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A REVIEW OF THE CHIRODISCINAE WITH DESCRIPTIONS OF NEW TAXA (ACARINA : LISTROPHORIDAE) (Part four)

BY

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Genus *Paralabidocarpus* new genus.

*Type species.* *Paralabidocarpus artibeii* n. sp.

*Diagnosis.* Body strongly compressed laterally. Propodosomal shield extending posteriorly beyond level of leg II. Two pairs of long setae immediately posterior to propodosomal shield. Legs I and II strongly enlarged distally and with broad blunt tips. Leg III with 4 segments; tarsus ending with a posteriorly curved claw, a smooth spur of moderate size, and caruncle. Leg IV slightly shorter than leg III, tarsal ending similar to that of leg III. Legs III and IV distinctly separated from legs I and II. Monotypic.

*Description.*

Body strongly compressed laterally.

*Dorsum.* Propodosomal shield extending posteriorly beyond level of leg II, lateral margins not extending ventrally between coxae I and II. Two pairs of long setae immediately posterior to propodosomal shield.

*Venter.* Lateral setae long and just dorsal to coxae III. Female opisthosoma about 1/3 total length, male opisthosoma about 1/5 total length. Posterior end of male truncated, heavily sclerotized, forming 2 valves with pair of circular anal copulatory suckers on medial surfaces.

*Legs.* Legs I and II strongly enlarged distally and with broad blunt tips. Leg III with 4 segments; tarsus ending with a posteriorly curved claw, a smooth spur of moderate size, and caruncle between claw and spur. Leg IV slightly shorter than leg III, segmentation, and tarsal ending similar to those of leg III. Legs III and IV distinctly separated from legs I and II.

Discussion. This genus differs from *Labidocarpus* Trouessart in its 2 pairs of long setae immediately posterior to the propodosomal shield instead of 1 pair of setae of moderate length, and the presence of a caruncle on each of tarsi III and IV.

*Paralabidocarpus artibei* new species.

(Figs. 32-35).

**Female.**

Idiosoma slender and strongly compressed laterally. Dorsal margin slightly convex. Length 377 microns (342-397), greatest depth (at level of leg III) 104 microns (85-116).

**Dorsum.** Propodosomal shield with acute postero-medial projection, without acute postero-lateral projections. With pair of sclerotized bars joining bases of setae immediately posterior to propodosomal shield. With 46 (44-49) annulations posterior to propodosomal shield.

**Venter.** Two subequal pairs of lateral setae just dorsal to coxae III. Without setae between coxae III or between coxae IV. Opisthosoma slightly longer than 1/3 total length, with about 31 annulations. Posterior end with 2 subequal pairs of setae.

**Legs.** Terminal segment of leg I with 2 setae of moderate length on posterior margin. Terminal segment of leg II with 1 seta of moderate length on posterior margin. Leg III with 4 segments; 1 distal seta on posterior margin of penultimate segment; tarsus as in generic description and with 2 minute spurs on medial surface. Leg IV slightly shorter than leg III, with 4 segments; setation, and tarsal ending similar to those of leg III; with 1 minute spur on medial surface of tarsus.

Gnathosoma without setae.

**Male.**

Idiosoma slender and strongly compressed laterally. Dorsal margin slightly convex. Length 265 microns (256-268), greatest depth (at level of leg III) 94 microns (85-98).

**Dorsum.** Propodosomal shield, setation, and sclerotized bars as in female. With 22 (21-24) annulations posterior to propodosomal shield.

**Venter.** Setation as in female. Opisthosoma about 1/5 total length, with 3 annulations. Posterior end with 3 pairs of setae; middle pair about 2/3 as long as dorsal pair, ventral pair much shorter than middle pair.

**Legs.** Legs as in female.

Gnathosoma without setae.
Type host. Bat: *Artibeus lituratus palmarum* Allen and Chapman.

Type locality. Siparia, Trinidad, West Indies.


![Paralabidocarpus artibei n. sp., lateral view of female.](image1)

![Paralabidocarpus artibei n. sp., lateral view of male.](image2)

![Paralabidocarpus artibei n. sp., lateral view of male leg III.](image3)

![Paralabidocarpus artibei n. sp., lateral view of male leg IV.](image4)


Discussion. The Chirodiscinae may be divided into 3 groups on morphological bases. These groups are primitive, intermediate, and specialized. The primitive group is characterized by having a dorso-ventrally compressed body, legs I and II partially adapted for claspers, and legs III and IV with well
developed caruncles but without claws. The only genus in this group, Chirodiscus, was believed by Trouessart (1893) to be a marsupial parasite, although the only record is from a bird (Trouessart and Neumann, 1890).

The intermediate group is characterized by having the dorso-ventrally compressed body, legs I and II well adapted for clasping, and legs III and IV with well developed caruncles but without claws. The only genus in this group, Schizocoptes, parasitizes insectivores of the family Chrysochloridae.

A genus of the Chirodiscinae, Schizocarpus, which is found parasitizing rodents of the family Castoridae seems to lie between the intermediate and the specialized group. It agrees with the intermediate group in having legs III and IV with well developed caruncles but without claws, whereas in the specialized group, the body is laterally compressed.

The specialized group is characterized by having a laterally compressed body, legs I and II well adapted for clasping, and legs III and IV with or without caruncles and with claws secondarily evolved by modification of tarsal setae. The five genera of this group, Eulabidocarpus, Alabidocarpus, Paralabidocarpus, Labidocarpus, and Olabidocarpus, are exclusively parasites of bats.

The evolution of the Chirodiscinae is suggested in certain progressive trends. These trends include the gradual modification of legs I and II from partial adaptation to strong adaptation for clasping, the gradual reduction of the caruncles and the development of "claws" from setae on legs III and IV, and the change from dorso-ventral compression to lateral compression of the body. The host associations appear to support the morphological evidence. The most primitive genus of Chirodiscinae, Chirodiscus, is found presumably on the most primitive hosts, marsupials, whereas an intermediate genus, Schizocoptes, is restricted to insectivores. The most specialized group, Eulabidocarpus, Alabidocarpus, Paralabidocarpus, Labidocarpus, and Olabidocarpus, is found on bats.

The genera parasitizing bats appear to have evolved along 2 lines. The first line is characterized by possession of strong, anteriorly curved claws and denticulated spurs on legs III and IV. It includes Eulabidocarpus and Alabidocarpus, of which the former is more primitive. The progressive trends in this line appear to be the increase in size of the propodosomal shield and the change from the grouping of legs I and II anteriorly and legs III and IV posteriorly to a single group with all legs on each side in close approximation. The second line is characterized by possession of weak, posteriorly curved claws and smooth spurs on legs III and IV. This line includes the least specialized Paralabidocarpus, the intermediate Labidocarpus and the specialized Olabidocarpus. The progressive trends of this line are the gradual loss of the already reduced caruncles and an increase in the number of smooth spurs on legs III and IV.

The above phylogenetic arrangement of the bat-infesting Chirodiscinae also is supported by host data. The most primitive genera, Eulabidocarpus and Paralabidocarpus, occur respectively on the families Pteropidae and Phyllostomatidae, whereas the most specialized genus, Olabidocarpus, is found on the families Ves-
pertilionidae and Molossidae. The family Pteropidae is representative of the more primitive suborder, Megachiroptera, and mammalogists seem to agree on the primitive position of the Phyllostomidae in the Microchiroptera. The Vespertilionidae and Molossidae, in the suborder Microchiroptera, are 2 of the most specialized bat families. Although some species of Eulabidocarpus are found on molossids, this may be a recent crossing over to a new host group.

The host relationships of Chirodiscinae are similar to those of the Myobiidae discussed by Jameson (1955). The latter group is found in association with marsupials, insectivores, bats, and rodents. In common with myobiids, the more primitive chirodiscine mites occur on marsupials, the intermediate forms on insectivores and the more specialized forms on bats. In contrast to myobiids, the chirodiscine mites on rodents do not appear to be as specialized as those on bats.

Host-Parasite List.

Class Aves
Order Caprimulgiformes
Family Podargidae
*Podargus strigoides* (Latham) (accidental host ?) .... *Chirodiscus amplexans* Trouessart

Class Mammalia
Order Insectivora
Family Chrysochloridae
*Amblysomus hottentotus* (Smith) ................. *Schizocoptes conjugatus* Lawrence
*Chrysospalax trevelyani* Gunther ............... *Schizocoptes conjugatus* Lawrence
*Chrysospalax villosus* Smith ..................... *Schizocoptes conjugatus* Lawrence

Order Chiroptera
Family Emballonuridae
*Coleura afra* (Peters) ................. *Labidocarpus tanganyikensis* n. sp.

Family Molossidae
*Moollus ater ater* Geoffroy-Saint-Hilaire .... *Eulabidocarpus flexipes* n. sp.
*Moollus major major* (Kerr) .............. *Eulabidocarpus flexipes* n. sp.

Family Phyllostomatidae
*Anoura geoffroyi geoffroyi* Gray ............... *Alabidocarpus furmani* n. sp.
*Artibeus lituratus palmarum* Allen and Chapman .... *Paralabidocarpus artibei* n. sp.

Family Pteropidae
*Pteropus giganteus giganteus* (Bruennich) .... *Eulabidocarpus compressus* (Ewing)
Family Rhinolophidae
*Rhinolophus capensis* Lichtenstein .......... *Alabidocarpus diceratops* Lawrence
*Rhinolophus clivosus* Cretzschmar ............. *Alabidocarpus nasicolus* (Lawrence)
*Rhinolophus hippocrepis* Bechstein .......... *Labidocarpus rollinati* Trouessart
*Rhinolophus ferrum-equinum* Schreber ...... *Alabidocarpus megalonyx* (Trouessart)

*Alabidocarpus minor* (Rollinat and Trouessart)

*Labidocarpus rollinati* Trouessart

*Rhinolophus megaphyllus* Gray ............. *Alabidocarpus recurvus* (Womersley)
<table>
<thead>
<tr>
<th>Family</th>
<th>Species</th>
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<tbody>
<tr>
<td>Vespertilionidae</td>
<td>Myotis myotis Borkhausen</td>
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<td>Myotis tricolor (Temminck)</td>
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<td></td>
<td>Myotis yumanensis saturatus Miller</td>
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<td>Order</td>
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<td>Castoridae</td>
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<td>Castor canadensis Kuhl</td>
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<td>Castor fiber Linnaeus</td>
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**Family Vespertilionidae**

*Myotis myotis* Borkhausen

*Myotis tricolor* (Temminck)

*Myotis yumanensis saturatus* Miller

*Order Rodentia*

*Family Castoridae*

*Castor canadensis* Kuhl

*Castor fiber* Linnaeus

**Summary.**

The subfamily Chirodiscinae Trouessart (Acarina : Listrophoridae) is reviewed including descriptions of a new genus and 7 new species. The following information is presented:

1. A diagnostic description of the subfamily and each of the genera and previously recorded species, including deposition of type specimens and host and locality data.

2. The description of *Paralabidocarpus* new genus.

3. Descriptions of the following new species: *Labidocarpus tanganyikensis* from the bat, *Coleura afra* (Peters) of Tanganyika, Africa; *Alabidocarpus furmani* from the bat, *Anoura geoffroyi* geoffroyi Gray, of Trinidad, West Indies; *Alabidocarpus longipilus* from the bat, *Myotis yumanensis saturatus* Miller, of California, U.S.A.; *Eulabidocarpus flexipes* from the bat, *Molossus major major* (Kerr), of Trinidad, West Indies; *Eulabidocarpus rectipes* from the bat, *Molossus ater ater* Geoffroy-Saint-Hilaire, of Trinidad, West Indies; *Olabidocarpus aitkeni* from the bat, *Molossus major major* (Kerr), of Trinidad, West Indies; and *Paralabidocarpus artibei* from the bat, *Artibeus lituratus palmarum* Allen and Chapman, of Trinidad, West Indies.

4. Keys to the genera and species.

5. List of hosts of all species.

6. Illustrations of all species which were available for study.

**LITERATURE CITED**


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