

AUSTRALASIAN ANTS OF THE GENUS *LEPTOTHORAX* MAYR (HYMENOPTERA :
FORMICIDAE : MYRMICINAE)

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The following species are discussed: *L. bilongrudi* sp. nov. (Papua New Guinea), *L. australis* Wheeler, and *L. renateae* sp. nov. (both North Queensland). The Australian species have peculiar lateral subocular carinae. *Leptothorax*, as presently constituted, is otherwise unknown from the Indo-Australian area.

□ *Ants, Formicidae, taxonomy, Leptothorax, Myrmicinae.*

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Leptothorax is a large and important myrmicine ant genus with over 200 nominal species known from the Palearctic, Ethiopian, Nearctic and Neotropical regions. Its diagnosis, synonymy and distribution were reviewed, with a monograph of the 11 Afrotropical species, by Bolton (1982). Apart from the three species considered here the genus has not been reported from the Indo-Australian area south of the Tropic of Cancer and east of Bangladesh (if one excludes the possibility, now under investigation by the author, that the Australian regional generic names *Podomyrma* Fr. Smith, *Dacryon* Forel, and *Pseudopodomyrma* Crawley, which were synonymised under *Podomyrma* by Taylor and D.R. Brown (1985), should all properly be considered junior synonyms of *Leptothorax*). The Sumatran generic record mentioned in passing by Wheeler (1934), when he described *L. australis* from north Queensland, seems never to have been substantiated. *L. bilongrudi* sp. nov. is the first species to be described from New Guinea, and *L. renateae* sp. nov. the second from Australia. These ants are poorly represented in collections, perhaps because they nest and forage arboreally and would thus tend to be overlooked by most ant collectors. In any case they appear to be rare. The three are apparently closely related; all have a typical *Leptothorax* palpal formula (maxillary 5:labial 3; confirmed in each by dissection), with 12-segmented antennae, unusual mandibular dentition, (described below under *L. bilongrudi*), and angularly projecting dorsolateral mesonotal borders. Twelve-segmented antennae are more usual than the alternative 11 in *Leptothorax*, and mesonotal projections are found in some neotropical species (Kempf, 1958, 1959). The mandibular dentition, however, apparently sets these species apart from all other members of the genus. In addition, the Australian species both have an unusual subocular

carinal complex on either side of the head. Each of these consists of a pair of equally very fine, closely parallel carinae, separated by a minute groove, which is about equal in width to an individual carina. These run together from the mandibular bases to meet the occipital carina on each side at an oblique angle (Fig. 4). Such structures have not been reported from other *Leptothorax* species. Somewhat similar carinae are seen in some species of *Myrmecina* Curtis, but otherwise they appear uniquely to characterise *L. australis* and *L. renateae*. Some records are cited using 1 degree coordinates to indicate mapping grid cells, as in Taylor (1987).

Specimens studied here are from the Australian National Insect Collection (ANIC) and the Queensland Museum (QM). Abbreviations for other collections are: BISHOP — B.P. Bishop Museum, Honolulu, Hawaii, USA; BM(NH) — British Museum (Natural History), London; GM — Museum d'Histoire Naturelle, Geneva, Switzerland; KUB — Masao Kubota collection, Odawara City, Japan; MCZ — Museum of Comparative Zoology, Cambridge, Massachusetts, USA. Conventions for measurements and indices follow Bolton (1982); HL is maximum head length, and HW the maximum width of the head behind the eyes.

***Leptothorax bilongrudi* sp. nov.**
(Figs 1-3)

TYPE LOCALITY

PAPUA NEW GUINEA: West Sepik Province, Victor Emanuel Range, at 5°07'S, 141°38'E, near Telefomin.

MATERIAL EXAMINED AND DISTRIBUTION

Known only from the type locality: holotype worker, 11 paratype workers, 2 paratype dealate females, taken at 1550 m (R.J. Kohout acc.1984.305, 17-19 Aug.).

Holotype gold-coated for scanning electron microscopy, mounted with a colour-matched paratype. Holotype, most paratypes, including females, in ANIC (type No. 7774), worker paratypes in BISHOP, BM(NH), GM, KUB, MCZ, QM.

ETYMOLOGY

Named for the collector, Rudolf Kohout. The specific epithet is undeclinable Papua New Guinea pidgin, meaning 'belonging to Rudi'.

WORKER

Dimensions (mm, holotype, smallest paratype, largest paratype (ranked by HW)): TL c. 4.5–6.2; HL 1.14, 0.98, 1.24; HW 0.96, 0.84, 1.24; CI 84, 86, 89; SL 1.16, 0.97, 1.27; SI 102, 99, 102; PW 0.75, 0.63, 0.83; AL 1.56, 1.34, 1.77. General features as in Figs 1–3. Mandibular dentition unusual for *Leptothorax*; consisting of 3 apical and 2 basal teeth separated by a long, minutely



Figs 1–3. *Leptothorax bilongrudi*, holotype worker, standard views. HW 0.96 mm; PW 0.75 mm; AL 1.56 mm.

crenulate, edentate blade; third apical tooth separated from second by a brief diastema; basal tooth formed from the slightly raised obtuse angle separating the inner and posterior mandibular borders. Median anterior clypeal border minutely emarginate; median clypeal carina barely differentiated from surrounding sculptural elements; frontal area a shallow depression. Eyes almost hemispherical, their longest diameters spanning 12–15 facets. Frontal carinae and lateral suborbital carinae lacking. Occipital border evenly arched in frontal view. A distinct occipital carina closely encloses the nape, and extends anteromedially on each side below the head to terminate on the postgena at about the level of the posterior border of the adjacent eye, short of the genal suture. Antennae 12-segmented, club 3-segmented, differentiated by the relative length of its segments, rather than by a marked step in their thickness; scapes when extended exceeding occipital border by around 1/3 their length. In dorsal view, pronotal collar relatively broad; humeri evenly rounded. Mesonotum narrow, separated from pronotum by a shallow, depressed sutural remnant; dorsolateral borders extended as acute salient projections terminating a slightly raised obtuse transverse crest. Propodeal spines long, posterodorsolaterally divergent, almost straight, with apices minutely upturned. Metapleural lobes somewhat salient, narrowly rounded. Petiolar peduncle proportionately very long and distinctly set-off from the node; spiracular rims slightly raised in dorsal view; subpetiolar process a minute anteroventral angle; node rounded in all directions, almost hemispherical, slightly longer than wide in dorsal view. Postpetiole as illustrated, almost circular in dorsal view, minutely wider than long. Sting somewhat transversely flattened and blade-like.

Mandibles smooth, except for piligerous punctures and faint, effaced traces of longitudinal sculpturing on their bases and outer borders. Clypeus with spaced longitudinal rugae. Frons microreticulate, more so posteriorly; interstitial microsculpture obscure, except on each side between the antennal insertion and eye; sculptural intensity diminishing progressively below the eyes; postgenae essentially smooth. Mesosoma less intensively sculptured than head; sculpture of petiole and postpetiole even more reduced; gaster smooth and shining, with a few very short basal ribs surrounding its articular condyle. Pilosity as illustrated; the hairs tapered and apically pointed; those on gastral dorsum scattered, separated by almost their average length. Colour medium-dark

brown with a reddish-orange cast under magnification, scapes and legs a little lighter, antennal funiculi medium-brown.

FEMALE

The largest female paratype has HW 1.17, and the smallest: HL 1.27; HW 1.10; CI 87; SL 1.15; SI 105; scutum W 0.92; AL 1.90. Differing from the worker in the usual features. Ocelli small, surrounding a slightly raised triangle into which each is somewhat inserted and directed more-or-less outwards. Scapes relatively short, exceeding occipital border by about 1/4 their length when extended. Scutum lacking notaulices or parapsidal lines. Anterolateral corners of scutellum extended laterally as rounded, minutely bowl-shaped lobes (possible homologues of the worker mesonotal extensions). Petiolar peduncle shorter and more tapered than in worker. Postpetiole distinctly broader than long in dorsal view. Propodeal spines relatively short, less divergent than in worker; about as long as the petiolar peduncle, as also in the worker.

Sculpturing much as in worker; the frons more closely reticulate, with more distinct interstitial microsculpture; postgenae with quite strong, somewhat effaced sculpture. Mesosomal sculpturing relatively strong, more as on the frons. Pilosity and colour as in worker.

Leptothorax australis Wheeler

Leptothorax australis Wheeler, 1934: 60, worker. Type locality: Queensland, Cairns District. (*L. (Gonithorax) australis*). Holotype in MCZ (examined).

MATERIAL EXAMINED AND DISTRIBUTION

Known only from north Queensland (grid cells 16/145 and 17/145; provisionally also 11/142 (female record)). Modern records are: Bellenden Ker Range, cableway base station, worker, 100 m (Earthwatch/Queensland Museum, 25–31 Oct. 1981, QM); Palmerston N.P., 9 workers on branch of recently felled giant rainforest tree (B.B. Lowery, 5.8.1975, ANIC, BM(NH), GM, MCZ); 8 km W of Tully, near Rocky Ck Bridge, 3 workers, in dead vine, lowland rainforest (B.B. Lowery, 22.9.1980, ANIC, QM). An alate female provisionally identified as *L. australis* (see below) was collected much further north: 15 km W of Capt. Billy Creek, Great Dividing Range (11°40'S, 142°45'E), (G.B. Monteith, 4–9.vii.1975).

WORKER

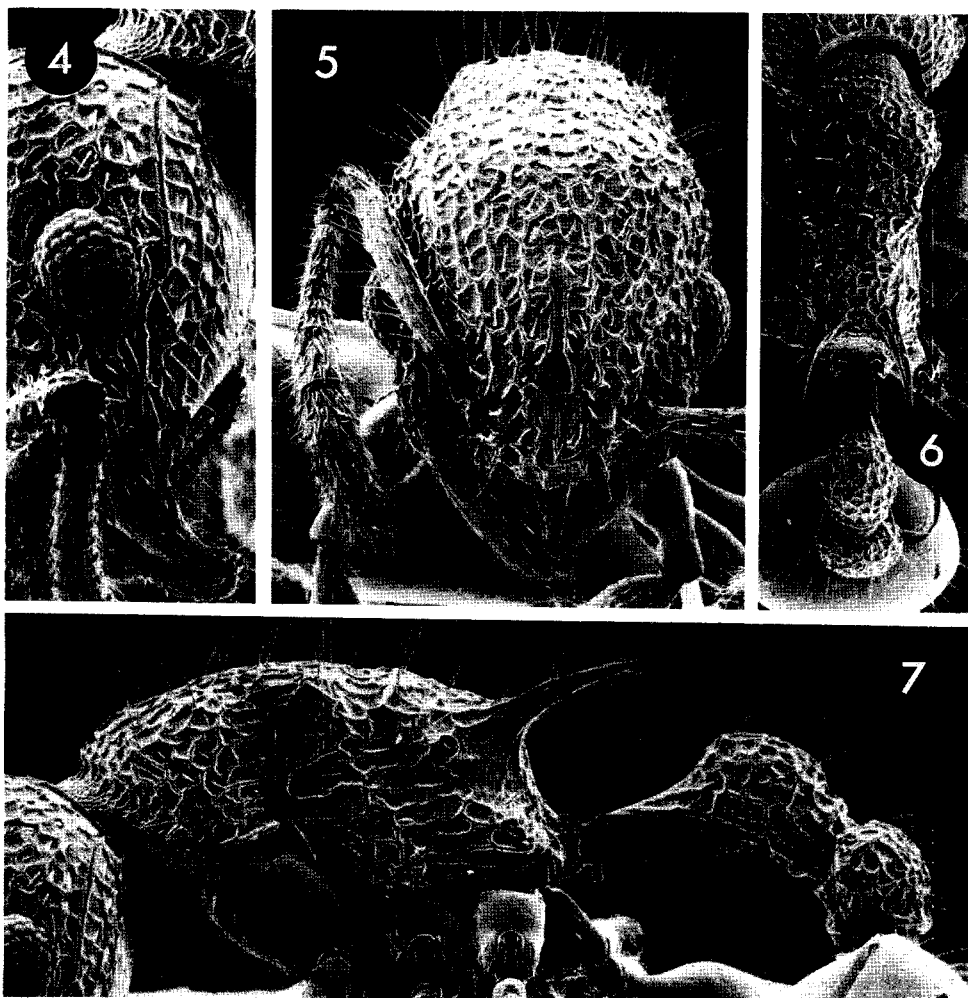
The smallest and largest available specimens (both from Palmerston N.P.) have the following dimensions (mm): TL *c.* 2.3, 2.6; HL 0.74, 0.78;

HW 0.63, 0.68; CI 85, 87; SL 0.49, 0.53; SI 78, 78; PW 0.46, 0.50; AL 0.90, 1.00. General features as in the original description, which omitted reference to the suborbital carinae (which are obscured on the holotype by mounting glue). They are almost exactly as illustrated for *L. renateae* (Fig. 4), except that each is more nearly straight below the eye. The sculpturing below the carinae is more finely textured and less reticulate than that above, unlike *L. renateae*, where both areas are similarly configured. The suborbital carinae are not homologous with the postgenal extensions of the occipital carina described for *L. bilongrudi*, since the latter are also present in *L. australis*.

Mandibular dentition as described above for *L. bilongrudi*; the third apical tooth disproportionately small; the two posterior teeth vestigial.

FEMALE

The female listed above is only slightly larger than the workers (HL 0.75, AL 1.21), and agrees with their salient features, including details of hair structure, propodeal spine length, and configuration of the sculpturing above and below the suborbital carinae. The petiolar node is slightly longer than wide in dorsal view, proportioned much as in *L. renateae* workers, but with the anterodorsal border less convex. There are no traces of frontal carinae.



FIGS 4-7. *Leptothorax renateae*, holotype worker: 4, lateral view of head, showing suborbital carina; 5-7, standard views. HW 0.71 mm; PW 0.49; AL 1.10 mm.

Leptothorax renateae sp. nov.
(Figs 4-7)

TYPE LOCALITY

QUEENSLAND: 11 km ENE of Mt Tozer (12°43'S, 143°18'E).

MATERIAL EXAMINED AND DISTRIBUTION

Known only from north Queensland (grid cells 12/143, 16/145): Mt Tozer area (distances and bearings from Mt Tozer): type locality, holotype worker, paratype worker (T. Weir, 11-16 July 1986, rainforest litter, ANIC berlesate 1064); same data but 3 km ENE, 12°44'S, 143°14'E, paratype worker (1-4 July 1986, ANIC berlesate 1052). Iron Range, E Claudie River, 20 m, dealate female (G. Monteith, 6 Dec. 1985, rainforest, stick brushing, QM berlesate 694). Cape Tribulation area (distances and bearings from the Cape, all coll. Monteith, Yeates and Thompson, 1982, rainforest pyrethrum knockdown samples): 2.0 km WNW (site 2), 7 Oct., 50 m, 2 paratype workers; 3.5 km W (site 7), 2 Oct., 680 m, dealate female; 4.5 km W (site 9), 2 Sep., 760 m, dealate female. Cape Tribulation area, 16°03' to 16°05'S, 145°28'E, littoral rainforest, paratype worker (A. Calder and T. Weir, 21-28 Mar. 1984, ANIC berlesate 940). Mossman Gorge, 3 mi E of Mossman, rainforest, paratype worker, c. 200 ft (R.W. Taylor acc.1966.90, 27-29 X.). All worker specimens except holotype designated paratypes; the females are only provisionally identified, and are not designated as paratypes. Holotype, most paratypes, and females, in ANIC (type No. 7773), worker paratypes in BM(NH), QM. Holotype gold-coated for scanning electron microscopy, mounted with a colour-matched paratype.

ETYMOLOGY

Named with gratitude for my assistant Renate Sadler.

WORKER

Dimensions (mm) of the smallest paratype (Cape Tribulation) and the holotype (the largest type) are: TL c. 3.4, 3.6; HL 0.74, 0.77; HW 0.63, 0.71; CI 86, 92; SL 0.57, 0.57; SI 90, 80; PW 0.49, 0.52; AL 0.97, 1.10. General features as in Figs 4-7. Very similar to *L. australis*, and agreeing in general with its original description, with the following differences: (1) Faint vestiges of frontal carinae present on head, extending back from posterior extremities of frontal lobes to slightly beyond level of posterior margins of eyes; each carina is essentially a minutely raised element of the longitudinal sculpturing, and is usually better developed posteriorly than in its medial section. There are no traces of such structures in *L. australis*, and they are more distinct in southern than northern specimens of *L. renateae*. (2) Pronotal humeri evenly rounded in dorsal view,

versus epaulate in *L. australis*. (3) Propodeal spines 1.3-1.5 times longer than the distance separating their bases, *versus* about as long as that distance in *L. australis*. (4) Petiolar node in dorsal view distinctly longer than wide, *versus* slightly wider than long in *L. australis*. (5) Lateral mesonotal projections larger and more prominent. (6) Pilosity consisting of moderately long tapered hairs with narrowly acute apices, relatively about 1.5-2 times as long as those of *L. australis*, which has untapered, blunt, minutely clubbed hairs. Mandibular dentition and suborbital carinae much as in *L. australis*. Southern specimens tend to be smaller, with proportionately narrow heads and long scapes.

FEMALE

The females listed above are only slightly larger than the workers, and agree with them in the same features noted above for *L. australis*. Frontal carinae as in worker; petiolar node in dorsal view relatively slightly longer proportional to its width. The mesosoma relatively bulky in the Iron Range specimen.

KEY TO AUSTRALASIAN LEPTOTHORAX SPECIES (WORKERS AND FEMALES)

- Subocular carinae present on each side of head, extending from mandibular base to occipital carina (Fig. 4); scapes short, failing to reach occipital border when laid back (Fig. 5); Australian species 2
Subocular carinae lacking (Fig. 3); scapes relatively long, clearly exceeding occipital border when laid back (Fig. 1); New Guinean species *L. bilongrudi* sp. nov.
- Pilosity consisting of moderately long, tapered hairs with finely acute apices (Fig. 7); petiolar node distinctly longer than broad in dorsal view *L. renateae* sp. nov.
Pilosity consisting of short, blunt or minutely clubbed hairs, proportionately about 1/2 to 2/3 as long as those in Fig. 7; petiolar node in dorsal view as broad or slightly broader than long *L. australis* Wheeler

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