MESOSOMA: Anterior mesoscutum smoothly rounded, thereafter more-or-less flattened; pronotum, mesoscutum and mesopleuron shining and mainly smooth, vestigial striolae, if present, confined to anterior katepisternum; length–width ratio of mesoscutum and scutellum combined about 2:1; axillae separated by width of at least one axilla to narrowly separated (i.e., less than width of one axilla); standing pronotal/mesoscutal setae consisting of well-spaced, incurved, erect and semi-erect setae only; appressed pronotal, mescoscutal and mesopleural setulae very sparse or absent. Propodeum shining and smooth, with a few weak striolae on metapleuron; propodeum always smoothly rounded; propodeal dorsum convex; standing propodeal setae consisting of up to a dozen or more longer erect and shorter sub-erect setae; appressed propodeal setulae very sparse or absent; propodeal spiracle nearer metanotal groove than declivitous face of propodeum; propodeal lobes present as well-developed, rounded flanges.

WING*:* Wing not seen (queen dealated).

PETIOLE AND POSTPETIOLE: Petiolar spiracle lateral and situated within anterior sector of petiolar node; node (viewed in profile) cuneate, vertex tapered; appearance of node shining and weakly striolate posteriad; 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 and weakly striolate posteriad; postpetiolar 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 foreparts dark yellowish-brown, gaster and antennal scape brown. Brachypterous alates not seen. Ergatoid or worker-female intercastes not seen.

QUEEN MEASUREMENTS: HML 2.27–2.43 HL 0.63–0.66 HW 0.58–0.61 CeI 91–95 SL 0.49–0.52 SI 83–86 PW 0.50–0.54 (n=9).

REMARKS.— *Monomorium xuthosoma* strongly resembles *M. termitobium* form '*binatu*' but can be distinguished from that form by its larger propodeal spiracle, the slightly different shape of the propodeum, its higher postpetiole and the pilosity of the promesonotum (at least four prominent pairs of erect setae present, including the infrahumeral pair). The queen is similar in form to that of '*binatu*', but the frons is markedly longitudinally striolate. The male is unknown. This unobtrusive member of the *M. rhopalocerum* complex is confined to Toliara province, where almost all specimens seen have come from the southwestern corner. One slightly aberrant worker (MCZ) was taken from Berenty Reserve, in the south-east. The species appears to be confined to spiny forest, where individuals have been taken from sifted litter and members of a colony were found in a rotten log.

THE *HANNELI*-GROUP

***Monomorium hanneli* Forel**

Figs. 26, 70–71.

Monomorium hanneli Forel, 1907a:18. Holotype ☿, KENYA: Mto-ya-Kifaru (Katona) (MHNG) [examined].
Monomorium moestum Santschi, 1914a:74, fig. 7. Syntype ☿ (lectotype here designated), KENYA: Naivasha (NHMB) [examined].
M. (*Notomyrmex*) *moestum* Emery, 1922:170. Syn. under *M. hanneli* Bolton, 1987: 426.
Monomorium valtinum Bolton, 1987:428. Holotype ☿, KENYA: Kilifi District, (MHNG) [examined]. syn. nov.

MATERIAL EXAMINED.— ***M. hanneli***: HOLOTYPE: ☿, Kenya, Mto-ya-Kifaru (Katona) (MHNG). 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. Holotype status based on monotypy (Code 73.1.2) is here

assumed. ***M. moestum***: LECTOTYPE: ☿, Kenya ('British East Africa'), Naivasha, Dec. 1911, Alluaud and Jeannel, 1900 m st. no. 14 (NHMB – Reg. No. 205a). Although described as a 'holotype' by Bolton (1987), Santschi gives a range of lengths for *M. moestum*, indicating more than one specimen was examined. The lectotype fixes the name for populations of *M. hanneli* with very large, dark workers. ***M. valtinum***: HOLOTYPE: ☿, Kenya, Kilifi District, Mahnert, V. & Perret, J-L., 29.x.1977 (MHNG) (See Bolton 1987 for measurements).

OTHER MATERIAL EXAMINED: **Prov. Antsiranana:** Ampasindava, Ambilanivy, 3.9 km 181 S Ambaliha 4–9.iii.2001 Fisher *et al*. (7☿, 1♀, 11♂); Forêt Anabohazo, 21.6 km 247 WSW Maromandia 11–16.iii.2001 Fisher *et al*. (1☿); Nosy Be, Rés. Lokobe, 6.3 km 112 ESE Hellville 19–24.iii.2001 Fisher *et al*. (6☿, 1♀); R.S. Manongarivo, 12.8 km 228 SW Antanambao 11.x.1998 B.L. Fisher (13☿). **Prov. Fianarantsoa:** R. S. Ivohibe, 6.5 km ESE Ivohibe, 24–30.x.1997 B.L. Fisher (1☿). **Prov. Mahajanga:** Forêt de Tsimembo 11.0 km 346 NNW Soatana 21–25.xi.2001 Fisher *et* al. (1☿); P.N. Ankarafantsika, Ankoririka, 10.6 km 13 NE Tsaramandroso 9–14.iv.2001 Rabeson *et al*. (2☿); P.N. Ankarafantsika, Tsimaloto, 2–8.iv.2001 18.3 km 46 NE Tsaramandroso Rabeson *et al*. (7☿); P.N. Tsingy de Bemaraha, 3.4 km 93 E Bekopaka 6–10.xi.2001 Fisher *et al*. (1♀, 4♂); P.N. Tsingy de Bemaraha, 2.5 km 62 ENE Bekopaka 11–15.xi.2001 Fisher *et al*. (1☿); Res. Bemarivo, 23.8 km 223 SW Besalampy Fisher *et al* 19–23.xi.2002 (1☿, 1♀). **Prov. Toamasina:** F. C. Andriantantely 4–7.xii.1998 (13☿, 1♀) 7–10.xii.1998 (27☿) H.J. Ratsirarson; F. C. Sandranantitra 18–21.i.1999 (15☿) 21–24.x.1999 (15☿) H.J. Ratsirarson; Mont. Akirindro, 7.6 km 341 NNW Ambinanitelo 17–21.iii.2003 Fisher *et* al. (1☿); Mont Anjanaharibe, 18.0 km 21 NNE Ambinanitelo 8–12.iii.2003 Fisher *et al*. (2☿). **Prov. Toliara:** Cap Sainte Marie, 14.9 km 261 W Marovato 13–19.ii.2002 Fisher *et al*. (7☿, 3♀); 10 km NW Enakara, Rés. Andohahela 24.xi.1992 B.L. Fisher (3☿); Rés. Berenty, Forêt Bealoka, 14.6 km 329 NNW Amboasary 3–8.ii.2002 Fisher *et al*. (1♀); Forêt de Petriky, 12.5 km W 272 Tolagnaro 22.xi.1998 B.L. Fisher (18☿, 2♀); P.N. Zombitse, 19.8 km 84 E Sakaraha 5–9.ii. 2003. Fisher *et al*. (10☿); P.N. Zombitse, 17.7 km 98 E Sakaraha 8.ii. 2003 Fisher *et al*. (12☿); Rés. Ambohijanahary, 35.2 km 312 NW Ambaravaranala 13–17.i.2003 Fisher *et al*. (1♀); R.S. Manongarivo, 10.8 km 229 SW Antanambao 8.xI.1998 B.L. Fisher (34☿, 11♀); S. F. Mandena, 8.4 km NNE 30 Tolagnaro 20.xi.1998 B.L. Fisher (26☿, 3♀); 2.7 km WNW 302 Ste Luce, 9–11.xii.1998 B.L. Fisher (2♀).

WORKER DESCRIPTION.— HEAD: Head rectangular; vertex planar or weakly concave; frons shining and smooth except for piliferous pits; pilosity of frons a mixture of incurved, semi-erect setae and slightly shorter decumbent setae. Eye small, eye width less than 1× greatest width of antennal scape; (in full-face view) eyes set above midpoint of head capsule; (viewed in profile) eyes set posteriad of 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 weakly to strongly defined; anteromedian clypeal margin emarginate, clypeal carinae terminating in blunt angles; paraclypeal setae moderately long and fine, curved; posteromedian clypeal margin extending slightly beyond level of posterior margin of antennal fossae. Anterior tentorial pits situated nearer antennal fossae than mandibular insertions; Frontal lobes sinuate, divergent posteriad. Psammophore absent. Palp formula 2,2. Mandibular teeth four; mandibles linear-triangular and smooth (except for piliferous pits); masticatory margin of mandibles strongly oblique; basal tooth approximately same size as t3 (four teeth present).

MESOSOMA: Promesonotum shining and mainly smooth, vestigial striolae, if present, confined to lower anterior mesopleuron; (viewed in profile) anterior promesonotum smoothly rounded, thereafter more-or-less flattened, promesonotum on same plane as propodeum; 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 few, mainly on sides of promesonotum. Metanotal groove strongly impressed, with distinct transverse costulae. Propodeum shining, dorsum and sides of propodeum mainly smooth, with weak to strong striolae on declivitous face and on metapleuron; propodeal dorsum slightly elevated anteriad and sloping away posteriad, propodeal angles not raised; propodeum distinctly angulate, propodeal angle sharp; length ratio of propodeal dorsum to its declivity about 3:2; standing propodeal setae consisting of one prominent pair anteri-

ad, with a few to many erect to decumbent setae on/around dorsal and declivitous faces of propodeum; appressed propodeal setulae very sparse or absent; propodeal spiracle nearer metanotal groove than declivitous face of propodeum. Vestibule of propodeal spiracle distinct in some specimens; propodeal lobes present as rounded flanges.

PETIOLE AND POSTPETIOLE: Petiolar spiracle lateral and situated within anterior sector of petiolar node; node (viewed in profile) cuneate, vertex tapered; appearance of node shining and smooth throughout; ratio of greatest node breadth (viewed from front) to greatest node width (viewed in profile) between 4:3 and1:1; anteroventral petiolar process present as a thin flange tapering posteriad; ventral petiolar lobe present; height ratio of petiole to postpetiole between 4:3 and 1:1; height–length ratio of postpetiole between 3:4 and 1:2; postpetiole shining and smooth; postpetiolar sternite depressed at about its center, with anterior process developed as a short, conspicuous spur angled at 45–90, or, not depressed at midpoint, its anterior end an inconspicuous lip or small carina.

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

GENERAL CHARACTERS: Color yellowish to tawny orange. Worker caste monomorphic.

HOLOTYPE MEASUREMENTS (*M. hanneli*): HML 1.43 HL 0.51 HW 0.43 CeI 84 SL 0.35 SI 81 PW 0.31.

LECTOTYPE MEASUREMENTS (*M. moestum*): HML 1.60 HL 0.56 HW 0.49 CeI 88 SL 0.38 SI 78 PW 0.34.

OTHER WORKER MEASUREMENTS (non-types): HML 1.22–1.49 HL 0.45–0.54 HW 0.38–0.45 CeI 82–87 SL 0.31–0.38 SI 82–86 PW 0.28–0.33 (n=20).

QUEEN DESCRIPTION.— HEAD: Head rectangular; vertex weakly concave or planar; frons shining and smooth except for piliferous pits and a few striolae around antennal sockets and frontal carinae; 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 anteriad, convexity reduced posteriad; 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 3:2 and 4:3; axillae contiguous, or nearly so; standing pronotal/mesoscutal setae consisting of a mixture of incurved, semi-erect setae and slightly shorter decumbent setae; appressed pronotal, mescoscutal and mesopleural setulae few, mainly on sides of pronotum and mesopleuron. Propodeum shining and smooth, metapleuron with a few distinct striolae; propodeum angulate, propodeal angle blunt, or, distinctly angulate, propodeal angle sharp; propodeal dorsum flat throughout most of its length, or, sloping posteriad, and depressed between raised propodeal angles; standing propodeal setae consisting of one pair of prominent setae anteriad, with a few smaller, erect to decumbent setae on and around dorsal and declivitous faces; appressed propodeal setulae very sparse or absent; propodeal spiracle equidistant from metanotal groove and declivitous face of propodeum; propodeal lobes present as well-developed, rounded flanges.

WING: Wing veins tubular and strongly sclerotised; vein m–cu present in some individuals; vein cu–a present.

PETIOLE AND POSTPETIOLE: Petiolar spiracle lateral and situated slightly anteriad of petiolar node, or, lateroventral and situated within anterior sector of petiolar node; node (viewed in profile) cuneate, vertex tapered; appearance of node shining and smooth; ratio of greatest node breadth

(viewed from front) to greatest node width (viewed in profile) between 3:2 and 1:1; anteroventral petiolar process absent or vestigial; height ratio of petiole to postpetiole about 4:3; height–length ratio of postpetiole between 3:2 and 4:3; postpetiole shining and smooth; postpetiolar sternite depressed at about its center, with anterior process developed as a short, conspicuous spur angled at 45–90º, or, 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 yellow-orange, gaster may have brownish tint. Brachypterous alates not seen. Ergatoid or worker-female intercastes not seen.

QUEEN MEASUREMENTS: HML 1.40–1.71 HL 0.47–0.57 HW 0.41–0.48 CeI 84–89 SL 0.34–0.41 SI 80–85 PW 0.31–0.44 (n=20).

MALE DESCRIPTION.— HEAD: (In full-face view) head width–mesosoma width ratio between 1:1 and 3:4; frons finely micropunctate. Compound eyes protuberant and elliptical; margin of compound eye clearly separated from posterior margin of clypeus. Ocelli not turreted. Ratio of length of first funicular segment of antenna to second funicular segment between 2:3 and 1:2. Maximum number of mandibular teeth and denticles two.

MESOSOMA: Mesoscutum broadly convex; a few vestigial striolae on dorsum of mesoscutum, otherwise smooth and shining; parapsidal furrows vestigial or absent; notauli absent; axillae separated by width of at least one axilla.

WING: Wing veins with vein M indistinct distally, otherwise tubular and sclerotised; vein m–cu absent; vein cu–a present.

PETIOLE AND POSTPETIOLE: Petiolar spiracle lateral and situated within anterior sector of petiolar node; node (viewed in profile) cuneate, vertex tapered, or, conical, vertex tapered; appearance of node shining and smooth; ratio of greatest node breadth (viewed from front) to greatest node width (viewed in profile) between 3:2 and 4:3, or, 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 about 3:2; postpetiole shining and smooth.

GASTER: Pilosity of first gastral tergite consisting of well-spaced, semi-erect setae.

GENERAL CHARACTERS: Color brown, head darker, appendages light brown.

MALE MEASUREMENTS: HML 1.34–1.61 HL 0.44–0.48 HW 0.39–0.44 CeI 88–98 SL 0.11–0.13 SI 28–31 PW 0.44–0.52 (n=11).

REMARKS.— *Monomorium hanneli* is distinctive throughout its range, being the only member of its species group in Madagascar. The main variation is a pale worker morphotype that has been found in most of the major collection localities, usually in the same transects, as the normal, darker morphotype. Since it has occasionally been collected in the same pitfall trap or in a pitfall trap adjacent to one in which the darker morphotype has been captured, it may conceivably occur within the same nests. This, however, cannot be established with certainty, as only one CAS nest series of just eight workers of this small species is known. The normal worker is usually yellow-orange to tawny orange, with a distinct metanotal groove and angulate propodeum. Well-spaced, erect setae are the usual pilosity pattern on the gaster and the antennal scape, the latter also possessing decumbent setae. The pale yellow or orange form has a much more rounded mesosoma profile, almost crescentic, with a less angulate propodeum. The head in profile is rather fuller than the normal morphotype, which, together with the rounded mesosoma, gives the ant somewhat of a bloated appearance. The gastral setae are abundant and decumbent, the setae on the scape decumbent or appressed. The appearance is reminiscent of a larger *M. chnodes*. Whatever the reason for these differences, the pale workers are not simply tenerals, since their morphology differs from that of other workers. Queens of the pale morphotype also exist, and the same differences in pilosity noted above are the

major distinction between these and the normal, darker form. The queen is a bright orange. The distinction between the two forms, however, is not clear-cut and individuals with an intermediate appearance occasionally occur.

Bolton (1987) separated two ostensibly different Kenyan forms, the smaller *Monomorium valtinum* and the larger *M. hanneli*, principally on the basis of the smaller eye in *M. valtinum*. This researcher had relatively few specimens available to him and these excluded queens and males. In Madagascar, by contrast, what I take to be *M. hanneli* is very common and I have been able to examine hundreds of specimens, including over twenty queens and around a dozen males (my descriptions being based on 20 of the former and 11 of the latter). The size of the eye is clearly variable: the number of ommatidia in workers examined ranges from six, in paired rows of three, to at least sixteen with three transverse rows of four ommatidia. On one pin holding three workers of a nest series, the middle worker had 16 ommatidia visible under a stereomicroscope, the other two 11. The body size of Malagasy workers also overlaps the parameters of the morphometric measurements given by Bolton for the two taxa. For this reason, I consider *M. valtinum* and *M. hanneli* to be representatives of the same species, and *M. valtinum* becomes a junior synonym in this work. The queens and males generally have lightly-sclerotized wing veins, with vein M indistinct distally in the male. Vein m–cu has been absent from the wings of all males examined thus far, but is occasionally present in alate queens.

The types described from African worker material differ from Malagasy material in being slightly (*Monomorium hanneli*, *M. valtinum*) to considerably (*M. moestum*) darker with a more brownish or reddish tinge to the cuticle, and in having very small but sharp clypeal denticles. Malagasy populations of this ant range from yellow to tawny orange, and the anteromedian clypeal margin is either straight or weakly emarginate with blunt to sharp angles rather than denticles. I understand these to be non-significant differences, *M. hanneli* revealing considerable variation in color and morphology among both African and Malagasy populations.

Monomorium hanneli has been collected throughout the island of Madagascar, most frequently near the coast. The usual habitat is rainforest, though it also occurs in dry tropical forest and spiny forest. Sifted leaf litter has been the usual collection method, but the nest series was taken from under a stone.

THE *HILDEBRANDTI*-GROUP

***Monomorium adiastolon* Heterick, sp. nov.**
Figs. 27, 72.

ETYMOLOGY.— Greek '*adiastolos*' ('confused') [i.e., with two other very similar species]

MATERIAL EXAMINED.— HOLOTYPE: ☿, **Prov. Antsiranana**, R.S. Manongarivo, 17.8 km 218 SW Antanambao, 1580 m 14º01′3″S, 48º25′1″E 27.x.1998 B.L. Fisher 1972/beating low vegetation, montane rainforest/1972(17)–3 (CAS). PARATYPES: **Prov. Antsiranana** (specimens with same collection data as holotype): One ergatoid (BMNH); 2☿ (MCZ).

OTHER MATERIAL EXAMINED: **Prov. Antsiranana:** 11.0 km WSW Befingotra, Res. Anjanaharibe-Sud, 16.xi.1994 B. (2☿) 18.xi.1994 (4☿, 5♀) 20.xi.1994 (3☿, 2♀) L. Fisher; R.S. Manongarivo, 12.8 km 228 SW Antanambao 11.x.1998 B.L. Fisher (2☿); R.S. Manongarivo, 14.5 km 220 SW Antanambao 20.x.1998 B.L. Fisher (1☿).

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 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 posteriad of midline of head capsule; eye elliptical,