MILLIPEDS ASSOCIATED WITH ANTS IN
WASHINGTON STATE

H. F. LOOMIS

5355 S.W. 92 St., Miami, Florida 33156

ABSTRACT

The first millipedes reported in association with ants were from nests of Formica obscuripes Forel. Several unidentifiable species, an introduced species from Europe, and 2 species representing new genera comprised the collection.

A collection of millipedes found in nests of the Western Mound-thatching ant, Formica obscuripes Forel, in Washington State by Mr. Gary D. Alpert, graduate student in the state university, was sent to me for identification. The collection was accumulated as an incidental feature of his work in the biology of Leptothorax diversipilosa Smith, stated to be a very rare ant thus far found only in nests of the above species. Also sent was the note "These millipedes were collected from among the ants while sorting through nest material. What the association is with the host ant, I did not observe. Most of the millipedes were found rather deep within the nest, approximately 24 inches below ground level. The host ants did not attack the millipedes, and they seemed to be allowed to move within the nest with impunity. Formica obscuripes is a very 'agressive' ant that seems to attract more than its share of inquilines because of the vegetative debris that accumulates within its nests."

While some of the milliped species undoubtedly were casual visitants in the nests, others apparently were there as facultative, rather than obligate, inquilines and include the only myrmecophilous millipedes thus far reported in the United States.

The collection is further noteworthy as containing two new species typifying new genera and a previously known European species now widespread in this country. Also represented were numerous specimens of Polyxenidae collected from six nests at Spokane and Pullman. These were sent to Dr. Bruno Condé, University of Nancy, Nancy, France, for identification which has not yet been reported. The specimens obviously were casual visitants, found "in the upper dry parts of the nests, crawling over the smaller twigs."

The 2 holotypes have been deposited in the U. S. National Museum of Natural History, with the paratypes placed in the Florida State Collection of Arthropods, in Gainesville.

Eurydesmidae

An 18-segmented male and female, of indeterminate genus, found in nest 18, Colfax, Whitman Co., 29 December 1967, were incidental visitors.

1Contribution No. 234. Bureau of Entomology, Division of Plant Industry, Florida Department of Agriculture and Consumer Services, Gainesville.
TRICHOPODESIDAE

The Chamberlin and Hoffman Checklist (1958) gave Ophiodesmus albonemus (Latzel), introduced from Europe, as the only recognized North American member of the family Vanhoeuffenidæ, a name later replaced by the earlier Trichopolydesmidae. Loomis (1960) added new genera and species, as well as previously named ones, to the family, and Buckett and Gardner (1968) described a new genus and type species. These genera and a genus currently described are separated in the following artificial key.

Key to genera of Trichopolydesmidae north of Mexico
1. Body with 19 segments .................. Bidentogon Buckett and Gardner
1'. Body with 20 segments .................................................. 2
2. Male with dorsal segment 7 enlarged .......... Chaetaspis Bollman
2'. Dorsum of male segment 7 little or not enlarged .................. 3
3. Antennæ filiform, followed by a broad, deep concavity; anterior sides of vertex precipitous ..................... Alportia new genus
3'. Antennæ subclavate to clavate; postantennal concavity, if present, not remarkably large; sides of vertex less precipitous ............. 4
4. Posterior corners of none of the keels caudally produced ........

.................................................................................. Antriadesmus Loomis
4'. At least a few caudal segments with posterior corners produced backward ........................................................................... 5
5. Outer margin of keels of male segment 2 thickened and with a large ventral concavity ................ Phreatodesmus Loomis
5'. Keels of male segment 2 not outwardly thickened, lacking a ventral concavity .......................................................... 6
6. Metazonites with an anterior row of 10 or more setae ..............
.................................................................................. Speodesmus Loomis
6'. Metazonites with less than 10 setae in anterior row .......... 7
7. Body 17-20 mm long; segment 2 with anterior row of 18-20 marginal setae; principal segments with 4 transverse rows of setae ....
.................................................................................. Harpogonopus Loomis
7'. Body rarely as long; segment 1 with fewer setae at front margin; most segments with no more than 3 transverse rows of setae .......... 8
8. Segment 1 oval, encircled by a row of marginal setae; setae of inner surface scattered .............................. Oodesmesus Loomis
8'. Segment 1 more semicircular, not enclosed by a row of marginal setae; inner setae in transverse rows ........................................... 9
9. Gonopods quite complicated .......... Tidesmus Chamberlin
9'. Gonopods more simple, somewhat resembling those of Polyodesmus ................................ 10
10. Posterior margin of keels with 3 teeth .................... Speorthus Chamberlin
10'. Posterior margin of keels apparently without teeth ..................
.................................................................................. Ophiodesmus Cook

In the present study a similarity was noted in the gonopods of Ophiodesmus verhoefii (Brolemann, 1895) with those of the New Mexican Speorithus tuganusius Chamberlin, 1952, as illustrated in Loomis 1960. A similar relationship was seen between the latter species and Speodesmus echinourus Loomis, 1960. While the 3 species appear to be distinctive, further investigation may require some generic consolidation.
Type species: *Alpertia lunatifrons* new species.

Diagnosis: Although this genus is based on specimens lacking a moult of maturity, several unusual characters justify its description. It is associated with the group of genora having the posterior corners of the keels acute and usually more or less produced backward, rather than those with the corners of many keels rounded. It may be closest to the poorly known *Chaetaspis* Bollman, 1887, but differs from it and other members of the family, in the filiform antennae with sockets opening obliquely from the front of a lateral declivity of the front part of the vertex, in the frontal ridge, and large mandibular stipes.

Description: Body small, quite compact, very poorly chitinized, with little color, and composed of 20 segments in both sexes.

Head very distinctive; antennae long, slender, joints subequal in thickness, sockets opening more to the side than upward; a swollen, crescentic ridge surrounding each socket in front, inwardly curving upward to meet opposite ridge between antennae; anterior side of vertex sharply descending behind each antenna to form mesal limits of a large depression extending some distance toward posterior margin of head; mandibular stipes large, subquadrate in vertical view, extending laterally farther than several succeeding segments but approximating those thereafter.

Segment 1 with 10 setae along front margin, 8 across middle, and 6 behind.

Succeeding segments with keels large, quite squarely projecting well beyond sides of body; outer margin and posterior angle thin, inner surface raised; poriferous keels with 3 seta-bearing teeth between anterior tooth and posterior angle; other keels with only 2 setiferous teeth; pronotites only moderately exposed; metazonites with deep median sulcus in each direction and 3 transverse series of 6 setae; first series and inner setae of middle one on broad, low, rather indefinite swellings; posterior setae projecting behind margin from subconic tubercles. Pores in normal sequence, opening upward from an elongate swelling opposite second setiferous tooth. Apex of last segment a typically deflexed mucro. Legs with low sterna, the pairs separated transversely by a strong depression.

*Alpertia lunatifrons* new species


Description: Body small, soft, shrivelling when slightly dry; male 8 mm long, 1.1 mm wide; female 9 mm long, 1.2 mm wide; color in alcohol faintly pink, increasing with slight drying.

Head (Fig. 1) with vertex wide behind but narrowed in front and abruptly descending between antennae and for some distance behind them into a large depression extending toward back of head; each socket surrounded in front by a ridge curving upward and inward to meet its counterpart between antennae, the confluence preceded by a broad depressed area; antennae long and slender with joint 6 linear, not appreciably thicker than any other joint; clypeus and labrum with 6 macrosetae each;
Fig. 1, Alpertia lunatiprons new species: Head and segment 1, dorsal view.

Fig. 2—5, Neotettixus striatus new species: 2. Side of head showing outline of eye, antennal socket, tentorial notch, mandibular stipe and cardo, front margin of segment 1, and first leg; 3. Anterior gonopods spread slightly by drying, anterior view; 4. Right posterior gonopod, lateral view; 5. Distal two-thirds of penis, posterior view.

labrum with 3 median teeth; surface of head finely setose, longest setae between the antennae; mandibular stipes large, projecting laterad farther than keels of first segments and nearly equalling those at midbody, almost rectangular in dorsal view, surface finely spiculate.

Segment 1 subsemicircular in outline; posterior angles thin, flat, acute, and much below level of inner surface; lateral margin with seta-bearing tooth in front of each posterior angle; posterior margin considerably produced back across dorsum; surface with 3 series of erect setae on minute, slender tubercles, those of last row most evident, 10 setae in front row, 8 across middle, and 6 in back row.

Succeeding segments with prozonites little exposed; metazonites with a distinct median depression in each direction and 3 transverse rows of 6 setae each, borne on low surface swellings, outer one on each side of middle row larger than others, those of posterior row most distinct; on penultimate segment the setae of posterior row longer than on other segments.

POLYDESMIDAE

Polydesmus inconstans Latzel 1884

Up-to-date synonymy of European forms of this introduced species is shown in Demange (1970), while American synonyms are listed in Chamberlin and Hoffman (1958).

An 18-segmented female from above nest differs from inconstans and may be Brolemann’s P. racovitszai, introduced at Seattle.

**NEMASOMATIDAE**

Five genera containing North American species now are recognized in this family. *Nemasoma* Koch and *Tivius* Chamberlin have been keyed, with interpretive figures, by Hoffman (1964); the 3 remaining genera are separated below.

**Key to 3 American genera of Nemasomatidae**

1. Gnathochilarium suddenly constricted below middle, narrowest at constriction; females with legs 1 and 2 larger than adjacent ones...
   
   ........................................................................................................................... *Neottiulus* new genus

   1'. Gnathochilarium gradually constricted below; female legs 1 and 2 not enlarged .................................................................................................................. 2

   2. Eyes present; anterior legs of male with inflated pouch at distal end of penultimate joint .......................... *Aprosphysosoma* Hoffman

   2'. Eyes lacking; penultimate joint of all legs without a pouch
   ........................................................................................................................... *Ameractis* Causey

   *Neottiulus* new genus

   **Type species:** *Neottiulus striatus* new species.

   **Description:** The position of this genus in the family is in doubt, but association with, if not within, the *Blaniulinae* seems most likely. Principal characters are the sudden constriction of the gnathochilarium of both sexes below its middle, where it is at least slightly narrower than its lower portion, the sides of the broad upper portion being straight and parallel; metazonites crossed above and below by well spaced striae ending considerably short of posterior margin; segment 7 of male narrowly open at middle behind gonopods which are heavy, quite simple, and without flagella, detectable setae or spicules; male with first pair of legs small, much modified, bent forward, and not distinctly segmented; females with first 2 pairs of legs heavier than adjacent ones; in both sexes the sternum vary greatly in width, the anterior sternum much wider than the next.

   *Neottiulus striatus* new species


   **Description:** Body poorly chitinized and shrivelling on drying; males more slender than females and with penult and antepenult segments legless. Largest male 12 mm long, 1 mm wide, 39 segments; largest female
14 mm long, 1.3 mm wide, 45 segments. Color in alcohol yellowish to yellowish brown with some darker markings, especially the black eye patches joined by a brown band, another band along front margin of segment 1, pore areas dark.

Head uniformly smooth, convex, and glabrous, lacking a median furrow on vertex; antennae separated by over 3 times the diameter of a socket; ocelli poorly developed, small, numerous, closely spaced, and much obscured in the black, oblique, pear-shaped group, its surface smooth and continuous with adjacent surface; tentorial notch deep and narrow (Fig. 2); labrum tridentate; gnathochilarium suddenly constricted below middle where it is slightly narrower than the basal portion, where its sides are slightly convex; sides of broad upper portion straight and parallel.

Segment 1 smooth and shining; lower sides slightly emarginate above the rather abruptly rounded lateral limits; a raised rim behind the emargination and a short but strongly impressed furrow below it in the lateral limit.

Segment 2 extending considerably below segment 1 behind which all segments are crossed by a strong interzonal furrow but lack a longitudinal median sulcus. Surface of segments brilliantly shining; several anterior ones smooth across dorsum but thereafter with deep, well separated striae above and below, beginning at the interzonal furrow and stopping variable distances quite short of posterior margin; intervals between striae flat. Pores beginning on segment 5 adjacent to interzonal furrow; surrounded by a broad, flat ring. Penultimate segment with an erect macroseta near posterior ventral margin each side. Last segment smooth, very faintly produced at apex and not exceeding valves; a caudally directed macroseta each side of apex in the margin itself; another on each side adjacent to outer angle of scale which is almost lenticular in shape with 2 subapical setae; valves smooth and convex, meeting in a groove, with 3 erect, equally spaced macrosetae near each inner margin.

Both pairs of gonopods heavy and quite simple (Fig. 3 and 4), mostly hidden in lateral view, their tips visible in ventral view within the large gonopodial opening which intrudes slightly in the posterior margin of segment 6 for a considerable distance but extends more than half way into segment 7, the posterior portion behind it narrowly open along middle line. Penis projecting from body in holotype; parallel sided, with 2 short terminal lobes (Fig. 5). First male legs reduced in size, strongly bent forward (Fig. 2), and with a faint suggestion of joints; second legs usually a little heavier than those that follow. Females with first legs large and heavy; second legs slightly smaller but larger than adjacent ones. The aberrant male from Seattle has legs 1 and 2 as in females; gonopodial opening small and misshapen, tips of gonopods exposed and appearing as in normal males.

LITERATURE CITED


The Florida Entomologist 55(3) 1972