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PILOGALUMNA COZADENSIS,
A NEW SPECIES OF GALUMNID FROM NEBRASKA, U.S.A.

BY

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In working with the galumnids in my collection of oribatid mites I found that a number of specimens from Nebraska showed several characteristics which differentiated them from other species of pilogalumnids. The description and drawings of the new species is based upon a study of these specimens.

Genus PILOGALUMNA Grandjean, 1956.

Generic characteristics: madibles normal; prodorsum without true projecting lamellae; L and S lines absent; two pairs of anal and three pairs of adanal setae or alveoli present; sensilli never pectinate (Balogh, 1972).

Description is based upon one holotype and twelve paratypes. Specimens will be deposited in the New York State Museum, Albany, New York.

Type locality. Cozad, Dawson Country, Nebraska from grasses pulled by their roots from under trees along irrigation ditches on August 22, 1941 (Nevin collection nos. 180-181).

Color. Light yellow-brown.

Size. Medium for galumnids. Body length: 0.526 mm, breadth: 0.363 mm. Range in length: 0.48 mm to 0.55 mm; in breadth: 0.35 mm to 0.41 mm.

Shape. Somewhat pearshaped.

Specific diagnosis. Interlamellar setae shorter than rostral setae; rostral setae slightly more than half the length of the lamellar setae; the prodorsal setae are fine and only slightly barbed; sensillus head bluntly pointed with rows of a few distinct barbs which extend onto the distal part of the pedicel; suture dorsosejugalis incomplete; areae porosae dorsosejugales elongate oval;

notogastral areae porosae elongate oval except for $A_1$ which is more rounded; adalar porose areas divided; area porosa pastanalis present; epimeral setae $1a, 1b, 2a, 3a, 3b, 4a$ and $4b$ usually present; genital seta $g_3$ and $g_4$ on the anterior margin of the genital plate; genital seta $g_3$ posterior to a midpoint between $g_1$ and $g_2$; circumpedal lines visible; adanal setae $ad_3$ anterior and lateral to lyrifissures $iad$; setae $ft^*$ present and not reduced on tarsus $T$; ungues of approximate equal lengths, the lateral and medial claws flair outward from the much heavier middle claw; dorsal, $d$, and ventral, $v$, setae on all femora are large and barbed.

Description based largely on holotype:

Prodorsum (figs. 1-5): The rostrum is bluntly pointed and bent ventrally giving the appearance of a line across the rostrum at about the level of the lamellar setae. The interlamellar setae are very short, 0.02 mm to 0.04 mm in length and very slender, with minute barbs. They are 0.118 mm apart at their bases. The lamellar setae are located on the dorsum of the rostrum.
They are by far the longest of the prodorsal setae extending beyond the bases of the rostral setae (fig. 1). The rostral setae project forward and medially but do not meet in front of the rostrum. They are attached to the ventral surface of the rostrum. The sensillus (fig. 5) is from 0.06 mm to 0.1 mm in length with a sharp curve at the base of the pedicel and ending in a head about one third the total length of the sensillus and about three times the width of the pedicel. The sensillus curves backward and laterad over the anterior surface of the pteromorph (fig. 1 and 5b). The oval areae porosae dorsosejugales are located just posterior to the interlamellar setae and at the mesial end of the incomplete sutura dorsosejugalis. In some specimens a faint line connects the medial ends of the distinct areas of the sutura dorsosejugalis.

**Notogaster** (figs. 1, 7 and 9). The dorsophragmatic apophyses of the notogaster, hy (fig. 1) are irregular in shape as seen in all permanently mounted specimens but appear more rounded in specimens examined in lactic acid. All visible notogastral setae are minute and appear about equal in length except that seta ti shows usually as an alveolus. Setae te and P_{1-3} are not longer than the other notogastral setae. The areae porosae adalares are divided into two oval areas, Aae, the outer and, Aai, the medial. They are subequal with Aae larger and with Aai often with its long axis perpendicular to Aae. There are three distinct pairs of mesonotic areae porosae. A_1 is nearly spherical, A_2 is oval and A_3 is elongate oval and close to the posteriolateral margin.
of the notogaster (fig. 8). Lyrifissures im, ih, ips and ip are present as is the pair of crescentic glandular openings, gla. There is no median notogastral pore.

**Ventral surface** (figs. 6-9). There are six genital setae, two in the anterior margin of each plate and the remaining four in an irregular row on each plate. Setae g₄ and g₅ are separated from one another for a greater distance than are the other adjacent setae. Seta g₆ is close to the posterior medial border of the genital plate. The epimeral setae were mentioned earlier. The epimeral setae which I have designated as 3a is minute and was not found on all specimens. Apodemata ap.sj and ap 3 are usually fused at their medial ends. In some cases this fusion is unilateral. Setae adₛ are located anteriolaterally to the anal plates. The lyrifissures, iad are mesad and posterior to setae adₛ. The area porosa postanal is seen only in a rear view of the mite. It is oval and about double the size of a single porose area A₃. In the region of epimere III thinner spherical spots are found in some specimens. Characteristic spatulashaped markings are found lateral to each genital plate with the open end of the spatula close to the plates.
Lateral region (figs. 7 and 8). Lines T and E are present. The pteromorphs are 0.295 mm in length and extend forward from their points of attachment by 0.146 mm but do not reach the apex of the rostrum. There is a distinct notch in the pteromorph (figs. 1 and 8). Three pteromorphic thickenings, "veins", are found anterior to the pteromorph groove and six to eight posterior to the groove. A delicate seta, ta, is found anterior to the pteromorph groove and the lyrifissure, ia, posterior to the groove.

Legs (figs. 10-13). All tarsi bear three unguis of about equal length sut with the middle one double the thickness of either of the other two.

Setal formulae: tarsi: 19-15-15-12; tibiae: 4-4-3-3; genua: 3-3-1-1; femora: 4-4-2-2; trochanters: 0-0-1-1.

Solenidial formulae: tarsi: 2-2-0-0; tibiae: 2-1-1-0; genua: 1-1-1-0; femora: 0-0-0-0; trochanters: 0-0-0-0.

Some characteristics of the setae and the solenidions of the legs which may be of value in separating species of the genus Pilogalumna are included under specific diagnosis and under the discussion.

DISCUSSION.

The genus Pilogalumna was established by Grandjean in 1956 with Pilogalumna ornatula as the type species. His descriptions and drawings served as models for latera work. Early descriptions and drawings of: P. tenuiclavus (Berlese, 1908), P. allifera (Oudemans, 1915), P. binadalares (Jacot, 1929) and of "Galumna alatum" (Jacot, 1934) are somewhat incomplete so that final identification by use of any of the descriptions is impossible. The following table gives the size differences for pilogalumnids described. The name associated with the measurements indicates the source of the figures but not necessarily the original description of the species.

Table of lengths and breadths of species of *Pilogalumna*.

<table>
<thead>
<tr>
<th>Species</th>
<th>Sex</th>
<th>Length (mm)</th>
<th>Breadth (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>P. ornatula</em></td>
<td></td>
<td>0.67</td>
<td>0.440</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.695</td>
<td>0.470</td>
</tr>
<tr>
<td><em>P. tenuiclavus</em></td>
<td>males</td>
<td>0.580</td>
<td>0.49</td>
</tr>
<tr>
<td></td>
<td>females</td>
<td>0.640</td>
<td></td>
</tr>
<tr>
<td><em>P. unknown</em></td>
<td></td>
<td>0.63</td>
<td>0.49</td>
</tr>
<tr>
<td><em>Galmna alatum</em></td>
<td>Jacot 1934</td>
<td>0.591</td>
<td>0.449</td>
</tr>
<tr>
<td></td>
<td>Jacot 1934</td>
<td>0.648</td>
<td>0.496</td>
</tr>
<tr>
<td><em>P. unknowns</em></td>
<td></td>
<td>0.609</td>
<td>0.56</td>
</tr>
<tr>
<td>identified by JACOT</td>
<td></td>
<td>(13 specimens)</td>
<td>0.580</td>
</tr>
<tr>
<td>as &quot;Galmna alatum&quot;</td>
<td></td>
<td>(II specimens)</td>
<td>0.593</td>
</tr>
<tr>
<td><em>P. binadalares</em></td>
<td></td>
<td>0.545</td>
<td>0.467</td>
</tr>
<tr>
<td>measurement of cotypes</td>
<td></td>
<td>(13 specimens)</td>
<td>0.511</td>
</tr>
<tr>
<td>NEVIN 1973</td>
<td></td>
<td>(II specimens)</td>
<td>0.444</td>
</tr>
<tr>
<td><em>P. allifera</em></td>
<td></td>
<td>0.548</td>
<td>0.372</td>
</tr>
<tr>
<td><em>P. kùmberleyensis</em></td>
<td></td>
<td>0.526</td>
<td>0.363</td>
</tr>
<tr>
<td><em>P. variabilis</em></td>
<td></td>
<td>0.548</td>
<td>0.372</td>
</tr>
<tr>
<td><em>P. bloemfonteinensis</em></td>
<td></td>
<td>0.548</td>
<td>0.372</td>
</tr>
<tr>
<td><em>P. cozadensis</em></td>
<td></td>
<td>0.526</td>
<td>0.363</td>
</tr>
</tbody>
</table>

Examination of specimens identified by JACOT as "*Galmna alatum*" showed the specimens to be a species of *Pilogalumna*. I do not have specimens of *P. tenuiclavus* from Europe for comparison. One character on which *P. binadalares* depends as a species is the more flattened and blunt head of the sensillus. In JACOT's 1934 description of *P. binadalares* he states that *P. binadalares* is smaller than his "*G. alatum*". He does not give measurements. The measurements given in the table above show that his cotypes are not smaller than "*G. alatum*". *P. binadalares* was first described by JACOT as *Galmna areolata binadalares* then in 1934 as *Galmna alatum binadalare*. The slide of the cotypes is labeled, apparently by JACOT, as *Galmna binadalare*. Since the specimens are pilogalumnids I assume that the correct name should be *Pilogalumna binadalares* (Jacot, 1929).

I believe that size would tend to indicate that *Pilogalumna cozadensis* is not *P. ornatula*, *P. tenuiclavus*, *P. binadalares*, nor Jacot's "*Galmna alatum*". The list of characters under specific diagnosis above when compared with those of other species tends to prove that *P. cozadensis* is a new species. A few points of differences among *P. cozadensis*, *P. kimberleyensis*, *P. variabilis* and *P. bloemfonteinensis* should be mentioned. *P. cozadensis* is the only one in the group with the head of the sensillus barbed and bluntly pointed at the tip. The interlamellar setae of *P. cozadensis* are much shorter and finer than those of the other species. The area porosa postanalis in *P. bloemfonteinensis* is about half the size of *P. cozadensis*. In *P. kimberleyensis* the area porosa postanalis is lacking. Engelbrecht does not mention the area porosa postanalis in the description of *P. variabilis*. *P. variabilis* may be separated from the other South African species and from *P. cozadensis* by the narrow pointed head of the sensillus. In *P. ornatula* the only other species for which there is a comprehensive description, the postanal pore is wide and ribbonlike. The sizes and shapes of the areae porosae adalares are of help in differentiating species.
A study of the setae and the solenidions of the legs shows a similarity between *P. cozadensis* and *P. bloemfonteinensis*. It is likely that other species would show this close relationship if they were studied in the same detail. I have used Engelbrecht’s drawings and descriptions of *P. bloemfonteinensis* as models in the study of *P. cozadensis*. In the formulae for the setae of the legs of *P. ornatula* Grandjean lists one seta for each trochanter I and II. I found none in *P. cozadensis*. Grandjean also gives twenty as the number of setae on tarsus I. I found nineteen in *P. cozadensis*. Engelbrecht lists nineteen for *P. bloemfonteinensis*. For tarsus I for *P. bloemfonteinensis* Engelbrecht states that the antiaxial fastigial seta ft' is inserted posteriorly of the solenidion w1. What I have interpreted as ft' is a larger and longer seta more lateral and anterior in position. The famulus z is anterior to solenidion w2 and in a dorsal position in *P. cozadensis*. The ventral setae of femora I and II are described and figured as small in *P. bloemfonteinensis*. They are large and distinctly barbed in *P. cozadensis*. In tarsus II seta is very close to pv' in *P. cozadensis*. In *P. cozadensis* solenidion φ is as long as tarsus I.

It is not possible to make complete comparisons between *P. allifera* and *P. cozadensis* without specimens of *P. allifera* for comparison. However one feature of *P. allifera* described by Oudemans is the great length of the inner (median) claw of tarsus IV. Oudemans believed that this feature of inner claw length in *P. allifera* to be unique among all the Oribatoidea. The inner claw of *P. cozadensis* is normal in length.

I wish to thank Dr. H. W. LEVI of Harvard University for the loan of specimens from the Museum of Comparative Zoology and Dr. D. E. JOHNSTON and Dr. G. S. IDE of The Ohio State University for the loan of specimens from the Acarology Laboratory.

ABSTRACT

*Pilogalumna cozadensis*, a new species of galumnid from Nebraska, U.S.A. Size: L. 0.526 mm. W. 0.363 mm; interlamellar setae 0.02 mm to 0.04 mm, much shorter than the lamellar or rostral setae; notogastral setae minute; presence of seta ti indicated by alveoli; genital seta g2 in the anterior border of the genital plate; adanal seta, ad4, anteriolateral to the lyrifissure iad, head of the sensillus bluntly pointed and with scattered barbs extending upon the pedicel; epimeral seta la present but minute.

RéSUMÉ

*Pilogalumna cozadensis*, une nouvelle espèce de Galumnidae du Nebraska (U.S.A.) est décrite. Elle est comparée aux autres espèces du genre dont elle diffère par la taille du corps, la longueur des poils interlamellaires et d’autres caractères.

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