MESOMORPH collection of scanned Termitinae termite nests and their network representations

Termitinae nests consist of large diameter chambers connected by low diameter tunnels. This particular architecture permits to represent them as a network (a chamber is a node and a tunnel is an edge). The present archive provides these network representations of the Termitinae nests analysed and modeled in Eom *et al.* (2015). If you use these networks please cite Eom *et al.* (2015) or, for the *Cubitermes* nests, Perna *et al.* (2008a,b,c, 2011).
See also our virtual nest museum (`http://www.mesomorph.org`) for further illustrations of these nests and the network approach to characterize them.

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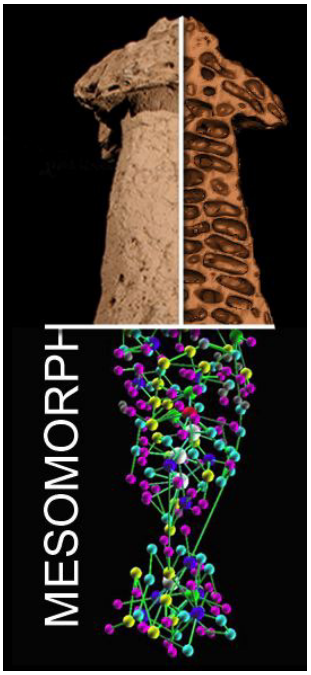

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Chapter 1

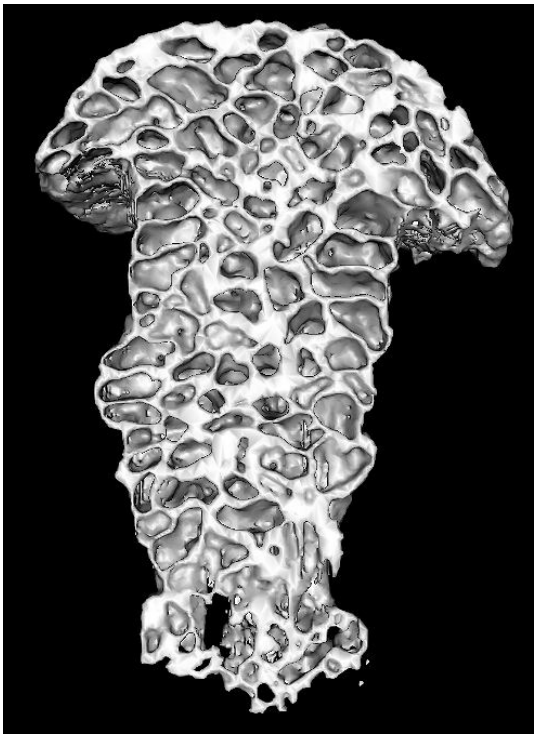
Termitinae nests

> "The structure of the nest does not provide us with any more information on the behavior involved in construction than the anatomy of an individual provides a knowledge of its embryology" (Noirot, 1970, p. 109)

1.1 *Cubitermes* nests (Termitinae)

The genus was described by Wasmann (1906) and recently reviewed by Ruelle (1992).
See Noirot and Noirot-Timothée (1962); Emerson (1956); Noirot *et al.* (1986); Soki *et al.* (1996); Soki and Josens (1996) for further information on nest growth (review in Josens and Soki 2010). Noirot (1970, p.94) describes that damaged nests are never repaired, which suggests a stigmergic construction process. Grassé (1984, p. 211ff) summarizes the construction work and related behaviour for this termite. Han and Lepage (1991) studies the relation between nest dimensions and population size in *Cubitermes fungifaber* (see also the review in Josens and Soki 2010). Haverty (1977) reports that only about 0.6 to 2.9 % are soldiers (depends on species).
Dejean *et al.* have investigated the ecological role of Cubitermes termitaries as a shelter for other insect communities, as well as the interactions between Cubitermes and ponerine ants of the genus *Centromyrmex*, e.g. Dejean and Ruelle (1995); Dejean *et al.* (1996); Dejean and Feneron (1996, 1999).
Guy Josens (ULB, personal communication) thinks that the hat is like some umbrella to protect against the rain (walls should be dry for gaz exchange). The CO_2 measurements in *Amitermes* mounds as a function of wall dampness support this hypothesis (CO_2 in mound increases with mound wall dampness, Schmidt *et al.* 2014). The queen lives in the base of the nest and is larger than the workers, but she can still circulate in part of the nest. In Bodot (1969) one can find some information about caste distribution as a function of mound age.

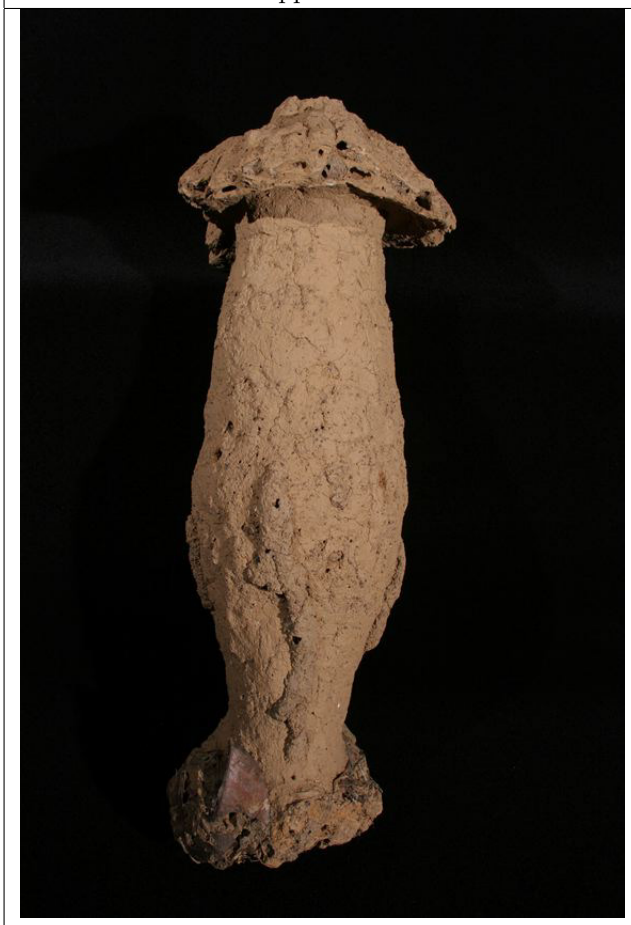
Name : *Cubitermes* spp. || **Id**: MeMo0009



Source: Philippe Annoyer (Association Insectes du Monde)

Origin and biological information: Central African Republic, collected on 3/3/2005 some km before the village of Banza (coming from Nola in direction to Bangui).

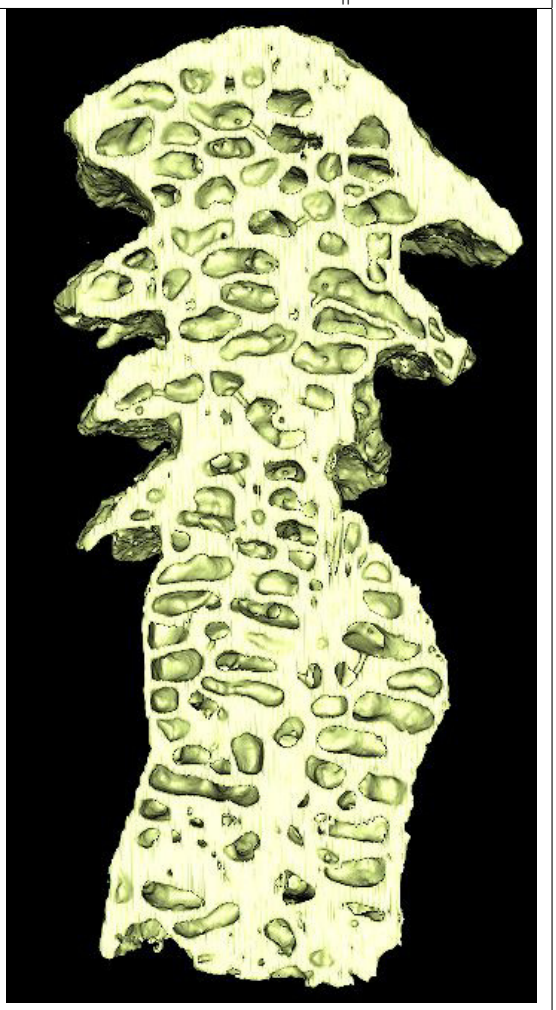
Name : *Cubitermes* spp. || **Id**: MeMo0010



Source: Philippe Annoyer (Association Insectes du Monde)

Origin and biological information: Central African Republic, coordinates 02°53'259 N and 16°10'264 E, 411 m, collected 15-20/02/2005.

Name : *Cubitermes* spp. || **Id**: MeMo0011



Source: MNHN Paris (André Nel, coll. Grassé)

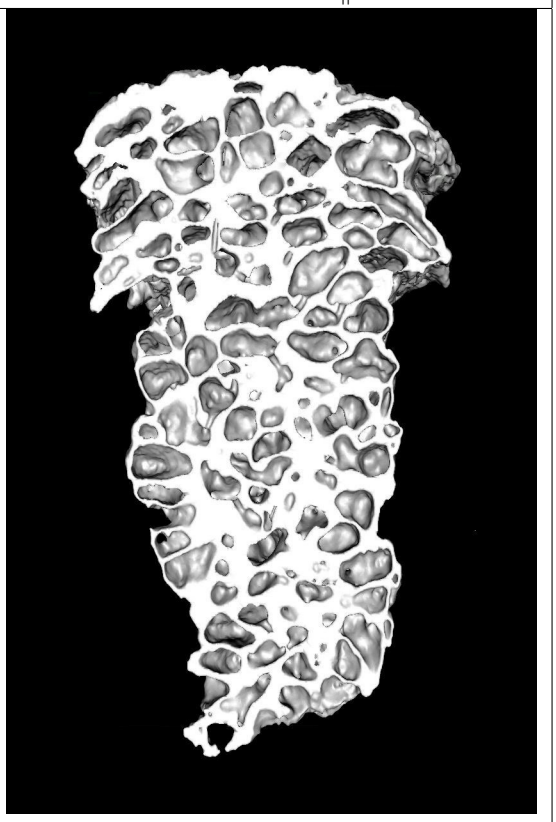
Origin and biological information: Black Africa.

Name : *Cubitermes fungifaber* || **Id**: MeMo0012

Source: Jean-Pierre Suzzoni, professor at Université Paul Sabatier

Origin and biological information: Cameroun, approximately 20 km from its capital Yaoundé, in an equatorial tropical forest.

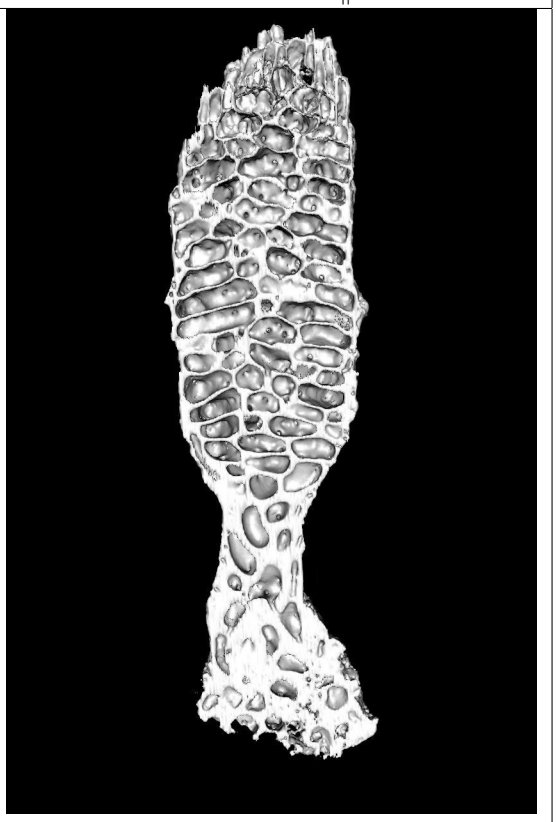
Name: *Cubitermes* spp. || **Id**: MeMo0018



Source: from Philippe Annoyer, MHNT

Origin and biological information: see MeMo0009 above, museum collection number MHNT-ZOO-2005-0-216

Name: *Cubitermes* spp. || **Id**: MeMo0019

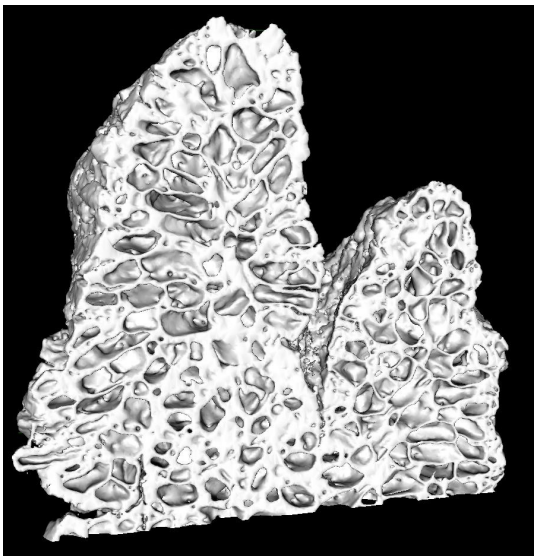


Source: MNHN Paris

Origin and biological information: Cameroun, collection Gaétan Molez

1.2 *Procubitermes* nests (Termitinae)

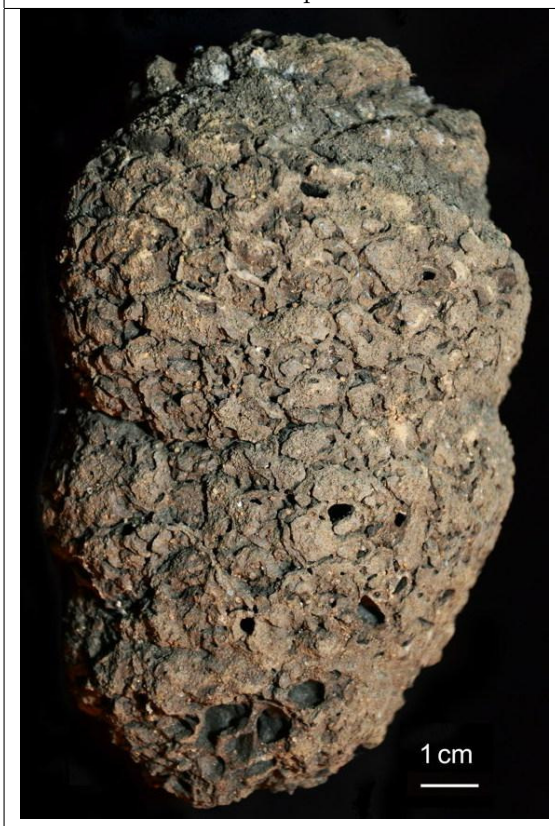
Name: *Procubitermes sjoestedti* || **Id**: MeMo0067

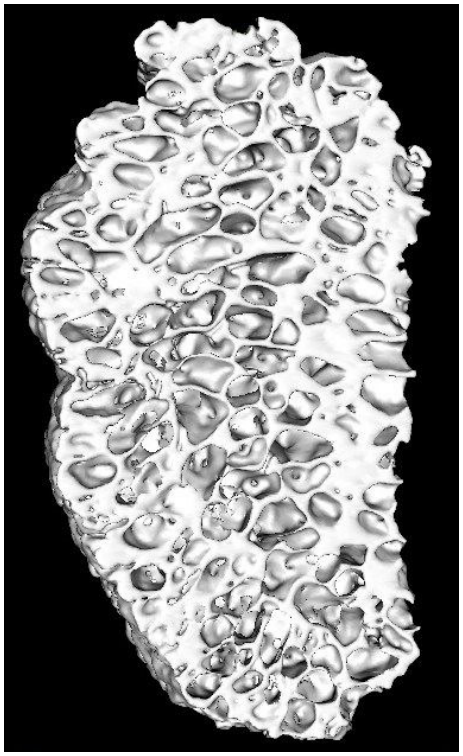


Source: Eric Darrouzet

Origin and biological information: Nest obtained from Eric Darrouzet that was used as a specimen in his exposition "Insectes bâtisseurs". Originally it comes from Côte d'Ivoire (collected by Alexandre Akpesse).

Name: *Procubitermes* sp || **Id**: MeMo0078

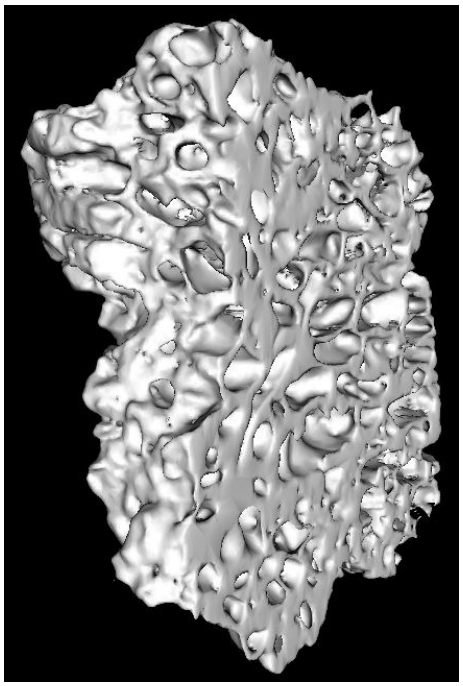




Source: Eric Darrouzet

Origin and biological information: Nest obtained from Eric Darrouzet

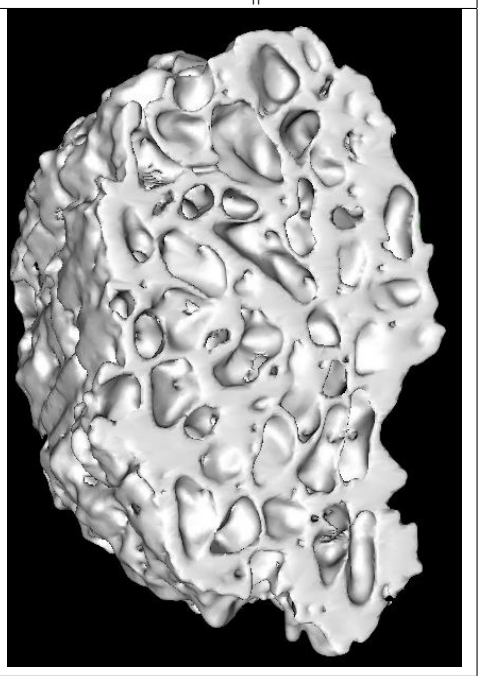
Name: *Procubitermes* sp || **Id**: MeMo0079a



Source: Eric Darrouzet

Origin and biological information: Nest obtained from Eric Darrouzet

Name: *Procubitermes* sp || **Id**: MeMo0079b



Source: Eric Darrouzet

Origin and biological information: Nest obtained from Eric Darrouzet

1.3 *Noditermes* nests (Termitinae)

Iniesto *et al.* (2001) already made a tomographic analysis of the nests of *Noditermes aburiensis*, and he found an organisation in layers with very low connectivity in particular in the peripheral parts.

Name: *Noditermes curvatus* || **Id**: MeMo0081

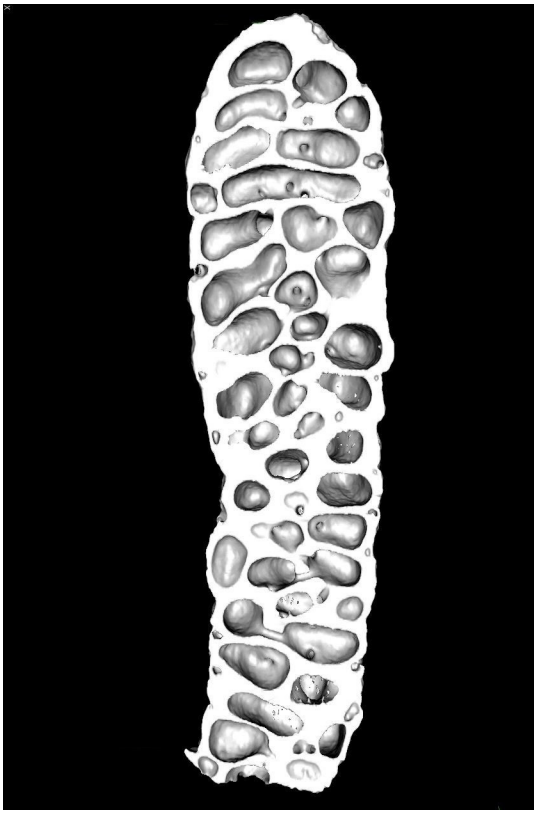
Source: IRD (Corinne Rouland-Lefèvre, Alain Robert)

Origin and biological information: Nest brought back from Congo, Brazzaville (pointe noire zone), by Corinne Rouland-Lefevre and Alain Robert in january 2009. Species determined by André Nel.

1.4 *Thoracotermes* nests (Termitinae)

Architecture was analyzed with CT scans by Deligne *et al.* (1995); Iniesto *et al.* (2001). For their impact on soil see Garnier-Sillam *et al.* (1991).

Name: *Thoracotermes* || **Id**: MeMo0029



Source: MNHN Paris

Origin and biological information: *Thoracotermes* nests are summarized in Grassé (1984, p. 225). The present nest seems to be a very young one, it is missing some of the features mentioned in Grassé (1984) (segmentation into different floors by circular constrictions, regular "bubble"-like surface structure). The description in (Noirot, 1970, p. 84) corresponds well to the present nest ("cylindrical turrets").

Name: *Thoracotermes macrothorax* || **Id**: MeMo0082

Source: IRD (Corinne Rouland-Lefèvre, Alain Robert)

General comments: Nest brought back from Congo, Brazzaville (pointe noire zone), by Corinne Rouland-Lefevre and Alain Robert in january 2009. Species determined by Alain Robert.

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