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A REVIEW OF THE ANT GENUS "MYCETAROTES" EMERY (Hymenoptera, Formicidae)¹

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(With 13 text-figures)

The generic division of the fungus-growing ant tribe Attini has not as yet been settled definitively in all details. However, most myrmecologists seem presently to accept the main features of the classification, which EMERY first sketched in 1913 and more fully elaborated in the Myrmicinae section of *Genera Insectorum* (1922). The only significant point of departure from this system, or rather its further development, consists in tentatively separating from *Cyphomyrmex* as full-fledged genera *Mycetosoritis*, *Mycetarotes*, *Mycetophylax* and *Trachymyrmex* (cf. BORGMEIER, 1950).

In the present paper I propose additional evidence for the generic distinctness of *Mycetarotes* from *Cyphomyrmex* by describing the hitherto unknown male sex. A new synonym of *M. parallelus* and the description of a new species are also presented.

This study is based upon material from the Borgmeier collection (CTB), from the Divisão de Defesa Sanitária Vegetal, Rio de Janeiro (DDSV), from the Departamento de Zoologia do Estado de São Paulo (DZSP), and from my own collection (WWK). The work was performed with the aid of a fellowship granted by the "Conselho Nacional de Pesquisas" of Brazil.

Mycetarotes Emery

Cyphomyrmex subgenus *Mycetarotes* Emery, 1913: 251. Type of the subgenus:
Cyphomyrmex parallelus Emery, 1905, by original designation. — Emery, 1922: 342-343.

Mycetarotes, Borgmeier, 1950: 384.

Worker — Monomorphic. Mandibles striolate, with 5-6 teeth. Antennae 11-segmented; funiculus without a differentiated apical club. Frontal carinae

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convex in front, prolonged to the rear as a pair of subparallel ridges, bifurcating before reaching the occiput; inner branch terminating as a prominent denticle, outer branch weaker or vestigial. Space between these ridges narrower than space between each ridge and the sides of head. Carinule on gena fine to vestigial, curving mesad posteriorly at level of eyes. A clearly delimited antennal scrobe absent. Occipital corners tridentate. Thorax with 6-7 pairs of teeth or spines on dorsum; posterior epinotal spines long and acute. Petiole with a pair of spines dorsally near the posterior border. First gastric tergite anterolaterally marginate. Integument opaque, lacking coarse sculpture; dorsum of head, postpetiole and gaster sharply reticulate-punctate. Erect hairs absent. Appressed hairs sparse.

Female — Similar to the worker. Posterior ocelli situated laterad of longitudinal ridges of vertex. Thorax with a humeral spine on pronotum; scutum with a median longitudinal furrow and parapsidal sutures; scutellum posteriorly bidentate. Epinotal spines well-developed. Venation of fore wing of the *Formica*-type; pterostigma small but well-defined.

Male — Antennae 12-segmented; scape shorter than funicular segments I-III combined, no reaching back to the tridentate occipital corner. Thorax with *Myrmicocrypta*-like tuberosities and appendages on scutum and scutellum, but lacking the pair of sharp longitudinal ridges on scutum. Humeral and epinotal spines well-developed. Pedicel resembling that of worker. First gastric tergite with a pronounced longitudinal impression in the middle. Standing hairs absent. Wings as in female.

Workers and females differ strikingly from *Cyphomyrmex* in head shape, especially in lacking a well-defined and impressed antennal scrobe. The posterior ridges, prolongations of the frontal carinae, do not run to the occipital corners, but are subparallel and terminate near the middle of the occipital border, forming a tooth at each side of a median excision. The relative slenderness of the strongly dentate or spinous thorax and the dorsally bidentate petiolar node are likewise good distinguishing characters.

The male sex diverges from that of *Cyphomyrmex* by the relatively short scape which, when laid obliquely back, does not attain the occipital corner, by the first funicular segment, which is distinctly shorter than the second, and by the strongly developed tuberosities and appendages of the mesonotal scutum and scutellum. As regards this mesothoracic armature, it resembles more closely the male of *Myrmicocrypta*, but the latter genus has the scape somewhat longer (nearly attaining the edentate occipital corner), the first funicular segment only half as long as the second, the mesothoracic scutum with a pair of longitudinal sharp ridges; the pterostigma of the fore wing is at best rudimentary.

In a critique of EMERY's classification, FOREL (1913) refuses to recognize the subgenera *Mycetarotes* and *Mycetophylax* which to his mind were merely based on a subjective appraisal of the worker characters. The discovery of the

male of *Mycetarotes* proves now that EMERY's surmise was not only correct but also shows conclusively that *Mycetarotes* is generically independent from *Cyphomyrmex*.

KEY TO MYCETAROTES SPECIES — WORKERS

- 1 — Thoracic dorsum with 7 pairs of teeth or spines, three pairs on mesonotum; anterior margin of clypeus notched in the middle *senticosus* sp. n.
 — Thoracic dorsum with 6 pairs of teeth or spines, two pairs on mesonotum; anterior margin of clypeus entire *parallelus* (Emery)

Mycetarotes parallelus (Emery)

(Figs. 1-3, 7-13)

Cyphomyrmex parallelus Emery, 1905: 162-163, fig. 23 (Worker, female; Brazil Mato Grosso: Coxipó).

Atta (*Mycocepurus*) *luederwaldti* Forel, 1911: 293-294 (Worker, female; Brazil São Paulo City: Ipiranga). *New Synonymy*.

Mycocepurus luederwaldti Luederwaldt, 1918: 68 (Nest).

Types — *M. parallelus*, workers and female collected by F. Silvestri, in the Emery collection at Genova, Italy; not seen. *M. luederwaldti*, workers and female collected by H. Luederwaldt, in the Forel collection at Geneva, Switzerland; syntypes in DZSP and CTB examined.

Worker — For a full description see EMERY (1905). All specimens examined by myself differ from the description and figure of the type in having the head slightly less elongate and the more or less vestigial carinule on genae not really prolonged caudad to the lateral occipital tooth, but curving mesad and terminating at the level of the eyes. I believe that EMERY slightly exaggerates the head length. As regards the carinule, the base of the lateral occipital tooth is prolonged forward in the form of a very indistinct and blunt margination which, in full face view, gives the impression of a carinule meeting, and joining up with, the carinule coming from the anterior end of the cheeks.

The distinguishing characters for this caste consist in the entire clypeus border, the rather feeble longitudinal ridges on vertex, the less conspicuous and more obtuse occipital teeth (fig. 1). Thoracic spines rather blunt and low, there being only two pairs of spines on the mesonotum (fig. 2). The petiole is about as broad as long. The postpetiole lacks anteriorly a pair of well-defined tuberosities, is more elongate and has posteriorly on dorsum a pronounced circular impression (fig. 3).

Female — Already described by EMERY (1905), who also gives a figure of the head. As regards the genal carinule, there applies the same as stated above for the worker. The wings, hitherto unknown, are identical with those of the male sex (see below and figs. 10, 11).

Male (undescribed) — Total length 3,7 mm; maximum length of head capsule 0,65 mm; maximum width of head including eyes 0,80 mm; maximum diameter of eyes 0,29 mm; length of scape 0,31 mm; Weber's length of thorax 1,16 mm; length of fore wing 2,86 mm. Fuscous reddish-brown; head more infuscated than rest of body; funiculi and legs more testaceous-brown. Wings smoky brown with dark brown veins. Integument finely but sharply reticulate-punctate and opaque. Erect hairs absent. Appressed hairs generally sparse and inconspicuous; longer, subappressed on clypeus, underside of head, anteromesial face of coxae and tip of gaster.

Head as shown in fig. 9. Chewing border of mandibles vestigially denticulate with a distinct apical and subapical tooth. Palpi 4 (3): 2. Median portion of clypeus strongly vaulted in both directions. Frontal carinae obliquely raised laterad. Scape shorter than funicular segments I-III combined, failing to attain the occipital corner when laid obliquely back over the head. Funicular segment I distinctly shorter than segment II. Ocelli on prominent tubercles. Occipital corners tridentate. Occiput excavate.

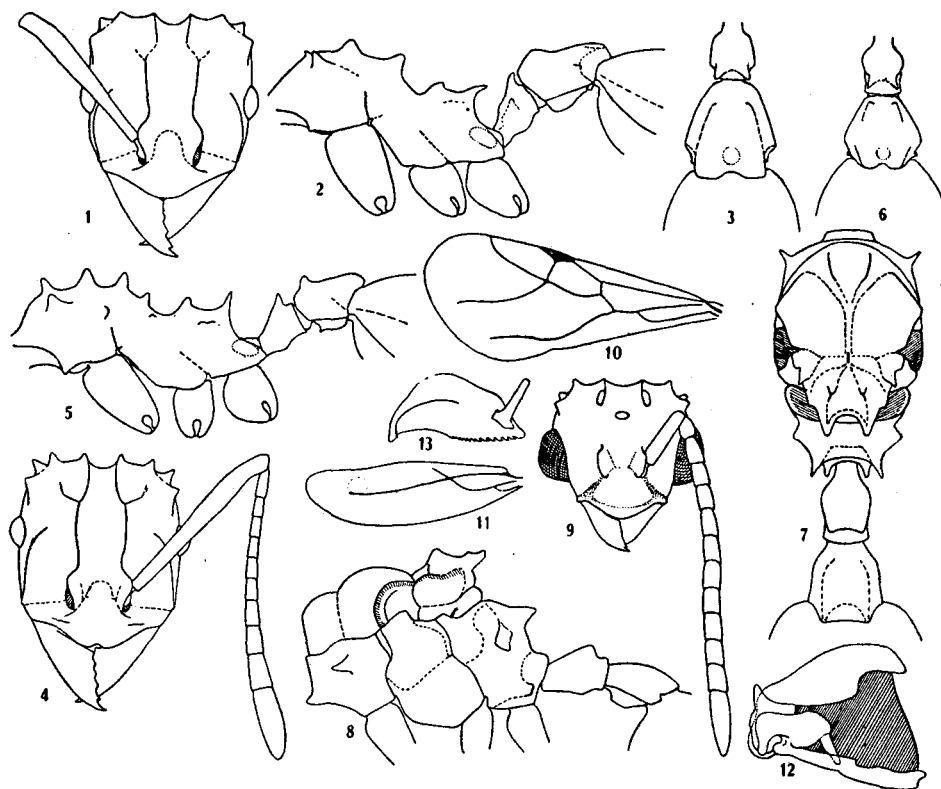
Thorax as shown in figs. 7, 8. Pronotum with a strong scapular spine. Mesonotum with fine rugulae, anteriorly and laterally vaulted, with deeply impressed Y-shaped Mayrian furrows or notauli. Prescutum with a shallow median longitudinal impression, laterally marginate above, before dropping down to the furrow of the notauli. Mesoscutal sclerites laterally sharply marginate and projecting, disc longitudinally impressed laterally, with a longitudinal swelling flanking the common stem of the Mayrian furrows. Transcutal furrow broad and deeply impressed, bisected in the middle by a sharp, short, longitudinal carina. Paraptera with a pair of appendages, the anterior lobate, the posterior dentate. Scutellum with a pair of stout, raised, longitudinally carinate tuberosities, terminating posteriorly in a pair of strong spines. Basal face of epinotum with a prominent tubercle at each side and an acute spine at the posterior corner. Wings as shown in figs. 10, 11. Note the clearly defined pterostigma and the venation of the *Formica*-type in the fore wing.

Pedicel segments resembling those of worker. Pair of spines on petiole reduced to short, blunt teeth. Postpetiole flattened and depressed, without a circular pit in front of the posterior border. First gastric tergite with a longitudinal median impression. Genitalia as shown in figs. 12, 13. Note the spinelike process dorsally on clasping surface of paramere and the hooklike digitus of the volsellae (fig. 12).

Description based on 12 males from the same colony, which did not offer any noticeable variation as regards measurements and structural characters.

Distribution — From central and southeastern Brazil to northern Argentina.

Specimens examined — Brazil, Goiás State: Anápolis (W. W. Kempf) 1 worker (WWK); Rio de Janeiro State: Escola Nacional de Agronomia, km 47 (C. R. Gonçalves) 41 workers, 2 females, 12 males (DDSV, WWK), Três Poços



Mycetarotes parallelus (Emery), worker — Fig. 1: Head; fig. 2: thorax in profile; fig. 3: pedicel in dorsal view — *Mycetarotes senticosus* sp. n., worker — Fig. 4: Head; fig. 5: thorax in profile; fig. 6: pedicel in dorsal view, — *Mycetarotes parallelus* (Emery), male — Fig. 7: Thorax and pedicel in dorsal view; fig. 8: thorax and pedicel in profile; fig. 9: head; fig. 10: fore wing; fig. 11: hind wing; fig. 12: paramere and volsella seen from the inside; fig. 13: penis valve in profile. Kempf del.

(T. Borgmeier) 1 worker (CTB); São Paulo State: Agudos (W. W. Kempf, R. Mueller) 4 workers (WWK), Guaratinguetá (W. W. Kempf) 1 worker (WWK), São Paulo (H. Luederwaldt) 5 workers (nidotypes of *M. luederwaldti* Forel) (DZSP, CTB), São Paulo, Instituto de Botânica (W. W. Kempf) 4 workers, 1 female (WWK). Argentina: Tucumán (N. Kusnezov) 4 workers (CTB).

Synonymy — As BORGMEIER (in litt.) already surmised, *M. luederwaldti* (Forel) is nothing but a synonym of *parallelus* (Emery). The nidotypes of the former fully agree with the description and figures of the latter as given by EMERY (1905).

Biology — According to LUEDERWALDT (1918) this ant lives in the open fields. Nest were found at the same sites where *Mycocepturus* occurred, but were less common. A nest in good conditions to be more carefully examined, was found in the soil at a depth of approximately 15 cm. The spherical cavity measured about 4 cm in diameter. The fungus garden did not consist of separated and suspended lobulate clusters as is the case in *Mycocepturus goeldii*, but formed a single, solid and homogeneous mass fastened to the bottom and to rootlets traversing the cavity.

Mycetarotes senticosus sp. n.

(Figs. 4-6)

Worker (holotype) — Total length 3,7 (3,7-4,0) mm; maximum length of head capsule 0,94 (0,94-0,98) mm; maximum width of head including eyes 0,87 (0,87-0,92) mm; length of scape 0,91 (0,91-0,94) mm; Weber's length of thorax 1,16 (1,19-1,27) mm. Yellowish-brown; cheeks and occiput rather ferruginous. Integument opaque; head, postpetiole and gaster sharply, rest of body more finely reticulate-punctate. Pubescence scarce and appressed. Erect hairs absent.

Head (fig. 4) longer than broad; sides scarcely convex; occipital corners, not considering the three prominent and subacute teeth, rather broadly rounded. Mandibles striolate, with 6 teeth on chewing border. Anterior margin of clypeus convex, notched in the middle. Frontal area impressed. Frontal carinae convex and covering the antennal socket, prolonged caudad as a pair of prominent ridges, which bifurcate in the rear before reaching occiput; inner branches more approximated to each other, sharp, strongly raised, terminating as a prominent tooth on occiput; outer branches weaker, obliquely running caudad, fading out before reaching the occipital corner. Occiput between mesial teeth excised. Carinule of cheeks distinct, curving mesad posteriorly and fading out at level of eyes.

Thorax (fig. 5) rather slender and elongate; promesonotum in profile convex; impressed at mesoepinotal junction. Pronotum with 3 pairs of spines, one spine anteroventrally at each side, 4 spines dorsally arranged in a transverse row. Mesonotum with 3 pairs of spines, disposed in two longitudinal rows, gradually diminishing in size to the rear. Basal face of epinotum anteriorly with a pair of short, posteriorly with a pair of long, acute, rather elevated spines. Sides of epinotum with a distinct tooth above and somewhat in front of the spiracle.

Petiole (fig. 6) longer than broad, its dorsum posteriorly with a pair of obliquely raised short spines. Postpetiole scarcely longer than broad, subtrapezoidal in dorsal aspect, dorsally strongly flattened with a pair of spinelike tuberosities near the anterior border; posterior border emarginate in the middle; circular pit rather vestigial. Gaster anterolaterally marginate.

The paratypes agree with the holotype in all essential features of structure and livery. Their measurements have already been given in the description of the holotype.

Types — 4 workers. Brazil, São Paulo State: Federal highway BR — 2, São Paulo — Curitiba, km 40, May 7, 1960 (W. W. Kempf) 2 workers (holotype and paratype); Rio de Janeiro State: Petrópolis, April 21, 1945 (W. W. Kempf) 1 worker (paratype); Santa Catarina State; Chapecó, December 1957 (F. Plaumann) 1 worker (paratype). All specimens in my collection (WWK).

This species differs from *parallelus* as follows: Clypeus notched in the middle; longitudinal carinae of vertex sharper and more prominent; teeth and spines of occiput better developed, rather acute; occipital corners more rounded; mesonotum with an additional pair of spines; epinotal spines more elevated; petiole longer than broad; postpetiole not longer than broad, having anteriorly on dorsum a pair of prominent tubercles and posteriorly an ill-defined circular pit.

All four specimens were taken as strays from forest floor cover. This may mean another distinctive trait, since *parallelus* is a denizen of open areas.

RESUMO

O autor confirma a independência genérica de *Mycetarotes* Emery pela descrição do macho de *M. parallelus* (Emery), até agora desconhecido. *M. luederwaldti* (Forel) é proposto como sinônimo de *parallelus* e descreve-se uma nova espécie, *M. senticosus* sp. n., do Brasil meridional.

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