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**EOSENTOMON HEATHERPROCTORAE N. SP.
(PROTURA: EOSENTOMIDAE) FROM ONTARIO**Ernest C. Bernard¹ and Michal Guzowski²**ABSTRACT**

A new species of eosentomid proturan, *Eosentomon heatherproctorae*, is described from Ontario. This new species is a member of the *transitorium* species-group. It differs from related North American species of this group in the following combination of characters: labral setae absent, foretarsal sensilla *d* and *t3* long and stout, no anterior setae on the sternite of the eighth abdominal segment, and six setae on the sternites of the ninth and tenth abdominal segments.

Among 37 Protura collected from 27 sites at the Queen's University Biological Station near Kingston, Ontario, were 10 specimens representing an undescribed species of *Eosentomon* Berlese. These specimens proved to be members of the *transitorium*-group *sensu* Tuxen (1964), characterized by a sharply bent caput processus in the female genital apparatus. This species group is primarily European and North African (Szeptycki 1986), with only a few species known from North America: *E. bernardi* Nosek, *E. richardi* Bernard, and *E. vermontense* Nosek (Bernard 1990, Nosek and Kevan 1984). The purpose of this paper is to describe the new species and differentiate it from similar members of the genus.

MATERIALS AND METHODS

Protura were extracted from soil cores and preserved in 80% ethanol. Specimens were cleared and expanded in Marc Andre I fluid at 60 °C for 15 minutes, then mounted in Marc Andre II medium on glass slides (Christiansen and Bellinger 1998). Mounts were cured in a 60 °C oven for four days, then ringed with Glyptal. Observations were made with phase and differential contrast microscopy. Drawings were made with the aid of a drawing tube.

Eosentomon heatherproctorae new species

Color and dimensions: Adult body pale amber, mean length (range) 710 µm (609-809); head length without labrum 98 µm (92-103); foretarsal length without claw (*n* = 13) 63 µm (60-64). LR = 11.5; PR = 6.2; TR (*n* = 12) = 5.7 (5.0-6.3).

Morphology: Pseudoculus broadly oval, with three diffuse, longitudinal lines on the posterior half. Clypeal apodeme with convex, slightly clavate lateral arms weakly connected to each other anteriorly (Fig. 1). Labrum with truncate apices angling inward to a V-shaped notch; labral setae absent (Fig. 2). Central pair of rostral setae inflated (Fig. 2), the inflation more visible laterally than dorsally. Digits of galea rounded, the outer digit curved slightly outward and longer than the other two digits; both lobes of lacinia curved, outer lobe not visibly dentate, inner lobe not hooked (Fig. 3). Mandible with two apical and one subapical teeth (Fig. 4).

Empodium of foretarsus about equal to length of claw. Empodia of middle and hind legs less than one-eighth the lengths of their unguis.

Central lobe of precosta on abdominal segments IV and V narrow, slightly

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narrowed at the midpoint but not incised (Fig. 9). Female squama genitalis (Fig. 11) with short, broad styli; proximo-lateral sclerotizations well-developed; caput processus prominent, sharply angled toward inner stylus margin; corpus processus narrow, weakly striate proximally, extending to inner stylus margin but not extending outward past the caput processus; median sclerotizations absent; filum processus much shorter than stylus; stylus apices finely rounded.

Chaetotaxy: Cephalic setae *aa* and *pa* present, anterior sensillum *as* present. Setae *sp* and *p* about equal in length (Fig. 1).

On mesonotum (Fig. 5), seta *p1* slightly longer than *p1'*; *p2* slightly longer than *p2'*; seta *p3'* setiform. Metanotal setae (Fig. 6) similar to those of mesonotum; bases of *p5* and *p5'* touching.

On foretarsus (Figs. 12,13), sensillum *b'1* absent, *c'* spatulate, thick; sensillum *a* short and slender; *b* weakly spatulate and almost reaching the base of $\beta 6$; *c* slightly expanded, reaching to the base of $\gamma 3$; *d* very long, reaching nearly to $\alpha 7$; *f1* narrowly spatulate, *f2* slender, almost equal in length to *f1*; *e* and *g* clearly spatulate. Sensillum *t1* equidistant to $\alpha 3$ and $\alpha 3'$, *t2* slender; *t3* long and thick, nearly reaching base of claw. Sensillum *a'* weakly spatulate, *b'2* slender and reaching well past $\alpha 6$. On metatarsus (Fig. 10), seta *D2* spiniform, less stout than *D5*.

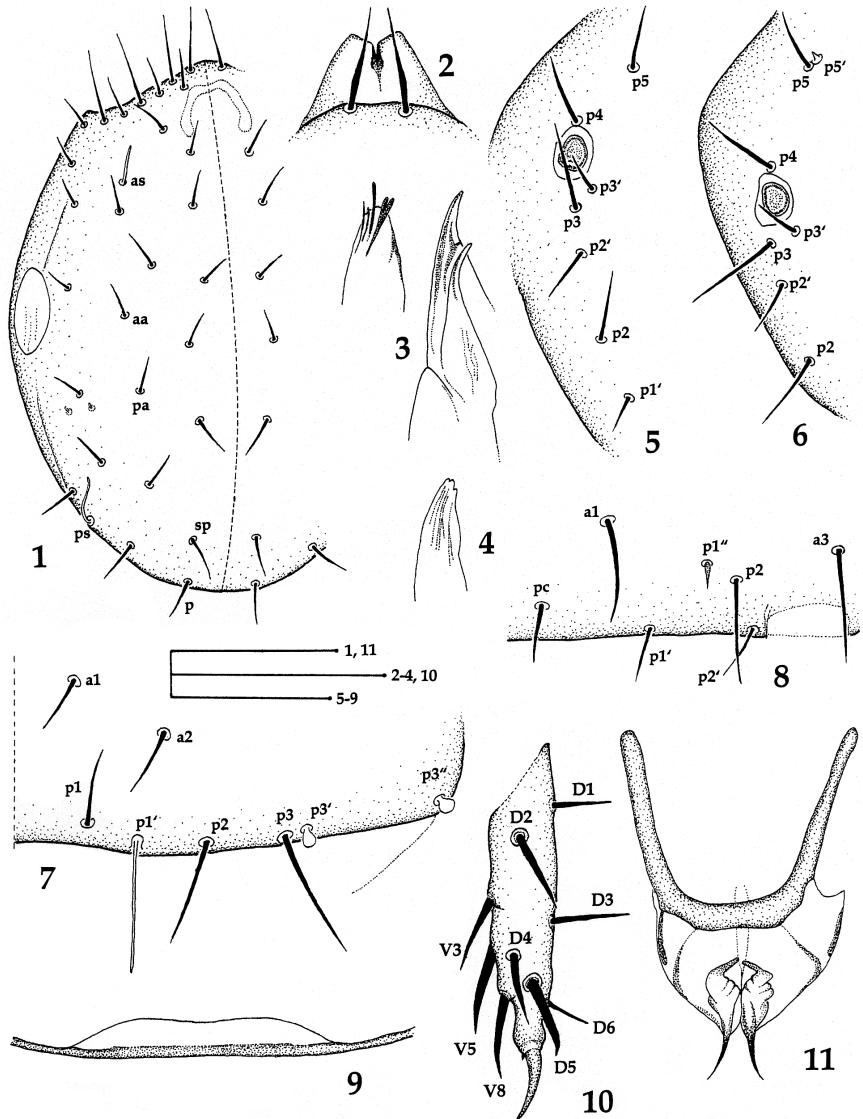
Abdominal setal composition given in Table 1. Tergum I setal formula 3:1:2, *p1'* longer than *p1*; *p3'* and *p3''* minute but swollen (Fig. 7). On terga II-VI, *p1'* and *p2'* longer than *p1* and *p2*; *p4'* more than half the length of *p4* and setiform. On tergum VII, *p1'* setiform, shorter than *p1*; *p4* and *p4'* of equal length and robustness. On tergum VIII, *pc* and *p1'* setiform, *p1''* aristate, *p2'* linear (Fig. 8).

Diagnosis: *Eosentomon heatherproctorae* n. sp. is a member of the *transitorium* group as defined by Tuxen (1964). Females in this group have the caput processus strongly reflexed toward the inner edge of the stylus, making a birdhead-like shape. The new species differs from other North American members of this group (*E. bernardi* Nosek in Nosek & Kevan, *E. richardi* Bernard, and *E. vermontense* Nosek in Nosek & Kevan) in the lack of labral setae (present in *E. bernardi* and *E. richardi*, unknown in *E. vermontense*), absence of anterior setae on sternum VIII (2 anterior setae in the other species), and six setae on sterna IX-X (four in *E. bernardi* and *E. vermontense*, six in *E. richardi*). Foretarsal sensillum *d* is much longer in *E. heatherproctorae* n. sp. than in the other three North American species.

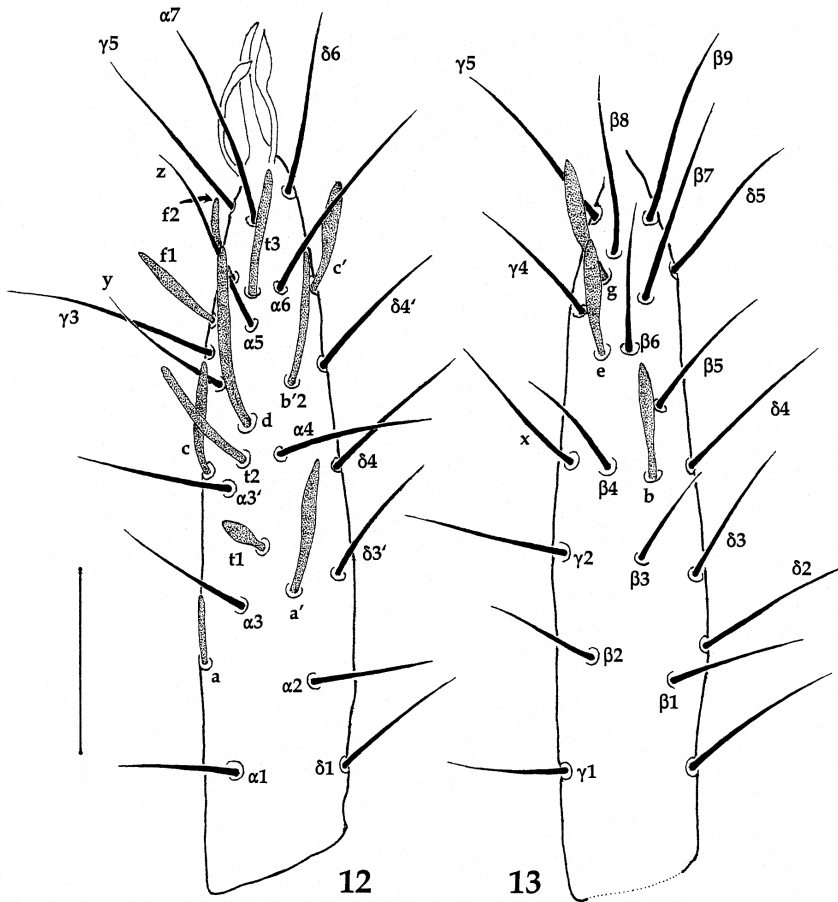
The presence of the accessory head setae *aa* and *pa* places *E. heatherproctorae* n. sp. in the subset named the "*delicatum*" group by Szeptycki (1985), where it will key to *E. wanda* Szeptycki. The new species differs from *E. wanda* in the following ways: labral setae absent, foretarsal sensillum *d* long and stout (short in *E. wanda*), sensillum *t1* equidistant to $\alpha 3'$ and $\alpha 3$ (in *E. wanda*, *t1* very close to $\alpha 3'$), ten anterior setae on tergum VII (four in *E. wanda*).

Types: Holotype female collected from soil cores 13 July 1996, Chaffey's Lock, Queen's University Biological Station (44°33'45"N, 76°19'21"W), near Kingston, Ontario. Nine paratypes (2 females, 5 males, 2 maturated juniors) collected at same locality from 14 June to 13 July 1996, M. Guzowski, collector. Holotype and 4 paratypes deposited in the Canadian National Collection; five paratypes deposited in the apterygote section of the University of Tennessee Entomology Collection.

It is our pleasure to name this species after Dr. Heather Proctor, who directed the research that led to the collection of this new species.



Figures 1-11. *Eosentomon heatherproctorae* n. sp. 1) Dorsum of head, left side. 2) Labrum and rostral setae, dorsal view. 3) Galea and lacinia of maxilla. 4) Apex of mandible. 5) Mesonotum, posterior margin of left side. 6) Metanotum, posterior margin of left side. 7) Abdominal tergite I, right side. 8) Abdominal tergite VIII, right side. 9) Precosta of abdominal tergum V. 10) Metatarsus. 11) Squama genitalis. Scale bars = 30 μm.



Figures 12, 13. *Eosentomon heatherproctorae* n. sp. 12) Foretarsus, dorsal view. 13) Foretarsus, ventral view. Scale bar = 15 μ m.

Table 1. Abdominal chaetotaxy of *Eosentomon heatherproctorae* n. sp.

	I	II	III	IV-VI	VII	VIII	IX-X	XI	XII
Dorsal									
Anterior setae	4	10	10	8	10	6	8	8	12
Posterior setae	12	14	14	16	16	9			
Ventral									
Anterior setae	4	6	6	6	6	0	6	8	9
Posterior setae	4	4	10	10	10	7			

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