

## COPTOTERMES RAFFRAYI Wasman (Fam. TERMITIDAE).

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(Fifteen Text-figures.)

This Termite was described in These Proceedings (Vol. xxv., 1900, p. 244) from specimens of the soldier caste collected by A. M. Lea near the Swan River, Western Australia, but its validity as a distinct species has not been accepted generally by more recent writers. Thus, Desneux (1904) included it, and the two earlier described species *C. lacteus* Froggatt and *C. acinaciformis* Froggatt, in the Australian fauna, while Silvestri (1909) regarded it as synonymous with *C. lacteus* Frogg. Holmgren (1911) merely referred to Silvestri's remarks and omitted it from his list of species; Froggatt (1915), however, followed Desneux in regarding it as specifically distinct. In his list of Australian species the latter writer did not include *C. michaelsoni* Silvestri, which is certainly a valid species and recognised as such by Holmgren and Mjöberg (1920).

The examination of numerous series of *Coptotermes* from various Australian localities convinces me that determination of species, based on soldiers and workers only, cannot always be made satisfactorily and that, in some cases, reference to the alate forms is essential. From the published description the differences in the soldier caste of *C. raffrayi* Wasm. and *C. lacteus* Frogg. appear to be so slight that one might, with reason, hesitate to regard them as specific, but with the material now available for study the validity of Wasman's species can, I think, be definitely established. If a comparison of the soldiers here regarded as *C. raffrayi* Wasm. with the types reveals specific differences, the former must be regarded as a new species, differing markedly in the alate forms from those hitherto described. With this possibility in view a description of the soldier is given.

I am indebted to the Authorities of the South Australian Museum for the privilege of examining co-types of *C. lacteus* Frogg. and to Messrs. J. Clark and C. F. Hill, for the specimens described hereunder.

COPTOTERMES RAFFRAYI Wasman. (Figs. 1—15.)

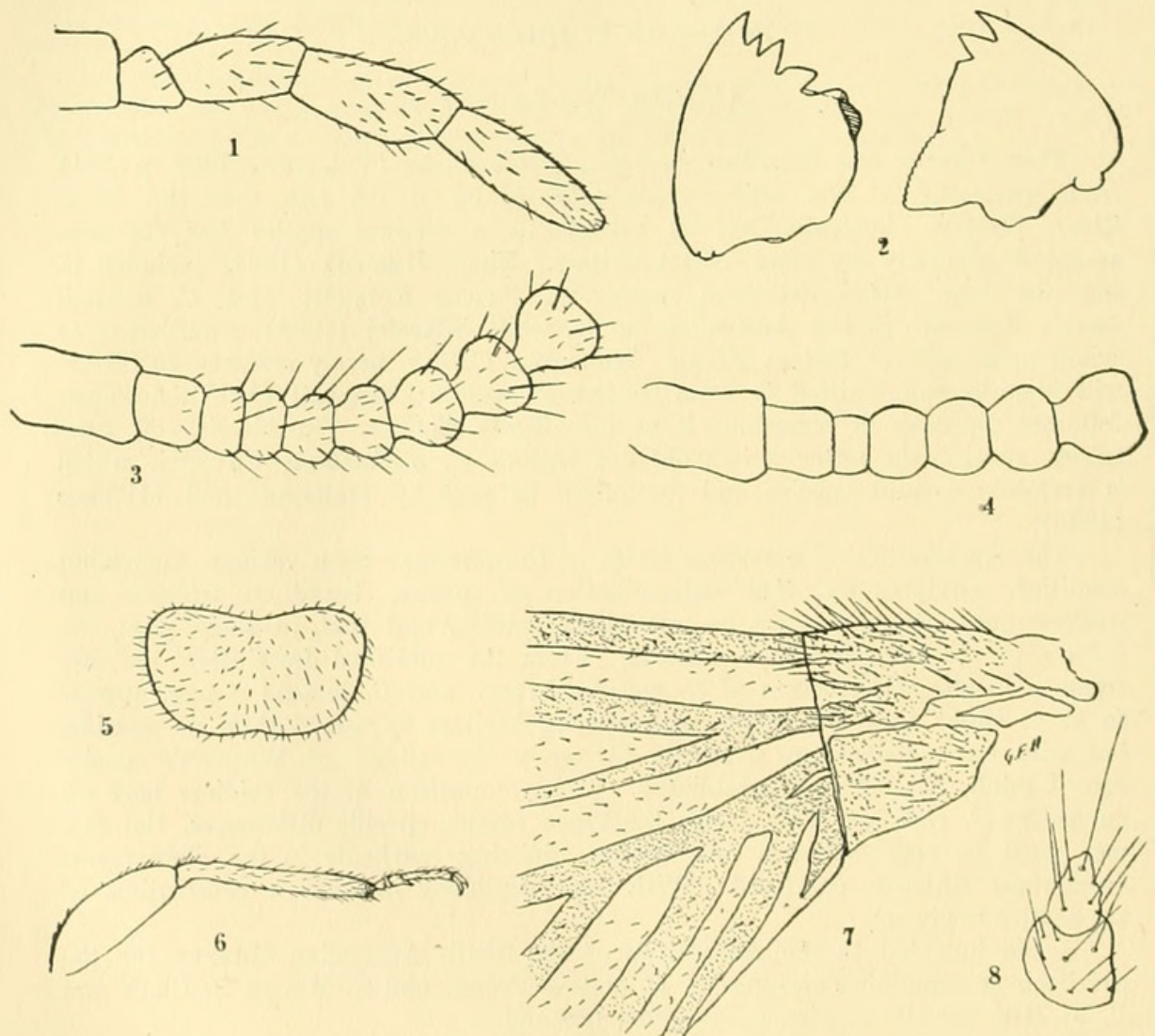
These Proceedings, Vol. xxv., 1900, p. 244.

*Imago.* (Figs. 1—8.)

*Colour:* Head, thorax and tergites 2—7 of abdomen dark chestnut, apical half of 8th and the whole of the 9th and 10th tergites ochraceous-orange, head darkest, labrum, post-clypeus, antennae, excepting first two segments, and palpi

yellow-ochre, first and second segments of antennae dark chestnut, sternites of abdomen ochraceous-tawny, apical segments as in tergites, the lateral margins, excepting the apical in the female and penultimate and apical in the male, suffused with dark brown; legs ochraceous-tawny with the apical one-third of femora and the entire tibiae suffused with dark brown; wings smoky, costal margin dark brown.

*Head* large, rounded, very little narrower than prothorax, slightly depressed on summit, slightly rugose in middle, sparsely clothed with moderately long hairs. Fontanelle minute, circular. Labrum large, convex, narrowed at base, swollen on sides, clothed with scattered long and short reddish hairs. Post-clypeus convex



*Coptotermes raffrayi* Wasman.—Imago.

Text-figs. 1. Maxillary palpus; 2. Mandibles; 3 and 4. Antenna, proximal segments; 5. Prothorax; 6. Hind leg; 7. Hind wing; 8. Cercus.

behind, concave in front, without median suture, three-tenths as long as wide. Ante-clypeus short, membranous, anterior margin slightly produced in the middle. Maxillary palpi (Fig. 1). Mandibles (Fig. 2). Antennae (Figs. 3 and 4) 19- or 20-jointed, arising from a raised tubercle within a small fossa situated, in

front of and close to eye, posterior margin of fossa elevated, segmentation variable but generally as follows:—1st joint short and stout, widest at apex, more than twice as long as wide, twice as long as 2nd; 2nd short, quadrate, as wide as middle of 1st; 3rd and 4th short, subequal, or 3rd shortest and narrowest of all and 4th and 5th subequal. Eyes large, circular (0.352 diam.), facets small (0.016 diam.), surrounded by whitish membrane, lower margin of eye very close to lower margin of head in profile (0.160). Ocelli oval (0.112 × 0.080), separated from eyes by a little less than their short diameter.

*Prothorax* (Fig. 5) wider than long, slightly concave in front, rounded on the sides, slightly bilobed behind, the entire outer margin slightly bent up, least in front, surface sparsely setose, like head. Meso- and metathorax with a group of setae in the median line about the anterior third, posterior margin of mesothorax as in prothorax, that of metathorax rounded, not at all bilobed. Wing-stumps unequal, those of forewings nearly twice as long as those of hindwings.

*Legs* (Fig. 6) rather slender, clothed sparsely with reddish hairs, first and third tarsals subequal, much longer than second, fourth long and slender, femora thickened, tibial spurs 3:2:2.

*Wings* (Fig. 7): Entire surface clothed uniformly and rather densely with short setae; first two veins very distinct, dark brown at base, yellowish towards apex, below the radius suffused with dark brown; radial sector branching within the wing-stump in the forewing, well beyond the suture in the hindwing, dark at base but soon becoming indistinct, running nearer to the radius than to the cubitus, with three or four indistinct inferior branches; median fused with the cubitus (see Fig. 7); cubitus with seven or eight branches, the first four or five dark, simple or branched once or twice, the others very indistinct, some branched, all generally joining the hind border in the proximal two-thirds of the wing. Apices of hindwings extending beyond those of forewings.

*Abdomen* clothed as in prothorax. Cerci (Fig. 8) short and stout. Styli short (0.064), wanting in female.

*Measurements:*

Length with wings: male 11.75—12.75; female 12.50—13.50.

Length without wings: male 6.25—7.00; female 7.00—7.50.

Head: at and including eyes, wide 1.316—1.410; from posterior margin of clypeus to base 1.128; deep 0.658.

Mandibles: right, long 0.564, wide 0.517; left, long 0.635, wide 0.423.

Prothorax: long 0.846—0.893; wide 1.363—1.457.

Wings: forewing, long 9.25, wide 2.960; hindwing, long 9.75, wide 3.196.

Tibia iii., 1.363.

Abdomen, wide 1.55—1.64.

*Soldier* (Figs. 9—13.)

*Colour:* Head deep chrome, palpi and antennae lighter, labrum darker, anterior margin of clypeus white, mandibles black with proximal one-third much lighter; thorax and abdomen dull yellow-ochre, with a whitish median stripe from middle of prothorax to apex of abdomen, bordered on either side by an irregular brown pattern.

*Head* (Figs. 9 and 10) widest across the middle, slightly rounded on the sides, broadly rounded behind, with few reddish setae. Labrum acuminate. Clypeus short, and wide. Frontal opening large, its lower margin contiguous to posterior margin of clypeus. Antennae (Fig. 11) 15- or 16-jointed, 3rd joint smallest, sometimes markedly so, 4th and 5th sub-equal or nearly so.

*Prothorax* (Fig. 9). Margin slightly bent up, emarginate in front, the sides rounded and curving in to the rounded and slightly emarginate posterior border, rather more setose than head.

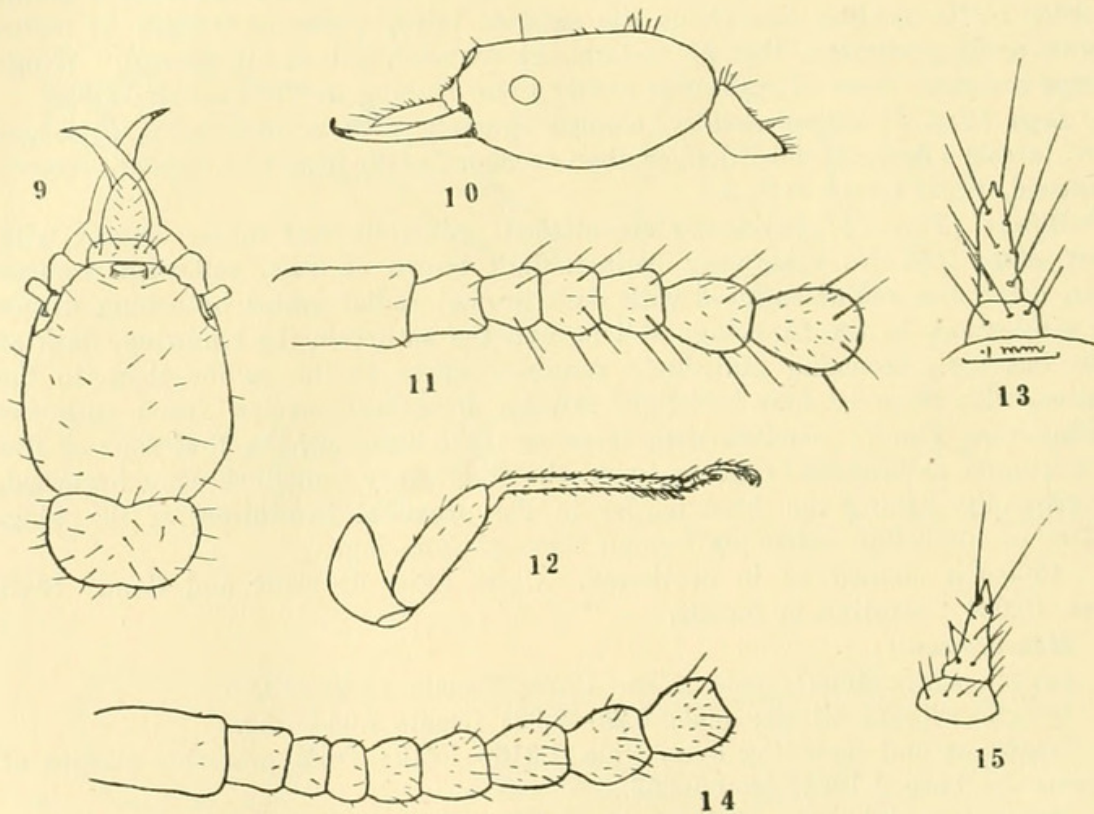
*Legs* (Fig. 12) moderately slender.

*Abdomen* elongate-oval, more pilose than thorax, with distinct median line on dorsum. *Cerci* (Fig. 13) moderately long (0.160) and slender. *Styli* short and slender, wanting in female.

*Measurements*:

Total length 5.5.

Head and mandibles: long 2.538—2.585.



*Coptotermes raffrayi* Wasman.

Text-figs. 9-13. Soldier. 9. Head and prothorax, dorsal aspect; 10. Head and prothorax in profile; 11. Antenna, proximal segments; 12. Hind leg; 13. Cercus. Text-figs. 14-15. Worker. 14. Antenna, proximal segments; 15. Cercus.

Head: from posterior margin of clypeus to base, long 1.60; wide 1.316—1.360; deep 0.940.

Mandibles: left, long 1.128—1.175.

Clypeus: long 0.144; wide 0.384.

Labrum: long 0.432.

Prothorax: long 0.564; wide 0.987.

Tibia iii. 1.128—1.222.

Abdomen: wide 1.270.

*Worker*. (Figs. 14 and 15.)

*Colour*: Head buff-yellow, antennae slightly paler; thorax and abdomen dirty white; legs whitish, hyaline.

*Head* and *thorax* with scattered reddish hairs. Antennae (Fig. 14) 15-jointed, 3rd and 4th joints small, 5th rather smaller than 6th.

*Abdomen* moderately setaceous, with median dorsal stripe as in soldier. Cerci (Fig. 15) short, acuminate.

*Measurements:*

Total length 5.00.

Head: wide 1.270—1.410; from posterior margin of clypeus to base, long 1.175—1.222.

Mandibles: left, long 0.520—0.564, wide 0.420—0.470; right, long 0.470, wide 0.517.

Prothorax: long, 0.517; wide, 0.90—0.94.

Tibia iii. 1.034—1.081.

*Affinities.*—The imago is easily distinguished from *C. lacteus* Frogg. by its less setose, much larger and darker head (hazel in *C. lacteus* Frogg.), much darker thorax and abdomen, yellow ventral surface, much shorter and darker wings, absence of minute Y-shaped marks on wing membrane, larger abdomen. From *C. acinaciformis* Frogg. it differs still more markedly; its dark colour alone will serve to separate the species. The imago of *C. michaelsoni* Silv. is not known.

The soldier caste differs from *C. lacteus* Frogg. in having a larger and darker head, reddish setae on head, thorax and abdomen (pale in *C. lacteus*), larger and darker frontal opening, darker abdomen and presence of median dorsal stripe. From *C. acinaciformis* Frogg. it differs in the above characters, except the last.

Described from a nest series of imagos, soldiers and workers, and from two series of soldiers and workers from S.W. Australia (Wonnerup, J. Clark, October, 1920; Mt. Barker, J. Clark, November, 1920; Swan River, C. F. Hill, February, 1921).

Types of imago and worker in writer's collection; co-types in Mr. Clark's collection.

All figures outlined with camera lucida. Figures 8, 13 and 15 drawn to same scale.

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