

TERMITES OF SOUTHEASTERN POLYNESIA

By

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BERNICE P. BISHOP MUSEUM

OCCASIONAL PAPERS

VOLUME XII, NUMBER 12

HONOLULU, HAWAII
PUBLISHED BY THE MUSEUM
September 15, 1936

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INTRODUCTION

The termites here reported were collected by the Mangarevan Expedition to southeastern Polynesia in 1934, chiefly by Elwood C. Zimmerman. Included are collections from the Society Islands, Mangareva, the Austral Islands, the Pacific Equatorial Islands, Oeno, and Pitcairn. Combined with the results of the Pacific Entomological Survey² and the accounts of the termites of Hawaii³ ⁴ and of Fanning and Washington Islands² ⁵, these collections give a fairly complete record of the distribution of termites in eastern and southeastern Polynesia. Notes on distribution and biology are by Mr. Zimmerman and, unless otherwise stated, the collections were made by him.

Several species among the known termites of the eastern Polynesian islands have an extraordinarily wide distribution. This seems to indicate that the slow, natural spread of the termite fauna before the advent of man has since been accelerated by the migrations of the indigenous peoples and especially by the visits of ships. It would be interesting to determine the relative importance of these methods of distribution. But for this we would need much more information than we now have of the distribution, affinities, and ecological incidence of each species, as well as such first-hand knowledge as is available among the inhabitants. Some clues might be found in the languages, but these would be meager at best. At present the known affinities are with the faunas to the west, with the exception of *Kaloterms* (*Rugiterms*) *athertoni* (Light) which is clearly neotropical, the subgenus *Rugiterms* being confined to the tropics of the new world. A knowledge of the termite faunas of the islands extending

¹ Mangarevan Expedition Publication 8.

² Light, S. F., Termites of the Marquesas Islands: B. P. Bishop Mus., Bull. 98, pp. 73-86, figs. 21-25, pls. 1-3, 1932.

³ Snyder, T. B., New termites from Hawaii, Central and South America, and the Antilles: U. S. Nat. Mus., Proc., vol. 61, art. 20, pp. 1-32, figs. 1-6, pls. 1-5, 1922.

⁴ Kofoid, C. A., Light, S. F., and others, Termites and termite control, Univ. California Press, Berkeley, 1934.

⁵ Kirby, Harold, Jr., *Cryptotermes hermsi* sp. nov., a termite from Fanning Island: Univ. California Pub. Zool. 26, pp. 437-441, 1945.

from Pitcairn to the coast of Chile might throw some light on the problem.

SPECIES COLLECTED

1. **Kalotermes (Neoterme) connexus** Snyder.

Neoterme connexus Snyder: U. S. Nat. Mus., Proc., vol. 61, art. 20, pp. 9-11, figs. 3-4, pl. 4, fig. 16, 1922.

Kaloterme (Neoterme) connexus; Light: B. P. Bishop Mus., Bull. 98, pp. 76-77, fig. 22, pl. 1, *D*, 1932.

Society Islands. Moorea, September 1934: Tepatu Valley, altitudes 300, 600, and 800 feet, from *Hibiscus tiliaceus*. Huahine, October 1934: valley southeast of Tahateao, altitude 300-500 feet, from *Hibiscus tiliaceus*. Raiatea, October 1934: south slope of Toahiva Valley, altitude 400-600 feet, from *Hibiscus tiliaceus*; valley east of Mt. Orotai, altitude 300 feet, from *Hibiscus tiliaceus*, Y. Kondo and Zimmerman; northwest ridge, Paaroa Bay, altitude 400 feet, on *Fragraea*; all collections contain numerous well-pigmented alates. Tahaa, October 1934: valley southeast of Mt. Purauti, altitude 800 feet, from *Hibiscus tiliaceus*.

This species, originally described from Hawaii, was also taken by the Pacific Entomological Survey in the Marquesas and in Moorea, Society Islands. Although not yet taken in Tahiti or Borabora, the species almost certainly is to be found there; further collecting needs to be done in the lowlands. The preferred host is *purau* (*Hibiscus tiliaceus*), a tree much used by the Polynesians. The distribution of this termite among the islands was probably aided materially by native and commercial intercourse.

Mr. Light has compared this species with a single topotype soldier of *K. (N.) samoanus* Holmgren from Samoa, identified by Hill, and with a paratype soldier and alate of *K. (N.) rainbowi* Hall from the Ellice Islands. There are marked differences between the soldier from Samoa and those from the Society and Marquesas Islands. The soldier from the Ellice Islands, however, is very similar to those from the Society and Marquesas Islands. The Ellice Islands alates show distinct differences from those of the Society Islands. Therefore the validity of these species must await a study of the range of variation among the individuals and colonies of the three regions. In view of the wide range of variation, not yet carefully studied, in *K. (N.) connexus* Snyder and the facts stated above, it seems

probable that these termites will ultimately be found to represent a single species, which would then be designated by the oldest name, *K. (N.) samoanus* Holmgren.

2. *Kalotermes (Rugitermes) athertoni* (Light).

Kalotermes (Metaneoterмес) athertoni Light: B. P. Bishop Mus., Bull. 98, pp. 78-80, fig. 23, pl. 1, *A-B*, pl. 2, *A-C*, 1932.

Society Islands, Tahiti, Mt. Aorai Trail, September 1934: altitude 5800 feet, two collections from dead *Metrosideros* (one from a dead limb); altitude 5500 feet, from dead *Metrosideros*; altitude 4500 and 5500 feet, from a *Weinmannia* stump.

This species occurs from sea level to 3500 feet in the Marquesas, where *Hibiscus tiliaceus* is its most common host.⁶ Although little time was spent searching for termites in the lowlands of Tahiti and although this species was not taken below 4,000 feet where collections of other species were made, it may occur, as it does in the Marquesas, from the lowlands to the heights of the interior. It is not common even on Mt. Aorai, for only four collections were made there in five days of rather careful searching.

K. (R.) athertoni, formerly thought by Light⁷ to represent a new subgenus, was previously known only from the Marquesas. A similar species taken by von Hagen in Ecuador was provisionally considered by Light⁸ to be the same. More careful study has shown that the Ecuador species is distinct. A comparison with authentic type material (Emerson, in lit.) shows that *K. athertoni*, although seemingly distinct, should be placed in the subgenus *Rugitermes*, confined to the neotropics where it has a wide distribution.

3. *Kalotermes* (?) *rapae*, new species (fig. 1).

Dealate female (young queen).—Generally castaneus; intersegmental membranes, sternites, legs beyond coxae, and an area in front of the eye distinctly lighter. Head (fig. 1, *f*) parallel-sided, longer than broad; transverse sutures faint; frons with two minute but conspicuous muscle marks near center, and behind them a fainter V-shaped figure and two large, inconspicuous muscle marks, one above each antenna. Eye (fig. 1, *e*) separated from dorsal margin of head by approximately its short diameter, and from ventral margin by approximately its long diameter, sharply truncated on antero-dorsal margin and less distinctly so on its ventral margin. Ocellus yellowish, not projecting, elongated, its long diameter approximately twice its short diameter; directed obliquely dorsad and anteriad; about half as long as long diameter of eye;

⁶ Light, S. F., Termites of the Marquesas Islands: B. P. Bishop Mus., Bull. 98, pp. 78-80, fig. 23, 1932.

⁷ Idem.

⁸ Light, S. F., The termites: California Acad. Sci., Proc., vol. 21, no. 20, p. 237, 1935.

separated from eye by about half the short diameter of ocellus. Antenna with 11-| segments (incomplete in all individuals available), first segment light brown, second pale, others dark brown; second and third subequal, fourth smallest. Maxillary palpi (fig. 1, *e*) with unusually thick distal segments; labial palpi (fig. 1, *e*) also with thick distal segments. Pronotum (fig. 1, *g*) with broadly and shallowly concave anterior margin; posterior margin with broad, shallow, somewhat angular median emargination; postero-lateral corners receding into biconvex posterior margin; Y-marking very broad and shallow. Meso- and metanota with faintly concave posterior margins. Anterior wing scale reaching to about middle of metanotum. All tibiae with three apical spines.

Measurements (in millimeters) of morphotype female:

Length	7.5
Length of head capsule.....	1.3
Length of head over all.....	1.6
Width of head with eyes.....	1.4
Width of head capsule.....	1.3
Maximum diameter of eye.....	0.3
Minimum diameter of eye.....	0.2
Length of pronotum.....	0.8
Maximum length of pronotum.....	0.9
Width of pronotum (in position).....	1.25

Soldier.—Frons brown, rest of head, antennae, and palpi yellow-brown; rest of body whitish except anterior margin of pronotum, the claws and apical spines of tibiae, which are reddish. Head (fig. 1, *a*) subrectangular, sides slightly concave near middle, somewhat bulging posteriorly; more than half as wide as long; about as high as wide; dorsal surface sloping forward slightly to frons, which makes an angle of about 45° with the vertical axis of the head (fig. 1, *c*); dorsal margin of frons somewhat bilobed, owing to a shallow groove arising at about junction of Y-suture and running onto frons; two low, shield-shaped bosses, one on each side dorsal to the antenna, each somewhat darker than rest of frons and succeeded posteriorly by a somewhat crescentic pale area. Antero-lateral region of head capsule provided with two prominent tubercles (fig. 1, *a*); one tubercle sharp, almost spinelike, at the extreme antero-lateral angle and directed laterad, anteriad, and slightly dorsad; the other, thicker and broader-based, situated on the antennal ridge between the antenna and the dorsal mandibular condyle. Postclypeus (fig. 1, *a*) narrow, dark, the free margin with a broad, low, median, angular convexity. Labrum (fig. 1, *a*) parallel-sided, wider than long, its anterior margin with a median triangular convexity. Gula (fig. 1, *h*) more than twice as wide anteriorly as at narrowest point. Antennae (fig. 1, *a*) of 14-15 segments; fourth shortest; third chitinized, shorter than second but longer than fourth or fifth; sixth about as long as wide; distal segments increasing in length; ninth to fifteenth subequal. Mandibles (fig. 1, *a*) nearly as long as width of head, basally thick and wrinkled, narrowed distally, strongly incurved in distal fourth; teeth reduced, two on right, one distinct tooth and two vestiges on left. Pronotum (fig. 1, *b*) weakly sclerotized, about as wide as head, less than half as long as wide; anterior margin shallowly, broadly, and angularly concave; antero-lateral corners shortly rounded, sides parallel, postero-lateral corners rounding into weakly biconvex posterior margin.

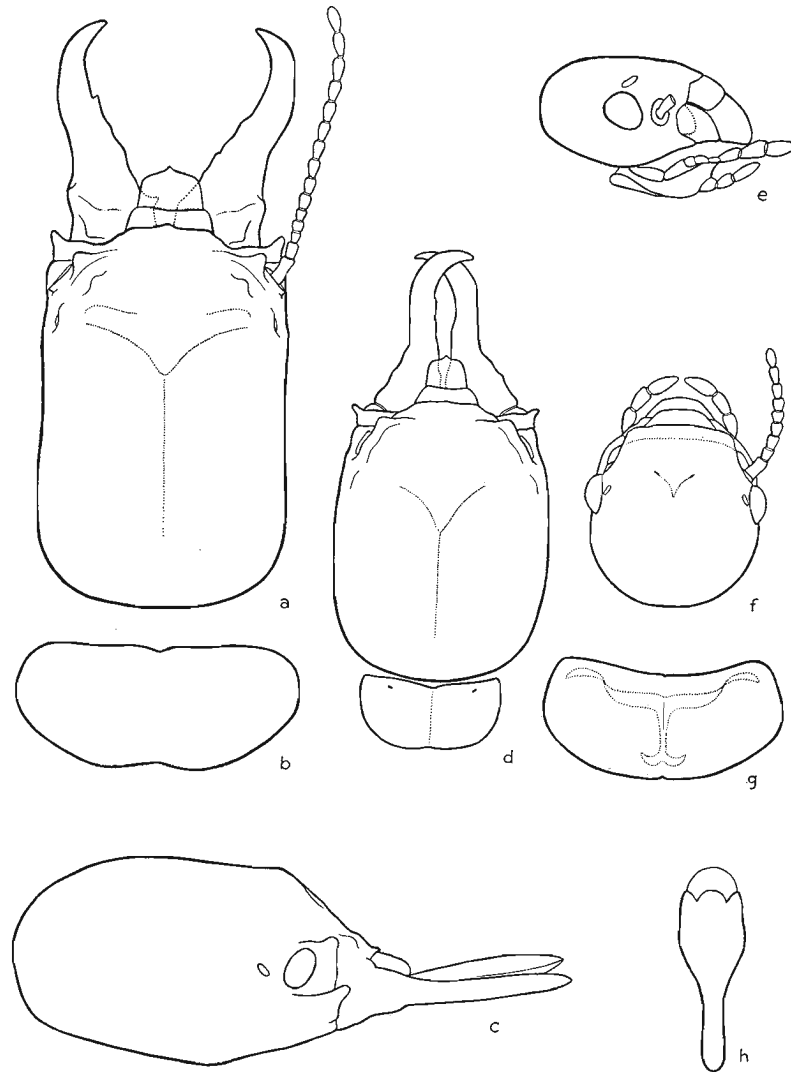


FIGURE 1.—*Kaloterms* (?) *rapae*: a, head of large soldier, dorsal view; b, pronotum of same; c, head of same, lateral view; d, head and pronotum of soldier of incipient colony, dorsal view; e, head of female, side view; f, head of same, dorsal view; g, pronotum of same; h, gula of large soldier. (Camera lucida drawings).

