

## A TYDEID MITE FROM NOCTUID MOTHS

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### ABSTRACT.

*Pronematus pyrrhippeus* is described as a new species found but rarely in the tympanic recesses of noctuid moths, probably as a phoretic but sometimes in company with other mites.

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The tiny prostigmatous mites of the family Tydeidae are believed to include some species that are plant feeders and others that are predaceous upon small insects or upon mites or their eggs (BAKER and WHARTON, 1952). BAKER (1945) described species of *Pronematus* from fig trees in California. MEYER and RYKE (1959) have lately found a new mite of this genus on *Prunus* in South Africa. The discovery in 1955 of the *Pronematus* here described in the external tympanic recess of a noctuid moth raised questions regarding the ecological significance of such an association. Since the moth appeared to be uninjured, it seemed likely that the mite was merely a casual traveller or phoretic. But since moths of the family Noctuidae are occasionally hosts to other mites, some of which occupy the tympanic organs, there was also a possibility that the new form might be associated in some way with actual or potential fellow travellers. During the following four years three more noctuid moths came to light (literally) bearing mites of the same new species. Two of these moths also harbored mites of at least one other kind, and on one no fewer than four different species were found. No interaction among the various mites was observed, however. When a mite of the new species was transferred experimentally to an established colony of moth ear mites (*Myrmonyssus phalaenodectes* Treat, 1954), it survived for two weeks — the full life span of the colony — though again without any direct interaction having been observed. Since the new mite is seldom encountered, at least on moths, it seems well to present the facts now in the hope that other students may gather additional information.

#### MATERIAL.

A total of 12 specimens has been found. Seven of these were lost during experimental transfers. Five were mounted and form the basis of the description to follow. Collections are listed below, chronologically according to hosts. All were made in Tyringham, Berkshire County, Massachusetts.

1. A single specimen from the right tympanic membrane of an undetermined male cuculliine, 18 June, 1955.

2. Six specimens from the right tympanic membrane of *Polia imbrifera* Guenée, female, 18 July, 1957. Five specimens were lost during attempted experiments. This moth also harbored 1 *Myrmonyssus phalaenodectes* female, 1 *Haemolaelaps casalis* Berlese, female, and 1 undetermined erythraeid larva. The *Myrmonyssus* female occupied the left tympanic organ, on the side opposite that where the *Pronematus* specimens were found.

3. Four specimens from the right tympanic recess of *Pseudospaelotis haruspica* Grote, female, 15 August, 1957. Two were lost after an experimental transfer. This moth also harbored several females of *Haemolaelaps casalis*.

4. A single specimen from the right tympanic membrane of *Acronycta vinnula* Grote, female, 28 June, 1959.

#### DESCRIPTION.

##### *Pronematus pyrrohippeus*, n. sp.

Acarina : Trombidiformes ; Family Tydeidae Kramer, 1877 ; Genus *Pronematus* G. Canestrini, 1886. The mite has the characters of the genus and family. Living specimens are light red with a slightly powdery appearance probably due to reflections from cuticular surfaces. Body pear-shaped, broader anteriorly. The mites move quickly when aroused, supporting the body on the three posterior pairs of legs and using the first pair as antennae. The second pair of legs is directed forward, the third and fourth pairs rearward. When the mites are mounted in Hoyer's medium the pigment soon is aggregated into orange red globules of various size. The color disappears when the slide is heated, and the specimens become highly transparent. The cuticle is thin and weakly striated, without punctations.

The following measurements show the range of variation in the five mounted specimens. Differences no doubt reflect in part the varying amounts of compression by the coverslips. Length : 230-266  $\mu$  ; maximum breadth : 100-130  $\mu$  ; length of gnathosoma : 47-63  $\mu$  ; palpus (including coxa) : 56-74  $\mu$  ; propodosoma : 44-48  $\mu$  ; metapodosoma : 70-85  $\mu$  ; hysterosoma : 156-181  $\mu$  ; leg I (from base of coxa) : 148-170  $\mu$  ; leg II : 137-160  $\mu$  ; leg. III : 141-163  $\mu$  ; leg IV : 163-200  $\mu$  (from trochanter : 145-154  $\mu$ ) ; tarsus I : 17-18  $\mu$  ; dorsal distal seta of tarsus I : 51-63  $\mu$  ; rod-like

sensory seta of tarsus I :  $13\ \mu$  ; rod-like sensory seta of tibia I :  $5\ \mu$  ; sensory seta of propodosoma :  $48-55\ \mu$  ; lateral seta of propodosoma :  $22-33\ \mu$ .

Seta distribution is as shown in Figures 1 and 2. All body setae are simple except the propodosomal sensory seta which is pilose. Dorsally the propodosoma bears four pairs of setae (including the sensory seta), the hysterosoma eight pairs.

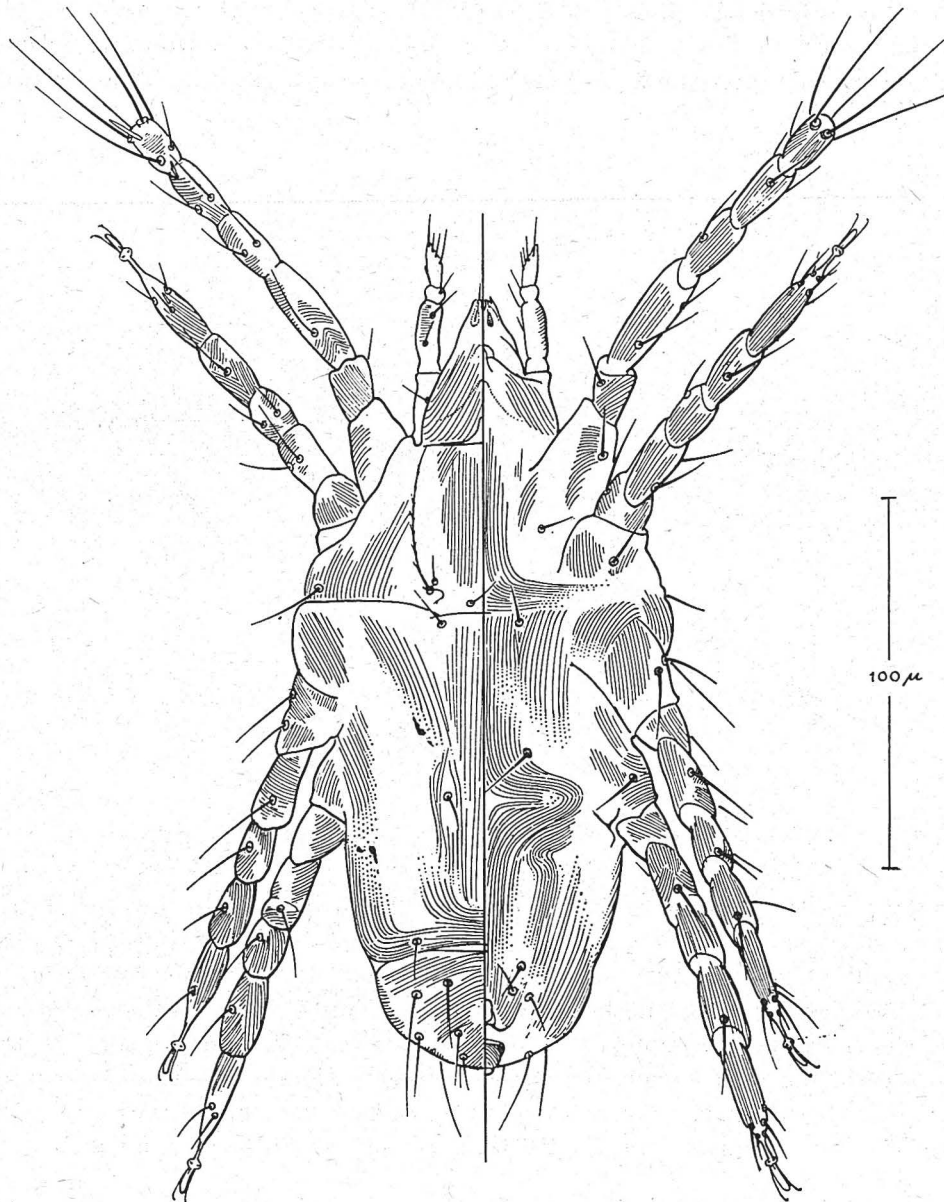


FIG. 1. — *Pronematus pyrrhohippeus* n. sp., (? ♀). Left side, dorsum ; right side, venter.

Ventrally there are one pair on the propodosoma and six pairs on the hysterosoma. The chelicerae are short as compared with the extended palpi, not reaching beyond the base of the palpal tarsus. The anus is terminal. On the ventral surface just anterior to the anus is a pair of rearwardly directed lobes or papillae. The sex was not determined, but the holotype is believed to be an unfertilized female. The early stages are unknown.

This species is closely similar to *P. brachytarsus* Baker, with which it has been compared both by BAKER<sup>1</sup> and by the author. It is distinguished from *brachytarsus* by the slightly more proximal position and greater length (13  $\mu$  as compared with

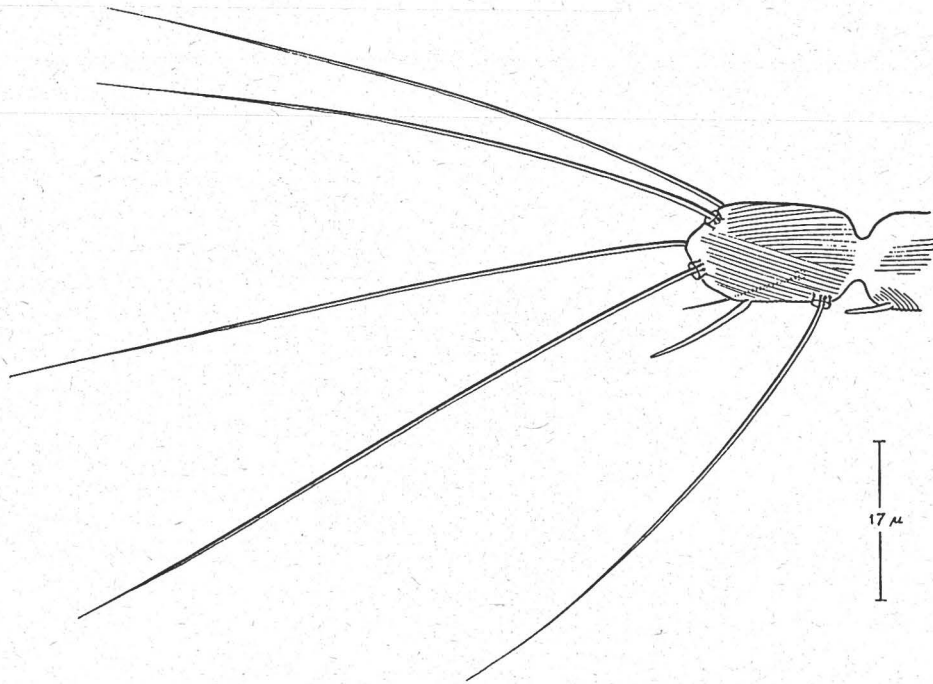


FIG. 2. — *Pronematus pyrrohippeus* n. sp., (? ♀). Median aspect of left tarsus I.

4  $\mu$ ) of the rodlike tarsal seta, by the shorter chelicerae, and by the red instead of yellowish color of the living mites. Baker's mounted specimens of *brachytarsus* are distinctly yellow, in contrast to the lack of color in mounted *pyrrohippeus*.

The holotype is No. 2679 in the collection of the United States National Museum. It was found in the right tympanic recess of *Polia imbrifera* Gn., female, taken at light in Tyringham, Massachusetts, 18 July, 1957. Figures 1 and 2 were drawn from this (? ♀) specimen. Four paratypes are in the collection of the author.

The specific name is derived from Greek *πυρρός*, red, plus *ἵππεύς*, a rider.

1. The author is much indebted to Dr. E. W. BAKER of the United States National Museum for critical examination of the type material and for helpful suggestions with the manuscript.

#### BEHAVIOR AND ECOLOGY.

The mites were all discovered during routine inspection of noctuid tympanic organs. Since several thousand moths were examined over a period of eight years, it is clear that the occurrence of *B. pyrrhhippeus* in this ecological context is unusual. The various host species are not closely related, indicating a low degree of host specificity if any. It may be mentioned that a single, undetermined specimen of the closely related genus *Tydeus* was found on the right tympanic membrane of a male *Acronycta* sp. on 16 July, 1955. This shows that phoresy upon moths is not necessarily restricted to tydeids of the species here described.

In each of the hosts, the mites when first noticed were at rest on or very near the tympanic membrane, which was always undamaged. They showed no obvious response to light, and were only gradually provoked to activity by stimulation with a fine bristle. Once active, however, they moved rapidly out of the tympanic recess and disappeared in various directions among the hairs of the host, where it was difficult if not impossible to find them again.

It is noteworthy that two of the four collections were from moths which harbored other species of mites at the same time. In both instances these included the mesostigmatid *Haemolaelaps casalis* Berlese, which is known as a parasite of various birds and mammals and is also often found in "straw, hay, detritus, etc." (STRANDTMANN and WHARTON, 1958). The only other example of *H. casalis* in my collection of mites from Lepidoptera is a single female from a *Septis arctica* male taken in Tyringham, Massachusetts, on 14 July, 1958.

Host number 2 (p. 148) furnishes the only record of *P. pyrrhhippeus* from a moth infested with the tympanicolous mite *Myrmonyssus phalaenodectes*. These mites in midsummer infest more than 30 percent of certain noctuids of the subfamily Hadeninae. In this instance, as in host number 3, there was no sign of any interaction among the various mites. Nevertheless, because of the reputation of some tydeids as predators upon other mites and their eggs, it seemed an interesting experiment to transfer some living *Pronematus* to an established colony of *M. phalaenodectes*. Accordingly, three specimens were transferred on 14 August, 1957, from the right tympanic recess of host number 2, *Pseudospaelotis haruspica* to the left tympanic recess of a female armyworm moth, *Pseudaletia unipuncta* Haworth, containing a gravid female of *M. phalaenodectes* which had already deposited eight eggs. Two of the transferred mites immediately left the recess and were permanently lost in the vestiture of the new host. A third entered the recess and came to rest near the brood female. The moth survived until 28 August, an exceptionally long time for this species under the conditions of the experiment. On this date it was dissected, and one *P. pyrrhhippeus* was found alive and apparently in good condition among the mites and eggs of the old *phalaenodectes* colony. It could not be determined whether any predation had taken place.

Despite the circumstances related above, it seems probable that *P. pyrrhhippeus*



is merely an occasional phoretic and is not regularly associated with other moth-infesting mites. The finding of specimens on otherwise mite-free moths (hosts number 1 and 4), and the lack of records of the species in conjunction the moth ear mite favor this view. The possibility of predation by *pyrrhipeus* in circumstances not involving moths is certainly not excluded.

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