A NEW STRUMIGENYS WITH NOTES ON OHIO SPECIES
(Formicidae: Hymenoptera)

CLARENCE HAMILTON KENNEDY
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MABEL MARY SCHRAMM

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A NEW STRUMIGENYS WITH NOTES ON OHIO SPECIES
(Formicidae: Hymenoptera)

CLARENCE HAMILTON KENNEDY,[1]
Ohio State University, Columbus, Ohio,
and
MABEL MARY SCHRAMM,
The Schauffler School, Cleveland, Ohio.

The genus Strumigenys is a group of small to very minute ants, those in the Ohio fauna averaging about 2 mm. in length for the workers, though some of the more southern forms are more than twice as large. The thirty or forty known species are recorded from all the continents. The records cover Samoa, New Zealand, Australia, New Guinea, Amboina, Ceylon, Japan, Southern Europe, Central and Southern Africa, the Eastern United States, Cuba, Central America and South America to Argentina.[2] Such minute, slow-moving and weak insects must have had eras of time to have spread so widely. It is remarkable that they have retained their generic integrity when spread for so long a time over such a wide and diversified area.

Three species, *pergandei* Emery, *pulchella* Emery and the new one described below, have been taken in Ohio. *Str. dietrichi* Smith, originally described from Mississippi, will probably be found in this state, as it has been taken in southeastern Tennessee and at Urbana, Illinois.

Some of the larger southern species nest under stones, but the four species regional for Ohio nest in rotten logs. In nearly all cases where the log has been identified it has been oak and usually white oak (*Quercus alba* L.). Three specimens of *pulchella* were found by the authors in a log of some softer hard wood in the Huron Bog at Willard, Ohio. The nests have always been found in those parts of the log which have been

[1]The new species was collected by Miss Schramm and the description written by her. Kennedy is responsible for the general and morphological notes, also for the illustrations.

[2]From de Dalla Torre, 1892, Cat. Hymen., Vol. XI; Wheeler, 1922, Distribution of Ants of the Ethiopean and Malagasy Regions, Bull. Amer. Mus. Nat. Hist., 45: 13–37; Mann, 1916, The Ants of Brazil, Bull. M. C. Z., 60: 399–491; Forel, 1900, Biol. Cent. Amer., Hymenoptera 3: 1–169, and Smith, 1931, Revision of the Genus Strumigenys, Ann. Ent. Soc. Amer., 24: 686–710.

continuously moist and which have rotted down to a soft, red punk. When such a log or stump has been located, usually in a woods undisturbed by stock, the collector divests himself of his collecting outfit, seats himself comfortably and prepares to cut up the punky parts of the log with a pocket knife. Otherwise the minute nest may be missed. Usually a half-hour's work will indicate the possibilities. If the ant Proceratium, or some other species of ponerine ant occurs and certain minute beetles are found, the chances are that a nest of Strumigenys occurs in the log. It is then a matter of careful and close work to locate it, as the nests of this ant are thin pockets the width of one's finger and seldom over an inch or two long. The punky material has to be split down to chips one-fourth to one-half inch in thickness. Usually about one nest out of three has been found by discovering only a stray Strumigenys or two and after working through the moist portion of the log and not finding the nest, then reworking the bushel or two of chips. Locating a nest of this ant is seldom a matter of hasty inspection. Usually the careful examination of a log that "looks good" takes the better part of a half day's work and more often than not yields no nest at all. About once a season the collector finds a nest on the first inspection.

In 1931, Kennedy, with a single stroke of the ax, on chopping one more stump before quitting, uncovered a nest of *pergandei* near London, Ohio, at the end of a long day's collecting. This yielded over one hundred workers, the largest nest taken in the state to date. In September, 1932, at Montvale Springs, Blount County, Tennessee, while watching his four-year old son in the hotel swimming pool he pulled a chunk out of a log near by and uncovered the nest of *dietrichi* noted below. The son was rushed into the hotel, the collecting kit procured and after four hours' work seventy-nine workers had been collected. This log had been "passed up" repeatedly on three previous ant collecting trips to Tennessee. The same log yielded a nest of *Ponera trigona opacior* Forel and another oak log near by gave over a hundred males and numerous workers of *Euponera gilva* Roger.

The species of Strumigenys are part of the fauna of the great mass of rotting logs that covered Ohio before the original forest was cleared away. Now these ants are extremely rare, as but a few fragments of these forests remain and such as do usually have had the logs and undergrowth cleared to make

room for stock. The few that are found usually occur in moist ravines or on the edges of swamps. However, none have been found in the very moist hemlock ravines of southern Ohio. They are evidently associated rather with white oak woods, the white oak-chestnut association of ecologists.

Nothing appears to be known of the food habits of the Ohio species. The slender sharply-toothed jaws and the highly developed glossa and maxillary combs suggest that they may be eaters of fungus mycelium. On boiling in KOH they do not show fragments of chitin such as are found in insect-eating ants.

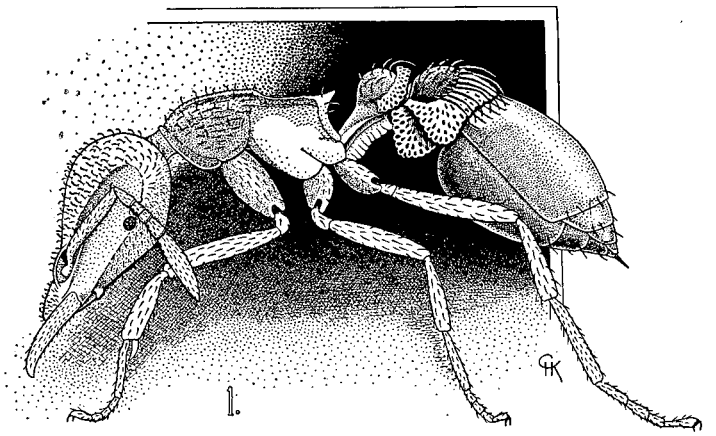


FIG. 1. *Strumigenys ohioensis*, sp. nov., showing the soft, white, fungus-like growths which occur on the petiole in many species of this genus. When boiled in KOH these show a delicate basal structure resembling the pitted surfaces of the other parts of the ant.

The ants of this genus are peculiar in the curious petticoat of soft white tissue which is attached to the petiole and the first segment of the gaster. In our local species these growths are white and look like a spongy fungus. They break down very quickly in KOH. These are shown in Fig. 1. A narrow drape of this hangs down from the underside of the first petiolar segment. A second which is lacy in appearance with its pitted surface is draped about the distal end of this segment, while the largest flounce is from the second segment of the petiole. Usually a narrow band of the same tissue crosses the dorsal side of the anterior end of the gaster. Nothing appears to be known of the structure or function of these parts.

The following is the description of a new species found by Miss Schramm at Tuppers Plains, Meigs County, southeastern Ohio.

Strumigenys ohioensis sp. nov.
(Figs. 1 and 2.)

Worker.—Length, 2 mm.

Head strongly converging anteriorly up to the clypeus. Eyes not visible from the anterior view. Apical border of clypeus rather broadly rounded. In middle of anterior portion of clypeus small smooth prominence. Mandibles dorsoventrally compressed; length about one-fifth of head without clypeus. Prominent acute basal tooth concealed by clypeus; the masticatory border with very little toothless space. The first tooth is rather prominent, the second somewhat smaller followed by a more elongated tooth following which there are four or five gradually diminishing toward apex of mandible. Antennal scapes moderately curved, but not angulate basically.

Thorax with a distinct longitudinal median carina which becomes two carinae at the mesoepinotal constriction diverging to epinotal spines; prothorax slightly flattened dorsally. Epinotal spines short, divergent, directed backward and slightly upward; infraspinal lamellae small and thin. Spongiform processes on posterior and ventral surfaces of petiole and on all of postpetiole except dorsal surface, being most abundant on ventral surface.

Head, thorax, and petiole reticulate-punctate, subopaque. Legs finely punctate. Frontal area of head, plurae of meso- and metathorax and dorsal surface of post-petiole smooth and shining.

Head covered with short curved hairs very slightly enlarged apically. Hairs bordering clypeus short and straight, projecting forward. Hairs on gaster very sparse except on posterior tip, where they are more abundant.

Color ferruginous brown with appendages lighter; gaster approaching black with the exception of the apical tip.

This species is probably closely related to *Strumigenys clypeata* Rogers, but it presents the following differences:

(1) The hairs on the clypeus are short and not spatulate. In *clypeata* they are spatulate and in the varieties, *laevinasis* Smith and *pilinasis* Forel, the clypeal hairs are as long as ⅓–½ the width of the clypeus. In *ohioensis* they are not over ⅛ as long as the width of the clypeus.

(2) The four long teeth on the mandible are more distinct (in greater length) from the apical series of smaller teeth than is shown in Smith's[3] figures of *clypeata*, *laevinasis* and *pilinasis*.

[3]See figs. 9, 11 and 12 in Smith, M. R., 1931, A revision of the genus strumigenys of America, north of Mexico, Ann. Ent. Soc. Amer., 24: 686–710.

In the three species figured in Smith's paper the large basal tooth is probably present but concealed under the clypeus.

(3) The eyes are not visible from the anterior view of the head. But as shown below for *dietrichi*, this may not be a reliable character.

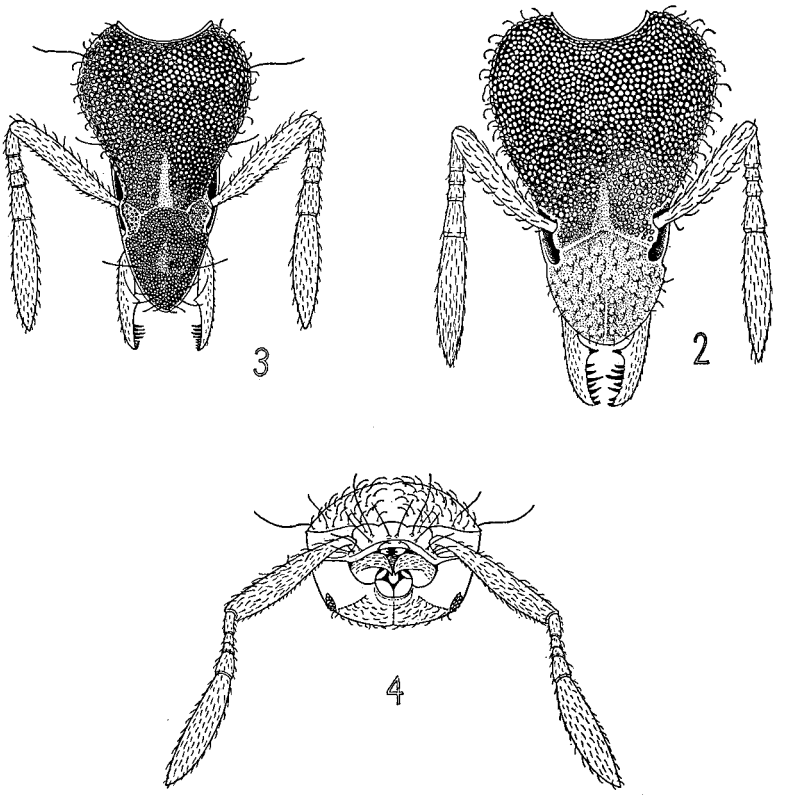


FIG. 2. *Strumigenys ohioensis*, sp. nov., frontal view of head showing the short hairs of uniform length on the clypeus which distinguish this species from *Str. clypeata* Rogers and its varieties which have either spatulate hairs or much longer hairs.

FIGS. 3 and 4. *Strumigenys dietrichi* Smith. 3, Frontal view of head. 4, Face, showing the vibrissae-like clypeal hairs.

Locality: Tuppers Plains, Meigs County, Ohio, M. M. Schramm, collector.

Described from two workers found in partially decayed oak rail embedded in the ground of a dense wooded area bordering a ravine.

Type and cotype to be deposited in the collection of the Museum of Comparative Zoology, Cambridge, Mass.

Notes on Other Species Regional for Ohio.

Strumigenys pergandei Emery.

The literature records this species for Massachusetts, New York, Pennsylvania, Maryland, Virginia, Pelee Island (Lake Erie), Ontario and Illinois. The authors have found this species common on Pelee Island (just north of the Ohio line in Lake Erie) where it occurs in white oak logs in the dense woods on the long sand spit at the south end of the island. This spit is subirrigated by the lake waters and has a high humidity and a mild climate. The mixed hardwood forest, which because of the subirrigation never experiences a dry season, is almost tropical in the luxuriance of its growth. Nests have been taken by Miss Mary Talbot, and the authors. A student, J. R. Gross, collected a few individuals in the Chagrin River gorge southeast of Cleveland. Kennedy collected a large nest (100 workers) in an oak stump at the Shriner's woods south of London, Ohio, in October, 1931, (see above). Miss Schramm records this species from the region around Marietta, Ohio. It is our commonest species and apparently is found over the whole state except in prairie areas and in the wet hemlock gorges.

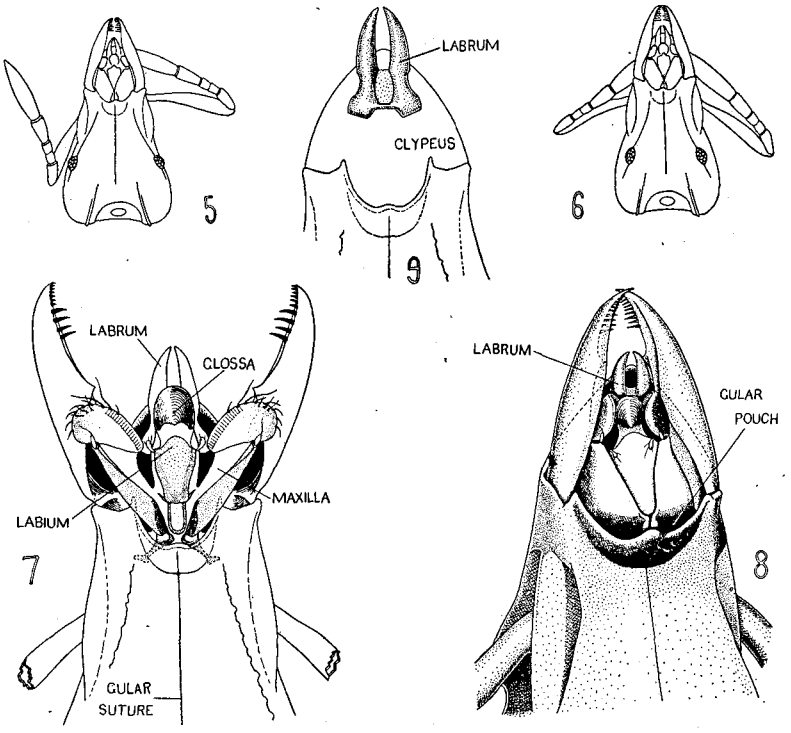
Strumigenys pulchella Emery.

This is another northern species, having been recorded for the District of Columbia, New York, Pennsylvania, Alabama, Mississippi, Illinois and Ohio. The authors collected three workers from a soft wood log in the Huron Bog at Willard, north central Ohio, August 15, 1931. Miss Schramm collected it at Lowell, southeastern Ohio, September 8, 1931, and a student, J. R. Gross, took one specimen in the Chagrin River gorge, southeast of Cleveland, October, 1932. This species is probably distributed over the whole forested area of Ohio, but is so minute that it is difficult to see unless a group of active individuals is uncovered. It appears to be much rarer than *pergandei*.

√**Strumigenys dietrichi** Smith.

This species was described by Doctor M. R. Smith from the region of Lucedale, Mississippi, where it was collected by the coleopterist, Henry Dietrich, who obtained seven specimens

from logs. It has recently been collected by Thomas Park from logs in a woods at Urbana, Illinois. On September 18, 1932, Kennedy found the nest, mentioned previously, in a white oak log on the grounds of the Montvale Springs Hotel, east of Maryville, Tennessee. This hotel is in the western foothills of the Chilhowee Mountains, which is the range just west of the Great Smoky Mountains. It was a large nest 1½ x 1 x ½ inches in size and contained over 80 workers.



FIGS. 5–9. *Strumigenys dietrichi* Smith. 5, Cotype, ventral surface of head, showing the eyes protruding beyond the lateral contour. 6, Tennessee specimen, a minor worker, narrow between the eyes. 7, Ventral view of mouth-parts expanded by KOH. 8, Ventral view of mouth-parts closed. 9, Ventral view of forked labrum attached to underside of clypeus.

The queen was not found and there was little brood. The nest was an ovoid chamber and appeared to connect by minute galleries through the red punky wood to two or three very much smaller chambers four to six inches distant where a few of the total number of workers were taken.

The ants (workers) from this nest checked with Smith's description and with Miss Hoke's figure[4] except for the position of the eyes, which in the type material are visible from the dorsal side of the head as is shown in our Fig. 5. In the first study of the Tennessee material all the specimens examined had the eyes under the head as is shown in our Fig. 6. Doctor Smith examined the Tennessee material and decided it was *dietrichi* and sent the authors a cotype for comparison. Mr. Thomas Park sent a worker of the Urbana, Illinois, material. On comparing these it was noticed that the cotype had the eyes visible from above, the Urbana specimen had the eyes only slightly more underneath the head and that both specimens were darker and slightly larger than the majority of the workers in the Tennessee nest. It was found that the few larger and darker (more robust) individuals of the Tennessee nest had the eyes at the edge of the head or actually protruding beyond the lateral contour. Thus the position of the eyes appears to be a matter of the size and vigor of the worker, the more robust having the eyes farther out from the gular suture.

The Mouth-parts of *Strumigenys dietrichi.*

While making this study the following notes on the structure of the mouthparts of *Strumigenys dietrichi* were made. The parts were boiled in KOH, dissected in glycerine under a binocular at a magnification of 87.8 times. They were then studied under a compound microscope. The figures shown are composites of seventy-six camera lucida sketches. Owing to the minute size few views were obtained *in toto*. The entire insect is only 2 mm. long, the mentum and submentum one two-hundredths of an inch and the labial palp one-thousandth of an inch in length.

The clypeus is the large triangular area in front of the antennal fossae. It has on its apex a group of long hairs that project like vibrissae. See Figs 3 and 4.

The labrum, Fig. 9, is cleft almost to its base, its two prongs usually projecting beyond the apex of the clypeus. The amount of protrusion varies from individual to individual and it was not determined whether the labrum could be thrust forward. In some dissections it appeared to be rigidly attached to the clypeus.

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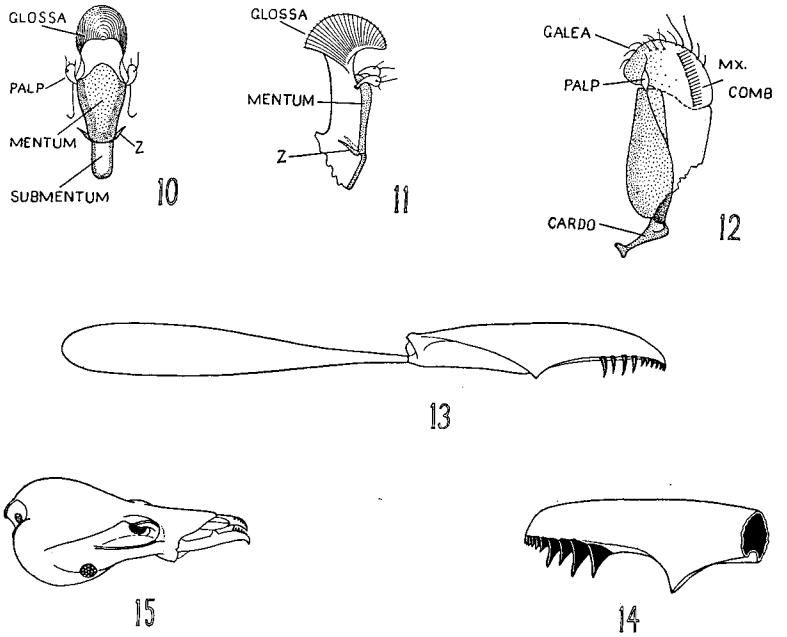
[4]Smith, 1931. Ann. Ent. Soc. Amer., 24, Pl. II, Fig. 6, p. 708.

The mandibles, Figs. 7, 8, and 13, 14, have three types of teeth, a large tooth at mid-length, a group of four long teeth towards the apex and between these and the apex a row of smaller teeth of very uniform length. See Figs. 13 and 14. From above both types of apical teeth appear like slender conical fangs, but a view from the base of the mandible towards the apex shows these to be triangular with their edges up. See Fig. 14. The inner face of the mandible is concave. The mandibular condyles are shown in Fig. 13. The smaller of the two tendons was not found.



FIGS. 10–15. *Strumigenys dietrichi* Smith. 10, Labium, ventral view. 11, Labium, lateral view, showing the one-segmented palp and the chitinous ridges on the glossa or tongue. 12, Right maxilla, flattened out, inner ventral view, showing the one-segmented palp and the maxillary comb of rigid hairs on the galea. 13, Left mandible, dorsal view, showing retractor tendon. 14, Outer half of right mandible, viewed from base, showing the three types of teeth and that the outer teeth are flat and not slender fangs as they appear in Figs. 3 and 13. 15, Craneum, latero-dorsal view, showing antennal fossa.

The maxillae, Figs. 7, 8, and 12, were difficult to figure because they lie in three planes. Fig. 8 shows them closed and in place. Fig. 7 shows them expanded by boiling in KOH. Fig. 12 shows the inside of the right maxilla flattened out. No trace of a lacinia was found. In each dissection were found a pair of maxillary tendons, but always detached from the maxillae, so they were not figured. These were very slender and their bases were joined by a slender bar of about one-third the length of either tendon. This bar may be homologous to

the lorum of the bee mouth parts. See Imms, 1929, General Textbook of Entomology, p. 257, Fig. 510.

The galea has two long hairs on its distal edge, preceded by one to three short hairs and followed by four to six short hairs. On its inner face is a row of very fine hairs which in some dissections appeared as a continuation of the maxillary comb. These varied from two to four in number.

The maxillary comb consists of about 16 rigid hairs lying tight against the inner surface of the galea. In some dissections the comb appeared to be much closer to the inner edge of the galea than as shown in Fig. 12, which is a camera lucida sketch of one dissection.[5]

The maxillary palp is one-segmented with a terminal bristle.

The labium is shown in Figs. 7, 8 and 10, 11. The submentum is a U-shaped bar. The mentum is heavily chitinized. The palps are one-segmented. The glossa is well developed with about 25 fine, sharp ridges running over its surface from side to side. On each lower angle of the mentum is a chitinized prong imbedded in the labial membrane which the author cannot homologize with parts in the mouth-parts of other insects. (Z in Fig. 11.) The lorum of the apidae is a similar prong but is attached at the lower angle of the submentum. It is possible that the parts, Z, are supports of a hypopharynx which was torn away in the dissections. See Donisthorpe, fig. 5, p. 6. Our footnote No. 5. No paraglossae were found.

The gular pouch, Figs. 7 and 8, is a prominent feature of the underside of the head. The bases of the labium and the maxillae can be withdrawn into this to some extent.

The gular suture is a prominent line down the mid-line of the ventral surface of the craneum. See Figs. 4, 5, and 7, 8.

These mouthparts are extraordinarily delicate and yet are used in digging the flat ovoid nest chambers. This is perhaps why these ants are found only in moist and very punky wood. The writer can conceive of no food other than the mycelium of wood infesting fungi which could be used by such delicate organs. No chitinous fragments were found in the bodies of these ants, as appear in the bodies of the ants which feed on other insects, when these are boiled in KOH. No aphids have been found in their galleries. They are an interesting and curious form of ant.

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[5]The best figures of ant mouth parts are those of Janet, 1904, Observations sur les Fourmis, No. 24, figs. 1–7. See also Donisthorpe, 1915, British Ants, pp. 2–16 for terms used.