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SOLENOPSIS PHORETICA, A NEW SPECIES OF APPARENTLY PARASITIC ANT FROM FLORIDA (HYMENOPTERA: FORMICIDAE)

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ABSTRACT

A new species of ant, Solenopsis phoretica, is described from a dealate queen found clinging to the petiole of a nest queen of Pheidole dentata Mayr in Gilchrist County, Florida. The position of the Solenopsis queen, as well as details of its morphology, strongly suggest that it represents a parasitic species. It is distinguished from other Solenopsis by its concave clypeal area and slender, elongate mandibles with an enlarged basal tooth. A single specimen is known.

Key Words: parasitic ant, parasitic Solenopsis, parasitic fire ant

RESUMEN

Se describe una nueva especie de hormiga, Solenopsis phoretica de una reina dealatada (que bota las alas) encontrada colgada al pecíolo de la reina hormiga de Pheidole dentata Mayr en el condado de Gilchrist en la Florida. La posición de la reina de Solenopsis y los detalles de su morfología, sugiere fuertemente que esta representa una especie parasítica. Se distingue esta especie de otras Solenopsis por tener la área del clípeo concavo y la mandíbula elongada y delgada con un diente basal engrandecido. Un solo especimen es conocido.

Solenopsis is a genus of over 180 described species (Bolton 1995). The genus shows variable habits. Many species are polyphagous, above-ground foragers, such as the notorious pest, Solenopsis invicta Buren. Other species, especially those species formerly placed in the subgenus Diplorhoptrum, are primarily subterranean foragers. Some of these subterranean species may issue from small galleries to carry off food and larvae from brood chambers of other ants (Hölldobler & Wilson 1990). A few species of Solenopsis are workerless parasites that were at one time placed in the genera Labauchena or Paranamyrma (Ettershank 1966). Here, we describe a new species of Solenopsis based on a single dealate queen. This species appears to be parasitic on other ants, but we do not know whether it is workerless, nor do we know whether it is closely related to any other parasitic species.

Character states defining Solenopsis are detailed by Ettershank (1966). In the North American fauna the genus can be recognized by the combination of a few character states: two-segmented petiole; two-segmented antennal club; propodeum lacking spines or angles; clypeus longitudinally bicarinate, with a median, apical marginal setae. The clypeal features are lacking on the species described below.

Solenopsis phoretica, Davis and Deyrup new species

Diagnosis of dealate female (Fig. 1): The dealate female is distinguished from other Solenopsis by the following combination of character states: mandibles elongate, teeth lacking or vestigial, except for apical point and enlarged basal angle; clypeus concave, smooth.

Description of holotype dealate female: features visible in lateral view described from left side. Measurements in mm. Total length (length of head excluding mandibles + length of mesosoma + length of petiole + length of postpetiole + length of gaster): 3.03; head length: 0.55; head width at rear margins of eyes in frontal view: 0.55; length of mesosoma: 0.88; length of petiole: 0.30; length of postpetiole: 0.20; length of gaster 1.10. Color: yellowish brown, appendages yellow.

Head: smooth, shining, sparsely covered with setigerous punctures separated by 2-8 times the width of a puncture, setae suberect, directed posteriorly in the frontal area, elsewhere directed anteriorly; ocelli not enlarged, each ocellus about the width of antennal scape at base; malar area long and narrow, slightly shorter than length of eye; mandibles elongate, over half the length of head at midline, apical tooth elongate, delimited proximally by a narrow notch apparently representing a vestigial tooth, inner profile of mandible strongly concave, concavity delimited proximally by strongly produced basal angle with a truncate apex; clypeus smooth, concave, without carinae, with four subapical elongate setae; antennae 10-segmented, scape reaching outer corners of head in frontal view, antennal club 2-segmented, club about as long as remainder of funiculus. Mesosoma: smooth and shining, with sparse setigerous
punctures on pronotum, near margins of mesonotum, mesopleura, sides of propodeum; disc of mesonotum and declivity of propodeum unpunctured; propodeum evenly declivitous in lateral view, only slightly convex; legs smooth, shining, with sparse, strong, semidecumbent, distally-directed hairs. Petiole: peduncle short, less than 0.25 length of base of petiole in lateral view; petiole in lateral view triangular, apex broadly and smoothly rounded; in posterior view apex strongly convex; ventral process narrowly expanded, with a small triangular tooth. Postpetiole: low and rounded above in lateral view; petiole in lateral view triangular, apex broadly and smoothly rounded; in posterior view apex strongly convex; ventral process narrowly expanded, with a small triangular tooth. Postpetiole: low and rounded above in lateral view; petiole in lateral view triangular, apex broadly and smoothly rounded; in posterior view apex strongly convex; ventral process narrowly expanded, with a small triangular tooth.

Type locality and associated information: collecting data on label of holotype: FL: Gilchrist Co., Route 47, 2.5 miles north of junction with Route 232, 9 February 1992, Lloyd R. Davis. Mandibles locked around petiole of nest queen of *Pheidole dentata*.

Etymology: species epithet derived from *phoretos* (Greek), meaning “carried,” referring to the phoretic relationship between the holotype and the nest queen of *Pheidole dentata*.

**DISCUSSION**

It is generally undesirable to describe a species of ant on the basis of a single queen. By convention and convenience, ant holotypes are generally workers. Workers, as well as males, may be very different from queens. In this case, no additional specimens have been found since the date of capture in 1992. Our intent is to alert the myrmecological community to this unusual species, in the hope that this exposure may lead to the discovery of more specimens and more natural history information.

Only a limited amount of speculation is justified, as only a single specimen is available. The generic placement of *S. phoretica* is based on its general resemblance to queens of such small *Solenopsis* species as *S. carolinensis* Forel and *S. abdita* Thompson. Resemblances include the two-segmented antennal club, smooth and shiny integument, the type and placement of setigerous punctures, and the shape of the petiole and postpetiole. If, however, the antennal club were three-segmented, rather than two-segmented, the spe-
cies could be plausibly placed in the genus *Mono-
morium*. We were also influenced by the preced-
etent of parasitic species of *Solenopsis* with re-
duced or absent clypeal carinae, such as the South
American *S. daguerrei* (Santschi). There is no ev-
eidence, however, that *S. phoretica* is closely re-
lated to *S. daguerrei* and its relatives. The latter
species lacks a number of features found in *S.
phoretica*: enlarged punctures bearing short setae
on the head and mesosoma; angulate subpetiolar
process; falcate mandibles with a strongly pro-
jecting basal angle. The petiole of *S. daguerrei* is
sharply angulate above in lateral view, the post-
petiole is narrow in posterior view, the anterior
dge of the mesonotum is slightly protuberant,
overhanging the pronotum, and the inner mar-
gins of the mandibles are oblique with four teeth
(including the apical tooth).

We suspect that *S. phoretica* is parasitic be-
cause it was found clinging to the petiole of a nest
queen of *Pheidole dentata* and because the mandi-
bles and concave clypeal area fit exactly around
the petiole. The radical nature of the clypeal and
mandibular modifications suggest a relatively
long phoretic association, although not necessar-
ily with *P. dentata*. There are other local ants, such
as *Pheidole crassicornis* Emery, *Solenopsis gemi-
nata* (Fabricius) and possibly *S. pergandei* Forel
that have a petiole that might well accommodate
the mandibles of *S. phoretica*. A phoretic rela-
tionship in which the parasite is attached to the pe-
tiole of the host queen is, to our knowledge, unique
in ants. *Solenopsis daguerrei* queens cling to the
neck of their host queen, immobilizing her, and
greatly decreasing her reproductive ability (Sil-
veira-Guido et al. 1973). There is also a highly spe-
cialized parasitic ant, *Teleutomyrmex schneideri*
Kutter, whose queens ride about unattached on
the host queen (Hölldobler & Wilson 1990).

It is impossible to define, on the basis of our
single observation, the nature of the suspected
parasitic relationship. *Solenopsis phoretica* seems
equipped for a prolonged period of phoresy on its
host, but it is still possible that *S. phoretica*
dismounts after it is fully imbued with the odor of
the host queen. It is tempting to suggest, by anal-
ogy with known parasitic *Solenopsis*, that *S.
phoretica* is a workerless parasite, but there is no
evidence of this, aside from the absence of worker
*Solenopsis* in the host nest. Whatever relation-
ship *S. phoretica* may have with its host, it is cer-
tain to be interesting and unusual. We hope that
myrmecologists and other naturalists working in
southeastern North America will be on the look-
out for this species. It might not be necessary to
find nest queens of the host, as at some point in
the life cycle of *S. phoretica* there should be nu-
merous alate *S. phoretica* in the host colony.

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