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NOTES ON THE ANT GENUS *HOLCOPONERA* MAYR,
WITH DESCRIPTIONS OF TWO NEW SPECIES

by

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In another place, I am offering as soon as possible a generic revision of tribe Ectatommini (subfamily Ponerinae). In the manuscript of this revision, I have been able to revise to species level, or at least give keys to the valid species of, several of the genera treated. Certain of the genera, however, proved too large and presented too many difficulties in the way of type procurement to be handled in this way. The revisionary notes that were gathered on at least a few of the species in such genera are scarcely more than by-products of the larger work, and it is felt that they are better published separately so as to cut down the bulk of the generic revision to a more useful size.

One of the genera that proved most difficult at species level was *Holcoponera* Mayr. This genus has already undergone one revision by Santschi (1929, *Zool. Anz.*, 82: 437-477, 47 figs.), who described a great many species and infraspecific variants in the pentanomial system of nomenclature. Santschi's paper at least has the virtue of having brought together scattered types and descriptive material, and the drawings are useful. It is unfortunately true, however, that his treatment lacks the consistency necessary for interpretation of his taxonomic actions in the light of modern population systematics. In *Holcoponera*, Santschi seized upon almost any difference, however minor, to serve as the basis for a new name. Especially singled out were such "diagnostic" characters as the mesepisternal lobe or flange, density of the costulate sculpture, form of the petiole and subpetiolar process, overall body size and proportions of the antennal segments—all characters showing a wide range of variation in *Holcoponera*. Apparently little effort was made to determine how this variation was limited, if at all, in single populations or even in single nest series, so that Santschi saw no inconsistency in describing from La Palma, 1600 M., Costa Rica, the form *H. simplex foreli* in mixture with other workers that he himself determined as *H. simplex simplex*, despite that fact that Forel had described the exceedingly similar *H. satzgeri* earlier from precisely the same locality!

Santschi had two methods of dealing with intergrades between the forms he recognized as name-worthy: he either ignored these intermediates, or he named them as subspecies or varieties. The most unfortunate result of such a practice is that the true species limits are obscured by a maze of poorly-characterized forms that cannot be traced to their correct species without a review of type material—a review taking more time and trouble than I care to spend at present. I shall therefore satisfy myself for now by dealing only with a few obvious and uncomplicated synonymies, which at least will balance for the future reviser the additions I am making here to the genus of two new species and one new combination. These additions are made because they are of more than routine interest in extending our conception of the amount of radiation that has occurred within *Holcoponera*.

Holcoponera striatula Mayr.

Gnamptogenys striatula Mayr, 1883, *Hor. Soc. Ent. Ross.*, 18 : 32, worker.

Type locality : French Guiana.

Holcoponera striatula var. *antillana* Santschi, 1929, *op. cit.*, p. 444, figs. 16, 21, worker, male. Type locality : Martinique. New Synonymy.

The characters cited by SANTSCHI are insignificant and show all degrees of intergradation in several series I have seen from Jamaica and elsewhere in tropical America. The Jamaican series alone will serve to illustrate this variation perfectly. Undoubtedly several other forms in the *striatula-brasiliensis* complex will fall as synonyms of *striatula* when the types and additional material can be studied. A large and varied lot of specimens belonging to this complex is in the collections of the U. S. National Museum and the Museum of Comparative Zoology, and I mention this here because these series will be invaluable to the eventual reviser of the group.

Holcoponera simplex Emery.

Ectatomma (Holcoponera) simplex Emery, 1896, *Bull. Soc. Ent. Ital.*, 28 : 46, fig. 7, worker, female. Type locality : Alajuela, Costa Rica.

Ectatomma (Holcoponera) Satzgeri Forel, 1908, *Bull. Soc. Vaud. Sci. Nat.* 44: 39, worker. Type locality: La Palma, 1600 M., Costa Rica. New Synonymy.

Ectatomma (Holcoponera) simplex subsp. *spurium* Forel, 1908, *ibid.*, p. 39, worker. Type locality: 'Guatemala (received from M. PERGANDE).' New Synonymy.

Holcoponera simplex st. *foreli* Santschi, 1929, *op. cit.*, p. 460, fig. 34, worker.

Type locality: La Palma, 1600 M., Costa Rica. New Synonymy.

In his 1929 work (pp. 459-462, fig. 33-37), SANTSCHI discusses all of these synonyms with illustrations, and cites further references (among which there are several errors in transcription of names, dates, etc.). In my introductory remarks, above, I have already referred to Santschi's recognition of the three conspecific variants at one locality and possibly, at least in part, from the same nest series. The differences supposed to separate these forms appear from Santschi's own paper to be trivial individual variations, paralleled in single series available to me from La Carpentera, Costa Rica (W. M. MANN) and from Hamburg Farm, Santa Clara Prov., Costa Rica (F. NEVERMANN). The name *spurium* applies to a single worker distinguished by similarly unreliable features, and supposedly from Guatemala. However, some or all of Pergande's material labelled as "Guatemala" may actually have come from Costa Rica, judging from the list of other ant species mentioned by Forel in various papers in which he dealt with this particular batch. Whether or not the locality cited is the correct one, however, the grounds for its distinction

by name from *H. simplex* are unconvincing, and it seems better for the present to consider *simplex* as a single distinct and rather localized species, easily recognized by the predominantly transverse costation of its post-petiolear sternum.

Holcoponera relictata (MANN) new combination.

Rhopalopone relictata Mann, 1916, *Bull. Mus. Comp. Zool.*, 60: 403, pl. 1, fig. 4, 5, worker.

The species *relictata* is referred to *Holcoponera* only after the discovery of the closely related *Holcoponera mina*, described below. *H. mina*, as will be seen from the description and then the discussion, is exactly intermediate between *relictata* and the remainder of the *Holcoponera* species, as represented by *H. strigata* (NORTON).

DESCRIPTIONS OF NEW SPECIES

The measurements and proportions are cited with abbreviations, the key to which is as follows: TL, total outstretched length, including mandibles; HL, full length of head with clypeus, excluding mandibles; HW, width of head across eyes; WL, diagonal length of alitrunk as measured from side view; CI, cephalic index, or width of head expressed as a percentage of HL ($HW/HL \times 100$).

Types are deposited in the United States National Museum, which owns the holotypes and a first set of paratypes; paratypes of each species are in the Museum of Comparative Zoology at Harvard University. I wish to thank Dr. M. R. SMITH, of the National Museum, and Dr. F. BRYK, of the Naturhistoriska Riksmuseet, Stockholm, for their aid in loaning specimens.

Holcoponera acuta new species (fig. 1).

Holotype worker: TL 4.7, HL 1.04, HW 0.90, WL 1.45 mm.; CI 87. Greatest diameter of compound eye about 0.20 mm. Exposed scape L 1.00 mm. (TL does not include the downcurved apical segments of the gaster.)

Color deep reddish brown, appendages and mandibles yellowish ferruginous. Costulation of medium density and coarseness, shining and with shining interspaces, approximately 30 (28-31) costulae between the compound eyes, 9 between the posterior extremities of the frontal carinae, 10 or 11 on the mesepisternum. Costulation transverse on the extreme anterior pronotum, the alitrunk otherwise longitudinally costulate. Petiolear node seen from above with concentric costulation around a few median

longitudinal elements (more regularly circular-concentric in some paratypes). Postpetiole and succeeding segment longitudinally costulate, the latter a bit more finely so; exposed tergital strip of second postpetiolar segment transversely striate in the middle, the striation becoming oblique laterad.

Head of the usual *Holcoponera* form; occipital border seen in perfect full-face view approximately straight, with a slight tendency toward concavity in the middle; posterolateral lobes moderately developed, slightly protruding beyond occipital border in full-face view and rather narrowly rounded as seen from the side (better developed than in *H. striatula* Mayr, but not so strongly as in *H. curtula* Forel, and not subtruncate). Eyes large, convex, their centers situated precisely at the posterior third of the head length (HL). Antennal scapes extending beyond occipital border by about 28% of their total exposed lengths. All segments of funiculus longer than broad, but segments 3-10 only slightly so.

Alitrunk of the form usual in the more slender *Holcoponera* species; propodeum with a definite, but obtuse and somewhat rounded margin setting off the declivity on the sides and above; dorsum of propodeum above with a very shallow transverse impression. Mesepisternal lobe (the mesosternal lobe of Santschi) reduced to a low anterior remnant with rounded border lying over the anterior coxa, and, after a brief gap, a low median tooth or tubercle.

Petiole (fig. 1) highly distinctive, its node inclined posteriad and its

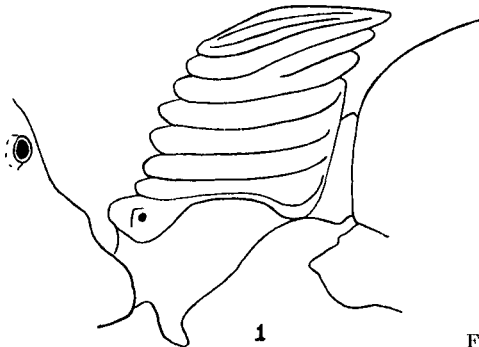


Fig. 1. — *Holcoponera acuta* Brown, paratype worker.

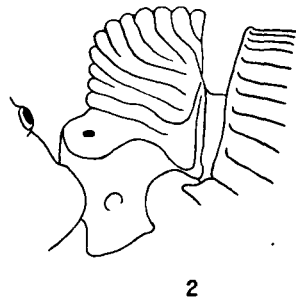


Fig. 2. — *Holcoponera mina* Brown, paratype worker. Left side views of petiole and neighboring structures.

upper portion produced posteriad as a distinct, subconical, dorsoventrally flattened tooth, resembling the condition seen in *Heteroponera dolo* (ROGER), *Rhytidoponera reticulata* Forel and *R. acanthoponeroides* Vieh-meyer to varying degrees. From dorsal view, the posterapical process is less acute, but still quite distinct and normally overhanging the surface of the postpetiolar segment. Subpetiolar process as shown in the figure; triangular, terminating in a rounded tooth curved posteriad. Postpetiole

without a well-defined anterior face, the striation continuing around the convex anterior portion without interruption almost to the anterior articular ring. Tooth on hind coxa small but acute.

Pilosity fine, tapered, sparse over dorsal surfaces of body, where the few longer hairs (average L ca. 0.28 mm.) appear to be arranged in bilateral symmetry. Shorter inclined and reclinate hairs sparse over appendages and arranged in sparse tufts along the posterior borders of the gastric segments on each side of the midline; exposed surfaces of ventral and dorsal segments at gastric apex each with a dense tuft or brush. Pubescence moderately abundant on appendages, mostly more or less reclinate.

Paratype workers (12 specimens from same nest as holotype), vary from about the size of the holotype up to specimens with a TL of 5.0 mm. and HL 1.14 mm. The head width varies slightly (CI 86-90), and the number of costulae between the compound eyes varies from about 26 to 31. The shape of the mesepisternal lobe is extremely variable; in a majority of specimens, the lobe forms a single convex flange extending nearly the entire length of the ventral border of the mesepisternum; in others, the lobe is reduced to a small irregular triangular flap overlapping the posterior part of the fore coxa. The lobes on opposite sides of the same specimen may differ considerably. There is some slight variation in the scape length, strength of the dorsal transverse impression of the propodeum, and in the form of the subpetiolar process.

Female (dealate). — TL 5.6, HL 1.18, HW 1.06, WL 1.82 mm., CI 90; greatest diameter of eye about 0.26 mm., exposed scape L 1.06 mm. Petiolar node slightly higher and slightly more compressed in an anterior-posterior direction relative to the situation in the worker, tooth at apex of node slightly inclined dorsad from the horizontal. Subpetiolar process with the sloping posterior border at midlength furnished with a low, obtusely rounded suggestion of a posteroventral lobe. Three ocelli present, moderate in size; 31 costulae between compound eyes. Median segments of funiculi almost or quite as broad as long, depending on angle of view. Otherwise differing from the worker by the characters usual for the genus.

Male. — Similar to the males of *H. striatula* Mayr, *H. curtula* Forel and *H. Wheeleri* Santschi in size, form and venation of forewing, but differing markedly in sculpture. Dorsum of head, including, clypeus, striate, weakly shining; posterior alitrunk with indistinct traces of striation, otherwise smooth and shining; mandibles with coarse longitudinal punctures; petiole and succeeding tergite shining, almost smooth, with feeble and loosely coriaceous surface. Body otherwise smooth, shining, with scattered punctures, becoming dense on appendages. Pilosity much as described for worker, the longer hairs not as long as in worker. Color piceous; appendages ferruginous; wings clearer than in *H. striatula*. The subpetiolar appendage terminates in a slender tooth, directed antero-

ventrad, instead of the bulky lobe of *striatula*. Compound eyes elongate-subreniform, convex, greatest diameter 0.38 mm., or slightly greater than the exposed length of a mandible measured from base to apex (slightly larger than in *striatula*). Gastric apex with genitalia missing.

The type series consists of the holotype worker, 12 paratype workers, one male and one female paratypes, collected by Dr. W. M. MANN at Huachi, Beni, Bolivia, during September, 1922. Though two kinds of labels are found on the various pins, all appear to represent the same nest series. This highly aberrant species is related to the group about *H. porcata* Emery. It can easily be recognized in the worker-female castes by means of the dentiform petiolar apex.

Holcaponera mina new species (fig. 2).

Holotype worker: TL 3.2, HL 0.73, HW 0.64, WL 1.00 mm.; CI 88. Greatest diameter of compound eye slightly less than 0.09 mm. Exposed L scape 0.54 mm. 22 distinct costulae between compound eyes; mesanepisternum with one oblique costa between the upper and lower costiform borders of the sclerite; mesokatepisternum with 5 short longitudinal costae between upper and lower costiform borders, making 10 costae total for each mesepisternum. Costation otherwise also rather coarse (relative to body size); 5-6 transverse costae on anterior pronotum; alitrunk otherwise, including propodeal declivity, predominantly longitudinally costate. Gaster longitudinally costate, sternum of post-petiole prevailingly so; sternum of succeeding segment transversely striate; exposed surfaces of apical gastric segments largely smooth, shining. Petiolar node transversely costate in front and above, the costae continuing obliquely posteroventrad on the sides (fig. 2). Mandibles and appendages with fine punctulation, largely more or less shining.

Pilosity moderate in length, fine, mostly inclined, fairly abundant and generally distributed except on appendages, forming sparse tufts or brushes on apical gastric segments. Pubescence fine, short, dense, reclinate, largely confined to appendages and mandibles. Clypeus with 4 long, fine hairs. Color (holotype is probably not at absolutely full adult coloration) medium-light reddish brown, mandibles, legs and antennae yellowish.

Head with parallel, feebly convex sides, occipital border virtually straight, with the merest hint of concavity as seen in perfect full-face view. No occipital lobes developed. Eyes small, with 7-8 facets in greatest diameter, their anterior margins precisely at the midlength of the head (mid-HL). Scapes short, gently curved at base and incrassate apicad, just barely overreaching occipital border as seen in perfect full-face view. Funiculus incrassate apicad, the last three segments forming a fairly distinct clava, although the two segments preceding the last three might also be included, to make a 5-segmented clava.

Alitrunk compact, evenly and gently convex, with only a trace of an impression on the posterior propodeal dorsum. Propodeal declivity plane, steep, set off from sides and dorsum by a distinct but obtuse angle or margin. Propodeal spiracles prominent, projecting posteriad from the lateral margins of the declivity. Mesepisternum divided by a distinct suture into upper and lower pieces; katapisternal lobe moderate in width, tapering gradually posteriad, with a gently convex free margin. Form of the petiole seen from the side as in fig. 2, as seen from above, the node is thick subdisciform, with upper surface transverse; node about $1\frac{1}{3}$ times as broad as long, with convex anterior and truncate posterior outline; costation of apex gently arched-transverse; posterior face broad, semi-circular, vertical, with loose transverse costation. Anterior face of postpetiole vertical, nearly smooth, set off sharply from the costate dorsum and sides by an irregular but continuous transverse rim or carina. Hind coxae each with a distinct but short tooth above; middle and posterior tibiae each with a single small, pectinate spur, the lateral spur, if present at all, reduced to similarity with adjacent setae, and therefore not readily identifiable; extra ("median") tooth of tarsal claw distinct, near base on all claws.

The holotype, together with 3 paratype workers (one headless) and a dealate, headless type female, were taken at Tumupasa, Bolivia (W. M. Mann *leg.*). The type nest series shows only slight variation among the workers; the color varies from light-medium to deep reddish brown, with mandibles and appendages ferruginous yellow; two specimens have slightly longer heads relatively than in the holotype, and there exist minor differences in sculpture.

Three additional workers from Llinguipata, Peru (N. HOLMGREN, Naturh. Riksmus., Stockholm) are larger (average HL 0.84 mm.), dark reddish brown in color, and tend to have the occipital outline a bit more distinctly concave. The largest of these has an extremely feeble sulciform line, traceable as a series of dents in the costae, running transversely across the posterior propodeum to mark the site of the obsolete metanotal groove; the specimen may be a worker-female intergrade.

Female. — The headless dealate from the type nest series is larger and more robust than the corresponding workers (WL 1.30 mm.). Petiolar node higher and more compressed anteroventrally than in workers, as is usual among ponerines; seen from above, the node is about twice as broad as long. Color and pilosity as in darker workers.

H. mina is the smallest *Holcoponera* so far reported as a member of the genus, and it seems to be most closely related to the two other small species: *H. strigata* Norton, found in southern Mexico southward to Honduras, and *H. relicta* Mann, from the Amazon Basin; measurements of *Holcoponera* species in the literature are usually too low. The closest relationship is with *H. relicta* (size, eye size, short scapes, tendency in some specimens to appearance of metanotal "suture," prominence of

propodeal spiracles, structure of petiole and especially of postpetiole), and *H. mina* is the intermediate form that decided for me the removal of *relicta* from *Rhopalopone* to *Holcoponera*. *H. mina* is distinguishable from *H. relicta* by a number of details, chief among which are the much thicker, less disciform petiolar node and the absence in *mina* of a distinct metanotal groove in normal workers. *H. strigata* and the other *Holcoponera* species differ in the structure of the postpetiole, which in all these species forms one continuously curved and uniformly costate convexity over the major anterodorsal surfaces.

Summary.

In *Holcoponera*, thorough revisionary work is rendered difficult by the poor quality of previous descriptions, by the excessive splitting of SANTSCHI in his revision of 1929, and by the difficulty of seeing all of the types involved. New synonymy is offered where the need is obvious in a few cases. *H. striatula* var. *antillana* Santschi proves to be an individual variant of *striatula* and is unworthy of nomenclatorial distinction. *H. simplex* Emery includes, as individual variants without claim to formal names, the three nominal species or subspecies from Costa Rica (*simplex s. str.*, *satzgeri* Forel and *foreli* Santschi). Another synonym, *H. spurium* Forel, occurs doubtfully in Guatemala. The species *relicta* Mann is transferred from *Rhopalopone* to the genus *Holcoponera* because the new species *H. mina* is intergradient between it and the other *Holcoponera* species. Two new species are described: *H. mina*, from Bolivia and Peru, and *H. acuta*, from Bolivia.

Zusammenfassung.

Eine gründliche Revision von *Holcoponera* ist sehr erschwert, einmal durch frühere mangelhafte Beschreibungen, dann durch Santschis übermässige Aufgliederung in seiner Revision von 1929, und durch die Schwierigkeit alle betreffenden Typen sehen zu können. Einige neuen Synonymen wurden festgestellt; *H. striatula* var. *antillana* Santschi ist nur eine individuelle Variante von *striatula*, und kann daher nomenclatorisch unbeachtet bleiben. *H. simplex* Emery schliesst als individuelle Varianten, ohne Anspruch auf formelle Namen, die drei sogenannten Arten oder Unterarten aus Costa Rica ein (*simplex s. str.*, *satzgeri* Forel and *foreli* Santschi). Das Auftreten von die synonymische *H. spurium* Forel in Guatemala ist zweifelhaft. Die Art *relicta* Mann wurde von der Gattung *Rhopalopone* zu der Gattung *Holcoponera* überführt. Die neue Art *H. mina* verknüpft *H. relicta* mit den andern Arten dieser Gattung. Zwei Arten sind neu beschreiben: *H. mina* (Bolivien und Peru) und *H. acuta* (Bolivien).

Résumé.

Il est difficile de faire une revision complète des *Holcopenera*, à cause des mauvaises descriptions publiées jusqu'ici, du morcellement excessif introduit par SANTSCHI dans son travail de 1929 et de l'impossibilité d'examiner tous les types se rapportant au genre. Des synonymies nouvelles sont proposées pour quelques cas particulièrement litigieux. *H. striatula* var. *antillana* Santschi est traité comme une variation individuelle de *striatula* et le nom *antillana* devra donc disparaître de la nomenclature. *H. simplex* Emery comprendra comme variations individuelles, sans nom particulier, les trois espèces ou sous-espèces *satzgeri* Forel, *spurium* Forel et *foreli* Santschi, du Costa Rica, avec une seule localité douteuse du Guatémala. L'espèce décrite comme *Rhopalopone relictæ* Mann est transférée au genre *Holcopenera*, par suite des caractères de transition de *H. mina* sp. nov. - *H. mina*, de la Bolivie et du Pérou, et *H. acuta*, de la Bolivie, sont décrits comme espèces nouvelles.

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