

M. termitobium, but lacks the sharply defined, narrowly separated clypeal carinae and strongly projecting clypeus of the latter. The proper affinities of this ant lie with *M. flavimembra* and its allies. Workers within a series are of uniform appearance, either bright yellow or orange with a dark brown gaster. The gaster is typically uniformly dark, but the base of the first gastral tergite may be a cloudy brownish-yellow. Sometimes the postpetiole is also dark brown. As with *M. flavimembra*, the basal mandibular tooth is greatly reduced, but is at least represented by a faint angle in all specimens seen.

Monomorium lepidum has a scattered distribution in western and southern parts of the island. Most records have come from Mahajanga Province. As with many of these small *Monomorium*, the species has a predilection for rotten twigs and tree stumps, but also features prominently in sifted litter and pitfall-trapped samples. Tropical dry forest is a typical habitat, but several series have come from rainforest.

***Monomorium madecassum* Forel**

Figs. 21, 59–60.

Monomorium minutum r. *madecassum* Forel, 1892c:255. Syntype ♀s (lectotype here designated), MADAGASCAR: Imerina (MHNG) [examined].

Monomorium madecassum Dalla Torre, 1893:67.

Monomorium minutum var. *leopoldinum* Forel, 1905:179 Syntype ♀s (lectotype here designated), DEMOCRATIC REPUBLIC OF CONGO: St. Gabriel, Stanleyville (MHNG) [examined]. Syn. nov.

Monomorium leopoldinum Bolton, 1987:397

Monomorium explorator Santschi, 1920:12, figs 1a–b. Holotype ♀, GABON: Samkita (NHMB) [examined]. Syn. under *M. leopoldinum* Bolton, 1987:397.

Monomorium aequum Santschi, 1928:195, fig.3b. Holotype ♀, DEMOCRATIC REPUBLIC OF CONGO: Stanleyville (NHMB) [examined]. Syn. under *M. leopoldinum* Bolton, 1987:397.

Monomorium (Monomorium) estherae Weber, 1943:361. Syntype ♀s (lectotype here designated), SUDAN, Imatong Mts. (MCZ) [examined]. Syn. under *M. leopoldinum* Bolton, 1987:397.

MATERIAL EXAMINED.—***M. madecassum***: LECTOTYPE: ♀, Madagascar, Imerina, coll. [P.] Camboué (MHNG). This specimen is designated the lectotype to fix the name for the species. Malagasy workers are generally smaller and less hairy than workers collected in Africa. PARALECTOTYPES: (i) ♀, Madagascar, Imerina, coll. [F.] Sikora (MHNG). (ii) ♀, Madagascar, Imerina, coll. [P.] Sikora (MHNG). ***M. leopoldinum***: LECTOTYPE: ♀, DEMOCRATIC REPUBLIC OF CONGO: St. Gabriel, Stanleyville, P. Kohl (MHNG). A lectotype is designated to fix the name ‘*leopoldinum*’ under which were placed certain African populations of what is here regarded as *M. madecassum*. PARALECTOTYPES: Two workers, same data as lectotype (MHNG). Repinned, with photocopies of the original labels. ***M. explorator***: HOLOTYPE: ♀, Gabon, Samkita, F. Faure (NHMB – Reg. no. 206). Santschi mentions only the one specimen was used for his description. ***M. aequum***: HOLOTYPE: ♀, Democratic Republic of Congo, Stanleyville, Reichensperger (NHMB – Reg. No. 216). This worker was designated a ‘holotype’ by Bolton (1987), and since the length is given as a single measurement, it seems clear no other specimens were examined. A holotype status fixed by monotypy (Code 73.1.2) is here assumed. ***M. estherae***: LECTOTYPE: ♀, Sudan, Imatong Mts., 24 July–5 Aug. 1943, N.A. Weber. 1423 (MCZ). The publication and the type label describe these two specimens as ‘cotypes’, but ‘syntypes’ is clearly intended. A lectotype is designated to fix the name ‘*estherae*’ for this taxon, whose representatives are slightly less hairy than those of *M. leopoldinum*. PARALECTOTYPE: ♀, same data as lectotype (MCZ). Repinned, with photocopies of the original labels.

OTHER MATERIAL EXAMINED: **Prov. Antsiranana**: Forêt Anabohazo, 21.6 km 247 WSW Maromandia 11–16.iii.2001 Fisher *et al.* (4 ♀); R.S. Manongarivo, 10.8 km 229 SW Antanambao 8.xi.1998 B.L. Fisher (5 ♀). **Prov. Fianarantsoa**: 28 km SSW Ambositra, Ankazomivady, 9.i.1998 (1 ♀), 11.i.1998 (12 ♀, 1 ♀), 13.i.1998 B.L. Fisher (6 ♀); P.N. Andringitra, Forêt Ravaro, 12.5 km SW Antanitotsy 10–15.i.2000 S. Razafimanimby (6 ♀). **Prov. Mahajanga**: Mahavavy River, 6.2 km 145 SE Mitsinjo 1–5.xii.2002 Fisher *et al.* (3 ♀); P.N. Ankarafantsika, Tsimaloto, 18.3 km 46 NE Tsaramandroso 2–8.iv.2001 Rabeson *et al.* (4 ♀); P.N.

Tsingy de Bemaraha, 3.4 km 93 E Bekopaka 6–10.xi.2001 Fisher *et al.* (1 ♀); P.N. Tsingy de Bemaraha, 2.5 km 62 ENE Bekopaka 11–15.xi.2001 Fisher *et al.* (1 ♀). **Prov. Toamasina:** Morarano-Chrome forêt, 25 km W, xi.1991 A. Pauly (1 ♀, 1 ♂ (*in cop.*)); S.F. Tampolo, 10 km NNE Fenoarivo Atn. 10.iv.1997 B.L. Fisher (2 ♀). **Prov. Toliara:** Cap Sainte Marie, 12.3 km 262 W Marovato 11–15.ii.2002 Fisher *et al.* (64 ♀, 1 ♀); Ehazoara Canyon, 26 km E Betioky 27.iv.1997 B.L. Fisher (2 ♀); Forêt Beroboka, 5.9 km 131 SE Ankidranoka 12–16.iii.2002 Fisher *et al.* (2 ♀); Forêt Mahavelo, Isantoria Riv., 5.2 km 44 NE Ifotaka 28.i–1.ii.2002 Fisher *et al.* (4 ♀); Forêt Mite, 20.7 km 29 WNW Tongobory 27.ii–3.iii.2002 Fisher *et al.* (1 ♀); Forêt Tsinjoriaka ['Tsinjoriaky'], 6.2 km 84 E Tsifota 6–10.iii.2002 Fisher *et al.* (73 ♀); southern Isoky-Vohimena Forest, 21.i.1996 B.L. Fisher (2 ♀); P.N. Andohahela, Manantalinjo, 7.6 km 99 E Hazofotsy 12–16.i.2002 Fisher *et al.* (2 ♀); P.N. Tsimanampetsotsa, 6.7 km 130 SE Efoetse, 18–22.iii.2002 Fisher *et al.* (1 ♀); P.N. Tsimanampetsotsa, Bemanateza, 23.0 km 131 SE Beheloka 22–26.iii.2002 Fisher *et al.* (2 ♀); P.N. Tsimanampetsotsa, Mitoho, 6.4 km 77 ENE Efoetse 18–22.iii.2002 Fisher *et al.* (4 ♀); P.N. Zombitse, 19.8 km 84 E Sakaraha 5–9.ii. 2003 Fisher *et al.* (1 ♀); Ranobe, Frontier Project 17–21.ii.2003, MGFO61 (1 ♀); Rés. Berenty, Forêt Anjapolo, 21.4 km 325 NW Amboasary 7.ii.2002 Fisher *et al.* (15 ♀).

WORKER DESCRIPTION.— **HEAD:** Head rectangular; vertex planar or weakly concave; frons shining and smooth except for piliferous pits; pilosity of frons a mixture of well-spaced, distinctly longer erect and semi-erect setae interspersed with shorter decumbent setae or setulae. Eye large, eye width 1.5× greater than greatest width of antennal scape, to moderate, eye width 1–1.5× greatest width of antennal scape; (in full-face view) eyes set above midpoint of head capsule; (viewed in profile) eyes set around midline of head capsule; eye elliptical, curvature of inner eye margin may be more pronounced than that of its outer margin. Antennal segments 12; antennal club three-segmented. Clypeal carinae always well-defined; anteromedian clypeal margin emarginate, clypeal carinae terminating in small denticles; paraclypeal setae moderately long and fine, curved; postero-median clypeal margin extending slightly beyond level of posterior margin of antennal fossae. Anterior tentorial pits situated nearer antennal fossae than mandibular insertions. Frontal lobes straight, parallel. Psammophore absent. Palp formula 1,2; Mandibular teeth three, plus minute, basal denticle or angle; mandibles with sub-parallel inner and outer margins, smooth (except for piliferous pits); masticatory margin of mandibles approximately vertical or weakly oblique; basal tooth a small to minute denticle or angle, much smaller than t3 (four teeth present).

MESOSOMA: Promesonotum shining and smooth on dorsum, entire lower mesopleuron often distinctly striolate but sculpture may be vestigial; (viewed in profile) promesonotum broadly convex; promesonotal setae greater than twelve; standing promesonotal setae a mixture of well-spaced, distinctly longer, erect and semi-erect setae which are curved distally and often paired, interspersed with much shorter, incurved, decumbent setae; appressed promesonotal setulae well-spaced over entire promesonotum. Metanotal groove strongly impressed, with distinct transverse costulae. Propodeum shining and smooth, with multiple hair like striolae on metapleuron; propodeal dorsum convex; propodeum always smoothly rounded; standing propodeal setae usually consisting of one prominent pair anteriorly, with other shorter setae very sparse or absent, more rarely consisting of two anterior pairs or three or four pairs ranged along either side of the propodeal dorsum; appressed propodeal setulae well-spaced and sparse; propodeal spiracle equidistant from metanotal groove and declivitous face of propodeum. Vestibule of propodeal spiracle absent or not visible. Propodeal lobes present as vestigial flanges or small strips of cuticle only.

PETIOLE AND POSTPETIOLE: Petiolar spiracle lateral and situated within anterior sector of petiolar node; node (viewed in profile) cuneate, vertex tapered, or, cuneate, vertex rounded; appearance of node shining and smooth throughout; ratio of greatest node breadth (viewed from front) to greatest node width (viewed in profile) about 4:3; anteroventral petiolar process absent or vestigial; ventral petiolar lobe weakly present to absent; height ratio of petiole to postpetiole between 3:2 and 4:3; height-length ratio of postpetiole between 4:3 and 1:1; postpetiole shining and smooth; post-

petiolar sternite without anterior lip or carina, or this structure vestigial.

GASTER: Pilosity of first gastral tergite consisting of well-spaced, erect and semi-erect setae interspersed with a few appressed setulae.

GENERAL CHARACTERS: Color light brownish-yellow to brown, gaster darker. Worker caste monomorphic.

LECTOTYPE MEASUREMENTS (*M. madecassum*): HML 1.24 HL 0.49 HW 0.40 CeI 82 SL 0.35 SI 86 PW 0.26.

LECTOTYPE MEASUREMENTS (*M. leopoldinum*): HML 1.41 HL 0.53 HW 0.44 CeI 84 SL 0.39 SI 89 PW 0.29.

LECTOTYPE MEASUREMENTS (*M. explorator*): HML 1.34 HL 0.51 HW 0.42 CeI 82 SL 0.36 SI 86 PW 0.28.

LECTOTYPE MEASUREMENTS (*M. aequum*): HML 1.48 HL 0.52 HW 0.45 CeI 87 SL 0.37 SI 82 PW 0.30.

LECTOTYPE MEASUREMENT (*M. estherae*): HML 1.34 HL 0.51 HW 0.41 CeI 80 SL 0.35 SI 85 PW 0.27.

OTHER WORKER MEASUREMENTS (non-types): HML 1.14–1.27 HL 0.46–0.51 HW 0.37–0.41 CeI 78–83 SL 0.32–0.37 SI 83–93 PW 0.23–0.27 (n=20).

QUEEN DESCRIPTION.— **HEAD:** Head square; vertex weakly concave or planar; frons shining and smooth except for piliferous pits; pilosity of frons a mixture of well-spaced, distinctly longer erect and semi-erect setae interspersed with shorter setae or setulae, which are decumbent or appressed, longer setae thickest on vertex. Eye elliptical, curvature of inner eye margin may be more pronounced than that of its outer margin; (in full-face view) eyes set at about midpoint of head capsule; (viewed in profile) eyes set posteriad of midline of head capsule.

MESOSOMA: Mesoscutum broadly convex anteriorly, convexity reduced posteriorly; pronotum, mesoscutum and mesopleuron shining and mainly smooth, vestigial striolae, if present, confined to anterior katepisternum; length-width ratio of mesoscutum and scutellum combined between 2:1 and 3:2; axillae narrowly separated (i.e., less than width of one axilla); standing pronotal/mesoscutal setae consisting of a mixture of incurved, semi-erect setae and slightly shorter decumbent setae; appressed pronotal, mesoscutal and mesopleural setulae few, mainly on sides of pronotum and mesopleuron; propodeum shining and smooth, with multiple hair like striolae on metapleuron; propodeum always smoothly rounded; propodeal dorsum flat throughout most of its length; standing propodeal setae consisting of a few decumbent setae only; appressed propodeal setulae well-spaced and sparse; propodeal spiracle nearer metanotal groove than declivitous face of propodeum. Propodeal lobes present as bluntly angled flanges.

WING: Wing veins predominantly depigmented, with distal segments reduced to vestigial lines; vein m-cu always absent; vein cu-a absent.

PETIOLE AND POSTPETIOLE: Petiolar spiracle lateral and situated within anterior sector of petiolar node; node (viewed in profile) conical, vertex tapered; appearance of node shining and weakly striolate posteriorly; ratio of greatest node breadth (viewed from front) to greatest node width (viewed in profile) about 4:3; anteroventral petiolar process present as a thin flange tapering posteriorly; height ratio of petiole to postpetiole between 4:3 and 1:1; height-length ratio of postpetiole between 3:2 and 4:3; postpetiole shining and smooth; postpetiolar sternite not depressed, its anterior end an inconspicuous lip or small carina.

GASTER: Pilosity of first gastral tergite consisting of a mixture of incurved, erect and semi-erect setae and slightly shorter decumbent setae.

GENERAL CHARACTERS: Color brown. Brachypterous alates not seen. Ergatoid or worker-female intercastes not seen.

QUEEN MEASUREMENTS: HML 3.01–3.12 HL 0.76–0.77 HW 0.74–0.75 CeI 96–99 SL 0.56–0.58 SI 76–77 PW 0.88–0.92 (n=2).

MALE DESCRIPTION.— **HEAD:** Head width–mesosoma width ratio between 1:1 and 3:4 to less than 1:2; frons finely longitudinally striolate. Compound eyes protuberant and elliptical tending to elongate; margin of compound eye clearly separated from posterior margin of clypeus. Ocelli turreted. Ratio of length of first funicular segment of antenna to second funicular segment about 1:3. Maximum number of mandibular teeth and denticles four.

MESOSOMA: Mesoscutum broadly convex; mesoscutum with a few vestigial striolae on its dorsum, otherwise both pronotum and mesonotum smooth and shining. Parapsidal furrows vestigial or absent; notauli vestigial. Axillae widely separated (i.e., by width of at least one axilla), axilla fused with scutellum.

WING: Wing veins predominantly depigmented, with distal segments reduced to vestigial lines; vein m–cu absent; vein cu–a absent.

PETIOLE AND POSTPETIOLE: Petiolar spiracle lateral and situated within anterior sector of petiolar node. Petiolar node, (viewed in profile) conical, vertex rounded; appearance of node shining and smooth; ratio of greatest node breadth (viewed from front) to greatest node width (viewed in profile) between 4:3 and 1:1. Anteroventral petiolar process absent or vestigial. Height ratio of petiole to postpetiole between 4:3 and 1:1; height–length ratio of postpetiole between 3:2 and 1:1; postpetiole shining, with vestigial sculpture.

GASTER: Pilosity of first gastral tergite consisting of a mixture of incurved, semi-erect setae and slightly shorter decumbent setae.

GENERAL CHARACTERS: Color chocolate, tibia and tarsi pale brownish-yellow.

MALE MEASUREMENTS: HML 2.80–2.84 HL 0.70 HW 0.72–0.74 CeI 104–106 SL 0.21–0.22 SI 28–31 PW 0.90–0.94 (n=2).

REMARKS.— Workers of *Monomorium madecassum* are immediately recognizable by virtue of their large propodeal spiracle, clypeal denticles, and relatively large eyes. The petiolar node and postpetiole also tend to be high and narrow in most specimens. The taxon *Monomorium leopoldinum*, described from African material, is morphologically indistinguishable from *M. madecassum* and is here made a junior synonym of the earlier name. *Monomorium aequum* was collected in the same locality (Stanleyville, Democratic Republic of Congo) as *M. leopoldinum*, and apart from smaller eyes and a broad head the lectotype is virtually indistinguishable from that of *M. leopoldinum*. *Monomorium explorator* Santschi, from Gabon, has a smooth mesopleuron without any hint of sculpture. Otherwise, however, it conforms closely to *M. madecassum*. African populations of *M. madecassum* are on average larger than Malagasy populations of this species. Workers also tend to be more hirsute, with more than two pairs of erect propodeal setae, according to Bolton (1987). By way of contrast, Malagasy workers usually have one or two pairs of erect propodeal setae, but a series from Ankarafantsika, Mahajanga Province, is pilose like the African workers. (As mentioned under ‘REMARKS’ for *Monomorium exiguum*, degree of pilosity does not appear to be useful as a diagnostic character at a species level for many small *Monomorium*.) The type specimens of *Monomorium estherae* are altogether like *M. madecassum*. The queen and male of *M. madecassum* are both very large for members of the *M. monomorium* group, and each, like the worker, possesses a very large propodeal spiracle. The compound eye of the male is elongate-oval. The reproductive wing is a pale off-white, although its veins are fairly well-defined.

Monomorium madecassum is the only member of its complex found on Madagascar, where it can be found throughout the island. Most CAS material has been collected in Toliara. Although not as abundant in samples as several other small species, this ant has been taken from different vegetation assemblages, ranging from spiny forest to rainforest, and can exist in disturbed forest areas

and even in grassland. Various collection methods have been successful, and its inclusion in malaise trap samples indicates this species will forage arboreally. The ant appears to have catholic tastes in terms of nest sites, colonies having been sampled in a dead branch above ground and also under stones.