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A NEW ANDROLAEOLAPS (ACARINA: LAELAPIDAE) FROM WOODPECKERS, WITH NOTES ON THE MESOPICOS SPECIES-GROUP OF THE GENUS

BY

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ABSTRACT:

Androlaelaps dendropicos n. sp. is described from Dendropicos elachus Oberholser from the Republic of Zaire, and Dendropicos fuscescens (Vieillot) from Mozambique. Remarks on the host relationships and morphology of the mesopicos species-group of Androlaelaps Berlese are included, noting certain trends which could be important in the taxonomy of the group and suggesting the inclusion of A. phoeniculi (Zumpt and Till) in the species-group.

Specimens of Androlaelaps Berlese from Dendropicos elachus Oberholser were sent to this Department for examination by Professor P. L. G. Benoit of the Koninklijk Museum voor Midden Afrika, Tervuren. Dr. W. M. Till had previously identified the series as "Androlaelaps wilkini-steyni group". Three females of the same species taken from Dendropicos fuscescens (Vieillot) were discovered in the collection of this Department. These had been examined by Till and were labelled as "Androlaelaps near mesopicos" by her. Although similar to Androlaelaps mesopicos (Radford) in some respects, the mites differed from this species in body size, size of the chelae, the presence of an anteroventral spine on coxa III, and the degree of reticulate patterning and sclerotisation of the sternal shield. With respect to the size of the mites and the nature of the dorsal and sternal shields the mites showed affinities with Androlaelaps wilkini (Till), the most distinct of the described species. Since the specimens from the two Dendropicos woodpeckers could not satisfactorily be assigned to any of the existing species we have decided to create a new species for their reception, described below.

Androlaelaps dendropicos n. sp., figs 1 and 2.

Female: Deutosternum with 6 rows of teeth, 2-4 teeth per row. Chelae 49-53 µ long. Pilus dentilis basally inflated and tapering distally, 12-14 µ in length. Arthrodial filaments subequal in length.

Dorsal shield ovoid, the posterior margin truncate. Seta z3 absent, px2 and px3 present. Shield bears 37 pairs of setae, of which j3-j6, J1-J5, z4-z6, Z1-Z4, s3-s5, px2 and px3 are reduced to short fine setae about 1/4 the length of the S-series. Setae j5 and z5 about 2/5 the distance between their bases, r4 situated on the integument lateral to the shield. Marginal setae more

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or less uniform in length and thickness, none reduced to microsetae. The shield with a reticulate pattern which fades on the mediocentral region of the shield. \( Z_5 \) ten times the length of \( J_5 \). Dorsal length 714-798 \( \mu \), dorsal width 433-504 \( \mu \); DL/DW = 1.6.

Sternal shield reticulate, fading posteriorly where it becomes faintly granular; continuous with the presternal area, on which the sternal setae I are situated. Posterior margin of the shield concave with a ragged margin. Sternal length 83-94 \( \mu \), sternal width 155-169 \( \mu \); SL/SW = 0.5-0.6. Sternal setae I shorter than setae II and III, and subequal to the metasternal setae.

Genital shield slightly expanded behind coxa IV and drop-shaped. Genital width 122-136 \( \mu \), genital width 2 94-100 \( \mu \); GW1/GW2 = 1.22-1.36. Genital setae 1/2-2/3 GW2. The shield has patterning and is well sclerotised.

Anal shield pear-shaped, 130-160 \( \mu \) long and 120-129 \( \mu \) wide. AL/AW = 1.1-1.3. Paranal setae situated level with the posterior margin of the anus and about 2/5 the length of the postanal seta. Reticulate patterning on the anterior margins. Integument of the idiosoma bears 23-27 pairs of setae.

Figs. 1-2: Androlaelaps dendropicos n. sp. 1) Dorsal view of female; 2) Ventral view of female.
Leg chaetotaxy typical for the group. Tibia III with 9 setae, tarsi II-IV with two thick terminal spines on II and two unequal thick spines on III and IV. Coxa III with a thick spiniform anteroventral seta. Length of tarsus IV about 5 times its width.

Deitonymph: Deutosternum with 6 rows of teeth, 2-4 teeth per row. Chelae 35 μ long. Pilus dentilis approximately 7 μ long.

Dorsal shield as for female. DL = 648 μ, DW = 376 μ; DL/DW = 1.7. Sternal shield tongue-shaped, reticulate, covering the entire intercostal region; SL = 308 μ, SW (at the level of the sternal seta II) = 110 μ; SL/SW = 2.8. Anal shield pear-shaped, reticulate. AL = 113 μ, AW = 82 μ; AL/AW = 1.3. Paranals situated almost level with medial region of the anus. Paranal setae 35 μ and postanal seta 89 μ in length. Leg chaetotaxy as for the female. Length of tarsus IV 4 times the width at the base.

Males: Known.

Types: Holotype ♀, 4 paratype ♀ and 1 deutonymph from Dendropicos elachus Oberholser, Kisanga, Elizabethville (1126 DB), Congo, IX, 48, leg N. Leleup, 3 paratype ♀♀ from Dendropicos fusescens (Vieillot), Buzi River, near Beira, Mozambique, 14 IX 61.

Holotype ♀, 3 paratype ♀♀ and 1 deutonymph in the collection of the Koninklijk Museum voor Midden Afrika, Tervuren, Belgium. 4 paratype ♀♀ in the collection of the South African Institute for Medical Research, Johannesburg, South Africa.

Diagnoses: Androlaelaps dendropicos n. sp. can be separated from the described species by the following combination of characters: Coxa III with an anteroventral spine, 23 absent from the dorsal shield, sternal shield reticulate and more or less continuous with the presternal area, chelae large (49-53 μ) and the marginal setae of the dorsal shield long, none markedly reduced.

Morphology: We consider here the morphology of the mesopicos species-group and Androlaelaps dendropicos n. sp. The morphology of A. phoeniculii (Zumpt and Till) will be discussed later.

Till (1963) distinguished the group by the sinuous posterior setae on the opisthosoma, the position of the first pair of sternal setae on the presternal area and by the presence of nine setae on tibia III. The described species are very similar morphologically and Till (1963) suggested that A. haydocki (Till) and A. mesopicos (Radford) might be variations of the same species. Till used differences in dorsal chaetotaxy, in shape of the shields of the venter and the chaetotaxy of certain leg segments to separate the species. An examination of the morphology of the group revealed certain gradients within the group which could be used in the separation of the species. There is a gradient in the degree of sclerotisation and reticulate patterning of the sternal shields. A. wilkini (Till) shows the greatest degree of sclerotisation and the most extensive reticulate patterning in the group. The sternal shield of A. dendropicos n. sp. is not as well sclerotised as that of A. wilkini (Till), being granular in appearance in parts, but with a greater degree of reticulate patterning than the remaining species. The shields of the remaining species are weakly sclerotised and without reticulate patterning although A. mesopicos (Till) shows traces of patterning on the anterior regions of the shield. The shields of the latter species are quite distinct from the presternal area. In the known males the anterior regions of the holoventral shields are weakly sclerotised and granular in appearance.

The dorsal shields of the group show similar gradients with respect to the pattern of reduction of the discal setae. The reduced setae of the shields are subequal in length and thickness...
and can be separated from the longer, thicker and usually barbed unmodified setae. The following pattern of reduction occurs on the group: Jr to J5, and Zt to Z4 and the px setae are reduced in all the species. In addition the following are reduced:

- A. wilkini: j4-j6, z5-z6
- A. dendropicos n. sp.: j3-j6, z4-z6, s3-s5 (z3 absent)
- A. steyni: j3-j6, z2-z6, s3-s5, S5 shorter than other marginal setae.
- A. mesopicos: j3-j6, z2-z6, s3-s5, S1, S4 and S5 (z3 absent)
- A. haydocki: j3-j6, z2-z6, s3-s5, Sx, S4, and S5. s6, S2 and S3 long and sinuous.

The reduced setae in A. wilkini are the longest of the group, not greatly reduced. A. dendropicos n. sp. and A. steyni lie between A. wilkini, A. haydocki and A. mesopicos in the length of the reduced setae, which in the latter two are reduced to microsetae. Correlated with this decrease in length from A. wilkini is an increase in the length of the Z5 setae. These are short and not very sinuous in A. wilkini increasing in length to A. haydocki. This is observed in the ratios of Z5 to J5 in the group.

<table>
<thead>
<tr>
<th>Species</th>
<th>Z5/J5</th>
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<tbody>
<tr>
<td>A. wilkini</td>
<td>3</td>
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<tr>
<td>A. dendropicos</td>
<td>10</td>
</tr>
<tr>
<td>A. steyni</td>
<td>10</td>
</tr>
<tr>
<td>A. mesopicos</td>
<td>20</td>
</tr>
<tr>
<td>A. haydocki</td>
<td>30</td>
</tr>
</tbody>
</table>

The males of A. mesopicos and A. steyni differ from the females in dorsal chaetotaxy. They do not show the same reduction of the marginal setae and in this respect resemble the females of A. dendropicos n. sp. The leg chaetotaxy does not show any gradients in the development of spinous and elongated setae. A. wilkini however appears to be the least specialised and A. haydocki the most specialised. Coxae III of A. dendropicos n. sp. and A. steyni have anteroventral spines.

**Host Relationships**: The species-group is specific on birds, as was noted by Till (1963) in her key to the genus. The fact that A. wilkini is recorded only from birds nesting in holes in the ground serves to add weight to this, since this species has not been recorded from rodents or other small burrow-inhabiting mammals with the same nest ecology as the bird hosts and which could provide alternative hosts. The hosts of A. wilkini are in no way as closely related as in the other species (refer to table). These, with one exception, are recorded from two families of birds of the same order, the Piciformes. We consider the record of A. steyni from a passeriform bird a result of the use this bird makes of the nests of Piciformes, which it does not do consistently (Bannerman 1953 and McLachlan and Liversidge 1972).

The Capitonidae and Picidae excavate fairly deep holes in the trunks or branches of trees, the genus Geocolaptes (Gmelin) being the exception. This woodpecker excavates tunnels in the ground for breeding purposes (McLachlan and Liversidge 1972). The woodpeckers and barbets generally make use of their nest holes for roosting out of the breeding season (McLachlan and Liversidge 1972).
<table>
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<tr>
<th>SPECIES</th>
<th>HOSTS</th>
<th>HOST ORDER</th>
<th>HOST FAMILY</th>
<th>HOST INFORMATION</th>
<th>REFERENCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Androlaelaps steyni (Till)</td>
<td>Lybius torquatus (Dumont)</td>
<td>Piciformes</td>
<td>Capitonidae</td>
<td>Johannesburg, Transvaal, 15.VII.60.</td>
<td>S.A.I.M.R. collection 1 ♂, 5 ♀♀.</td>
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<td></td>
<td>Trachyphonus vailanti Ranzani</td>
<td>—</td>
<td>—</td>
<td>Modderfontein, Transvaal, 13.XI.60.</td>
<td>S.A.I.M.R. collection 1 ♂, 5 ♀♀.</td>
</tr>
<tr>
<td>Androlaelaps mesopicos (Radford)</td>
<td>Mesopicos g. griseocephales (Boddaert)</td>
<td>Piciformes</td>
<td>Picidae</td>
<td>Pietermaritzburg, Natal, VI.69.</td>
<td>S.A.I.M.R. collection 1 ♂, 7 ♀♀.</td>
</tr>
<tr>
<td></td>
<td>Mesopicos goertae (Müller)</td>
<td>—</td>
<td>—</td>
<td>North East Domango, Ghana, IV.69.</td>
<td>S.A.I.M.R. collection 1 ♂, 19 ♀♀.</td>
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<tr>
<td>SPECIES</td>
<td>HOSTS</td>
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<td>Mapalane, Mozambique, 3.VII.53.</td>
<td>S.A.I.M.R. records 3 ♀♂</td>
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<td>Chirundu, Rhodesia, 22.II.64.</td>
<td>S.A.I.M.R. records 4 ♂♂, 12 ♀♀.</td>
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<td>(Oberholser)</td>
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True host specificity (orthoxenous, Nutting 1968) is rare among the nidicolous Dermanyssoidea which are associated with a specific nest ecology rather than a specific host. Although this is true for the mesopicos species group, the host records suggest a possible trend towards specificity at the genus level (polyoxenous, Nutting 1968).

The mesopicos species-group was probably derived from nidicoles of small mammals which became specific on birds nesting underground as in *A. wilkini*. The radiation of the group from ground nesting birds to tree nesting birds must be speculative but the existence of a ground nesting woodpecker, *Geocolaptes olivaceous* (Gmelin), could provide some clues. We checked specimens of this species from the Transvaal Museum, but no Mesostigmatic mites were found.

The radiation to this type of nest ecology would restrict the spread of the group to other bird groups as this is a nesting habit found in only a few groups of birds. The biology of nidicoles as discussed by Camin (1963) and others with respect to life cycle, feeding habits and host finding behaviour would further restrict the transfer of the group to alternative hosts. The transfer to birds occasionally making use of this type of nest would not be viable as the parasites are very nest specific. Conclusions on the results of microclimatic investigations by Daniel (1969) showed that nest locality manifested itself primarily in the influence of different humidity. Camin (1963), Radovsky (1969) and others have demonstrated the importance of humidity in the sensory behaviour and generally in the biology of these mites and the importance of this in nests in trees must be considered.

The continued presence of the host after breeding is also significant as without this the mites would die in an isolated environment. This presence would also exclude new hosts. Daniel (1969) noted the drop in numbers of mites in underground nests to nests slightly above ground. In the nests of the mesopicos species-group there would be probably few other nidicoles if any, and this could lead to a closer host parasite association.

The paucity of *Androlaelaps* Berlese recorded from birds compared with records from small mammals suggests that birds are not suitable hosts for a genus which consists of essentially "nest specific" species (Wharton 1957). The hosts of the mesopicos species-group probably provide the only nest ecology which could be successfully invaded. However, as has been noted, the spread to other bird groups is not likely and any adaptive trends would be confined within bird groups similar to the hosts. It is possible that adaptive processes have become directed towards genus specificity.

It is interesting to note that the morphological trends already discussed could parallel the possible trends in the evolution of parasitism in the group. *A. wilkini* is the starting point of the morphological trends and is possibly close to the start of the evolutionary trends in the group. The existence of a ground nesting woodpecker and the apparent trend to genus specificity in the species from woodpeckers suggest that the spread from a bird-specific parasite of ground-nesting birds to parasites of tree-nesting birds occurred on woodpeckers first. The position of *A. dendropicos* in the morphological trends is also significant in this respect. Apparent familial specificity in *A. steyni* indicates a more recent transfer to the Capitonidae.

The Position of *Androlaelaps phoeniculi* (Zumpt and Till).

*A. phoeniculi* is recorded from a single host species which is similar to the hosts of the mesopicos species-group in breeding habits. The host is from an order of birds having affinities with the hosts of the mesopicos species-group. Morphologically *A. phoeniculi* resembles members of the mesopicos species-group in the situation of the sternal setae I on the presternal integument, the granular weakly sclerotised sternal shield, the reduction of the setae on the dorsal shield, the
shape and chaetotaxy of the shield, the chaetotaxy of leg II in the male and the presence of nine setae on tibia III. The sinuous nature of the Z5 setae in the mesopicos species-group is the most significant difference. However, when the Z5 setae of A. wilkini are considered this difference becomes less significant. These are short as in A. phoeniculii and not markedly sinuous. On the basis of host relationships and similarity of morphology we feel that this species could be included in the mesopicos species-group.

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Références

Bannerman (D. A.), 1953. — The birds of West and Equatorial Africa. — 1: Oliver and Boyd.
Mackworth-Praed (C. W.) and (Captain C. H. B.) Grant, 1958. — Birds of the Southern third of Africa. — Longmans.
Mayr (E.), 1957. — Evolutionary aspects of host specificity among parasites of Vertebrates in First Symposium on host specificity among parasites of Vertebrates. — Neuchatel Imprimerie Paul Attinger S. A. 7-14.