3 not produced into postero-lateral projections (Fig. 1); maxillary palpi fused into one segment with a short apical spine (Fig. 11) *simplex*

Ephemerella simplex McDunnough

Ephemerella simplex McDunnough 1925: 41; Ide 1930: 211; McDunnough 1931: 208 (nymph); Traver 1935: 620; Burks 1949: fig. 6; Leonard 1950: 19; Burks 1953: 75.

MALE IMAGO (in alcohol). Length: body 6-6.5; forewing 6-6.5 mm. General color brown. Head brown; upper portion of eyes pale, lower portion black. Thorax dark brown; legs light brown; wings hyaline, costal and stigmatic areas opaque, longitudinal veins brown. Abdominal segments light brown, irregular dark brown sublateral maculae on segments 1-7. Genitalia as in Figure 2. Caudal filaments light brown.

FEMALE IMAGO (in alcohol). Length: body 6-6.5; forewing 6-6.5 mm. General color similar to male. Subanal plate moderate in length, rounded apically.

MATURE NYMPH. Length: body 6-8; caudal filaments 3-4 mm. General color brown. Body without occipital, thoracic or dorsal abdominal tubercles. Abdomen with distinct postero-lateral projections on segments 4-9. Caudal filaments pale, sparsely setaceous.

Type Locality. Laprairie, Quebec, Canada.

Type. No. 1276, Canadian National Collection, Ottawa, Ontario.

DISTRIBUTION. *Ephemerella simplex* is a boreal eastern North American species with a wide latitudinal and longitudinal distribution. It has been collected from Manitoba to Nova Scotia and austrad to Illinois, North Carolina and Tennessee. The authors have examined specimens from the following localities:

ILLINOIS. Winnebago Co., Rock River, Rockton, 25-VI-47, B. D. Burks (INHS). MANITOBA. Churchill, 31-VI-37, W. J. Brown (CNC). MICHIGAN. Cheboygan Co., Indian River, 4-VII-48, GFE. NEW BRUNSWICK. Boiestown, 13-VII-38, W. J. Brown (CNC); Charlo River, 2-VIII-50, E. L. Bousefield; Tracadie River, 4-VIII-50, E. L. Bousefield; NW. Miramichi River, 13-VII-51, E. L. Bousefield. NEW HAMPSHIRE. Gorham, 21-VII-29, W. J. Brown. NEW YORK. Adirondack Park, Cedar River near Indian Lake, 20-VI-41, T. H. Frison and H. H. Ross (INHS);

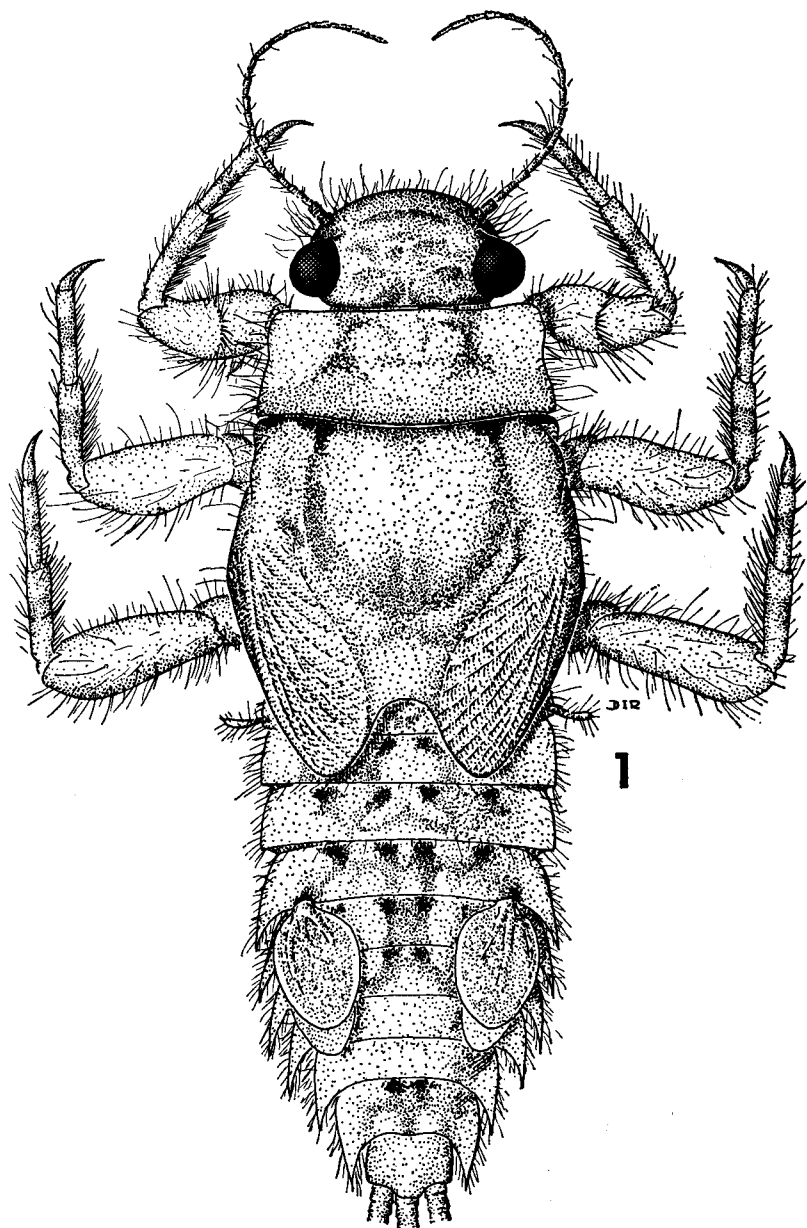


FIG. 1. *Ephemera simplex*, mature female nymph, dorsal view.

Cayuga Co., near Fairhaven, 31-VII-32, J. G. Needham (JRT). NOVA SCOTIA. Near Amherst, 9-VII-50, E. L. Bousefield. ONTARIO. Birch Falls, 17-VII-26, F. P. Ide (CNC); Grimsby 19-VIII-28, W. J. Brown (CNC); Prescott, 1-VII-25, F. P. Ide (CNC); Normandale, 6-VII-25, G. S. Walley (CNC); Niagara Falls, 29-VII-25, G. S. Walley (CNC). QUEBEC. Laprairie (Holotype), 8-VII-24, G. S. Walley (CNC); Cascades Point, 4-VII-30, G. S. Walley (CNC); Lachine, 19-VI-29, G. S. Walley (CNC); South Bolton, 21-VII-30, L. J. Milne (CNC); Knowlton, 6-VII-30, L. J. Milne (CNC); Knowlton, 22-VI-29, G. S. Walley (CNC); St. Annes, 24-VI-25, F. P. Ide (CNC); Vaudreuil, 25-VI-30, G. S. Walley (CNC). TENNESSEE. Sevier Co., Gatlinburg, 14-VI-40, T. H. Frison (INHS). VIRGINIA. Shenandoah River, Berryville, 12-V-38, E. Surber (JRT).

TAXONOMY. The form of the male penes of *E. simplex* is distinctive; however, previously published figures of this structure (Fig. 3) (McDunnough, 1931 and Burks, 1953) do not have the same appearance as penes we have prepared on slides from fresh material (Fig. 2). We have examined several slides of *E. simplex* male genitalic structures which were prepared by J. McDunnough and they compare favorably with the figure in his publication. We find that extensive clearing in KOH accounts for these observed differences.

BIOLOGY. The biology of this species is relatively unknown. McDunnough (1931) reports that the main mating flights occur in the last week of June and the first week of July in southern Quebec. Leonard (1950) reports adults in Michigan from the second week of July to the third week in August.

Ephemerella lita Burks

Ephemerella sp. No. 1 Traver 1937: 73.

Ephemerella lita Burks 1949: 235, 1 fig.; Burks 1953: 74, 1 fig.

Ephemerella lita was named from nymphs collected in the Rock River, in northern Illinois from 1925 to 1928. These nymphs are morphologically distinct from *E. simplex*, but only adults of *E. simplex* have been collected from the vicinity of the Rock River in recent years (Burks, 1947). It is possible that the adults of *E. lita* and *E. simplex* are morphologically alike or at least we have not yet discovered the distinguishing characteristics. Traver (1937) reported the nymphs of *E. lita* from North Carolina under the designation *Ephemerella* sp. No. 1.

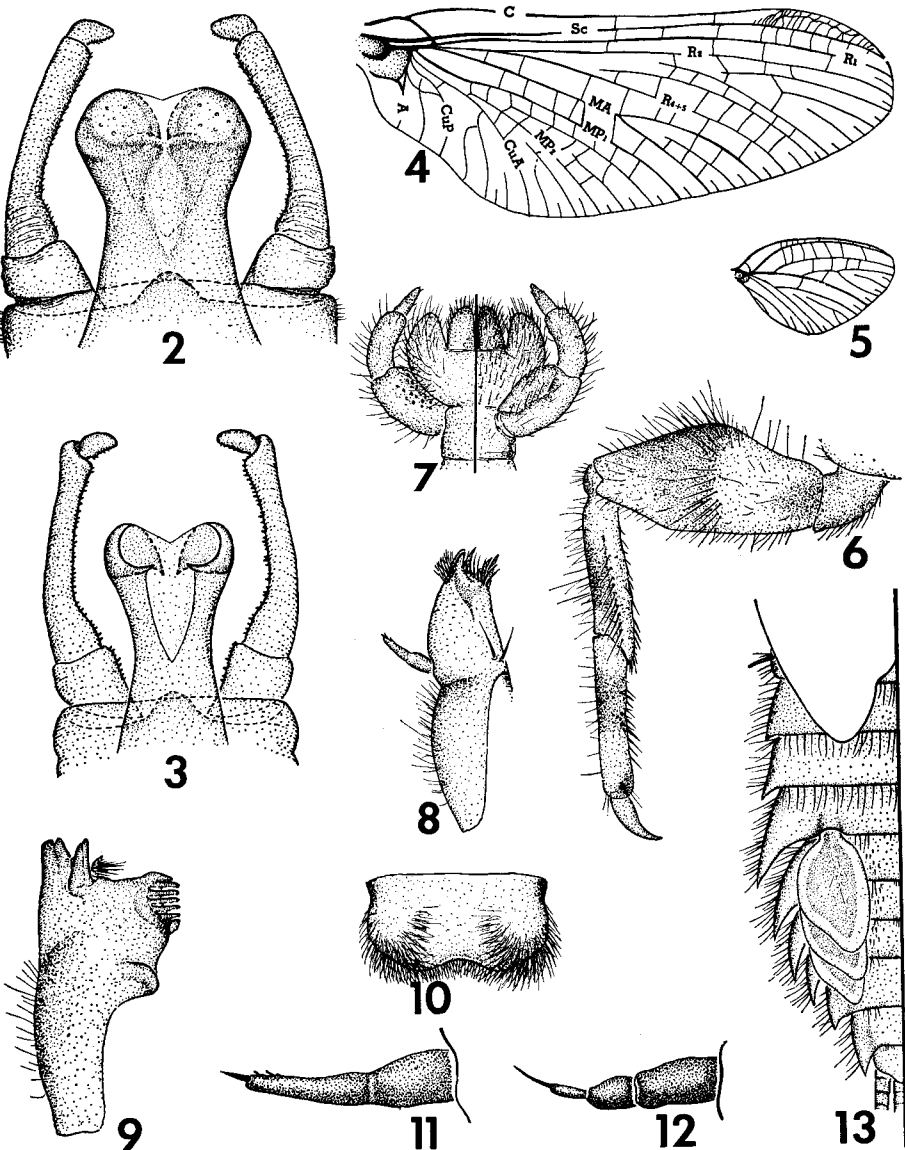
MATURE NYMPH. Length: body 8 mm; caudal filaments 5.5 mm. General color light brown. Body without occipital, thoracic or dorsal abdominal tubercles. Abdomen with distinct postero-lateral projections on segments 2-9. Caudal filaments pale, sparsely setaceous.

Type Locality. Oakwood, Illinois.

Type. Illinois Natural History Survey, Urbana.

DISTRIBUTION. This species is known from widely separated localities in Illinois, Indiana, North Carolina and Pennsylvania. Specimens examined by the authors are from the following localities:

INDIANA. Pigeon River, 26-VI-29, H. T. Spieth (AMNH). NORTH CAROLINA. Little River, Cedar Mountain, 12-VII-30, J. R. Traver (CU); Cowee Mountain, 28-VI-29, J. R. Traver (CU); Ocona Luffy River, 22-



FIGS. 2-11. *Ephemerebella simplex*. Fig. 2, male genitalia, dorsal view (drawn from alcoholic material); fig. 3, male genitalia, dorsal view (after McDunnough, 1931); fig. 4, forewing of male imago; fig. 5, hind wing of male imago; fig. 6, right nymphal foreleg; fig. 7, labium; fig. 8, maxilla; fig. 9, left mandible; fig. 10, labrum; fig. 11, maxillary palpus. FIGS. 12-13. *E. lita*. Fig. 12, maxillary palpus; fig. 13, left side abdominal terga of mature nymph.

VI-30, J. R. Traver (CU); near Blowing Rock, 7-VI-36, L. C. Thomsen (JRT); Nantahala Gorge, 6.1 mi. E. Nantahala, 20-VII-57, S. and D. Mulaik. PENNSYLVANIA. Lackawana Co., Scranton, summer 1945, H. K. Townes (JRT).

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