

Figure 2. Holotype of *T. lubei* gen. et sp. nov.: (a) photograph and (b) drawing.

of a small bird [19]; indeed, the body of *T. lubei* is larger than that of a rufous hummingbird (figure 3d).

Although the average size of workers within modern ant communities tends to increase with latitude [36,37], almost all of the largest individual living ant species (any caste  $\geq 3$  cm long) inhabit tropical regions with MAT over 20°C (figure 4a,b). They are scattered among subfamilies, have differing castes as the largest achieve great size by different morphologies and are widely separated on different continents.

- *Dinoponera* spp. (subfamily Ponerinae): tropical Brazil, Bolivia and Peru. *Dinoponera* species (*Dinoponera gigantea*, *Dinoponera lucida*, *Dinoponera longipes*, *Dinoponera mutica* and *Dinoponera quadriceps*) reach and may exceed 30 mm in length [38], except *Dinoponera australis* (25 mm or less), whose range extends outside the tropics. They lack morphologically distinct worker and queen castes [39,40].
- *Dorylus wilverthi* (subfamily Dorylinae): equatorial Africa [41–45]. The largest living ant, with queens reaching 52 mm long [46], similar in size to *T. lubei*. Great size is achieved here, however, in a much different manner: the gaster is approximately 80 per cent of body length (cf. fig. 16–13a of Hölldobler & Wilson [46]), compared with approximately 60 per cent in *T. lubei*. Queens show a suite of characteristics

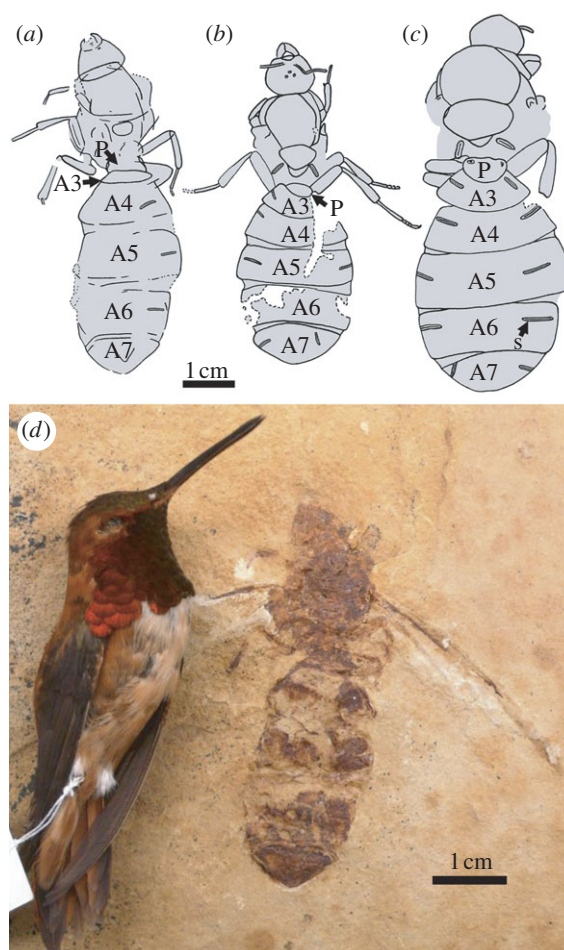


Figure 3. (a–c) Comparative bodies (wings not drawn) of (a) *T. lubei*, (b) *T. similinum*, (c) *T. giganteum* and (d) *T. lubei* holotype with rufous hummingbird (*Selasphorus rufus*) for size comparison; (b,c) redrawn from Lutz [20]. P, petiole; s, spiracle; A3–7, abdominal segments three through to seven (=gaster segments I–V).

restricted to legionary ants, including physogastry, where the gaster becomes swollen, distended with sclerites widely separated by a membrane, containing expanded ovaries that allow rapid production of large numbers of eggs and so extremely large colonies [42,47,48].

- *Camponotus gigas* (subfamily Formicinae): southeast Asian region [45,48,49]. Queens average slightly over 31 mm in length, and major workers approximately 28 mm, but reach 30 mm [48,50].
- *Myrmecia brevinoda* (subfamily Myrmeciinae): eastern Australia [51]. Major workers reach 36 mm and queens 31 mm in length [52]. Only a subset of those ant groups synonymized as *M. brevinoda* reach lengths over 3 cm [52,53].

Seven of these eight species inhabit distinctly megathermal environments (figure 4a,b): the five large *Dinoponera* species have a distribution with a median MAT of 25.7°C, with a CQMT of 23.9°C; *D. wilverthi* median MAT is 24.7°C, CQMT 23.4°C; and *C. gigas* median MAT is 25.3°C, CQMT 24.2°C. Only *M. brevinoda* breaks this pattern, with a range extending through eastern Australia from the hot tropics of northern Queensland (approx. 16° S) south to warm-temperate Victoria (approx. 39° S).