

IMAGO OF THE WOOD-TERMITE *HETEROTERMES GERTRUDAE* ROONWAL (RHINOTERMITIDAE : HETEROTERMITINAE) FROM NORTH-WEST HIMALAYAS

By

M. L. ROONWAL* and S. C. VERMA⁺

*Desert Regional Station, Zoological Survey of India,
Paota, Jodhpur*

(with 3 Text-figures and 2 Tables)

INTRODUCTION

The termite *Heterotermes gertrudae* Roonwal (Rhinotermitidae, Heterotermitinae) was described from the North-Western Himalayas (Almora, Almora District, Uttar Pradesh) on the basis of soldiers and workers only (Roonwal, 1953). Nothing further is known about it (*vide* Roonwal, 1970a).

Recently a valuable collection of imagoes, with associated soldiers and workers, became available to us, and the hitherto unknown imago is described here. The body-measurements, etc. were taken as defined in Roonwal (1970b). The affinities of the species are also discussed.

ACKNOWLEDGEMENTS

Our thanks are due to the collector, Dr. Ganpat S. Roonwal of the Department of Geology, Delhi University, for placing the material at our disposal; and to the Council of Scientific and Industrial Research, New Delhi, for financial assistance.

IMAGO OF *HETEROTERMES
GERTRUDAE* ROONWAL

(Text-figs. 1 and 2; and Table 1)

1953. *Heterotermes gertrudae* Roonwal, *Indian J. Ent.* New Delhi, 15 (2) : 115-118. Soldier and worker. *Type-locality* : Almora (Uttar Pradesh, India). 5500 ft.

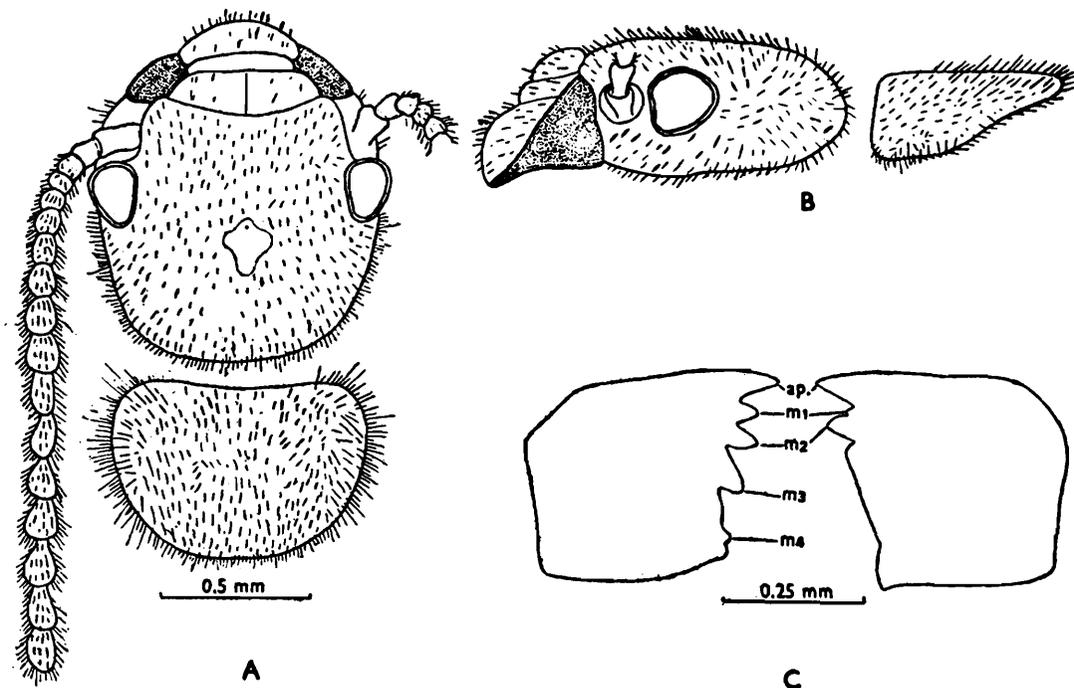
* Emeritus Scientist (C.S.I.R.).

⁺ Junior Research Fellow (C.S.I.R.).

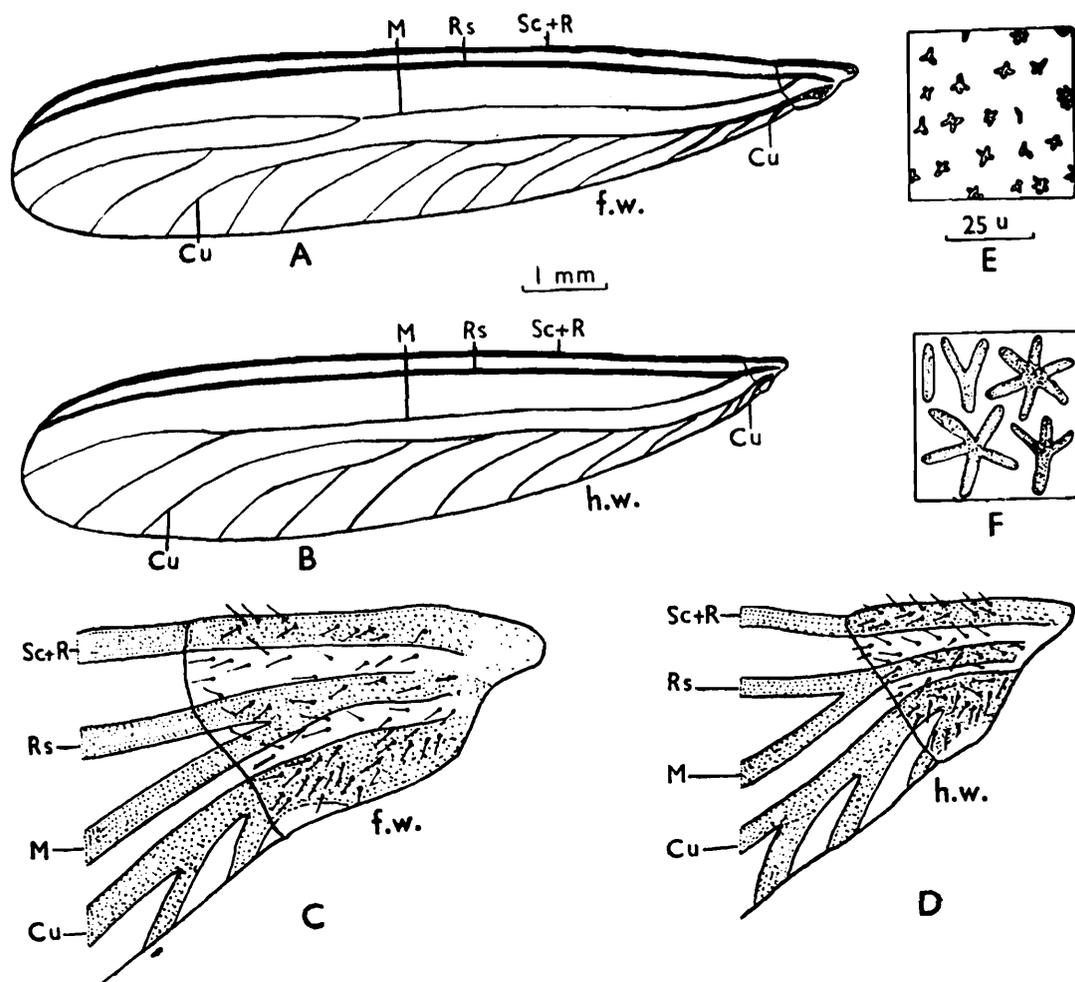
Material.—One tube, with several imagoes (alates) and associated soldiers, workers and nymphs, Melha (alt. ca. 1500 m. above M. S. L., approximate lat. 32°40' N., long. 76°05' E) on bank of R. Ravi (Chamba District, Himachal Pradesh, India), G. S. Roonwal coll., 26 May 1970, ex wooden beam in roof of a house. (Deposited with the Zoological Survey of India, Calcutta.)

IMAGO : Hitherto unknown, and is described below.

Head and body yellowish brown dorsally, paler ventrally; antennae and legs paler; fairly thickly pilose, with short to longish hairs. Total length with wings 10.0-11.5, without wings 5.5-5.8 mm. Head-capsule subround, slightly narrowing posteriorly; sides straight, posterior margin convex. Y-suture not visible. Fontenelle minute, rounded, situated in middle of head-dorsum. Eyes blackish, rather small, subround, slightly elongated ventrally; not greatly projecting from head; situated close to antennal base; minimum eye-antennal distance 0.027 mm. Ocelli absent. Antennae 17-segmented, moderately pilose; segment 1 longest; 2 about half of 1; 3 slightly smaller than 2; 4 smallest; 5 to the penultimate one gradually increasing in length in that order. Labrum subrectangular, almost twice as wide as long, and with a few short hairs distally. Anteclypeus band-like, hyaline, apilose. Postclypeus swollen, with a few hairs; divided into right and left halves by a faint median line. Mandibles pale yellowish



Text-fig. 1. *Heterotermes gertrudae* Roonwal. Imago (♀). Melha (Chamba District, Himachal Pradesh). (A) Head and pronotum, in dorsal view. (B) Ditto, in side view. (C) Mandibles, in dorsal view. ap. apical tooth; $m_1 - m_4$, first to fourth marginal teeth,



Text-fig. 2. *Heterotermes gertrudae* Roonwal. Imago (♀). Melha (Chamba District, Himachal Pradesh). (A) Left fore-wing. (B) Left hind-wing. (C) Base of left fore-wing, enlarged. (D) Ditto, hind-wing. (E) Some micrasters on fore-wing membrane, in natural position. (F) Ditto, enlarged and re-arranged.

Cu 1-11, cubitus veins 1-11; *f.w.*, fore-wing; *h.w.*, hind-wing; *M*, media; *R*, radius; *Rs*, radial sector; *Sc*, subcosta.

with blackish margins. Left mandible with an apical and 4 marginal teeth; apical large and prominent; marginal 1 smaller than apical; 2 larger than and close to 1; 3 somewhat smaller than 2, separated from the latter by a wide margin; 4 very small, blunt and widely separated from 3. Right mandible with an apical and two marginal teeth; apical large and pointed; marginal 1 very small, and just above 2, the latter large and prominent. Pronotum shield-like, wider than long, with anterior corners rounded and sides convex; anterior margin concave, posterior margin convex, both margins without median notch. Meso- and metanota subequal, smaller than pronotum; both with posterior margins convex and without median notch. Legs rather short, moderately hairy. Tarsi with 4 segments, the last one terminating in a pair of claws; arolium absent. Apical tibial spur formula 3 : 2 : 2.

Wings almost colourless and translucent; membrane with a few small hairs all over, specially on the veins; entire membrane sculptured with numerous tiny 'micrasters', each with one to six arms. Length (without scale) of forewing *ca.* 8.0-9.0, of hindwing *ca.* 7.5-8.5 mm.; veins, specially the anterior ones, pale brown. Forewing with a well chitinised vein (subcosta + radius) running all along anterior margin;

TABLE 1.—*Heterotermes gertrudae* Roonwal. Body-measurements (in mm.). etc. of imagoes (Melha, Chamba District, Himachal Pradesh)

Body-parts	Range (mm.) (5 exs.)
1. Total length (with wings)	10.0 -11.5
2. Total length (without wings)	5.5 - 5.8
3. Length of head with mandibles	1.16 - 1.21
4. Length of head to lateral base of mandibles	0.89 - 0.95
5. Max. width of head (with eyes)	0.89 - 0.95
6. Max. height of head	0.53 - 0.58
7. Max. length of labrum	0.16
8. Max. width of labrum	0.32 - 0.37
9. Max. diameter of eyes	0.23
10. Min. diameter of eyes	0.18 - 0.20
11. Max. length of pronotum	0.47 - 0.53
12. Max. width of pronotum	0.84 - 0.89
13. Max. length of mesonotum	0.42
14. Max. width of mesonotum	0.79
15. Max. length of metanotum	0.42
16. Max. width of metanotum	0.79
17. Length of fore-wing without scale	8.0 - 9.0
18. Length of hind-wing without scale	7.5 - 8.5

radial sector running parallel to the previous one to the tip of wing. Remaining veins rather faintly marked; media arising from radial sector inside wing-scale, with 3 branches in distal half. Cubitus arising independently inside wing-scale, with about 11 branches to posterior margin of wing. Hindwing veins as in forewing, but media arising from radial sector just outside wing-scale, running across wing and giving 2 branches distally. Abdomen thickly hairy with moderately long hairs all over. Cerci short, 2-segmented, *ca.* 0.14 mm. long. Styli very small, 2-segmented, *ca.* 0.09 mm. long.

DISCUSSION

1. Affinities

The soldiers from the Chamba District agree well with the type material from Almora, U.P., in all respects (Table 2). The workers of the two lots also agree except that the Chamba ones are slightly

smaller (total length 4.5-5.2 *vs.* 5-6 mm.; and head-length to tip of labrum 1.16-1.26 *vs.* 1.25-1.35 mm.).

Like the soldier, the imago also is close to *H philippinensis* (Light) of the Philippines but is distinctly larger, as follows :—Total length, with wings 10.0-11.5 mm. (*vs.* 9-10 in *philippinensis*), without wings

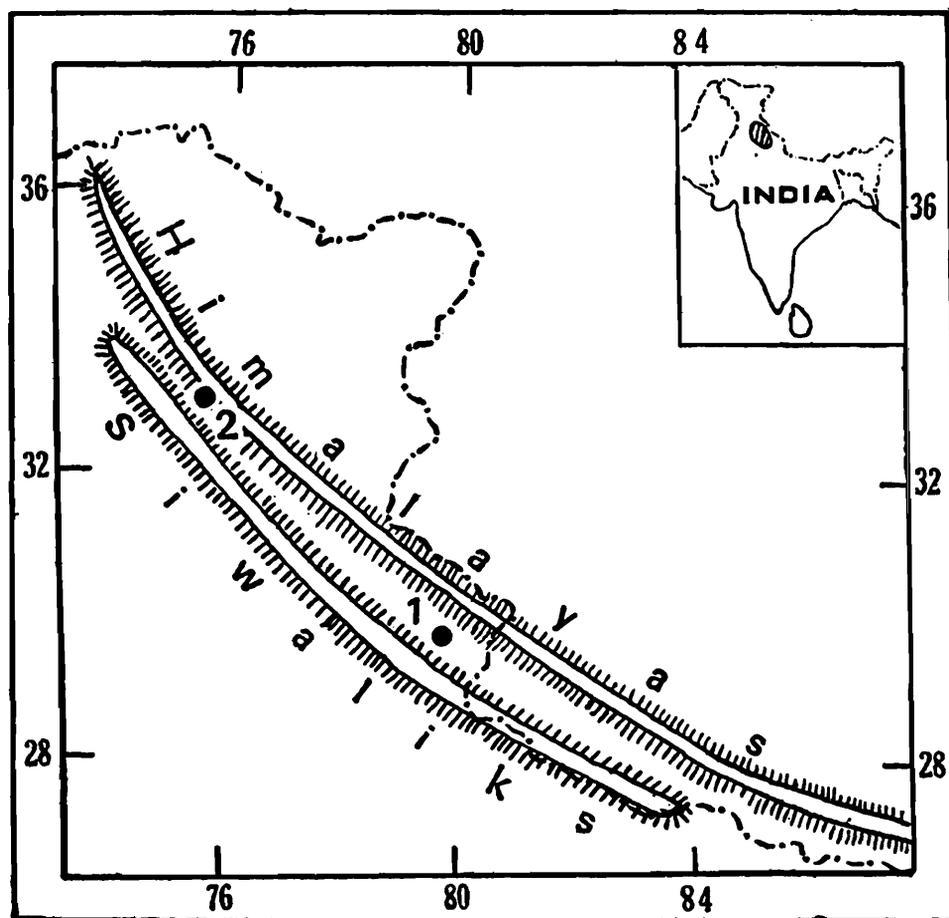
TABLE 2.—*Heterotermes gertrudae* Roonwal. Body-measurements (in mm.), etc. of soldiers.

Body-parts	Melha, (Chamba Dist., Himachal Pradesh) (3 exs.)	Almora (Uttar Pradesh) (From Roonwal, 1953, (6-8 exs.)	Range for species
1. Total length, with mandibles	4.9-5.2	—	4.9-5.2
2. Length of head with mandibles	2.47-2.63	2.18-2.70	2.18-2.70
3. Length of head to lateral base of mandibles	1.63-1.74	1.50-1.78	1.50-1.78
4. Max. width of head	1.00-1.05	0.98-1.05	0.98-1.05
5. Max. height of head	0.84	0.83-0.98	0.83-0.98
6. Max. width of labrum	0.21	—	0.21
7. Max. length of labrum	0.42-0.47	—	0.42-0.47
8. Max. length of right mandible	1.00	0.90-1.00	0.90-1.00
9. Max. length of left mandible	1.00	0.90-1.05	0.90-1.05
10. Min. (median) length of postmentum	1.26-1.32	1.13-1.50	1.13-1.50
11. Min. width of postmentum	0.16	0.13-0.19	0.13-0.19
12. Max. width of postmentum	0.42-0.47	0.30-0.38	0.30-0.47
13. No. of antennal segments	15	12-17 (mostly 14-16)	12-17 (mostly 15)
14. Max. length of pronotum	0.47-0.53	0.53-0.75	0.47-0.75
15. Max. width of pronotum	0.79-0.84	0.83-0.90	0.79-0.90

5.5-5.8 mm. (*vs.* 3.5-4.0); maximum head-width 0.89-0.95 mm. (*vs.* 0.86); length of forewing without scale 8.0-9.0 mm. (*vs.* 7.8 mm). The pronotum also differs in the anterior margin having no median depression (*vs.* with a depression).

2. Distribution

The species is confined to the North-West Himalayas (Text-fig. 3) at about 1500-1600 m. altitude, having been found so far in Uttar Pradesh (Almora District) and Himachal Pradesh (Chamba District). It attacks wood-work in houses.



Text-fig. 3. Map of NW India, showing the distribution of *Heterotermes gertrudae* Roonwal. (Inset : India ; shaded area is range of *H. gertrudae*). 1, Almora (Almora District, Uttar Pradesh). 2, Melha (Chamba District, Himachal Pradesh).

SUMMARY

The hitherto unknown imago of *Heterotermes gertrudae* Roonwal, originally described from soldiers and workers only (Roonwal, 1953), is described here, from material consisting of winged imagoes with associated soldiers and workers from the Chamba District, Himachal Pradesh.

The affinities, as determined on the basis of all the castes, place the species close to *Heterotermes philippinensis* (Light), of the Philippines, from which, however, it differs in being larger (*gertrudae* is, in fact, the largest among the oriental species), and in some other respects.

The species is confined to the North-West Himalayas (Chamba District, Himachal Pradesh, and Almora District, Uttar Pradesh) at ca. 1400-1500 m. altitude. It attacks wood-work in houses.

REFERENCES

- ROONWAL, M. L. 1953. Systematics of oriental termites. No. 1. A new species of termite, *Heterotermes gertrudae* sp. nov., from North India (Isoptera, family Rhinotermitidae).—*Indian J Ent.*, New Delhi, 15 (2) : 115-118.
- ROONWAL, M. L. 1970a. Termites of the Oriental Region, 315-391. In *Biology of Termites* (Ed. by K. Krishna and F. M. Weesner), Vol. 2.—New York (Academic Press).
- ROONWAL, M. L. 1970b. Measurement of termites (Isoptera) for taxonomic purposes.—*J zool. Soc. India*, Calcutta, 21 (1) 9-66.