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New *Dolichorhinotermes* from Ecuador and in Mexican Amber (Isoptera: Rhinotermitidae)

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ABSTRACT

Two new species of the Neotropical termite genus *Dolichorhinotermes* Snyder and Emerson (Rhinotermitidae: Rhinotermitinae) are described and figured. *Dolichorhinotermes lanciarius* Engel and Krishna, new species, from southeastern Ecuador, is the largest species of the genus and is distinctive in both the major and minor soldier caste. *Dolichorhinotermes apopnus* Engel and Krishna, new species, preserved in earliest Miocene amber from Chiapas, Mexico, is similar to *D. dominicanus* Schlemmermeyer and Canello in Early Miocene (Burdigalian) amber from the Dominican Republic but differs in several significant respects. Distinctions between *Rhinotermes* and *Dolichorhinotermes* are briefly discussed.

RESUMEN

Se describen e ilustran dos especies nuevas pertenecientes al género *Dolichorhinotermes* Snyder y Emerson (Rhinotermitidae: Rhinotermitinae). *Dolichorhinotermes lanciarius* Engel y Krishna, especie nueva, proveniente del sureste de Ecuador, es la especie de mayor tamaño del género y se distingue tanto en los soldados mayores como en los menores. *Dolichorhinotermes apopnus* Engel y Krishna, especie nueva, preservada en ámbar de la base del Mioceno basal de Chiapas, México, es más semejante a *D. dominicanus* Schlemmermeyer y Canello encontrada en ámbar del Mioceno basal (Burdigaliano) de la República Dominicana. Se presentan algunos comentarios sobre las diferencias para distinguir entre *Rhinotermes* y *Dolichorhinotermes*.

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INTRODUCTION

Termites of the genus *Dolichorhinotermes* Snyder and Emerson are distinctive members of the Neotropical rhinotermitid fauna. Six modern species have hitherto been described from various localities throughout tropical America, ranging from Bolivia, Peru, and Brazil northward to Surinam, Guyana, French Guiana, Trinidad, and Panama, and Martinique and Haiti in the West Indies (e.g., Emerson, 1925; Snyder, 1924, 1926, 1949; Constantino, 1991, 1998; Ensaf and Betsch, 2002; Ensaf et al., 2004). In addition, a single fossil has been described in Early Miocene amber from the Dominican Republic (Schlemmermeyer and Canello, 2000). The genus has had a checkered past in that some authors have felt the distinctions between *Dolichorhinotermes*, *Rhinotermes* Hagen, and *Acorhinotermes* Emerson were subtle and intergraded (e.g., Mathews, 1977). However, Quennedey and Deligne (1975) identified significant morphological characters of the soldier head capsule, particularly features of the labrum, that justify the recognition of separate, albeit closely related, genera.

Herein we provide the description of a remarkable new species of *Dolichorhinotermes* from southeastern Ecuador, representing the first record of the genus from that country. In addition we newly record the genus *Dolichorhinotermes* for the southern Mexican paleofauna. The only other known fossil of the genus is *Dolichorhinotermes dominicanus* Schlemmermeyer and Canello in Early Miocene (Burdigalian) amber from the Dominican Republic. The Mexican fossil is remarkably similar to *D. dominicanus* but is specifically distinct. Previously, the termite fauna of Mexican amber included six species representing four families: *Mastotermes electromexicus* Krishna and Emerson (Mastotermitidae), *Calcaritermes vetus* Emerson and *Incisitermes krishnai* Emerson (Kalotermitidae), *Coptotermes sucineus* Emerson and *Heterotermes primaevus* Snyder (Rhinotermitidae), and *Nasutitermes electrinus* Krishna (Termitidae).

SYSTEMATICS

Genus *Dolichorhinotermes* Snyder and Emerson

Dolichorhinotermes Snyder and Emerson *In* Snyder, 1949: 374. Type species: *Rhinotermes longilabius* Emerson, 1925, by original designation.

DIAGNOSIS: Imago with third flagellar article shorter than first flagellar article. Major soldier with labrum distinctly elongate, apex of labrum frequently extending to mandibular apex (in *Rhinotermes* the labrum is subquadrate and much shorter). Minor soldier with opening of frontal gland at front of head but not on conspicuous prolongation of head capsule; mandibles vestigial, with rounded margins; sides of head in dorsal aspect straight or convex.

Dolichorhinotermes lanciaris, new species
figures 1–2

Dolichorhinotermes hageni Mathur and Thapa, 1962: 29. Maiti, 2006: 12. *Nomen nudum*.

DIAGNOSIS: The new species is distinctly larger than all previously described species in all comparable metrics, particularly the soldier, which is the largest of all known species. Noteworthy features include the dentition of the major soldier mandibles (fig. 1) and the shape of the major and minor soldier labra (figs. 1–2). Refer also to section on comparisons (see below).

DESCRIPTION: **Imago.** Unknown.

Major soldier. Head, thorax, and abdomen yellow; legs and antennae pale yellow; mandible yellow except apical half reddish brown and teeth dark reddish brown. Head with sparsely-scattered, relatively short, erect to suberect, pale yellow setae. Labrum with a few erect, pale yellow setae at apex, dorsal surface largely devoid of setae except for a few sparsely scattered, short, erect, pale yellow setae. Pronotum with scattered, short, erect to suberect, pale yellow setae; remaining thoracic sclerites sparsely setose. Legs with scattered pale yellow setae, setae minute and intermixed with a few short to moderate-length setae. Abdomen sparsely setose. Head broader posteriorly, with lateral margins gently rounded and converging anteriorly, posterior border gently rounded. Mandibles large; left mandible with two stout teeth, first just apical of midpoint, second just basal of midpoint, first tooth distinctly longer than second tooth, first tooth slightly curved along posterior surface, second tooth straight; right mandible with two teeth near midpoint, first tooth shorter than

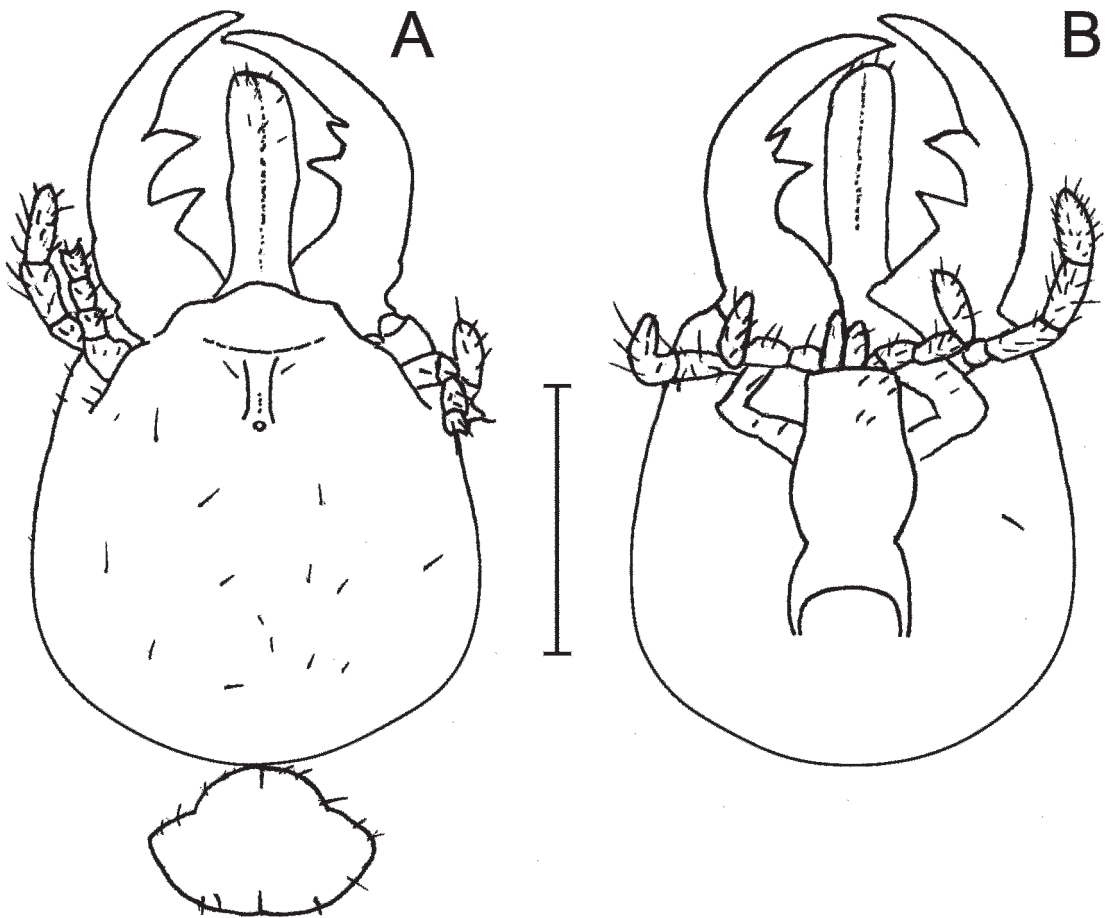


Fig. 1. *Dolichorhinotermes lanciarius* Engel and Krishna, new species, major soldier. A. Dorsal aspect of head and pronotum. B. Ventral aspect of head. Scale bar = 1.0 mm.

second tooth and both shorter than those of left mandible, second tooth extending straight out from inner mandibular surface, first tooth running closer along mandibular surface (fig. 1). Labrum elongate, slightly wider at apex, apex rounded, without emargination, with slight dorsal, longitudinal depression extending posteriorly from apical margin about one-half of labral length. Palpi and postmentum as depicted in figure 1. Antenna with at least 14 articles (total number uncertain), third flagellar article distinctly shorter than first flagellar article, pedicel and second through fourth flagellar articles roughly equal in length. Pronotum saddle-shaped, anterior margin broadly rounded medially; lateral margins converging posteriorly; poste-

rior margin relatively straight. Legs relatively slender and long. Measurements provided in table 1 for holotype and paratype.

Minor soldier. Head, thorax, and abdomen pale yellow, sparsely setose, setae erect to suberect and pale yellow. Head with lateral borders weakly and gently convex, sides converging anteriorly, and slightly converging from midpoint posteriorly to a gently rounded posterior border. Labrum with several erect, pale yellow setae at apex, otherwise dorsal surface with scattered, short, pale yellow setae, setae slightly more numerous in apical half than basal half. Antenna with 16 articles, third flagellar article distinctly shorter than the first. Mandibles vestigial, representing by broad, fleshy lobes bearing a minute

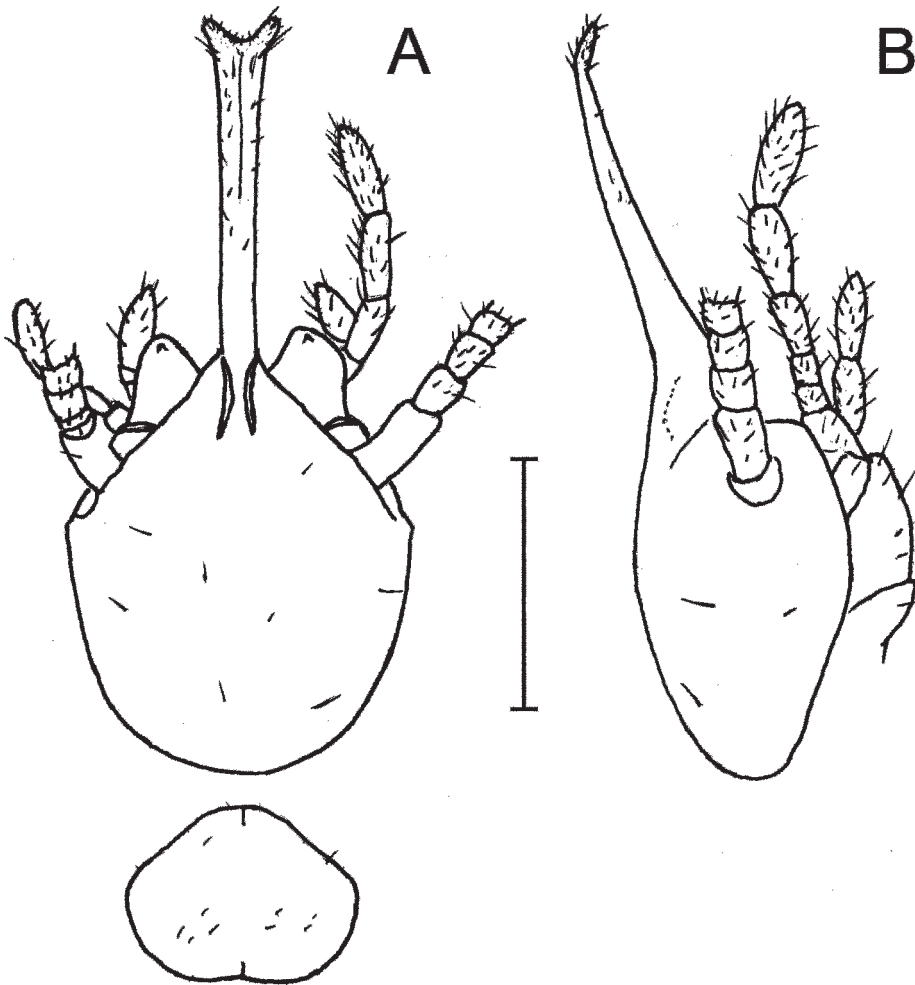


Fig. 2. *Dolichorhinotermes lancarius* Engel and Krishna, new species, minor soldier. A. Dorsal aspect of head and pronotum. B. Lateral aspect of head. Scale bar = 0.5 mm.

sclerotized point (fig. 2). Labrum narrow, elongate, forked at apex, lateral processes of fork relatively widely separated. Range of measurements for paratypes provided in table 1.

HOLOTYPE: Major soldier, Ecuador, Gualaquiza, 6.xi.1934 [6 November 1934], coll. W. v. Hagen [Gualaquiza, at 3°24'S 78°33'W, is a village in Morona-Santiago Province on the eastern slopes of the Andes about 97 km northeast of Loja]. The holotype is preserved in the Division of Invertebrate Zoology, American Museum of Natural History.

PARATYPE: One major soldier, several minor soldiers, several workers, same data as holotype. Deposited in the Division of Invertebrate Zoology, American Museum of Natural History.

ETYMOLOGY: The specific epithet is taken from the Latin for "lancer" in reference to the lance-like labrum of soldiers in the genus.

COMPARISONS: *Dolichorhinotermes lancarius* can be readily separated from all other species in the genus by its larger body proportions (refer to table 1). The species is generally quite similar to *D. japuraensis* Constantino from Brazil but, aside from size,

TABLE 1
Measurements of soldiers of *Dolichorhinotermes lanciarius*, new species
 (all measurements in millimeters)

Metric	Major soldier Holotype	Major soldier Paratype	Minor soldier Paratypes
Number of specimens	1	1	3
Length of head to side base of mandibles	1.58	1.58	0.69–0.71
Length of head with mandibles	2.60	2.55	n.a.
Length of head to apex of labrum	2.50	2.55	1.55–1.58
Maximum width of head	1.68	1.68	0.69
Maximum height of head (without postmentum)	0.95	0.97	0.49–0.51
Length of left mandible	1.27	1.32	vestigial
Length of right mandible	1.22	1.27	vestigial
Length of labrum along midline	0.77	0.79	0.79–0.81
Width of labrum at apex	0.23	0.26	0.13–0.15
Width of labrum at base	0.20	0.23	0.08
Maximum width of postmentum	0.43	0.46	0.30
Minimum width of postmentum	0.33	0.38	0.26
Length of postmentum	0.77	0.77	0.36
No. of antennal articles	–	14 ^a	15 ^a –16
Median length of pronotum	0.43	0.48	0.36
Maximum width of pronotum	0.82	0.84	0.51
Length of metatibia	1.35	1.37	0.94–0.96

^aThe antenna is broken after the 14th article in the major soldier paratype and after the 15th in one of the minor soldier paratypes and so the total number is unknown for these individuals.

differs by the rounded labral apex in major soldiers (very weakly medioapically concave in *D. japuraensis*), sparse setation (setae of head more numerous and elongate in *D. japuraensis*), more distinctly convex anterior margin of the pronotum (very weakly convex in *D. japuraensis*); right mandible with two, well-developed teeth (one, stout tooth medially and one, minute tooth at basal third in *D. japuraensis*); and by the more pronounced apical, labral forking in the minor soldier (weakly concave at the apex of the labrum in *D. japuraensis*).

***Dolichorhinotermes apopnus*, new species**
 figures 3–4

DIAGNOSIS: The Mexican amber species is remarkably similar to *D. dominicanus* except that *D. apopnus* lacks the integumental wrinkles lateral to the postclypeal groove (imbriicate in the Mexican fossil), the general body proportions are distinctly smaller (head width, with compound eyes, in *D. dominicanus* 1.60 mm, while it is 1.30 mm in the new fossil;

the compound eye is 0.32 mm in *D. dominicanus*, only 0.26 mm in *D. apopnus*; length of metatibia 1.6 mm in *D. dominicanus*, 1.25 mm in *D. apopnus*), and the integument of the head is darker.

DESCRIPTION: Imago. Length of head to apex of clypeus 1.02 mm; width of head, with compound eyes 1.30 mm; maximum diameter of compound eye, with ocular sclerite 0.26 mm; separation of compound eye from lower margin 0.03 mm; length of ocellus 0.13 mm; width of ocellus 0.06 mm; ocellular distance 0.03 mm; median length of pronotum 0.87 mm; width of pronotum 1.02 mm; length of metatibia 1.25 mm; length of forewing scale 0.77 mm; length of hind wing scale 0.49 mm. Head large, broadly rounded, distinctly wider than long, with upwardly lifted frontoclypeal region whereby postclypeus forms wide, projecting proboscis (figs. 3–4). Postclypeus projected forward to form broad proboscis, width of extension greater than compound eye diameter; with wide, dorsal, mediolongitudinal groove. Fontanelle small, located at base of uplifted proboscis and at base of dorsal groove,

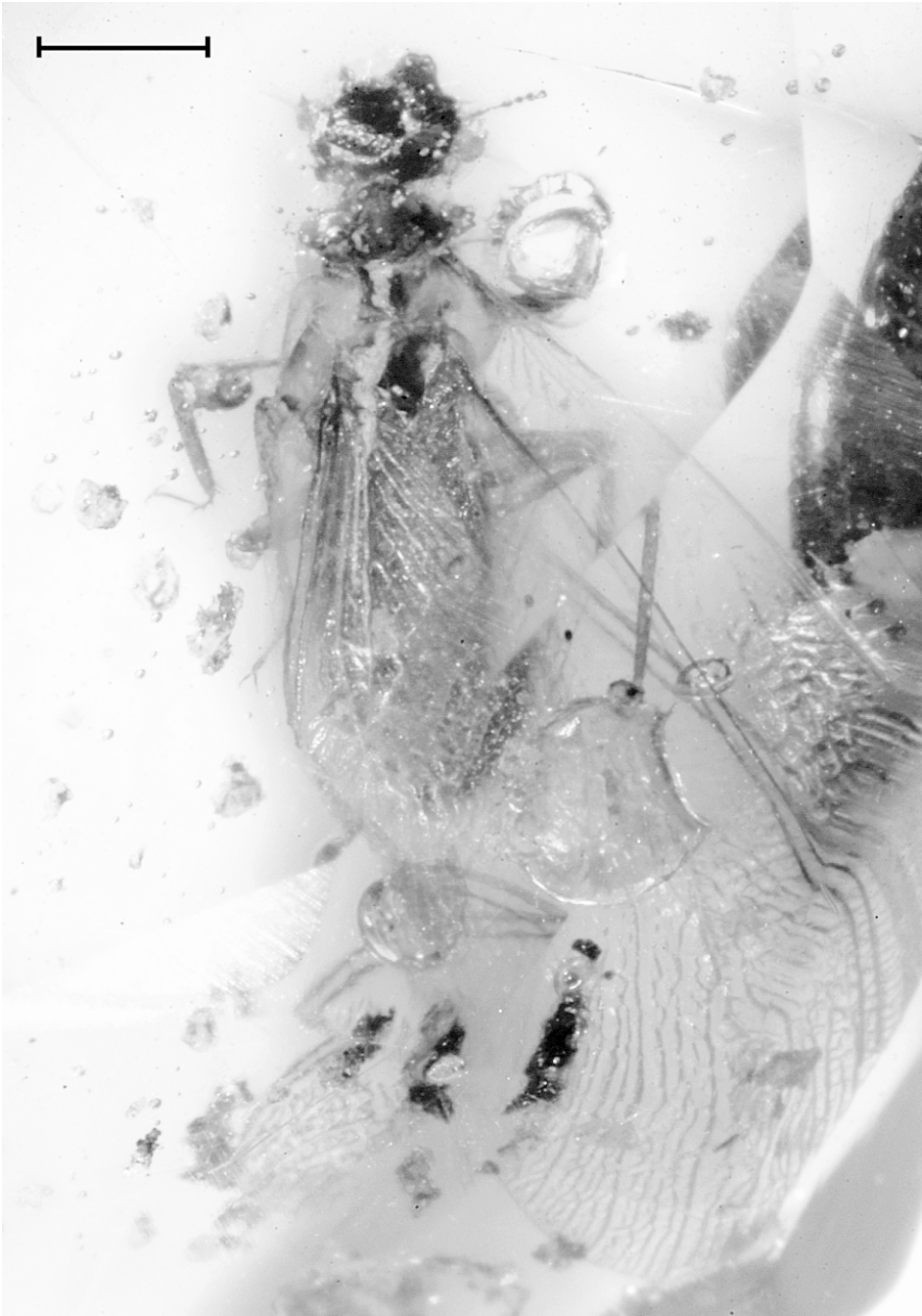


Fig. 3. Photomicrograph of holotype imago of *Dolichorhinotermes apopnus* Engel and Krishna, new species (AMNH Ch-50). Scale bar = 1.0 mm.

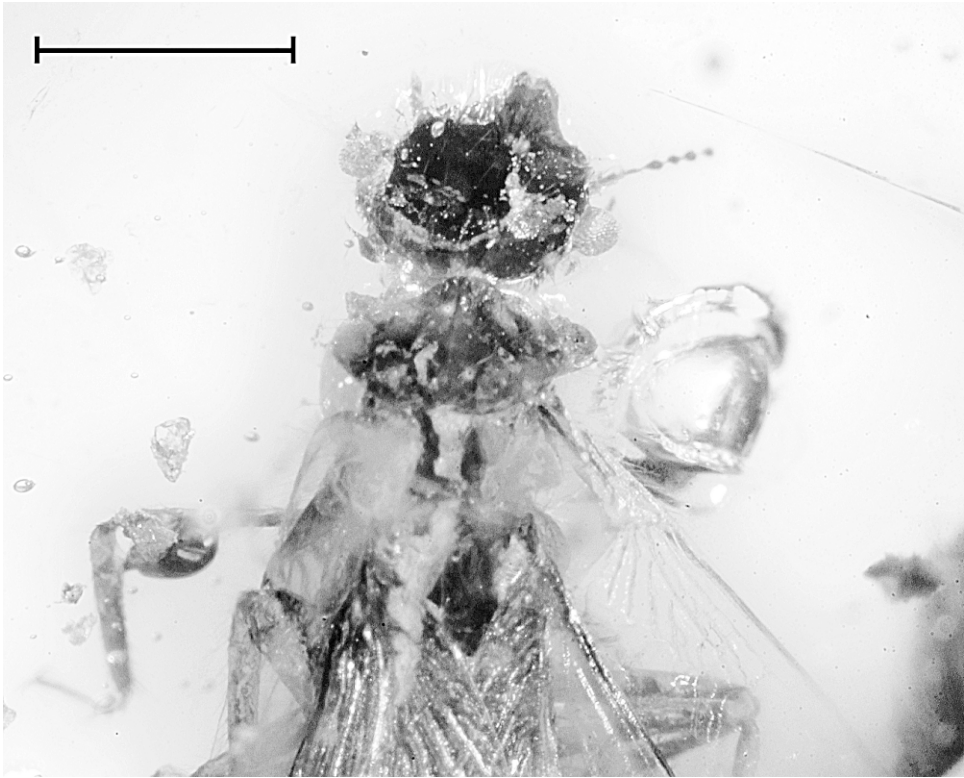


Fig. 4. Photomicrographic detail of head, pronotum, and basal portions of wings of holotype imago of *Dolichorhinotermes apopnus* Engel and Krishna, new species (AMNH Ch-50). Scale bar = 1.0 mm.

positioned at level of ocelli. Compound eyes large, bulging, exophthalmic (figs. 3–4). Ocelli raised, large, elongate (longer than wide), not touching compound eyes. Antennae incomplete, left antenna broken at pedicel, right antenna broken at fourth flagellar article; third flagellar article slightly shorter than first flagellar article; flagellar articles with several erect setae. Integument of head smooth except slightly imbricate (but not wrinkled) lateral to postclypeal groove. Head and antennae dark brown, nearly black. Head with scattered, erect setae, such setae not located anterior to level of ocelli, a few setae distinctly clustered near posterior border of compound eye. Pronotum wider than long, anterior margin slightly convex medially, integument brown, with sparse erect to suberect setae, some setae directed posteriorly. Remainder of thorax and abdomen brown. Legs brown, with scattered shorter setae; pretarsal ungues simple; arolium absent. Wing membrane hyaline, strongly

reticulate; veins very faintly brown except C and Sc brown; forewing scale longer than hind wing scale, forewing scale apex overlapping basal half of hind wing scale when in repose; scale with several, erect to suberect setae, suberect setae directed toward wing apex.

HOLOTYPE: Imago, AMNH Ch-50, amber, Mexico, Chiapas, Simojovel. The holotype is deposited in the Amber Fossil Collection, Division of Invertebrate Zoology, American Museum of Natural History.

ETYMOLOGY: The specific epithet is the Greek word *apopnus*, meaning “deceased”.

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