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 artibei 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 1 posteriorly curved claw, 1 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 adanal 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 1 posteriorly curved claw, 1 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.

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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.

Deposition of types. Holotype female, allotype male, and 10 paratypes deposited in the United States National Museum, Washington, D. C., and 14 paratypes in the University of California's Department of Entomology and Parasitology, Berkeley.

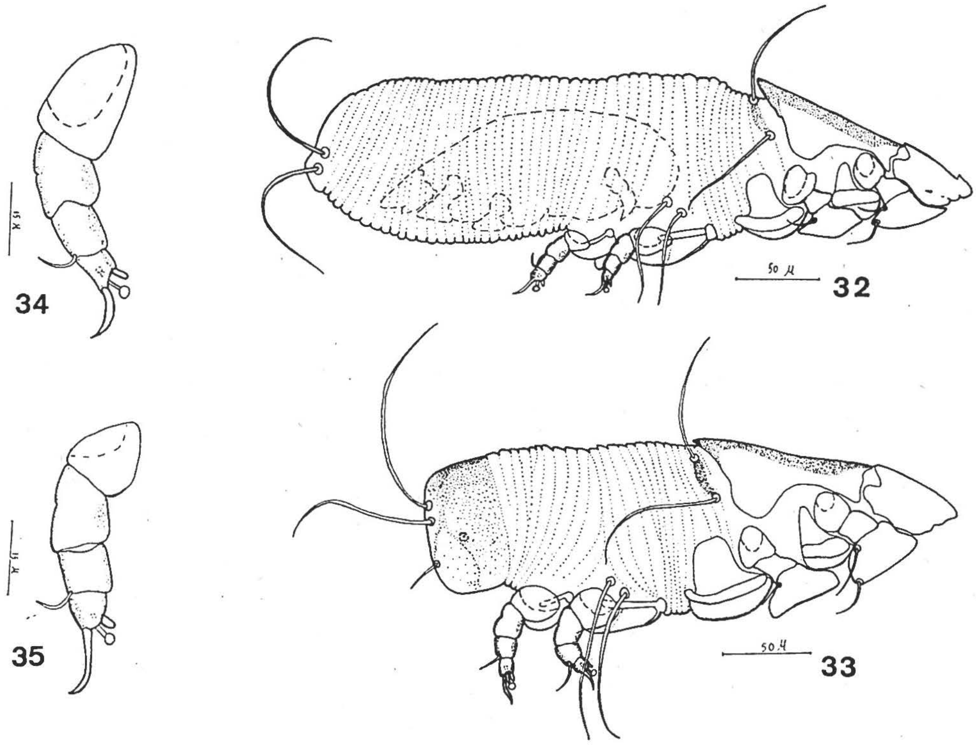

FIG. 32 : *Paralabidocarpus artibei* n. sp., lateral view of female. — FIG. 33 : *Paralabidocarpus artibei* n. sp., lateral view of male. — FIG. 34 : *Paralabidocarpus artibei* n. sp., lateral view of male leg III. — FIG. 35 : *Paralabidocarpus artibei* n. sp., lateral view of male leg IV.

Distribution. Trinidad, West Indies : several specimens including females, males and copulatory nymphs from a collection of *Artibeus lituratus palmarum*, Trinidad Department of Agriculture No. 58-1354, collected by T. H. G. AITKEN, 30 May 1958.

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 clasping, 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 Vespertilionidae and Molossidae. The family Pteropidae is representative of the more primitive suborder, Megachiroptera, and mammalogists seem to agree on the primitive position of the Phyllostomatidae in the Microchiroptera. The Vespertilionidae and Mollossidae, 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	
Molossus ater ater Geoffroy-Saint-Hilaire..........	*Eulabidocarpus flexipes* n. sp.
	Eulabidocarpus rectipes n. sp.
Molossus major major (Kerr).....................	*Eulabidocarpus flexipes* n. sp.
	Olabidocarpus aitkeni 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
	Labidocarpus natalensis Lawrence
Rhinolophus clivosus Cretzschmar..............	*Alabidocarpus nasicolus* (Lawrence)
	*Labidocarpus natalensis*¹ Lawrence
Rhinolophus hipposideros 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)

Family Vespertilionidae	
Myotis myotis Borkhausen......................	*Olabidocarpus belsorum* (Eyndhoven)
Myotis tricolor (Temminck)......................	*Alabidocarpus calcaratus* Lawrence
	Labidocarpus cristatus Lawrence
Myotis yumanensis saturatus Miller................	*Alabidocarpus longipilus* n. sp.
Order Rodentia	
Family Castoridae	
Castor canadensis Kuhl........................	*Schizocarpus mingaudi* Trouessart
Castor fiber Linnaeus..........................	*Schizocarpus mingaudi* Trouessart

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.

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