CARNIVORY IN *EPHEMERELLA INERMIS* EATON NYMPHS (EPHEMEROPTERA: EPHEMERELLIDAE)[1]

Lynda D. Corkum[2]

ABSTRACT: A photograph is presented of an *Ephemerella inermis* Eaton nymph with the anterior portion of a Tanytarsini (Diptera: Chironomidae) larva protruding from its mouth. Few unidentified animal fragments have been reported in gut contents of large nymphs of this species, which is commonly a detritivore.

Ephemerellid nymphs are typically detritivores and/or herbivores, however there have been occasional reports of animal fragments in the guts of these mayflies (Hamilton, 1979). I collected an *Ephemerella inermis* Eaton nymph with the anterior portion of a Tanytarsini larva protruding from its mouth (Fig. 1) from the Highwood River, Alberta (50° 47'00" N, 113° 49'13" W) on 12 June 1979 at 2130 h M.S.T. (water temperature was 15°C). At the sample site, 133.1 km downstream from its source in the Rocky Mountain Forest, the river is a 4th order stream. Here, the river (50 m wide and 1047 m above m.s.l.) flows through hilly grassland. The nymph was taken in a 3-min kick net sample (mesh opening = 180 microns) over a stream bottom of shale, rock and sand; aquatic macrophytes were absent. Although there was no overhanging vegetation, poplars, willow shrubs and grasses were common beside the river. Streambank erosion was evident upstream. At the site, mean current velocity and flow 3 cm above the substrate (Gurley current meter) was 1.33 m/s and 0.79 m/s, respectively.

Mayfly nymphs (51.3%) and chironomid larvae (20.6%) dominated the kick fauna. Of the mayflies, 35.5% were *Ephemerella* nymphs; 17.7% of the chironomids were *Tanytarsini* larvae.

I analyzed the gut contents of 50 other *E. inermis* nymphs from the kick sample (21 females: head capsule width = 1.39 mm ±0.147, total body length excluding caudal filaments = 6.76 mm ±0.868; 29 males: HCW = 1.39 mm ±0.195, TBL = 6.34 mm ±0.947) similar in size to the *Ephemerella* predator (male: HCW = 1.52 mm, TBL = 6.39 mm). Gut contents of these other nymphs consisted of detrital particles; no evidence of animal fragments were found. Hamilton (1979) reported that over 90% of food ingested by all size classes of *E. inermis* nymphs was detritus.

Early workers considered that any animal fragments found in the guts of ephemerellid nymphs were accidently taken (likely as dead matter) when

[1]Received May 27, 1980

[2]Department of Zoology, University of Alberta, Edmonton, Alberta, Canada T6G 2E9

plant material was consumed (Percival & Whitehead, 1929; Muttkowski & Smith, 1929). Muttkowski and Smith (1929) reported that 18.5% of the gut contents of *Drunella* sp. nymphs and 3.7% of *Ephemerella* sp. nymphs consisted of animal matter.

Carnivory among ephemerellid nymphs has most frequently been reported in species of the genus *Drunella: coloradensis, cornuta, doddsi, flavilinea, grandis* and *spinifera* (Gilpin & Brusven, 1970; Shapas & Hilsenhoff, 1976; Hamilton, 1979). Animal fragments have been shown to dominate the gut contents of relatively large nymphs of only two species, *D. cornuta* (Shapas & Hilsenhoff, 1976) and *D. spinifera* (Gilpin & Brusven, 1970; Hamilton, 1979). Identified prey contents of these species are chironomid larvae and/or ephemeropteran nymphs. Few unidentified arthropod fragments have been reported in *E. inermis* (Hamilton, 1979), *E. inermis/infrequens, Serratella tibialis* and *Timpanoga hecuba* (Gilpin & Brusven, 1970). From the photograph (Fig. 1), it is evident that a relatively large *E. inermis* nymph can capture a dipteran larva.

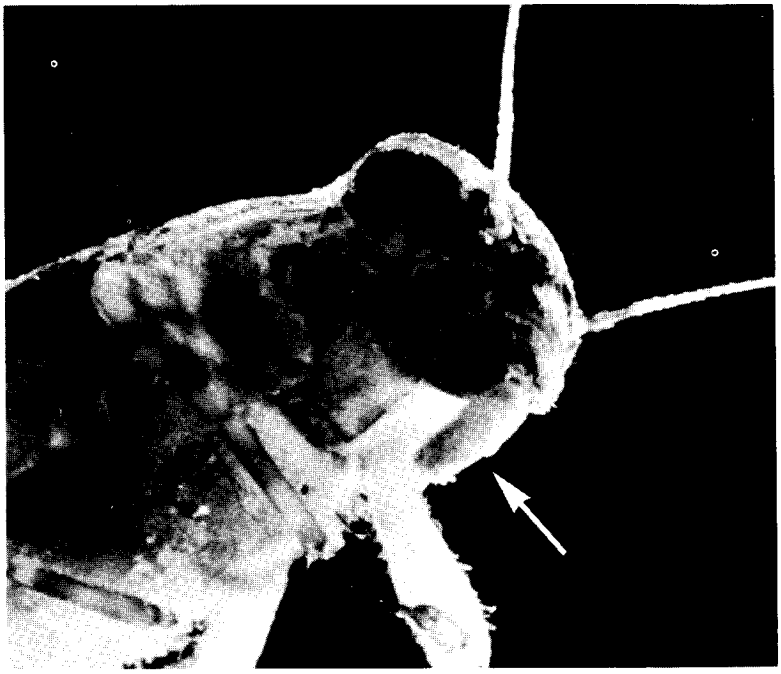

Fig. 1. Photograph of *Ephemerella inermis* nymph with a Tanytarsini larva protruding from its mouth.

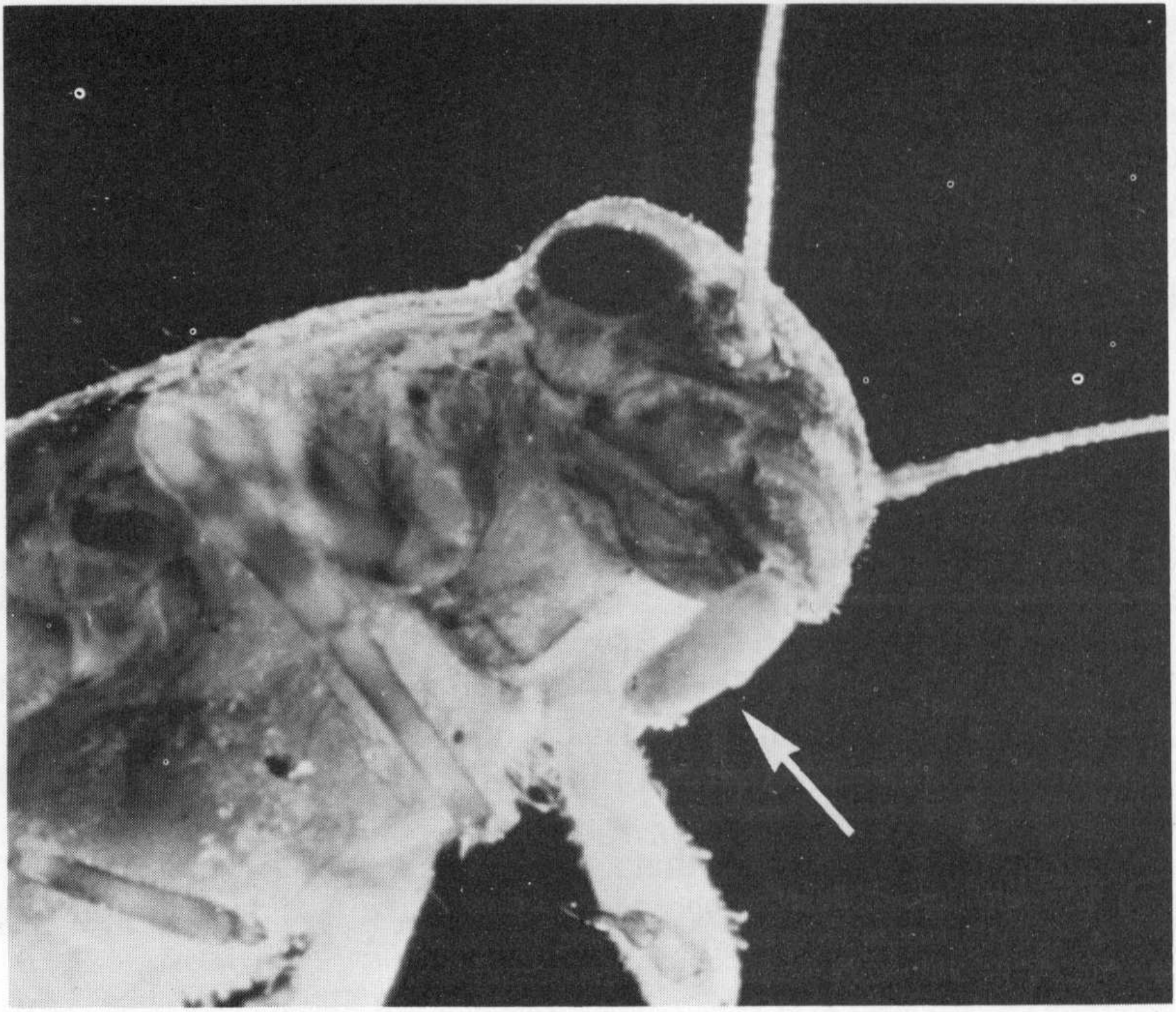

Fig. 1. Photograph of *Ephemerella inermis* nymph with a Tanytarsini larva protruding from its mouth.

ACKNOWLEDGEMENTS

I thank R.W. Mandryk and R.H. Seward for taking the photograph.

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MURRAY I. COOPER

We regret to announce the recent passing of Murray I. Cooper. He was a long time and active member of the American Entomological Society, including service as President and Chairman of the Finance Committee of the Society.

Dr. Cooper was a graduate of Cornell University and earned his PhD in Entomology from the University of Illinois. He was a pest control entomologist and was active in several professional organizations, including the Philadelphia Section of the Institute of Food Technologists, the Society of Sigma Xi, the American Registry of Professional Entomologists and Pi Chi Omega. A World War II veteran, he was retired from the Army with the rank of Captain. He is survived by his wife, the former Meta Flamberg who resides at 244 Buckboard Rd., Willow Grove, Pa. 19090, two daughters, a son, a sister, a brother and three grandchildren.