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**REVISION OF THE SUBGENUS *AULACOMYRMA* EMERY
OF THE GENUS *POLYRHACHIS* FR. SMITH,
WITH DESCRIPTIONS OF NEW SPECIES**

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ABSTRACT

The subgenus *Aulacomyrma* Emery of the genus *Polyrhachis* Fr. Smith is revised. Thirty-six species are recognized, including seven previously described: *P. dohrni* Forel, *exarata* Emery, *excellens* Viehmeyer, *geometrica* Fr. Smith, *pallipes* Donisthorpe, *porcata* Emery and *sculpta* Emery, and twenty-nine species described as new: *P. abdita*, *annulata*, *bedeloweryi*, *breviata*, *decora*, *gentilis*, *gressitti*, *impressa*, *kokoda*, *lumi*, *maai*, *mamba*, *minima*, *monticola*, *orokana*, *parva*, *pelecta*, *planata*, *retusa*, *roberti*, *roomi*, *simulans*, *snellingi*, *sulcifera*, *umboi*, *variegata*, *wamuki*, *wardi* and *wilsoni*. A neotype for *P. dohrni* Forel is designated. *P. sculpta* Emery, previously placed in the subgenus *Campomyrma* Wheeler, is now recognized as a member of the subgenus *Aulacomyrma*. A key based on the worker caste is provided and known distributions of individual species are given.

Key words: Hymenoptera, Formicidae, Formicinae, *Polyrhachis*, *Aulacomyrma*, New Guinea, Bismarck Archipelago, Indonesia, systematics, new species, distribution.

INTRODUCTION

The subgenus *Aulacomyrma* was erected by Emery (1921) as a subgenus of *Polyrhachis* Fr. Smith with *P. porcata* Emery as the type species. He characterized the subgenus by the following: first gastral segment occupying a large portion of the gaster, anteriorly elevated and projecting above the petiolar scale; scale biconvex with arched dorsal margin terminating on each side in acute teeth; mesosoma stout, partly marginate; humeri armed with teeth or spines; body sculpture consisting of regular, more-or-less coarse furrows. Emery (1921) also included another four species in the subgenus, *P. dohrni* Forel, *exarata* Emery, *excellens* Viehmeyer and *serrata* Fr. Smith. Evidently he had doubts about including *serrata*, but continued to list this species as *Aulacomyrma* with a question mark (Emery, 1925), until Donisthorpe (1932) placed it ultimately under *Echinopla* Fr. Smith. Chapman & Capco (1951) misspelt the name as *Aulocomyrma* and included six species, *P. exarata*, *excellens*, *mystica* Karavaiev, *pallipes* Donisthorpe, *porcata* and *serrata*, with the last species listed twice (under *Polyrhachis* and *Echinopla*). Bolton (1995) listed nine species of *Aulacomyrma*, including *P. carbonaria* Fr. Smith, *dohrni*, *exarata*, *excellens*, *geometrica* Fr. Smith, *mystica*, *pallipes*, *porcata* and *schizospina* Karavaiev. Dorow (1995) transferred *P. carbonaria* to the subgenus *P. (Myrma)* and synonymized *P. mystica* with *P. cryptoceroides* Emery within the subgenus *P. (Myrmhopla)*. Kohout (1998) considered the type of *P. schizospina* to be a queen of *P. numeria* Fr. Smith a species within the subgenus *P. (Myrma)*. *P. sculpta* Emery, listed by Emery (1925), Chapman & Capco (1951), Bolton (1995) and Dorow (1995) in the subgenus *P. (Campomyrma)*, is now recognised as a member of the subgenus *Aulacomyrma*, bringing the number of previously described species in the subgenus to seven.

Illustrations

Photographs of some specimens were prepared courtesy of Brian L. Fisher (CASC, Department of Entomology) and photographed by April Nobile with a JVC KY-F70B 3CCD digital camera attached to a Leica M420 stereomicroscope. The remaining photographs were prepared, courtesy of Steve O. Shattuck (ANIC, CSIRO Division of Entomology), by Natalie Barnett using a ProgRes 3012 scanning digital camera (Jenoptik) attached to a Leica MZ16A stereomicroscope. All digital images were processed using Auto-Montage (Syncroscopy, Division of Synoptics Ltd, USA) software. Images of the specimens will also be available in full color on the ant the following websites: www.calacademy.org/research/entomology/types (www.antweb.org) and www.ento.csiro.au/science/ants (www.ozants.com.au). All illustrations depict the primary types, except those of *P. pallipes* (Figures 19, 22 & 25) representing a type-compared specimen. Digital images of the holotype of *pallipes* are available on CASC ant website (CASTYPE06955).

Methods

References and synonyms of individual species are listed only where relevant to the context of this paper. For full synonymy citations see Bolton (1995) and Dorow (1995). Publication dates and the spelling of species epithets and authors' names follow Bolton (1995). Where a holotype specimen is mentioned as 'unique', this infers that this was the only specimen available for that species description and no syntypes or paratype specimens are known to exist.

Morphological terms used in this paper closely follow those defined by Bolton (1994), except for the alitrunk, which in all my previous taxonomic papers has consistently been referred to as the mesosoma. However, following a specific request by the editors, the morphological terms referring to the occiput, occipital margin and the occipital corners were, on this occasion, replaced by the terms vertex, preoccipital margin and the posterolateral corners, respectively, with their meanings remaining the same.

The present study is based on the worker caste only, as the queens of the majority of species are unknown. Where queens associated with workers are known, notes are added under the appropriate species heading. Males are extremely rare and in fact only a single associated male is known for only one species. As such, it has no taxonomic value for the revision of the group and has been omitted from this work.

The localities at which ants were collected by the Bishop Museum's collectors were checked against that institution's list of New Guinean localities (BPBM, 1966, unpublished). In some cases the latitude and longitude co-ordinates, or altitude, are only approximate. The use of the words "New Guinea" or "Bismarck Archipelago" alone indicate the geographic delimitation of these regions regardless of the current political boundaries.

Standard Measurements and Indices

Measurements and indices follow those of Kohout (1990: 499): **TL** – Total length (the necessarily composite measurement of the entire ant when measured in profile); **HL** – Head length (the maximum measurable length of the head in perfect full face view, measured from the anterior-most point of the clypeal border or teeth, to the posterior-most point of the preoccipital margin); **HW** – Head width (width of the head in perfect full face view, measured immediately in front of eyes); **CI** – Cephalic index ($HW \times 100/HL$); **SL** – Scape length (length of the antennal scape, excluding the condyla); **SI** – Scape index ($SL \times 100/HW$); **PW** – Pronotum width (width of the pronotal dorsum measured at the bases of pronotal spines or teeth); **MTL** – Metathoracic tibial length (maximum measurable length of the tibia of the hind leg).

Dimensions for the holotype of each species are in parentheses following the range for all specimens.

All measurements were taken using a Zeiss (Oberkochen) SR stereomicroscope with an eyepiece graticule calibrated against a stage micrometer. All measurements are expressed in millimeters.

Abbreviations

Abbreviations used for specimen data are: Arch. = Archipelago; c. = about (*L. circa*); I. = Island; Is = Islands; Mt = Mount; Mtn = Mountain; Mts = Mountains; nr = near; Pen. = Peninsula; Pltn = Plantation; Prov. = Province; R. = River; Ra. = Range; Rd = Road; rf. = rainforest; w = worker/s.

Institutions and depositories (with the names of cooperating curators)

ANIC – Australian National Insect Collection, CSIRO, Division of Entomology, Canberra, Australia (S.O. Shattuck, R.W. Taylor); BMNH – The Natural History Museum, London, U.K. (B. Bolton); BPBM – Bernice P. Bishop Museum, Honolulu, HI, U.S.A. (K.T. Arakaki); CASC – California Academy of Sciences, San Francisco, CA., U.S.A. (B.L. Fisher); MCZC – Museum of Comparative Zoology, Harvard University, Cambridge, MA., U.S.A. (S.P. Cover); LACM – Natural History Museum of Los Angeles County, Los Angeles, CA, U.S.A. (R.R. Snelling); MNHU – Museum für Naturkunde, Humboldt-Universität, Berlin, Germany (Dr F. Koch, A. Kleine-Möllhoff); OXUM – Oxford University Museum, Oxford, U.K. (C. O'Toole); QMBA – Queensland Museum, Brisbane, Australia (C. Burwell, G.B. Monteith); SNSD – Staatliche Naturhistorische Sammlungen, Museum für Tierkunde, Dresden, Germany (R. Emmrich, U. Kallweit); UCDC – University of California, Davis, Department of Entomology, CA., U.S.A. (P.S. Ward).

SYSTEMATICS

Genus *Polyrhachis* Fr. Smith, 1857

Polyrhachis Fr. Smith, 1857: 58. Type species: *Formica bihamata* Drury, 1773: 73, pl. 38, figs 7, 8, worker; by original designation.

Subgenus *Aulacomyrma* Emery, 1921

Aulacomyrma Emery, 1921: 17 (as subgenus of *Polyrhachis* Fr. Smith). Type species: *Polyrhachis porcata* Emery, 1921: 20, worker; by original designation.

Aulacomyrma Emery; Emery, 1925: 197. (as subgenus of *Polyrhachis* Fr. Smith). Diagnosis revised.

Aulacomyrma Emery; Chapman & Capco, 1951: 256 (misspelling). Subgenus of *Polyrhachis* Fr. Smith, 1857.

Aulacomyrma Emery; Hung, 1967: 402. Senior synonym of *Johnia* Karavaiev, 1927.

Aulacomyrma Emery; Dorow, 1995: 12. As subgenus of *Polyrhachis* Fr. Smith, 1857.

Aulacomyrma Emery; Bolton, 1995: 21. As subgenus of *Polyrhachis* Fr. Smith, 1857.

Diagnosis of the subgenus

Worker. Small ants (HL 1.00-1.70) with general characteristics of the genus. Anterior clypeal margin arcuate, majority of species with small notch or shallow emargination medially. Frontal carinae sinuate with laminate lobes; frontal triangle usually indistinct or visible only in certain illuminations and views. Eyes ranging from flattened to strongly protuberant. Preoccipital margin with a distinct ridge posteriorly and laterally in all but one species (*decora*), where it is suppressed by overlying cephalic sculpture. Mesosoma with dorsum showing all stages from fully marginate to completely immarginate. Pronotal humeri armed with spines, teeth or simply angular. Promesonotal suture present. Mesonotal and propodeal dorsa virtually fused. Metanotal groove completely lacking or only very weakly indicated by a hairline break in dorsal sculpture and/or by shallow incisions of lateral margins in species with marginate mesosoma. Propodeum terminating posteriorly in a pair of short teeth, tubercles or simply rounded, except in one species (*wilsoni*), where it is armed with long, mostly outwardly directed spines. Petiole scale-like; dorsal margin acute, usually entire, but occasionally with intercalary teeth or short spines, medially emarginate or unevenly jagged, laterally armed with short spines or teeth. In several species (*decora* and its allies) petiole deeply transversely sculptured with dorsal margin more-or-less blunt. Base of first gastral segment usually concave medially, accommodating posterior face of petiole; dorsal margin of concavity acute or blunt and often raised above dorsum of segment; first gastral segment sometimes truncate or simply convex. Sculpture of head and body mostly consisting of regularly spaced striae that are either longitudinal or convoluted producing a characteristic “geometrical” appearance; gastral sculpture more modest, usually consisting of longitudinal striae; most distinct on sides of first gastral segment.

Queen. Very much like worker with usual characters identifying full sexuality, including three ocelli and complete thoracic structure with wings. Armament of pronotal humeri somewhat reduced, lateral petiolar spines distinctly shorter. Sculpture of head and body similar to that of worker, pattern of striation following structural characteristics of fully developed mesosoma.

Male. A single associated male is known for only one species (*wardi*) and as such has been omitted from this work. Hung (1967) studied the male genitalia of *Polyrhachis* and noted that they proved to be quite similar throughout the genus.

Distribution and biology. The known distribution of the subgenus ranges from the islands of eastern Indonesia (Aru, Misool), across the New Guinean mainland and adjacent islands (Umboi)

to the Bismarck Archipelago, including New Britain and New Ireland. Little is known about their biology and nesting habits, however, a small colony of *P. dohrni* was collected by the author from a dry hollow twig on a living tree at the edge of lowland rainforest. The internal walls of the twig cavity were lined with a little silk. The only other record of a nest is of *P. wardi*, collected by Dr Phil Ward, also from a dry twig of a rainforest tree. The colonies of both species were rather small, with only a few workers (5 and 11 respectively, including 2 and 3 alate queens and a single male). If such a nesting pattern is the norm for other species of the subgenus, that might explain the general scarcity of *Aulacomyrma* material even in the best collections. This might also account for the fact that all previously described species were based on unique specimens. In spite of the exemplary cooperation of the listed institutions, this situation has only marginally improved in this revision with almost half the new species described from single specimens.

KEY TO AULACOMYRMA SPECIES

(Based on worker caste)

- 1 Anterior face of first gastral segment distinctly concave medially, accomodating posterior face of petiole; concavity delimited dorso-medially by acute or blunt margin that is often raised above dorsal surface of segment 2
- Anterior face of first gastral segment medially truncate or convex; if weakly concave then concavity too shallow to accommodate posterior face of petiole and its dorsal border rounded, without distinct margin 3
- 2 Mesosomal dorsum distinctly marginate laterally along its entire length; margins interrupted only at sutures 10
- Mesosomal dorsum with ill-defined margins, formed in part by outermost dorsal striae or with margins completely lacking and dorsum rounding onto the sides in laterally uninterrupted curve 27
- 3 Sculpture of mesosomal dorsum consisting of mostly longitudinal striae, that weakly converge anteriorly on pronotal dorsum *bedeloweryi*
- Sculpture of mesosomal dorsum with striae forming variously curved, transverse, V-, U- or semicircular-shaped pattern 4
- 4 Eyes convex or protuberant, clearly breaking cephalic outline in full face view 5
- Eyes flattened and somewhat sunk into shallow concavity in cephalic sculpture, at most touching but not extending beyond lateral cephalic outline in full face view 9
- 5 Petiole with both faces distinctly striate 6
- Petiole with both faces finely reticulate-punctate or shagreened 8
- 6 Mesosoma distinctly antero-posteriorly compressed; propodeal declivity very high, vertical to main axis of body *gressitti*
- Mesosoma relatively long, not antero-posteriorly compressed; propodeal declivity relatively low, oblique to main axis of body 7
- 7 Pronotal dorsum rather massive, particularly anteriorly, distinctly convex in lateral view; petiole with lateral spines curved outwards and backwards; first gastral segment uniformly finely reticulate-punctate *kokoda*
- Pronotal dorsum in lateral view only moderately convex anteriorly, rather flat towards promesonotal suture; petiole with short, upturned lateral teeth; first gastral segment distinctly longitudinally striate laterally, finely reticulate-punctate dorsally *decora*

- 8 Pronotal humeri with short, acute spines; dorsal petiolar margin with pair of short intercalary teeth and pair of blunt angular projections situated between them and lateral petiolar teeth....
.....*breviata*
- Pronotal humeri with broadly-based, angular teeth and lateral margins distinctly raised and continuous to midlength of the pronotum; dorsal petiolar margin jagged, without distinct intercalary teeth*pelecta*
- 9 Larger species (HL > 1.56); petiole finely shagreened with sharp dorsal margin bearing pair of short, acute, intercalary teeth.....*roomi*
- Smaller species (HL <1.40); petiole with both faces distinctly transversely striate; dorsal margin blunt, intercalary teeth lacking *mamba*
- 10 Clypeus unsculptured, smooth and shiny..... 11
- Clypeus sculptured as rest of head..... 13
- 11 Petiole with dorsal margin entire; head smooth and very shiny*maai*
- Petiole with dorsal margin medially emarginate with a pair of intercalary teeth flanking emargination; head distinctly, mostly longitudinally, striate 12
- 12 Petiole strongly transverse, with rather distinct, acute intercalary teeth; propodeal dorsum terminating in very prominent, somewhat upturned, tooth-like prominences, with blunt apices; mandibles distinctly reddish-brown; pilosity and pubescence very sparse to absent....
.....*roberti*
- Petiole about as wide as high, with rather blunt, short intercalary teeth; propodeal dorsum terminating in rounded angles; mandibles, except narrow masticatory border, black; pilosity and pubescence moderately abundant but not concealing underlying sculpture.....*simulans*
- 13 Eyes moderately convex, in full face view exceeding, even if only marginally, lateral outline of head 14
- Eyes rather flat, in full face view sometimes almost level with, but not exceeding lateral outline of head 25
- 14 Propodeal dorsum separated from declivity by distinct, transverse ridge that may be straight, curved or arched and somewhat weakened medially 15
- Propodeal dorsum not separated from declivity by transverse ridge or margin; both surfaces meeting in medially uninterrupted, although abrupt, curve 18
- 15 Lateral margins of mesonotal-propodeal dorsum confluent, converging posteriorly and terminating in blunt angles with their posterior margins continued medially, forming almost straight, transverse ridge that may be somewhat weakened medially.....*parva*
- Lateral margins of mesonotal-propodeal dorsum not confluent; margins of mesonotum converging posteriorly, those of propodeum subparallel or diverging, terminating posteriorly in pair of distinct spines, laterally directed teeth or rounded prominences with their posterior margins continued medially, forming more-or-less inward bowed, somewhat arched, transverse ridge..... 16
- 16 Propodeal dorsum armed posteriorly with very distinct, long, outwards, backwards and weakly downwards directed spines; their posterior margins forming a deeply, inwardly bowed and distinctly medially arched, transverse ridge*wilsoni*

- Propodeal dorsum armed posteriorly with short teeth or rounded prominences; their posterior margins forming a weakly inwardly bowed ridge, that may be somewhat weakened medially 17
- 17 Propodeal teeth acute, broad-based and directed outwards; first gastral segment only very finely longitudinally striate laterally; numerous hairs and appressed pubescence present on all body surfaces *wardi*
- Propodeal teeth reduced to small, rounded prominences in dorsal view; first gastral segment distinctly longitudinally striate laterally; hairs and appressed pubescence virtually absent from most body surfaces..... *exarata*
- 18 Sculpture of mesosomal dorsum consisting of longitudinal, widely-spaced striae, with only about 13 striae spread across width of pronotal dorsum; mesonotal-propodeal dorsum distinctly transverse, almost twice as wide as long..... *sulcifera*
- Sculpture of mesosomal dorsum consisting of mostly longitudinal, narrowly-spaced striae, with about 20 or more striae spread across width of pronotal dorsum; mesonotal-propodeal dorsum only marginally wider than long..... 19
- 19 Smaller species (HL <1.10) 20
- Larger species (HL >1.20)..... 21
- 20 Sides of mesosomal dorsum subparallel; propodeal dorsum terminating posteriorly in distinct, rounded angles with their posterior margins weakly curved inwards, continuing medially for some distance but failing to meet..... *minima*
- Sides of mesosomal dorsum distinctly converging posteriorly; propodeal dorsum completely unarmed, descending into declivity across its full width *gentilis*
- 21 Dorsum of pronotum transversely convex between lateral margins 22
- Dorsum of pronotum virtually flat..... *planata*
- 22 Propodeal dorsum terminating in dentiform angles, that are not distinctly raised above its surface; striae on pronotal dorsum converging anteriorly..... 23
- Propodeal dorsum terminating in distinct teeth; their lateral margins raised, leaving the posterior margin of propodeum weakly concave medially; striae on pronotal dorsum longitudinal, more-or-less parallel, not converging anteriorly..... *lumi*
- 23 Vertex with transverse, strongly bowed, almost semicircular striae; lateral margins of mesonotal-propodeal dorsum confluent, converging posteriorly, not distinctly incised at metanotal groove (New Guinea)..... *sculpta*
- Vertex longitudinally striate; lateral margins of mesonotal-propodeal dorsum distinctly incised at metanotal groove; mesonotal margins converging posteriorly, propodeal margins more-or-less parallel-sided 24
- 24 Femora distinctly bicolored; light reddish-brown with very dark brown apices; eyes only moderately convex, in full face view just marginally breaking lateral outline of head (Bismarck Archipelago)..... *dohrni*
- Femora unicolored, very dark brown or black; eyes convex, clearly extending beyond lateral outline of head (Umboi Island)..... *umboi*
- 25 Anterior face of first gastral segment with acute margin that is moderately raised above face of segment; legs distinctly light, mostly yellow or reddish-yellow *pallipes*

- Anterior face of first gastral segment with blunt margin that is not raised above face of segment; legs generally dark reddish-brown or black..... 26
- 26 Eyes situated close to lateral outline of head in full face view; pronotal dorsum with greatest width at about midlength of segment (New Ireland) *abdit*
- Eyes situated well away from lateral outline of head in full face view; pronotal dorsum with greatest width across humeri (Irian Jaya) *variegata*
- 27 Propodeal dorsum separated from declivity by distinct, rather acute, transverse ridge 28
- Propodeal dorsum not separated from declivity by transverse ridge; both surfaces medially confluent 29
- 28 Eyes strongly protuberant, almost fully extending beyond lateral outline of head in full face view; mesonotal-propodeal dorsum strongly transverse, distinctly wider than long, sides subparallel..... *orokana*
- Eyes only moderately convex, situated in shallow depression in cephalic sculpture and only partly extending beyond lateral outline of head in full face view; mesonotal-propodeal dorsum about as long as width across posterior transverse ridge; sides of mesonotal-propodeal dorsum converging posteriorly *impressa*
- 29 Petiole with dorsal margin entire 30
- Petiole with dorsal margin more-or-less emarginate medially..... 33
- 30 Smaller species (HL <1.15) 31
- Larger species (HL >1.34)..... 32
- 31 Petiole strongly transverse, both faces finely shagreened; propodeal dorsum terminating in a pair of small rounded prominences *wamuki*
- Petiole about as wide as high, both faces distinctly striate; propodeal dorsum terminating in downward and weakly inward curved angles *snellingi*
- 32 Pronotal dorsum only weakly transversely convex, almost flat, with spines directed anteriorly; mesosomal dorsum with sides subparallel; mesosoma with prominent, regularly spaced, longitudinal striae, those on pronotal dorsum anteriorly converging; anterior face of first gastral segment with acute margin that is strongly raised above dorsal face of segment ..
..... *excellens*
- Pronotal dorsum strongly transversely convex with spines directed more-or-less laterally; mesosomal dorsum with sides converging posteriorly so that pronotum is notably broader than propodeum; pronotal dorsum with inverse, narrowly U-shaped to semicircular striae; mesonotal-propodeal dorsum with V-shaped striae; anterior face of first gastral segment with acute margin that is only moderately raised above face of segment *porcata*
- 33 First gastral segment finely shagreened *annulata*
- First gastral segment distinctly longitudinally striate laterally 34
- 34 Propodeal declivity oblique to main axis of body; femora of front legs very light, yellowish-brown, those of mid- and hind legs very dark, reddish-brown or black.....
..... *geometrica*
- Propodeal declivity abrupt, vertical to main axis of body; femora of all three pairs of legs uniformly dark reddish-brown or black 35

- 35 Dorsal petiolar margin medially emarginate with distinct acute teeth flanking emargination; larger species (HL 1.37)..... *monticola*
 - Dorsal petiolar margin only narrowly and shallowly emarginate without distinct teeth flanking emargination; smaller species (HL 1.12)..... *retusa*

The species-groups

The thirty-six species of *Aulacomyrma* can be divided, on the basis of external morphological characters, into two, mostly intergrading, species-groups:

The *dohrni* – group, including *abdita* sp. nov., *dohrni* Forel, *exarata* Emery, *gentilis* sp. nov., *lumi* sp. nov., *minima* sp. nov., *pallipes* Donisthorpe, *parva* sp. nov., *planata* sp. nov., *roberti* sp. nov., *sculpta* Emery, *simulans* sp. nov., *sulcifera* sp. nov., *umboi* sp. nov., *variegata* sp. nov., *wardi* sp. nov. and *wilsoni* sp. nov.

The *porcata* – group, including *annulata* sp. nov., *bedeloweryi* sp. nov., *breviata* sp. nov., *decora* sp. nov., *excellens* Viehmeyer, *geometrica* Fr. Smith, *gressitti* sp. nov., *impressa* sp. nov., *kokoda* sp. nov., *maai* sp. nov., *mamba* sp. nov., *monticola* sp. nov., *orokana* sp. nov., *pelecta* sp. nov., *porcata* Emery, *retusa* sp. nov., *roomi* sp. nov., *snellingi* sp. nov. and *wamuki* sp. nov.

The margination of the mesosoma or its partial or complete loss is an important character, evident in a number of species that are intermediate between the *dohrni*-group, which includes species with a laterally marginate mesosomal dorsum and the *porcata*-group with a partly or completely immarginate condition. The transition is illustrated by the following series of species: *exarata* → *planata* → *sculpta* → *excellens* → *porcata* → *orokana* → *geometrica* → *decora*. In the first species, *exarata*, a member of the *dohrni*-group, the mesosoma is fully laterally and posteriorly, marginate. The second species, *planata*, still has complete lateral margins, but the posterior propodeal margins extend only partly towards the midline as short ridges. They fail to meet medially and there is a gap through which the dorsum meets the declivity. In *sculpta*, which could be considered intermediate between the *dohrni*- and *porcata*-group, the lateral margins of the mesosoma are less distinct posteriorly, leaving the propodeum only weakly marginate laterally and completely immarginate posteriorly. The margins of the mesosoma are incomplete in *excellens* and related species, with the pronotal margins weak and extending from the pronotal spines for only part of the length of the pronotum. The margins merge with the outermost dorsal striae and curve onto the sides of pronotum, failing to reach the promesonotal suture. The mesonotal-propodeal dorsum is usually only partly marginate, leaving one or the other laterally immarginate. In *porcata* there is only an indication of weak lateral margins of the mesosoma, with the propodeum terminating in barely distinct tubercles. The propodeum in *orokana* has a distinct transverse posterior margin, but the lateral margins of mesosoma are completely lost. A complex of species, represented in the series by *geometrica*, has the mesosoma virtually immarginate, although in some the outermost striae of the mesonotal dorsum form ill-defined lateral margins. Finally *decora* and its allies have the mesosoma completely immarginate.

Within the series, changes in other characters are also evident, notably in the convexity of the mesosomal dorsum and the degree of concavity of the anterior face of the first gastral segment. In species related to *dohrni* and *excellens*, the mesosomal dorsum between the lateral margins is almost flat or only moderately transversely convex, and the first gastral segment is more-or-less distinctly concave anteriorly. By contrast, in species related to *porcata* and *geometrica*, the dorsum of mesosoma is distinctly transversely convex and rounds onto the sides in an uninterrupted curve. Also, as the series progresses, the first gastral segment tends to be somewhat less concave and finally culminates in species having the anterior face only truncate or even convex, as in *decora*. In most species the surface of the petiole is shagreened with the dorsal margin distinctly acute and armed with rather well developed lateral spines. In species allied to *decora*, the petiolar node in lateral view is blunt with both faces deeply transversely striate and armed with rather short lateral teeth. The affinities of these species are not immediately apparent,

but *porcata* and *snellingi*, both possessing a transversely striate petiole with a rather acute dorsal margin, evidently represent intermediate forms.

Parallel to the characters discussed above is a change in the form of the sculpture of the mesosoma which, in *dohrni*-group species, consists mostly of simple, longitudinal striation. The sculpture tends to become more complicated as the series progresses, with the dorsal striation in *porcata*-group species curved into simple V- or U-shapes, notably on the pronotal dorsum. The sculpture of species at the end of the series is even more complex, featuring variously curved patterns, giving them a characteristic “geometrical” appearance.

Polyrhachis dohrni species-group

This group is characterized by the following: mesosoma distinctly and fully laterally marginate with margins interrupted only at sutures. Pronotal humeri armed with broad-based teeth, short spines or acute angles which are laterally continuous with the pronotal margins. Propodeal dorsum terminating in dentiform angles or tubercles, but also in distinct, posteriorly directed tooth-like prominences as in *roberti* and *lumi*, or in laterally directed blunt teeth as in *wardi*. In one species, *wilsoni*, the lateral margins are greatly extended and terminate in long, outwardly curved, acute spines. Posterior margination of propodeum varying from complete transverse ridge separating dorsum from declivity as in *exarata* and *parva*, where ridge is straight, and *wilsoni*, where it is deeply curved inwards, to a situation where posterior margin is lacking and both surfaces are confluent, as in *dohrni* or *pallipes*. Petiole scale-like with anterior and posterior faces convex and dorsal margin acute, with rather distinct lateral spines or teeth. Species related to *dohrni* have dorsal petiolar margin entire, or at most weakly jagged, as in *lumi*; in *roberti* and *simulans* dorsal petiolar margin medially emarginate with short teeth or denticles flanking emargination. Anterior face of first gastral segment in all but one species (*roberti*) distinctly concave, accommodating posterior face of petiole; anterodorsal margin of concavity acute and weakly elevated, as in *pallipes* and *planata*, or blunt and not at all raised above dorsal surface of segment, as in *abdita* and *simulans*. Sculpture of head and mesosomal dorsum consisting of mostly longitudinal striation, that in most species tends to be anteriorly convergent on pronotum. In two species, *roberti* and *simulans*, longitudinal sculpture is virtually absent from clypeus that is virtually smooth, only very finely reticulate-punctate.

Polyrhachis (Aulacomyrma) abdita, new species

Figures 1, 4, 7

TYPE MATERIAL

HOLOTYPE: PAPUA NEW GUINEA, New Ireland Prov., Lelet Plateau, c. 03°20'S, 151°56'E, 800-1000m, 19-24.vii.1984, R.J. Kohout acc. 84.95 (worker). **PARATYPES:** data as for holotype (12 workers). Type distribution: holotype and 2 paratypes in ANIC; 2 paratypes each in BMNH, CASC, LACM, MCZC and QMBA.

WORKER

Dimensions: TL c. 4.64-5.44 (5.19); HL 1.15-1.37 (1.31); HW 1.03-1.22 (1.18); CI 88-90 (90); SL 1.22-1.40 (1.40); SI 114-119 (119); PW 1.00-1.18 (1.18); MTL 1.28, 1.09-1.34 (1.28) (13 measured).

Anterior clypeal margin arcuate with shallow emargination medially; in profile clypeus virtually straight with very weakly impressed basal margin, indicated laterally by a faint line that barely breaks cephalic sculpture. Frontal carinae sinuate, with laminate lobes. Sides of head very

weakly convex, almost straight in front of eyes before converging towards bases of mandibles. Eyes rather flat, with anterior margins somewhat sunk into shallow depressions in cephalic sculpture; in full face view almost level with, but failing to break lateral cephalic outline. Mesosoma marginate along entire length. Pronotal humeri armed with broad-based, angulate, acute teeth, that are laterally continuous with pronotal margin. Dorsum of pronotum widest at midlength. Promesonotal suture distinct; metanotal groove lacking dorsally, position marked by shallow emarginations in lateral margin. Propodeum with lateral margins only narrowly rounded posteriorly; dorsum descending into virtually vertical declivity in an unobstructed curve. Petiole with sharp dorsal margin, its apex higher than anterodorsal margin of first gastral segment; lateral petiolar spines directed outwards and slightly curved backwards from bases. First gastral segment concave medially, accomodating posterior face of petiole; anterodorsal margin of concavity rather blunt, not elevated above dorsal face of segment.

Mandibles finely, mostly longitudinally, striate-rugose, with shallow pits towards masticatory border. Sculpture of body consisting of more-or-less regularly spaced striae, that are mostly longitudinal on head, distinctly anteriorly converging on pronotal dorsum and posteriorly converging on mesonotal-propodeal dorsum; striae oblique on sides of mesosoma and longitudinal on sides of gaster. Petiole and dorsum of gaster finely, microscopically, shagreened.

Entire body with numerous semierect to erect, off-white to silvery hairs, that do not exceed greatest diameter of eye in length. Silvery to silvery-grey appressed pubescence fairly abundant, partly concealing underlying sculpture, notably on propodeal dorsum, where it curves towards midline. Gastral pubescence rather abundant, silvery at sides and along posterior margins of segments; becoming distinctly silvery-grey on dorsal surface of first gastral segment.

Black; mandibular masticatory border, apices of antennal scapes, funiculi, femora and tarsi medium to dark reddish brown, with funiculi and tarsi becoming lighter apically. Tibiae distinctly lighter, except their proximal and distal ends, which are very narrowly dark, reddish brown.

Sexuals and immature stages unknown.

ETYMOLOGY

Name derived from the Latin word *abditus*, meaning hidden, concealed.

REMARKS

The known distribution of *P. abdita* is limited to Lelet Plateau on New Ireland. *P. abdita* is very similar to *P. dohrni*, but can be distinguished by the characters listed under the latter. Of these, the most important are the more flattened eyes and complete absence of an anterodorsal process on the first gastral segment in *abdita*. Because of their similarity and adjoining distributions, *abdita* could be considered a higher altitude population of *dohrni*. However, with most of the distinguishing characters constant and no intermediate forms detected, I believe they represent distinct species.

Polyrhachis (Aulacomyrma) dohrni Forel, 1901

Figures 2, 5, 8

Polyrhachis dohrni Forel, 1901: 34. Holotype queen. Type locality: BISMARCK ARCHIPELAGO, Credner I. (F. Dahl), ?MNHU (holotype apparently lost).

Polyrhachis (Aulacomyrma) dohrni Forel; Emery, 1921: 17. Combination in *P. (Aulacomyrma)*.

Polyrhachis (Aulacomyrma) dohrni Forel; Emery, 1925: 198.

NEOTYPE DESIGNATION

The holotype of this species should be lodged in the MNHU, together with other specimens collected by Friedrich Dahl from the Bismarck Archipelago. Extensive searches by Dr Frank Koch and the author failed locate it there or in any other collections examined and it is considered lost. Forel (1901: 35) stated that the specimen was taken from the stomach of a bird *Pachycephala melanura* on Credner I., 7.viii.1896. Because of considerable damage to the specimen (“Pro- und Mesothorax stark defekt”), Forel was apparently uncertain about the caste and in the original description listed the specimen as a worker with a question mark. However, further on he wrote: “... drei deutliche Punktaugen (♀ ??)”. Because *dohrni* workers do not possess ocelli, the specimen Forel described was undoubtedly a queen.

To establish the nomenclatural stability of the species, I have designated, in accordance with Article 75.3.5. of the *International Code of Zoological Nomenclature* (Fourth Edition), a worker specimen as the neotype of *Polyrhachis dohrni* Forel. The specimen was selected from a colony of 5 workers and 2 alate queens collected from a nest inside a dry hollow twig on a living tree in the grounds of the Lowland Agricultural Experimental Station, Kerevat, East New Britain Province, 04°20'S, 152°02'E, c. 50m, rf. edge, 14.vii.1984, R.J. Kohout acc. 84.67. The locality is situated only about 35km SW of Credner Islands, the type locality of *P. dohrni*. The neotype has been deposited in ANIC.

WORKER

Dimensions: TL c. 4.74-5.80 (5.44); HL 1.22-1.37 (1.34); HW 1.09-1.23 (1.23); CI 86-92 (92); SL 1.25-1.43 (1.40); SI 113-121 (114); PW 1.06-1.25 (1.18); MTL 1.15-1.37 (1.37) (9 measured).

Anterior clypeal margin arcuate with shallow notch medially. In profile clypeus virtually straight with very weakly impressed basal margin that is laterally indicated by a hairline break in cephalic sculpture. Frontal carinae sinuate, with laminate lobes. Frontal triangle indistinct. Sides of head weakly convex. Eyes moderately convex, in full face view usually breaking lateral cephalic outline. Mesosoma marginate along entire length; pronotal humeri armed with broadly-based, acute teeth that are laterally continuous with posteriorly converging, uninterrupted, pronotal margin. Promesonotal suture distinct; metanotal groove lacking dorsally, position marked by shallow emargination of lateral margins. Mesonotal margins posteriorly converging; propodeal margins subparallel, terminating in blunt processes that appear as minute teeth in profile. Propodeal dorsum descending abruptly into weakly concave propodeal declivity. Petiole scale-like, biconvex, with sharp dorsal margin, its apex higher than anterodorsal margin of first gastral segment; lateral petiolar spines directed outwards and slightly curved backwards from bases. First gastral segment concave medially, accommodating posterior face of petiole; anterodorsal margin not elevated above dorsal face of segment in lateral view, however, when viewed from behind, appearing somewhat medially produced.

Mandibles finely, mostly longitudinally, striate-rugose. Sculpture of body consisting of more-or-less regularly spaced striae, mostly longitudinal on head, pronotal dorsum and sides of gaster; V-shaped on mesonotal and propodeal dorsa, oblique on sides of mesosoma. Petiole and dorsum of gaster finely, microscopically, shagreened.

Entire body with numerous semierect to erect, off-white to pale-yellow hairs, that do not exceed greatest diameter of eye in length. Silvery appressed pubescence fairly abundant, but not concealing underlying sculpture, except on propodeal dorsum, where it curves towards midline. Gastral pubescence rather abundant, silvery at sides and along posterior borders of segments, becoming distinctly golden on dorsal aspect of first gastral segment.

Black; mandibular masticatory border, apices of antennal scapes, funiculi, distal parts of femora and tarsi medium to dark reddish brown, with funiculi and tarsi becoming lighter apically.

Tibiae distinctly lighter, except proximal and distal ends, that are very narrowly dark, reddish brown.

QUEEN

Dimensions: TL c. 6.50-6.95; HL 1.53-1.56; HW 1.34-1.40; CI 87-90; SL 1.47-1.56; SI 109-112; PW 1.37-1.47; MTL 1.56-1.59 (4 measured).

Very much like worker with usual characters identifying full sexuality, including three ocelli and complete thoracic structure with wings. Sculpture, pilosity and color as in worker except eyes more prominent, clearly breaking cephalic outline in full face view. Lateral petiolar spines distinctly shorter.

Male and immature stages unknown

MATERIAL EXAMINED

PAPUA NEW GUINEA: East New Britain Prov., Gazelle Pen., LAES Kerevat, 04°20'S, 152°02'E, 10-14.vii.1984 (RJK accs 84.27, 67, 71) (w, ♀); ditto, 60m, 31.viii-1.ix.1955 (J.L. Gressitt) (w); ditto, 28.viii.1955 (J.L. Gressitt) (♀); ditto, 135m, 20-25.xi.1959 (T.C. Maa) (w); Malmaluan-Vunakanau, 8.v.1956 (J.L. Gressitt) (w); Baining Mts, St Paul Mission, 04°15'S, 151°47'E, 350m, 5.ix.1955 (J.L. Gressitt) (w); ditto, 7.viii.1955 (J.L. Gressitt) (♀); ditto, Gaulim, 04°26'S, 152°05'E, 140m, 19-28.x.1962 (J. Sedláček) (w). New Ireland Prov., Kableman, 8km ESE of Kavieng, 02°37'S, 150°51'E, c. 5m, 25.vii.1984 (RJK acc. 84.120) (w); East Coast, c. 3km S of Konos, 03°09'S, 151°43'E, c. 100m, 22.vii.1984 (RJK acc. 84.113) (w); West Coast, Gilingil Pltn, c. 04°28'S, 152°40'E, 2m, 6.vii.1956 (E.J. Ford Jr) (w); Ridge above "Camp Bishop", 15km up Kait R., 250-500m, 11.vi.1956 (J.L. Gressitt) (w).

REMARKS

P. dohrni is apparently limited to the Bismarck Archipelago: New Britain, neighboring islands and low altitude localities along the coast of New Ireland. It is similar to *P. abdita* from Lelet Plateau, but differs in several characters. The eyes of *dohrni* are moderately convex and in full face view break the lateral outline of the head, if only marginally. The mesosomal dorsum is more slender and the pronotal humeri armed with broad-based, more anteriorly directed, acute teeth. The propodeal margins terminate posteriorly in blunt distinct processes that appear as minute teeth in profile. The anterodorsal margin of the first gastral segment is not raised above its dorsal face in lateral view but, viewed from behind, the margin appears medially produced. The legs, notably the proximal halves of the femora, and apices of antennal scapes are distinctly lighter reddish-yellow and the dorsal gastral pubescence is more golden. In contrast, *P. abdita* has distinctly flattened eyes that do not reach the lateral outline of the head in full face view. The mesosoma is somewhat wider posteriorly. The pronotal teeth are less produced, more angular and the greatest pronotal width is at its midlength. The lateral propodeal margins are only narrowly rounded posteriorly, not dentiform. The anterodorsal margin of the first gastral segment, when viewed from behind, is smoothly rounded, without any indication of a median process. The antennal scapes and femora are more-or-less uniformly medium to dark reddish-brown and the relatively abundant pubescence, including that of the gaster, is silvery or silvery-gray.

Polyrhachis (Aulacomyrma) exarata Emery, 1887

Figures 3, 6, 9

Polyrhachis exarata Emery, 1887: 226. Holotype worker. Type locality: INDONESIA, Misool I., Waigamma (O. Beccari), MCSN (examined).

Polyrhachis (Aulacomyrma) exarata Emery, 1921: 17. Combination in *P. (Aulacomyrma)*.

WORKER

Dimensions of holotype: TL c. 4.84; HL 1.18; HW 1.06; CI 90; SL 1.31; SI 123; PW 1.00 ; MTL 1.21.

Clypeus with anterior margin shallowly truncate in middle; median longitudinal carina distinct. Sides of head in front of eyes only weakly convex. Eyes convex, in full face view clearly breaking lateral cephalic outline. Mesosoma marginate along entire length. Pronotal humeri with rather strong, forward directed, broad-based teeth; propodeal margins terminating posteriorly in short, rounded processes, that appear in profile as minute, weakly upturned teeth. Propodeal dorsum separated from declivity by a distinct, slightly inward bowed, transverse ridge. Petiole with dorsal margin sharp, somewhat sinuate in dorsal view; lateral spines acute, bent outwards and backwards. First gastral segment only shallowly concave; dorso-medial margin of concavity blunt, not raised above dorsal face of segment.

Dorsum of head and pronotum with shiny, regularly spaced, striae, longitudinal on pronotum and posteriorly converging towards midline on mesonotal-propodeal dorsum. Petiole with both faces finely shagreened. Sides of first gastral segment distinctly, longitudinally striate with sculpture becoming more reticulate-punctate on dorsum.

Mandibles and sides of head with a few short semi-erect to erect hairs that are virtually absent from dorsum of head, vertex, mesosoma and petiole, except for a few scattered hairs at base of pronotal teeth. Sides and apex of gaster with numerous semi-erect to erect, medium length hairs and with somewhat dilute, silvery, appressed pubescence lining posterior margin of first gastral segment. Antennae and legs with yellow, appressed pubescence and numerous relatively short erect hairs.

Black, with mandibular masticatory border and antennal scapes reddish brown. Funiculus a shade lighter with extreme tip of last segment narrowly black. Legs mostly yellow, except distal portion of femora, proximal ends of tibiae and first tarsal segment, that are medium to dark reddish brown.

Sexuals and immature stages unknown.

REMARKS

In general appearance, *P. exarata* resembles *P. parva*. They share rather strong, broad-based pronotal teeth that are somewhat weakly emarginate at their bases; a distinct, weakly inward bowed, transverse ridge separating the propodeal dorsum from the declivity and an almost identical color scheme. However, they differ in several characters, including the longitudinal striation of the pronotal dorsum. In *P. exarata* the striation is parallel with the pronotal margins, while in *parva* the striae distinctly converge anteriorly. The propodeal margins in *exarata* terminate in narrowly rounded processes that are weakly widened before rounding into the posterior margin. In contrast, the propodeal margins in *parva* terminate in minute blunt angles. The anterior face of first gastral segment is medially concave in *exarata* with the anterodorsal margin of the concavity bluntly rounding onto the dorsum of the segment. In *parva* the concavity is strongly and acutely marginate, with its anterodorsal margin produced dorso-medially and raised above the dorsal face of the gaster.

Polyrhachis (Aulacomyrma) gentilis, new species

Figures 10, 13, 16

TYPE MATERIAL

HOLOTYPE: PAPUA NEW GUINEA, Morobe Prov., Huon Pen., Mongi Watershed, Zingzingu, 1200m, 9-10.iv.1955, E.O. Wilson #761 (worker). Type distribution: unique holotype in MCZC.

WORKER

Dimensions of holotype: TL c. 4.84; HL 1.28; HW 1.09; CI 85; SL 1.31; SI 120; PW 0.87; MTL 1.22.

Anterior clypeal margin with shallow notch medially. In profile clypeus almost straight anteriorly, weakly convex posteriorly with shallow basal margin. Frontal carinae sinuate with raised laminate lobes; frontal triangle indistinct. Sides of head almost straight in front of eyes, converging anteriorly towards bases of mandibles; gently rounding behind eyes into preoccipital margin. Eyes moderately convex, in full face view breaking lateral cephalic outline. Mesosoma laterally marginate, virtually parallel-sided. Pronotal humeri armed with broad-based teeth that are laterally continuous with pronotal margins; margins weakened posteriorly before reaching distinct promesonotal suture. Metanotal groove absent. Propodeal dorsum terminating in rather distinct, rounded prominences, their posterior margins continued medially but failing to meet, leaving a very narrow gap through which propodeal dorsum descends into declivity; viewed from behind, posterior margin forming an open inverted 'V'; propodeal declivity concave in lateral view. Petiole with dorsal margin acute, entire; lateral spines relatively short, curved backwards, sinuate in dorsal view. Anterior face of first gastral segment concave, anterodorsal margin of concavity rather acute, but not raised above dorsal face of segment.

Mandibles with rather distinct striae radiating from bases towards masticatory borders. Head mostly longitudinally striate, striae on sides curving inwards from posterolateral corners and continuing anteriorly towards mandibular bases. Striae on vertex mostly longitudinal, a few irregular, mostly transversely bowed striae, medially along preoccipital margin. Pronotal dorsum with striae converging anteriorly towards pronotal collar; striae on mesonotal-propodeal dorsum longitudinal for most of their length, curving strongly inwards before reaching posterior margin. Petiole with both faces and first gastral segment laterally and dorsally shagreened.

Head with numerous, erect and semi-erect, relatively short, hairs that do not exceed the greatest diameter of the eyes in length; hairs distinctly less abundant on mesosomal dorsum and first gastral segment, where they are posteriorly curved. Posterior and ventral gaster with more abundant hairs, some as long as greatest diameter of eyes. Mostly medium length, pale yellow to golden, diluted appressed pubescence on all body surfaces, most abundant and golden on gastral dorsum, almost hiding underlying sculpture; pale yellow or silvery on metapleuron, propodeal declivity and posterior margins of gastral segments.

Black, with legs dark to medium reddish brown. Tibiae, except proximal ends, apical segments of tarsi and funiculi distinctly light yellowish brown.

Sexuals and immature stages unknown.

ETYMOLOGY

Name derived from the Latin word *gentilis*, meaning gentle.

REMARKS

With its small size and parallel sided mesosoma, *P. gentilis* superficially resembles *P. wamuki*. However in *wamuki* the pronotal margins are lacking and the lateral margins of the pronotal spines curve directly onto the sides of the segment without continuing towards the promesonotal suture. The sculpture of the pronotal dorsum also differs with the striae in *gentilis* only weakly converging, while they are strongly inversely V-shaped and merge along the midline in *wamuki*.

Polyrhachis (Aulacomyrma) lumi, new species

Figures 11, 14, 17

TYPE MATERIAL

HOLOTYPE: PAPUA NEW GUINEA: West Sepik Prov., Torricelli Mts, Lumi, 03°28'S, 142°02'E, 400-550m, 4-13.viii.1984, R.J. Kohout acc. 84.273) (worker). **PARATYPES:** data as for holotype (2 workers). Type distribution: holotype in ANIC, 1 paratype each in QMBA and MCZC.

WORKER

Dimensions: TL c. 5.69-5.90 (5.69); HL 1.50-1.53 (1.53); HW 1.31-1.37(1.37); CI 89, 87-89 (89); SL 1.53-1.56 (1.56); SI 114-117 (114); PW 1.15-1.18 (1.18); MTL 1.43-1.47 (1.47) (3 measured).

Clypeus arcuate, anterior margin medially truncate; median carina blunt, but distinct; in profile clypeus straight with base rather flat. Frontal triangle well defined. Frontal carinae sinuate with raised laminate lobes; central area relatively wide with weak, blunt, longitudinal carina. Sides of head in front of eyes weakly converging towards mandibular bases. Eyes moderately convex, in full face view just reaching lateral cephalic outline. Mesosoma with lateral margins converging posteriorly. Pronotal humeri armed with broad-based, acute teeth, their anterior and lateral margins sharp and distinctly raised. Mesonotum and propodeum with hairline break in dorsal sculpture and emarginations of lateral margins indicating position of metanotal groove. Propodeal dorsum with lateral margins emarginate, terminating posteriorly in blunt, tooth-like prominences that are distinctly raised, posterior margins continued for some distance, forming short, transverse, medially unconnected ridges. Dorsal margin of petiole sharp, with some irregularities along outline, lateral petiolar spines acute, posteriorly curved. Anterior face of first gastral segment medially concave with anterodorsal margin of concavity blunt.

Sculpture of body consisting of more-or-less regular striae of various intensities, striae rather flat and anteriorly converging on clypeus and vertex, where they are strongly impressed, meeting along midline; striae mostly longitudinal on sides of head. Mesosomal dorsum with striae regularly spaced, those along pronotal margin somewhat converging anteriorly towards pronotal collar; striae converging posteriorly on propodeum and oblique on sides of mesosoma. Both faces of petiole finely shagreened. Sides of first gastral segment with regular longitudinal striae, less distinct on dorsum.

Erect to semi-erect, medium length hairs on mandibular masticatory border, median portion of anterior clypeal margin, along frontal carinae, antennal scapes and vertex. In full face view, hairs completely absent from sides of head between eyes and mandibular bases. Dorsum of mesosoma and gaster with numerous erect hairs that are directed posteriorly on gastral dorsum and distinctly longer towards apex of gaster. Petiole with a few, short, erect hairs along dorsal margin. Mostly silvery, appressed pubescence scattered in various densities over body; most dense on

pronotal humeri and propodeal dorsum, almost obscuring underlying sculpture. Pubescence off-white or yellowish on gaster, densest along gastral margins and curving towards midline.

Black; distal funicular segments and legs medium to dark reddish-brown.

Sexuals and immature stages unknown.

ETYMOLOGY

Named after the type locality, Lumi village in the Torricelli Mountains, Papua New Guinea.

REMARKS

P. lumi is close to *exarata*, but has the head, in full face view, distinctly larger and the eyes only reaching and not exceeding the lateral cephalic outline; the mesosoma in lateral view strongly arched, terminating in rather distinct, posteriorly and dorsally directed, blunt teeth and the legs dark brown. In contrast, the eyes in *exarata* clearly break the lateral cephalic outline, the mesosomal dorsum is almost flat with the propodeum terminating in narrowly rounded processes that are weakly widened laterally before rounding inwards and forming a transverse posterior margin and the legs are mostly yellow.

Polyrhachis (Aulacomyrma) minima, new species

Figures 12, 15, 18

TYPE MATERIAL

HOLOTYPE: PAPUA NEW GUINEA, Morobe Prov., Huon Pen, lower Busu R., 5.v.1955, lowland rf., E.O. Wilson #954 (worker). Type distribution: unique holotype in MCZC.

WORKER

Dimensions of holotype: TL c. 3.98; HL 1.06; HW 0.98; CI 92; SL 1.15; SI 117; PW 0.81; MTL 1.06.

Anterior clypeal margin arcuate, with very shallow notch medially; clypeus in profile virtually straight anteriorly, with basal margin shallowly impressed. Frontal carinae strongly sinuate with laminate lobes. Sides of head in front of eyes only weakly converging anteriorly. Eyes convex, in full face view clearly breaking lateral cephalic outline. Mesosoma marginate, margins of pronotal dorsum rather weak, but reaching promesonotal suture. Pronotal dorsum virtually parallel sided; humeri armed with acute, laterally directed, broad-based teeth. Promesonotal suture distinct; metanotal groove indicated by distinct incisions in lateral margins. Propodeum with lateral margins weakly widened posteriorly, terminating in rounded prominences and continued inwards, forming medially discontinued ridges that partly separate propodeal dorsum from relatively high and concave declivity. Petiole transverse, dorsal margin acute and weakly notched medially, strongly sinuate in dorsal view; lateral spines backwardly curved. Anterior face of first gastral segment concave; anterodorsal margin of concavity acute but only very weakly elevated above dorsal face of segment.

Mandibles finely striate. Head mostly longitudinally, somewhat irregularly, striate; striae on sides of head more regular and weakly curved inwards. Sculpture of mesosomal dorsum consisting of longitudinal striae, somewhat anteriorly converging on pronotal dorsum, posteriorly converging on mesonotal-propodeal dorsum; oblique on sides. Propodeal declivity finely shagreened; somewhat transversely wrinkled medially, very smooth and glossy ventrally. Petiole and dorsum of gaster shagreened, sides of first gastral segment longitudinally striate.

Relatively short, yellowish or off-white, erect or curved hairs on head and mesosoma, most dense and longest on mandibles and clypeus, only a few short, variously curved hairs breaking the outline of vertex and mesosoma. Dorsum of first gastral segment with only a few short hairs, more abundant, longer and more golden towards apex. Somewhat untidy, relatively long, appressed or decumbent, greyish or silvery pubescence present in various density on all body surfaces, densest along preoccipital margin, pronotal humeri, propodeal dorsum, meso- and metapleura and coxae; fairly dense on gastral dorsum, ranging from silvery to golden.

Black. Mandibles, antennae and legs light to medium yellow, only basal portion of scapes, distal ends of femora and first tarsal segments a shade darker.

Sexuals and immature stages unknown.

ETYMOLOGY

Name derived from the Greek word *minys*, meaning little or small, referring to its small size.

REMARKS

P. minima is one of the smallest members of the subgenus. It is somewhat similar to *P. wardi* but, besides its smaller size (HL 1.09 in *minima* versus HL 1.15-1.34 in *wardi*), it differs in having a more convex mesosoma, posteriorly weakened pronotal margins, propodeal margins that are not produced into laterally directed teeth and a higher and more concave propodeal declivity.

Polyrhachis (Aulacomyrma) pallipes Donisthorpe, 1948

Figures 19, 22, 25

Polyrhachis (Aulacomyrma) pallipes Donisthorpe, 1948: 603. Holotype worker. Type locality: NEW GUINEA, Finschhafen (E.S. Ross), CASC (*examined*).

WORKER

Dimensions: TL c. 4.48-4.98 (4.98); HL 1.15-1.28 (1.25); HW 1.03-1.12 (1.12); CI 87-91 (90); SL 1.22-1.31 (1.31); SI 114-118 (117); PW 0.94-1.06 (1.03); MTL 1.12-1.22 (1.18) (6 measured).

Anterior clypeal margin arcuate, with shallow notch medially; in lateral view basal margin only weakly impressed, indicated by hairline break in cephalic sculpture. Frontal triangle indistinct. Frontal carinae with strongly sinuate, laminate lobes. Sides of head weakly converging anteriorly; convex and more strongly converging posteriorly into preoccipital margin. Eyes weakly convex, in full face view not or only just reaching lateral cephalic outline. Mesosoma marginate along entire length. Pronotal dorsum armed with broad-based, anteriorly pointed teeth, their lateral margins shallowly emarginate at bases. Promesonotal suture distinct; metanotal groove lacking, position indicated by shallow emarginations in lateral margins. Propodeal dorsum descending into declivity in medially uninterrupted curve; lateral margins terminating posteriorly in short, blunt, processes resembling teeth in lateral view. Petiole with dorsal margin entire, acute; lateral spines relatively long, curved backwards and upwards. First gastral segment concave anteriorly, dorsal margin of concavity sharp and produced dorso-medially above dorsal surface of segment.

Sculpture of head consisting of somewhat irregularly spaced, mostly longitudinal striae, rather flat on clypeus and preoccipital margin, becoming stronger laterally. Mesosomal dorsum with mostly longitudinal striae, anteriorly converging on pronotal dorsum, V-shaped on propodeal

dorsum. Anterior and posterior face of petiole shagreened. Gaster finely longitudinally striate; concavity of first gastral segment smooth and shiny.

Medium length, mostly erect, yellow to golden hairs scattered over entire body surfaces, longest on head and apically and ventrally on gaster, hairs shorter on mesosomal dorsum; only a few, short hairs on dorsum of first gastral segment. Appressed, mostly silvery pubescence on head, mesosoma and petiole; rich golden and dense pubescence on dorsum of first gastral segment, largely obscuring underlying sculpture.

Black; mandibular masticatory margin, distal ends of scapes and basal segments of funiculi light reddish brown; funicular segments becoming gradually lighter towards apex of antennae, apical segments light yellow. Trochanters, femora, tibiae and tarsi light yellow, except distal ends of femora and basal ends of tibiae and tarsi narrowly reddish-brown.

Sexuals and immature stages unknown.

ADDITIONAL MATERIAL EXAMINED

PAPUA NEW GUINEA: Bubia, Markham V., 50m, 20.ix.1955 (J.L. Gressitt) (w); Huon Pen., lower Busu R., 27.iv.1955, lowl. rf. (E.O. Wilson #705) (w); Lae, Busu R. area, 8.i.1968, rf. (B.B. Lowery) (w); 40km W of Madang, 05°13'S, 145°25'E, 140m, 30.i.1989, rf. (P.S. Ward #10088-14) (w). Northern Prov., Kokoda, 25.v.1972 (P.M. Room #364) (w); ditto, 400m, 22.iii.1956 (J.L. Gressitt) (w).

REMARKS

The head and mesosoma of the holotype have almost completely lost the silvery or pale golden pubescence, that is still evident on the propodeal declivity and gastral dorsum. The anterodorsal process of the first gastral segment is well developed, almost as prominent as in *porcata*. Specimens from Kokoda differ in several aspects, notably in the color of the antennal scapes, joints of the femora, tibiae and basal tarsal segments which are very dark brown.

Polyrhachis (Aulacomyrma) parva, new species
Figures 20, 23, 26

TYPE MATERIAL

HOLOTYPE: PAPUA NEW GUINEA, Central Prov., nr Eilogo, 21.xii.1980, J.W. Ismai (worker). **PARATYPES:** data as for holotype (4 workers). Type distribution: holotype in BMNH; 1 paratype each in, ANIC, CASC, MCZC and QMBA.

WORKER

Dimensions: TL c. 4.18-4.69 (4.59); HL 1.09-1.25 (1.18); HW 0.92-1.12 (1.04); CI 84-90 (88); SL 1.12-1.28 (1.28); SI 114-125 (123); PW 0.87-1.03 (0.94); MTL 1.18, 1.06-1.22 (1.18) (6 measured).

Anterior clypeal margin with shallow notch medially; clypeus in profile straight anteriorly, with a weakly impressed basal margin. Frontal carinae sinuate, with laminate lobes. Sides of head in front of eyes gently converging towards bases of mandibles. Eyes convex, distinctly breaking lateral cephalic outline. Mesosomal dorsum marginate along entire length, margins distinctly converging posteriorly. Pronotal humeri armed with broad-based, forward projecting, triangular teeth. Promesonotal suture distinct; metanotal groove lacking. Propodeal dorsum terminating posteriorly in minute blunt angles, their posterior margins continuous and meeting medially, forming transverse, somewhat medially weakened ridge separating propodeal dorsum from

declivity. Dorsal margin of petiole acute, entire, terminating laterally in acute, outwards and backwards curved spines. First gastral segment concave anteriorly; anterodorsal margin of concavity acute, produced dorso-medially and weakly raised above dorsal face of segment.

Mandibles finely longitudinally striate, becoming finely rugose-punctate towards masticatory borders. Head, including clypeus, regularly, longitudinally striate. Mesosomal dorsum longitudinally striate, interspaces wider than those on head; striae mostly oblique on lateral mesosoma. Petiole with anterior and posterior faces shagreened, wrinkled on sides. First gastral segment finely, longitudinally, striate-rugose laterally, shagreened dorsally.

Entire body with relatively short, erect or curved, silvery hairs. Appressed, mostly silvery pubescence abundant everywhere, notably on dorsum of mesosoma, where it fills interspaces between striae; dense on dorsum of gaster, partly obscuring underlying sculpture.

Black. Antennal scapes, joints of femora, tibiae and basal tarsal segments very dark brown, almost black. Mandibular masticatory border reddish brown. Funiculi reddish-brown at bases, each subsequent segment progressively lighter.

Sexuals and immature stages unknown.

ADDITIONAL MATERIAL EXAMINED

PAPUA NEW GUINEA: Gulf Prov., Ivimka camp, Lakekamu Basin, 7.7°S 146.8°E, 120m, lowland wet forest, 23.xi.1996 (R.R. Snelling #96-357) (w); Central Prov., Karema, Brown R., lowland rf., 8-11.iii.1955 (E.O. Wilson #534, 564) (w).

ETYMOLOGY

Derived from the Latin word *parvus*, meaning little, in reference to its small size.

REMARKS

Superficially similar to *exarata*, with the differences listed under the remarks section of that species.

Polyrhachis (Aulacomyrma) planata, new species

Figures 21, 24, 27

TYPE MATERIAL

HOLOTYPE: PAPUA NEW GUINEA, East Sepik Prov., 8km SSW of Dagua, 03°29'S, 143°16'E, 800m, lowland rf., 12-14.vii.1980, P.S. Ward #4747-10 (worker). Type distribution: unique holotype in ANIC.

WORKER

Dimensions of holotype: TL c. 4.59; HL 1.25; HW 1.08; CI 86; SL 1.31; SI 121; PW 1.00; MTL 1.18.

Clypeus with anterior margin arcuate, entire. Sides of head weakly convex and gently converging in front of eyes towards bases of mandibles. Eyes convex, clearly breaking cephalic outline in full face view. Mesosomal dorsum distinctly marginate along entire length, pronotal and mesonotal margins converging posteriorly. Pronotal dorsum rather flat; humeri armed with broad-based, blunt teeth. Propodeal margins divergent, terminating posteriorly in blunt processes, that appear as minute teeth in profile and form short, transverse, medially unconnected ridges, so

that propodeal dorsum descends into concave declivity in medially uninterrupted curve. Petiole strongly transverse, dorsal margin entire; lateral spines very distinct, strongly curved backwards and upwards. Anterior face of first gastral segment concave medially; anterodorsal border of concavity sharply margined, but not distinctly raised above dorsal surface of segment.

Mandibles very finely longitudinally striate. Head and dorsum of mesosoma more-or-less regularly striate; striae mostly longitudinal on head and dorsum of mesosoma, anteriorly converging on clypeus and oblique on sides of mesosoma. First gastral segment shagreened dorsally, longitudinally striate laterally, striae much finer than those on rest of body.

Relatively short, mostly erect, off-white or yellowish hairs, scattered over all dorsal body surfaces; hairs longer on apical segments and venter of gaster, some almost as long as greatest diameter of eye. Rather sparse, appressed, silvery pubescence scattered over dorsum of head and mesosoma dense on pronotal humeri, propodeal dorsum, along lateral and posterior borders of gastral segments and especially on metapleuron and propodeal declivity; midline of declivity glabrous.

Black. Mandibular masticatory border widely, inner mandibular border narrowly, light yellowish brown. Antennal scapes dark reddish brown; funiculi brown, segments becoming progressively lighter towards apex, apical segments yellowish brown. Legs very light, yellowish white (unique holotype may not be fully pigmented individual), only basal portion of trochanters, distal ends of femora, proximal ends of tibiae and basal tarsal segments dark, reddish-brown.

Sexuals and immature stages unknown.

ETYMOLOGY

Name derived from the Latin word *planus*, meaning flat, alluding to its virtually flat pronotal dorsum.

REMARKS

In general appearance and color, *P. planata* is similar to *P. pallipes*. However, it differs from that and other *Aulacomyrma* species by its virtually flat pronotal dorsum and distinctly transverse petiolar node with its lateral spines strongly bent backwards.

Polyrhachis (Aulacomyrma) roberti, new species

Figures 28, 31, 34

TYPE MATERIAL

HOLOTYPE: PAPUA NEW GUINEA, Tatupiti nr Tapini, 1200m, viii.1962, rf., R.W. Taylor acc. 2293 (worker). **PARATYPES:** data as for holotype (2 workers). Type deposition: holotype in ANIC; 1 paratype each in MCZC and QMBA.

WORKER

Dimensions: TL c. 5.74-6.15 (6.15); HL 1.59-1.62 (1.62); HW 1.40-1.43 (1.43); CI 88-89 (88); SL 1.62-1.65 (1.65); SI 114-116 (115); PW 1.18-1.25 (1.25); MTL 1.56-1.65 (1.65) (3 measured).

Median portion of anterior clypeal margin projecting anteriorly as narrow, medially emarginate lobe. Clypeus transversely convex, straight in profile with rather distinct basal margin and frontal triangle. Frontal carinae sinuate with laminate lobes. Central area with short but distinct longitudinal carina. Sides of head in front of eyes moderately convex, behind eyes rounding into convex preoccipital margin. Mesosoma marginate along entire length, margins

broken at promesonotal suture and distinctly notched at metanotal groove. Pronotal dorsum moderately convex; humeri armed with broad-based, acute teeth. Promesonotal suture distinct; metanotal groove indicated dorsally by weakly incised line breaking sculpture. Propodeum armed posteriorly with pair of strong, broad-based, triangular, dorsally curved teeth, their posterior margins continued medially but failing to meet, leaving a small gap through which propodeal dorsum meets declivity. Petiole strongly transverse, dorsal margin medially emarginate with pair of distinct, acute, intercalary teeth flanking emargination; lateral spines long and straight with tips weakly curved upwards; dorsal margin between intercalary teeth and lateral spines jagged. Anterior face of first gastral segment very shallowly concave with dorso-medial margin blunt.

Mandibles with very fine shallow punctures. Clypeus very finely, microscopically shagreened, contrasting with rest of head that is finely, but distinctly and regularly striate; striae mostly longitudinal on sides of head, converging medially on vertex. Mesosoma longitudinally striate, striae converging posteriorly on mesonotum and oblique on sides. Both faces of petiole microscopically shagreened. First gastral segment shagreened, a few longitudinal striae on sides.

Dorsum of head with very few erect hairs on anterior clypeal margin, antennal scapes, frontal carinae and area between eyes and posterolateral corners. Mesosomal dorsum with a few erect or semierect, medium length hairs on pronotal humeri, mesonotal and propodeal dorsa and dorsal surfaces of propodeal teeth. Petiole with several short hairs arising from posterior face just below dorsal margin. Dorsum and apex of gaster with more numerous, distinctly longer, golden hairs. Silvery, rather diluted, appressed pubescence on pronotal humeri, dorsum and sides of propodeum, coxae and petiole, more dense and distinctly golden on dorsum of first gastral segment.

Black and glossy. Mandibles and eyes distinctly light reddish-brown. Appendages very dark brown, almost black, inner surfaces of front femora, front and middle tibiae and distal segments of tarsi medium to light reddish brown. Apex of gaster reddish brown.

Sexuals and immature stages unknown.

ETYMOLOGY

Named in honor of my former mentor, Dr Robert W. Taylor, who introduced me to and guided my first steps in my studies on *Polyrhachis* ants.

REMARKS

This species is characterized by well developed pronotal and propodeal teeth and notably by its remarkable petiole, which is strongly transverse and furnished with a pair of acute dorsal teeth with a medial emargination between them and relatively long, lateral spines. It stands near *P. simulans* with both sharing similar sculpture of the head and mesosoma, including the absence of any striae on their mandibles and clypeus. However, they differ in a number of characters, of which the most distinct are discussed under *simulans*.

Polyrhachis (Aulacomyrma) sculpta Emery, 1887

Figures 29, 32, 35

Polyrhachis sculpta Emery, 1887: 226. Holotype worker. Type locality: NEW GUINEA, Sorong (L.M. D'Albertis), MCSN (examined).

Polyrhachis (Campomyrma) sculpta Emery; Emery, 1925: 180. Combination in *P. (Campomyrma)*.

WORKER

Dimensions of holotype: TL c. 5.24; HL 1.40; HW 1.18; CI 84; SL 1.47; SI 124; PW 1.09; MTL 1.34.

Clypeus arcuate, medially shallowly emarginate with distinct longitudinal median carina; in profile clypeus virtually straight with basal margin weakly impressed medially. Frontal triangle indistinct. Frontal carinae strongly sinuate with raised laminate lobes. Eyes relatively large, convex, in full face view clearly breaking lateral cephalic outline. Sides of head only weakly converging anteriorly, convex and converging behind eyes. Pronotal and mesonotal dorsa marginate, lateral margins of propodeal dorsum ill-defined. Pronotal humeri armed with triangular teeth, lateral margins shallowly emarginate at bases. Promesonotal suture distinct; metanotal groove lacking, position indicated by interruption of lateral mesosomal margin. Propodeal dorsum descending into virtually vertical declivity in rather abrupt, medially unbroken curve; lateral propodeal margins terminating in small, blunt, tubercles. Petiole with sharp dorsal margin, shallowly emarginated medially; lateral teeth short, very weakly curved backwards. First gastral segment concave anteriorly, anterodorsal margin of concavity elevated above dorsal surface of segment.

Mandibles finely, longitudinally striate. Sides and front of head regularly, longitudinally striate, striae on clypeus converging anteriorly and meeting along midline; striae on vertex distinctly transversely bowed, almost semicircular. Mesosoma with striae converging anteriorly on pronotal dorsum, somewhat V-shaped on mesonotal and propodeal dorsa and oblique on sides. Petiole and dorsum of gastral segments shagreened.

Silvery or off-white hairs present on all body surfaces and appendages. Numerous, semi-erect to erect, very short to medium length hairs on front and sides of head in front of eyes; hairs very short and strongly anteriorly inclined on vertex. Antennal scapes with numerous hairs along leading edges and at distal ends. Hairs on pronotal dorsum very uneven in length and direction, ranging from short to medium, erect to semi-erect or undulated; hairs mostly posteriorly directed on mesonotal and propodeal dorsa. Petiole with a few hairs along dorsal margin. Gaster with mostly short, posteriorly directed hairs on dorsum of first gastral segment, increasing in length and density towards gastral apex where they are relatively long and more golden. Silvery appressed pubescence scattered over body; most dense on dorsum and sides of propodeum, where it almost completely hides underlying sculpture, and along posterior margins of gastral segments.

Black, with antennal scapes, basal segments of funiculi and femora very dark reddish brown. Apical segments of funiculi, tibiae and tarsi light to very light yellowish brown.

Sexuals and immature stages unknown.

REMARKS

P. sculpta is characterized by the posteriorly less distinct lateral margins of the mesosoma, leaving the propodeum only weakly margined laterally and completely immarginate posteriorly. The sculpture of the vertex is transversely bowed in contrast to the longitudinal striation of the rest of the head. With its rather untidy silvery pubescence *sculpta* superficially resembles *P. variegata*, but they differ in many aspects, especially the eyes, that are convex in *sculpta*, and distinctly flat in *variegata*. The propodeal declivity is virtually vertical in *sculpta*, while it is distinctly oblique in *variegata*. The anterodorsal margin of first gastral segment is elevated above the dorsal surface of the segment in *sculpta*, while it is only weakly concave in *variegata*, with the dorso-medial margin blunt.

***Polyrhachis (Aulacomyrma) simulans*, new species**

Figures 30, 33, 36

TYPE MATERIAL

HOLOTYPE: PAPUA NEW GUINEA, Morobe Prov., Huon Penins., lower Busu Riv., 5.v.1955, lowland rf. (E.O. Wilson #950) (worker). Type distribution: unique holotype in MCZC.

WORKER

Dimensions of holotype: TL c. 5.74; HL 1.43; HW 1.31; CI 92; SL 1.47; SI 112; PW 1.15; MTL 1.37.

Anterior clypeal margin arcuate, entire; in profile clypeus weakly convex with rather flat basal margin. Frontal triangle indicated by change in cephalic sculpture. Frontal carinae sinuate, with raised laminate lobes. Sides of head gently convex in front of eyes. Eyes only moderately convex, not reaching lateral cephalic outline in full face view. Mesosoma laterally marginate along entire length. Pronotal humeri armed with acute teeth, their margins raised and continuous with pronotal margins. Promesonotal suture distinct; metanotal groove indicated by shallow incisions in lateral margins. Propodeal dorsum with lateral margins terminating posteriorly in narrowly rounded angles with weakly raised margins, appearing as small teeth in lateral view; medially propodeal dorsum rounding into declivity in an uninterrupted curve. Dorsal petiolar margin acute, with medial emargination flanked by pair of intercalary teeth; lateral margin somewhat jagged and terminates in outwards and weakly backwards directed, slender spines. Anterior face of first gastral segment concave, dorso-medial margin of concavity rather blunt.

Mandibles, clypeus and frontal triangle rather smooth, very finely, superficially shagreened with scattered minute punctures, strongly contrasting with rest of head, that is longitudinally striate with striae weakly curved on sides; striae less regular on vertex and somewhat curved along midline. Striation on pronotal dorsum distinctly converging anteriorly and medially; striae on mesonotal- propodeal dorsum converging towards propodeal declivity and oblique on sides. Petiole with both faces finely shagreened. First gastral segment longitudinally striate, striae on dorsum distinctly finer and converging medially towards anterior margin.

Head, body and appendages with numerous erect to semi-erect, whitish or silvery hairs; no hairs on mandibles and clypeus, except a few along anterior margin, and sides of head between eyes and mandibular bases. Gaster with numerous, short, backward-curved hairs, those closer to apex distinctly longer. Mostly appressed, greyish or silvery pubescence on all body surfaces, most diluted on head and pronotum, with denser patches on meso- and metapleura, lateral borders of propodeal declivity and propodeal dorsum, where it curves towards midline. Pubescence relatively abundant on gastral dorsum, but not hiding underlying sculpture.

Black or very dark brown, with funiculi and tibiae of hind legs a shade lighter. Mandibular masticatory borders, tibiae, except their basal margin and apical tarsal segments light, almost yellow with reddish tint.

Sexuals and immature stages unknown.

ETYMOLOGY

Name derived from the Latin word *simulo*, meaning imitate or copy, in reference to its similarity to *P. roberti*.

REMARKS

P. simulans closely resembles *P. roberti* and they share similar sculpture of the head and mesosoma, including the absence of striae on their mandibles and clypeus. However, they differ in a number of characters, of which the most distinct is the anterior clypeal margin which is entire in *simulans*, while in *roberti* the median portion of the margin projects as a narrow, medially emarginate lobe. In full face view the eyes do not reach the cephalic outline in *simulans*, while they clearly exceed it in *roberti*. In *simulans* the lateral margins of the propodeal dorsum terminate in blunt rounded angles, that do not project posteriorly. In contrast, the margins in *roberti* terminate in a pair of strong, broad-based, triangular, dorsally curved teeth, that project well beyond the posterior border of the propodeum. The petiole in *simulans* is about as wide as high, while in *roberti* it is clearly transverse, distinctly wider than high. Most of the body surfaces in *simulans* have abundant, erect hairs, while only a few hairs break the outline of the head and mesosoma in *roberti*.

***Polyrhachis (Aulacomyrma) sulcifera*, new species**

Figures 37, 40, 43

TYPE MATERIAL

HOLOTYPE: PAPUA NEW GUINEA, Wum, Upper Jimmi Valley, 05°25'S, 144°23'E, 840m, 17.vii.1955, J.L. Gressitt (worker). Type distribution: unique holotype in MCZC.

WORKER

Dimensions of holotype: TL c. 5.19; HL 1.28; HW 1.12; CI 87; SL 1.40; SI 125; PW 1.06; MTL 1.28.

Anterior clypeal margin arcuate, entire; in profile clypeus very weakly convex with rather shallow basal margin indicated by hairline break in cephalic sculpture. Sides of head in front of eyes only weakly convex. Eyes strongly convex, in full face view clearly breaking cephalic outline. Mesosomal dorsum laterally marginate along entire length. Pronotal humeri armed with strong, broad-based, acute teeth, with distinctly raised margins. Promesonotal suture distinct; metanotal groove lacking, position indicated laterally by shallow emargination in the mesosomal margin. Propodeal dorsum with laterally widened margin, forming distinct rounded prominences, posteriorly continued as transverse, inwardly bowed ridges that almost completely separate dorsum from declivity, except for very narrow medial gap. Petiole distinctly transverse, with acute, medially jagged dorsal margin and slender, acute, strongly upturned lateral spines. Anterior face of first gastral segment concave with anterodorsal margin acute, but not distinctly raised above dorsal face of segment.

Mandibles finely longitudinally striate. Sculpture of head and body consisting of widely spaced, mostly regular, longitudinal striae, giving dorsal surfaces a "ploughed" appearance. Sides of mesosoma with mostly oblique striae, propodeal declivity rather smooth. Petiole shagreened. Gaster with fine, mostly longitudinal striation, striae on dorsum converging towards anterodorsal margin.

Rather short, mostly erect, silvery and yellowish hairs present on all body surfaces, except inferior edges of antennal scapes, dorsal petiolar margin and extensor surfaces of femora and tibiae. Hairs on gastral dorsum more golden and posteriorly curved, those on apex distinctly longer. Appressed pubescence generally very sparse or absent, somewhat more abundant and yellowish on pronotal and propodeal dorsa, notably on humeral teeth and along posterior propodeal margin, silvery on metapleuron and lateral borders of propodeal declivity. Gastral pubescence more abundant and distinctly golden.

Black, with striae and interspaces rather shiny. Antennal scapes, joints of femora and tibiae and proximal portion of basal tarsal segments black or very dark brown. Funiculi and rest of legs light or medium yellow.

Sexuals and immature stages unknown.

ETYMOLOGY

Derived from the Latin word *sulcus*, meaning furrow or goove in reference to the “ploughed” appearance of the dorsal sculpture.

REMARKS

A remarkable species easily recognized by its cephalic and mesosomal striation, that has only about 13 widely spaced striae present across the pronotal dorsum.

Polyrhachis (Aulacomyrma) umboi, new species

Figures 38, 41, 44

TYPE MATERIAL

HOLOTYPE: PAPUA NEW GUINEA, Umboi I., 1km N of Awelkom, 600m, 21-28.ii.1967, G.A. Samuelson (worker). Type distribution: unique holotype in MCZC.

WORKER

Dimensions of holotype: TL c. 5.24; HL 1.31; HW 1.15; CI 88; SL 1.37; SI 119; PW 1.12; MTL 1.28.

Anterior clypeal margin with distinct notch medially; in profile clypeus only very weakly convex with shallow impression just behind anterior margin and moderately impressed basal margin, indicated laterally by break in cephalic sculpture. Frontal triangle indistinct. Frontal carinae sinuate with moderately raised laminate lobes. Head widest just behind eyes, sides converging anteriorly towards mandibular bases. Eyes convex, in full face view clearly breaking cephalic outline. Mesosoma marginate; pronotal and mesonotal dorsa with lateral margins converging posteriorly, propodeal margins parallel. Pronotal humeri armed with angle-like teeth with moderately raised margins, bases weakly emarginate laterally. Promesonotal suture distinct; metanotal groove lacking dorsally, position indicated by slight notch and change in direction of lateral margins. Propodeal dorsum terminating in minute blunt angles, posterior margins continued inwards for only a short distance with dorsum descending into declivity in medially uninterrupted curve. Petiole with dorsal margin acute, weakly jagged; lateral spines curved slightly backwards and upwards. Anterior face of first gastral segment concave, anterodorsal margin distinct, but not acute or raised above dorsal face of segment.

Sculpture of head and mesosoma consisting of more-or-less regularly spaced striae, mostly longitudinal on sides of head, slightly converging on clypeus; striae on vertex curving from posterolateral corners towards central area; a few short, transverse striae along medial preoccipital margin. Pronotal dorsum with striae weakly converging anteriorly, striae on mesonotal-propodeal dorsum distinctly converging posteriorly. Petiole shagreened and somewhat wrinkled. Sides of first gastral segment longitudinally striate, dorsum shagreened.

Head with numerous, erect, rather short, pale yellow hairs not longer than greatest diameter of eye, hairs much less abundant on mesosoma, only few breaking mesosomal outline in lateral view. Gaster with a few short hairs on dorsum of first segment; hairs denser and distinctly longer on ventral surfaces and towards gastral apex. White or silvery, rather diluted, appressed pubescence

on head; denser patches on pronotal humeri, propodeal dorsum, metapleuron, coxae and petiole. Propodeal declivity bordered dorsally and laterally by longer and semierect silvery pubescence. Gastral pubescence rather diluted and silvery along posterior borders of tergites; more abundant and pale golden on dorsum of first gastral segment.

Black, tibiae and apical tarsal segments medium to light reddish-brown; funiculi progressively lighter towards apices, terminal segments light reddish-brown.

Sexuals and immature stages unknown.

ETYMOLOGY

Named after the locality Umboi Island, situated just off the Huon Peninsula along the northeastern coast of Papua New Guinea.

REMARKS

P. umboi is somewhat similar to *P. pallipes*, but lacks an acute and raised anterodorsal margin of first gastral segment and having less acute pronotal teeth and generally darker appendages.

Polyrhachis (Aulacomyrma) variegata, new species

Figures 39, 42, 45

TYPE MATERIAL

HOLOTYPE: INDONESIA, IRIAN JAYA, Guega, W of Swart Valley, 03°36'S, 138°25'E, 1200m, 15.xi.1958, J.L. Gressitt (worker). Type distribution: unique holotype in MCZC.

WORKER

Dimensions of holotype: TL c. 5.54; HL 1.43; HW 1.37; CI 96; SL 1.47; SI 107; PW 1.06; MTL 1.40.

Anterior clypeal margin distinctly medially emarginate; in profile clypeus very weakly convex, almost straight with rather flat but distinct basal margin. Frontal carinae sinuate, rather short, only moderately raised; frontal triangle indistinct. Sides of head convex, distinctly converging anteriorly towards mandibular bases. Eyes distinctly flat, not reaching cephalic outline in full face view. Mesosoma marginate with propodeal margins somewhat weakly defined. Pronotal humeri armed with laterally directed, broad-based teeth, margins raised and laterally continuous with pronotal margins. Promesonotal suture distinct; metanotal groove lacking. Propodeum terminating in small but distinct tuberculae. Propodeal dorsum descending into oblique declivity in uninterrupted curve. Petiole with acute, finely jagged dorsal margin and short, weakly backwards and upwards curved lateral spines; in dorsal view, dorsal petiolar margin weakly anteriorly bowed. Anterior face of first gastral segment very weakly concave with anterodorsal margin blunt, not raised above dorsum of segment.

Mandibles finely longitudinally striate at bases, becoming more reticulate with several shallow pits towards masticatory borders. Clypeus with very fine, weakly V-shaped striae at base, merging into irregular rugae anteriorly. Vertex and sides of head with fine, rather flat, mostly longitudinal striae. Pronotal dorsum with striae diverging, more-or-less parallel with lateral pronotal margins; striae posteriorly converging on mesonotal-propodeal dorsum, mostly oblique on sides of mesosoma, propodeal declivity only finely shagreened. Petiole with both faces finely shagreened.

Gaster with sides longitudinally striate, striae distinctly finer dorsally, first gastral tergite finely reticulate anteromedially.

A few, rather short, erect hairs along outer mandibular edges, anterior clypeal margin, leading edge of antennal scapes, frontal carinae and outer surfaces of hind tibiae; a solitary hair arising from vertex. Hairs completely absent from dorsum of mesosoma, petiole and first gastral segment; only a few hairs, shorter than greatest diameter of eye, concentrated on apex and venter of gaster. Silvery, appressed and semierect, somewhat untidy pubescence in various densities on vertex, pronotal humeri, propodeal dorsum, metapleura, coxae and anterior face of petiole; pubescence virtually absent from front of head; gaster with pubescence more abundant dorsally but not obscuring underlying sculpture.

Black, mandibular masticatory border dark red. Funiculi apically and legs generally dark to medium reddish-brown, tibiae and apical tarsal segments a shade lighter.

ETYMOLOGY

Named for its somewhat different appearance from that of other members of the subgenus (Latin *varius*, *variegatus* = different, different sort).

REMARKS

A rather distinct species easily separated from most others by the posteriorly wide head and distinctly flat eyes, that are situated well away from the lateral margins of the head. The rather flat and fine sculpture, untidy silvery pubescence and notably the obliquely descending propodeal declivity are also quite distinctive.

Polyrhachis (Aulacomyrma) wardi, new species

Figures 46, 49, 52

TYPE MATERIAL

HOLOTYPE: PAPUA NEW GUINEA, East Sepik Prov., 3km S of Wewak, 03°37'S, 143°37'E, 400m, 15.ii.1989, P.S. Ward #10199 (worker). **PARATYPES:** data as for holotype (10 workers, 3 alate ♀, with some of the specimens not entirely hardened and fully pigmented). Type distribution: holotype, 1 nidoparatype worker and 1 nidoparatype queen in ANIC; 2 nidoparatype workers each in BMNH, CASC, MCZC and QMBA.

WORKER

Dimensions: TL c. 4.33-5.09 (4.84); HL 1.15-1.34 (1.28); HW 1.00-1.18 (1.09); CI 83-88 (85); SL 1.31, 1.22-1.37; SI 114-126 (120); PW 0.94-1.06 (0.97); MTL 1.12-1.25 (1.18) (11 measured).

Anterior clypeal margin shallowly emarginate medially; clypeus in profile weakly convex with shallow basal margin. Frontal carinae sinuate, with laminate lobes. Sides of head weakly convex, anteriorly converging. Eyes strongly convex, in full face view clearly breaking cephalic outline. Mesosomal dorsum marginate along entire length; weakly convex in profile. Pronotal humeri virtually right-angled, with margins raised. Promesonotal suture distinct. Metanotal groove lacking dorsally, position indicated by emarginations of lateral margins. Propodeal dorsum with lateral margins diverging and extended into rather short, blunt, laterally directed teeth, posterior margins continued as transverse, somewhat incurved ridge, dividing propodeal dorsum from declivity. Petiole with dorsal margin acute, entire, terminating laterally in distinct, backwardly

curved spines with weakly upturned tips. First gastral segment concave anteriorly; concavity sharply margined dorsally, but not elevated above dorsal face of segment.

Mandibles irregularly longitudinally striate. Head mostly longitudinally, somewhat irregularly striate-rugose; sculpture more regular on sides; striae originating from below posterolateral corners bowed inwards and then outwards, terminating at bases of mandibles. Striation of mesosomal dorsum longitudinal, anteriorly diverging on pronotum, posteriorly converging on mesonotal-propodeal dorsum, mostly oblique on sides of mesosoma. Petiole with both faces shagreened, some rugosity evident towards sides. First gastral segment mostly shagreened dorsally, sides finely, longitudinally striate.

Rather short, mostly erect, silvery and yellowish hairs on all body surfaces and appendages. Appressed, silvery or greyish pubescence very sparse on head, more abundant on dorsum of mesosoma, curving towards midline, not concealing underlying sculpture; patches of denser pubescence on meso- and metapleuron, coxae and petiole; pubescence fairly abundant on first gastral segment, silvery on sides and richly golden on dorsum, almost hiding underlying sculpture.

Black, including coxae and most of antennal scapes. Apices of scapes, funiculi, mandibular masticatory border, distal portion of femora, proximal ends of tibiae and basal tarsal segments very dark to dark reddish brown. Rest of legs light yellow, almost white in some specimens.

QUEEN

Dimensions: TL c. 5.84-6.10; HL 1.43-1.47; HW 1.25-1.26; CI 85-87; SL 1.40-1.43; SI 112-113; PW 1.25-1.28; MTL 1.40 (3 measured).

Similar to worker with usual differences associated with caste. Sculpture similar, pattern of striation following fully developed thoracic structure. Pronotal humeri less acute, propodeal teeth less distinct and petiolar spines shorter. Color of body and appendages identical to worker.

Male and immature stages (larvae and a pupa) present in ANIC.

ADDITIONAL MATERIAL EXAMINED

INDONESIA, IRIAN JAYA (New Guinea: Neth. on data label), Waris, S of Hollandia, 450-500m, 1-7.viii.1959, sweeping, T.C. Maa (w). PAPUA NEW GUINEA: East Sepik Prov., Amok, N of Maprik, 03°35'S, 142°57'E, 165m, 6.i.1960 (T.C. Maa) (w).

ETYMOLOGY

Named in honor of the collector of the type series, Dr Phil S. Ward.

REMARKS

P. wardi is a very distinct species separated from other *Aulacomyrma* by the distinctly laterally widened margins of the propodeal dorsum that extend into short, bluntly terminated, laterally directed teeth.

Polyrhachis (Aulacomyrma) wilsoni, new species

Figures 47, 50, 53

TYPE MATERIAL

HOLOTYPE: PAPUA NEW GUINEA, Huon Pen., lower Busu R., 5.v.1955, lowland rf., E.O. Wilson #950 (worker). **PARATYPES:** data as for holotype, but 3.v.1955, E.O. Wilson #895, 969 (3 workers) and 9.v.1955, E.O. Wilson #984 (worker); Bulolo, 3000ft, 19.xii.1970, rf., B.B.

Lowery (4 workers); W. Bulolo, 2500ft, 22.xii.1970, rf., B.B. Lowery (3 workers). Type deposition: holotype and 2 paratypes in MCZC; 2 paratypes each in QMBA, ANIC, BMNH and CASC.

WORKER

Dimensions: TL c. 4.13-4.84 (4.59); HL 1.12-1.28 (1.25); HW 1.00-1.15 (1.09); CI 87-92 (87); SL 1.22-1.31 (1.28); SI 114-122 (117); PW 0.94-1.09 (1.00); MTL 1.09-1.22 (1.22) (12 measured).

Anterior margin of clypeus arcuate with very shallow notch medially; in profile clypeus weakly convex. Sides of head in front of eyes gently converging anteriorly. Eyes convex, clearly breaking cephalic outline in full face view. Frontal carinae distinctly raised, sinuate; frontal area relatively wide, with short median carina that merges posteriorly into cephalic sculpture. Mesosoma marginate along entire length. Pronotal humeri armed with broad-based, triangular, blunt, teeth. Mesonotal and propodeal dorsa fused, with lateral margins deeply emarginate, terminating in very long, outwardly curved spines, their posterior margins continued as transverse, deeply inwardly bowed ridges, that meet medially and separate propodeal dorsum from declivity. Petiole with sharp, dorsal margin, shallowly indented medially; lateral spines acute and curved backwards, their tips slightly upturned. Anterior face of first gastral segment concave, accommodating posterior face of petiole; anterodorsal margin of concavity distinct medially, but not raised above dorsal face of segment.

Sculpture of head, mesosoma and sides of gaster consisting of regularly spaced striae, mostly longitudinal on dorsum of head and sides of gaster, anteriorly converging on pronotal dorsum, converging posteriorly and joining along midline on mesonotal and propodeal dorsa. Propodeal declivity, petiole and dorsum of first gastral segment shagreened.

Abundant, yellowish, semi-erect to erect hairs present on all body surfaces and appendages, longest hairs almost as long as greatest diameter of eye. Hairs absent from inferior edges of scapes and dorsal surfaces of femora. Body with mostly off-white or yellowish, appressed pubescence, denser and silvery on metapleuron and reddish on gastral dorsum.

Black, with antennal scapes, distal portions of femora, proximal and distal ends of tibiae and basal segments of tarsi dark to medium brown; funiculi and rest of legs distinctly lighter, medium to light yellowish brown or reddish-yellow.

Sexuals and immature stages unknown.

ADDITIONAL MATERIAL EXAMINED

PAPUA NEW GUINEA: Adelbert Mts, Wanuma, 800-1000m, 26.x.1958 (J.L. Gressitt) (w); Wau Gorge, 3000', rf., 30.xii.1970 (B.B. Lowery) (w); ditto, 7.i.1971 (B.B. Lowery) (w).

ETYMOLOGY

Named in honor of Prof. Edward O. Wilson of Harvard University, who collected many new *Aulacomyrma* species during his extensive field work throughout Papua New Guinea.

REMARKS

A remarkable species, easily distinguished from all other known members of the subgenus by the very elongate, strongly divergent, propodeal spines.

Polyrhachis porcata species-group

This group is characterized by the following: mesosomal margins poorly defined or completely absent. Pronotal humeri armed with broad-based teeth or short spines; pronotal lateral margins absent or extending posteriorly for only a short distance before merging with outermost dorsal striae and curving onto sides of pronotum without reaching promesonotal suture. Mesonotal-propodeal dorsum usually with only one or other marginate, or completely immarginate. Petiole scale-like with anterior and posterior faces convex and dorsal margin acute or blunt. Anterior face of first gastral segment distinctly concave in all species, except *decora* and its allies, where it is truncate or even convex. Within the group the species tend to polarise into four, rather intergrading, complexes, centering on *excellens*, *porcata*, *geometrica* and *orokana*. Species in the *excellens* complex are more similar to the *dohrni*-group species, featuring short and weak pronotal margins and only a weakly convex mesosomal dorsum. The sculpture of mesosoma consists of mostly longitudinal, relatively widely spaced striae of a "ploughed" appearance, as in *excellens* or *maai*. Species of the *porcata* complex tend to have the mesosomal dorsum, distinctly transversely convex, the pronotal dorsum completely immarginate, and the mesonotal-propodeal dorsum with one or the other marginate, as in *porcata* or *monticola*. The sculpture of the mesosomal dorsum consists mostly of longitudinal striae curved into various V- or U-shaped patterns, notably on the pronotum. The *geometrica* complex include species with a virtually immarginate mesosoma, both laterally and posteriorly, although in some species closely related to *geometrica* the outermost striae of the mesonotal dorsum form an ill-defined lateral margin. The pronotal humeri are armed with distinct, more-or-less isolated teeth or spines. The anterior face of the first gastral segment is only shallowly concave, as in *geometrica* or *roomi*, or simply convex as in *decora* or *kokoda*. The sculpture of the mesosomal dorsum is intricate with the striae forming transverse, V-, U- or semicircle-shaped patterns, giving the surface a characteristic "geometrical" appearance.

The two species comprising the *orokana* complex are in most aspects very similar to species of the *geometrica* complex. However, they differ by the presence of a very prominent transverse ridge on propodeum, separating the propodeal dorsum from the declivity and by the complete lack of lateral mesosomal margins.

Polyrhachis (Aulacomyrma) annulata, new species

Figures 48, 51, 54

TYPE MATERIAL

HOLOTYPE: PAPUA NEW GUINEA, Mt Tafa, 8km SE of Mondo, 08°38'S, 147°07'E, 8500ft, ii.1934, L.E. Cheesman (B.M.1934-321) (worker). Type distribution: unique holotype in BMNH.

WORKER

Dimensions of holotype: TL 5.54; HL 1.47; HW 1.47; CI 100; SL 1.43; SI 97; PW 1.12; MTL 1.40.

Anterior clypeal margin arcuate, emarginate medially. In profile clypeus moderately convex with basal margin weakly impressed, indicated by hairline break in cephalic sculpture. Frontal carinae sinuate with moderately raised laminate lobes. Sides of head in front of eyes converging anteriorly; rounding behind eyes into relatively shallow preoccipital margin. Eyes moderately convex, just reaching lateral cephalic outline in full face view. Mesosoma only partially marginate, somewhat antero-posteriorly compressed; pronotal humeri armed with broad-based acute spines with lateral margins continued posteriorly for a short distance before merging with

outermost dorsal striae and curving onto sides. Promesonotal suture distinct; metanotal groove lacking. Mesonotal dorsum with distinct lateral margins formed by outermost lateral striae. Propodeum immarginate laterally; propodeal dorsum separated from relatively high, shallowly concave declivity by posterior-most stria that forms a weakly defined posterior margin. Petiole strongly transverse, dorsal margin acute, medially emarginate, strongly sinuate in dorsal view; lateral spines rather short, weakly bent backwards. First gastral segment concave with the anterodorsal margin of concavity rather blunt.

Mandibles finely longitudinally striate-rugose. Head mostly regularly striate, striae V-shaped on clypeus, longitudinal along sides of head and somewhat converging anteriorly from vertex towards frontal carinae. Mesosomal dorsum striate; pronotal striae longitudinal, anteriorly converging on pronotum, oblique on sides; mesonotal-propodeal dorsum with striae strongly bowed, more-or-less semicircular, oblique on sides. Petiole shagreened, becoming more transversely reticulate towards base. Gaster uniformly, finely reticulate.

Mandibles with a few, anteriorly curved hairs along outer and masticatory borders. Antennal scape with a few erect hairs along leading edge and at apex. A few scattered, rather short, variously directed hairs breaking outline of head and mesosoma. Gaster with some longer erect hairs, bordering segments. Appressed pubescence virtually absent from dorsum of head and mesosoma; pale golden pubescence on gastral dorsum, almost obscuring underlying sculpture.

Black. Antennae, femora and first tarsal segments very dark brown, rest of legs medium to light reddish brown; mandibles with anterior half reddish brown; apex of last funicular segment distinctly yellow.

Sexuals and immature stages unknown.

ETYMOLOGY

Name derived from the Latin word *annulatus*, meaning ringed or circular, with reference to the form of the sculpture of the mesonotal-propodeal dorsum.

REMARKS

With the antero-posteriorly compressed mesosoma, dorsal petiolar margin medially emarginate and striae of the mesonotal-propodeal dorsum more-or-less semicircular, *annulata* is somewhat similar to *breviata*. However, both species are easily separated by their size (HL 1.47 in *annulata* versus 1.15 in *breviata*) and shape of the petiole which, in *annulata*, is strongly transverse, while in *breviata* the petiole is almost as high as wide. The sculpture of the pronotal dorsum in *annulata* consists of longitudinal, anteriorly converging striae, while in *breviata* the striae are transverse and strongly anteriorly bowed medially.

Polyrhachis (Aulacomyrma) bedeloweryi, new species

Figures 55, 58, 61

TYPE MATERIAL

HOLOTYPE: PAPUA NEW GUINEA, E. Highlands Prov., Mingende, 05°58'S, 144°53'E, 5200ft, 11.i.1968, B.B. Lowery #NG507 (worker). **PARATYPES:** data as for holotype (3 workers). Type deposition: holotype in ANIC; 1 paratype each in BMNH, MCZC and QMBA.

WORKER

Dimensions: TL c. 5.29-5.54 (5.29); HL 1.37-1.40 (1.37); HW 1.22-1.25 (1.25); CI 89-91 (91); SL 1.53; SI 122-125 (1.22); PW 0.94-0.97 (0.97); MTL 1.56-1.59 (1.59) (4 measured).

Anterior clypeal margin arcuate with very shallow notch medially; basal margin flat, indicated only by a faint hairline; clypeus with shallow medial depression; very weakly convex in profile. Frontal carinae sinuate with laminate lobes; central area with a weak, short, longitudinal carina. Sides of head in front of eyes converging anteriorly, weakly convex; behind eyes rounding into convex preoccipital margin. Eyes convex, in full face view clearly breaking lateral cephalic outline. Mesosomal dorsum laterally marginate except pronotal margin posteriorly incomplete. Pronotal humeri armed with short, distinct teeth, their lateral margins continued posteriorly before merging with the outermost dorsal striae and curving onto sides. Promesonotal suture distinct; metanotal groove indicated by a shallow emargination in lateral outline of segment. Mesonotal and propodeal dorsa fused, posteriorly unarmed; descending into declivity in an abrupt, uninterrupted curve. Petiole with dorsal margin entire; lateral spines weakly curved backwards with tips upturned. First gastral segment with base medially truncate, anterodorsally immarginate and evenly curved onto dorsum of segment.

Mandibles finely longitudinally striate. Clypeus and sides of head shagreened, overlaid by weak irregular rugosity; rest of head with rather weak and shallow, mostly longitudinal striation, most distinct on vertex with striae converging between and behind frontal carinae, fading before reaching basal clypeal margin. Mesosomal dorsum with rather distinct, more-or-less regular striae; anteriorly converging on pronotal dorsum with outermost striae continued obliquely along sides. Striae on mesonotal and propodeal dorsa mostly longitudinal with outermost striae forming rounded posterior corners; median striae rounding into propodeal declivity, terminating just below level of dorsal face of segment. Sides of propodeum with mostly horizontally aligned striae. Petiole with both faces rather smooth, finely shagreened. Sides of first gastral segment distinctly longitudinally striate, striae becoming much finer towards dorsal and anterior faces of segment that are shagreened.

Off-white, sparse, rather short, erect or semierect hairs on all body surfaces, including leading edge of antennal scape. Greyish appressed pubescence present as scattered short hairs on dorsum of head; more concentrated on pronotal humeri, propodeal dorsum, petiole and coxae. Sides of propodeum and dorso-lateral borders of propodeal declivity with patches of relatively dense pubescence. Gastral dorsum anteriorly and laterally with light cover of off-white or golden pubescence, not masking underlying sculpture.

Black and rather shiny with appendages almost uniformly very dark reddish brown or black. Mandibular masticatory border reddish brown. Apex of last funicular segment and apical tarsal segments, distinctly light yellowish brown.

Sexuals and immature stages unknown.

ADDITIONAL MATERIAL EXAMINED

PAPUA NEW GUINEA: E. Highlands Prov., Chuave, 06°07'S, 145°08'E, 22km SE, 2300m, 24-28.xi.1967 (P. Colman) (w).

ETYMOLOGY

Named after the late B.B. (Bede) Lowery, S.J., whose significant collecting skills and activities across Australia, New Guinea and elsewhere in Southeast Asia, brought to light many new ant species, including a number of those described here.

REMARKS

The specimens of the type series were collected at the base of a *Casuarina* tree on the edge of a coffee plantation. *P. bedelowskyi* is relatively close to *P. porcata*. They share almost identical sculpture of the mesosomal dorsum. However, *bedelowskyi* differs in having the striation upon the head much finer, the eyes distinctly more convex, the petiole finely shagreened and the first gastral segment with the base only shallowly truncate, lacking the anterodorsal process found in *porcata*.

***Polyrhachis (Aulacomyrma) breviata*, new species**

Figures 56, 59, 62

TYPE MATERIAL

HOLOTYPE: INDONESIA, IRIAN JAYA (New Guinea: Neth. on data label), Wisselmeren (= Wissel Lakes), Urapura, Kamo Valley, 03°55'S, 136°15'E, 1530m, 11.viii.1955, J.L. Gressitt (worker). **PARATYPE:** data as for holotype (worker). Type distribution: holotype in MCZC; paratype in QMBA.

WORKER

Dimensions: TL c. 4.23-4.43 (4.23); HL 1.15-1.22 (1.15); HW 1.09-1.12 (1.09); CI 92-95 (95); SL 1.22-1.25 (1.22); SI 112; PW 0.78-0.81 (0.78); MTL 1.12 (2 measured).

Anterior clypeal margin arcuate, shallowly emarginate medially; in profile clypeus weakly sinuate with shallowly impressed basal margin. Frontal carinae relatively short with laminate lobes. Sides of head convex in front of eyes, rounding behind into rather shallowly convex preoccipital margin. Eyes moderately convex, in full face view breaking lateral cephalic outline. Mesosoma rather short, somewhat antero-posteriorly compressed, dorsum completely immarginate. Pronotal dorsum widest at midlength; humeri armed with short, acute teeth. Promesonotal suture distinct; metanotal groove lacking. Mesonotal-propodeal dorsum rounding into sides and declivity in uninterrupted curve. Dorsal margin of petiole medially emarginate with a pair of acute intercalary teeth flanking emargination; additional pair of blunt, tooth-like projections, half way between intercalary teeth and rather short lateral teeth. Anterior face of first gastral segment truncate medially, rounding onto dorsal face of segment, without a distinct anterodorsal margin.

Mandibles finely longitudinally striate. Sculpture of head and mesosoma consisting of relatively fine striation; striae on head mostly longitudinal along moderately convex outline of head; V-shaped on clypeus and vertex, meeting along midline. Pronotal dorsum with transverse, strongly anteriorly bowed striae continued obliquely on sides. Striae on mesonotal-propodeal dorsum forming virtual semicircles or U-shaped patterns, continued obliquely along sides; posterior-most striae medially interrupted by rather smooth surface at base of propodeal declivity. Petiole with anterior face weakly transversely striate, medially overlaid by superficial, irregular, mostly vertical, reticulation; posterior face shagreened. First gastral segment more finely longitudinally striate, striae on dorsum converging anteriorly and merging into rather smooth, finely shagreened base.

A few erect or semi-erect, rather short, off-white or silvery hairs scattered on dorsum of head and mesosoma, a few hairs arising from leading edge of antennal scapes and dorsal margin of petiole. Propodeal declivity bordered laterally with short, semi-erect, silvery-gray hairs, that extend onto propodeal lobes. Somewhat longer, yellowish to golden hairs around apex and venter of gaster, almost completely absent from dorsum. Appressed pubescence virtually absent, except on gastral dorsum where it is silvery to golden and partly obscures underlying sculpture.

Black, including antennal scapes and coxae. Funiculi medium reddish brown with proximal portion of basal segments bordered black. Legs mostly light to medium yellowish brown; distal half of femora, proximal end of tibiae and basal segment of tarsi dark reddish brown.

Sexuals and immature stages unknown.

ETYMOLOGY

Name derived from the Latin word *brevior*, meaning shorter, referring to the distinctly short body.

REMARKS

P. breviata is rather similar to *gressitti*, with both species featuring a distinctly shortened body and similar configuration of the petiole, including an emarginate dorsal margin bordered by intercalary teeth. However, *gressitti* is easily recognized by its very high propodeal declivity and the direction of the striae that are mostly longitudinal on the vertex. In *breviata* the striae on the vertex are distinctly V-shaped and meet along the midline. This species also somewhat resembles *annulata* with distinguishing characters listed in the remarks section under that species.

Polyrhachis (Aulacomyrma) decora, new species

Figures 57, 60, 63

TYPE MATERIAL

HOLOTYPE: INDONESIA, IRIAN JAYA (New Guinea: Neth. on data label), Vogelkop, Fak Fak, S. coast of Bomberai Pen., 02°55'S, 132°18'E, 10-100m, 3.vi.1959, T.C. Maa (worker). **PARATYPES:** data as for holotype (3 workers); Vogelkop, Bomberai, Bomberai Pen., 02° 48'S, 132°50'E, 700-900m, 6.vi.1959, T.C. Maa (2 workers); ditto, 10.vi.1959, J.L. Gressitt (worker). Type distribution: holotype and 2 paratypes in MCZC; 1 paratype each in ANIC, BMNH, CASC and QMBA.

WORKER

Dimensions: TL c. 5.19-5.74 (5.19); HL 1.31-1.37 (1.31); HW 1.09-1.15 (1.09); CI 81-84 (83); SL 1.37-1.47 (1.43); SI 126-131 (131); PW 0.90-0.94 (0.90); MTL 1.43-1.47 (1.43) (7 measured).

Clypeus with anterior margin arcuate, shallowly medially emarginate; in profile clypeus weakly convex with distinct notch anteriorly formed by furrow between clypeal striae; basal margin very weakly impressed. Frontal triangle indistinct. Frontal carinae very short, strongly raised with laminate lobes. Eyes very convex, protuberant, somewhat protracted posteriorly. Sides of head in front of eyes weakly converging anteriorly; strongly converging behind into laterally and posteriorly immarginate posterolateral corners; in lateral view relatively high vertex descends abruptly into narrow margin. Mesosomal dorsum laterally and posteriorly immarginate. Pronotal humeri armed with very strong, laterally and anteriorly directed spines with raised margins, dorsum of spines shallowly concave. Promesonotal suture distinct; metanotal groove lacking. Combined length of mesosomal and propodeal dorsa distinctly longer than pronotum. Propodeal dorsum descending uninterrupted into rather short propodeal declivity. Petiole scale-like with sharp dorsal margin terminating laterally in short, acute teeth. Base of first gastral segment anteriorly convex.

Mandibles finely longitudinally striate. Sculpture of head, mesosoma and petiole consisting of strongly raised, regularly spaced striae with deep interspaces resulting in a “ploughed” appearance; striae anteriorly converging on clypeus, U-shaped on apex of vertex, strongly curved medially from posterolateral corners towards central area between frontal carinae. Pronotal dorsum with inverse, open V-shaped striae, descending obliquely and uninterrupted onto sides. Mesonotal and propodeal dorsa with regular, U-shaped striae that are continued along sides and interrupted medially by smooth surface of declivity. Petiole with dorsally bowed striae on both faces. Gaster with distinctly finer striae, longitudinal on sides, less distinct and anteriorly converging on dorsum.

Off-white, erect, medium length hairs on dorsum of head and mesosoma, a few distinctly shorter hairs along dorsal margin of petiole. Hairs on gaster golden, somewhat longer, curved posteriorly on dorsum. Silvery, appressed pubescence virtually absent from head and mesosoma; small, thin patches on propodeal lobes, along declivity, coxae and subpetiolar process. Gaster with fairly dense, reddish-golden pubescence mostly restricted to dorsum of first segment.

Black with very smooth and glossy striae on head, mesosoma and petiole. Antennal scapes very dark, funiculi dark reddish brown with only apical funicular segment distinctly lighter. Legs dark reddish brown, except trochanters and femora, blending from light yellow over proximal halves to very dark brown at distal ends.

Sexuals and immature stages unknown.

ADDITIONAL MATERIAL EXAMINED

PAPUA NEW GUINEA: Huon Pen., Mongi Watershed, Wamuki, 800m, 19-20.iv.1955 (E.O. Wilson #847 (w)).

ETYMOLOGY

Named for its highly decorative sculpture pattern.

REMARKS

P. decora is rather similar to *gressitti*, *kokoda* and *mamba* which all have virtually identical sculpture of the mesosoma and a rather convex base of the first gastral segment. It differs from all of them in having a highly convex vertex, a feature notably distinct in lateral view. Additionally, *decora* differs from *gressitti* in having the mesosomal dorsum distinctly longer, from *kokoda* by the longitudinally striate first gastral segment and from *mamba* by the strongly convex, protuberant eyes.

Polyrhachis (Aulacomyrma) excellens Viehmeyer, 1912

Figures 64, 67, 70

Polyrhachis excellens Viehmeyer, 1912: 14, fig. 19, 19a, 19b. Holotype worker. Type locality: NEW GUINEA (Kais. Wilhelmsland on data label), Torricelli Mts (Schlaginhaufen), SNSD (*examined*).

Polyrhachis (Aulacomyrma) excellens Viehmeyer; Emery, 1921: 17. Combination in *P. (Aulacomyrma)*.

Worker

Dimensions of holotype: TL c. 5.19; HL 1.31; HW 1.15; CI 88; SL 1.47; SI 128; PW 0.87; MTL 1.40.

Anterior clypeal margin arcuate with shallow notch medially; basal margin indicated by hairline break in cephalic sculpture. Frontal triangle indistinct. Frontal carinae strongly raised and sinuate with laminate lobes; central area relatively wide with median stria forming short, longitudinal carina. Sides of head in front of eyes weakly converging anteriorly. Eyes strongly convex, in full face view clearly extending beyond lateral cephalic outline. Pronotal dorsum immarginate, rather flat in profile with greatest width at about midlength. Pronotal humeri armed with very prominent, acute spines. Promesonotal suture distinct, well impressed. Mesonotal and propodeal dorsa fused, with ill-defined lateral margins formed by outermost dorsal striae, terminating posteriorly in short, dorsally flattened, blunt teeth. Propodeal dorsum descending into declivity in even, uninterrupted curve. Petiole with dorsal margin sharp, entire; lateral spines relatively short, curved backwards. First gastral segment concave anteriorly; dorsal margin of concavity produced dorso-medially into an extremely high, lip-like prominence that appears very thin in lateral view and almost reaches height of apex of petiolar margin.

Mandibles finely longitudinally striate at bases, more reticulate-punctate at masticatory borders. Sculpture of head and mesosoma very prominent, consisting of strongly raised, regularly-spaced striae that are longitudinal on sides of head and mesonotal-propodeal dorsum; anteriorly converging on clypeus, vertex and pronotal dorsum; oblique on sides of mesosoma. Dorsal surface of pronotal spines and both faces of petiole smooth, microscopically shagreened. First gastral segment very finely striate, striae converging anteriorly and terminating before anterodorsal process that is finely microscopically shagreened.

Semi-erect to erect, short, off-white hairs fringing outer mandibular margins and antennal scapes, only a few hairs arising from clypeus, sides of head near mandibular bases, frontal carinae, vertex and pronotal dorsum. Hairs completely absent from mesonotal-propodeal dorsum. Gaster with a few hairs dorsally and numerous, medium length, golden hairs along posterior margins of apical gastral segments and at apex. Appressed pubescence virtually absent from body, except small diffused patch bordering propodeal declivity.

Body black with striae smooth and shiny. Antennal scapes and femora dark to very dark reddish-brown. Rest of legs medium to light yellowish-brown, except proximal and distal ends of segments bordered dark reddish-brown. Funiculi missing.

REMARKS

The holotype is the only known specimen of this spectacular species. The very strongly produced anterodorsal margin of the first gastral segment in *P. excellens* represents the most extreme development of this remarkable character.

Polyrhachis (Aulacomyrma) geometrica Fr. Smith, 1859

Figures 65, 68, 71

Polyrhachis geometricus Fr. Smith, 1859: 141. Holotype worker. Type locality: INDONESIA, Aru I. (A.R. Wallace), OXUM (*examined*).

Polyrhachis (Aulacomyrma) geometrica Fr. Smith: Donisthorpe, 1932: 453. Combination in (*Aulacomyrma*).

WORKER

Dimensions: TL c. 4.89-5.14 (4.89); HL 1.25-1.34 (1.25); HW 1.09-1.18 (1.09); CI 87-88 (87); SL 1.31-1.37 (1.31); SI 116-122 (120); PW 0.90-0.94 (0.94); MTL 1.25- 1.28 (1.25) (3 measured).

Anterior clypeal margin arcuate, only very shallowly truncate medially; clypeus virtually straight in profile. Frontal carinae strongly sinuate, with raised margins; central area relatively wide with distinct, longitudinal carina running towards anterior clypeal margin. Frontal triangle

indistinct. Eyes convex, clearly breaking lateral cephalic outline in full face view. Sides of head in front of eyes only weakly converging anteriorly. Pronotum immarginate, widest just below humeri that are armed with small, acute, dorso-ventrally flattened, triangular teeth. Promesonotal suture distinct; metanotal groove lacking, position indicated by slight change in direction of dorsal sculpture and slight depression in lateral outline. Propodeum unarmed. Petiole with dorsal margin emarginate between distinct intercalary teeth; lateral spines relatively long, curved backwards. Anterior face of first gastral segment very shallowly concave medially at base.

Head in front of eyes and on sides more-or-less regularly, longitudinally striate; preoccipital margin with median striae transversely bowed and lateral striae converging anteriorly towards central area between frontal carinae. Sculpture of pronotal dorsum consisting of inverse, wide U- and V-shaped striae, that are laterally uninterrupted and continuous along sides. Mesonotal dorsum with more regular, semicircular striae, outermost forming an ill-defined lateral margin; propodeal dorsum with striae continued obliquely along sides. First gastral segment distinctly, and more densely, longitudinally striate; striae converging anteriorly towards base.

Holotype with pilosity almost completely absent from dorsum of mesosoma and gaster, a few erect to semierect, short hairs on dorsum and sides of head, vertex, along antennal scapes and on tibia of middle and hind legs. Rather sparse, appressed, silvery pubescence scattered over dorsum of head and mesosoma; more abundant along dorso-posterior borders of gastral segments.

Black, including antennal scapes, coxae, trochanters (except narrow light band at distal ends) and femora of middle and hind legs. Femora of front legs, tibiae and tarsi distinctly light yellowish or reddish brown, except proximal and distal ends of segments very dark brown or black. Basal funicular segments very dark brown with paler, reddish brown bands at their apices; lighter bands becoming progressively wider in distal funicular segments, that are mostly pale, reddish-brown.

ADDITIONAL MATERIAL EXAMINED

PAPUA NEW GUINEA: Huon Pen., lower Busu R., 12.v.1955, lowl. rf., E.O. Wilson #1018 (w). Milne Bay Prov., Opanabru, 12mi W of Raba Raba, 2600ft, 1.viii.1969, rf, R. Pullen (worker).

REMARKS

P. geometrica is similar to the other species of the complex, notably to *annulata*, *breviata* and *monticola*, and in addition to the characteristic “geometrical” sculpture they share the medially emarginate dorsal margin of the petiole and rather shallowly concave base of the first gastral segment. However, *geometrica* is easily recognizable by the color of the front femora which are very light, yellowish brown in contrast to the entirely black femora of the middle and hind legs. In the other allied species the femora of all legs are more-or-less uniform in color.

Polyrhachis (Aulacomyrma) gressitti, new species

Figures 66, 69, 72

TYPE MATERIAL

HOLOTYPE: PAPUA NEW GUINEA: Adelbert Mts, Wanuma, 04°36'S, 145°06'E, 800-1000m, 25.x.1958, J.L. Gressitt (worker). Type deposition: unique holotype in MCZC.

WORKER

Dimensions of holotype: TL c. 4.23; HL 1.15; HW 0.90; CI 78; SL 1.25; SI 139; PW 0.78; MTL 1.25.

Anterior clypeal margin with minute notch medially; clypeus in profile virtually straight with weakly impressed basal margin. Frontal triangle indistinct. Frontal carinae sinuate, with rather short, laminate, anteriorly truncate lobes. Sides of head in front of eyes converging anteriorly; rounding behind eyes into convex preoccipital margin. Eyes strongly convex, protuberant, in full face view clearly breaking lateral cephalic outline. Mesosoma laterally and posteriorly immarginate, distinctly antero-posteriorly compressed, notably when viewed from side. Pronotal humeri armed with rather strong, horizontal, anteriorly directed spines; pronotal dorsum evenly curved in profile. Promesonotal suture strongly impressed; metanotal groove lacking. Mesonotal-propodeal dorsum distinctly wider than long; propodeal declivity exceptionally high. Petiole with dorsal margin acute, sinuate in dorsal view, lateral spines relatively short, curved backwards. Anterior face of first gastral segment convex.

Mandibles finely longitudinally striate. Sculpture of head and mesosoma consisting of regularly spaced, smooth and glossy striae; mostly longitudinal and somewhat anteriorly converging on head, transverse and anteriorly bowed on pronotum; striae on mesonotal-propodeal dorsum forming imperfect semicircular pattern with outmost striae continuing obliquely onto sides and posteriorly extending into propodeal declivity. Petiole with both faces transversely striate, striae less distinct dorsally, becoming wrinkles just below dorsal margin. First gastral segment distinctly longitudinally striate, dorsum with striae finer and distinctly converging towards base.

Mostly medium length, erect or curved, golden hairs on dorsum of head, mesosoma and gaster; distinctly shorter hairs along leading edge of antennal scapes, dorsal margin of petiole and legs. Appressed pubescence virtually absent from most body surfaces, except dorsum of first gastral segment, where it is rather diluted and reddish.

Black; mandibular masticatory border, antennal scapes, most of femora, basal segment of tarsi and apical segments of gaster reddish brown to dark rusty red. Funiculi, trochanters, proximal ends of femora and apical tarsal segments, light to very light reddish brown.

Sexuals and immature stages unknown.

ETYMOLOGY

Named in honor of the collector, the late J.L. Gressitt, Bernice P. Bishop Museum, Honolulu, Hawai'i.

REMARKS

Another remarkable species very similar to *P. decora*, but with a distinctly longer and exceptionally high propodeum with its outline forming an almost perfect semicircle in dorsal view.

Polyrhachis (Aulacomyrma) impressa, new species

Figures 73, 76, 79

TYPE MATERIAL

HOLOTYPE: PAPUA NEW GUINEA, Huon Pen., lower Busu R., 10.v.1955, lowl. rf., E.O. Wilson #1003 (worker). **PARATYPES:** data as for holotype, but 27.iv.1955, E.O. Wilson #706 (worker); 10.v.1955, E.O. Wilson #988 (2 workers); 12.v.1955, E.O. Wilson #1018 (worker) and 17.v.1955, E.O. Wilson #1054 (7 workers, 1 dealate ♀). Type distribution: holotype, 1 paratype worker and paratype ♀ in MCZC; 2 paratype workers each in ANIC, BMNH, CASC and QMBA.

WORKER

Dimensions: TL c.5.09-5.69 (5.19); HL 1.31-1.47 (1.34); HW 1.12-1.28 (1.12); CI 83-89 (83); SL 1.34-1.47 (1.34); SI 120-122 (120); PW 0.94-1.09 (0.94); MTL 11.25-1.34 (1.28) (12 measured).

Anterior clypeal margin arcuate, narrowly truncate medially; basal clypeal margin flat, indicated only by hairline break in cephalic sculpture. Frontal triangle indistinct. Frontal carinae relatively short, strongly raised. Sides of head in front of eyes weakly converging towards mandibular bases; strongly rounded behind into rather short preoccipital margin. Eyes convex, somewhat sunk into shallow concavity in cephalic sculpture on sides of head; in full face view only moderately extending beyond lateral cephalic outline. Mesosoma laterally immarginate with dorsum rounding onto sides in unbroken curve. Pronotal humeri armed with short, acute spines. Promesonotal suture deeply impressed; metanotal groove lacking. Propodeal dorsum delimited posteriorly by distinct transverse ridge that separates dorsum from declivity, posterolaterally with minute, somewhat dorsally raised, rounded prominences. Petiole with sharp dorsal margin; lateral spines acute, weakly curved backwards and upwards. First gastral segment shallowly concave anteriorly, anterodorsal margin of concavity blunt.

Sculpture of head and mesosoma mostly consisting of regularly spaced striae; longitudinal on sides of head, converging anteriorly on clypeus and vertex; somewhat inversely U-shaped on pronotal dorsum and obliquely rounding onto sides. Striae on mesosomal and propodeal dorsa forming incomplete semicircles, outermost striae continued obliquely on sides of propodeum. Both faces of petiole shagreened. First gastral segment with dorsum finely striate; intensity of sculpture increasing laterally with sides of gaster very distinctly longitudinally striate.

Relatively short, off-white and yellowish hairs scattered over all dorsal surfaces of head, mesosoma and gaster; hairs silvery and distinctly shorter along dorsal and lateral borders of propodeal declivity and dorsal margin of petiole. Off-white or silvery appressed pubescence, generally directed towards midline, present over all dorsal surfaces of body; most dense on pronotal humeri and dorsum and sides of propodeum. Gastral pubescence golden, rather dense, almost completely obscuring underlying sculpture dorsally.

Body black. Antennae, femora, proximal ends of tibiae and basal tarsal segments black or very dark brown; extreme tip of apical funicular segment, distal end of trochanters, tibiae and apical tarsal segments medium to light yellowish to reddish brown.

QUEEN

Dimensions: TL c. 6.20; HL 1.56; HW 1.31; CI 84; SL 1.53; SI 117; PW 1.25; MTL 150 (1 measured).

Queen essentially as worker, with usual characters identifying full sexuality, including three ocelli and complete thoracic structure with wings. Sculpture of head and body similar to worker, direction of striae following structural characteristics of fully developed mesosoma.

Male and immature stages unknown.

ETYMOLOGY

The name *impressa* is derived from a self explanatory term 'impressive' relating to the rather striking appearance of this species.

REMARKS

P. impressa is very similar to *P. orokana* described below and both species share the laterally immarginate mesosomal dorsum, strong transverse ridge separating the propodeal dorsum from declivity and virtually identical sculpture of the mesosomal dorsum. They can be distinguished by the shape of the fused mesonotal-propodeal dorsum which is about as wide as long in *impressa* and is strongly transverse, distinctly wider than long in *orokana*. The eyes in *impressa* are only moderately convex and situated in a shallow depression in the cephalic sculpture, only partly extending beyond the lateral outline of the head in full face view. In contrast, the eyes in *orokana* are strongly convex, protuberant and in full face view they fully extend beyond the lateral cephalic outline. The antennal scapes in *impressa* bear numerous hairs over all their surfaces, while in *orokana* the hairs are confined to their leading edges. The petiole in *impressa* has the lateral spines relatively long and weakly bent backwards, while they are rather short and virtually straight in *orokana*.

Polyrhachis (Aulacomyrma) kokoda, new species

Figures 74, 77, 80

TYPE MATERIAL

HOLOTYPE: PAPUA NEW GUINEA, Northern Prov., Kokoda, 9.iii.1972, P.M. Room #250 (worker). **PARATYPES:** data as for holotype (1 worker); Oivi Ridge, Kokoda Rd, 1200ft, rf., 18.i.1971, B.B. Lowery (1 worker). Type distribution: holotype in ANIC; 1 paratype each in MCZC and QMBA.

WORKER

Dimensions: TL c. 4.64-5.09 (4.79); HL 1.22-1.31 (1.31); HW 1.00-1.06 (1.03); CI 79-82 (79); SL 1.36-1.43 (1.43); SI 135-139 (139); PW 0.97-1.03 (1.00); MTL 1.31-1.40 (1.37) (3 measured).

Clypeus with anterior margin medially truncate or very shallowly emarginate; median longitudinal carina weakly elevated posteriorly before descending towards shallowly impressed basal margin. Frontal carinae sinuate, with rather short, laminate, anteriorly truncate lobes. Sides of head in front of eyes convex; narrowed behind into convex preoccipital margin. Eyes strongly convex, clearly breaking cephalic outline in full face view. Mesosoma immarginate, dorsum sloping onto sides and propodeal declivity in unbroken curve. Pronotal dorsum very strongly raised anteriorly, convex in profile. Pronotal humeri armed with acute, rather long, downward curved spines; bases broad, margins raised. Promesonotal suture distinct; metanotal groove lacking. Petiole with both faces convex and dorsal margin somewhat angular; lateral spines short, curved backwards. Anterior face of first gastral segment convex.

Mandibles distinctly, longitudinally striate. Sculpture of head, mesosoma and petiole consisting of regularly spaced, rather smooth and glossy striae. Head with longitudinal, mostly anteriorly converging striae; clypeal striae terminating just short of anterior margin. Striae on mesosomal dorsum forming an imperfect elliptical pattern, divided in half by promesonotal suture; outermost striae continued obliquely onto sides and posteriorly extending onto propodeal declivity. Petiole with transverse, dorsally arched striae on anterior face; inversely V-shaped on posterior face and converging upwards towards dorsal margin. Gaster finely, microscopically, shagreened.

Abundant, long, mostly erect or curved, golden hairs on most of body and appendages, hairs reaching greatest diameter of eyes in length, distinctly shorter on antennal scapes and along dorsal margin of petiole. Propodeal declivity with patch of very short, somewhat dorsally curved,

off-white hairs. Appressed, golden pubescence very sparse on dorsum of head and mesosoma; more distinct on pronotal dorsum, forming V-shaped patch running from pronotal spines across the segment, and posteriorly towards propodeal declivity. Thin covering of mostly white or silvery pubescence on sides of mesosoma, coxae, appendages and posterior margins of gastral segments; pubescence most abundant and distinctly reddish on gastral dorsum, somewhat obscuring underlying sculpture.

Black, masticatory margins of mandibles, antennal scapes and most of legs medium to dark reddish-brown. Trochanters and basal femora distinctly yellow.

Sexuals and immature stages unknown.

ADDITIONAL MATERIAL EXAMINED

PAPUA NEW GUINEA: Catalina Estate, 48km N of Port Moresby, 09°27'S, 147°09'E, 500m, 3.ix.1959 (T.C. Maa) (w).

ETYMOLOGY

Named after the type locality, Kokoda village, situated on the northern rim of the Owen Stanley Ranges in the Northern Province of Papua New Guinea.

REMARKS

P. kokoda is superficially similar to *P. mamba* described below, with both species evidently sympatric. The paratype of *kokoda* was collected together with a *mamba* queen at the same locality at Oivi Ridge and they were subsequently mounted on the same pin. Both species share the somewhat elliptical striation of the mesosomal dorsum but there the similarity ends. They differ in numerous characters, including the shape of the eyes, which in *kokoda* are strongly convex and clearly project beyond the lateral outline of the head. In contrast the eyes in *mamba* are virtually flat and sunk into a shallow concavity in the cephalic sculpture and they do not break the cephalic outline in full face view. In lateral view the outline of the mesosoma in *kokoda* features a strongly convex pronotal dorsum and the propodeal dorsum descends into the declivity in an uninterrupted curve. In *mamba* the pronotum is flatter and the propodeal dorsum descends abruptly into a rather short, vertical declivity. The dorsum of the petiole has an acute margin in *kokoda*, while it is bluntly rounded in *mamba*. The first gastral segment of *kokoda* is finely shagreened in contrast to *mamba*, where its sides are distinctly, longitudinally striate. The pubescence on the head and body is golden in *kokoda*, with a distinct reddish tint on the gastral dorsum, while in *mamba* the pubescence is uniformly greyish or white.

Polyrhachis (Aulacomyrma) maa, new species

Figures 75, 78, 81

TYPE MATERIAL

HOLOTYPE: PAPUA NEW GUINEA, W. Highlands, Minj, 05°51'S, 144°40'E, 8-13.ix.1959, T.C. Maa (worker). **PARATYPE:** PAPUA NEW GUINEA, W. Highlands, Nondugl, 05°52'S, 144°43'E, 1600m, 9.vii.1955 (J.L. Gressitt) (worker). Type distribution: holotype in MCZC, paratype in QMBA.

WORKER

Dimensions: TL c. 4.84-5.34 (5.34); HL 1.28-1.37 (1.37); HW 1.12-1.26 (1.26); CI 87-92 (92); SL 1.40-1.50 (1.50); SI 119-125 (119); PW 0.90-1.00 (1.00); MTL 1.34-1.53 (2 measured).

Anterior clypeal margin arcuate, narrowly and shallowly notched medially; clypeus weakly convex in lateral view. Sides of head in front of eyes gently converging anteriorly; curving rather abruptly behind eyes into relatively short preoccipital margin. Eyes moderately convex, only marginally extending beyond cephalic outline. Frontal carinae only moderately raised; central area with short, weakly defined, median carina. Mesosomal dorsum with ill-defined margins. Pronotal dorsum with sides parallel; humeri armed with broad-based, triangular teeth with slightly raised anterior and lateral margins, with latter continued posteriorly towards well impressed promesonotal suture. Mesonotal-propodeal dorsa fused, sides weakly converging posteriorly before widening and again converging and terminating in acute teeth. Petiole with dorsal margin sharp, entire; lateral spines acute and curved backwards and slightly upwards. Anterior face of first gastral segment concave, accommodating posterior face of petiole, anterodorsal margin of concavity weakly medially produced above dorsal face of segment.

Head very smooth and shiny. Mesosomal dorsum smooth between widely spaced, longitudinal striae, that are broken at promesonotal suture and terminate at point where propodeal dorsum descends into declivity that is medially smooth, lacking any sculpture. Sides of mesosoma similarly sculptured, with striae mostly oblique. Anterior face of petiole smooth and shiny, posterior face and dorsum of first gastral segment shagreened. Sides of gaster with very fine, closely spaced, longitudinal striae.

Off-white or yellowish hairs present on mandibles, anterior portion of clypeus and leading edges of antennal scapes; a few hairs arising along frontal carinae and on vertex. In frontal view, no hairs projecting from sides of head between eyes and mandibular bases. A few short, semierect hairs, scattered over mesosomal and gastral dorsa, density and length increasing towards apex and venter of gaster. Pubescence virtually lacking, except for patches of fine, silvery short hair, at sides of propodeal declivity, anterior face of petiole, and dorsum of first gastral segment where it has distinct reddish tint.

Body, including antennal scapes and legs, virtually black, only mandibular masticatory border and apical segments of funiculi and tarsi dark to medium reddish-brown. Color of legs a shade lighter in paratype.

Sexuals and immature stages unknown.

ETYMOLOGY

Named in honor of the late T.C. (Tsing-Chao) Maa of the Tunghai University in Taiwan, who was a longtime associate of the Bernice P. Bishop Museum, Honolulu, Hawai'i. Maa was a field worker *supreme* who collected many of the types lodged in that museum, including a number of the new species described in this paper.

REMARKS

P. maa is a very distinctive species that somewhat resembles *excellens*. Both species share the similar, almost parallel-sided mesosomal dorsum with mostly longitudinal striation and a rather glossy appearance. However, besides the very prominent, anterodorsal process of first gastral segment in *excellens*, they differ in the sculpture of the head, that is very smooth and shiny in *maa* and distinctly longitudinally striate in *excellens*. Also the interspaces between the mesosomal striae are rather shallow in *maa*, while they are much deeper in *excellens*.

***Polyrhachis (Aulacomyrma) mamba*. new species**

Figures 82, 85, 88

TYPE MATERIAL

HOLOTYPE: PAPUA NEW GUINEA, Northern Prov., Owen Stanley Ra., Mamba Plantation, c. 7km WNW of Kokoda, 08°51'S, 147°41'E, 500m, 31.viii-1.ix.1984, R.J. Kohout acc. 403) (worker). **PARATYPES:** data as for holotype (60 workers, 1 dealate ♀). Type distribution: holotype, most paratype workers and paratype ♀ in ANIC; 2 paratype workers in each BMNH, CASC, MCZC, LACM and QMBA.

WORKER

Dimensions: TL c. 6.00, 5.04-5.54; HL 1.47, 1.31-1.40; HW 1.28, 1.12-1.18; CI 87, 84-85; SL 1.47, 1.37-1.40; SI 115, 119-122; PW 1.06, 0.90-0.94; MTL 1.50, 1.34-1.40 (4 measured).

Anterior clypeal margin arcuate, entire to narrowly truncate or very shallowly emarginate medially. Longitudinal median carina weakly raised, terminating posteriorly in a shallow basal margin. Frontal carinae strongly sinuate with rather short, laminate, anteriorly sharply truncate lobes. Side of the head in front of eyes very weakly convex, rounded behind into preoccipital margin. Eyes flat, situated well forward on sides of head, virtually identical to those in *P. impressa* and *P. roomi*, not breaking lateral cephalic outline in full face view. Mesosoma immarginate laterally and posteriorly. Pronotal humeri armed with rather broad-based, laterally and anteriorly directed, more-or-less blunt spines. Promesonotal suture shallow; metanotal groove lacking. Petiole in profile with dorsum rounded, lateral teeth minute, upturned. Anterior face of first gastral segment convex.

Mandibles finely and densely, longitudinally striate. Dorsum of head with mostly regular striae, similar to those in *P. roomi* in orientation; longitudinal and anteriorly converging on clypeus; obliquely curving from sides of head towards basal clypeal margin; transverse and anteriorly bowed on vertex, outermost striae converging forwards between frontal carinae. Mesosoma with striation resembling that of *P. kokoda*, notably on mesonotum and propodeum. Pronotal striation in *mamba* somewhat different, due to shape of dorsum between pronotal spines; curved inwards in *kokoda*, straight in *mamba*. Anterior and posterior faces of petiole with transverse, slightly dorsally bowed striae, that are connected along sides. First gastral segment with sides finely longitudinally striate; dorsally striae becoming less distinct, dorsum finely shagreened.

Short to medium length, erect, curved or sinuate, off-white to silvery hairs present on dorsum of head, mesosoma, petiole and first gastral segment; somewhat longer, yellowish to golden and more erect hairs on legs and gaster. Appressed, mostly greyish pubescence in various densities on most of body, notably on pronotal dorsum, including spines, meso- and metapleuron, lateral borders of propodeal declivity and coxae; somewhat longer on dorsum of gaster and almost obscuring underlying sculpture.

Black; mandibular masticatory border, antennal scapes, joints of femora and tibiae, basal tarsal segments and apical segments of gaster dark reddish-brown. Funiculi, except base of first segment, and most of legs light to very light reddish-yellow.

QUEEN

Dimensions: TL c. 6.35; HL 1.53; HW 1.37; CI 89; SL 1.56; SI 114; PW 1.34; MTL 1.59 (1 measured).

Similar to worker with usual differences indicating caste. Sculpture of head and body similar to worker, direction of striae following structural characteristics of fully developed mesosoma. Colour as in worker except funiculi distinctly darker and femora and tibiae with more extensive dark patches around joints.

ADDITIONAL MATERIAL EXAMINED

PAPUA NEW GUINEA: Northern Prov., Kokoda, 25.v.1972 (P.M. Room #360) (w); ditto, 1.vi.1972 (P.M. Room #360) (w); Oivi Ridge, Kokoda Rd, 1200ft, rf., 18.i.1971, B.B. Lowery (dealate♀). Morobe Prov., Bulolo, 2500-3500ft, rf., 2.i.1968, B.B. Lowery (w).

ETYMOLOGY

Species named after the type locality, Mamba Plantation nr Kokoda, Papua New Guinea.

REMARKS

P. mamba is similar to *P. kokoda*, with distinguishing characters given in the remarks section of the latter species. Among these, the most important are the flat eyes in *mamba* that do not reach the lateral cephalic outline in full face view. Also, the striae on the vertex in *mamba* are transversely bowed, while they are longitudinal in *kokoda*. One dealate queen was collected foraging with workers on the trunks and branches of freshly felled trees on the edge of a recent rainforest clearing. The second queen was collected with a *kokoda* worker at Oivi Ridge nr Kokoda.

Polyrhachis (Aulacomyrma) monticola, new species
Figures 83, 86, 89

TYPE MATERIAL

HOLOTYPE: PAPUA NEW GUINEA, Morobe Prov., Sarawaget Ra., 3km E of Gain, 06°25'S, 146°46'E, 1000-1200m, rf., 26.viii.1984, R.J. Kohout acc. 84.363 (worker). Type deposition: unique holotype in ANIC.

WORKER

Dimensions of holotype: TL c. 5.19; HL 1.37; HW 1.25; CI 91; SL 1.40; SI 112; PW 1.00; MTL 1.31.

Anterior clypeal border arcuate, emarginate medially; clypeus straight in profile, basal margin weakly impressed, laterally indicated by distinct line breaking cephalic sculpture. Frontal carinae with lamellate lobes. Sides of head weakly convex in front of eyes, rounding behind into weakly convex preoccipital margin. Eyes moderately convex, only marginally exceeding lateral cephalic outline. Mesosomal dorsum immarginate for most of length, distinctly converging posteriorly. Pronotal humeri armed with broad-based, triangular, dorso-ventrally flattened teeth. Promesonotal suture relatively shallow, distinctly incised laterally; metanotal groove only weakly indicated by faint break in sculpture. Mesonotal dorsum with outermost dorsal striae forming an ill-defined lateral margin. Propodeal dorsum immarginate, terminating posteriorly in small rounded prominences formed by inwardly curved lateral striae; medially dorsum sloping into declivity in rather abrupt, uninterrupted curve. Dorsal margin of petiole with acute intercalary teeth, bordering medial emargination, margin jagged laterally, terminating in relatively long, strongly backward- curved spines with weakly upturned tips. First gastral segment concave

anteriorly; concavity with blunt dorsal margin that is not elevated above dorsal surface of segment.

Mandibles finely, somewhat irregularly, longitudinally striate-rugose. Sculpture of head consisting of regularly spaced striae; V-shaped on clypeus and mostly longitudinal on sides; striae on vertex converging anteriorly between and along frontal carinae. Striae on pronotal dorsum strongly converging anteriorly; striae on mesonotal-propodeal dorsum converging posteriorly, forming V-shaped pattern; laterally striae continued obliquely onto sides. Petiole with both faces microscopically shagreened. First gastral segment distinctly, longitudinally striate laterally; dorsally striae becoming finer and less distinct, medially and anteriorly finely shagreened.

A few short, erect or curved, yellowish hairs on head, including mandibular masticatory border, anterior clypeal margin, sides of head between eyes and posterolateral corners and along leading edges of antennal scapes; hairs absent between eyes and bases of mandibles or along inferior edges of scapes. Mesosomal dorsum and first gastral segment with a few short erect hairs, variously curved. Petiole with several very short hairs fringing dorsal margin. Apex of gaster with numerous, relatively long, golden hairs. Mostly silvery, very sparse appressed pubescence on head; more abundant on pronotal humeri, propodeal dorsum, sides and upper portion of declivity, coxae, petiole and posterior margins of gastral segments; first gastral segment with distinctly golden pubescence almost obscuring sculpture.

Black; antennae, femora, bases of tibiae and basal tarsal segments very dark reddish-brown. Tip of last funicular segment, distal ends of trochanters, most of tibiae and tarsi, light to very light reddish-brown.

Sexuals and immature stages unknown.

ETYMOLOGY

Name derived from the Latin word *montis*, meaning mountain.

REMARKS

Known from a single worker collected foraging on low vegetation. *P. monticola* is rather similar to *annulata* and *breviata* and shares with them the somewhat antero-posteriorly compressed body and the medially emarginate dorsal petiolar margin. However, *monticola* is easily separated by the sculpture of the mesonotal-propodeal dorsum that consists of V-shaped, posteriorly converging striae, while in *annulata* and *breviata* the striae form virtual semicircles or U-shaped patterns.

Polyrhachis (Aulacomyrma) orokana, new species

Figures 84, 87, 90

TYPE MATERIAL

HOLOTYPE: PAPUA NEW GUINEA, E. Highlands, Orokana, 27.xi.1967, under bark of tree, B.B. Lowery (worker). **PARATYPES:** data as for holotype (3 workers). Type distribution: holotype in ANIC; 1 paratype each in BMNH, MCZC and QMBA.

WORKER

Dimensions TL c. 4.94-5.69 (c. 4.94); HL 1.25-1.31 (1.25); HW 1.00-1.06 (1.03); CI 76-82 (82); SL 1.25-1.28 (1.25); SI 121-125 (1.21); PW 0.87-0.90 (0.870); MTL 1.18-1.22 (1.18) (4 measured).

Anterior clypeal margin arcuate, entire; basal margin very weakly impressed, indicated by hairline break in cephalic sculpture. Frontal triangle indistinct. Frontal carinae relatively short, strongly raised with laminate lobes. Sides of head slightly convex in front of eyes, rounding almost immediately into preoccipital margin behind. Eyes strongly convex, situated well back on sides of head, fully protruding beyond lateral cephalic outline. Mesosoma laterally immarginate with dorsum rounding onto sides in unbroken curve; evenly convex in profile. Pronotal humeri armed with somewhat dorso-ventrally flattened, acute teeth; anterior margins dorsally raised; lateral margins continued obliquely downwards and merging on sides with lateral striae. Promesonotal suture distinct, metanotal groove lacking. Mesonotal and propodeal dorsa fused, distinctly transverse, separated from declivity by distinct transverse ridge terminating laterally in rounded prominences. Petiole with acute dorsal margin terminating laterally in very small, upturned teeth. First gastral segment shallowly concave anteriorly, anterodorsal margin of concavity obtuse, not raised above dorsal face of segment.

Sculpture of head and mesosoma consisting of regularly spaced striae, mostly longitudinal on head, converging anteriorly on clypeus. Striation on pronotal dorsum inversely U-shaped anteriorly, becoming widely V-shaped towards promesonotal suture and continuing obliquely onto sides. Mesonotal and propodeal dorsa with almost semicircular striae, extended obliquely along sides. Petiole shagreened. First gastral segment longitudinally striate laterally and dorsally.

Rather short, erect or curved, silvery and off-white hairs on most dorsal surfaces of body, shortest lining dorsal margin of petiole, longest and yellowish on dorsum and apical gaster. Silvery appressed pubescence on pronotal dorsum forming distinct V-pattern, running diagonally from pronotal humeri towards middle and dispersing before reaching promesonotal suture. Pubescence on mesonotal and propodeal dorsa becoming rather dense and somewhat directed medially; sparse on sides of propodeum, dense posteriorly on propodeal lobes and coxae. Propodeal declivity bordered laterally and dorsally with very fine, short, upward curved pubescence. Petiole and dorsum of gaster with fairly abundant pubescence, not obscuring underlying sculpture.

Black. Antennae, femora, proximal ends of tibiae and first tarsal segment very dark to dark reddish-brown, tibiae and tarsi distinctly light yellow.

Queen and male unknown. Larvae of various stages of development and a pupa in ANIC.

ETYMOLOGY

Named after the locality Orokana in the Southern Highlands Province of Papua New Guinea.

REMARKS

P. orokana is very similar to *P. impressa*, both featuring almost the same sculpture pattern of the mesosomal dorsum, somewhat posteriorly protracted eyes and the concave anterior face of first gastral segment. However they differ in a number of characters, including the shape of the mesosomal-propodeal dorsum which, in *orokana* is transverse, distinctly wider than long, while in *impressa* it is as long as wide. The eyes in *orokana* are convex and protuberant and fully extend beyond the lateral cephalic outline in full face view. In comparison the eyes in *impressa* are less convex, somewhat sunk into a shallow concavity in the cephalic sculpture and extend only moderately beyond the cephalic outline. The lateral petiolar teeth in *orokana* are very small and

upturned, while in *impressa* they are relatively long and curved backwards and upwards. The lateral gaster has distinct, horizontally directed, longitudinal striae in *orokana*; while in *impressa* the striae are oblique and directed towards the dorso-anterior margin of the first gastral segment.

***Polyrhachis (Aulacomyrma) pelecta*, new species**

Figures 91, 94, 97

TYPE MATERIAL

HOLOTYPE: PAPUA NEW GUINEA, Karubaka, Swart Valley, 03°35'S, 138°30'E, 1500m, 11.xi.1958, J.L. Gressitt (worker). **PARATYPE:** data as for holotype (1 worker). Type distribution: holotype in MCZC; paratype in QMBA.

WORKER

Dimensions (holotype cited first): TL c. 5.49; HL 1.47, 1.43; HW 1.28, 1.28; CI 87, 89; SL 1.50, 1.50; SI 117, 117; PW 1.12, 1.12; MTL 1.43, 1.40 (2 measured).

Anterior clypeal margin arcuate, entire; slightly sinuate in profile. Frontal triangle indistinct. Frontal carinae strongly sinuate, raised, with laminate lobes; central area relatively wide with rather distinct longitudinal carina formed by strongly raised median stria. Sides of head gently convex, only weakly converging anteriorly. Eyes convex, in full face view breaking lateral cephalic outline. Pronotal humeri armed with broad-based triangular teeth, that are shallowly concave dorsally between distinctly raised margins; lateral margins continued for some distance before merging with dorsal striae along sides. Promesonotal suture distinct; metanotal groove lacking. Mesonotal dorsum only partially marginate. Propodeal dorsum immarginate, with posterior angles weakly indicated. Petiole relatively narrow, as wide as high, with dorsal margin somewhat jagged; lateral spines short, slender, directed outwards and only slightly curved backwards. Anterior face of first gastral segment only shallowly concave medially at base.

Sculpture of head consisting of regularly spaced striae; mostly longitudinal, converging medially and anteriorly on clypeus and between frontal carinae. Pronotal dorsum with broadly open, inverse V-shaped striae. Sculpture of mesonotal-propodeal dorsa differing between holotype and paratype; striae in holotype forming incomplete semicircles, open inversely U-shaped posteriorly; in paratype striae strongly converging posteriorly and meeting along midline in V-shaped pattern. Dorsum of first gastral segment microscopically shagreened, becoming finely longitudinally striate towards sides.

Short, erect or semierect, off-white or yellowish hairs present in various densities on most body parts, except inferior edge of antennal scapes. Rather sparse, appressed pubescence everywhere; more dense on coxae and anterior face of petiole and propodeal declivity that is bordered laterally by very short, greyish, semierect fine hairs. Gastral dorsum with light cover of silvery pubescence not concealing underlying sculpture.

Black; antennae and legs dark to very dark reddish-brown. Mandibular masticatory borders, funiculi, tibiae, except proximal ends, and distal tarsal segments distinctly lighter.

Sexuals and immature stages unknown.

ETYMOLOGY

Name derived from the Latin *pellax*, meaning deceitful or decoy, in reference to its close resemblance to *P. geometrica*.

REMARKS

P. plecta is rather close to *P. geometrica* but differs in having the pronotal teeth broad-based, the lateral propodeal margins feebly dentate posteriorly, the dorsal margin of the petiolar node more-or-less entire and the first gastral segment with very fine striations confined to its sides. In contrast, the pronotal teeth in *geometrica* are distinctly smaller and more acute, the propodeum smoothly rounds into the declivity, the dorsal margin of petiolar node is distinctly medially emarginate and the whole surface of first gastral segment is distinctly and finely, striate.

Polyrhachis (Aulacomyrma) porcata Emery, 1921

Figures 92, 95, 98

Polyrhachis (Aulacomyrma) porcata Emery, 1921: 20. Holotype worker. Type locality: NEW GUINEA (NE), (Staudinger et Bang-Hass), MCSN (*examined*).

Polyrhachis (Aulacomyrma) porcata Emery, 1925: 198, Pl. 3, figs 29, 29a.

WORKER

Dimensions (holotype cited first): TL c. 5.74, 6.35; HL 1.47, 1.68; HW 1.28, 1.47; CI 87, 87; SL 1.56, 1.75; SI 122, 119; PW 1.06, 1.18; MTL 1.62, 1.75 (2 measured).

Anterior clypeal margin arcuate, with very narrow medial notch; clypeus weakly convex in profile with basal margin slightly impressed medially and marked laterally by a hairline break in cephalic sculpture. Frontal triangle indistinct; frontal carinae strongly sinuate with laminate lobes. Eyes only weakly convex, not breaking cephalic outline in full face view. Sides of head weakly converging anteriorly; rounding behind eyes into convex preoccipital margin. Pronotal dorsum immarginate; humeri armed with short, laterally and anteriorly directed, rather acute spines, margins raised with dorsal surface between them weakly concave. Promesosoma suture strongly impressed; metanotal groove lacking. Mesonotal and propodeal dorsa with outermost striae stronger than others, forming ill-defined and incomplete lateral margins. Propodeal dorsum posteriorly immarginate, unarmed, descending into declivity in sudden, unbroken curve. Petiole with dorsal margin acute, entire, somewhat medially and dorsally compressed and sinuate in dorsal view; lateral teeth rather short, curved posteriorly. Anterior face of first gastral segment concave medially, dorsal margin of concavity produced dorso-medially into prominent ridge, distinctly raised above dorsal surface of segment.

Mandibles finely, longitudinally striate. Head mostly longitudinally striate with striae on vertex converging medially between frontal carinae. Pronotal dorsum with outermost striae almost semicircular and continuing uninterrupted in oblique direction on sides; innermost striae more narrow and inverse U-shaped. Striae on mesonotal and propodeal dorsa converging posteriorly, terminating just short of declivity. Anterior and posterior faces of petiole transversely striate, striae somewhat bowed dorsally. (These are well marked laterally, but somewhat obscure medially in specimen from Gemeheng.) Dorsum of first gastral segment finely, longitudinally striate, central striae converging anteriorly and terminating before reaching almost smooth, finely shagreened, dorso-medial prominence.

Medium length, yellowish or golden hairs present on all body surfaces; erect or semierect on dorsum and sides of head in front of eyes, between frontal carinae and on vertex. Antennal scape with numerous short erect hairs along leading edge. Numerous erect, suberect and variously curved hairs on dorsum of mesosoma, but virtually absent from sides. Petiole with pair of short erect hairs arising on each side along dorsal margin. Gaster with numerous, relatively long hairs along posterior margins of segments; hairs on dorsum of first gastral segment shorter and distinctly curved posteriorly. Appressed pubescence virtually absent, with only small, silvery patches on metapleuron, lateral and dorsal borders of propodeal declivity, sides of petiole and

coxae. Pubescence on dorsum of gaster confined to narrow, silvery band along posterior edge of first gastral segment; anterior portion of dorsal face, with rather diluted golden pubescence.

Black. Appendages very dark reddish-brown, with only tip of apical funicular segment and apical tarsal segments very light reddish-brown.

Sexuals and immature stages unknown.

ADDITIONAL MATERIAL EXAMINED

NEW GUINEA: Huon Penins., Mongi Watershed, Gemeheng, 1300m, 11-13.iv.1955 (E.O. Wilson #788) (w).

REMARKS

A very distinct, virtually black species that is more-or-less regularly longitudinally striate with the petiole transversely striate. Pubescence is virtually lacking from the body, with only a few scattered, erect, hairs on the head, dorsum of mesonotum, propodeum and the gaster.

Polyrhachis (Aulacomyrma) retusa, new species
Figures 93, 96, 99

TYPE MATERIAL

HOLOTYPE: INDONESIA, IRIAN JAYA (New Guinea: Neth. on data label), Vogelkop, Fak Fak, S. coast of Bomberai Pen., 02°55'S, 132°18'E, 10-100m, 3.vi.1959, T.C. Maa (worker). Type distribution: unique holotype in MCZC.

WORKER

Dimensions of holotype: TL c. 4.43; HL 1.12; HW 1.04; CI 93; SL 1.22; SI 117; PW 0.87; MTL 1.12.

Clypeus with anterior margin arcuate, weakly truncate; in profile clypeus straight anteriorly with outline raised towards basal margin due to a short carina formed by median stria; basal margin impressed medially, laterally indicated by break in cephalic sculpture. Frontal triangle indistinct. Frontal carinae with raised laminate lobes. Sides of head in front of eyes converging anteriorly towards mandibular bases; posteriorly rounding into weakly convex preoccipital margin. Eyes strongly convex, clearly breaking cephalic outline in full face view. Pronotal humeri armed with acute, broad-based teeth, lateral margins curving from bases onto sides, pronotal dorsum immarginate. Promesonotal suture distinct. Metanotal groove lacking. Lateral margin of mesonotal dorsum formed by outermost dorsal striae. Propodeum immarginate laterally and posteriorly with dorsum descending into declivity in uninterrupted curve. Dorsal margin of petiole with shallow emargination medially, weakly jagged laterally, lateral spines relatively long, curved outwards, backwards and upwards. Anterior face of first gastral segment concave, with dorsal margin of concavity acute, not elevated above dorsal face of segment.

Sculpture of head and body consisting of more-or-less regularly spaced striae; mostly longitudinal on dorsum of head, those on vertex curving medially towards frontal carinae and central area. Pronotal striation distinctly converging anteriorly, several median striae curving transversely onto pronotal collar. Mesonotal-propodeal dorsum with striae V-shaped, converging posteriorly and terminating just before propodeal dorsum descends into declivity. Petiole with anterior face wrinkled, transversely at base of segment and vertically on sides; posterior face of

petiole finely shagreened. First gastral segment distinctly striate laterally, striae less distinct dorsally and becoming reticulate-punctate centrally.

Head and mesosoma with numerous, yellow, erect hairs, notably on front of head; distinctly shorter hairs arising from vertex and mesosomal dorsum. Petiole with a few short, erect hairs on dorsal margin. First gastral segment with a few, short, posteriorly directed hairs, more erect and distinctly longer on apex and venter. Very sparse, pale yellow, appressed pubescence on dorsum of head, mesosoma and gastral dorsum.

Black, including antennal scapes, femora and proximal ends of hind tibiae. Funiculi, except apices and basal tarsal segments medium to dark reddish-brown. Tibiae, except their proximal ends, apical segments of tarsi and last funicular segments distinctly light reddish-brown.

Sexuals and immature stages unknown.

ETYMOLOGY

From the Latin word *retusus*, meaning blunted, rounded, referring to the bluntly terminated propodeal dorsum of this species.

REMARKS

P. retusa is relatively close to *porcata*, however, they differ in a number of characters, including their relative size (HL 1.12 in *retusa* versus 1.50-1.68 in *porcata*). The pronotal dorsum in lateral view is much less convex in *retusa* with the pronotal teeth short and broad-based and the petiole is narrow in profile with its dorsal margin distinctly acute. The first gastral segment of *retusa* is concave, but its dorsal margin is not elevated dorsally. In contrast, the pronotal dorsum in *porcata* is distinctly convex in lateral view with the humeri armed with laterally and anteriorly directed, acute spines. The petiole, in lateral view, is scale-like, with both faces distinctly convex and the dorsal margin less acute. The first gastral segment is concave with the dorsal margin of the concavity produced above the face of the segment.

Polyrhachis (Aulacomyrma) roomi, new species

Figures 100, 103, 106

TYPE MATERIAL

HOLOTYPE: PAPUA NEW GUINEA, Northern Prov., Sangara, 18.xii.1971, P.M. Room (worker). **PARATYPES:** data as for holotype (4 workers). Type distribution: holotype in ANIC, 1 paratype each in BMNH, CASC, MCZC and QMBA.

WORKER

Dimensions: TL c. 6.05-6.60 (6.60); HL 1.50-1.72 (1.56); HW 1.28-1.50 (1.34); CI 85-88 (86); SL 1.56-1.72 (1.59); SI 115-126 (119); PW 1.03-1.18 (1.06); MTL 1.53-1.68 (1.59) (5 measured).

Anterior clypeal margin distinctly emarginate medially, dentate on each side of emargination; clypeus with weakly raised longitudinal carina, almost straight in profile; basal margin weakly impressed and indicated laterally by faint line breaking cephalic sculpture. Frontal carinae with strongly sinuate and distinctly raised laminate lobes. Sides of head convex. Eyes virtually flat, situated well forward on sides of head; inner margins somewhat sunk into shallow concavity in cephalic sculpture; not or only just reaching lateral cephalic outline in full face view. Mesosoma

with pronotal and propodeal dorsa laterally immarginate; mesonotal dorsum with outermost striae forming short margin. Pronotal humeri armed with short, laterally and anteriorly directed, horizontal spines. Promesonotal suture rather shallow, indicated by change in direction of sculpture; metanotal groove lacking. Propodeal dorsum separated from declivity by faint posterior border that, viewed from behind, forms inverse 'V' terminating laterally in small denticles. Dorsal petiolar margin with pair of acute intercalary teeth medially, shallowly emarginate between them; laterally margin somewhat jagged, lateral teeth acute, weakly upturned. Anterior face of first gastral segment shallowly concave, narrowly rounding onto dorsum of segment.

Mandibles densely, rather finely, longitudinally striate. Dorsum of head with mostly regular striae; longitudinal and anteriorly converging on clypeus, obliquely curving from sides of head towards basal clypeal margin, transverse and anteriorly bowed on vertex with outermost striae converging towards central area between frontal carinae. Pronotal dorsum mostly regularly, transversely striate; striae curving vertically onto sides. Striae on mesonotal-propodeal dorsum transverse, bowed posteriorly into open U-shapes; sides with striae more-or-less horizontal. Petiole and gaster finely shagreened.

Dorsum of head and mesosoma with medium length, mostly erect, off-white or yellowish hairs; hairs somewhat posteriorly curved and golden on gastral dorsum, distinctly longer along sternites and on gastral apex. Appressed pubescence much reduced on head and mesosomal dorsum, only patches of sparse, off-white or silvery pubescence on sides of propodeum, along propodeal declivity, petiole and coxae. Golden and rather dense gastral pubescence mostly confined to dorsum of first segment, not completely concealing underlying sculpture.

Black; most of antennal scapes, basal half of first funicular segment, joints of femora and tibiae, bases of basal tarsal segments and gaster dark to very dark reddish-brown. Mandibular masticatory border, basal and distal ends of antennal scapes, funiculi and most of legs light to very light reddish-yellow.

Sexuals and immature stages unknown.

ETYMOLOGY

Named in honour of the collector, Dr Peter M. Room of CSIRO, Division of Entomology, Indooroopilly, Queensland, Australia, who collected scores of ants, many new to science, during the years of his appointment as an agricultural entomologist in Papua New Guinea.

REMARKS

This species is easily recognisable by its relatively large size.

Polyrhachis (Aulacomyrma) snellingi, new species

Figures 101, 104, 107

TYPE MATERIAL

HOLOTYPE: INDONESIA, IRIAN JAYA, PT. Freeport Concession, Siewa camp, 03.04°S, 136.38°E, 200ft, 18-30.iv.1998, lowland secondary rf., Malaise trap, R.R. Snelling #16 (worker). Type distribution: unique holotype in LACM.

WORKER

Dimensions of holotype: TL c. 4.59; HL 1.15; HW 1.06; CI 92; SL 1.28; SI 121; PW 1.00; MTL 1.15.

Anterior clypeal margin with shallow notch medially; in profile clypeus virtually straight with only very weakly impressed basal margin. Frontal carinae sinuate with laminate lobes. Sides of head weakly convex, gently converging anteriorly, curving behind eyes into relatively shallow preoccipital margin. Eyes convex, in full face view clearly breaking lateral cephalic outline. Mesosomal dorsum only partially marginate. Pronotal humeri armed with very strong, anteriorly directed, broad-based spines, with raised margins, central areas distinctly concave; lateral margins of spines extended posteriorly for some distance, merging with outermost dorsal striae and curving onto sides, not reaching distinct promesonotal suture. Mesonotal dorsum marginate; propodeum poorly margined, outermost striae delimiting lateral edges of dorsum and terminating in downward and weakly inward curved angles. Propodeal dorsum descending into declivity in even, uninterrupted curve. Petiole with both faces convex, dorsal margin acute; lateral spines relatively short, acute, curved weakly backwards and upwards. First gastral segment with anterior face concave; dorsal margin of concavity sharp, not elevated above dorsal face of segment.

Mandibles finely, mostly longitudinally, striate. Head, including clypeus, distinctly striate; striae mostly longitudinal on front of head and vertex, somewhat oblique on sides. Dorsum of mesosoma distinctly longitudinally striate, striae converging anteriorly; dorsal surfaces of pronotal spines not striate, finely shagreened. Mesonotal-propodeal dorsum longitudinally striate, striae converging posteriorly towards declivity. Petiole with anterior face transversely striate; posterior face with fan-shaped striae running from apex of dorsal margin towards sides and base of segment. Anterior face of first gastral segment with transverse striae that are continued posteriorly along sides and towards dorsum; dorsal surface more finely, longitudinally, striate.

Numerous erect or semierect, yellowish or off-white hairs, shorter than greatest diameter of eye, present on most body surfaces. Mostly greyish or silvery, appressed or semierect pubescence present in various densities on most body surfaces, sparse on head, rather abundant on pronotal dorsum and mostly confined to interspaces between striae and pronotal spines. Propodeal dorsum with pubescence relatively long and distinctly curved towards midline. Gastral dorsum with rather dense pubescence partly obscuring sculpture.

Black, mandibular masticatory border very narrowly and funiculi towards apices, very dark reddish-brown. Legs generally medium reddish-brown, apices of mid and hind femora, tibiae and first tarsal segments, very dark reddish-brown.

Sexuals and immature stages unknown.

ETYMOLOGY

Named in honor of its collector, Roy R. Snelling of the Natural History Museum of Los Angeles County.

REMARKS

P. snellingi is a very distinctive species. It is the only known member of the subgenus having the lateral striation of the first gastral segment extending transversely across its anterior face.

Polyrhachis (Aulacomyrma) wamuki, new species
Figures 102, 105, 108

TYPE MATERIAL

HOLOTYPE: PAPUA NEW GUINEA: Morobe Prov., Huon Penins., Mongi Watershed, Wamuki (= Wamuri), 06°32'S, 147°30'E, 800m, 19-20.iv.1955, E.O. Wilson #847 (worker).

PARATYPE: data as for holotype (1 worker). Type distribution: holotype in MCZC; paratype in QMBA.

WORKER

Dimensions (holotype cited first): TL c. 4.38, 4.23; HL 1.15, 1.12; HW 1.04, 1.00; CI 90, 89; SL 1.22, 1.15; SI 117, 115; PW 0.84, 0.81; MTL 1.09, 1.06 (2 measured).

Anterior clypeal margin arcuate, shallowly emarginate medially; in profile clypeus virtually straight anteriorly, with very weakly impressed basal margin. Frontal carinae sinuate, with laminate lobes. Sides of head in front of eyes almost straight, anteriorly converging. Eyes moderately convex, breaking cephalic outline in full face view. Mesosomal dorsum virtually parallel-sided. Pronotal dorsum immarginate; humeri armed with acute, broad-based teeth with weakly raised margins. Promesonotal suture distinct; metanotal groove lacking. Mesosomal-propodeal dorsum with ill-defined lateral margins formed by outer-most dorsal striae. Propodeum terminating in distinct, rounded prominences, their posterior margins continued inwards for some distance, forming short, medially unconnected ridges, partly separating dorsum from shallowly concave declivity. Dorsal petiolar margin sinuate in dorsal view, somewhat jagged medially and towards sides, with relatively long, acute lateral spines, directed laterally and weakly curved backwards. First gastral segment with anterior face concave; anterodorsal margin of concavity rather sharp and moderately elevated above dorsal face of segment.

Mandibles finely longitudinally striate; striae overlaid by shallow punctures towards masticatory margin. Head, including clypeus, distinctly, mostly regularly, longitudinally striate; striae on sides of head and vertex weakly curved and converging between frontal carinae. Mesosomal dorsum with regular striae; inversely V-shaped on pronotal dorsum, converging anteriorly and medially and continued obliquely onto sides; mesonotal-propodeal dorsum with striae curving posteriorly and inwards towards declivity, where they terminate and form an ill-defined blunt margin. Petiole shagreened. First gastral segment very distinctly longitudinally striate laterally; striae much less distinct dorsally, median area behind anterodorsal margin shagreened.

Mostly golden, rather short hairs dispersed over most body surfaces. Appressed, silvery pubescence rather sparse on head and mesosoma; more abundant, mostly golden pubescence on gastral dorsum.

Black, with antennal scapes and legs at their joints, dark reddish-brown. Mandibular masticatory border, funiculi and most of legs yellow or relatively light, yellowish-brown with reddish tint.

Sexuals and immature stages unknown.

ETYMOLOGY

Named after the type locality, Wamuki village on Huon Peninsula, Papua New Guinea.

REMARKS

P. wamuki is characterised by its small size, virtually parallel-sided mesosomal dorsum and its wide, strongly transverse, petiolar node.

ACKNOWLEDGEMENTS

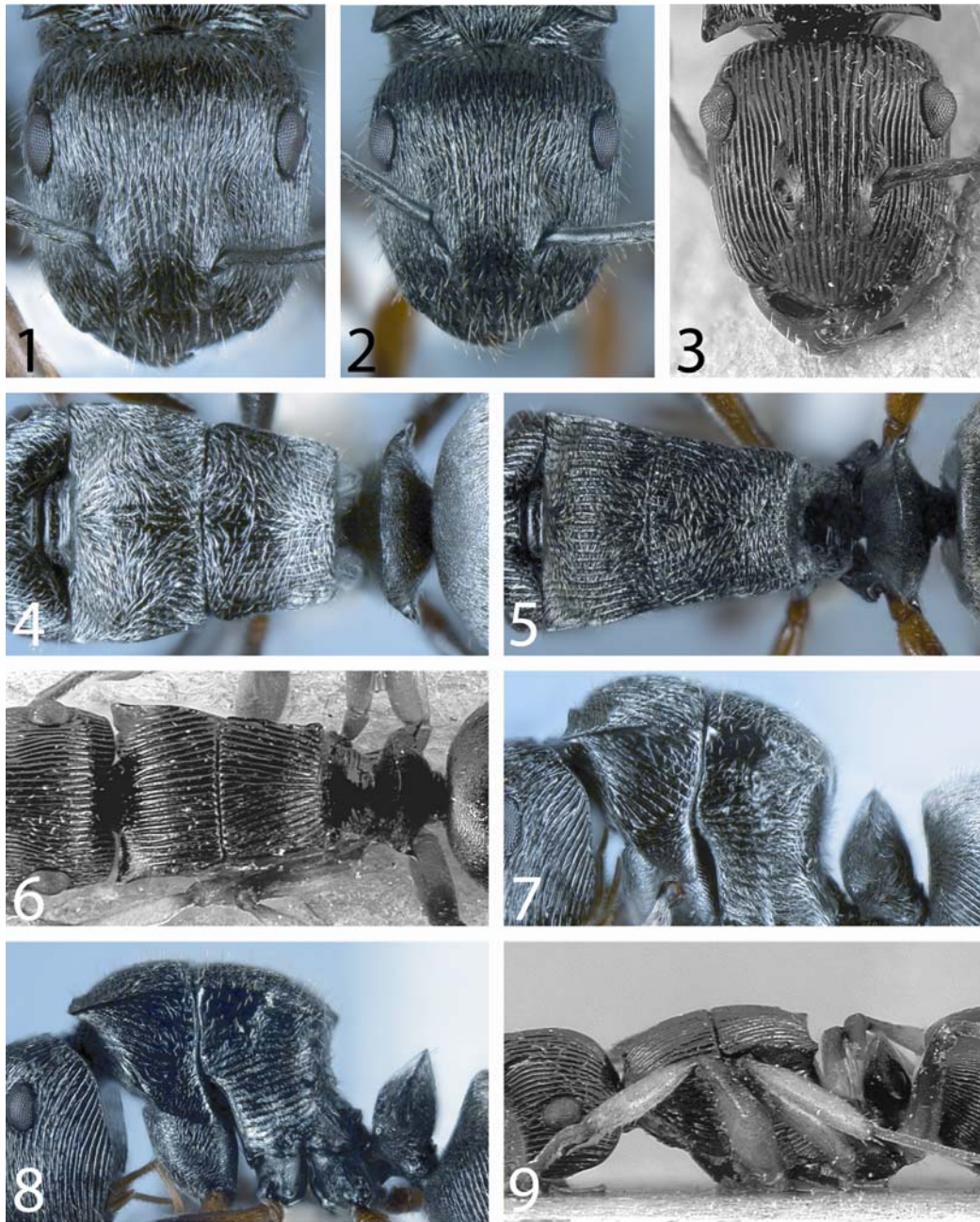
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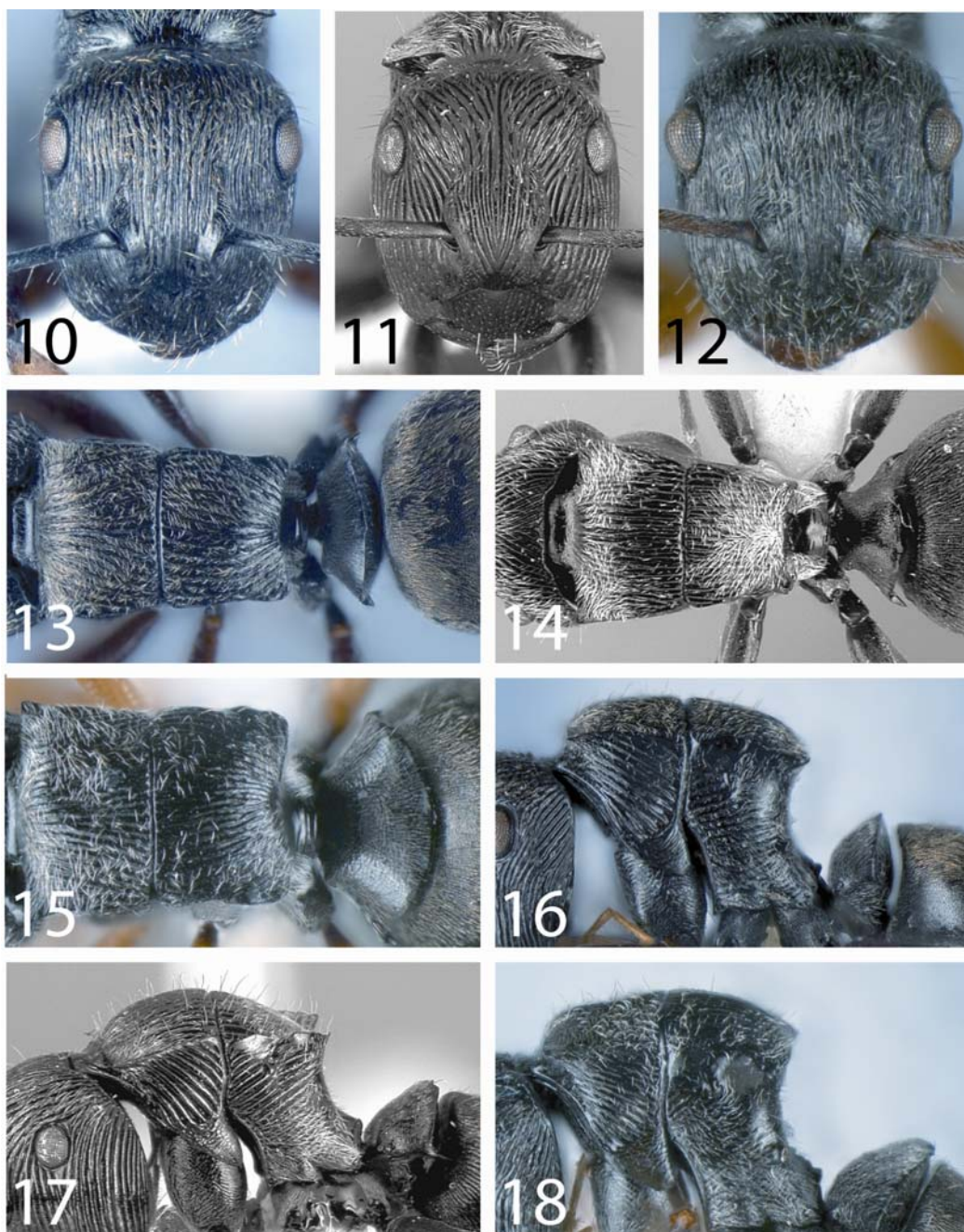
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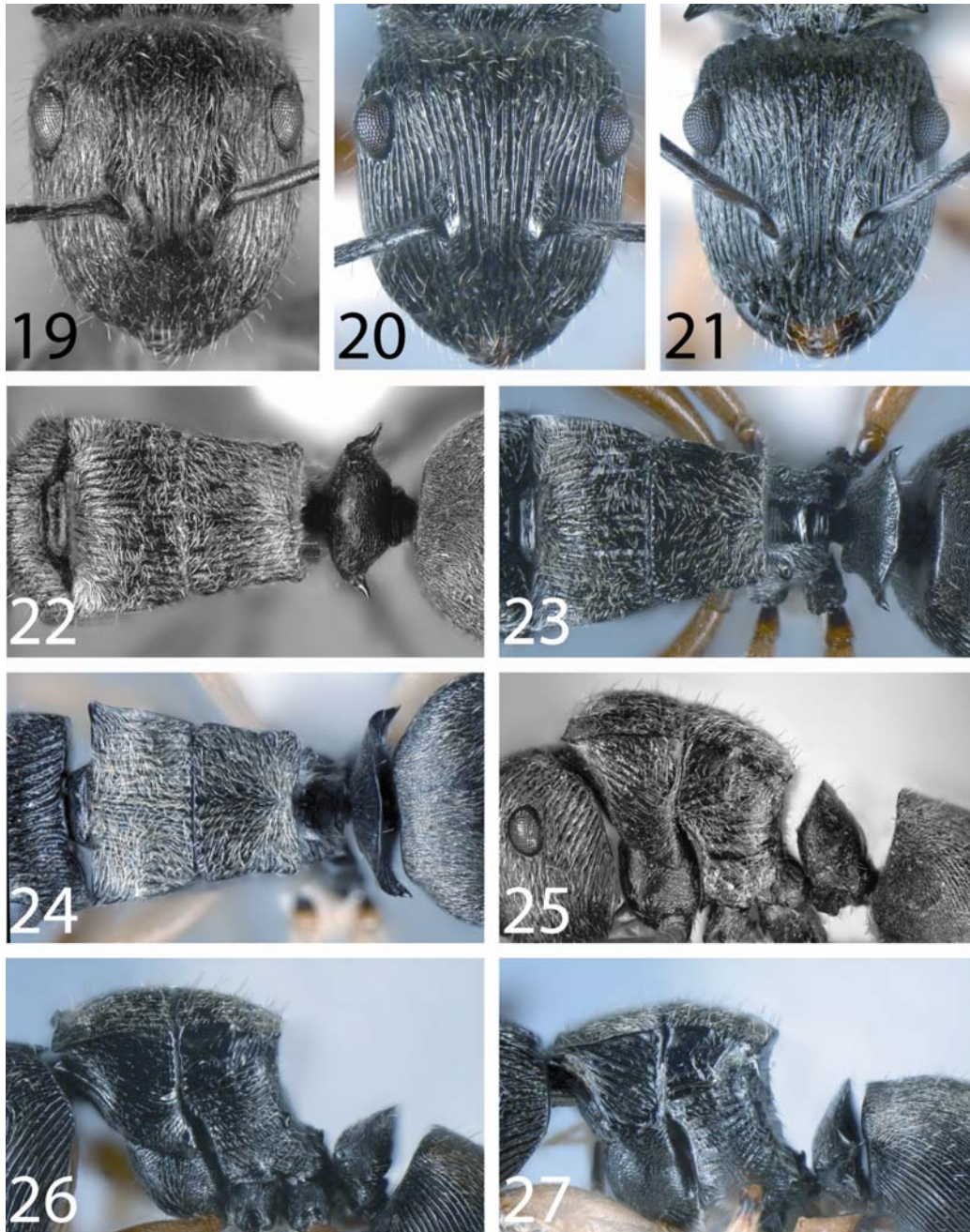
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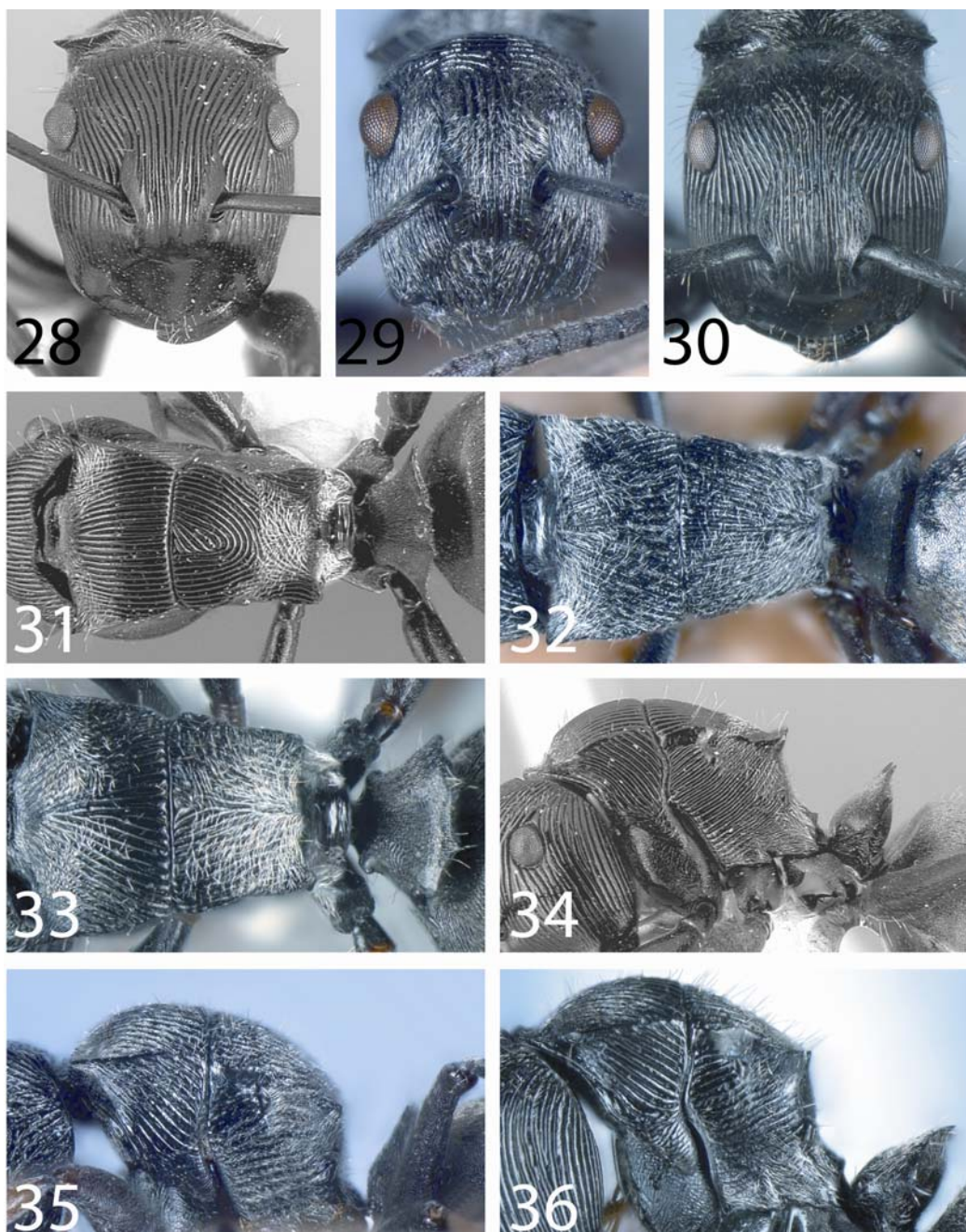
Figures 1-3, head in full face view: 1, *P. abdita*; 2, *dohrni*; 3, *exarata*. **Figures 4-6**, dorsal view of mesosoma and petiole: 4, *P. abdita*; 5, *dohrni*; 6, *exarata*. **Figures 7-9**, Lateral view of mesosoma and petiole: 7, *P. abdita*; 8, *dohrni*; 9, *exarata*.



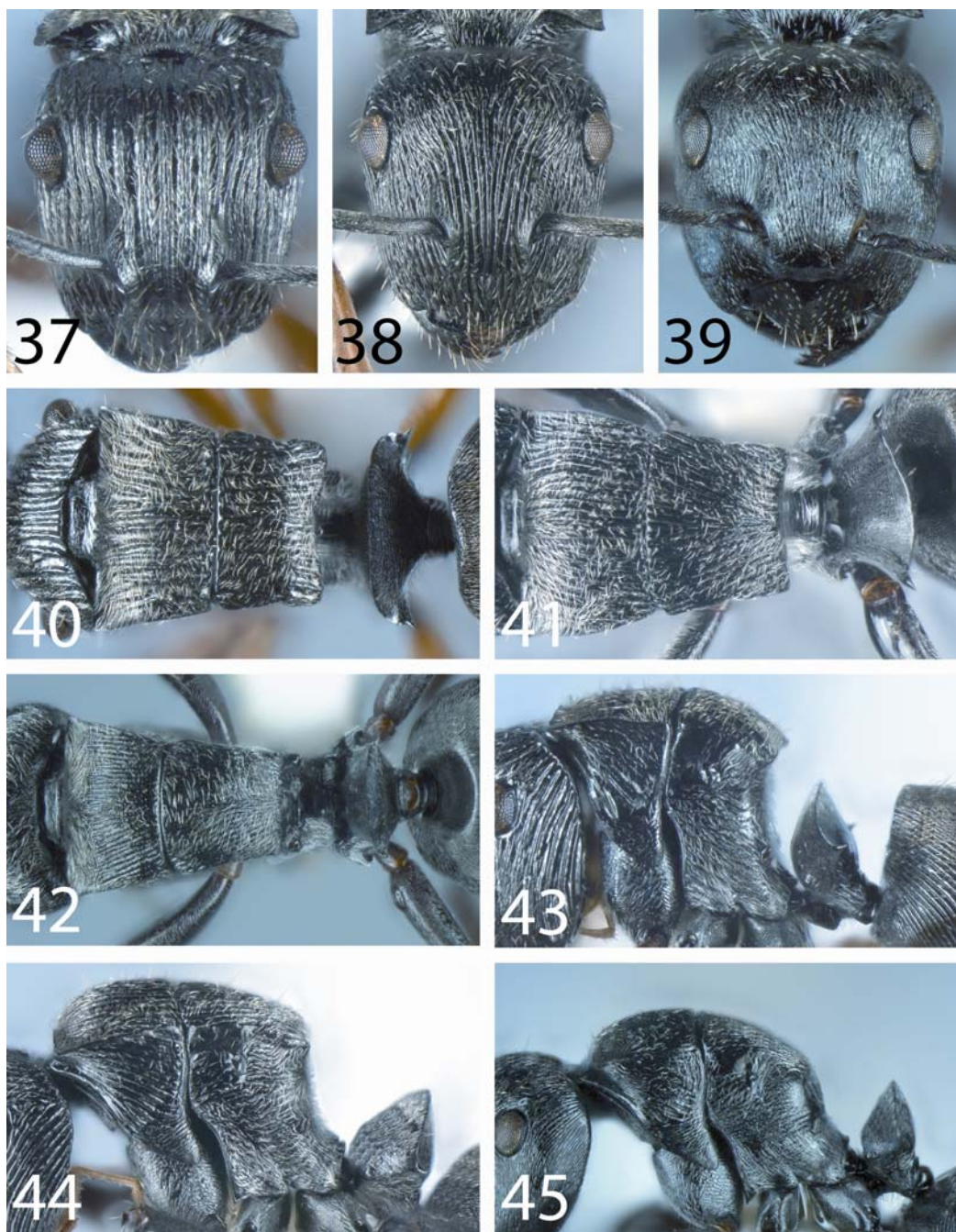
Figures 10-12, Head in full face view: 10, *P. gentilis*; 11, *lumi*; 12, *minima*. **Figures 13-15**, Dorsal view of mesosoma and petiole: 13, *P. gentilis*; 14, *lumi*; 15, *minima*. **Figures 16-18**, Lateral view of mesosoma and petiole: 16, *P. gentilis*; 17, *lumi*; 18, *minima*.



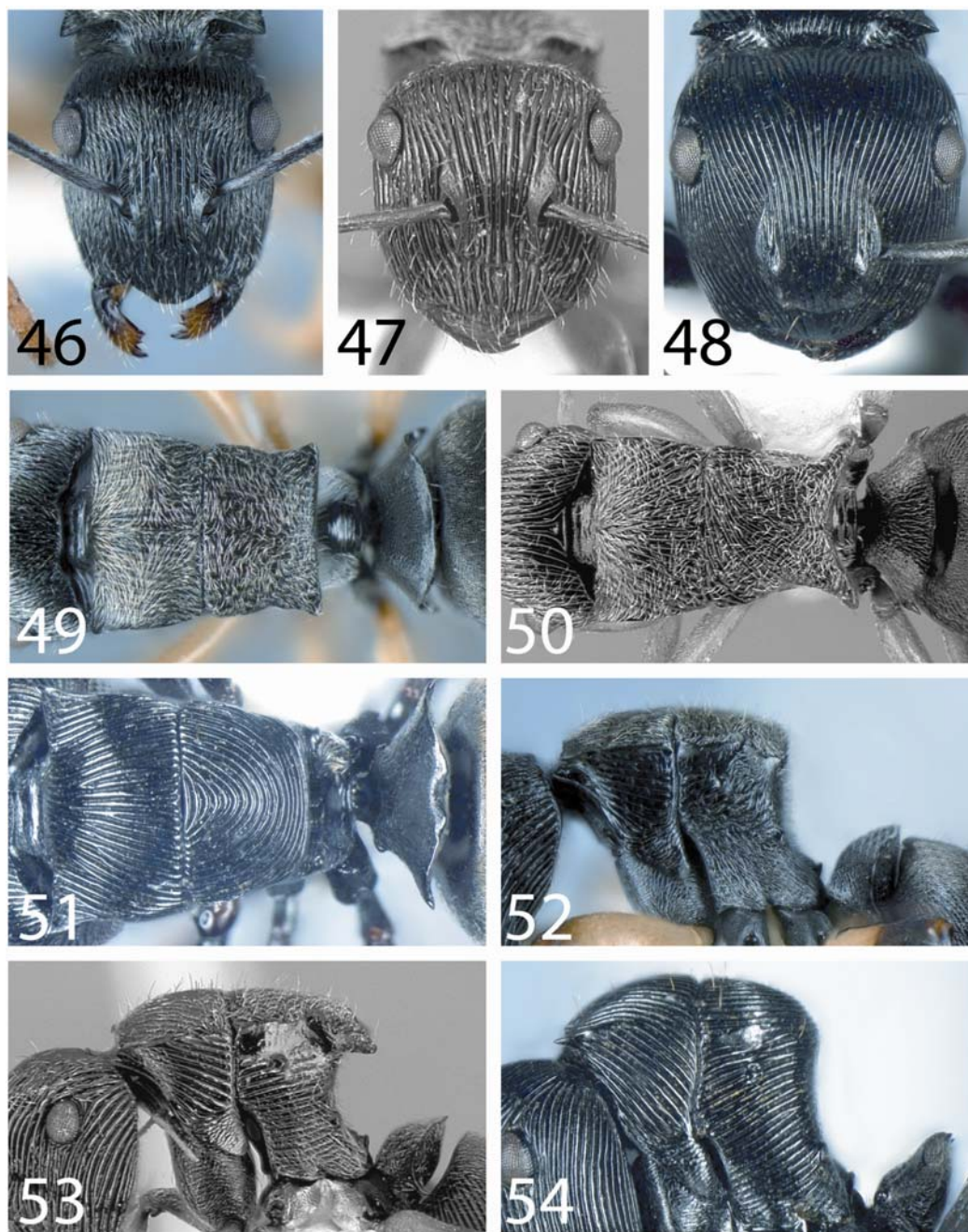
Figures 19-21, Head in full face view: 19, *P. pallipes*; 20, *parva*; 21, *planata*. **Figures 22-24**, Dorsal view of mesosoma and petiole: 22, *P. pallipes*; 23, *parva*; 24, *planata*. **Figures 25-27**, Lateral view of mesosoma and petiole: 25, *P. pallipes*; 26, *parva*; 27, *planata*.



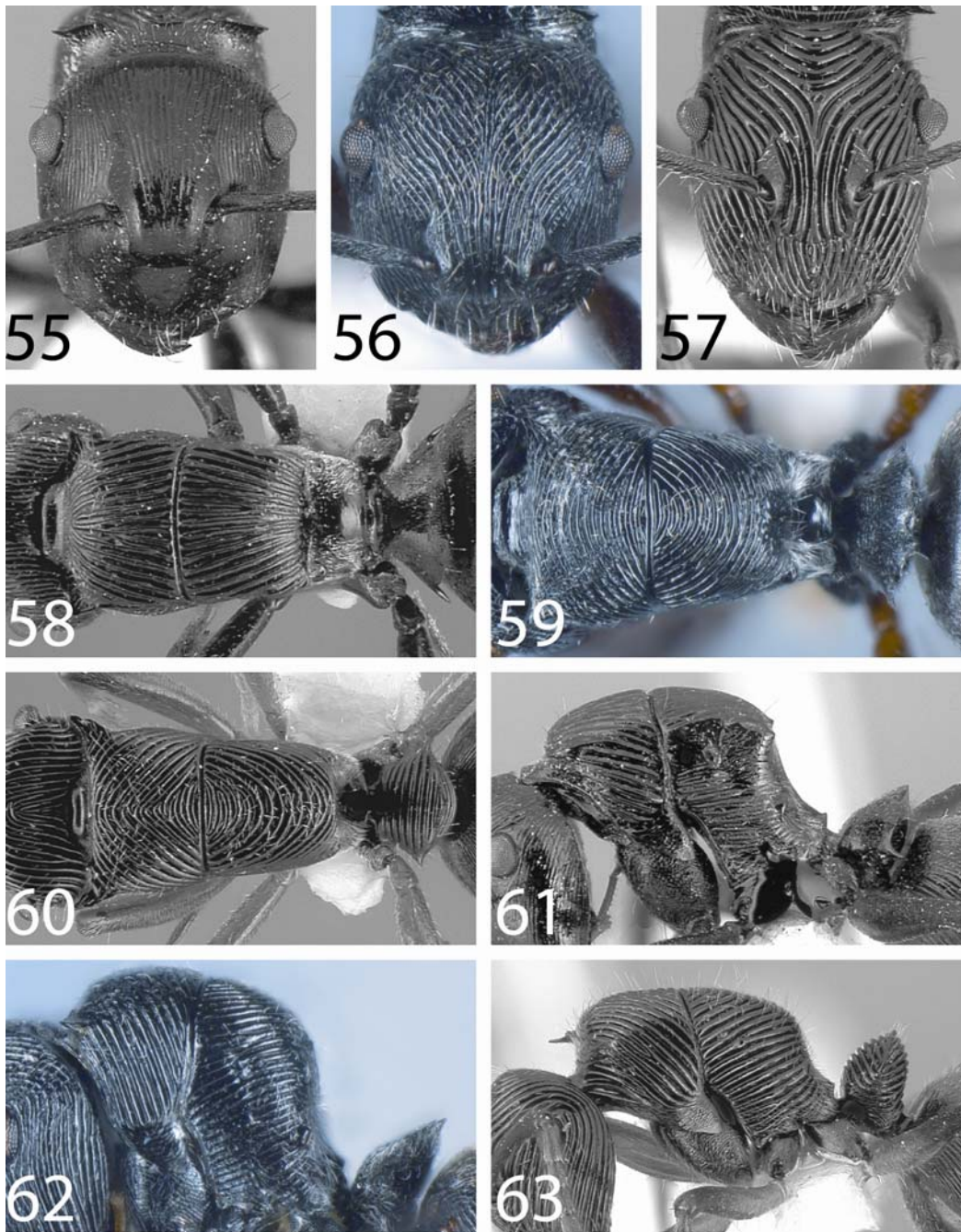
Figures 28-30, Head in full face view: 28, *P. roberti*; 29, *sculpta*; 30, *simulans*. **Figures 31-33**, Dorsal view of mesosoma and petiole: 31, *P. roberti*; 32, *sculpta*; 33, *simulans*. **Figures 34-36**, Lateral view of mesosoma and petiole: 34, *P. roberti*; 35, *sculpta*; 36, *simulans*.



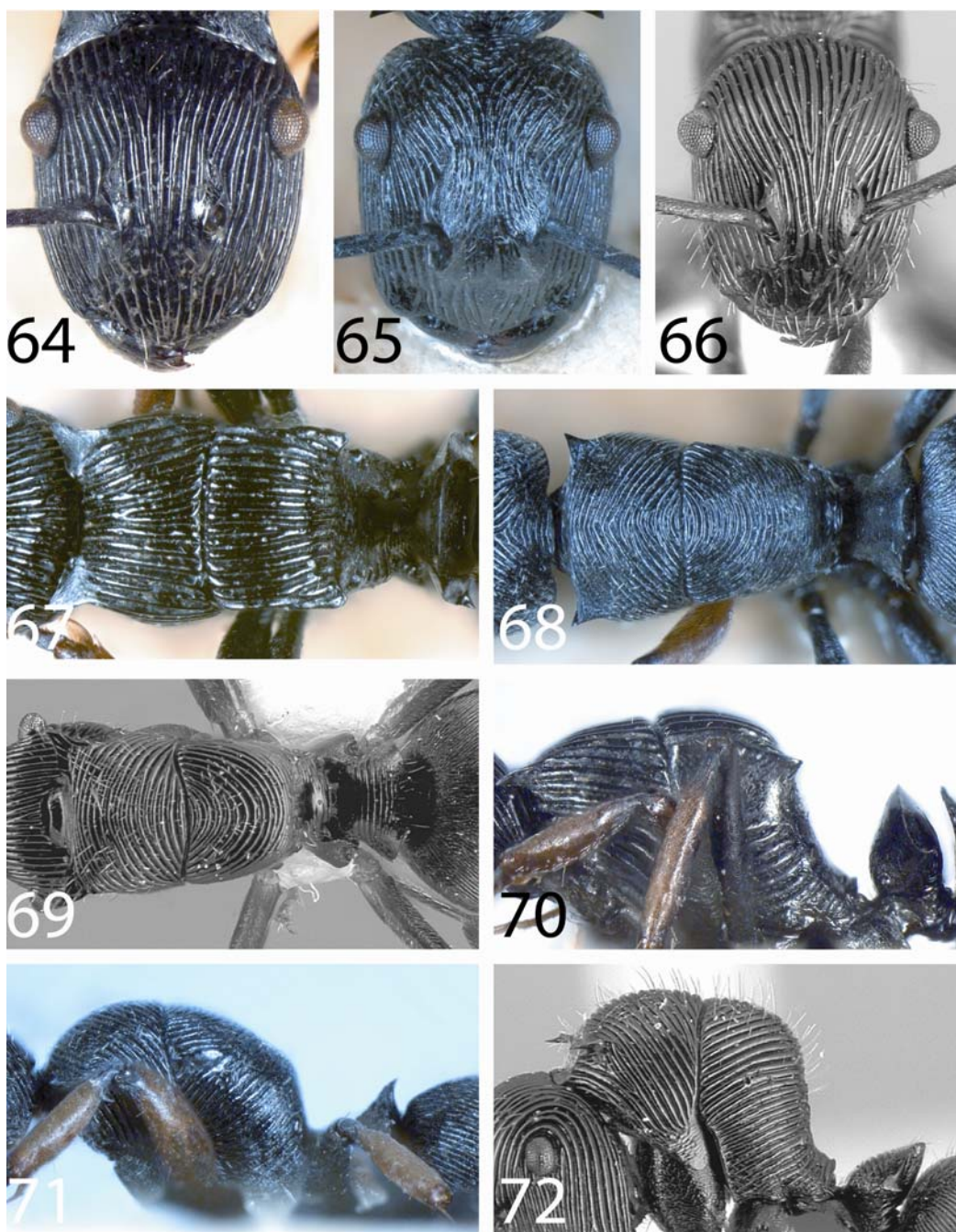
Figures 37-39, Head in full face view: 37, *P. sulcifera*; 38, *umboi*; 39, *variegata*. **Figures 40-42**, Dorsal view of mesosoma and petiole: 40, *P. sulcifera*; 41, *umboi*; 42, *variegata*. **Figures 43-45**, Lateral view of mesosoma and petiole: 43, *P. sulcifera*; 44, *umboi*; 45, *variegata*.



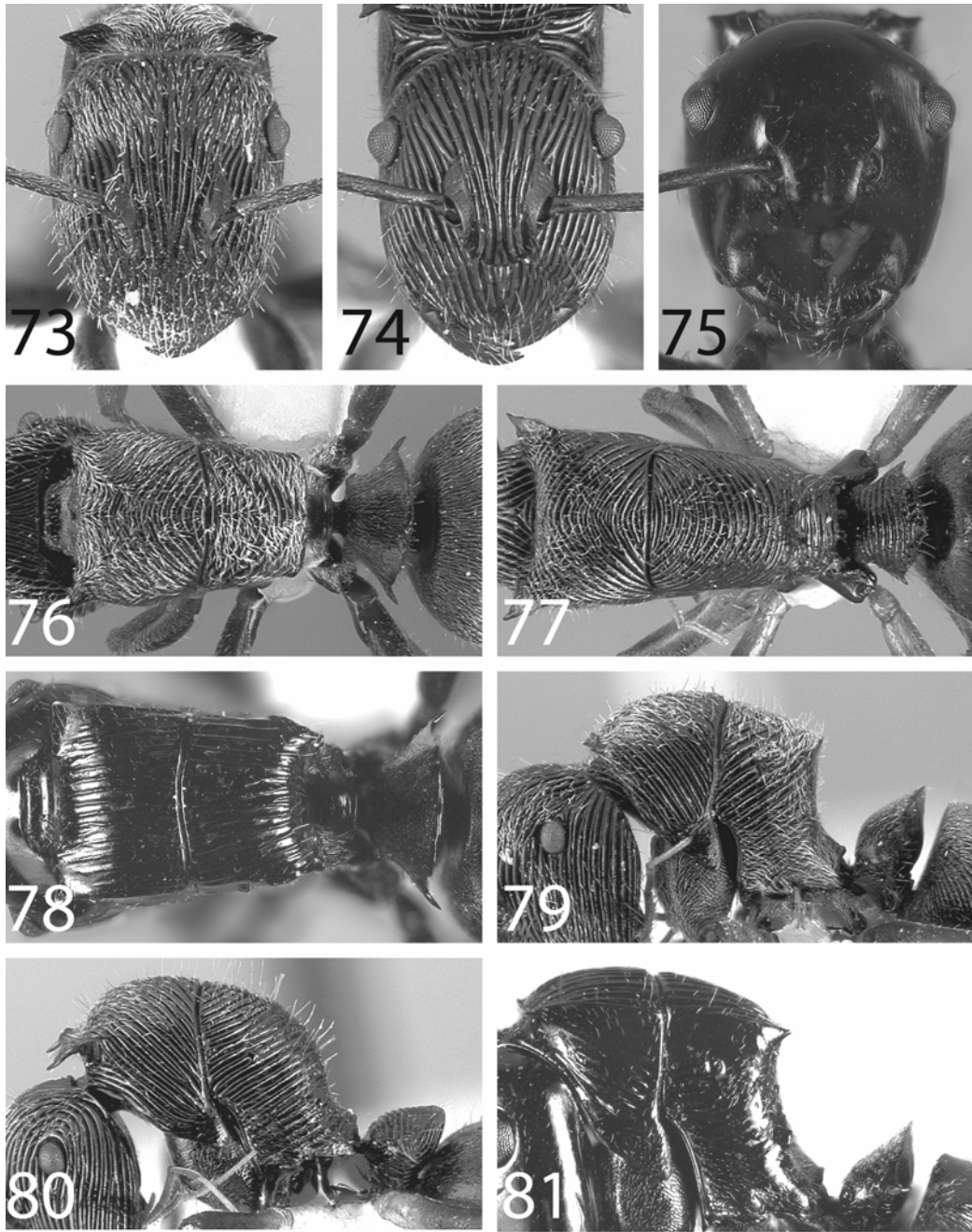
Figures 46-48, Head in full face view: 46, *P. wardi*; 47, *wilsoni*; 48, *annulata*. **Figures 49-51**. Dorsal view of mesosoma and petiole: 49, *P. wardi*; 50, *wilsoni*; 51, *annulata*. **Figures 52-54**, Lateral view of mesosoma and petiole: 52, *P. wardi*; 53, *wilsoni*; 54, *annulata*.



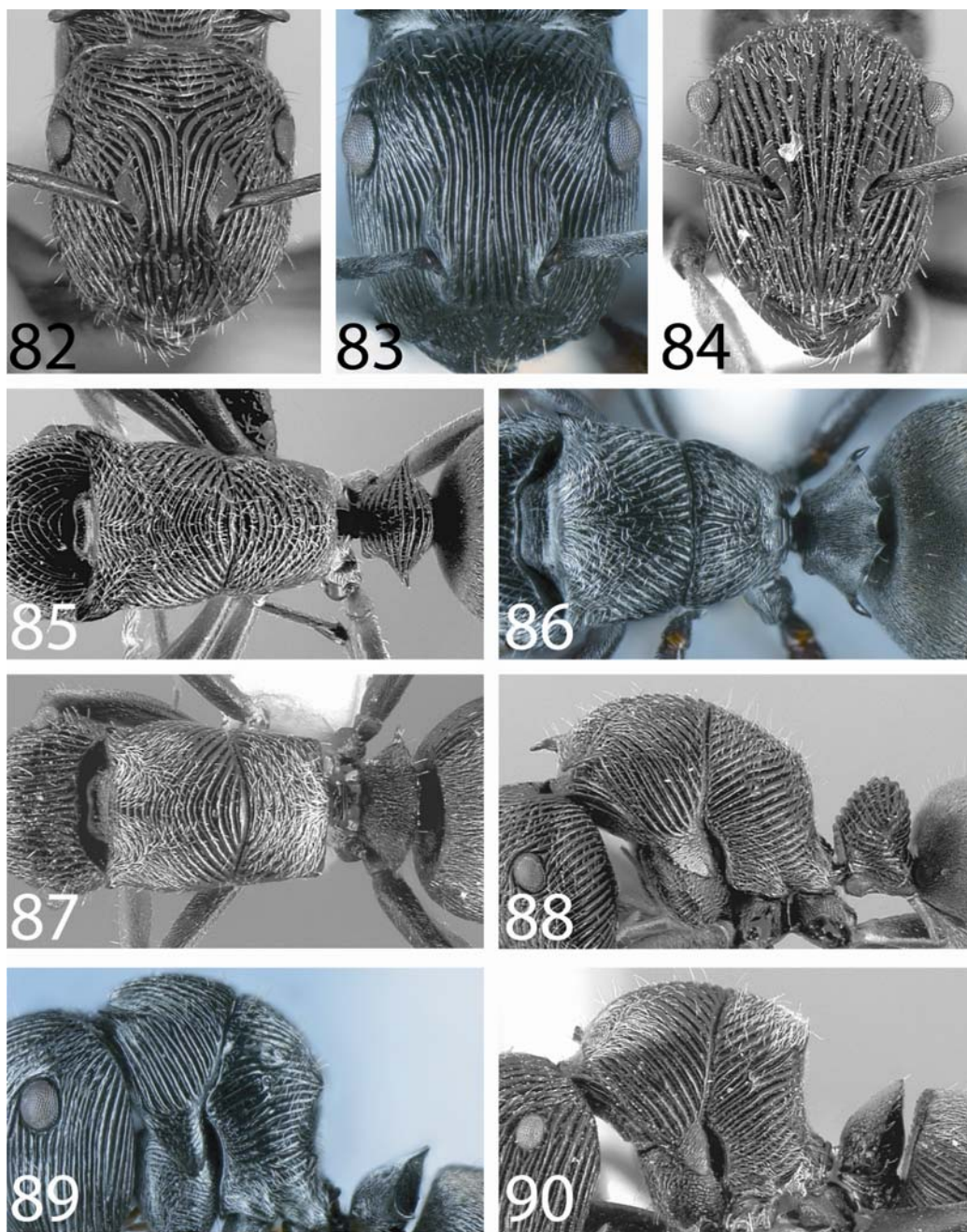
Figures 55-57, Head in full face view: 55, *P. bedeloweryi*; 56, *breviata*; 57, *decora*. **Figures 58-60**, Dorsal view of mesosoma and petiole: 58, *P. bedeloweryi*; 59, *breviata*; 60, *decora*. **Figures 61-63**, Lateral view of mesosoma and petiole: 61, *P. bedeloweryi*; 62, *breviata*; 63, *decora*.



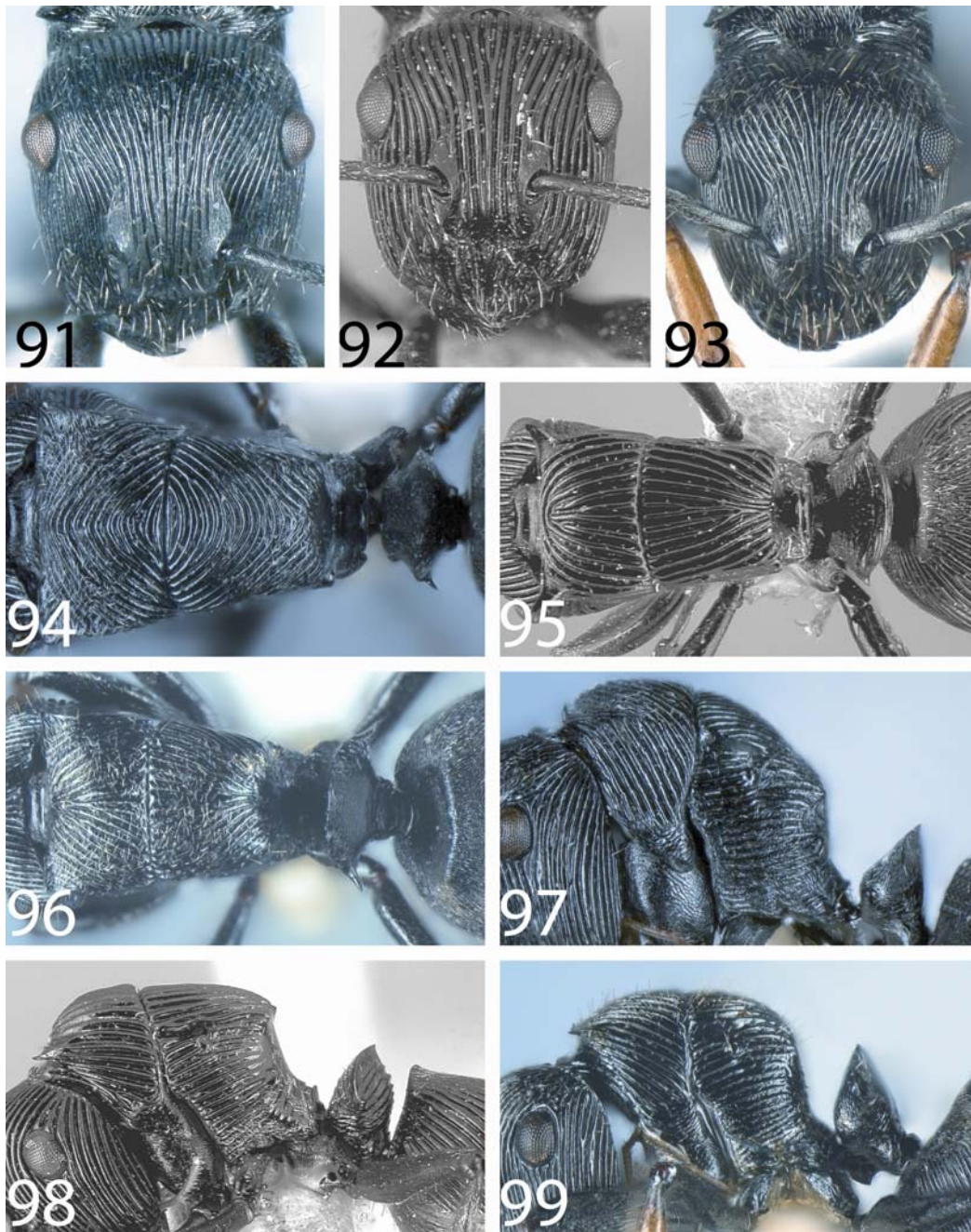
Figures 54-66, Head in full face view: 64, *P. excellens*; 65, *geometrica*; 66, *gressitti*. **Figures 67-69**, Dorsal view of mesosoma and petiole: 67, *P. excellens*; 68, *geometrica*; 69, *gressitti*. **Figures 70-72**, Lateral view of mesosoma and petiole: 70, *P. excellens*; 71, *geometrica*; 72, *gressitti*.



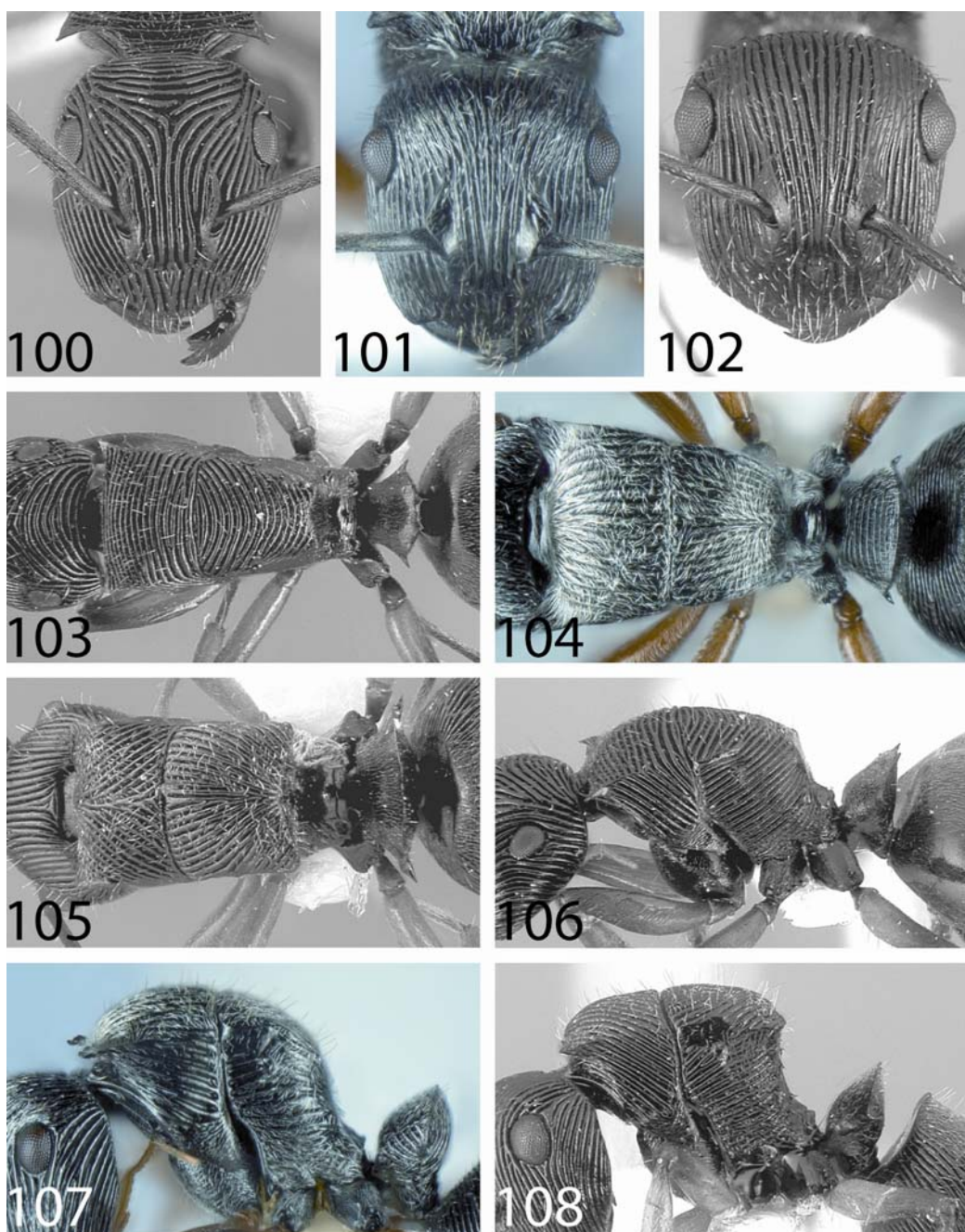
Figures 73-75, Head in full face view: 73, *P. impressa*; 74, *kokoda*; 75, *maai*. **Figures 76-78**, Dorsal view of mesosoma and petiole: 76, *P. impressa*; 77, *kokoda*; 78, *maai*. **Figures 79-81**, Lateral view of mesosoma and petiole: 79, *P. impressa*; 80, *kokoda*; 81, *maai*.



Figures 82-84, Head in full face view: 82, *P. mamba*; 83, *monticola*; 84, *orokana*. **Figures 85-87**, Dorsal view of mesosoma and petiole: 85, *P. mamba*; 86, *monticola*; 87, *orokana*. **Figures 88-90**, Lateral view of mesosoma and petiole: 88, *P. mamba*; 89, *monticola*; 90, *orokana*.



Figures 91-93, Head in full face view: 91, *P. pelecta*; 92, *porcata*; 93, *retusa*. **Figures 94-96**, Dorsal view of mesosoma and petiole: 94, *P. pelecta*; 95, *porcata*; 96, *retusa*. **Figures 97-99**, Lateral view of mesosoma and petiole: 97, *P. pelecta*; 98, *porcata*; 99, *retusa*.



Figures 100-102, Head in full face view: 100, *P. roomi*; 101, *snellingi*; 102, *wamuki*. **Figures** 103-105, Dorsal view of mesosoma and petiole: 103, *P. roomi*; 104, *snellingi*; 105, *wamuki*. **Figures** 106-108, Lateral view of mesosoma and petiole: 106, *P. roomi*; 107, *snellingi*; 108, *wamuki*.