Revision of the Checklist of Indiana Ants with the Addition of Five New Species (Hymenoptera: Formicidae)

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Introduction

In 1967, the list of Indiana ants by Morris (4) was revised and expanded to include nine species not previously reported from the State (7). In 1979, an extensive revision of the catalog of the Hymenoptera in America (which includes two supplements) was published by Krombein, Hurd, *et al* (3). Because of the 1979 revision of the Catalog and the collecting by Schrock of five species of ants new to the State, it was felt that a revision of the checklist of Indiana ants was in order, as well as offering some information about Schrock's five species of ants.

Morris (4) included 92 species in his annotated list of ants. When revised in 1967, the resulting list included 85 species (7). The present list again includes 92 species of ants believed to occur in Indiana.

Methods and Materials

By comparing the names of ants on the 1967 list (7) with corresponding names in the 1979 Catalog (3), it was possible to make the necessary corrections. Although the 1967 checklist used Morris' order of names, the present paper lists the species of ants according to the 1979 Catalog (3). With each species name, the Catalog page number is given.

During the summer of 1981, Schrock collected ants using pitfall traps placed in the same 20 stands of a stripmine study area that was previously used in 1964 to collect ants (6). The purpose was to compare the 1981 collections with those done in 1964 (8). Schrock collected five species not taken in 1964. Here, the attempt is made to reveal some of the diagnostic characteristics of these five ants for the purpose of assisting in identification. For this, scanning electron microscope photos were used. The results follow the checklist given below.

Results

A Checklist of Indiana Ants

Numbers preceding species names correspond to page numbers in the "Catalogue of Hymenoptera in American North of Mexico", Volume 2, Apocrita (Aculeata) by K. V. Krombein, P. D. Hurd, Jr., D. R. Smith *et al* 1979 (3).
Collected by J. R. Schrock, 1981. New State record.
* Name change in the checklist of 1967 (7). See the 1979 Catalog.

1331 *Neivamyrmex nigrescens* (Cresson)
1335 *Amblyopone pallipes* (Haldeman)*
1338 *Proceratium pergandei* (Emery)*
1339 *Proceratium silaceum* Roger
1342 *Ponera pennsylvanica* Buckley*
1343 *Hypoponera opacior* (Forel)*
1348 *Myrmica americana* Weber*

1348 *Myrmica e. emeryana* Forel*
1349 *Myrmica incompleta incompleta* Provancher*
1349 *Myrmica incompleta sulcinodoides* Emery*, (Invalid subspecies—some authors)
1349 *Myrmica lobicornis fracticornis* Emery
1350 *Myrmica pinetorum* Wheeler
1350 *Myrmica punctiventris* Roger*
1351 *Myrmica spatulata* M. R. Smith#
1358 *Stenamma brevicorne* (Mayr)
1358 *Stenamma diecki* Emery
1359 *Stenamma meridonale* Smith
1361 *Aphaenogaster fulva* Roger
1361 *Aphaenogaster mariae* Forel
1362 *Aphaenogaster rudis rudis* (Emery)
1362 *Aphaenogaster tennesseensis* (Mayr)
1362 *Aphaenogaster texana carolinensis* Wheeler
1363 *Aphaenogaster treatae treatae* Forel
1367 *Pheidole bicarinata bicarinata* Mayr*
1372 *Pheidole pilifera pilifera* (Roger)
1378 *Crematogaster cerasi* (Fitch)
1378 *Crematogaster clara* Mayr
1379 *Crematogaster lineolata* (Say)*
1382 *Monomorium minimum* (Buckley)
1383 *Monomorium pharonis* (Linnaeus)
1387 *Solenopsis molesta* (Say)
1392 *Leptothorax ambiguous ambiguous* Emery
1392 *Leptothorax curvispinosus* Mayr
1393 *Leptothorax longispinosus* Roger
1394 *Leptothorax schaumi* Roger
1396 *Leptothorax pergandei pergandei* Emery
1397 *Leptothorax muscorum* (Nylander)
1398 *Harpagoxenus americanus* (Emery)#
1399 *Myrmecina americana* Emery
1400 *Tetramorium caespitum* (Linne)
1406 *Smithistruma abdita* (L. & R. Wesson)#
1406 *Smithistruma filitalpa* Brown
1411 *Trachymyrmex septentrionalis* (McCook)
1415 *Dolichoderus mariae* Forel
1416 *Dolichoderus plagiatus* (Mayr)
1416 *Dolichoderus pustulatus* Mayr
1419 *Iridomyrmex pruinosus analis* (Andre)
1419 *Iridomyrmex pruinosus pruinosus* (Roger)
1420 *Conomyrma insana* (Buckley)*
1421 *Tapinoma sessile* (Say)
1424 *Brachymyrmex depilis* Emery
1425 *Camponotus americanus* Mayr
1425 *Camponotus ferrugineus* (Fabricius)
1426 *Camponotus novaeboracensis* (Fitch)
1427 *Camponotus pennsylvanicus* (DeGeer)
1428 *Camponotus castaneus* (Latreille)
1431 *Camponotus caryae caryae* (Fitch)
1431 *Camponotus caryae discolor* (Buckley)

1432 *Camponotus nearcticus* Emery
1433 *Camponotus subbarbatus* Emery
1433 *Camponotus (Colobopsis) mississippiensis* Smith#
1436 *Lasius neoniger* Emery
1436 *Lasius niger* (Linnaeus)
1438 *Lasius minutus* Emery
1439 *Lasius umbratus* (Nylander)
1440 *Acanthomyops claviger* (Roger)*
1441 *Acanthomyops interjectus* (Mayr)*
1441 *Acanthomyops latipes* (Walsh)
1442 *Paratrechina longicornis* (Latreille)
1443 *Paratrechina arenivaga* (Wheeler)*
1444 *Paratrechina parvula* (Mayr)
1445 *Prenolepis imparis imparis* (Say)
1450 *Formica neogates* Emery
1451 *Formica pallidefulva nitidiventris* Emery
1451 *Formica pallidefulva pallidefulva* Latreille*
1451 *Formica schaufussi schauffusi* Mayr
1452 *Formica fusca* Linnaeus
1454 *Formica montana* Emery*
1456 *Formica exsectoides* Forel
1456 *Formica ulkei* Emery
1457 *Formica dakotensis* Emery
1458 *Formica integra* Nylander
1460 *Formica obscuripes* Forel*
1460 *Formica obscuriventris obscuriventris* Mayr
1463 *Formica postoculata* Kennedy & Dennis
1463 *Formica querquetulana* Kennedy & Dennis
1465 *Formica puberula* Emery
1465 *Formica rubicunda* Emery
1465 *Formica subintegra* Emery
1465 *Formica subnuda* Emery
1466 *Polygerus breviceps* Emery*
1467 *Polygerus lucidus lucidus* Mayr*

Discussion

Brief descriptions of the five ants collected by Schrock (8) follows. The reader is directed to the literature for additional information. The attempt is made to use scanning electron microscope photographs to supplement verbal descriptions of certain key characteristics of these five ants.

Myrmica pinetorum Wheeler. (3.5 – 4.0 mm). This ant was taken by pitfall trapping in 19 of 20 stands. It did not appear in traps placed in the sole bareground stand which has remained as such since formed in 1950. The Wessons (12) reported that this species was common in pine woods on sandy soil in Ohio. There, colonies built carton turrets from the soil up through the pine needles. They also found the ant commonly in dry oak openings. Apparently this ant occupies more diversified habitats here. Characteristic of this species are the strongly convex or angular frontal lobes, also the frontal area (above the clypeus) which is crossed by rugae; at least, never completely smooth and shining (Figure 1). In addition, the insertions of the antennae are hidden by the strongly convex frontal lobes as shown in the figure. Figure 2 depicts some of the features of the Genus *Myrmica* showing the strong sculpturing composed

FIGURE 1. *Myrmica pinetorum* Wheeler. Head, dorsal. Frontal lobes obscuring antennal insertions. Frontal area with rugae. (X90).

FIGURE 2. *Myrmica pinetorum* Wheeler. See text. (X26).

of rugae and interrugal structure. Note the long epinotal spines, and lack of promesonotal suture.

Myrmica spatulata M. R. Smith. (4.3 - 4.6 mm). All stands yielded this ant which Creighton (2) noted ranges from Mississippi to Illinois. M. R. Smith, who described this species, collected specimens from a nest in the soil of a low, heavily wooded area in Mississippi (10). Although Smith designated this ant as a variety of *schenki*, Creighton (2) dropped the latter name and raised *spatulata* to specific status because "there are so many outstanding characters shown by the worker caste". He noted that the very large spatulate lamina on the antennal scape varied widely in size and chose the structure of the frontal lobes as being unique and more consistent than the laminae. Figure 3 shows the base of the right antenna and the spatulate lamina; also shown are the

FIGURE 3. *Myrmica spatulata* M. R. Smith. Head, dorsal. Base of right antennal scape, showing large lamina. (X290).

frontal lobes which Creighton considered more consistent in a structure than the laminae. Note the frontal lobes which are narrow and hardly project above the antennal fossa (Figure 4). The frontal area is obscured by rugae as in the preceding species.

Harpagoxenus americanus (Emery). (2.5 - 2.75 mm). Ants representing this species were taken once in each of three adjacent spoilbank stands. According to Smith (11), *Leptothorax curvispinosus* Mayr is the preferred host ant of *H. americanus*. The latter species is widely distributed throughout the eastern half of the United States, but not as widely distributed as its host. *L. curvispinosus* is a common species of the spoilbanks. Smith (11) correctly observed that "Intensive collecting will reveal the presence of this slave-making species in localized spots . . ." Characteristic of *H. americanus* are the antennal scrobes which are longer than the scapes. Figure 5 shows the broad impression in the clypeus with a small lobe at either end. Also, note the large apical tooth of the mandible and the basal degenerate teeth. The mandibular structure suggests evolution

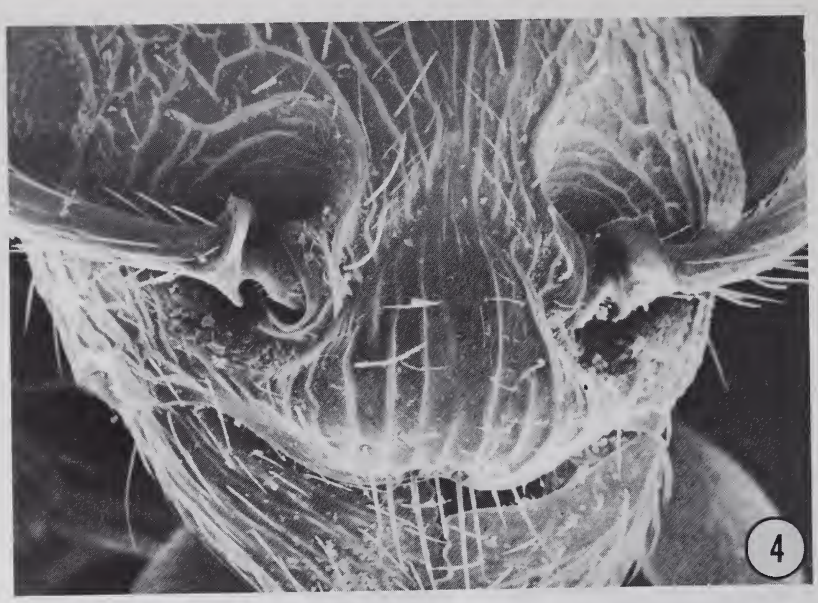

FIGURE 4. *Myrmica spatulata* M. R. Smith. Head, dorsal. Antennal insertions visible. Frontal area with rugae. (X100).

FIGURE 5. *Harpagoxenus americanus* (Emery). Head, front. Clypeal impression with lobes or blunt teeth laterally. Well-developed apical tooth of right mandible. (X180)

in the direction of the type of mandible found in the more advance species of *Polygerus*, another slave-making ant of the spoilbanks.

Smithistruma abdita (L. & R. Wesson). (2.6 - 2.52 mm). Like *S. filitalpa* Brown, also collected in the spoilbanks, *S. abdita* is an ant of open areas. The pitfall traps in neither of the two wooded stands have yielded these ants. The 1981 collections (8) revealed that the latter species is much more widely distributed within the study area. Both are small ants not likely to be taken by usual collecting methods. Dacetine ants, according to Brown (1) have less than 6 segments in the antennal funiculus (except males); white spongy-like appendages or thin-layered lateral wings on one or both sides of the pedicel; or have heads that are flattened and pear-shaped, narrowed anteriorly with a broad, deep occipital cleft; mandibles linear, each with 2 or 3 large apical teeth, also a hidden tooth or spine at the inner border; or having a combination of the foregoing characteristics. the large spoon-shaped hairs which in this species are confined to the area of the clypeus are visible (Figure 6). Other species traits are the 4 stout principal teeth of the mandible and less than 7 spoon-shaped hairs on either side of the midline of the clypeal border.

FIGURE 6. *Smithistrum abdita* (L. & R. Wesson). Large spoon-shaped hairs on clypeus. Four principal teeth, each mandible. (X700).

Camponotus (Colobopsis) mississippiensis M. R. Smith. Ants of the Subgenus *Colobopsis* are unique since the major workers and females have their heads margined and truncated anteriorly. Smith reported that *C. mississippiensis* commonly nests in the twigs of white ash, *Fraxinus americanus* (9). He observed that the ants fed mostly, if not exclusively on honey dew excreted by aphids, scale insects, etc. Examination of white ash saplings in the stand where only one specimen, a dealate female, was

taken revealed no evidence of nesting by this species of ant. Since the nests are in trees, the usual methods of collecting ants would not likely recover this species. The truncated heads of the major workers and females are shaped like small stoppers which exactly fit circular openings of the nest. Unwelcome ants as well as other insects are thereby prevented from entering when the "stoppers" are in place. Figure 7 is a dorsal

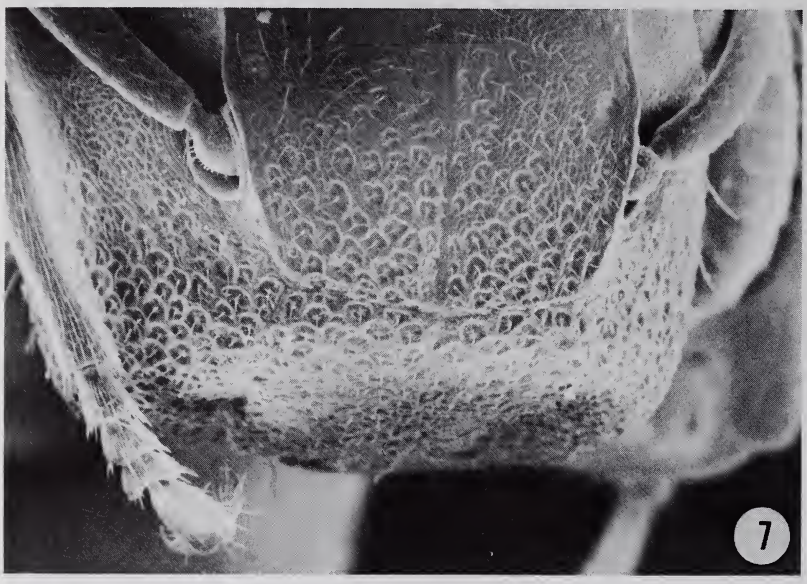

FIGURE 7. *Camponotus (Colobopsis) mississipiensis* M. R. Smith. Head, dorsal, truncated anteriorly. Note margin separating truncated part from rest of head. (X100).

view of the head showing the anterior truncation; Figure 8, a frontal view showing the upper margin of the truncation at the anterior border of the frontal lobes. When the head is placed in the nest opening, only the clypeus, mandibles, and cheeks are visible from the outside by a would-be intruder. This specimen was identified by Dr. W. E. LaBerge, Illinois Natural History Survey.

Pitfall trappings for ants has the advantage of collecting a diversity of species. The original trapping in 1964 (6) yielded 34 species from the study area which is less than one-quarter mile square. This represents about one-third of the total species recorded for the State. However, there are many advantages to collecting at nest sites. Unanswered questions about the *Camponotus (Colobopsis) mississippiensis* dealate female could have been answered had the specimen been taken at the nest. As it is, we can only speculate as to its nest location, if any; or whether it was in the process of founding a nest, or blown here by the wind, or carried by train, plane, or automobile. Having shed wings, it is possible that nest founding could have occurred. In 1923, Smith (9) described the species from Mississippi. It has since been taken in Illinois. Therefore, it is not unreasonable to suspect its presence in Indiana.

Acknowledgment

We gratefully acknowledge Dr. Wallace E. LaBerge, Illinois Natural History Survey,

FIGURE 8. *Camponotus (Colobopsis) mississippiensis* M. R. Smith. Head, front showing clypeus, cheeks, and upper margin of truncation. (X63).

for determining the dealate female ant, *Camponotus (Colobopsis) mississippiensis* M. R. Smith.

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