

# Macronyssidae (Acarina: Mesostigmata) of Cuban Bats

F. DUSBÁBEK

Institute of Parasitology, Czechoslovak Academy of Sciences, Prague

**Abstract.** Seven mite species of the family Macronyssidae have been found on bats from the island of Cuba and the adjoining island Isla de Pinos: *Macronyssoides kochi* (Fonseca, 1948), *Chirotonyssus robustipes* (Ewing, 1925), *Ch. haematophagus* (Fonseca, 1935), *Ch. venezolanus* (Vitzthum, 1932), *Ch. cubensis* sp. n., *Steatonyssus* (*Steatonyssus*) *ceratognathus* (Ewing, 1923) and *Cryptonyssus* sp. A new species *Chirotonyssus cubensis* is described from the Cuban endemic bat species *Tadarida* (*Mormopterus*) *minuta* (Miller). Only protonymphs of *Cryptonyssus* sp. have been found which do not agree with the description of any known species of this genus.

Up to the present time a total number of 7 mite genera of the family Macronyssidae have been known from bats of Neotropic region. From bats of the Antilles subregion the representatives of the genera *Radfordiella* Fonseca, 1948, *Chirotonyssus* Auguston, 1945, *Parichoronyssus* Radovsky, 1966 and *Macronyssoides* Radovsky, 1966 have been collected. These mites have been mostly found in Trinidad (RADOVSKY 1967a), the genus *Chirotonyssus* Auguston, 1945 in Jamaica (RADFORD 1938, as *Liponyssus*) and in Cuba (SILVA TABOADA 1965, as *Ichoronyssus*).

From the Cuban territory a single species, *Chirotonyssus robustipes* (Ewing, 1925) from *Tadarida brasiliensis muscula* (Gundlach), Cueva Tenebrosa, Sierra de Cubita, Prov. Camagüey (SILVA TABOADA 1965) has been known to date. In our material, collected from 1005 specimens of bats belonging to 19 species in the territory of Cuba and the adjoining island Isla de Pinos, another 6 species have been identified. A note on their occurrence was made in a preliminary report (DUSBÁBEK 1967).

## 1. *Macronyssoides kochi* (Fonseca)

*Ichoronyssus kochi* Fonseca, 1948 — Proc. Zool. Soc. London 118: 278.

**Material:** 3 ♀♀, 9 deutonymphs and 49 protonymphs from *Artibeus jamaicensis parvipes* Rehn, Cueva del Indio, Tapaste, Prov. Havana, 24. 5. 1965; 1 protonymph from *Brachyphylla nana* Miller from the same locality and of same date; 1 deutonymph from *Phyllonycteris poeyi* Gundlach from

the same locality and of same date; 15 protonymphs from *Artibeus jamaicensis parvipes* Rehn, Laguito, Marianao, Havana, 24. 6. 1965; 1 protonymph from the same host, Cueva del Caguane, Punta del Este, Isla de Pinos, 26. 6. 1965; 1 ♀ from the same host, Barrigonal del Aroyo Grande, Santa Fé, Isla de Pinos, 21. 1. 1966; 3 ♀♀ from *Brachyphylla nana* Miller, Finca Elejardi, San Antonio de los Baños, Prov. Havana, 1. 1. 1967 — all lgt. F. Dushábek and J. de la Cruz.

This species is known from *Artibeus lituratus* Licht. (FONSECA 1948) and from *Desmodus rufus* Vesey-Fitzgerald [= *D. rotundus* (Geoffr.)] in Brasil; from *Artibeus lituratus palmarum* Allen et Chapman, *A. jamaicensis trinitatis* Andersen, *Glossophaga s. soricina* (Pallas) and *Desmodus r. rotundus* (Geoffr.) (RADOVSKY 1967a), in Trinidad. In Panama it was found on *Artibeus jamaicensis* Leach and *A. toltecus* (Saussure) (YUNKER and RADOVSKY 1966, RADOVSKY 1967a). RADOVSKY (1967a) indicates as usual host *Artibeus* species, which fact is confirmed by our results. While this mite has been found on 8.3 % of examined bats of the species *Artibeus jamaicensis parvipes* Rehn, the percentage of infestation on *Brachyphylla nana* Miller was only 3.7 and on *Phyllonycteris poeyi* Gundlach even 0.7 %, this latter percentage representing a single immature specimen.

Morphologically our specimens agree with the species described by RADOVSKY (1967a). Dorsal plate of female bears 26 pairs of setae, M8 is missing. Setae M11 are normal, setiform, without blunt, flattened, weakly dilated tips. Propodosomal plate of protonymphs of our material is 235 µ long, but other dimensions are corresponding.

## 2. *Chirotonyssus robustipes* (Ewing)

*Liponyssus robustipes* Ewing, 1925 — Ent. News 36 : 20.

Material: 2 protonymphs from *Tadarida brasiliensis muscula* (Gundlach), Trinidad, Prov. Las Villas, 11. 7. 1964; 10 ♀♀, 12 ♂♂, 129 protonymphs from the same host, Bahia de Cabañas, Prov. Pinar del Rio, 16. 4. 1965; 2 ♀♀, 1 ♂, 67 protonymphs from the same host, La Ortigasa, Prov. Pinar del Rio, 17. 4. 1965; 8 protonymphs from the same host, Cueva Colón, Mayajigua, Prov. Las Villas, 25. 4. 1965 — all lgt. V. Černý; 1 ♀, 1 ♂, 266 protonymphs from the same host, Cueva del Circulo, Cairije, Sierra de Cubita, Prov. Camagüey, 26. 10. 1965; 24 protonymphs from the same host and locality, 30. 10. 1965; 1 protonymph from the same host, cave near Cairije, Sierra de Cubita, Prov. Camagüey, 30. 10. 1965; 1 protonymph from *Tadarida laticaudata yucatanica* (Miller), Yaguajay, Prov. Las Villas, 2. 11. 1965 — all lgt. F. Dushábek and J. de la Cruz.

This mite has been found in the USA on *Tadarida brasiliensis mexicana* (Saussure), *T. b. cynocephala* (Le Conte), *Eptesicus fuscus* (Beauvois) (EWING 1925, AUGUSTON 1945, RADOVSKY 1967a etc.), in Panama on *Tadarida brasiliensis* (Geoffroy Saint-Hilaire) and *Myotis nigricans* (Schinz) (YUNKER and RADOVSKY 1966, RADOVSKY 1967a), in Chile and Jamaica on *Tadarida brasiliensis* (Geoffroy Saint-Hilaire), in Brasil on *Tadarida macrotis* (Gray) (FONSECA 1948) and probably in Mexico on *Natalus mexicanus* MILLER (HOFFMANN 1944). The mite has been reported from Cuba by SILVA TABOADA (1965) who found it on *Tadarida brasiliensis muscula* (Gundlach). Our studies revealed that 94 % of bats of this species examined were infested by this parasite.

The specimens of our material differ somewhat from the specimens found on *Tadarida brasiliensis mexicana* (Saussure) from California, which have been kindly sent to me by Dr. F. J. Radovsky. They differ mostly in the presence of additional unpaired setae in the posterior half of dorsal plate of both sexes, but mainly in a greater length of dorsal opisthosomal setae of female which are as long as 75 µ. Besides a greater length of setae on propodosomal plate protonymphs differ especially in the presence of 8—10 pairs of ventral setae placed on unarmed venter beyond sternal plate, in contrast to 7 pairs recorded by RADOVSKY (1967). Otherwise the specimens from both hosts agree in other dimensions and therefore I consider it possible to evaluate the mentioned differences only as intraspecific variability.

### 3. *Chiroptonyssus haematophagus* (Fonseca)

*Liponissus* (sic.) *haematophagus* Fonseca, 1935—Mem. Inst. Butantan 10 : 25.

Material: 3 protonymphs from *Molossus major tropidorhynchus* Gray, Nueva Genora, Isla de Pinos, 25. 6. 1965; 1 ♀, 1 protonymph from the same host and locality, 13. 1. 1966; 2 protonymphs from the same host, Marianao, Havana, 29. 7. 1965—all lgt. F. Dusbábek and J. de la Cruz.

This species has been collected in Brasil, Mexico, Panama and Trinidad (FONSECA 1935, YUNKER and RADOVSKY 1966, RADOVSKY 1967a) from *Molossus coibensis* (Allen). *M.a. ater* Geoffr., *M.m. major* (Kerr) and from other unidentified host, maybe *Molossus abrasus* (True), *M. rufus* Geoffr. or *Tadarida macrotis* (Gray). Despite the fact that this mite manifests a considerable affinity to the representatives of the genus *Molossus*, it has been found only on 8 % of examined bats belonging to the Cuban population of *Molossus major tropidorhynchus* Gray.

Morphologically our specimens fully agree with the description and illustration of this species by RADOVSKY (1967a).

### 4. *Chiroptonyssus venezolanus* (Vitzthum)

*Liponissus* (sic.) *venezolanus* Vitzthum, 1932—Zeitschr. Parasitenk. 4 : 9

Material: 267 protonymphs from *Tadarida laticaudata yucatanica* (Miller), Yaguajay, Prov. Las Villas, 10. 6. 1965; 7 protonymphs from the same host and locality, 2. 11. 1965; 1 protonymph from *Tadarida minuta* (Miller) of the same data and locality; 4 protonymphs from *Noctilio leporinus mastivus* (Vahl), Cueva Grande, Caguana, Mayajigua, Prov. Las Villas, 10. 6. 1965; 33 protonymphs from *Tadarida macrotis* (Gray), Trinidad, Prov. Las Villas, 12. 6. 1965—all lgt. F. Dusbábek and J. de la Cruz.

This mite is known from Venezuela, Panama, Mexico and the United States and has been found on *Molossus nasutus* Spix, *M. coibensis* (Allen) and *Tadarida femorosacca* (Merriam) (VITZTHUM 1932, YUNKER and RADOVSKY 1966, RADOVSKY 1967a). In Cuba the mite has been found on 88.9 % of all examined bats of the species *Tadarida laticaudata yucatanica* (Miller) and on all 7 examined specimens of *Tadarida macrotis* (Gray), which may be regarded as its main hosts. The finds on the remaining two bat species in Cuba have apparently been accidental. The protonymphs in our material do not differ morphologically in any way from the description recorded by RADOVSKY (1967a).

### 5. *Chiroptonyssus cubensis* sp. n.

Fig. 1, 2

Type host: *Tadarida (Mormoterus) minuta* (Miller). Type locality: Trinidad, Prov. Las Villas, Cuba, 12. 6. 1965, lgt. F. Dusbábek and J. de la Cruz. Material: 2 protonymphs from type host, Finca Casablanca, Omaja, 28. 5. 1959 —lgt. V. Černý; 3 protonymphs from type host, Yaguajay, Prov. Las Villas, 10. 6. 1965; 1 ♀, 77 protonymphs from type host and locality, 12. 6. 1965; 182 protonymphs from type host and locality, 13. 6. 1965; 2 protonymphs from *Chilonycteris fuliginosa torrei* G. M. Allen, Cueva Nueva, Caguane, Prov. Las Villas, 11. 6. 1965—all lgt. F. Dusbábek and J. de la Cruz.

Holotype (female) and all paratypes (protonymphs) are deposited in the collection of the Institute of Parasitology, Czechoslovak Academy of Sciences in Prague.

**Female (Holotype):** Idiosoma 674 long, 490 wide (all dimensions in  $\mu$ ).

**Dorsum (Fig. 1A):** Dorsal plate 580 long, 325 wide, as if cut off anteriorly, with reticulate sculpture and abruptly narrowed in its posterior half. The plate bears only 23 pairs of unbarbed setae: Series D (40—47) complete, series S includes S1—S4

(45—50), and S7 (16), in series M only setae M5 (45), M10 (37) and M11 (31) developed. Setae ET2 and S8 are missing. Setae Sc and V are 47, F1—17, F3—28 long. Unarmed dorsum bears 70—75 pairs of setae 40—45 long, most of which are pointed and slightly barbed, only setae on the posterior part of body are visibly thickened and barbed, with blunt tips and as long as 67. Peritreme 199 long, reaching the level

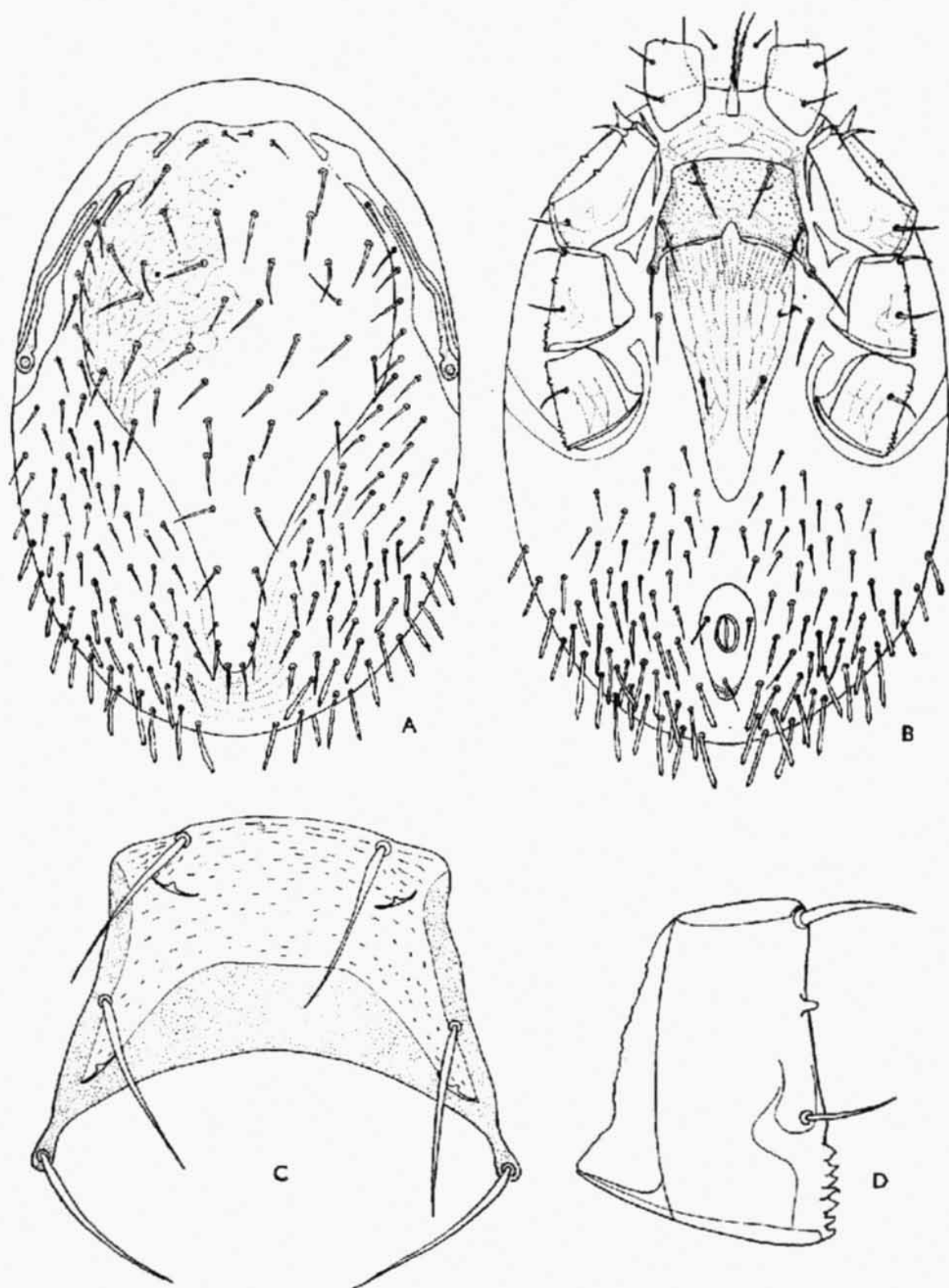


Fig. 1. *Chiroptonyssus rubensis* sp. n., female: A — dorsal view, B — ventral view, C — sternal plate, D — coxa III.



of the middle of coxa II. Peritremal plate relatively wide, in the second half of the peritreme slightly narrowed; its distal end fusing with dorsal plate at the level of ET1.

**Venter (Fig. 1B):** Tritosternal lacinia barbed. Sternal plate (in median axis) 78 long, 125 wide (at the level of St2), with a fine pattern and with weakly sclerotized posterior band, differing only in the absence of pattern (Fig. 1C), with three pairs of setae (55—58), St3 being placed on a very narrow projection of shield. Epigynal plate with a short anterior projection, with typical pattern. Genital setae 35, metasternal setae 43 long. Anal plate 106 long, 67 wide. Anal pore placed 39 from the anterior margin of plate. Anal setae 35 long, placed at the level of the anterior margin of anal pore, postanal seta 31 long. Sternal plate flanked by two pairs of elongated triangle-shaped endopodal platelets, the third pair at the level of coxa IV fused with peritremal shield. Unarmed venter covered with 45—50 pairs of setae of which the anterior ones are setiform, 35—43 long, the posterior ones thickened, barbed, with blunt tips, 67—70 long.

**Gnathosoma:** Deutosternal groove with 7 teeth arranged in a single file. Chelicerae normal, second segment 137 long, digitus fixus 35 long, digitus mobilis at the inside with a membrane-like border, 34 long. Gnathosomal setae are 18, hypostomel 48 and 15 long.

**Legs:** Legs II visibly thickened with stout claws. Coxa II with a stout pointed anterior spur. Coxa III and IV with dentate posterior margin (Fig. 1D). Tibia I 114 long, tarsus I 192, tarsus IV 206 long.

**Protonymph:** Idiosoma 270—700 long, 208—416 wide, of oval shape.

**Dorsum (Fig. 2A):** Propodosomal plate 152—161 long, 133—156 wide, very finely sculptured, bearing 11 pairs of setae. Seta F1 and F3 are 9 long, the mutual distance between setae of pair F1 is 19; other setae on propodosomal plate are 16—23 long. Pygidial plate 55—63 long, with only three pairs of setae (S6, S8 and D8 are missing). Setae S7 are 9, M10 and M11 are 36—39 long. Peritreme 59—62 long. Unarmed dorsum is covered with 22 pairs of thickened setae, mostly not barbed and 20—27 long.

**Venter (Fig. 2B):** Tritosternal lacinia are slightly barbed. Sternal plate 113—122 long, 99—106 wide, sternal setae 24—27 long. Anal plate relatively wide, with straight anterior margin 43—51 long, 40—47 wide. Between sternal and anal plates 13—15 setae, one unpaired seta being as a rule asymmetrically placed in one half of idiosoma. Caudal setae barbed, 31 long.

**Gnathosoma:** Six deutosternal denticles developed. Gnathosomal setae are 9, hypostomal 27 and 8 long. Chelae smooth, digitus fixus frazzled at tip.

**Legs:** Legs II powerfully thickened, with strong claws. Tarsus I and IV are 98 long.

The new species differs from heretofore known species of the genus *Chiroptonyssus* Auguston, 1945 primarily in the shape of dorsal plate of female, which is abruptly narrowed at its posterior half, and in the reduction of setae on plate to mere 23 pairs. The absence of S8 is characteristic. Also the shape of sternal plate of female

is characteristic. Protonymphs of the new species can be distinguished by the presence of only 3 pairs of setae on pygidial plate and the absence of S8.

*Chiroptonyssus cubensis* sp. n. manifests a high affinity to *Tadarida minuta* (Miller), and was found on 65.2% of examined specimens. The finding on *Chilonycteris fuliginosa torrei* G. M. Allen is apparently accidental.

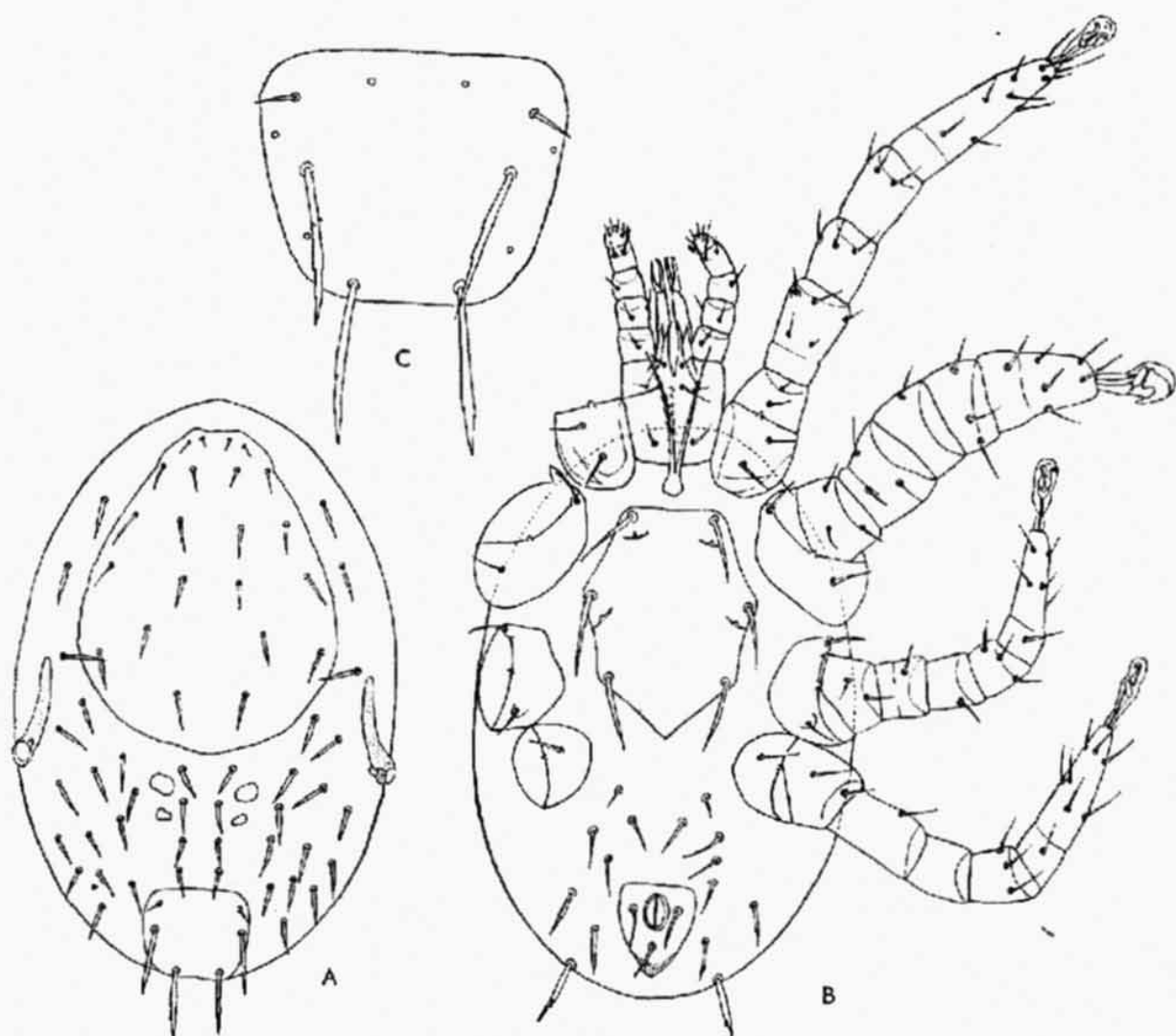


Fig. 2. *Chiroptonyssus cubensis* sp. n., protonymph: A — dorsal view, B — ventral view, C — pygidial plate.

## 6. *Steatonyssus (Steatonyssus) ceratognathus* (Ewing)

*Ceratonyssus ceratognathus* Ewing, 1923—Proc. U. S. Nat. Mus. 62: 11

**Material:** 1 ♂ from *Chilonycteris fuliginosa torrei* G. M. Allen, Cueva Colón, Mayajigua, Prov. Las Villas, 25. 4. 1965; 6 ♀♀, 5 ♂♂, 70 protonymphs from *Eptesicus fuscus dutertrei* (Gervais) from the same locality and data—all lgt. V. Černý; 5 ♀♀, 3 ♂♂, 1 protonymph from the same host and locality, 9. 6. 1965; 114 ♀♀, 7 ♂♂, 277 protonymphs from *Eptesicus fuscus* ssp., Sierra Colombo, Isla de Pinos, 24. 6. 1965; 1 ♂ from *Macrotus waterhousei minor* Gundlach, Punta del Este, Isla de Pinos, 25. 6. 1965; 1 ♀ from *Eptesicus fuscus dutertrei* (Gervais), Cueva del Indio, Tapaste, Prov. Havana, 10. 1. 1966; 1 ♂, 4 protonymphs from *Eptesicus fuscus* ssp., Cueva de los Lagos, Cerro de la Guanabana, Isla de Pinos, 14. 1. 1966; 3 ♀♀, 6 ♂♂, 15 protonymphs from the same host, Cueva de Isla, Punta del Este, Isla de Pinos, 17. 1. 1966—all lgt. F. Dusbábek and J. de la Cruz.

So far this mite has been known only from the territory of the United States, where it was found on *Nycticeius humeralis* (Rafinesque) and on other unidentified hosts (EWING 1923, RADOVSKY and FURMAN 1963). In Cuba it has been collected in abundance from *Eptesicus fuscus* (Beauvois), namely on 68.7 % of examined bats; but in some localities the percentage of infestation was 100. The mentioned host is the only vespertilionid bat occurring in abundance in Cuba. Other species of the family Vespertilionidae, belonging to the genera *Lasiurus*, *Antrozous* and even the species *Nycticeius humeralis cubanus* (Gundlach) are rare in Cuba and we had no luck in capturing them.

Females with embryos represented in our material more than 80 % of all females.

Morphologically our specimens correspond with the description of species published by RADOVSKY and FURMAN (1962), TILL and EVANS (1964) and RADOVSKY (1967a) and agree with basic dimensions. In males, however, besides reticular sculpturing on holoventral plate there is also a striate sculpturing in the genital part. Anterior seta on coxa III of male is visibly thickened with a side protuberance.

## 7. *Cryptonyssus* sp.

Material: 11 protonymphs from *Eptesicus fuscus dutertrei* (Gervais), Cueva Colón, Mayajigua, prov. Las Villas, 25. 4. 1965—Igt. V. Černý; 1 protonymph from *Eptesicus fuscus* ssp., Sierra Colombo, Isla de Pinos, 24. 6. 1965; 6 protonymphs from the same host, Cueva del Abono, Sierra de Casas, Isla de Pinos, 28. 6. 1965; 2 protonymphs from the same host, Cueva de Isla, Punta del Este, Isla de Pinos, 17. 1. 1966—all lgt. F. Dusbábek and J. de la Cruz.

In the New World the genus *Cryptonyssus* Radovsky, 1966 includes two species known from vespertilionid bats in USA and Mexico. Our specimens are similar to the protonymphs of the species *C. flexus* Radovsky, 1967 in having a weakly sculptured pygidial plate, but in having 13—14 pairs of setae on unarmed dorsum they remind of *C. desultorius* Radovsky, 1966. From both species our protonymphs clearly differ in a greater length of setae on pygidial plate, especially in the length of D8. As for basic dimensions, our specimens are between both mentioned species (all dimensions are given in  $\mu$ ): Length of idiosoma 450, of propodosomal plate 186, D8 48, S6 63, S7 59, M10 70, M11 70, stigma with peritreme 47, tarsus I 111, leg I 405. It is apparently a distinct species which it will be possible to describe after obtaining adult specimens.

RADOVSKY (1967a, 1967b, 1968) proposes to include in the genus *Cryptonyssus* the following species: *Liponyssus pipistrelli* Oudemans, 1904, *Bdelonyssu dogieli* Bregetova, 1953 and *Ornithonyssus pavlovskii* Lange, 1959, all known from the Eurasian continent. The protonymphs of these species, however, considerably differ from our specimens.

## REFERENCES

- AUGUSTON G. G., A new genus, new species of dermanyssid mite (Acarina) from Texas. Bull. S. Calif. Acad. Sci. 44: 46—47, 1945.
- DUSBÁBEK F., Parasitic mites of Cuban bats from ecological and zoogeographical viewpoint. Wiad. Parasitol. 13: 525—532, 1967. (In Russian.)
- EWING H. E., The dermanyssid mites of North America. Proc. U.S. Nat. Mus. 62:1—26, 1923.
- , New mites of the family Dermanyssidae (Acarina). Ent. News 36: 18—22, 1925.
- FONSECA F. DA, Notas de acarologia. XXII. *Liponyssus haematophagus* sp. n. (Acarina, Liponissidae). Mem. Inst. Butantan 10: 43—46, 1935.
- , A monograph of the genera and species of Macronyssidae Oudemans, 1936 (Synon: Liponyssidae Vitzthum, 1931) (Acari). Proc. Zool. Soc. London 118: 249—334, 1948.
- HOFFMANN A. M., Los ectoparasitos de los murciélagos Mexicanos. Univ. Nac. Mexico, pp. 1—50, 1944.
- RADFORD C. D., Notes on some new parasitic mites, I. Parasitology 30: 427—440, 1938.
- RADOVSKY F. J., Revision of the macronyssid and laelapid mites of bats: Outline of classi-

- lication with descriptions of new genera and new type species. J. Med. Ent. 3: 93—99, 1966.
- , The Macronyssidae and Laelapidae (Acarina: Mesostigmata) parasitic on bats. Univ. Calif. Publ. ent. 46: 1—288, 1967a.
- , Adaptive Radiation of Parasitic Mesostigmata. IInd International Congress of Acarology, Nottingham, Thesis of paper, 1967b.
- , Evolution and adaptive radiation of Gamasina (Acarina: Mesostigmata) parasitic on vertebrates. Parasitology (Leningrad) 2: 124—136, 1968. (In Russian.)
- , FURMAN D. P., The North American Species of *Steatonyssus* (Acarina: Dermanyssidae). Ann. Ent. Soc. Amer. 56: 258—276, 1963.
- SILVA TABOADA G., Lista de los Parásitos Hallados en Murciélagos Cubanos. Poyeana, Ser. A, La Habana 12: 1—14, 1965.
- TILL W. M., EVANS G. O., The genus *Steatonyssus* Kolenati (Acari: Mesostigmata). Bull. Brit. Mus. (Nat. Hist.) 11: 513—582, 1966.
- VITZTHUM H. G., Neue parasitische Fledermausmilben aus Venezuela. Z. Parasitenk. 4: 1—17, 1932.
- YUNKER C. E., RADOVSKY F. J., The Dermanyssid Mites of Panama (Acarina: Dermanyssidae). in: Wenzel R. L., Tipton V. J., Ectoparasites of Panama. Field Mus. Nat. Hist., Chicago, Illinois, pp. 83—103, 1966.

Received 3 May 1968.

F. D., Parasitologický ústav ČSAV,  
Flemingovo n. 2, Praha 6, ČSSR