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Some Ectoparasites of Bats (Dipt.)

By G. F. FERRIS, Stanford University, California.

(Plates XXII, XXIII.)

Those superlatively curious ectoparasites of bats, the Diptera of the families Nycteribiidae and Streblidae are among the least known of all the parasitic groups and but two species of Nycteribiidae and four of Streblidae have heretofore been recorded from North America. The Department of Entomology of Stanford University has accumulated a small amount of material belonging to both of these families and through the kindness of Professor Kellogg this has been turned over to me to work up. At the present time only part of the material can be reported upon, the remainder, belonging to the Streblid genus *Trichobius*, being withheld until a later paper.

The present paper presents the description of one new species and redescribes one species of Nycteribiidae and records and figures a third, and describes a new genus and species of Streblidae. The types of the new species are in the Stanford University collection.

NYCTERIBIIDAE.

Penicillidia antrozoï (Townsend). (Plate XXII, figs. 1, 2.)

Nycteribia antrozoï Townsend, Jour. New York Ent. Soc., Vol. I, p. 79 (1893).

Penicillidia mexicana (Bigot), Speiser, Zeitschrift für systematische Hymenopterologie und Dipterologie, Vol. II, p. 172 (1902).

Five specimens, two males and three females, from *Antrozous pallidus pacificus*, (Santa Paula, Ventura County, and Snelling, Merced County, California). The species was originally described from a single male taken from *Antrozous pallidus* in New Mexico.

Speiser is inclined to consider this species as identical with *Penicillidia mexicana* (Bigot), but, while this may be the case, such a conclusion is at present unwarranted. Speiser was able to examine the types of *P. mexicana* and redescribed the species but his redescription was not accompanied by figures and is not of such a nature as to throw much light upon the matter. For the present, at least, *P. antrozoï* should be allowed to stand.

♀. Length, 3 mm. *Head* rather slender with numerous short spines on the ventral side and along the anterior margin. Ocelli distinctly 2-faceted. Palpi rather long, with numerous stout spines.

Thorax somewhat broader than long. Legs of the type common to the genus.

Abdomen short oval, its shape varying with the degree of distention. On the dorsal side there are apparently three segments, but the exact number is difficult to determine due to the extent of the membranous areas. That this is the real number is indicated by the presence of but three pairs of spiracles. The first segment is very large, occupying nearly a third of the abdomen and is produced backward medially, the tip being broadly truncate. Following the first segment is a membranous area. The second tergite is divided medially into two plates and the third likewise into two plates which are widely separated. The first segment bears numerous short spines on its face and two clusters of long, stiff spines at the apex. Second segment likewise with numer-

ous short spines with a fringe of long spines along the posterior margin and a cluster of short heavy spines at the apex of each plate. Third segment with a cluster of stiff, heavy spines at the apex of each plate.

Ventrally there are apparently six sternites. The first occupies about a third of the abdomen and bears along its posterior margin the usual comb. Second segment membranous, beset with numerous short spines arranged in more or less regular rows, each spine set upon a chitinous papilla. Remaining sternites short and not extending across the abdomen, the lateral margins being filled by the pleurites of the apparent third dorsal segment, each of these sternites beset with numerous spines, the last having a cluster of stiff spines at each posterior lateral angle.

♂. Length, 3 mm. *Head* and *thorax* as in female.

Abdomen elongated, truncate at the tip. Dorsally there are seven segments each of which bears a pair of spiracles. First segment very short, indistinctly separated from the second. Second to sixth subequal in length. Seventh as long as any other three, about twice as wide across the anterior margin as across the posterior. Second to fourth segments with a row of slender spines along the posterior margin and a few short spines on the disk. Fifth and sixth segments with numerous very long stout spines along the posterior margin. Seventh with a number of stout spines on the disk and at the apex. Ventrally there are visible but five sternites, the first four subequal in length. First segment with numerous short spines on the disk and with the usual comb along the posterior margin. Second and third sternites with numerous short spines and with a row of slender spines along the posterior margin. Fourth with a row of slender spines along the posterior margin the median portion of which is occupied by a group of short and very heavy, almost tubercle-like, spines. Claspers on the last segment long and slender reaching to the anterior margin of the segment.

Penicillidia corynorhini n. sp. (Pl. XXIII, fig. 3.)

A single female, taken from *Corynorhinus townsendi* (White River, Tulare County, California) which, according to Miller, "List of North American Land Mammals in the United States National Museum, 1911," is probably *Corynorhinus macrotis pullescens*. The species is very distinct, differing from *P. antrozoii* in the remarkable backward prolongation of the first dorsal segment of the abdomen, in the short, broad head and in numerous minor details. A direct comparison with any of the European species is not possible, due to the insufficiency of the descriptions.

♀. Length, 2.3 mm. Color yellow. *Head* rather short and broad almost destitute of spines dorsally. Ocelli 1- or obscurely 2-faceted. Palpi short.

Thorax wider than long, not especially distinctive.

Abdomen dorsally with four apparent segments and with at least four pairs of spiracles. First segment produced backward medially, the apex rounded. Second composed of two medially separated plates which are produced back to the end of the abdomen. Third segment membranous. Fourth segment a small trapezoidal plate terminating the abdomen.

The chaetotaxy of the dorsal sides is as follows: First segment with a few short stout spines on the disk and with several long slender spines along the margin at the apex. Each plate of the second segment with numerous short spines on the disk and terminating in a cluster of exceedingly long stout spines. Third segment thickly beset with short spines, each arising from a papilla. Fourth segment with several stout spines along the posterior margin.

Ventrally there are apparently five segments. The first occupies about half the abdomen and bears the usual comb. Second membranous, thickly beset with short spines which are arranged in more or less definite rows, the base of each surrounded by a small chitinous area. Third divided medially into two plates. Fourth and fifth undivided, each with a row of small spines along the posterior margin.

Cyclopodia similis Speiser. (Plate XXIII, fig. 4.)

Cyclopodia similis Speiser, Archiv. für Naturgeschichte, LXVII Bd. 1, h. 1, pp. 51-52, tf. 2c., Taf. 3, f. 5 (1901).

A single male from an unknown bat (Apia, Samoa), which I refer to this species. There are certain minor details in which the specimen seems to differ from Speiser's description but they seem hardly important enough to justify the naming of a new species. The opportunity is taken to present figures.

STREBLIDAE.

NYCTEROPHILIA n. gen.

Streblidae of the subfamily Nycteroboscinae, with functional wings in which there are apparently nine longitudinal veins in addition to the costa, of these veins only the first two and a portion of the third being strongly developed, the others very weak. Tip of the wing notched. Thorax much compressed, high convex. Legs short, the posterior femora scarcely reaching beyond the end of the body, the anterior femora very short,

compressed. Abdomen with but three dorsal segments, the first two very short, and with six or seven ventral segments.

Type of genus *Nycterophilia coxata* n. sp.

The wing venation of this genus differs very much from that of any of the other Streblidae. The genus seems to be nearest to *Megistopoda*, but the functional wings, the short posterior femora and the much expanded anterior femora separate it at once.

Nycterophilia coxata n. sp. (Plate XXII, fig. 6 and text-fig. 5.)

Several males and females from a bat, *Macrotus californicus* (Santa Margherita River, Calif.).

♀. Length, 1.8 mm.; length of wing, 1.3 mm. Color yellow. *Head* rather small, apparently attached to the upper side of the prothorax. Apex with a crown of stout spines, occiput and cheeks with a few small spines. Eyes quite large, distinctly pigmented, situated close to the apex of the head and consisting of a single facet.

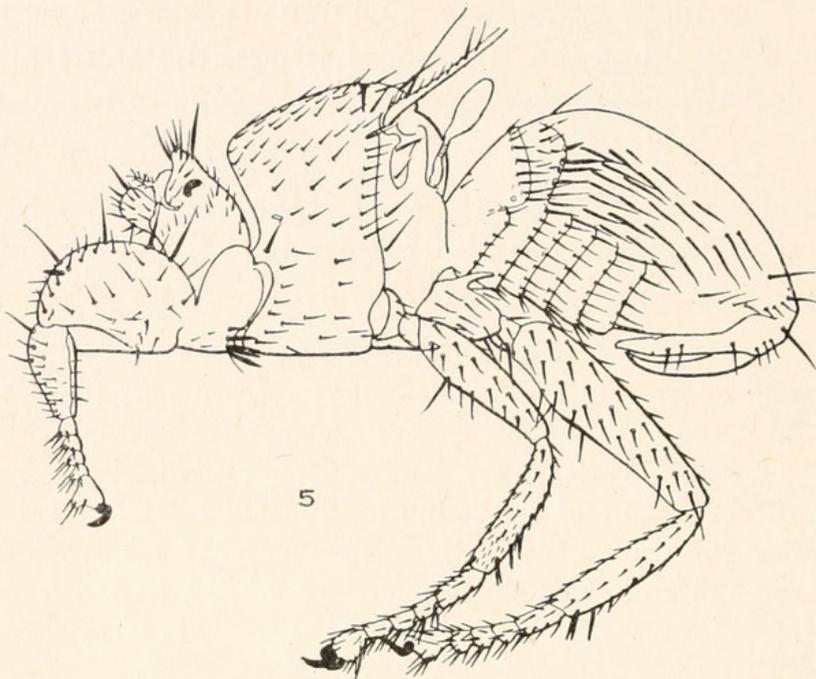
Prothorax very small, ventrally with a row of stout spines along the posterior margin. Mesothorax and metathorax high convex, much compressed, the mesothorax, in profile, slightly concave anteriorly. Both segments rather sparsely beset with small spines.

Anterior legs short, the femora much compressed and expanded dorsoventrally, the dorsal margin with numerous stout spines, the inner face with several short, stout, almost tubercle-like spines. Tibia slightly shorter than the femur. Tarsus equal to tibia, five segmented, the last segment somewhat expanded, the claws not cleft.

Middle and posterior legs in general similar to each other, slender, the middle pair somewhat the shorter. Posterior femora scarcely or not at all exceeding the abdomen. Coxae of middle pair very small. Coxae of posterior pair quite large and bearing a spur on the dorsal margin, this spur arising at the proximal end.

Wings large, apparently functional. First and second longitudinal veins distinct, the second meeting the anterior margin of the wing slightly beyond half way. A third longitudinal vein is distinct for a very short distance from the base and is connected to the second vein by a distinct cross vein, thence continuing much reduced to the tip of the wing, meeting the margin at the base of a distinct notch. The wing is apparently folded along this vein when at rest. Between the second and third veins are three interrupted veins, apparently branches of the second, and behind the third vein are three more which are apparently branches of the third. There are thus in all, nine longitudinal veins, exclusive of the costa, and one cross vein.

Abdomen soft, presenting two segments dorsally, the first segment very short. Ventrally there appear to be at least three segments but they are very indistinctly marked. The entire abdomen is beset with large spines with spiral markings.



Nycterophila coxata n. sp. male, wings not shown.

♂. Similar to female except for abdomen. The first two tergites are weakly chitinized and bear a row of short spines along the posterior margin. The remainder of the dorsum is membranous and the median portion is entirely free from spines. Laterally, however, it is beset with long stiff spines. There are apparently seven sternites, the first six distinctly chitinized and with a row of spines along the posterior margin. The seventh sternite occupies about a third of the length of the abdomen. The male claspers are three in number and are appressed to the ventral side of the abdomen.

EXPLANATION OF PLATES.

Plate XXII.

Fig. 1. *Penicillidia antrozoi* (Townsend) : dorsal and ventral views of male.

Fig. 2. *Penicillidia antrozoi* (Townsend) : dorsal and ventral views of abdomen of female.

Fig. 6. *Nycterophila coxata* n. sp. : wing.

Plate XXIII.

Fig. 3. *Penicillidia corynorhini* n. sp. : ventral and dorsal views of female.

Fig. 4. *Cyclopodia similis* Speiser : dorsal and ventral views of male.



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