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## NOTES ON THE GUESTS OF SOME CALIFORNIAN ANTS.

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The following notes are based on a small collection of ants and myrmecophiles made in the vicinity of Stanford University during the spring of 1910. The paper does not include many records, but as there are few exact data recorded concerning the hosts of our western myrmecophiles, I have thought that any additional notes will be worth while.

Unless otherwise noted, all of the ant guests are from nests in the low hills about a mile south of the Stanford University campus. The nests of seventeen species of ants were examined during the spring. Fourteen of these species entertained guests or parasites.

I am under obligations to Dr. W. M. Wheeler of Harvard University who has named most of my ants, and to Prof. H. C. Fall of Pasadena, for examining the type of *Hetaerius wheeleri* n. sp. This paper was prepared in the Entomological Laboratory of Stanford University.

**Camponotus maccooki** Forel. The commonest local *Camponotus*. On March 5th, I found beneath a stone in a small colony of this ant, a single specimen of *Cremastochilus planatus* Lec. The beetle had evidently been ill treated, both hind and one of the middle tarsi being gone. In a much larger colony, on March 9th, two more specimens were taken. Both of these were perfect. Three weeks later I revisited this nest and took three more of the beetles, one of them with a leg mutilated.

The occurrence of specimens from two nests, one of the nests containing specimens during the greater part of the time that *C. planatus* is taken, tends to show that the occurrence of this species with *Camponotus* is not altogether accidental. On the same date (March 30) I took two specimens of the same beetle with *Formica rufa* var. *occidentalis* Wheeler. A week later the same nest contained a flourishing colony of *Camponotus*, which

colony remained up to the time when my observations ceased, so it is probable that the *Camponotus* occupied the nest, the beetle normally was with them and the occurrence of the *Formicas* accidental.

Throughout March the cockroach *Ischnoptera* sp. was abundant in most of the nests. It seemed to be tolerated by the ants. All ants are not so indifferent as *Camponotus*, and in the nests of *Formicas*, dead and mutilated specimens are common.

The Californian ant-cricket, *Myrmecophila formicarum* Scudder occurs in practically every nest.

***Camponotus maculatus* sub. sp. *vicinus* Mayr.** Common, though less abundant than *C. maccooki*, nesting under stones. The only guest found was *Myrmecophila formicarum*, which was abundant.

***Camponotus hyatti* Em.** Rare. Two colonies found during the year. One of these, found November 4, 1909, had excavated run-ways in a fallen board. This colony was small, only fifteen major and minor workers being taken. On April 19, Mr. E. J. Newcomer took a series from a nest in a rotten log.

***Formica rufibarbis* var. *occidentalis* Wheeler.** Common, nesting mostly under stones. Associated with it are often found small colonies of the little ant *Leptothorax andrei*. The majority of the nests harbor *Myrmecophila formicarum*.

On February 13, I found with this ant a single specimen of a *Heterius*, different from any of our described species. Another specimen of the same was taken from a different nest on March 5. They were clinging to the undersides of the stones which covered the nests. I have named this species *Heterius wheeleri*, after Dr. William M. Wheeler of Harvard University, in recognition of his work on myrmecophily.

*Heterius californicus* Horn was found locally only with this ant. The beetle seems to be very rare in collections, but can be found by careful search. Between February 27 and March 30, twenty one specimens were taken. They occur generally singly, or two in a nest, though one nest contained five and another three. Their occurrence in the first was interesting, because the nest had been occupied the previous week by a strong colony of *Tapinoma sessile*, and the beetles had either

moved with the *Formicas*, or had found and entered the nest later. *Tapinoma* does not harbor *Hetærius* as a rule. The very long hairs covering the dorsal surface of *Hetærius californicus* give the little beetle a distinctive appearance and it is undoubtedly a true symphile. When disturbed, it either feigns death or walks awkwardly away.

***Formica cinerea* var. *neocinerea*** Wheeler. Not common. I have myself found no myrmecophilous insects with this ant, but have before me *Hetærius tristriatus* Horn, taken at Lake Merced, Cal., March 6, 1910, by Mr. F. X. Williams.

***Formica rufa* var. near *coloradensis***. Several mounds along Corte Madera Creek were examined, but nothing taken except *Myrmecophila formicarum*, which was abundant. On March 13, in a colony under a board were two specimens of *Batrissus zephyrinus* Casey. They were walking about among the ants, which paid no attention to them.

***Formica fusca* var. *argentata*** Wheeler. Common. Generally in damp locations in the hills. I have taken four specimens of *Hetærius tristriatus*, one each from four nests of this ant on April 17, 1910.

***Prenolepis imparis*** Say. Common in damp places. This is our local honey ant, but the workers away from the nest are as often seen on carrion or dung as on anything from which they might obtain honey. It harbors *Myrmecophila formicarum*, and often the thief-ant, *Solenopsis molesta* Say.

***Tapinoma sessile*** Say. Abundant everywhere. *Myrmecophila formicarum* occurs in most of the nests, and colonies of *Solenopsis molesta* are common. The nest of one little colony of *Tapinoma* contained a colony of *Solenopsis* approximately five times as numerous in individuals as the host colony.

On December 22, in a nest containing colonies of both *Tapinoma* and *Solenopsis* was a little wingless Proctotrypid, *Isobrachium myrmecophilum* Ashmead. A second specimen was taken from another nest on February 13. Ashmead<sup>1</sup> states that this genus is parasitic upon the ants or upon myrmecophilous Coleoptera. The latter being so rare in the nests of *Tapinoma* it is probable that *Isobrachium* is a parasite of the ant itself.

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<sup>1</sup>Bull. 45, U. S. Nat. Mus.

**Leptothorax andrei** Em. Very small colonies are not rare. Those found were either associated with *Formica rufibarbis* var. *occidentalis* Wheeler, or independent.

**Stenammas andrei**. Common in dry localities. In March and April *Ischnoptera* sp. is abundant in the nests. *Myrmecophila formicarum* is common also. On March 5, I took a single *Cremastochilus pilisicollis* Horn in a large nest, and on the 30th took from two nests, three specimens of *Cremastochilus schaumii* Lec. A specimen of the latter species from the nest of this ant is in the Stanford University collection.

*C. schaumii* leaves the nests in the early part of April and is seen flying in the sunshine, or more often lying in the roads.

**Pheidole californica** Mayr. Common, nesting under sticks, stones and old cans. One flourishing nest was under a piece of steel rail. *Solenopsis molesta* frequently shares the nest. The type of the Staphylinid, *Conosoma heathi* Wasmann, was collected in April from the nests of *Pheidole*, but I took none during my spring collecting.

**Solenopsis molesta** Say. Common. It nests with *Tapinoma sessile*, *Camponotus maculatus* subsp. *vicinus*, *Camponotus maccooki* and *Prenolepis imparis*. Independent nests are not uncommon.

**Cremastogaster lineolata** subsp. **coarctata** Say. Common under stones in damp places. *Myrmecophila formicarum* occurs in most of the nests.

#### **Hetaerius wheeleri** sp. nov.

Length 2 mm. Color reddish brown. Form broadly oval, robust, shining. Upper surface finely punctate, each puncture with fine recumbent hair. Head piceous, coarsely punctate, hairy; front concave. Prothorax wider than long, narrowed in front; margin inflexed at the third distance from base, separated from disc by impunctate impression, which becomes broader and deeper from front to rear and ends in deep pit at the posterior angle; divided at basal third by shallow impression; the posterior part elevated, piceous, the anterior part flat; disc wider than long, punctate, each puncture with fine hair. Elytra slightly wider than thorax at base; outer striæ becoming confluent with margin at about one half distance to base of elytra; the first two discal striæ nearly attaining the apex of the elytra; inner striæ extending about two thirds the distance to apex. Propygidium finely punctate, hairy. Prosternum flattened, coarsely punctured, emarginate at base and apex, margined at summit from base to five-eighths distance from base to apex;

marginal lines sinuate between and diverging in front and rear of coxæ. Front femora about one third as wide as long.

Type and the single paratype taken from a nest of *Formica rufibarbis* var. *occidentalis* Wheeler, at Stanford University, California.

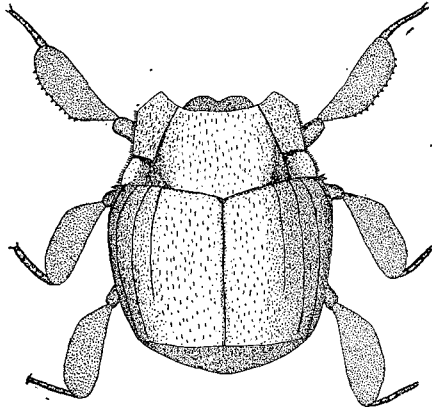


Fig. 1. *Hetariius wheeleri*, sp. nov.

The size, structure of prothorax and the scattered, recumbent hairs will separate this species from those near it.

There are eleven denticles on the outer edge of the anterior tibiæ. The number seems to vary among the different species, but to be fairly constant in the same one and may be of some taxonomic importance.