

**GLYPTOTERMES AMPLUS, A NEW DAMPWOOD TERMITE
(ISOPTERA: KALOTERMITIDAE) FROM ST. LUCIA**

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ABSTRACT

Glyptotermes amplus n. sp. is described from soldiers and imagos collected on St. Lucia, West Indies. It is the seventh described species of West Indian *Glyptotermes* and is the largest species among its Lesser Antillean congeners.

Key Words: taxonomy, new species, Neotropics, West Indies, Lesser Antilles

RESUMEN

Glyptotermes amplus n. sp. es descrita de soldados e imagos colectados en St. Lucia, Antillas Menores. Es la séptima especie descrita de la especie antillana *Glyptotermes* y la mayor especie entre sus congeneres de las Antillas Menores.

Glyptotermes Froggatt is a tropicopolitan genus that is the second most diverse in the family Kalotermitidae after *Neotermes* Holmgren (Krishna 1961). The soldier caste of *Glyptotermes* is rather variable among species, but most can be distinguished from those of other kalotermitid genera by their rather cylindrical head capsule, steep frons, and short, thickened mandibles. The soldier head capsule of many *Glyptotermes* species is also characterized by a pair of rounded frontal protuberances that are separated by a median depression or cleft. Unlike those of the closely aligned genus *Calcaritermes* Snyder, *Glyptotermes* soldiers do not have an enlarged apical spur on the front tibia. Wing venation of the imago of *Glyptotermes* is similar to that of *Calcaritermes* in which the sclerotized media runs close and parallel to the radial sector to the wing tip. *Glyptotermes* spp. are typically found in wet forests infesting sound or rotting wood or wood scars in live trees.

In the New World, all 25 known species of *Glyptotermes* are Neotropical in distribution of which 6 have been described from the West Indies (Constantino 1998). *Glyptotermes pubescens* Snyder (1923) and *G. liberatus* (Snyder) (1929) were described from Puerto Rico and Jamaica, respectively. *Glyptotermes liberatus* is also known from Puerto Rico (Martorell 1973). *Glyptotermes adamsoni*, *G. parvoculatus*, and *G. tubifer* were described by Krishna & Emerson (1962) from Trinidad and Tobago, Trinidad only, and St. Vincent, respectively. The description of *G.* (= *Calotermes*) *posticus* (Hagen) (1858) is based on a single dealated female from St. Thomas U.S.V.I., and according to Snyder (1929), is probably that of a *Cryptotermes* species. Furthermore, Snyder (1929) determined that the soldier described as *Kalotermes posticus*

by Banks (1919) was actually that of a new species that Snyder (1929) renamed *Kalotermes liberatus*. Nevertheless, Krishna (1961) included *posticus* in his revised species list of *Glyptotermes*. Two unidentified *Glyptotermes* spp. were reported from Dominica and Martinique (Scheffrahn et al. 1994).

During a 1998 expedition to St. Lucia, a new species of *Glyptotermes* was collected. The descriptions of the soldier and imago of *Glyptotermes amplus* n. sp. are provided herein.

MATERIALS AND METHODS

Morphometrics of specimens preserved in 85:15 ethanol: water were made with a stereomicroscope fitted with a calibrated ocular micrometer. Scanning electron micrograph prints were scanned at 600 dpi, the digital image outline traced using photograph-enhancing software (Photo Magic, Micrografx, Inc., Richardson, TX), the background converted to black, and the scale bar digitally redrawn (Scheffrahn et al. 1999).

Latitude and longitude coordinates were measured at collection sites using a Garmin GPS model 38 global positioning receiver (Garmin International, Olathe, Kansas). Coordinates of collection sites were converted to decimal degrees and mapped (Fig. 3) using ArcView GIS version 3.0a software and relevant map data from Digital Map of the World version 1.0 (Environmental Systems Research Institute, Inc. Redlands, CA).

The holotype soldier and morphotype imago are deposited in the collection of the American Museum of Natural History, New York [AMNH]. Paratype soldiers and imagos are deposited in the National Museum of Natural History (Smithsonian Institution), Washington, D.C. [USNM]; the

Florida State Collection of Arthropods, Florida Department of Agriculture and Consumer Services, Division of Plant Industry, Gainesville [FSCA]; and the authors' collection at the University of Florida Research and Education Center, Ft. Lauderdale [FTLD].

Glyptotermes amplus, New Species

Imago (Fig. 1A, Table 1).

General color dark castaneous brown except as noted. Frons slightly lighter than remainder of head; epicranial suture indistinct. T-shaped pattern on pronotum midline slightly paler. All ventral surfaces of lighter tint than dorsum; anteclypeus pale yellow. Wing scale venation and sclerotized veins beyond the scale including costa, subcosta, radius, radial sector, and media dark brown; wing membranes brown.

Head capsule with few scattered short or medium bristles; lateral margins of pronotum fringed with more numerous alternating short

and long bristles. Bristle patterns on each tergite and sternite consist of about 8 long and a few more short bristles. Antennae with 13-14 articles; relative length formula usually $2 < 3 > 4 = 5$. Eyes medium-sized, slightly triangulate with straight margins bordering antennae, ocelli, and posteroventral margins of head. Ocelli prominent, white, and ellipsoid; narrowly separated from eyes. Pronotum about as wide as head; anterior margin broadly concave, posterior margin akin to 3 adjacent octagon sides with the median (most posterior) side slightly emarginate. Fore wings with radius, radial sector, and median veins running closely parallel to tips of wings; connected near tips by 2-3 short, pigmented cross veins; surfaces covered with large, evenly-spaced tubercles. Subcosta extending about 1/6 length of fore wings beyond sutures; cubitus faint. Arolia present.

Soldier (Fig. 1B-D, Table 2).

Head capsule, in dorsal and lateral views, grading from pale orange-brown in posterior 1/3

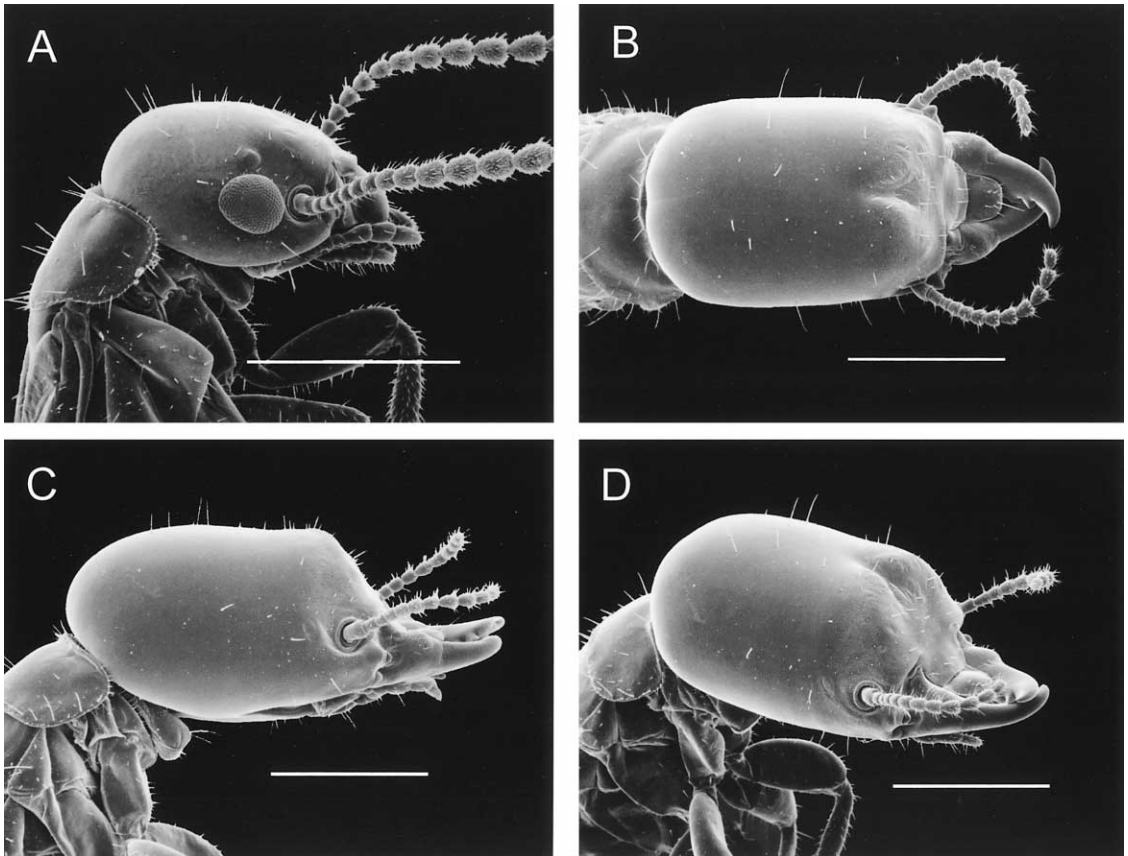


Fig. 1. Lateral view (A) of *Glyptotermes amplus* imago from Barre De L'Ilse rain forest, St. Lucia. Dorsal (B), lateral (C), and oblique (D) views of soldier head capsule of *G. amplus* from Edmond Forest Reserve, St. Lucia. Scale bars equal 1 mm.

TABLE 1. MEASUREMENTS OF *GLYPTOTERMES AMPLUS* IMAGO.

Measurement in mm (n = 5♂, 5♀ from 2 colonies)	Range	Mean ± S.D.	Morphotype
Head length with labrum	1.37-1.47	1.42 ± 0.030	1.42
Head length to postclypeus	1.00-1.11	1.06 ± 0.039	1.03
Head width, maximum at eyes	1.21-1.24	1.22 ± 0.013	1.22
Eye diameter, maximum	0.26-0.30	0.29 ± 0.011	0.29
Eye to head base, minimum	0.15-0.20	0.20 ± 0.020	0.16
Ocellus diameter, maximum	0.11-0.14	0.13 ± 0.008	0.13
Pronotum, maximum length	0.64-0.72	0.69 ± 0.027	0.65
Pronotum, maximum width	1.12-1.24	1.18 ± 0.040	1.17
Total length with wings	8.52-9.51	9.03 ± 0.39	9.23
Total length without wings	5.18-6.39	5.91 ± 0.44	5.96
Fore wing length from suture	6.25-6.67	6.45 ± 0.15	6.32
Fore wing, maximum width	1.45-1.65	1.56 ± 0.057	1.45
Hind tibia length without spurs	0.88-1.01	0.96 ± 0.039	0.93

to orange-brown in middle, to dark orange-brown at frontal protuberances; narrow black band between antennal fossae running along anterior margin of frons and postclypeus. Mandibles nearly black in distal half, grading to dark reddish-brown near bases. Anteclypeus translucent pale yellow. Labrum translucent ferruginous orange. Pronotum pale yellow-brown with hyaline midline and yellow-brown margins. Scattered medium and short bristles on head capsule, nota, tergites, and sternites.

Head capsule subcylindrical. Frontal protuberances rounded in dorsal view. Protuberances separated by median cleft; cleft narrow and deeper at its origin on the vertex, then becoming wider and shallower at mid-frons. Protuberances and cleft covered with faint rugose striations. Frontal plane sloping near 60° from plane of vertex. Labrum lingulate, nearly transparent. Eye spots large, hyaline, and elliptical; margins diffuse with head capsule pigmentation; centers

slightly above centers of antennal fossae. Mandibles short, stout; with basal 1/3 consisting of conspicuous humps; humps covered with rugose striations. Mandible points recurvate. Dentition distinct, teeth bluntly conical. Antennae with 11-13 articles; relative length formulae usually $2 > 3 < 4 < 5$ or $2 > 3 = 4 < 5$. Pronotum as wide as head, twice as wide as long. Anterior margin of pronotum weakly concave with minute median incision; posterior margin parallels anterior margin except for narrow weak concavity near middle; lateral margins evenly convex.

Comparisons.

The imago of *G. amplus* is much larger than that of any congener in the Lesser Antilles, including *G. adamsoni*, *G. parvoculatus*, *G. tubifer*, and several undescribed species from Dominica, St. Lucia, and St. Vincent. The imagos of the Greater Antillean *G. liberatus* and *G. pubescens*

TABLE 2. MEASUREMENTS OF *GLYPTOTERMES AMPLUS* SOLDIER.

Measurement in mm (n = 9 from 4 colonies)	Range	Mean ± S.D.	Holotype
Head length to tip of mandibles	2.64-2.97	2.82 ± 0.098	2.87
Head length to median cleft	1.32-1.48	1.39 ± 0.055	1.40
Head length to genal tip	1.93-2.10	2.05 ± 0.054	2.07
Genal tips outside width	1.16-1.28	1.23 ± 0.041	1.24
Frontal protuberances outside width	0.95-1.03	1.00 ± 0.028	1.01
Head width, maximum	1.34-1.54	1.44 ± 0.055	1.47
Head height, excluding postmentum	1.11-1.31	1.23 ± 0.059	1.26
Pronotum, maximum width	1.23-1.47	1.35 ± 0.072	1.47
Pronotum, maximum length	0.64-0.69	0.66 ± 0.022	0.67
Left mandible length; tip to ventral condyle	1.11-1.21	1.16 ± 0.031	1.16
Total length	4.85-6.63	5.92 ± 0.55	5.94
Hind tibia length without spurs	0.83-0.93	0.89 ± 0.032	0.92
Eye spot, maximum diameter	0.15-0.21	0.18 ± 0.018	0.20

are somewhat smaller (head width 1.06-1.15 and 1.08-1.14 mm, respectively) than *G. amplus*. The imago of *G. liberatus* is nearly as darkly pigmented as *G. amplus*, however, the pronotum of the former is much narrower, the ocelli smaller, and the wing membrane tubercles smaller and denser than in *G. amplus*. The imago of *G. pubescens* is reddish-brown, its compound eyes smaller, and wing membrane tubercles smaller than those of *G. amplus*.

The soldier of *G. amplus* is larger or much larger in all measurements than soldiers of congeners from the Lesser Antilles. Unlike *G. amplus*, the median frontal cleft, frontal protuberances, rugosity, and mandibular humps are absent in the soldier of *G. liberatus* (Fig. 2A). The head capsule of *G. liberatus* is narrower and proportionally longer and the pronotum narrower than in *G. amplus*. The frons plane of *G. liberatus* slopes at a smaller angle to the vertex plane than that of *G. amplus*. The anterior margins of the frontal protuberances of *G. pubescens* soldiers are truncate (Fig. 2B); while in *G. amplus* they are hemispherical. The median frontal cleft of *G. pubescens* is deeper and hardly widens toward the frons while in *G. amplus* the cleft is more shallow and widens broadly toward the frons. The frons plane of *G. pubescens* slopes at a greater angle to the vertex plane than that of *G. amplus*.

Type Material.

Holotype soldier and 3 paratype soldiers (1 for SEM): St. Lucia, Edmond Forest Reserve, 13.838°N 60.996°W, 28.v.1998 (collection reference no. STL195). Morphotype imago, 2 paratype soldiers and 4 paratype imagos [USNM]: St. Lucia, Barre De L'Isle ridge, 13.920°N 60.959°W, 30.v.1998 (STL417). One paratype soldier: same data as STL417, second colony from same location (STL422). Five paratype imagos and two paratype soldiers [FSCA]: St. Lucia, Quillesse Forest

Reserve, 13.843°N 60.974°W, 27.v.1998 (STL110). Three paratype soldiers: St. Lucia, Font Hill, 18.047°N 77.947°W, 30.v.1997 (JA641). Additional *G. amplus* material examined: second colony, same data as STL110; one soldier, pseudergates; (STL111). All above material taken collectively by J. A. Chase (JC), J. Krecek (JK), B. Maharajh (BM), J.R. Mangold (JM), and R. H. Scheffrahn (RS).

Etymology.

This species is named "amplus" after the Latin word for large, referring to the large size of imagos and soldiers compared with other West Indian *Glyptotermes* species.

Specimens from other West Indian *Glyptotermes* Examined.

Dominica: *Glyptotermes* sp.: Cabrit Peninsula-Ft. Shirley, 15.58°N 61.48°W, 28.v.1994, JC, JK, JM, and RS coll., imagos, soldiers, (DM030); Crompton Point, 15.58°N 61.37°W, 29.v.1994, otherwise same data (DM062); Springfield Station trail to Mount Joy, 15.35°N 61.38°W, 30.v.1994, otherwise same data (DM142); **Grenada:** *Glyptotermes parvoculatus*: Concord Falls, 12.12°N 61.73°W, 18.xiii.1997, JC and BM coll., dealates, soldiers (GR054). **Jamaica:** *Glyptotermes liberatus*: Lowe River, 18.250°N 77.505°W, 25.v.1997, JC, JK, BM, JM, Yves Roisin, and Paul Ban, coll., imagos, soldiers (JA145). **Martinique:** *Glyptotermes* nr. *tuberifer*: Conservation Area, Precheur Grand Riviere, 14.84°N 61.22°W, 1.vi.1994, JC, JK, JM, and RS coll., imagos, soldiers (MA051). **Puerto Rico:** *Glyptotermes liberatus*: El Yunque Park, Sierra Palm Trail, 18.30°N 65.78°W, 31.v.1993, JC, JM, Julian de la Rosa (JR), and RS coll., imagos, soldiers (PR143); Highway 143 between hws. 139 & 140, 18.18°N 66.48°W, 2.vi.1993, same data (PR224, 225); *Glyptotermes pubescens*: Hwy 787 5 km E. Cidra, 18.17°N

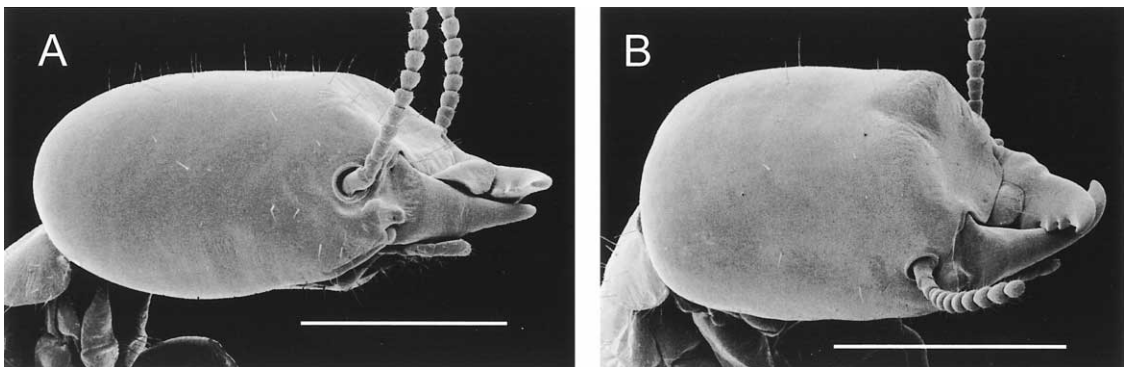


Fig. 2. Frontolateral view (A) of *G. liberatus* soldier head capsule from Highway 143 between Highways 139 and 140, Puerto Rico (PR224). Oblique view (B) of *Glyptotermes pubescens* soldier head capsule from Monte de Estado camp, Puerto Rico (PR246).

66.13°W, 31.v.1993, JC, JM, JR, and RS coll., imagos, soldiers (PR160); Monte de Estado camp on Hwy 366, 18.15°N 66.97°W, 2.vi.1993, same data (PR245, 246); Cambalache State Forest, 18.43°N 66.60°W, 4.vi.1993, same data (PR312). **St. Lucia:** *Glyptotermes* sp.: Barre De L'Isle, 13.924°N 60.959°W, 27.v.1998, JC, JK, BM, JM, and RS coll., 1 soldier (STL66); Quillesse Forest Reserve, 13.843°N 60.974°W, same data, imagos, dealates, soldiers (STL109); same data, dealates, soldiers (STL112). **St. Vincent:** *Glyptotermes tuberifer*: Fancy (end of the road), 13.380°N 61.171°W, 24.v.1998, JK, BM, and JM coll., imagos (STV50); *Glyptotermes* sp.: Vermont Falls Trail, 13.217°N 61.215°W, 25.v.1998, JK, BM, and JM coll., imagos, dealates (STV152).

BIOLOGY

Five colonies of *G. amplus* were collected from 3 of 20 sites (Fig. 3) surveyed for termites in St. Lucia in 1998. Colonies of *G. amplus* were encountered in moist dead limbs of various woody hosts in the type localities, all of which were rain-forest habitats (400 meters in elevation. Three

colonies contained winged imagos, suggesting that dispersal flights commence in late spring and early summer. Like other *Glyptotermes*, the foraging galleries of *G. amplus* are often more darkly stained than the surrounding wood suggesting a microbial origin for the stain.

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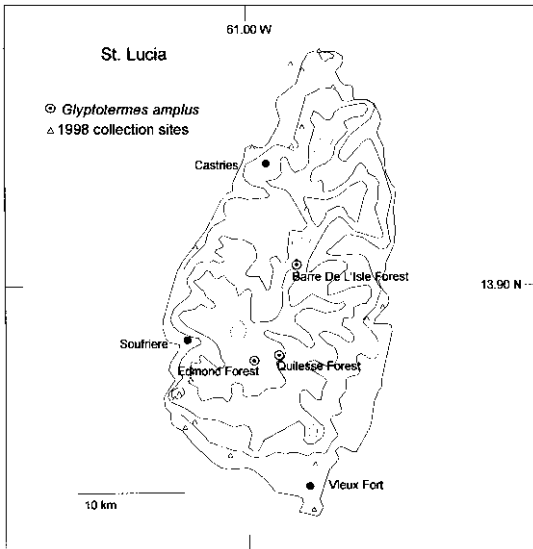


Fig. 3. Localities of *Glyptotermes amplus* and 1998 termite collection sites on St. Lucia, West Indies. Topographic lines are spaced at approximately 200 meter increments.