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TWO NEW ELONGATE SPECIES OF PLANODISCUS (ACARI : UROPODINA) 
WITH A KEY TO THE KNOWN SPECIES

BY Richard J. ELZINGA

TAXONOMY UROPODINA

ABSTRACT: Planodiscus capillilatus and Planodiscus kistneri from Peru are described and a key to the known species of this genus is presented.

TAXONOMIE UROPODINA

ZUSAMMENFASSUNG: Planodiscus capillilatus und Planodiscus kistneri aus Peru werden beschrieben und Bestimmungsschlüssel für die bekannt Arten wird vorgestellt.

The genus Planodiscus was described by Sellnick (1926) from mites associated with the army ant genus Eciton. A single species, P. squamatin, was known. Eight additional species have been described by Elzinga & Rettenmeyer, 1966 (burchelli), 1970 (cuiiens, elongatus, foreli, hamatus, setosus), and Elzinga, 1990 (borgmeieri, mexicanus).

Of the above, two species (elongatus, borgmeieri) are much longer than broad. An additional two elongate species from Peru can now be described and added to this elongate group.

Planodiscus capillilatus n. sp.

FEMALE.

Body elongate, 950-1040 μm long and 250-280 μm wide; other measurements in Table I. Cuticular punctation on entire dorsum and venter distinct and relatively uniformly distributed.

Dorsum (Fig. 1): with over 90 pairs of large setae, evenly dispersed, flattened, slender, usually unnotched except for a few anterior lateral ones with small unequal tines (Fig. 1 insert); no greatly elongate posterior setae; central raised area forming anterior prolongation indistinct (Fig. 5), with distinct membranous anterior extension; holdfast lobes reduced (Fig. 5); 2 unpaired anteromedial setae of equal size; 40-46 pairs of small marginal setae; 2 posterior rows of fringed, mushroom-shaped setae, anterior row of 4 on posterior margin on dorsal shield, and posterior row of 8 setae behind shield margin on membranous area.

Venter (Fig. 2): sternoventral shield concave longitudinally between legs II-IV, with pronounced indentations adjacent to coxae II-IV; 4 pairs of setae on sternoventral shield between coxae I-IV, 1st pair near or contiguous to anterior pores, each of subsequent pairs of setae adjacent to coxae III-IV; genital plate approximately 2/3rds as wide as long, widest point equidistant from each end, narrowed posteriorly, punctuation absent near edges; metapodal plate with carina along pos teromedial margin, punctuation similar to that of other ventral plates; sternoventral shield posterior to coxae IV with 3 pairs of setae, 1st pair anterior to widest part of shield, 2nd and 3rd pairs posterior to widest point, with 3rd pair not extending to anus; distance from widest part of sternoventral shield to coxae IV much less than distance to anus; lateral plates narrowed anteriorly, each plate with 3 setae and pores and subequal to width of lateral plate at widest point.

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2. Department of Entomology, Kansas State University, Manhattan, Kansas 66506, U.S.A.

TABLE 1: Measurements (in microns) of new Planodiscus.

<table>
<thead>
<tr>
<th>No. Specimens Measured</th>
<th>P. capillillatus (3 ♂)</th>
<th>P. kistneri (1 ♂, 3 ♀)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Range</td>
<td>♂</td>
<td>♀</td>
</tr>
<tr>
<td>Body length</td>
<td>980-1,010</td>
<td>1,245</td>
</tr>
<tr>
<td>Length sternoventral plate</td>
<td>685-705</td>
<td>854</td>
</tr>
<tr>
<td>Posterior edge genital plate to posterior edge of sternoventral plate</td>
<td>442-450</td>
<td>567</td>
</tr>
<tr>
<td>Width sternoventral plate between legs III-IV</td>
<td>117-123</td>
<td>180</td>
</tr>
<tr>
<td>Width sternoventral plate between legs IV &amp; anus</td>
<td>157-180</td>
<td>255</td>
</tr>
<tr>
<td>Length genital plate including flange in ♂</td>
<td>137-145</td>
<td>170</td>
</tr>
<tr>
<td>Width genital plate including flange in ♀</td>
<td>85-90</td>
<td>107</td>
</tr>
<tr>
<td>Length lateral plates</td>
<td>345-377</td>
<td>470</td>
</tr>
<tr>
<td>Width lateral plates</td>
<td>40-48</td>
<td>60</td>
</tr>
</tbody>
</table>

**Legs**: Posteroventral seta of coxa I lacking barbs; chaetotaxy of legs II-IV similar.

**Gnathosoma**: distal hypostomal setae lacking barbs, 2nd pair slightly shorter than 1st pair and lacking barbs, 3rd pair 2X length of 1st pair and with 4 barbs; gnathosomal setae same length as 1st hypostomal pair, with 2 barbs.

**MALE. Unknown.**

**DISTRIBUTION AND HOSTS.** This species is known only from the type locality and host.

**TYPES.** Holotype female with the following data: Peru: Madre de Dios Dept., Tambopata Wildlife Reserve, 9-1-1983, D. H. KISTNER No. 5073, Eciton drepanoporum Nest 206, Ex. Biv. sample; slide no. RE-1,005. Holotype deposited in California State University, Chico collection. Additional 2 female paratypes deposited with holotype and in author’s collection.

The species is named for its great number of large dorsal setae.

**Planodiscus kistneri** n. sp.

**FEMALE.**

Body elongate, 1,245 μm long and 400 μm wide; other measurements in Table I. Cuticular punctuation strong. Agrees with description of *P. capillillatus* except as follows:

**Dorsum** (Fig; 3) : with 34 pairs of large setae, evenly dispersed, equally notched (Fig. 3 insert); central raised area of anterior prolongation distinct and enlarged (Fig. 6), containing 3 anterior pairs of moderately sized setae and a posterior pair of larger setae; holdfast lobe mechanism enlarged (Fig. 6), largest proportionally of any *Planodiscus* (ELZINGA, 1979); 2 unpaired large setae present, 1st at ending of prolongation and 2nd positioned at about one-third the body length posteriorly; 43 pairs of small marginal setae.

**Venter** (Fig. 4) : sternoventral shield proportionally wider (see Table I) except anterior margin, which is reduced in width; 1st pair of sternoventral setae beyond legs IV posterior to region opposite metapodal carinae, 3rd pair reaching anus; lateral plate setae positioned farther posteriorly on plate.

**Legs** : posteroventral setae of coxae I lacking barbs; appendages located in deep foveae pedales.

**Gnathosoma** : distal hypostomal setae barbless, 2nd pair 2/3 length of 1st pair and lacking barbs, 3rd pair nearly 2X length of 1st pair and with 6 barbs; gnathosomal setae 2/3 length of 1st hypostomal pair, with 5 barbs.

**MALE.**

Body similar to female but slightly smaller, 1,215-1,250 μm long; other measurements in Table I; 8 pairs of sternoventral setae, 5th pair not covered by posterior flange of genital plate.
Fig. 1: *Planodiscus capillilatus* n. sp., female, dorsum showing tips of enlarged setae. Fig. 2: *Idem*, ibid., venter. Fig. 3: *Planodiscus kisneri* n. sp., female, dorsum showing setal tip type. Fig. 4: *Idem*, ibid., venter.
Locality and Hosts. This species is known only from the type locality and host.

Types.

Holotype female with the following data: Peru: Madre de Dios Dept., Tambopata Wildlife Reserve, 9-1-1983, D. H. Kistner No. 5073; Eciton drepanophorum nest 206, Ex. Biv. sample; slide no. RE-1,003. Allotype male with same data except slide no. RE-1,002. Holotype and allotype deposited at California State University, Chico. Additional paratype males (2) from same locality and host species are deposited in author’s collection. This species is named for the collector.

Key to Species of Planodiscus

1. Body slender, 2.5 to 3.5 times longer than broad. 8
   Body oval to round, less than 2.5 times longer than broad ................................... 2
2. Metapodal plate with carina along posteromedial margin ........................................ 3
   Metapodal plate with carina approximately in middle of plate .................................. 4
3. Sternoventral shield without distinct indentation at coxa III, body length greater than 1,200 μm. hamatus Elzinga & Rettenmeyer
   Sternoventral shield with distinct indentation at coxa III, body length less than 1,150 μm. .................. burchelli Elzinga & Rettenmeyer
4. Body almost round, more than 65 pairs of large dorsal setae ........ setosus Elzinga & Rettenmeyer
   Body distinctly oval, less than 50 pairs of large dorsal setae ........................................ 5
5. Anterodorsal prolongation indistinct, anteromedial margin of dorsum usually distinctly membranous; 2 unpaired anteromedial dorsal setae present .................. cupiens Elzinga & Rettenmeyer
   Anterodorsal prolongation distinct, anteromedial margin of dorsum not membranous or with only narrow membranous area, unpaired anteromedial dorsal setae absent .................. 6
6. Large dorsal setal tips evenly notched (terminal tines same length); genital plate in female with light punctations on entire surface ... squamatim Sellnick
   Large dorsal setae with one tine of notch reduced ........................................ 7
7. Sternoventral shield less than 700 μm; more than 45 pairs of large dorsal setae .................................. forcet Elzinga & Rettenmeyer
   Sternoventral shield greater than 800 μm; less than 40 pairs of large dorsal setae .......... mexicanus Elzinga
8. More than 90 pairs of large dorsal setae; body length less than 1,100 μm. \textit{capillilatus} n. sp.
Less than 50 pairs of large dorsal setae; body longer than 1,100 μm. \textit{9}

9. Anterodorsal prolongation and holdfast lobes large; most large dorsal setae evenly notched at tip. \textit{kistneri} n. sp.
Anterodorsal prolongation moderate to poorly defined; most large dorsal setae unnotched or with one tine of notch reduced in size. \textit{10}

10. Large dorsal setae number 40-45 pairs; anterior half body wider than posterior half; on \textit{labidus} army ants. \textit{borgmeieri} Elzinga
Large dorsal setae number less than 35 pairs; posterior half similar width or wider than anterior half; on \textit{Eciton} army ants. \textit{elongatus} Elzinga & Rettenmeyer

Biology of \textit{Planodiscus}

Only adult \textit{Planodiscus} are known, and these have all been phoretic on Neotropical army ants. Available data indicate that army ant genus \textit{Eciton} is the primary host carrier. Rettenmeyer (1961) searched over 60,000 army ants of the genera \textit{Nomomyrmex}, \textit{Labidus}, and \textit{Neivamyrmex} and found only two \textit{Planodiscus}, both from \textit{Neivamyrmex}, whereas over 1,500 specimens were separated from \textit{Eciton} at ratios of one mite to 648 ants for \textit{P. burchelli}, one mite to 392 ants for \textit{P. hamatus}, and one \textit{P. elongatus} to 345 of its preferred host, \textit{E. mexicanum}. This pattern has been repeatedly seen by collectors.

Since army ants are highly active and nomadic, phoretic mites must secure themselves firmly or risk being rubbed off. All known \textit{Planodiscus} attach themselves to the ventral surface of the middle and/or hind tibiae near the femoral-tibial joint of the ant. Although the mite uses its legs to climb onto the ant and for stabilizing itself at the preferred site, it is the anterior cuticular holdfast (Figs. 5, 6), formed by the overlapping and extended anterior part of the dorsum, that snaps firmly around the ant tibia and is responsible for the secure attachment (Elzinga, 1978). Less specialized and nearly oval \textit{Planodiscus} have relatively weak holdfasts, whereas advanced species have enlarged holdfasts and are slender in shape (Elzinga, 1979). Attachment sites on the ant have been studied using the Scanning Electron Microscope (SEM) to detect any mite damage or feeding wounds, but none have been detected.

A single or at most two eggs have been found within females, but none contained developing embryos. Also, since the eggs are large and limited in number, it is believed that food must be abundant wherever postembryonic development takes place. Because the ancestors to these mites are the \textit{Trichocylliba}, many of which are scavengers, it is postulated that the \textit{Planodiscus} immature stages develop at abandoned army ant statary phase bivouac sites where extensive uneaten prey is localized. Since the number of such sites is finite for any army ant species, the likelihood of another army ant colony reusing the site after mite development has been completed is certainly possible.

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References


