Dtsch. ent. Z., N. F. 39 (1992) 1–3, 123–129

Revision of the *minuta*-group of the genus *Gnamptogenys*

(Hymenoptera, Formicidae)

By

JOHN E. LATTKE

Abstract

The Neotropical *minuta* group of *Gnamptogenys* ROGER is revised. A group synopsis for the workers is given, as well as a comparative table of characters that separate the group from the rest of *Gnamptogenys*. The possible evolutionary history of the nine species of the group is discussed. An identification key is included, and information for each species is reviewed.

Introduction

The ant genus *Alfaria* was described by EMERY in 1896 and later sunk as a junior synonym of *Gnamptogenys* ROGER in BROWN's (1958) revision of the ponerine ant tribe Ectatommini. BRANDÃO & LATTKE (1990) reviewed the history of *Alfaria* (from now on renamed *minuta* group) and discussed its generic status, agreeing with BROWN's judgement. During later studies of the ectatommine genera (LATTKE, unpub. ms.) the specimens were examined more intensively and with a broader comparative base. New characters that permitted a more precise definition of the group, as well as indications of its evolution, were found. The group as defined here is strictly neotropical, ranging from Mexico to Argentina, with nine species.

Material and Methods

Specimens from the following collections were examined with a Wild stereoscopic microscope equiped with an ocular micrometer:

JTLC – JOHN T. LONGINO Collection, Sarasota, Florida, U.S.A.
LACM – Los Angeles County Museum of Natural History, Los Angeles, California, U.S.A.
LNKD – Landessammlungen für Naturkunde, Karlsruhe, Germany
MCZC – Museum of Comparative Zoology Collection, Harvard University, Cambridge, Massachusetts, U.S.A.
MIZA – Museo del Instituto de Zoología Agrícola, Universidad Central de Venezuela, Maracay, Venezuela
MUSB – Museo de Ciencias Naturales, Universidad Simón Bolívar, Caracas, Venezuela
MUSP – Museo Universidade de São Paulo, São Paulo, Brasil
PSWC – PHILIP S. WARD Collection, Davis, California
USNM – United States National Museum, Washington, D.C.

Genus *Gnamptogenys* ROGER *minuta* Group

Worker Synopsis

Mandibles with a striate to rugulose dorsal surface. Maxillary palps 1; labial palps 2 (*G. minuta*). Anterior clypeal lamella well developed; a distinct longitudinal median cephalic

carina is developed to a varying degree; a prominent carinae briefly curves from the anterolateral cephalic border and partially delimits the antennal fossae. Frontal carinae greatly expanded laterad, completely covering antennal insertions in dorsal view: distance from the anterior margin of the frontal lobes to the anterior clypeal margin, excluding the lamella, is shorter than the width of a frontal lobe. Scapes generally longitudinally striate and widest apicad; funniculus incrassate. Eyes relatively small and usually lacking a fine and shallow surrounding sulcus. Promesonotal suture effaced, metanotal groove variable; well developed lamella present along anterior mesepisternal edge. Prosternal process posteriorly bidentate. Metacoxal fossae open to the posterior metasternal invagination. Node with a convex dorsal margin in lateral view, petiolar spiracle ventral and sunk in a pit. Posterior edge of petiolar sternite forms an internal prominent ridge (dissection necessary). Second gastric segment usually prominently arched beneath itself.

Empodia lacking, claws simple or with poorly developed teeth; no single, stout seta on the foretibial apex; one apical spur (rarely none) on each of meso- and metatibiae; row of thick setae present on base of foretarsus I, opposite the strigil.

Discussion

The species *G. striolata* BORGMEIER was regarded as a link between the *minuta* group and the rest of *Gnamptogenys* by BROWN (1958:222), thus forcing his aforementioned synonymization. It later seemed that *G. caelata* KEMPF finished closing the gap from *minuta* to "orthodox" *Gnamptogenys* (KEMPF 1967:112). Even though *G. striolata* and *G. caelata* have sculpturing similar to *Gnamptogenys* of other groups, including a circumocular sulcus and a metacoxal denticle, they equally possess all the aforementioned *minuta* characters. Characters that separate the *minuta* group from the rest of *Gnamptogenys* are given in Table 1. In order to assess the significance of these characters one must consider another ectatommine genus: *Ectatomma* F. SMITH. Of these two genera *Ectatomma* has the greatest amount of primitive character states and is closely related to *Gnamptogenys* (LATTKE,

Table 1
Differences between *minuta* group and other *Gnamptogenys*.

Character	*Gnamptogenys*	*minuta*
Distinct dorsomedian cephalic carinae	none	present
Lateral expansion of frontal lobes	partially covers antennal insertions	completely covers antennal insertions
Prominent seta on foretarsal base opposite comb	present	absent
Row of setae on foretarsal base opposite comb	absent	present
Prominent anterolateral carinae	absent	present
Orientation of petiolar spiracle	lateroventral	ventral
Position of petiolar spiracle	same level as surrounding integument	sunk in a pit

unpub. ms.). The moderate degree of second gastric segment curvature, and presence of a circumocular sulcus and row of basal foretarsal setae can be found in *Ectatomma*. Surface sculpturing in *Ectatomma* can exhibit parallel rugulae, striae and occasional costae. Thus the costate/costulate patterns of *G. striolata* and *G. caelata* do not compel an ancestor from another *Gnamptogenys* group. *G. caelata* is an extremely small species and wants apical spurs on the last pair of legs, whereas spurs are still conserved in the rest of *Gnamptogenys* species and *Ectatomma*. This small size and lack of spurs suggests a more derived taxon and not inmediate ancestorship between *minuta* group and other *Gnamptogenys*. The metacoxal tooth probably represents a case of homoplasy.

Two subgroups can be recognized within *minuta* : the *striolata* subgroup with costulate to rugulose sculpture, presence of a circumocular sulcus, no longitudinal striae on the dorsal surface of the frontal lobes, moderately curved second gastric segment, median clypeal denticle, propodeal denticles, subquadrate subpetiolar process, and metacoxal teeth. The last four character states are considered apomorphic for the group. The *minuta* subgroup has more or less foveolate or areolate "ground-plan" sculpture; absence of a circumocular sulcus, propodeal and clypeal denticles and metacoxal teeth. The subpetiolar process is an anteriorly produced lobe, the second gastric segment is prominently arched, scapes and frontal lobe dorsum are longitudinally striate. This second group can be divided into two complexes: one with fine, opaque subgranulose roughening on the ground-plan integument and no carinae bordering the lateral edges of the propodeal declivitous face (*fieldi, minuta, petiscapa*). The complex includes *bufonis, simulans, vriesi* and *falcifera*, They share a mostly strigulate sculpture, though it maybe effaced to a variable degree, and carinae that partially or totally surround the propodeal declivity.

Biology

Little is known of their biology, but it is apparent that most are leaflitter and soil foragers in humid forests. The soil nest of *G. simulans* and the fact that *G. minuta* is frequently caught in leaflitter samples, but no one has yet reported a nest, makes it probable that the species are soil nesters. Males are not yet known.

Key for the determination of workers of the *minuta* group of *Gnamptogenys*

1 Sculpture rugose or roughly costulate; clypeus with an anteromedian denticle; subpetiolar process subquadrate 7
– Sculpture of head, mesosoma, and gaster consisting of extremely fine opaque, amorphous or subgranulose roughening; clypeus lacking an anteromedian denticle 2
– Sculpture strigulate, a giving silky luster to integument, to partially smooth and shining; clypeus without an anteromedian denticle 4
2 Mandibles falcate, apical margins concave and edentate (North-Central Venezuela) . . . ***fieldi***
– Mandibles tringular, apical margins approximately straight and denticulate 3
3 Metanotal groove distinctly impressed; spiracles of gastric segments I and II shining and conspicuous (Northeast Venezuela) . . . . . ***petiscapa***
– Metanotal groove absent; spiracles of gastric segments I and II opaque and inconspicuous (Belize – Brazil) . . . . . ***minuta***
4 Metanotal groove very well impressed 5
– Metanotal groove absent or partially developed 6
5 Clypeal lamella medianly concave and with two lateral angulate lobes; eyes prominent, subglobulose; WL > 3,00 mm (Ecuador) . . . . . ***vriesi***
– Clypeal lamella medianly straight to slightly convex and laterally rounded; eyes not notably prominent; WL < 3,00 mm (Southern Mexico – Nicaragua) . . . . . ***bufonis***

6 Mandibles triangular and denticulate (Costa Rica) . . . . . ***simulans***
– Mandibles falcate and edentate (Northern South America) . . . . . ***falcifera***
7 Postpetiolar tergum with parallel chains of coarse punctures separated by irregular rugulae arranged in pattern arching over posteromedian area of finer longitudinal costulation, apical meso- and metatibial spur present (Southeast Brasil) . . . . . ***striolata***
– Tergum of postpetiole roughly longitudinally costulate; apical hind tibial spurs absent (Colombia – Southeast Brazil) . . . . . ***caelata***

In the following section the species are organized in alphabetical order. In "Material" the countries have been abbreviated in the following way: BEL = Belize, BRA = Brazil, COL = Colombia, COR = Costa Rica, ECU = Ecuador, GUY = Guyana, MEX = Mexico, NIC = Nicaragua, PAN = Panama, PER = Peru, SAL = El Salvador, VEN = Venezuela.

Gnamptogenys bufonis (MANN)

Alfaria bufonis MANN, 1926: 101.
Gnamptogenys bufonis (MANN); BROWN 1958: 227, 317; KEMPF 1972: 112; BRANDÃO & LATTKE 1991.

Diagnosis: Very fine striae interspersed with foveolae, edentate mandibles with longitudinal dorsal costulae. Metacoxa with pointed tubercle. Declivitous propodeal face sunken and surrounded posteriorly by more or less raised lateral carina. Fine striation can be partially or wholly effaced on some areas of body, especially gaster. Basal flanges of scape well developed.

Ecology: Found in lowland and montane rainforest.

Comments: Specimens from Costa Rica tend to be smaller than the Mexican material and have effaced sculturing. The Mexican specimens have lesser developed carinae around the declivitous propodeal face than the Costa Rican material. See BRANDÃO & LATTKE 1991.

Material: COR, Puntarenas, Península de Osa, 5 km W Rincón de Osa, 8° 42 N 83° 31 W, 50 m; COR, Península de Osa, 16-VIII-66; MEX, Chiapas, 1830 m, 12,9 km N Pueblo Nuevo, Solistahuacán; MEX, Oaxaca, 10 km S Valle Nacional, 610 m; NIC, Sta. María de Ostuma.

Gnamptogenys caelata KEMPF

Gnamptogenys caelata KEMPF, 1967: 121; KEMPF 1972: 112.
Gnamptogenys soror KEMPF & BROWN, 1968: 90; KEMPF 1972: 115. **syn. nov.**

Diagnosis: Mandibles laterally rugose, smooth and shining along apical margin; antennal scapes longitudinally rugulose; transverse sutures on mesosomal dorsum lacking. Subpetiolar process subquadrate; propodeal denticles present.

Ecology: Taken in leaf litter samples.

Comments: The species *soror* was described by KEMPF and BROWN on account of its greater size and other differences, admittedly "not striking" by the same authors. A specimen that combines a number of characters previously thought to be particular for each form provides evidence for this synonymy. Large size, combined with small eyes, vermiculate sculpture and a variable pattern of costulation on the petiolar node makes separation of the two arbitrary.

Material: COL, Amazonas, 7 km N Leticia.

Gnamptogenys falcifera KEMPF

Gnamptogenys falcifera KEMPF, 1967: 353; KEMPF 1972: 112; PERRAULT 1986: 158; LATTKE 1990: 16; BRANDÃO & LATTKE 1991.

Diagnosis: Basal propodeal face, disc of the petiolar and postpetiolar dorsum, and gastric tergite II smooth and shining. The head subquadrate, eyes flat, and metacoxa lack dorsal tooth. The declivitous propodeal face is sharply marginate laterally and dorsally.

Ecology: Captured from forest leaf litter samples.

Comments: The Venezuelan specimens seem to differ little from PERRAULT's description of the workers: notably in the strongly impressed areolae on the mesosoma, petiole and gaster, and the partially impressed metanotal groove. See BRANDÃO & LATTKE 1990.

Material: COL, Meta, Quebrada Susamuka, 23 km NW Villavicencio, 1000 m; ECU, Limoncocha; PER, Panguana, 9° 37′ S 74° 56′ W, 220 m; VEN, Táchira, Siberia, 1280 m.

***Gnamptogenys fieldi* LATTKE**

Gnamptogenys fieldi LATTKE, 1990: 15.

Diagnosis: Numerous piligerous tubercles on body; small eyes; promesonotal suture weakly impressed, metanotal groove shallowly impressed. Metacoxae lacking dorsal teeth; meso- and metatibial claws with a basal tooth.

Ecology: Cloud forest leaflitter sample.

Comments: See LATTKE 1990.

Material: Holotype. VEN, Aragua, Parque Nacional HENRI PITTIER, 1100 m.

***Gnamptogenys minuta* (EMERY)**

Alfaria minuta EMERY, 1896: 106; BORGMEIER 1957: 117.
Alfaria emeryi FOREL, 1901: 326; BROWN 1958: 228.
Opisthoscyphus scabrosus MANN, 1922: 5; BROWN 1958: 228.
Alfaria mus SANTSCHI, 1931: 265; BROWN 1958: 228.
Alfaria panamensis WEBER, 1940: 80, nec. SANTSCHI 1931; BROWN 1958: 228.
Alfaria carinata WEBER, 1940: 82; BROWN 1958: 228.
Gnamptogenys minuta (EMERY) BROWN, 1958: 316; KEMPF 1961: 492; KEMPF 1972: 113; BRANDÃO & LATTKE 1991.
Gnamptogenys pneodonax KEMPF, 1968: 375; KEMPF 1972: 114; LATTKE 1990: 22; BRANDÃO & LATTKE 1991. **Syn. nov.**

Diagnosis: Very small eyes; apex of scapes smooth and shining; petiolar node low and convex. Propodeal spiracles at apex of protuberances; metapleural lobe shining; coxal tooth absent.

Ecology: Leaf litter and soil dweller of humid forests though occasionally found in dry forests.

Comments: Examination, including the measurement of all the characters used by KEMPF to differentiate *pneodonax* from *minuta* show a continuous variablity. Other traits, such as the tooth of the frontal carinae, are allometric characters that vary proportionally with the specimen size. The tubercles of the propodeal spiracles can be cylindrical, barrel-like, conical or inverted conical. The meso- and metatarsal claws may have or not a basal denticle, sometimes varying in development in the same individual.

Material: BEL, Caves Branch; BRA, Amazonas, Benjamin Constant; BRA, Para, Iriboca, Pirelli plantation; COL, Guajira, Río Don Diego, 25–50 m; COL, Amazonas, 7 km N Leticia; COL, Magdalena, Parque Tayrona, Pueblito, 210 m; COL, Magdalena, El Campano, 1330 m, 11° 07′ N 74° 06′ W; COL, Magdalena, 3 km SE Minca, 11° 08′ N 74° 06′ W, 1050 m; COL, Magdalena, 4 km N San Pedro, 10° 57′ N 74° 03′ W, 550 m; COL, Magdalena, Cañaveral, 11° 19′ N 73° 56′W, 200 m; COR, Península de Osa; COR, Puntarenas, Monteverde, 10° 18′ N 84° 49′ W, 1300 m; COR,

Guanacaste, Pq. Nac. Santa Rosa, 10° 51′ N 85° 37′ W, 300 m; COR, San Jose, 1 km N La Ese, 9° 27′ N 83° 43′ W, 1400 m; COR, San José, 2 km E San Gerardo, 9° 28′ N 83° 35′ W, 1600 m; ECU, Napo, Limoncocha, 250 m; ECU, Napo, 20 km S Tena, 600 m; ECU, Pichincha, 47 km S Santo Domingo de los Colorados, Estación Rio Palenque; GUY, Rio Mazaruni, forest settlement, 302 m; PAN, Isla Barro Colorado; PER, Panguana, 9° 37′ S 74° 56′ W, 220 m; PER, Pasco, Chontilla, 22 km SE Iscozazin; SAL, Quetzaltepec; VEN, Anzoátegui, Valle de Guanape, Cerro Tucusito; VEN, Miranda, Parque Guatopo, 35 km N Altagracia; VEN, Carabobo, vic. Patanemo, 13,5 km SW Puerto Cabello, 150 m; VEN, Táchira, Siberia, 1280 m; VEN, Mérida, La Azulita, 950 m.

***Gnamptogenys petiscapa* LATTKE**

Gnamptogenys petiscapa LATTKE, 1990: 19.

Diagnosis: Elongate head; scapes surpassing posterior cephalic margin by more than their apical width. Mandibles triangular, shining and with 5–6 teeth. Metacoxal dorsum without teeth.

Ecology: A soil or leaf litter dweller of humid forests.

Comments: Among the *minuta* group species this one stands out due to its elongate scapes and elevated lobes of the frontal carinae. In the other species of the genus the lobes are low and hide the antennal condyles from lateral view.

Material: Holotype. VEN, Monagas, Parque Nacional El Guácharo, 1100 m.

***Gnamptogenys simulans* (EMERY)**

Alfaria simulans EMERY, 1896: 42; BORGMEIER 1957: 117.
Gnamptogenys simulans (EMERY); BROWN 1958: 317; KEMPF 1972: 114; BRANDÃO & LATTKE 1991.

Diagnosis: Propodeal declivity concave and surrounded by a crest; surface with weak radiate punctuations.

Ecology: One nest was found in wet forest at a depth of 10 cm in the ground. Workers have been observed attacking annelids on the forest floor, they are slow and immobilize upon disturbance.

Comments: Striate sculpturing can be effaced to a variable degree.

Material: COR, Puntarenas, Monteverde, 1500 m, 10° 18′N 84° 48′W; COR, Heredia, 13 km N Volcán Barba, 10° 15′N 84° 05′W 500 m; COR, Heredia, La Selva, 10° 26′N 83° 59′W; COR, Osa Península; COR, Heredia, 10° 21′N 84° 04′W,500 m

***Gnamptogenys striolata* (BORGMEIER)**

Alfaria striolata BORGMEIER, 1957: 116.
Gnamptogenys striolata (BORGMEIER); BROWN 1958: 222; KEMPF 1972: 115; BRANDÃO & LATTKE 1991.

Diagnosis: Clypeal lamella with a median denticle; cephalic dorsum with rough longitudinal costulae. The rest of the head and thorax with longitudinal costulae and foveolae; gaster foveolate; propodeal denticles present.

Ecology: Rarely collected in leaf litter.

Comments: See "Discussion".

Material: BRA, Bahia, Ilheua – Itab., km 22, (CEPEC).

***Gnamptogenys vriesi* BRANDÃO & LATTKE**

Gnamptogenys vriesi BRANDÃO & LATTKE, 1991.

Diagnosis: Anterior clypeal border concave, bulging compound eyes, deeply impressed propodeal declivity and anterior border of petiole with raised margins.

Ecology: No information available.
Comments: See BRANDÃO & LATTKE 1991.

Material: Holotype. Ecuador, Morona – Santiago, Los Tayos.

Acknowledgements: My gratitude to C. R. BRANDÃO, and R. SNELLING for the loan of specimens. P. S. WARD, J. LONGINO, and S. PECK generously donated and loaned specimens. Additional thanks to B. BROWN, E. ROSS, D. SMITH, and the Smithsonian Institute.

References

BORGMEIER, T. (1957): Mirmecologischen Studien. I. – Anais Acad. bras. Ciencias **29**(1): 103–128.
BRANDÃO, C. R. & J. LATTKE (1991): Description of a new Ecuadorean *Gnamptogenys* species, with a discussion on the status of the *Alfaria* Group. – J. New Y. Ent. Soc. **98**: 489–494.
BROWN, W. L. (1958): Contributions toward a reclassification of the Formicidae. II. Tribe Ectatommini. – Bull. Mus. Comp. Zool. **118**: 175–362.
EMERY, C. (1896): Studi sulle formiche della fauna neotropica. XVII–XXV. – Boll. Soc. ent. ital. **28**: 33–107.
FOREL, A. (1901): Nouvelles especes de Ponerinae. – Rev. Suisse Zool. **9**: 325–353.
KEMPF, W. W. (1961): A survey of the ants of the soil fauna in Surinam. – Studia Ent. **4**: 481–554.
– (1967 a): New ants from southwestern and central Brazil. – Studia Ent. **9**: 121-128.
– (1967 b): Three new South American ants. – Studia ent. **10**: 353–360.
– (1968): Miscellaneous studies on Neotropical ants. IV. – Studia Ent. **11**: 369–415.
– (1972): Catalogo abreviado das formigas da região neotropical. – Studia Ent. **15**: 1–344.
LATTKE, J. (1990): Revisión del género *Gnamptogenys* ROGER en Venezuela. – Acta Terramaris **2**: 1–45.
– (unpub. ms.): Phylogenetic relationships and classification in the Ectatommini (Hymenoptera: Formicidae).
MANN, W. M. (1922): Ants from Honduras and Guatemala.-Proc. U. S. Nat. Mus. **61**(15): 1–54.
– (1926): Some new Neotropical ants. – Psyche **33** (4–5): 97–101.
PERRAULT, G. H. (1986): *Gnamptogenys falcifera* KEMPF, 1967. Description de l'ouvriere et levee d'un doute. – Rev. Francaise Ent. **8**(4): 157–159.
ROGER, J. (1863): Die neu aufgeführten Gattungen und Arten meines Formiciden-Verzeichnisses, etc. – Berlin. ent. Zeitschr. **7**: 131–214.
SANTSCHI, F. (1931): Fourmis de Cuba et de Panama. – Rev. Entomol. **1**(3): 265–282.
WEBER, N. (1940): Rare ponerine genera in Panama and British Guiana. – Psyche **47** (2–3): 75–84.

Author's address:

JOHN E. LATTKE
Fundacion Terramar
Apartado 89.000
Caracas, 1080-A
Venezuela