

INCISITERMES FURVUS, A NEW DRYWOOD TERMITE
(ISOPTERA: KALOTERMITIDAE) FROM PUERTO RICO

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ABSTRACT

The imago and soldier of *Incisitermes furvus* n. sp. from western Puerto Rico are described for the first time. This is the seventh species of *Incisitermes* reported from the West Indies.

RESUMEN

Se describen por vez primera el imago y el soldado de *Incisitermes furvus* sp. n. de Puerto Rico. Esta es la séptima especie de *Incisitermes* registrada de las Indias Occidentales.

Key Words: New species description, soldier, winged imago, West Indies.

The genus *Incisitermes* was established by Krishna (1961) to accommodate the reclassification of a large subgroup of kalotermitid species previously placed together in the genus *Kaloterмес* Hagen. The known distribution of *Incisitermes* is limited to both

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the Nearctic and Neotropical Americas (Snyder 1949, Araujo 1977), Australia (Gay 1976), India (Roonwal & Verma 1973), and islands of the Pacific Ocean (Krishna 1961).

A new dark and rather small species of *Incisitermes* was collected during a recent survey of the termites of Puerto Rico. The imago and soldier castes of *Incisitermes furvus* n. sp. are described herein.

MATERIALS AND METHODS

Fourteen colonies of *I. furvus* n. sp. were sampled in four locations in Puerto Rico including three colonies from Reserva Forestal Maricao (18°09'N, 66°59'W) on 19-V-1992 by S.C. Jones and one on 2-VI-1993 by J. R. Mangold; eight from Bosque Estatal de Guajataca (18°25'N, 66°58'W) on 3-VI-1993; one from Area Recreativa Rio Abajo (18°20'N, 66°43'W) on 4-VI-1993; and one sample from Bosque Estatal de Cambalache (18°26'N, 66°36'W) on 4-VI-1993; the latter ten collected by J. A. Chase, J. de la Rosa Guzman, J. R. Mangold and R. H. Scheffrahn. Colonies were dwelling inside standing and fallen native dead tree trunks and branches of sound condition. The termites were collected by aspirator and field-preserved in 85% ethanol.

Measurements of specimens, made with a calibrated ocular micrometer to a maximum accuracy of ± 0.01 mm, follow the conventions of Krishna & Emerson (1962). Thirty-four imagos (14 from Maricao, 18 from Guajataca and one each from Rio Abajo and Cambalache) and 52 soldiers (14 from Maricao, 31 from Guajataca, four from Rio Abajo, and three from Cambalache) were used for measurements. Scanning electron micrographs were made with a Hitachi S-4000 field emission microscope (10kV) of specimens dehydrated in absolute ethanol and 1,1,1,3,3,3-hexamethyldisilazane (Nation 1983) and then sputter-coated with gold.

The holotype imago from Guajataca and morphotype soldier from the Maricao site (2-VI-1993) will be deposited in the collection of the National Museum of Natural History, Washington, D.C. Paratype soldiers and alates will be deposited in the American Museum of Natural History, New York, New York, in the Florida State Collection of Arthropods, Florida Department of Agriculture and Consumer Services., Division of Plant Industry, Gainesville, Florida, and in the author's collection.

Incisitermes furvus, new species

IMAGO (Figs. 1-5, Table 1). Head capsule, antennae, and notum very dark brown; wing scales and membranes blackish, costal veins including costal margin, radius, and radial sector very dark brown, in all, giving the winged imago a strikingly uniform black appearance when viewed dorsally. Clypeus concolorous at base with head grading to pale yellow anteriorly; labrum light brown. Head with about 16 fine setae projecting from vertex and frons in lateral profile. Compound eye subtriangular, composed of very small facets; ocellus small, oblong, and hyaline, margin sharply defined-surrounding head pigmentation, less than one half diam above eye. Antennae composed of 15-17 segments, usually 16; third or fourth segment shortest. Mandible dentition as in Fig. 4 and as described for *Incisitermes* by Krishna (1961); Pronotum wider than long, about as wide as head; anterior margin squarely incised to form about a 160° angle, anterior corners rounded; posterior margin shallowly concave, posterior corners reduced to two rounded, about 45° curves; all margins with scattered long and short setae. Wing membrane tuberculate; median and cubitus veins and their branches delineated by a single row of papillae smaller than those on membrane, costal veins densely covered with even smaller papillae. In forewing, radial sec-

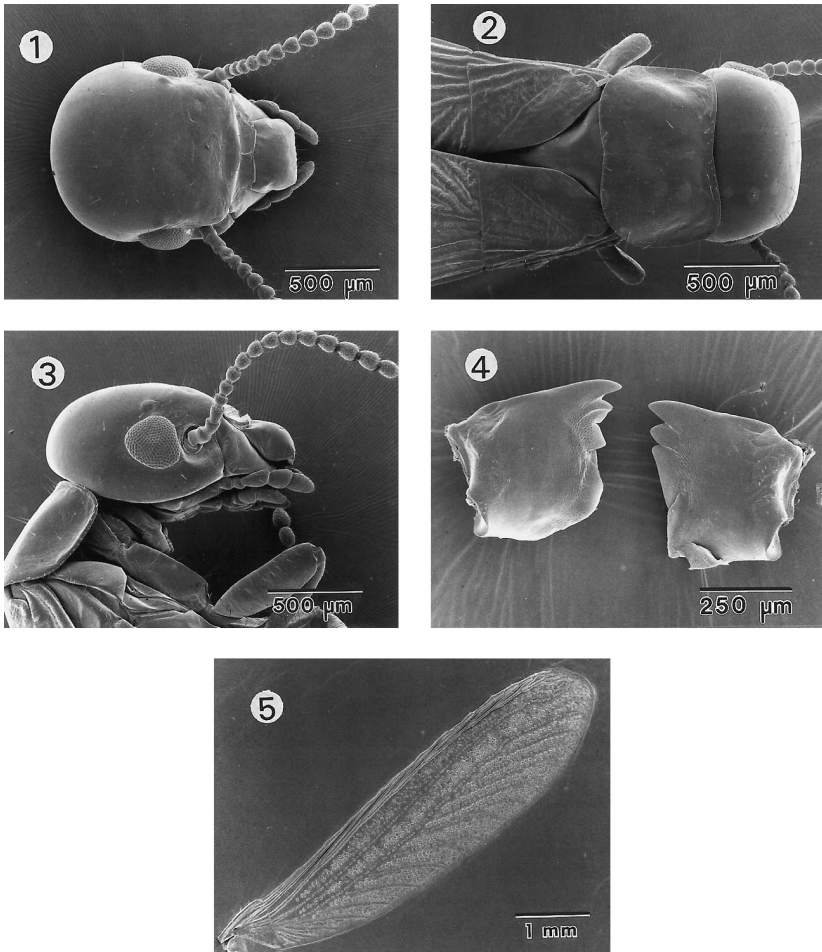


Fig. 1-5. Scanning electron micrographs of *Incisitermes furvus* winged imago. Dorsal views of head (1), thorax, and wing scales (2); lateral view of head and pronotum (3); and dorsal views of mandibles (4) and right forewing (5).

tor with about eight anterior branches; unsclerotized media unbroken to apex; cubitus with 11-13 posterior branches. Arolia present.

Comparisons. The imago of *I. furvus* differs from imagos of most *Incisitermes* species by its very dark body and wings although three other small Neotropical *Incisitermes* are rather dark and small and might be confused with *I. furvus*. These include *I. milleri* (Emerson), known from the Florida Keys and Jamaica (Emerson 1943) and the Dominican Republic (R.H.S., unpublished), *I. nigrinus* (Snyder) from Guatemala (Snyder 1946) and Mexico (Emerson 1969), and *I. bequaerti* (Snyder) from Cuba (Snyder 1929), the Bahamas and U.S. Virgin Islands (Snyder 1956), the Turks and

TABLE 1. MEASUREMENTS OF *INCISITERMES FURVUS* IMAGO

Measurement in mm (n=34)	Range	Mean \pm SD	Holotype
Number antennal segments	15-17	15.72 \pm 0.53	16
Head length to labrum tip	1.25-1.48	1.37 \pm 0.045	1.44
Head length to lateral base of mandibles	0.96-1.10	1.02 \pm 0.030	1.10
Head maximum width at eyes	1.04-1.16	1.09 \pm 0.029	1.12
Eye maximum diameter	0.26-0.31	0.29 \pm 0.015	0.30
Ocellus maximum diameter	0.10-0.14	0.11 \pm 0.009	0.11
Distance from eye to lower margin of head	0.14-0.20	0.17 \pm 0.016	0.16
Pronotum median length	0.58-0.72	0.65 \pm 0.029	0.64
Pronotum maximum length	0.68-0.84	0.76 \pm 0.036	0.76
Pronotum maximum width	0.98-1.16	1.09 \pm 0.037	1.08
Hind tibia length	0.83-0.93	0.87 \pm 0.030	0.93
Forewing length at suture	5.12-6.42	5.83 \pm 0.36	5.83
Forewing maximum width	1.46-1.88	1.68 \pm 0.12	1.69
Body length without wings	4.73-6.09	5.45 \pm 0.33	4.92
Total length with wings	7.45-8.94	8.23 \pm 0.49	8.23

Caicos (Scheffrahn et al. 1990), the Dominican Republic (R.H.S., unpublished), and Puerto Rico [S.C. Jones (USDA-FS, Tucson, AZ) & R.H. S. unpublished]. Table 2 gives relevant characters to separate these species from *I. furvus* and each other. The imagos of *I. milleri* are smaller and have 1-4 fewer antennal segments than *I. furvus*. Wings of *I. bequaerti* are hyaline and larger and wider than *I. furvus*. *Incisitermes nigritus* imagos are closest to *I. furvus* but can be separated by the larger and more robust bodies, larger eyes and ocelli, and more tuberiferous wing membranes of *I. furvus*.

SOLDIER (Figs. 6-9, Table 3). Head capsule, when viewed dorsally, red-brown in front grading to pale yellow posteriorly; from above, sides parallel, anterior corners nearly square at mandibular articulations, posterior margin evenly rounded; ventral surface pale yellow except for reddish anterior margin. Head capsule, when viewed laterally, with 40-50 dorsal setae of variable length to 0.13 mm; setae shorter but of same density on ventral surface. Frons slopes about 30° from vertex, weakly and broadly concave, surface very weakly rugose. Anteclypeus a narrow, white trapezoid. Labrum light yellow-brown, spatulate. In most specimens, eyespot composed of a poorly defined hyaline ellipse having diffuse border with surrounding pigmentation; eyespot regions about same diam and standing about one-half diam behind, and at same height, as antennal fossae. In a few specimens, a small more well-defined hyaline or gray eye rudiment visible within center of unpigmented region. Mandibles rather slender with outer margins smooth, angled dorsally about 30° from plane of head, dentition as in Fig. 9; left mandible with long, narrow distal blade and three marginal teeth, first two pointed forward, prominently arising in distal third of mandible, the third tooth less prominent, arising from a shelf on the basal half; right mandible with serrate blade in distal half and two triangulate teeth in basal half. Antennae with 10-14 segments, usually 12, rarely 10 as in Fig. 6; third longest, narrower than first; third as long as fourth and fifth together; in some specimens, fourth fused to third. Postmentum as in Fig. 8. Pronotum with median incision in anterior margin forming square angle of about 135°; anterior corners sharply rounded; posterior margin with a slight or no concavity; posterior corners broadly rounded; setae on margins of same length and density as head. Femora weakly inflated.

TABLE 2. COMPARISON OF CHARACTERS OF NEOTROPICAL INCISITERMES IMAGOS (RANGE OF MEASUREMENTS IN MM).

Character	<i>Incisitermes</i> Species ¹			
	<i>milleri</i>	<i>furvus</i>	<i>nigritus</i>	<i>bequaerti</i>
No. of antennal segments	13–14	15–17	14–16	15–17
Body color	very dark brown	very dark brown	very dark brown ²	castaneous to very dark brown
Wing color	hyaline to dark ³	very dark	dark ^b	hyaline
Papillae on wing membrane	faint	prominent	faint	absent
Maximum diam. eye	0.20–0.27	0.26–0.31	0.19–0.25	0.26–0.34
Maximum diam. ocellus	0.09–0.11	0.10–0.14	0.09	0.14–0.16
Hind tibia length	0.68–0.76	0.83–0.93	0.69–0.75	0.70–0.85
Length forewing to suture	4.60–5.37	5.12–6.42	5.00–5.50	7.58–8.23
Width forewing	1.29–1.50	1.46–1.88	1.39–1.50	2.07–2.43
Body length	4.28–5.12	4.73–6.09	5.00–5.25	5.12–5.83 (6.75)
Total length with wings	6.40–7.76	7.45–8.94	7.50–8.00	9.40–10.50
Body length ÷ total length	0.62–0.69	0.63–0.68	0.65–0.67	0.50–0.60 (0.64)

¹Characters and measurements obtained from the following: *I. milleri*, Emerson 1943 and four specimens from four locations in Barahona and Pedernales Provinces, Dominican Republic. *I. furvus*: this study. *I. nigritus*: Snyder 1946 and paratypes from U. S. National Museum. *I. bequaerti*: Snyder 1929 (his maximum measurements in parentheses); five specimens from one site each in Barahona, San Pedro de Macoris, and Peravia, and two sites in Pedernales Province Dominican Republic; Bosque Estatal de Guanica, Puerto Rico; and Providenciales, Turks and Caicos B.W.I.

²Pigmentation faded in paratypes examined. Coloration based on Snyder 1946.

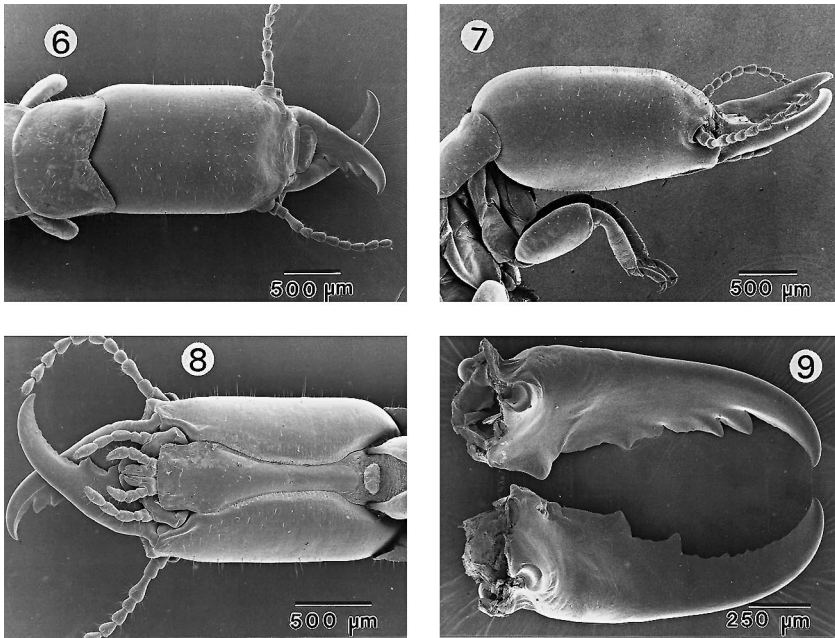
³Wing membranes of *I. milleri* from Jamaica and Florida hyaline (Emerson 1943) and dark from the Dominican Republic (Scheffrahn, unpubl.).

Comparisons. Compared with *Incisitermes nigritus*, soldiers of *I. furvus* have longer, apically more slender mandibles with all marginal teeth more prominent, larger and more diffuse eye spot, a longer third antennal segment, and a deeper pronotal incision. The headcapsule of *I. bequaerti* flatter than that of *I. furvus*, and the soldier of *I. milleri* is smaller than that of *I. furvus*.

Etymology. This species name is taken from the Latin term “*furvus*” which describes the dark, swarthy body color and dark wing tint of the imago.

DISCUSSION

Soldiers of *I. furvus* so far collected neither vary as greatly in size nor possess very distinct long- and short-headed forms as is common among *Incisitermes* species. Both fully pigmented and lighter freshly-molted alates were collected in colonies in May and June suggesting an early to mid-summer flight season. Alates flew readily upon extraction from wood during collection. This habit, along with the dark pigmentation



Figs. 6-9. Scanning electronic micrographs of *Incisitermes furvus* soldier. Dorsal and lateral views of head and pronotum (6,7); ventral view of head (8); and dorsal view of mandibles (9).

of *I. furvus* alates indicate that this species is a daytime flier. *Incisitermes furvus* appears to be a relatively common species within the mountainous forests of its limited range in western Puerto Rico.

Incisitermes furvus is the thirteenth Neotropical *Incisitermes* to be described (Araujo 1977). Of these, seven species are reported from the West Indies including *I. bequaerti*, *I. incisus* (Silvestri), *I. milleri*, *I. schwarzi* (Banks), *I. snyderi* (Light), and *I. tabogae* (Snyder) (Darlington 1992). Recent collections of *Incisitermes* in the West Indies by the author and others hint that one or more new species resembling *I. snyderi* may be identified. Our understanding of the West Indian *Incisitermes* is hampered by taxonomic difficulties common to other termite genera from the whole region (Collins 1988). Further descriptions, redescriptions, and revisions of this region's termites await completion.

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TABLE 3. MEASUREMENTS OF *INCISITERMES FURVUS* SOLDIERS.

Measurement in mm (n=52)	Range	Mean \pm SD	Morphotype
Number antennal segments	11-14	12.4 \pm 0.78	13
Third antennal seg. length	0.15-0.24	0.19 \pm 0.021	0.19
Third antennal segment maximum width	0.088-0.11	0.10 \pm 0.006	0.10
Third antennal segment minimum width	0.050-0.069	0.060 \pm 0.005	0.056
Head length with mandibles	2.53-3.33	2.90 \pm 0.20	2.86
Head length to lateral base of mandibles	1.50-2.20	1.86 \pm 0.16	1.87
Left mandible length to dorsal base	1.13-1.40	1.26 \pm 0.068	1.33
Pronotum median length	0.53-0.80	0.66 \pm 0.057	0.67
Pronotum maximum length	0.68-1.00	0.83 \pm 0.072	0.80
Head maximum width	1.03-1.33	1.20 \pm 0.064	1.21
Pronotum maximum width	1.00-1.35	1.20 \pm 0.071	1.20
Head maximum height	0.85-1.07	0.96 \pm 0.055	0.95
Postmentum maximum width	0.44-0.58	0.51 \pm 0.030	0.51
Postmentum minimum width	0.16-0.27	0.21 \pm 0.021	0.22
Postmentum length	1.12-1.78	1.44 \pm 0.15	1.44
Hind tibia length	0.70-0.96	0.85 \pm 0.063	0.88

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