

THE *TOSCHII* CLADE

This clade includes two species only: *toschii* and *terroni*, both from the African tropics. *Toschii* and *terroni* share the blunt propodeal spines and the frontal carinae very close to each other and posteriorly fused. Another character shared by these two species is the first gastral sternite strongly protruding anteriorly. This character is not specifically considered in our cladistic analysis because it appears in an unpredictable way among the other species of the genus.

Proceratium toschii (Consani)

Fig. 118

Sysphincta toschii Consani, 1951: 167, fig. 1. "Worker". Original description. Type locality: Nairobi, Kenya. Type material: holotype sub-ergatoid gyne labelled: "Kenia, Nairobi, IX-45, S. Patrizi leg., *Sysphincta toschii* Cons., 1949 det. M. Consani" in DIVA, examined.

Proceratium toschii Consani, Brown, 1958: 248. First combination in *Proceratium*.

DIAGNOSIS. A *Proceratium* species belonging to the *toschii* clade and differing from its sister species, *terroni*, in the worker, by the presence of suberect, long hairs on the head and on the mesosoma.

DESCRIPTION. *Sub-ergatoid gyne* (Fig. 118). The sole known specimen exhibits a regular worker morphology coupled with the presence of large eyes and of the anterior ocellus. Head slightly longer than broad, with the sides weakly diverging posteriorly. Vertex convex. Clypeus medially reduced, subconvex, with superficially crenulate margin and about as long as the antennal socket. Antennal socket with broad torulus. Frontal carinae raised, very close each other on the two anterior thirds weakly diverging posteriorly and on the last third connected each other and almost perpendicular to the cephalic capsule. Lateral expansions of the frontal carinae narrow. Genal carinae absent. Gular area not impressed. Eyes relatively large, with ca. 25 ommatidia and below the midline of the head. Anterior ocellus present and developed. First funicular joint 1/5 longer than broad. Funicular joints 2-10 broader than long. Last funicular joint about as long as the sum of joints 7-10. Scapes much short of the vertexal margin and gently thicken-

ing apically. Masticatory margin of the mandibles with 3-4 denticles before the pointed apical tooth. Palp formula not visible in the sole known specimen.

Mesosoma about as long as the maximum head length (mandibles included), convex dorsally. Propodeal suture superficially impressed dorsally. Promesopleural and meso-metapleural sutures impressed ventrally only. Basal face of the propodeum gently declivous posteriorly. Area between the basal and declivous faces with a relatively large, blunt tooth on each side. Propodeal lobes subround. Propodeal spiracle small, round and placed above mid height of the propodeum in lateral view. Metapleural gland with inflated and transparent bulla.

Petiole with weakly cuneiform apex in profile broader than long, in dorsal view; its sides shortly diverging anteriorly and convex posteriorly. Anterior border of the petiole concave and marginate, the margin toothed on each side. Ventral process of the petiole lamelliform and subrectangular. Postpetiole in dorsal view broader than the petiole and with posteriorly diverging sides. Postpetiolar sternite anteromedially with a marked subconvex projection. Posterior half of the postpetiolar sternite convex. Constriction between postpetiole and gaster impressed. Gastral tergite I strongly convex and about 1/4 longer than the postpetiole. Gastral sternite I subround and projecting anteriorly. Remaining gastral tergites and sternites curved ventrally.

Legs slender but not very elongate. All tibiae with a pectinate spur. Spurs of fore legs without basal spine. Fore basitarsi longer than the mid ones. Hind basitarsi about 1/5 shorter than hind tibiae. Tarsomeres of mid and hind legs missing in the holotype. Pretarsal claws of fore legs simple. Arolium of fore legs developed.

Sculpture. Head, mesosoma and petiole granulate, the granulation more marked on the head. Postpetiole, gaster and legs smooth and with sparse, minute, superficial punctures.

Body covered by the following types of hairs (only the head and part of the mesosoma have well preserved hairs): (1) short, dense, suberect, on the head and mesosoma; (2) longer than type (1), suberect, rare on the head, on the mesosoma and on the scapes; (3) long, subdecumbent on the petiole, postpetiole and gaster; (4) shorter than hair type (1), dense, subdecumbent

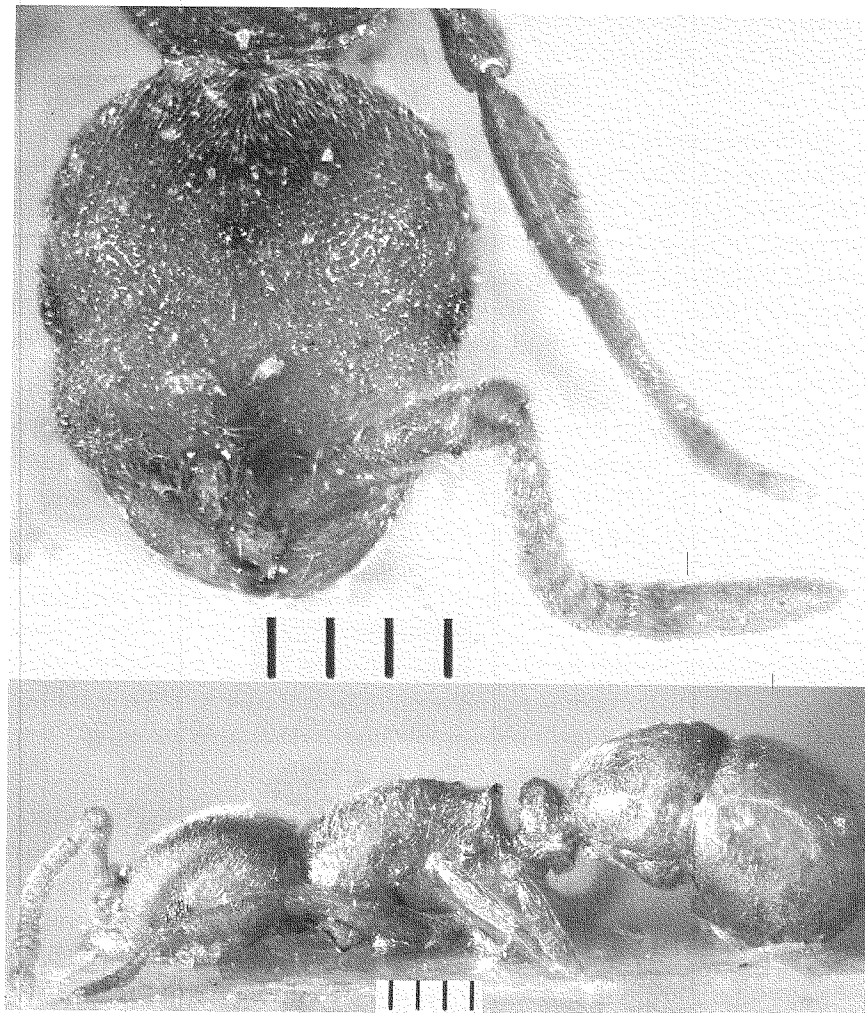


Fig. 118 – *Proceratium toschii* Consani. Sub-ergatoid gyne (holotype) from Nairobi, Kenya: head (top) in dorsal view and meso- and metasoma (bottom) in side view. Distance between two scale bars 0.1 mm.

and decumbent on the funicular joints. In addition the funicular joints bear whitish, thick, appressed, short, sparse hairs.

Colour light brown; area behind the ocelli darker.

Measurements in mm and Indices: TL 3.17; HL 0.77; HW 0.72; EL 0.10; SL 0.53; WL 0.88; PeL 0.25; PeW 0.28; HFeL 0.58; HTiL 0.48; HBaL 0.40; LS4 0.15; LT4 0.65; CI 93.5; SI 68.8; IGR 0.23.

MATERIAL EXAMINED: KENYA: Nairobi, IX.1945, 1 worker (holotype), S. Patrizi [DIVA].

DISCUSSION. *P. toschii* is the sister species of *terroni* to which it resembles in general body shape. In addition to the pilosity already mentioned in the respective diagnoses, the two species should differ also by the head shape, if the material we have been able to see is representative. The sole two specimens representing these two species known so far differ also for the presence of eyes in *toschii* (absent in *terroni*). Since the *toschii* holotype is likely to be a sub-ergatoid gyne, we don't attribute much importance to this character.

DISTRIBUTION: Kenya.

***Proceratium terroni* Bolton**

Figs. 119, 120

Proceratium coecum Terron, 1981: 91, fig. 2 worker. Worker. Original description. Type locality: Kala, Cameroon. Type material: worker labelled: "P. sp. 2 OL, Cameroun: Kala, 950 m, (18 km W Yaoundé), tamisage tissu ligneux en decomposition, 10.X.1972, G. Terron Leg., *Proceratium coecum* Terron, Holotype"; in CIRA, examined.

Proceratium terroni Bolton, 1995: 367. Replacement name for *P. coecum* Terron. Nec *Ponera caeca* Donisthorpe, 1949; junior synonym of *Proceratium papuanum* Emery (q. v.)

DIAGNOSIS. A *Proceratium* species belonging to the *toschii* clade and differing from its sister species *toschii*, in the worker, by the lack of suberect, long hairs on the head and on the mesosoma.

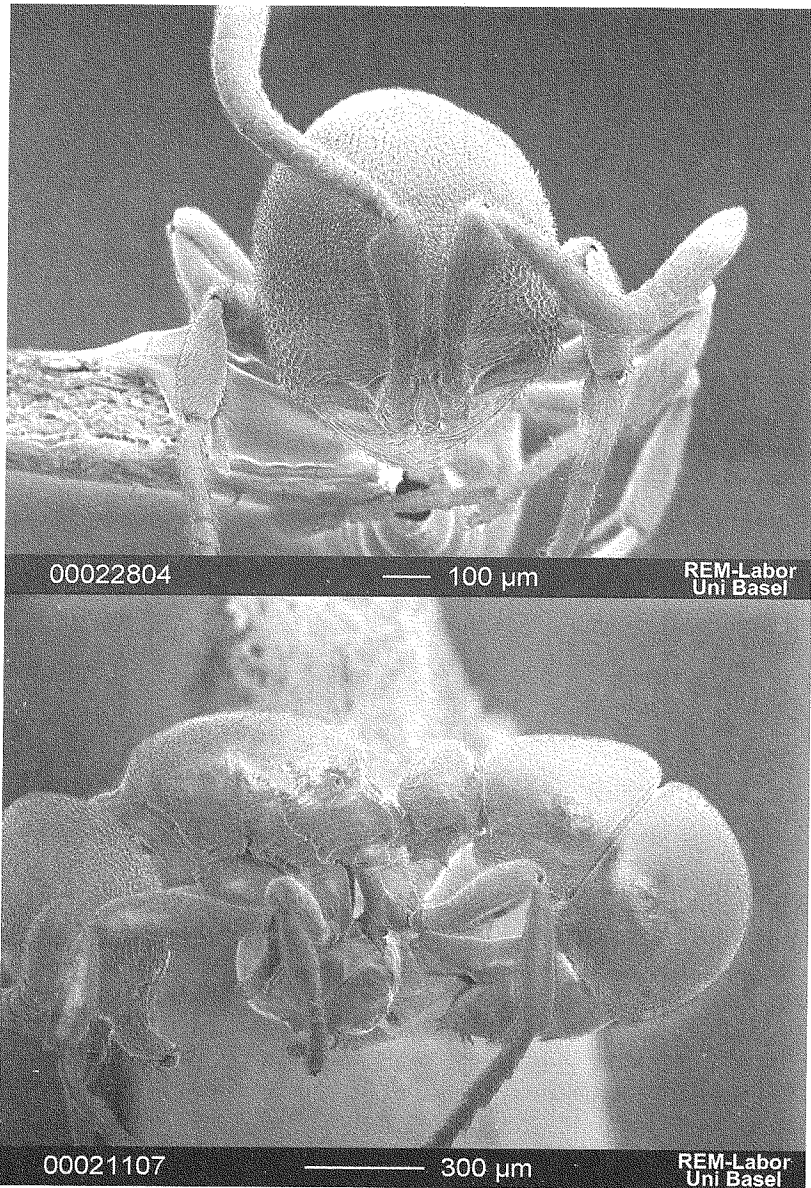


Fig. 119 – *Proceratium terroni* Bolton. Worker (holotype) from Kala, Cameroon: head (top) in dorsal view and meso- and metasoma (bottom) in side view.

DESCRIPTION. *Worker* (Figs. 119 & 120). Head longer than broad, with weakly convex sides gently converging into a strongly convex vertex. Clypeus medially reduced, subconvex, between the and about as long as the antennal sockets. Antennal socket with broad torulus. Frontal carinae raised, very close each other on the two anterior thirds gently convex and connected each other and almost perpendicular to the head capsule on the last third. Lateral expansions of the frontal carinae narrow. Anterolateral area close to the antennal insertions impressed. Genal carina absent. Gular area not impressed. Eyes absent. First funicular joint slightly longer than broad. Funicular joints 2-10 much broader than long. Last funicular joint about as long as the sum of joints 7-10. Scapes much short of the vertexal margin and gently thickening apically. External border of the mandibles flat. Masticatory margin of the mandibles with 3 denticles before the pointed apical tooth. Palp formula 3,2.

Mesosoma gently convex and shorter than maximum head length (mandibles included) in profile. Promesopleural and meso-metapleural sutures impressed ventrally only. Basal face of the propodeum gently declivous posteriorly. Area between the basal and declivous faces of the propodeum gently concave medially and with a blunt tooth on each side. Propodeal lobes subround. Propodeal spiracle round and above the mid height in lateral view. Metapleural gland bulla inflated and transparent.

Petiole with the anterior half sloping anteriorly and with the posterior half convex in profile, broader than long in dorsal view; its sides anteriorly shortly diverging and posteriorly convex. Anterior border of the petiole V-shaped and marginate. Ventral process of the petiole lamelliform, subrectangular with concave ventral margin. Postpetiole in dorsal view with the anterior border slightly broader than the petiole; its sides gently diverging posteriorly. Postpetiolar sternite anteromedially with a large subconvex projection. Posterior half of the postpetiolar sternite convex. Constriction between postpetiole and gaster impressed. Gastral tergite I strongly convex and slightly longer than the postpetiole. Gastral sternite I subround and strongly projecting anteriorly. Remaining gastral tergites and sternites curved ventrally.

Legs slender and slightly elongate. All tibiae with a pectinate spur. Spurs of fore legs without basal spine. Fore basitarsi longer than the mid ones.

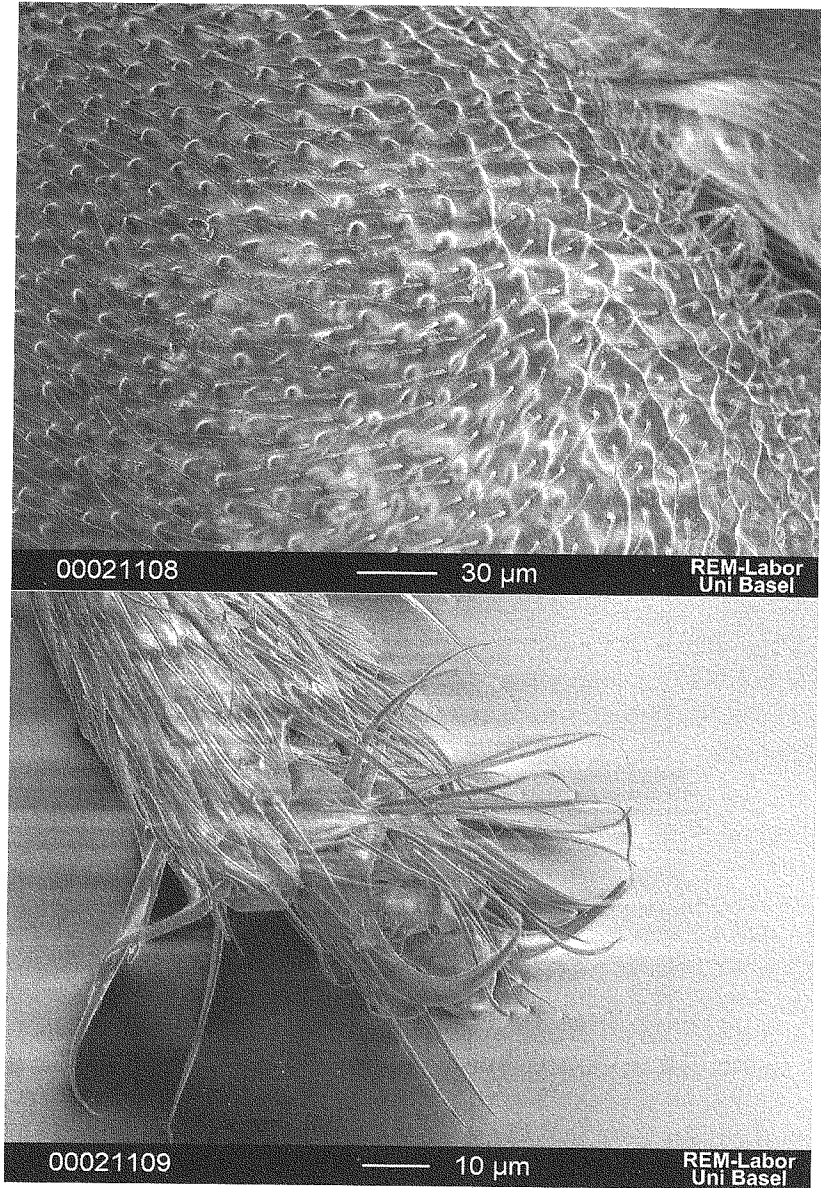


Fig. 120 – *Proceratium terroni* Bolton. Worker (holotype) from Kala, Cameroon: magnification of the cephalic sculpture (top) and arolium of the fore leg (bottom).

Hind basitarsi 1/5 shorter than hind tibiae. Second tarsomere of hind legs subequal in size to the pretarsus. Pretarsal claws simple. Arolia developed.

Sculpture. Head, mesosoma and petiole granulate, the granulation strongly marked on the head and on the mesosoma, superficial on the petiole. Postpetiole, gaster and legs smooth and with sparse, minute, superficial, piligerous punctures.

Body covered by hairs of three main types: (1) short, dense, decumbent on the whole body, absent from the posterior half of the metapleurae, on the postero-lateral sides of the petiole and on the postpetiolar sternite; (2) longer than type (1), subdecumbent and restricted only on the posterior half of the metapleurae, on the postero-lateral sides of the petiole and on the postpetiolar sternite; (3) shorter than hair type (1), dense, subdecumbent and decumbent on the funicular joints. In addition the funicular joints bear whitish, thick, appressed, short, sparse hairs.

Colour light brown.

Measurements in mm and Indices: TL 2.53; HL 0.69; HW 0.61; EL absent; SL 0.46; WL 0.70; PeL 0.21; PeW 0.25; HFel 0.48; HTiL 0.38; HBaL 0.27; LS4 0.12; LT4 0.44; CI 88.4; SI 66.7; IGR 0.27.

MATERIAL EXAMINED: CAMEROON: Kala, 18 km W Yaoundé, 950 m, tamisage tissu ligneux en decomposition, 10.X.1972, 1 worker (holotype), G. Terron [CIRA].

DISCUSSION. *P. terroni* is the sister species of *toschii* (q. v.). The discussion under the latter species contains the little which can be said about their presumed relationships. Another character not considered in our data matrix appears to stress the similarity between *toschii* and *terroni*: the shining postpetiole, a relatively rare trait appearing only among a few species of the *silaceum* clade.

DISTRIBUTION: Cameroon.

THE *ARNOLDI* CLADE

This clade includes four species: *arnoldi*, *burundense*, *lunatum* and *galilaeum*. The first three species inhabit the African continent, while *P. galilaeum* is known from Israel only. The species belonging to this clade share a pair of transparent maculae on the vertexal angles and the presence of an often salient, transparent bulla on the posterior border of the postpetiole.

Proceratium lunatum Terron

Fig. 121

Proceratium lunatum Terron, 1981: 96, fig. 1. Worker. Original description. Type locality: Mbalmayo, Kala and U. O. Bikok, Cameroon. Type material: holotype worker labelled: Cameroun: Arboretum de Mbalmayo (51 km D de Yaoundé), 17.III.1968, G. Terron leg., *Proceratium lunatum* Terron, Holotype, 1759 sp. 1", in CIRA; one paratype worker labelled: Cameroun: Kala (18 km W Yaoundé), Ve Berlèse, sp. 1, tamisage terre et terreau, 16.V.1974, G. Terron Leg., *Proceratium lunatum*, Paratype" in CIRA; two paratype workers labelled: "1759, Mbalmayo, Cameroun, 17.III.1968, Paratypus, *Proceratium lunatum*, G. Terron, 1981" in BMNH, MNHN; one paratype worker labelled: "UO Bikok, Cameroun, 19.III.1974, (G. Terron); Paratypus, *Proceratium lunatum* Terron", in MHNG, examined.

DIAGNOSIS. A *Proceratium* species belonging to the *arnoldi* clade and differing from its sister species, *burundense*, by the larger and deeper integumental foveae and by the deeper sculpture on the gaster in the worker.

DESCRIPTION. *Worker* (Fig. 121). Head slightly longer than broad, its sides gently diverging posteriorly. Vertex in full face view almost straight in the middle, in full dorsal view flat and bearing on each side a round, semi-transparent macula. Clypeus medially reduced, subconvex or almost straight, between and as long as or slightly longer than the antennal sockets. Anterior border of the clypeus minutely crenulate. Antennal socket with broad torulus. Frontal carinae slightly distant from each other, partially covering the antennal insertions. Frontal area concave posteriorly, the concavity connected to a longitudinal carina prolonging posteriorly. Lateral expansions of the frontal carinae narrow, slightly raised, diverging on the two an-

terior thirds and slightly converging on the posterior third. Genal carinae marked, each carina corresponding to the external border of a deep sulcus. Eyes small, recognisable as a dark dot below the integument and placed on the midline of the head. First funicular joint slightly longer than broad. Funicular joints 2-10 broader than long. Last funicular joint about as long as the sum of joints 7-10. Scapes much short of the vertexal margin and gently thickening apically. External border of the mandibles concave. Masticatory margin of the mandibles with 3 denticles before the pointed apical tooth. Palp formula 3,2.

Mesosoma convex in profile and as long as the maximum head length (mandibles included). Basal face of the propodeum gently declivous posteriorly. Area between the basal and declivous faces of the propodeum gently concave. Basal and declivous faces of the propodeum separate laterally by a lamellaceous tooth. Sides of the declivous face of the propodeum with a broader and obtuse posteriorly lamella. Lower mesopleurae with well defined sutures, their posterior half inflate and smooth. Propodeal spiracle round and above mid height in lateral view.

Petiolar node convex in profile, the dorsum of the node declivous posteriorly and bearing an irregular point postero-medially. Petiole in dorsal view with diverging sides on the anterior sixth and convex posteriorly. Anterior border of the petiole almost straight and carinate, the carina angulate on each side. Ventral process of the petiole lamellaceous, subrectangular, the lamella slightly pointed posteriorly. Postpetiole anteriorly broader than the petiole; its sides gently convex. Postpetiolar dorsum with a postero-medial, transparent, raised bulla below the integument. Postpetiolar sternite anteromedially with a marked subtriangular projection. Postpetiolar sternite in side view strongly convex posteriorly. Constriction between postpetiole and gaster impressed. Gastral tergite I convex on the curvature and with a postero-medial transparent, raised bulla below the integument. Remaining gastral tergites and sternites curved ventrally.

Legs slender but not very elongate. All tibiae with a pectinate spur. Spurs of fore legs without basal spine. Fore basitarsi longer than the mid ones. Hind basitarsi about 1/4 shorter than hind tibiae. First tarsomere of hind legs subequal in size to the pretarsus. Pretarsal claws simple. Arolia developed.

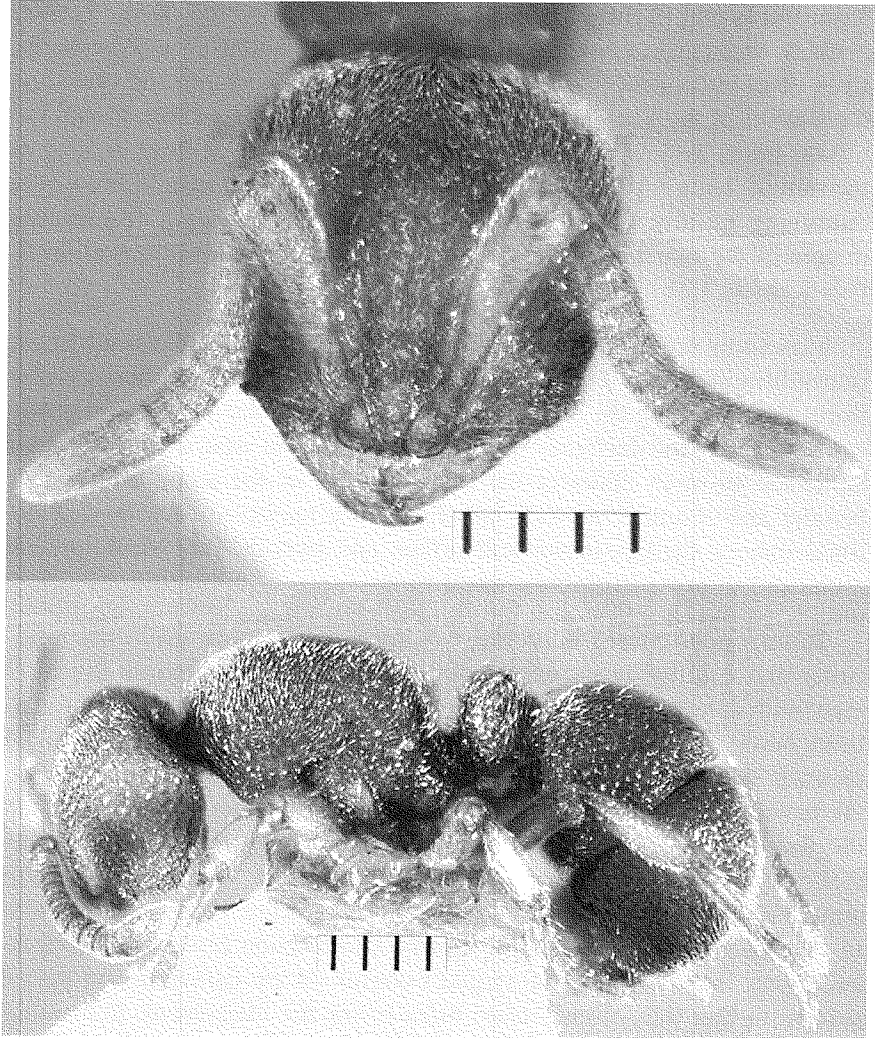


Fig. 121 – *Proceratium lunatum* Terron. Worker (paratype) from Mbalmayo, Cameroon: head (top) in dorsal view and meso- and metasoma (bottom) in side view. Distance between two scale bars 0.1 mm.

Sculpture. Head, mesosoma, petiole, postpetiole and gaster irregularly foveolate and granulate, the foveae slightly shallower and sparser on the head. Gaster with additional longitudinal, irregular, thin rugosities. Legs punctate.

Body covered by hairs of three main types: (1) short, dense, subdecumbent on the whole body, slightly shorter, sparse and suberect on the funicular joints; (2) longer than type (1), very sparse and subdecumbent on the whole body, rare and slightly shorter on the scapes, slightly denser, longer and more raised on the propodeum, on the petiole, on the postpetiolar sternite and on the femora; (3) shorter than hair type (1), dense and decumbent on the funicular joints only. In addition the funicular joints bear whitish, thick, appressed, short, sparse hairs.

Colour. Light ferruginous-brown with lighter antennae and legs.

Measurements in mm and Indices: TL 2.93-2.95; HL 0.71-0.73; HW 0.67-0.68; EL 0.03-0.04; SL 0.47-0.49; WL 0.85-0.86; PeL 0.28-0.29; PeW 0.34-0.36; HFeL 0.52-0.54; HTiL 0.44-0.45; HBaL 0.33; LS4 0.18-0.19; LT4 0.48-0.52; CI 93.0-94.4; SI 66.2-67.1; IGR 0.36-0.38.

MATERIAL EXAMINED: CAMEROON: Arboretum de Mbalmayo (51 km S de Yaoundé), 17.III.1968, 1 worker (holotype), G. Terron [CIRA]; Mbalmayo, 17.III.1968, 2 workers (paratypes), G. Terron [BMNH, MNHN]; Kala (18 km W Yaoundé), tamisage terre et terreau, 16.V.1974, 1 worker (paratype), G. Terron [CIRA]; UO Bikok, 19.III.1974, 1 worker (paratype), Berlesate, G. Terron [MHNG].

DISCUSSION. *P. lunatum* is the sister species of *burundense* with which it shares synapomorphically the foveolate sculpture of the gaster. The extent of this structure, however, represents the easiest way to distinguish the two species.

DISTRIBUTION: Cameroon.

Proceratium burundense de Andrade n. sp.

Fig. 122

TYPE MATERIAL: holotype worker (unique) from Burundi labelled: "Burundi, Bujumbura, 4.III.77, A. Dejean" in BMNH.

DERIVATIO NOMINIS: "*burundense*" is a neologism indicating the provenance from Burundi.

DIAGNOSIS. A *Proceratium* species belonging to the *arnoldi* clade and differing from its sister species, *lunatum*, in the worker, by the head more elongate and the scape longer and less robust, by the smaller and more superficial foveae over the whole integument and by the subtler sculpture on the gaster.

DESCRIPTION. *Worker* (Fig. 122). Head slightly longer than broad, its sides weakly convex. Vertex in full face view slightly convex, in full dorsal view flat and bearing on each side a round, semitransparent macula. Clypeus medially reduced, subconvex, between the and slightly longer than the antennal sockets. Anterior border of the clypeus minutely crenulate. Antennal socket with broad torulus. Frontal carinae far from each other, partially covering the antennal insertions. Frontal area concave posteriorly, the concavity connected to a longitudinal carina prolonging posteriorly. Lateral expansions of the frontal carinae broader than in *lunatum*, slightly raised, diverging on the two anterior thirds and slightly converging on the posterior third. Genal carinae marked, each carina corresponding to the external border of a deep sulcus. Eyes relatively large, composed by 9 ommatidia and placed on the midline of the head. First funicular joint slightly longer than broad. Funicular joints 2-10 broader than long. Last funicular joint about as long as the sum of joints 7-10. Scapes much shorter than the vertexal margin and gently thickening apically. External border of the mandibles concave. Masticatory margin of the mandibles with 3-4 denticles before the pointed apical tooth. Palp formula 3,2.

Mesosoma convex in profile and slightly longer than the maximum head length (mandibles included). Basal face of the propodeum gently declivous posteriorly. Area between the basal and declivous faces of the propodeum weakly concave. Basal and declivous faces of the propodeum separate laterally by a lamellaceous tooth. Sides of the declivous face of the propodeum

with a broader and posteriorly obtuse lamella. Lower mesopleurae with well defined sutures, their posterior half strongly inflate and smooth. Propodeal spiracle round and above mid height in lateral view.

Petiolar node subconvex in profile, the dorsum of the node almost flat and bearing an irregular point postero-medially. Petiole in dorsal view with the sides diverging on the anterior fifth and convex posteriorly; its anterior border almost straight, carinate and laterally denticulate. Ventral process of the petiole lamelliform, subrectangular, the lamella strongly pointed posteriorly. Postpetiole anteriorly broader than the petiole; its sides gently convex. Postpetiolar dorsum with a postero-medial, semitransparent, flat bulla below the integument. Postpetiolar sternite anteromedially with a marked subtriangular projection. Postpetiolar sternite strongly convex posteriorly in profile. Constriction between postpetiole and gaster impressed. Gastral tergite I convex on the curvature and with a postero-medial, semitransparent, flat bulla below the integument. Remaining gastral tergites and sternites curved ventrally.

Legs slender and more elongate than in *lunatum*. All tibiae with a pectinate spur. Spurs of fore legs without basal spine. Fore basitarsi longer than the mid ones. Hind basitarsi about 1/4 shorter than hind tibiae. First tarsomere of hind legs subequal in size to the pretarsus. Pretarsal claws simple. Arolia present.

Sculpture. Head, mesosoma, petiole, postpetiole and gaster with small, irregular foveae and granulate, the foveae smaller, shallower and sparser on the anterior third of the first gastral tergite. Gaster with additional longitudinal, irregular, thin rugosities on the posterior two thirds. Legs punctate.

Pilosity similar to *lunatum* but the hair type (1) suberect and subdecumbent and type (2) sparser.

Colour. Light ferruginous-brown with lighter legs.

Measurements in mm and Indices: TL 3.44; HL 0.79; HW 0.72; EL 0.06; SL 0.54; WL 1.02; PeL 0.33; PeL 0.33; PeW 0.38; HFeL 0.59; HTiL 0.51; HBaL 0.39; LS4 0.24; LT4 0.61; CI 91.1; SI 68.3; IGR 0.39.

MATERIAL EXAMINED: BURUNDI: Bujumbura, 4.III.1977, 1 worker (holotype), A. Dejean [BMNH].

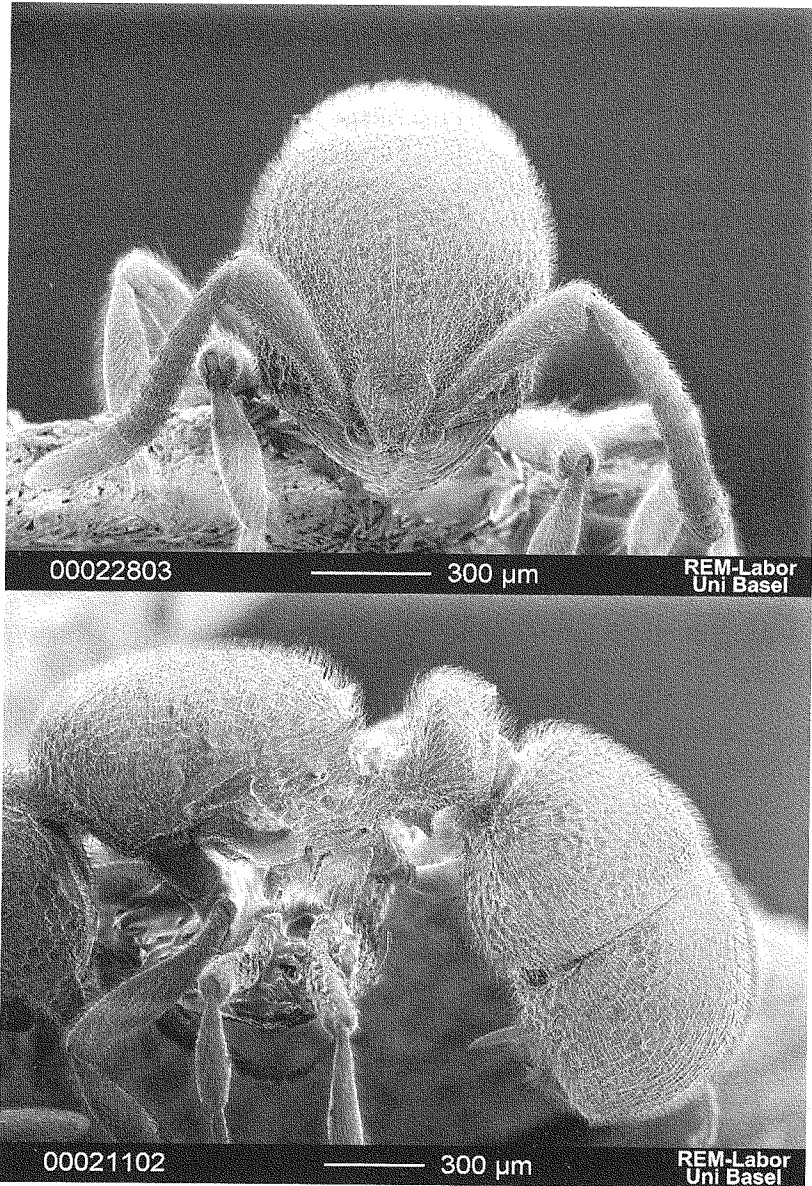


Fig. 122 – *Proceratium burundense* de Andrade. Worker (holotype) from Bujumbura, Burundi; head (top) in dorsal view and meso- and metasoma (bottom) in side view.

DISCUSSION. *Burundense*, known on one worker only, is the sole *Proceratium* species in which what we regard as a true worker has compound eyes. The sole worker of *P. toschii* also has well-developed eyes composed by 25 ommatidia but in this specimen the anterior ocellus is also well-developed. A true worker of *cubanum* has eyes consisting of a single convex facet as the other workers of the clade where it belongs. A second *cubanum* worker with well defined ommatidia, ocular pilosity and traces of ocelli is considered as sub-ergatoid in this paper (see the discussion under *convexiceps*).

DISTRIBUTION: Burundi.

***Proceratium arnoldi* Forel**

Fig. 123

Proceratium (Sysphincta) Arnoldi Forel, 1913: 210. Worker. Original description. Type locality: Bulawayo, Zimbabwe. Type material: holotype worker labelled: "Bulawayo (Arnold). *Sysphincta* Roger, sp. *Proceratium (Sysphincta) arnoldi* For., type" in MHNG, examined. A worker from Bulawayo, S. Rhodesia, 29.III.1913, G. Arnold, Arnold Coll. B.M.1934-354, labelled as syntype in BMNH is likely to be the specimen on which Arnold (1915) based his description and was probably never examined by Forel.

Sysphincta Arnoldi Forel, Arnold, 1915: 35. First combination in *Sysphincta*.

Proceratium arnoldi Forel, Brown, 1958a: 247. Figs. 1, 34-35 (worker).

DIAGNOSIS. A *Proceratium* species belonging to the *arnoldi* clade and resulting as outgroup of *lunatum* and *burundense*, and differing from both species, in the worker, by the sculpture more superficial and by the first gastral tergite more than 1/4 longer than the postpetiole instead of at least 1/7 of the length of the postpetiole.

DESCRIPTION. *Worker* (Fig. 123). Head longer than broad, with the sides gently diverging posteriorly. Vertex in full face view weakly convex. Clypeus medially reduced, gently convex, between the and slightly longer

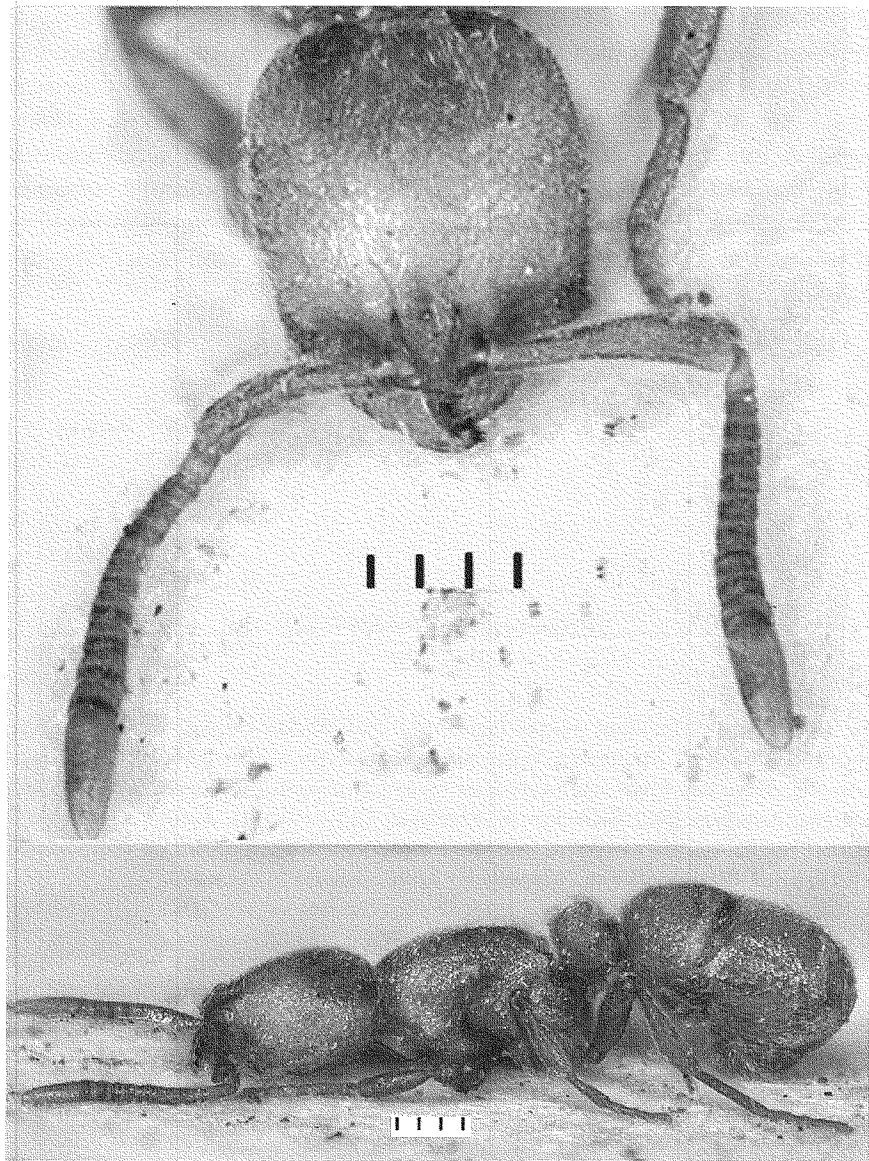


Fig. 123 – *Proceratium arnoldi* Forel. Worker from Bulawayo, Zimbabwe: head (top) in dorsal view and meso- and metasoma (bottom) in side view. Distance between two scale bars 0.1 mm.

than the antennal sockets. Anterior border of the clypeus gently convex. Antennal socket with broad torulus. Frontal carinae slightly far from each other, partially covering the antennal insertions. Frontal area concave on the posterior third. Lateral expansions of the frontal carinae narrow, raised, diverging on the two anterior thirds and subparallel on the posterior third. Genal carinae marked, each carina corresponding to the external border of a deep sulcus. Eyes small, visible as a dark dot below the integument. Eyes placed on the mid line of the head. First funicular joint $1/4$ longer than broad. Funicular joints 2-10 broader than long. Scapes short of the vertexal margin and gently thickening apically. External border of the mandibles concave. Masticatory margin of the mandibles with 3 denticles before the pointed apical tooth. Palp formula 3,2.

Mesosoma gently convex in profile and as long as the maximum head length (mandibles included). Promesopleural and meso-metapleural sutures impressed ventrally only. Basal face of the propodeum declivous posteriorly. Declivous face of the propodeum gently concave anteriorly. Basal and declivous faces of the propodeum separate laterally by a lamelliform tooth. Sides of the declivous face of the propodeum with a broader and posteriorly subangulate lamella. Lower mesopleurae with well-defined sutures, its posterior half inflate and smooth. Propodeal spiracle round and above mid height in lateral view.

Petiolar node convex in profile, the dorsum of the node convex and bearing postero-medially a small, faint point. Petiole in dorsal view with the sides diverging on the anterior fifth and convex posteriorly. Anterior border of the petiole almost straight and carinate, the carina angulate on each side. Ventral process of the petiole lamelliform, subrectangular, pointed anteriorly and posteriorly. Postpetiole anteriorly broader than the petiole; its sides diverging posteriorly. Postpetiolar dorsum with a postero-medial, very faint, semitransparent, flat bulla below the integument. Postpetiolar sternite anteromedially with a marked subtriangular projection and strongly convex posteriorly in side view. Constriction between postpetiole and gaster impressed. Gastral tergite I convex on the curvature and with a postero-medial, very faint, semitransparent, flat bulla below the integument. Remaining gastral tergites and sternites curved ventrally.

Legs slender and slightly elongate. All tibiae with a pectinate spur. Spurs of fore legs without basal spine. Fore basitarsi longer than the mid ones. Hind basitarsi 1/4 shorter than hind tibiae. Second tarsomere of hind legs subequal in size to the pretarsus. Pretarsal claws simple. Arolia large.

Body covered by hairs of three main types: (1) short, dense, subdecumbent on the whole body, sparse and suberect on the funicular joints; (2) longer than type (1), sparse and subdecumbent on the whole body, slightly shorter and rare on the scapes, absent on the funiculi; (3) shorter than hair type (1), dense and decumbent on the funicular joints only. In addition the funicular joints bear whitish, thick, appressed, short, sparse hairs.

Sculpture. Head, mesosoma, petiole, postpetiole and gaster punctate and superficially foveolate, the punctures very sparse and superficial on the gaster which is slightly shining, the foveae shallower, smaller, sparser and more irregular on the head.

Colour. Light brown.

Measurements in mm and Indices: TL 3.24-3.29; HL 0.78-0.79; HW 0.68-0.69; EL 0.02-0.03; SL 0.51; WL 0.90-0.92; PeL 0.33-0.34; PeW 0.35; HFeL 0.57; HTiL 0.48-0.49; HBaL 0.36-0.37; LS4 0.25-0.26; LT4 0.66-0.67; CI 87.2-87.3; SI 64.5-65.4; IGR 0.38-0.39.

MATERIAL EXAMINED: ZIMBABWE: Bulawayo, 1 worker (holotype), Arnold [MHNG]; same locality, 29.III.1913, 1 worker (probably not a syn-type), Arnold [BMNH].

DISCUSSION. *P. arnoldi* results from our analysis as the outgroup of *lunatum* and *burundense*. *Arnoldi* also differs from *lunatum* and *burundense* by the smaller value of CI (87.2-87.3) instead of 91.1-94.4. *Arnoldi*, *lunatum* and *burundense* share the palp formula 3,2 and the lower mesopleurae shining and inflate. The shape of the head of *arnoldi* is more similar to the one of the outgroup species, *galilaeum*, than to *lunatum* and *burundense*.

DISTRIBUTION: Zimbabwe.

Proceratium galilaeum de Andrade n. sp.

Figs. 124, 125

Proceratium arnoldi Forel, Kugler, 1988: 256. Misidentification.

TYPE MATERIAL: holotype worker labelled: "ISRAEL, Galilée, Eilon, N. Betzet, 20.IV.1982, Besuchet, Löbl" in MHNG; 1 paratype worker same data and collection as the holotype.

DERIVATIO NOMINIS: "*galilaeus*" is an adjective indicating the provenance from Galilee.

DIAGNOSIS. A *Proceratium* species appearing as the basalmost of the *arnoldi* clade and differing from its ingroup species, *arnoldi*, in the worker, by the body sculpture more superficial, by the longer scapes, by the palp formula 4,3 instead of 3,2, and by the longer mid and hind basitarsi.

DESCRIPTION. *Worker* (Figs. 124 & 125). Head longer than broad and with subparallel sides. Vertex weakly convex in full face view and flat in full dorsal view. Clypeus medially reduced, superficially convex, between the and as long as the antennal sockets. Anterior border of the clypeus minutely crenulate. Antennal socket with broad torulus. Frontal carinae slightly far from each other, partially covering the antennal insertions. Frons gently concave medially and connected to a superficially marked longitudinal carina prolonging posteriorly. Lateral expansions of the frontal carinae narrow, raised, diverging on the two anterior thirds and subparallel on the posterior third. Genal carinae marked, each carina corresponding to the external border of a deep sulcus. Eyes small, visible as a dark dot below the integument over the mid line of the head. First funicular joint about 1/4 longer than broad. Funicular joints 2-10 broader than long. Last funicular joint about as long as the sum of joints 7-10. Scapes short of the vertexal margin and gently thickening apically. External base of the mandibles concave. Masticatory margin of the mandibles with 4 denticles before the pointed apical tooth. Palp formula 4,3.

Mesosoma gently convex in profile and slightly shorter than maximum head length (mandibles included). Promesopleural and meso-metapleural sutures impressed ventrally only. Basal face of the propodeum declivous posteriorly. Declivous face of the propodeum gently concave anteriorly. Basal and declivous faces of the propodeum separated laterally by a lamel-

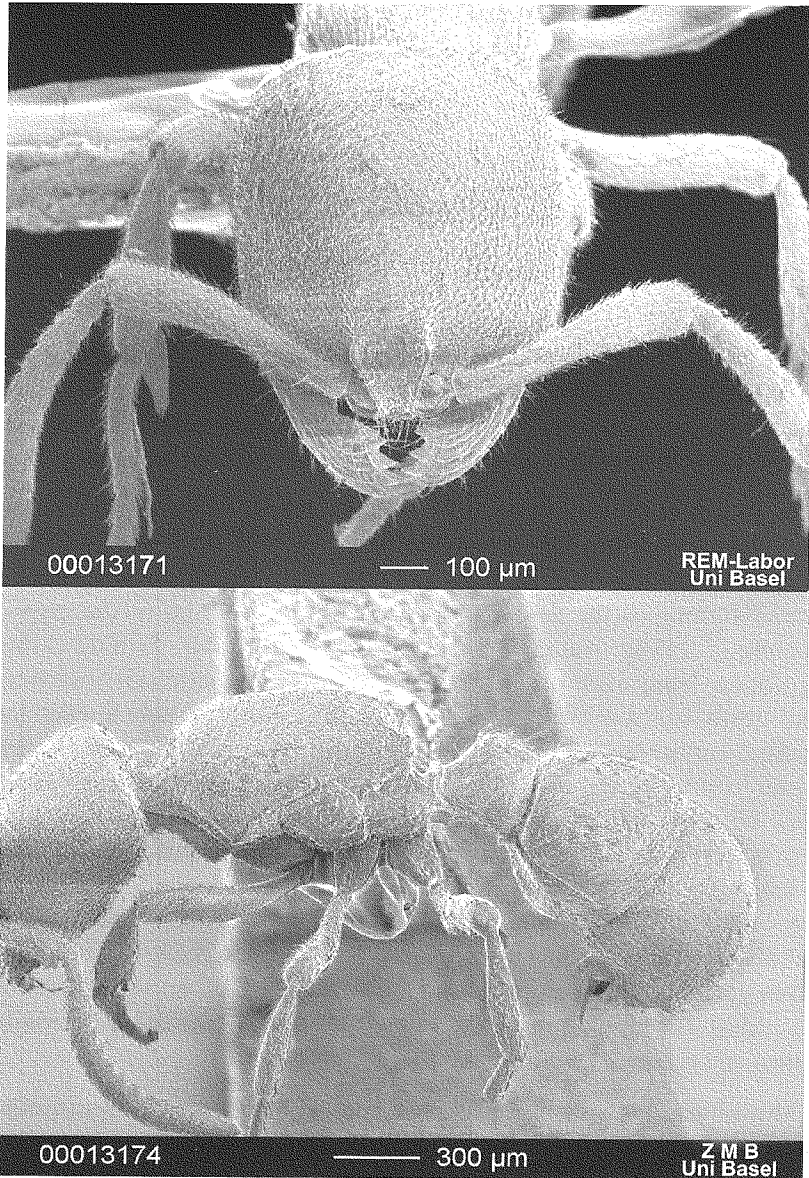


Fig. 124 – *Proceratium galilaeum* de Andrade. Worker (holotype) from Galilee, Israel: head (top) in dorsal view and meso- and metasoma (bottom) in side view.

lifiform tooth. Sides of the declivous face of the propodeum with a narrow lamella broader and subangulate posteriorly. Lower mesopleurae with well defined sutures and strongly inflat. Propodeal spiracle round and above mid height in lateral view.

Petiolar node subrectangular in profile, the dorsum of the node almost flat and bearing a postero-medial transparent, salient bulla below the integument. Petiole in dorsal view with its sides diverging on the anterior fourth and convex posteriorly. Anterior border of the petiole almost straight and carinate, the carina angulate on each side. Ventral process of the petiole lamelliform, rectangular, the lamella not pointed. Postpetiole anteriorly broader than the petiole; its sides diverging posteriorly. Postpetiolar dorsum with a postero-medial, transparent, salient bulla below the integument. Postpetiolar sternite anteromedially with a marked subtriangular projection. Postpetiolar sternite strongly convex posteriorly in profile. Constriction between postpetiole and gaster impressed. Gastral tergite II convex on the curvature and with a postero-medial, transparent, flat bulla below the integument. Remaining gastral tergites and sternites curved ventrally.

Legs slender and slightly elongate. All tibiae with a pectinate spur. Spurs of fore legs without basal spine. Fore basitarsi longer than the mid ones. Hind basitarsi 1/5 shorter than hind tibiae. Second tarsomere of hind legs subequal in size to the pretarsus. Pretarsal claws simple. Arolia present.

Sculpture. Head granulopunctate. Mesosoma and petiole granulopunctate and with traces of very sparse and superficial, irregular, foveae-like depressions. Postpetiole, gaster and legs minutely punctate.

Body covered by hairs of three main types: (1) short, dense, subdecumbent on the whole body, sparse and erect on the funicular joints; (2) longer than type (1), sparse and subdecumbent on the whole body, slightly shorter on the scapes, absent on the funiculi; (3) shorter than hair type (1), dense and decumbent on the funicular joints only. In addition the funicular joints bear whitish, thick, appressed, short, sparse hairs.

Colour. Light brown.

Measurements in mm and Indices: TL 3.11-3.40; HL 0.76-0.79; HW 0.66-0.69; EL 0.03-0.05; SL 0.53-0.55; WL 0.87-0.95; PeL 0.32-0.34; PeW 0.30-0.34; HTiL 0.51-0.54; HBaL 0.41-0.44; LS4 0.25-0.30; LT4 0.59-0.69; CI 86.8-87.3; SI 69.6-69.7; IGR 0.42-0.43.

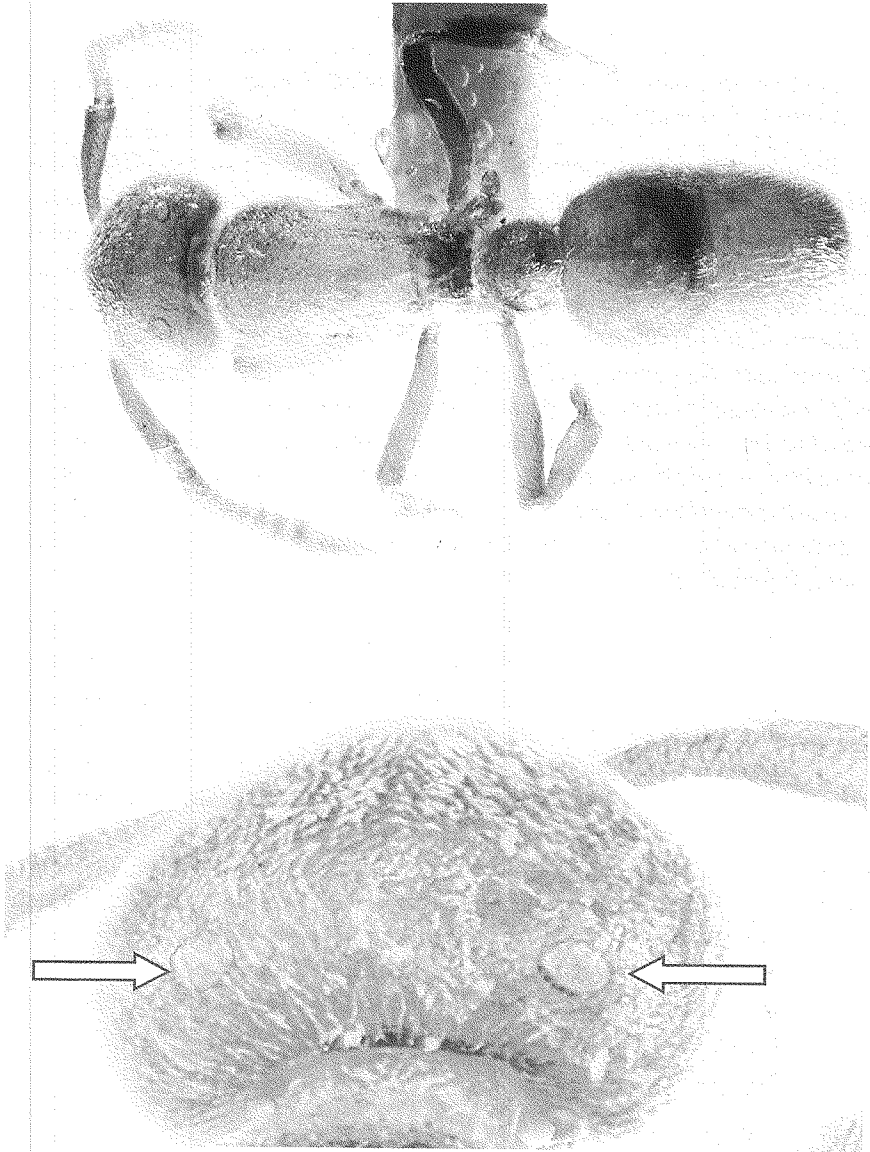


Fig. 125 – *Proceratium galilaeum* de Andrade. Worker (holotype) from Galilee, Israel: dorsal view (top) and detail of the head with the vertexal maculae shown by the arrows (bottom).

MATERIAL EXAMINED: ISRAEL: Galilee, Eilon, N of Betzet, 20.IV.1982, 2 workers (holotype and paratype), C. Besuchet & I. Löbl [MHNG].

DISCUSSION. *P. galilaeum* is the basalmost species of the *arnoldi* clade. It is easily recognisable by a clear, salient bulla on the posterior border of the petiole. It is easily distinguished from the other species of the clade by the less reduced palp formula (4,3 instead of 3,2) and by the lower mesopleurae entirely inflated. The description is based on the same specimens identified and published as *P. arnoldi* by Kugler (1988).

DISTRIBUTION: Israel.