A new termite species (Isoptera: Termitidae: Termitinae: Amitermes) and first record of a Subterranean Termite from the Coastal Desert of South America

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At about one hundred species (Scheffrahn & Su 1987), Amitermes, is the second largest genus after Microcerotermes in the subfamily Termitinae. This cosmopolitan genus is found in a wide variety of habitats from rainforests e.g., Amitermes excellens (Silvestri) from Guyana (Emerson 1925) and Amitermes dentatus (Haviland) from Sumatra (Gathorne-Hardy et al. 2001) to deserts, e.g. Amitermes emersoni Light from Coachella, California (Light 1930) and Amitermes desertorum Desneux from Egypt (Sands 1992). Only eight species of Amitermes are known from the Neotropics and only five occur across mainland South America. Soldiers of Amitermes are characterized by a bulbous head capsule and sickle-shaped mandibles, each with a single tooth of various shapes on their inner margins. Soldiers of all species have a large cephalic gland opening to a circular fontanelle on the frons. When confronted by an agonist, the soldier emits a terpenoid secretion which oozes onto setae around and below the fontanelle (Scheffrahn et al. 1983). Herein, is described a new Amitermes from Peru and the first record of a subterranean termite along the Pacific coastal desert of South America.

Specimens of a single foraging group of Amitermes lunae sp. nov. were collected at the type locality (Fig. 1) from dry bamboo that was in soil contact for several days. Laboratory images of preserved specimens in 85% ethanol (Figs 2) were made using an Olympus SZX9 stereomicroscope fitted by a LM Scope camera tube to an Olympus E-410 digital camera. The worker enteric valve was exposed by dissecting out the P2, removing muscle, slitting the valve tube longitudinally, and mounting it in PVA slide medium (Bioquip Products). The enteric valve photographs (Fig. 3) were taken with an Olympus BH-2 compound microscope with phase-contrast optics using the camera attachment above.

Description. Amitermes lunae Scheffrahn sp. nov.

Imago unknown. Soldier (Fig. 2). Monomorphic. Head capsule pale yellow on vertex above cephalic gland grading to light ferruginous orange away from gland. Mandibles ferruginous at base becoming darker beyond labrum. Body and legs pale yellow. Head capsule quadrate with rounded corners in dorsal and ventral views, thick and bulbous in lateral view. Mandibles curved ~100˚ with greatest curvature beyond marginal tooth. Mandibles narrowing gradually from marginal teeth to apex. Marginal teeth sub triangular; teeth projecting from edge of blade, not notched from behind. Antennae with 15 articles, 2>3<4=5. Measurements in mm, holotype and paratype, respectively: maximum head width 1.09, 1.07; maximum head length (posterior to left mandible condyle) 1.33, 1.33; maximum head height (postmentum to vertex) 0.86, 0.84; left mandible maximum length (lateral condyle to point) 0.80, 0.79; pronotum maximum width 0.72, 0.69; pronotum maximum length 0.35, 0.35; hind tibia length 0.99, 0.94.

Worker (Fig. 3). Head capsule pale or very pale yellow. Antennae with 15 articles, 2>3<4<5. Enteric valve with six flattened elongate pads lining entire length of P2. Pads covered with minute spines; spines more dense near anterior of pads and becoming larger near the posterior. P2 relatively long and narrow, enteric valve not everted into paunch. Maximum head width (n = 10), mean±SD (range): 1.04mm±0.020 (1.01–1.09).

Of the nine species of Amitermes known from the Neotropics (Fig. 2), the A. lunae soldier is closest to those of A. foreli Wasmann and A. amifer Silvestri as all three have a median, subtriangular marginal tooth. A. lunae is smaller than the latter two and unlike A. foreli, does not build an epigeal mound. A. amifer is also a larger pasture species that nests in logs and mounds of other termites in the Matto Grosso of southern Brazil, Paraguay, and Argentina (Araujo 1970). Amitermes workers cannot be identified externally, however a critical comparison of enteric valve morphology has not been conducted on this group and may be useful for worker identification. Sands (1992) did not illustrate this character in...
his African *Amitermes* revision. Photographs of the enteric valve (Fig. 3) are the first for *Amitermes* and are meant to stimulate such studies.

**FIGURE 1.** Type locality of *A. lunae*. Red arrow indicates location where this species was collected from bamboo lying on the soil (photo by C. Chauchat).

The holotype and paratype soldiers and 17 type series workers (UF vial code PE-171) are deposited, respectively, in the University of Florida Termite Collection (Ft. Lauderdale Research and Education Center, Fort Lauderdale, Florida) and the Florida Collection of Arthropods (Florida Department of Agriculture and Consumer Services, Division of Plant Industry, Gainesville, Florida). The remaining 34 type series workers are equally divided between the Muséum National d’Histoire Naturelle, Paris, and the private collection of JBH. *Amitermes lunae* is named for its type and only known locality, the Huaca de la Luna archeological site.

A single foraging group of *A. lunae* consisting of two soldiers and 51 workers was collected by JBH on 5 June 2009 at Huaca de la Luna archeological site near Trujillo, Peru (-8.135, -78.991, 57 m elevation, 5.5 km from the coast). We expect that this species will be found in similar localities ranging from extreme southwestern Ecuador, the Sechura and Peruvian deserts, and possibly south into the Atacama desert of Chile.

With the exception of Cuba, *Amitermes* is a mainland species with *A. beaumonti* Banks being common in humic localities from the Yucatan to Panama. In South America, *A. foreli* Wasmann is a dominant mound building species in pastures and grasslands of northern Colombia and western Venezuela. *Amitermes amicki* Scheffrahn, described from the arid island of Aruba, is sympatric with or replaces *A. foreli* in the deserts around Barranquilla and the Guajira peninsula in Colombia to the Paraguana peninsula and Barquisimeto in northern Venezuela. The three remaining described species in South America, are *A. excellens*, *A. aporema* Constantino, and *A. amifer* Silvestri. The first two are Amazonian species and *A. amifer* occurs in the Gran Chaco of Argentina, Paraguay and the Matto Grosso of Brazil.

*Amitermes lunae* was collected in order to identify the termite responsible for osteophagy of the skeletal remains of a Moche woman at Huaca de la Luna (Huchet et al. in press). In a more recent 2009 grave excavation where bone
consumption was evident (left femur diaphysis), the remains of sub-fossil *Amitermes* head capsules were discovered close to the skeleton. Additionally, a nearly complete sub-fossil of an *Amitermes* worker was found inside a small bone fragment. The latter was identified as *Amitermes* based on generic level dentition patterns of both worker mandibles (Huchet, unpublished). At the same site, JBH also collected *Cryptotermes brevis* (Walker) infesting structural bamboo. This extends the endemic range of *C. brevis* north from the Lima vicinity (Scheffrahn et al. 2009).

The Peruvian and Atacama deserts (-5 to -30°) is one of the few regions on earth where little or no rainfall occurs. Plant life, however, is supported by riparian habitats from Andean runoff and isolated *lomas* communities which receive their moisture in the form of fog-deposited dew (Rundel et al. 2007). The Huaca de la Luna site is adjacent to the Moche River where groundwater supports native vegetation and agricultural irrigation has extended plant growth well beyond the river banks. As noted before, some *Amitermes* species are suited for desert habitats, however, no subterranean termites have been reported from localities with as little precipitation as at the Huaca de la Luna site.

![Image](image_url)

**FIGURE 2.** Left: Ventral, dorsal, and lateral habitus of holotype soldier of *A. lunae*. Bar = 1 mm. Right: Neotropical *Amitermes* soldier headcapsules: A. *A. cryptodon* Light, Rabinal, Guatemala; B. *A. amicki*, Taratara, Venezuela; C. *A. beaumonti*, La Ceiba, Guatemala ; D. *A. excellens*, El Callo, Venezuela, E. *A. foreli*, Barquisimeto, Venezuela, F. *A. lunae* sp. nov., holotype; G. *A. amifer* Coxipo, Brazil (redrawn from Light 1932) ; H. *A. aporema*, Aporema, Brazil (redrawn from Constantino 1992) ; I. *A. ensifer* Light, Jala, Mexico (redrawn from Light 1930). Scale bar = 1mm.

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FIGURE 3. Enteric valve cuticular lining of A. lunae worker. Left: five pads shown, one pad bisected along slit line. Bar = 0.2mm. Right: close up of bottom pads. Bar = 0.05.

References


