

## The identity, distribution and bioecology of *Odontotermes distans* Holmgren et Holmgren (Isoptera : Termitidae : Macrotermitinae)

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**Abstract.** The paper discusses the taxonomic status of *Odontotermes distans* Holmgren et Holmgren. The detailed structure of the nest is described and data on distribution and swarming behaviour of the species have been incorporated.

**Keywords.** *Odontotermes distans* Holmgren et Holmgren ; bioecology ; taxonomy.

### 1. Introduction

Holmgren and Holmgren (1917) described two species namely, *Odontotermes distans* (imago caste only) and *Odontotermes parvidens* (soldiers and workers). Both these species have been recognised as separate species by several workers (Snyder 1949 ; Rattan Lal and Menon 1953 ; Roonwal and Pant 1953 ; Ahmad 1955, 1958 ; Chatterjee and Thakur 1967 ; Roonwal 1970, 1979 ; Roonwal and Chhotani 1962 ; Roonwal and Verma 1977). Snyder (1933) described another species *Odontotermes almorensis* (imago caste only) from Almora (Kumaon Hills, Uttar Pradesh). The unknown imago caste of *Odontotermes parvidens* was described by Mathur and Sen-Sarma (1958) based on a collection of imagoes with associated soldiers and workers from Dehra Dun.

Subsequent detailed examination and comparison of imagoes of *Odontotermes parvidens* (described by Mathur and Sen-Sarma 1958) with cotype imagoes of *Odontotermes distans* reveals that imagoes of both these species are identical in all respects and cannot be separated in any way. The two species, therefore, are considered as conspecific. On the basis of page precedence, the later species, *Odontotermes parvidens* becomes a junior synonym of *Odontotermes distans*. Holmgren (1912) named a collection of termites made by T. B. Fletcher at Chaumahani (now in Bangla Desh) as *Odontotermes microdens*, but the name remained as *nomen nudum*. Silvestri (1914) ascribed the authorship of the name to Holmgren, but according to Snyder (1949) and Roonwal and Chhotani (1962), Silvestri is the correct author of the name *Odontotermes microdens*. Further mention of both the names, representing two separate species by Rattan Lal and Menon (1953) is obviously an error.

## 2. Synonymy

The full synonymy and literature citations involving the various species are given below :

1. *Odontotermes distans* Holmgren et Holmgren (1917)  
*Odontotermes (Cyclotermes) distans* K. Holmgren and N. Holmgren 1917: 153, Imago.  
*Odontotermes (Odontotermes) distans* : Snyder 1949: 225; Roonwal and Pant 1953: 55; Mathur and Thapa 1962: 63; Roonwal and Verma 1977: 446.
2. *Odontotermes almorensis* Snyder (1933) Syn. nov.  
*Termes (Cyclotermes) almorensis* Snyder 1933: 8-9.  
*Odontotermes (Odontotermes) almorensis* : Snyder 1949: 219; Roonwal and Pant 1953: 54; Ahmad 1955: 227-228; Mathur and Thapa 1962: 62.
3. *Odontotermes parvidens* Holmgren et Holmgren (1917) Syn. nov.  
*Odontotermes (Cyclotermes) parvidens* Holmgren and Holmgren 1917: 154. Soldiers and workers.  
*Odontotermes (Odontotermes) parvidens* : Snyder 1949: 236; Ahmad 1955: 227-228.  
*Odontotermes parvidens* : Mathur and Sen-Sarma 1958: 6-9; Mathur and Thapa 1962: 68; Roonwal and Chhotani 1962: 356-359; Chatterjee and Thakur 1967: 45-48; Roonwal 1970: 365-367.  
*Termes (Termes) parvidens* : Rattan Lal and Menon 1953: 83-84.
4. *Odontotermes microdens* Silvestri (1914) nomen nudum.  
*Odontotermes microdens* Silvestri 1914: 428; Snyder 1949: 236; Roonwal and Chhotani 1962: 356.  
*Termes (Termes) microdens* : Rattan Lal and Menon 1953: 81.

## 3. Distribution

This species is very widely distributed throughout India, Pakistan, Bangla Desh, Bhutan, and Burma (figure 1). Sen-Sarma *et al* (1975) recorded this species from Chaubatia (2250 m above sea-level) in Kumaon Hills, Uttar Pradesh, which appears to be the first record of a fungus growing termite at such a high altitude. Recently Roonwal and Chhotani (1977) recorded this species from the hilly region of Bhutan.

Summary of distributional records is as follows:

*Bangla Desh* : Chaumahani, Sylhet.

*Bhutan* : Phuntsholing; Samchi and Thimpu River bank.

*Burma* : South Shan State.

*India* : *Assam* : Dibrugarh; Gauhati; Goalpara; Jeypore; Kamakhya; Sibsagar. *Himachal Pradesh* : Dharmsala; Jaloh forest, near Yol camp (Dharm-sala); Hemirpur; Kulu valley; Mandi and its environs; Palampur. *Jammu and Kashmir* : Ramban and its environs; Gagra and Tandeh forest (Udhampur); Ramnagar chowki (Jammu). *Karnataka* : Shevroy hills; Kadiar rocks; Hospet;

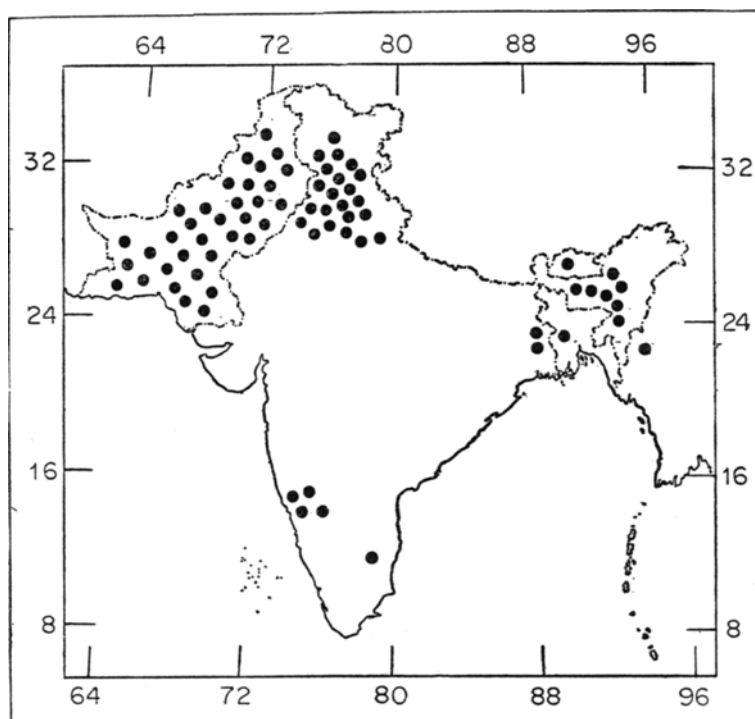


Figure 1. Geographical distribution of *Odontotermes distans* Holmgren et Holmgren.

on road from Mysore to Mercara. *Punjab* : Amritsar and its environs; Batala; Quadian; Gurdaspur and its environs; Pathankot. *Uttar Pradesh* : Almora; Askot; Doon valley; Gorakhpur; Bageshwar; Bhowali; Dharmoti; Peora; Pilibhit; Ranikhet; Ramnagar; Shajhanpur. *West Bengal* : Chilapata and Jainti forest, Buxa and Cooch Behar Forest Division; Kalimpong and Samsing. *Pakistan* : Widely distributed throughout Pakistan.

#### 4. Bioecology

*Odontotermes distans*, as it is now recognised, is one of the most common and major wood-destroying termites of India and has been recorded feeding on the bark, woody surface, wood debris, such as fallen branches, twigs, bark fragments, dry leaves and cowdung, etc. It also destroys occasionally the sapwood of standing trees, fallen logs and timber of *Cassia javanica*, *Duabanga sonneratiodes*, *Engelhardtia spicata*, *Litsaea polyantha*, *Malanorrhoea glabra*, *Pinus roxburghii*, *Schima wallichii*, *Shorea robusta*, *Sterculia villosa* *Syzygium cumini* and *Tectona grandis*. It has also been recorded as a serious pest of *Cajanus cajan* in Assam and is reported to have accelerated the process of death of Teak trees in Gorakhpur in Uttar Pradesh (Roonwal 1954). In Bangla Desh, it has been observed feedings on stumps, logs and debris of *Magnifera indica* and also on cowdung. In Pakistan, it has been recorded in the submountainous areas at a height of about 1500 metres

above sea level, feeding on the dry grasses, plant debris and logs of *Anisoptera glabra*. Recently Thakur (1978b) recorded this species on some clones of poplars in the Tarai region of Uttar Pradesh.

The feeding pattern is characteristic. The workers construct mud plaster covering on the host and feed under it. The feeding pattern however, varies according to the texture of the host wood. The construction of the mud plaster coverings is usually carried out during the summer months and after rains. For this, the workers bring small balls of wet mud and stick them with saliva, forming a broad covering of about 2.5 cm height from the surface. Internally, the covering is supported by small irregular partition walls, with intercommunicating chambers on either sides. The outer surface is uneven and rough, but internally, it is somewhat smooth.

Many species of termites, such as *Angulitermes dehraensis*, *Coptotermes heimi*, *Doonitermes capillosus*, *Euhamitermes lighti*, *Microtermes obesi*, *Microtermes unicolor*, *Nasutitermes fletcheri* and *Odontotermes obesus* have been found living with this species.

### 5. The nest (figure 2)

*Odontotermes distans* is primarily a subterranean species, though occasionally it also constructs somewhat dome-shaped mounds, having no buttresses or chimney-like projections (Chatterjee and Thakur 1966; Thakur 1978b). The mounds are usually found under cool, shady places. The height varies from 75 cm to 1.40 m and circumference from 5 to 8 m. The internal structure of the mound is reported to be similar to that of *Odontotermes obesus* (Chatterjee and Thakur 1966).

Recently a subterranean nest, which was located in the open ground, was dug and traced out in the New Forest Estate, Dehra Dun. There was no external manifestation of the existence of the nest underground. Its existence could be known from a big swarm, which took place in the last week of February. Alates were issuing forth from as many as ten holes on the ground over an area of about three square metres. One of the holes was marked for subsequent digging. A clear narrow tunnel was found running into a horizontal passage for a distance of about 15–20 cm below the ground level. From there a tunnel suddenly went deep into the soil. After digging for about 60–70 cm further, a full view of the nest could be observed. The underground nest occupied an area of about 2–3 m and constituted a labyrinth of irregular verticle chambers, separated by thick walls. The fungus gardens are lodged in dome-shaped chambers, arranged in tiers. All the chambers are interconnected by narrow passages, issuing out from each fungus comb chamber. One of the fungus comb was found lodged as deep as 1.25 m from the ground level. The royal chamber is about 7–10 cm long, 5–6 cm wide and 2–2.5 cm high and is situated eccentrically near the larger central chamber.

### 6. Swarming

Swarming time and behaviour studies of this species have been under observation at Dehra Dun since 1969. Swarming in this species primarily takes place

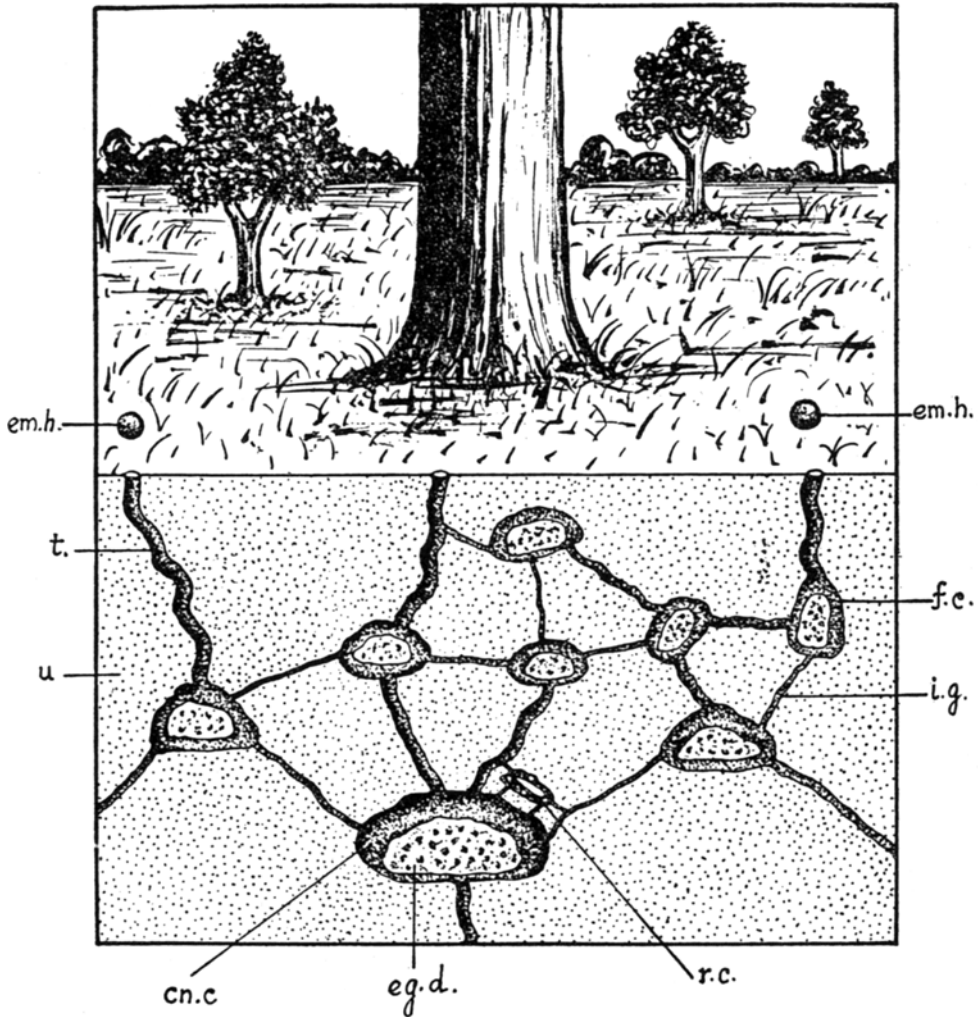


Figure 2. Diagrammatic vertical section through the nest of *Odontotermes distans* Holmgren et Holmgren (New Forest Estate, Dehra Dun, Uttar Pradesh, India) *cn.c.*, central fungus comb chamber; *eg.d.*, egg depository (Central fungus comb.); *em.h.*, emergence hole; *f.c.*, fungus comb; *i.g.*, intercommunicating galleries; *r.c.*, royal chamber; *t.*, tunnel; *u.*, underground portion of the nest.

from the last week of February to early March. Alates have also been collected in April, July and September from small slit like holes on the ground after heavy rain showers. The swarming is crepuscular, taking place at sunset. Alates often retreat into the nest with the approach of darkness. Alates have also been collected at light between 7.30 and 8.30 p.m. Most probably, these individuals are the left out lot, which finding no suitable place for nesting and having retained their wings, are attracted to light.

The alates come out in a stream, sometimes 4-5 at a time from small elliptical slit-like holes of about 2 to 2.5 cm diameter. A large number of soldiers and

workers also come out and guard these holes, often scouting the area to ensure safety of alates against the predators. The wings remain in folded condition at the time of emergence. The unfolding follows just before taking to flight, which is done after fluttering about for a short distance of about 6–10 cm and then fly away to seek their mates. The alates often cover a distance of about 100 m or so, attaining an average height of about 20–35 m before descending on the ground. The females often alight on grass blades, weeds, bushes, stems of shrubs and trees, fence posts, etc. The 'mating call' by the female is characterised by violent fluttering of wings somewhat in a circular fashion. This is accompanied by the to and fro movement of abdomen, and continues until a male is attracted. The male alights behinds his 'would be bride' and touches the anal end of her abdomen, when she stops all movements of wings and abdomen. The pair then forms a tandem and descends from the substratum in search of suitable site for colony foundation.

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