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NOTE

CARCASS CONSUMPTION BY *NASUTITERMES CALLIMORPHUS* (BLATTODEA: ISOPTERA) IN HIGHLAND FORESTS FROM BRAZIL

Igor Eloi, Mário Herculano de Oliveira & Maria Avany Bezerra-Gusmão

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Carcass consumption by *Nasutitermes callimorphus* (Blattodea: Isoptera) in highland forests from Brazil

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Despite the small number of species, termites (Blattodea: Isoptera) are among world's most representative organisms regarding biomass (Bignell & Eggleton 2000). These insects are mainly known from wood-feeding, which is universal among the lower termites (exoradically other items might be used as food, but no specialization in feeding habit is known), however, the higher termites (Termitidae) were able to diversify their diet and occupy many previously available niches (Bucek et al. 2019). Besides plant material, higher termites are mainly reported as feeding on fungi, lichens, humus, other termite's faeces, nest materials, dead siblings (intra-colonial cannibalism) and, rarely, on mammal carcasses (Lima & Costa-Leonardo 2007). Wood (1978) lists parts of vertebrate carrion as "special or incidental" items in the diet of these insects. Freymann et al. (2007) have observed that termites from the genus *Odontotermes* may frequently forage on carrion (hooves), but that item might represent a way to supplement on macro and micro-nutrient, rather than a main source of energy.

The termite genus with the higher number of species, *Nasutitermes* Dudley, 1890 (around 248 extant taxa), comprise wood feeding insects and is present through most of the world's tropical territory, with some species being regarded as notorious pests in the

Neotropics (Constantino 2002). Despite the amount of living species only *N. corniger* (Queiroz et al. 2017), *N. nigriceps* (Thorne & Kimsey 1983) were previously reported as feeding on mammal carcasses (excluding reports of damage on archaeological sites, which we don't consider here). Here we report a third species of *Nasutitermes* feeding on mammal carrion.

The observation was made during a field trip on 11 August 2016 in the highland humid forest state reserve Mata do Pau Ferro (6.962°S & 35754°W) (Image 1). With 607ha of protected woodland, the park is located 9km away from the municipality of Areia, Paraíba, Brazil. The altitude ranges from 400m to 600m and observed precipitation during the sample month is registered to be 26.8mm (annual rainfall=1208.3mm) (AESA 2019).

A common house dog *Canis familiaris* skull was found partially covered by carton sheets typically made by *Nasutitermes* spp. (Image 2). Inside the skull, multiple workers and soldiers were found and collected (preserved in 80% alcohol), as well as the bones. The termites were identified as *Nasutitermes callimorphus* Mathews, 1977 (Image 3), a common species inside Brazilian evergreen forests. This species does not build a separated termitarium, rather lives within dead wood covered in carton sheets or in underground galleries. They can be commonly found in carton galleries built

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Image 1. Northeastern Brazil. Paraíba State is highlighted in dark gray. Sample location (white dot) is approximately 100km away from the state capital, João Pessoa (white triangle).



Image 2. Dog skull attacked by termites of the species *Nasutitermes callimorphus*. Note the carton sheet covering the whole palate area.



Image 3. Soldier of *Nasutitermes callimorphus*, the species found in the bones.

over the soil surface or in foraging parties constituted by many large workers and soldiers. The food content from the gut of workers collected from the carrion had a ferruginous red colouration, hinting that termites might be feeding on muscle leftovers.

Most termites species reported as carrion feedings are also reported as damage-causing in other reports (Prestes et al. 2014). These commonalities tempt one to suppose that saprophyly in termites can be related to the feeding plasticity (a trait ever so frequent in pest species). However, *N. callimorphus* belongs with

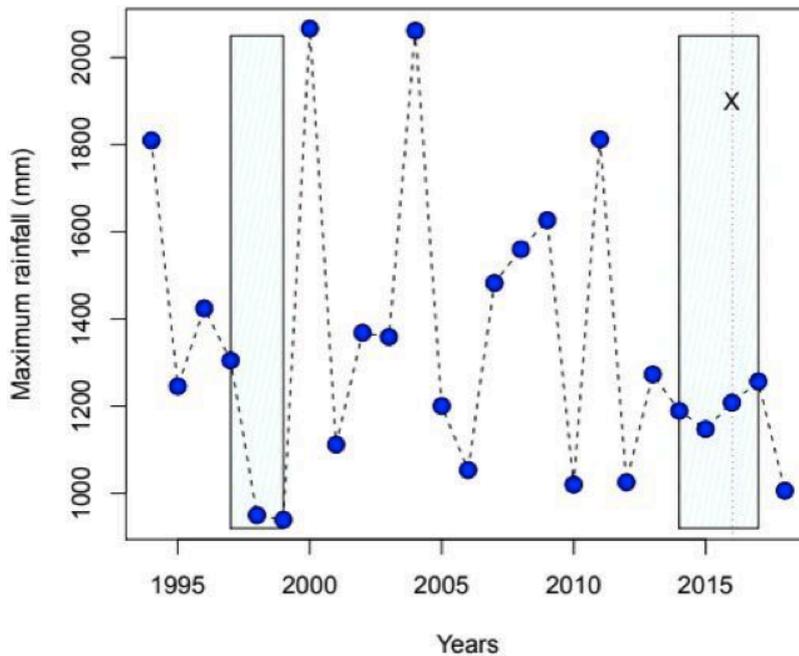


Figure 1. Time series of maximum rainfall registered for Areia municipality from 1994 to 2018. The boxes highlight the years which el niño prolonged the dry season. "X" marks the sample date. Data available online on AESA (2019).

Rhynchothermes nasutissimus (Silvestri, 1901) (Prestes et al. 2014) in a group of termites that do not represent a threat to anthropic activities such as agriculture or habitational buildings.

The majority of carrion feeding reports were made during dry seasons, suggesting that termites may explore carcasses as a supplementary source of nutrients (Thorne & Kimsey 1983). Our sample took place during a time period in which el niño had prolonged dry season into a particularly tough drought (Figure 1). This (plus previous reports) supports the hypothesis of drought being a force driving necrophagous behaviour in termites, allowing one to hypothesize that climate change may play a key role in niche exploration by termites and therefore in the rise of new adaptations.

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