INSTITUT DES PARCS NATIONAUX DU CONGO ET DU RWANDA

Exploration du Parc National de la Garamba

MISSION H. DE SAEGER

en collaboration avec

P. BAERT, G. DEMOULIN, I. DENISOFF, J. MARTIN, M. MICHA, A. NOIRFALISE, P. SCHOEMAKER, G. TROUPIN et J. VERSCHUREN (1949-1952).

FASCICULE 42

ISOPTERA

BY

W. VICTOR HARRIS (London)

BRUXELLES

1963

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Two hundred and seventeen series of Isoptera were obtained by Mr. H. DE SAEGER and his colleagues in the course of their expedition to the Garamba National Park, 1949-1952. The number of individuals in each series ranged from one to several hundred, made up variously of representatives of the reproductive, soldier and worker castes together with immature stages.

The Garamba National Park is an area of some 1850 square miles (480.000 hectares) situated in the extreme north-east of the Congo, between 3°5′ and 4°4′ north and 29° and 30° east, adjacent to the Bahr el Ghazal province of the Sudan and on the Nile-Congo watershed. The altitude varies between 700 and 850 metres above sea level. The vegetation is of the type known as Guinean savanna, a mixture of woodland and grassland conforming to type 16 of KEAY (1959) and extending from Senegal to Uganda. Gallery forest occurs along the river banks, providing a habitat similar to that of the forest-savanna mosaic to the south - KEAY's type 8. While the termite fauna is predominantly that of the Guinean savanna, there are elements hitherto known from the Bas-Congo where the forest-savanna mosaic re-appears south of the tropical rain forest. Eight local vegetation communities are recognised and recorded when termites have been recovered from soil samples.

A high proportion of the termite series were extracted from soil samples. These were obtained either as soil cores for pedological examination or from termite mounds. Large *Macrotermes* mounds are a feature of the woodlands and savannas, and the mushroom-shaped mounds of *Cubitermes* in the open grassland. Other series were collected in a variety of ways, by means of Berlese funnel from rotten wood, and from runways on tree trunks, from arboreal nests and imagos in flight.

Thirty-four species of termites are listed, of which four are here described as being new to science. In addition the imago of one species is re-described in detail, together with the hitherto undescribed imago of a related East African species of the same genus for comparison. Owing to the present confusion existing in the systematics of the African species of the genus *Anoplotermes* it has not been possible to deal adequately with this important group of soil inhabiting termites.

The data given with each species is taken from DE SAEGER (1956). Locality, unless stated otherwise, is indicated by reference to one of two « cellules biologiques », I situated in the north of the Park and II further south below the Garamba River. Additional figures refer to collecting stations indicated on the maps in DE SAEGER (1954). The collectors, indicated by their initials, were MM. H. DE SAEGER, G. DEMOULIN and J. VERSCHUREN.

In DE SAEGER's introduction to this series of reports on the Garamba National Park (1954) there are thirteen plates of termite mounds which should be examined in connection with the present paper.

Following the systematic list of Garamba termites there is an account of termites as a component of the soil macro-fauna, and of the species found inhabiting mounds of other termites. The vernacular names of termites as used by the Zande people are given in an appendix.

I have to thank Mr. W. A. SANDS for his assistance with the sub-family *Nasutitermitinae*.

Family **KALOTERMITIDAE.**

1. *Glyptotermes ueleensis* COATON.

Family **RHINOTERMITIDAE.**

Subfamily COPTOTERMITINAE.

2. *Coptotermes sjöstedti* HOLMGREN.

Subfamily RHINOTERMITINAE.

3. *Schedorhinotermes lamanianus angulatus* (EMERSON).

Family **TERMITIDAE.**

Subfamily AMITERMITINAE.

4. *Amitermes evuncifer* SILVESTRI.
5. *Microcerotermes fuscotibialis* (SJÖSTEDT).
6. *Microcerotermes parvulus* (SJÖSTEDT).
7. *Anoplotermes* spp.

Subfamily TERMITINAE.

8. *Thoracotermes macrothorax* (SJÖSTEDT).
9. *Cubitermes antennalis* SJÖSTEDT.
10. *Cubitermes sankurensis* WASMANN.
11. *Basidentitermes aurivillii* (SJÖSTEDT).
12. *Basidentitermes demoulini* n. sp.
13. *Pericapritermes desaegeri* n. sp.
14. *Termes hospes* (SJÖSTEDT).
15. *Promirotermes pygmaeus* n. sp.
16. *Mucrotermes heterochilus* (SILVESTRI).

Subfamily MACROTERMITINAE.

17. *Pseudacanthotermes militaris* (HAGEN).
18. *Pseudacanthotermes spiniger* (SJÖSTEDT).
19. *Synacanthotermes heterodon* (SJÖSTEDT).
20. *Protermes hirticeps* (SJÖSTEDT).
21. *Macrotermes bellicosus* (SMEATHMAN).
22. *Macrotermes natalensis* (HAVILAND).
23. *Odontotermes akengeensis* (EMERSON).
24. *Odontotermes culturarum* SJÖSTEDT.
25. *Odontotermes garambae* n. sp.
26. *Odontotermes scrutor* (SJÖSTEDT).
27. *Ancistrotermes crucifer* (SJÖSTEDT).
28. *Microtermes osborni* EMERSON.

Subfamily NASUTITERMITINAE.

29. *Coarctotermes tenebricus* (SILVESTRI)
30. *Nasutitermes arborum* (SMEATHMAN).
31. *Nasutitermes incurvus* (SJÖSTEDT).
32. *Trinervitermes auriterrae* SJÖSTEDT.
33. *Trinervitermes carbonarius* SJÖSTEDT.
34. *Trinervitermes oeconomus* (TRAGARDH).

Family KALOTERMITIDAE.

1. — **Glyptotermes ueleensis** COATON.

Glyptotermes ueleensis COATON, 1955, J. ent. Soc. S. Afr., **18** : 119-124.

701. « I/0/2, galerie humide, G.D., 14.VII.50 » one soldier and a number of nymphs collected in decayed, dead branches.

This dry-wood termite was described from Tora : Yebo in the Uele Forest. The soldier from Garamba is slightly smaller than the range given by COATON.

	mm.
Length of head and mandibles	2,27
Length of head	1,59
Width of head	1,04
Length of left mandible	0,77

Family RHINOTERMITIDAE.

Subfamily COPTOTERMITINAE.

2. — **Coptotermes sjöstedti** HOLMGREN.

(Figs. 1-4.)

Coptotermes sjöstedti HOLMGREN, 1911, K.Sv. Vet. Akad. Handl., **46** (6) : 73-74.

841/4. « Nalugwambala, galerie humide, G.D., 25.IX.50 » soldiers and workers from soil samples taken on sloping ground 20 m from the river, and associated with *Ancistrotermes* and *Macrotermes*.

2030. « II/gd/4, savane herbeuse, H.D.S., 3.VII.51 » winged imagos taken from a large swarm emerging from 20,45 to 21,15 hours, after rain on the previous day.

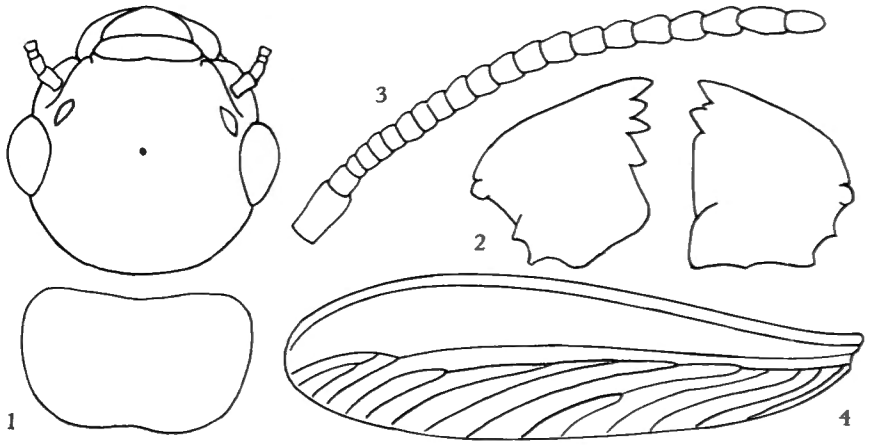
The only description of the adult *C. sjöstedti* is that given by VON ROSEN (1912) of dried specimens in the Zoological Museum, Munich and originating in Mozambique. The other record of this species in Eastern Africa is that of SJÖSTEDT (1900), a single soldier from western Tanganyika. This opportunity is taken to re-describe the adult *C. sjöstedti* from Garamba.

Imago-female. — Generally red-brown with head darker than the rest of the body, legs pale. All parts with a noticeable covering of short hairs.

Head with short rounded posterior, large protruding eyes, wide frontal margin; clypeus lightly chitinised, short and not inflated; labrum tongue-

shaped, longer than broad; ocelli large, roundly oval, close to the eyes; antennae with 21 segments, III short, II not as long as III and IV together, IV, V, and VI equal in length; fontanelle present as a small triangular pale spot; two crescent-shaped pale areas anterior to the ocelli.

Pronotum with anterior margin slightly concave, corners rounded and sides curving regularly to a slight median cleft in the posterior margin.



FIGS. 1-4. — *Coptotermes sjöstedti* HOLMGREN.
Imago : 1, Head and pronotum; 2, Mandibles; 3, Antenna; 4, Wing.

Wings brown with dense covering of small bristles; radius and radial sector veins strongly chitinised, the remainder only so at the base of the wing; medius with 3-4 small branches distally, cubitus branched throughout its length, both veins rising separately from the scale.

Males tend to be slightly smaller than the females.

	Males and females (5). mm.
Total length including wings	14,50
Width of head across the eyes	1,32- 1,36
Eye, maximum diameter	0,38- 0,42
Ocellus, long diameter	0,18- 0,20
Ocellus, short diameter	0,13
Distance of ocellus from eye	0,03- 0,04
Pronotum, width	1,09- 1,14
Pronotum, length	0,64- 0,73
Hind tibia, length	1,36
Forewing, length	12,00-13,00
Forewing, width	3,20

Differs from *amanii* in its larger size apart from the pronotum, in the presence of distinct pale crescent spots anterior to the ocelli, and in possessing larger ocelli closer to the eyes. The wings are distinctly longer than those of *amanii*, and there are differences in the shape of the pronotum (1).

Distribution. — *C. söjstedti* was described from Cameroun and has since been recorded many times from Senegal to Angola. *C. amanii* occurs in East Africa and *C. intermedius* SILV. in West Africa. The genus is of considerable economic interest in view of the damage it does to building timbers, especially hut poles.

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(1) *Coptotermes amanii* SJÖSTEDT.

Only the soldier caste of this termite has been described (SJÖSTEDT, 1911, Arkiv. Zool., **1** (20) : 17). This opportunity is taken to describe the imago from the type locality, Amani, Tanganyika.

Imago. — Red-brown in colour, the head at most slightly darker than the rest of the body. Pubescence general, but not conspicuous.

Head with short rounded posterior, large protruding eyes, wide frontal margin; clypeus short, moderately chitinised, inflated; labrum broad, tongue-shaped; ocelli oval, some distance from the eyes; pale areas anterior to ocelli ill-defined and inconspicuous; fontanelle not distinguishable from numerous small pale spots on head capsule; antennae with 21 (sometimes 22) segments, III, IV and V equal in length.

Pronotum with sinuate anterior margin, corners prominent, posterior roundly bi-lobed.

Wings pale brown, with dense covering of small, pale bristles; medius branching near mid point.

	Morphotype mm.	Range (9) mm.
Total length including wings	11,50	11,50
Width of head across the eyes	1,23	1,23 — 1,28
Eye, maximum diameter	0,33	0,33 — 0,36
Ocellus, long diameter	0,13	0,11 — 0,15
Ocellus, short diameter	0,09	0,09 — 0,10
Distance of ocellus from eye	0,06	0,05 — 0,06
Pronotum, width	1,04	1,00 — 1,09
Pronotum, length	0,68	0,68
Hind tibia, length	1,18	1,18 — 1,23
Forewing, length	8,50	8,50 — 9,50
Forewing, width	2,68	2,64 — 2,91

Described from a large number of winged adults from Tanganyika, Amani (P. B. KEMP, 1950, No. 66 and 339) also Morogoro (W. V. HARRIS, 1933, No. 95).

Morphotype, female in British Museum (Nat. Hist.).

Allotype, male in British Museum (Nat. Hist.).

Subfamily RHINOTERMITINAE.

3. — **Schedorhinotermes lamanianus angulatus** (EMERSON).

Rhinotermes (*Schedorhinotermes*) *lamanianus* (SJÖST.) var. *angulatus* EMERSON, 1928, Bull. Amer. Mus. Nat. Hist., **57** : 429-430.

246. « I/c/2, galerie forestière, H.D.S., 3.II.50 » minor soldiers and workers.

1429. « II/ed/16, extension de galerie forestière, H.D.S., 20.III.51 » minor soldiers and workers collected in rotten wood.

1914. « II/fd/18, galerie forestière dense, H.D.S., 15.VI.51 » major and minor soldiers from termite constructions surrounding the entrance to a nest of Apides in a hollow *Irvingia*, several larvae with appendages, resembling a Chilopod, moving in the column of termites. (These are the larvae of *Plastopolypus* sp., Lepidoptera, Tineidae.)

Distribution. — The Garamba specimens agree closely with Emerson's description of his variety from Congo : Niapu. Two other varieties have been described, viz. *australis* (FULLER) from Congo, Mozambique and South Africa; and *bequaertianus* (SJÖST.) from Katanga. *S. lamanianus* was originally described from Congo : Mukimbungu and has been recorded in Eastern Africa from Kenya south to Zululand, and in Angola.

Family TERMITIDAE.

Subfamily AMITERMITINAE.

4. — **Amitermes evuncifer** SILVESTRI.

Hamitermes evuncifer SILVESTRI, 1912, Ann. Mus. civ. Stor. Nat. Genova, **5** : 231.

413. « I/b/3, galerie forestière, H.D.S., 14.IV.50 » soldiers and workers from an arboreal nest.

620. « Kpaika, savane arborescente, G.D., 20.VI.50 » soldiers and workers collected in soil.

741/1. « Km 17, petite forêt sèche, G.D., 2.VIII.50 » soldier collected in soil sample, in association with *Ancistrotermes crucifer* and *Anoplotermes* sp.

906. « I/a/1, savane arborescente, H.D.S., 26.X.50 » soldiers and workers in moist soil at a depth of 5 cm; vernacular name « Bulumba » (termites).

2067. « II/gd/4, savane herbeuse, H.D.S., 6.VII.51 » soldiers and workers in the dead branches of a shrub, *Nauclea latifolia.*

3311. « II/PpK/73/d/9, lisière d'un ravin fortement boisé, H.D.S., 8.IV.52 » alates collected by sweeping vegetation.

3996. « II/jd/10, vallon dénudé, H.D.S., 1.IX.52 » soldiers and workers from a dark coloured carton nest at the base of an unoccupied *Macrotermes* mound.

The arboreal nest is shown on Plate IV, figure 2.

Distribution. — *A. evuncifer* was described from Portuguese Guinea. It has been recorded subsequently from many localities between Senegal and Angola in the west, and the Sudan, Eritrea, Uganda and Kenya in the east. In the Congo it is known from Duma, Ubangi District and Niangara, in Uele.

5. — **Microcerotermes fuscotibialis** (SJÖSTEDT).

Eutermes fuscotibialis SJÖSTEDT, 1896, Ent. Tidskr., **17** : 298.

3118. « II/fd/17, galerie forestière dense, H.D.S., 13.II.52 » soldiers and workers from an arboreal nest of paper-like material, in a shady thicket.

Distribution. — Described from Cameroun, *M. fuscotibialis* is recorded from Guinea to northern Angola. Congo records are Mukimbungu, Zambi, Léopoldville, Stanleyville and Avakubi.

6. — **Microcerotermes parvulus** (SJÖSTEDT).

Eutermes parvulus SJÖSTEDT, 1911, Ent. Tidskr., **32** : 159.

431. « Km 17, sur terre apportée sur affleurement granitique, H.D.S., 18.IV.50 » soldiers and workers associated with *Cubitermes sankurensis.*

1217. « II/f, savane herbeuse, H.D.S., 5.XII.50 » a single soldier associated with *Trinervitermes auriterrae* and *Ancistrotermes crucifer* in a mound also occupied in part by ants.

1250. « II/id/4, savane herbeuse, H.D.S., 14.II.51 » alates obtained by sweeping vegetation.

1408. « II/gd/4, savane herbeuse, H.D.S., 16.III.51 » queen, soldiers and workers in a mushroom mound of *Cubitermes antennalis*, which also contained *Promirotermes pygmaeus* and de-alates of *Macrotermes* together with a colony of ants.

2232. « II/gc/4, savane herbeuse, H.D.S., 11.VIII.51 » queen and workers from a mushroom mound of *Cubitermes sankurensis*, associated with *Ancistrotermes crucifer* and *Anoplotermes sp.*

2317*c*. « II/gd/4, savane herbeuse brûlée, H.D.S., 26.VIII.51 » soldiers and workers from a cylindrical mound with a rounded top, 40 cm high and 15 cm in diameter, of black earth.

2317*d*. « II/gd/4, savane herbeuse brûlée, H.D.S., 26.VIII.51 » soldiers and workers in soil.

2358. « II/fd/6, savane herbeuse de bas-fond, H.D.S., 31.VIII.51 » soldiers and workers collected in dry stubble.

2492. « II/fd/4, savane herbeuse, H.D.S., 1.X.51 » soldiers and workers collected from mushroom mounds of *Cubitermes antennalis*, together with a variety of other termites.

2493. « II/fd/5, savane herbeuse de vallée, H.D.S., 29.IX.51 » soldiers and workers from an old Macrotermes mound, associated with *Ancistrotermes crucifer*, *Pseudacanthotermes spp.* and *Promirotermes pygmaeus*.

2736. « II/gd/4, savane herbeuse, H.D.S., 10.IX.51 » soldiers and workers in a mound of *Cubitermes antennalis*.

3049. « II/gd/4, savane herbeuse, H.D.S., 24.I.52 » soldiers and workers collected by Berlese funnel from soil to depth 10 cm under tufts of grass and 24 hours after the passage of fire.

3259. « II/gd/4, termitière « morte » en savane herbeuse, H.D.S., 15.III.52 » alates, queen, soldiers and workers from an old mound of *Macrotermes* not yet colonised by woody plants.

Distribution. — The type locality of *M. parvulus* is Congo : Mukimbungu. It is known from Senegal, Guinea, Ghana and from the former French Congo.

7. — **Anoplotermes** spp.

677/3. « I, o/3, savane de pente, G.D., 7.VII.50 » workers found in soil samples to depth of 15 cm associated with *Ancistrotermes crucifer*.

683/2. « I/a/1, savane arbustive, G.D., 10.VII.50 » workers found in soil samples, associated with *Microtermes osborni*.

687/3. « I, a/1, savane de pente, G.D., 10.VII.50 » alates found in soil samples.

688/1. « I/a/1, savane de pente, G.D., 10.VII.50 » workers collected in soil samples in Acacia woodland.

727/1. « I/o/1, savane herbeuse, le long de la rivière, G.D., 26.VII.50 » workers found in soil samples to depth of 15 cm, associated with *Microtermes osborni*.

727/3. « I/o/1, savane herbeuse, le long de la rivière, G.D., 26.VII.50 » workers in soil samples to depth of 8,5 cm, associated with *Odontotermes scrutor*.

741/1. « Km 17, petite forêt sèche, G.D., 2.VIII.50 » workers in soil samples, with *Ancistrotermes crucifer* and *Amitermes evuncifer.*

749/1. « I/b/4, savane herbeuse, G.D., 9.VIII.50 » workers in soil samples.

783. « I/o/2, galerie humide, G.D., 25.VIII.50 » workers in soil samples, associated with *Pseudacanthotermes militaris* and *Basidentitermes spp.*

815/4. « I/o/2, galerie humide, G.D., 13.IX.50 » workers in soil samples.

829. « I/a/1, savane arbustive, G.D., 19.IX.50 » workers collected when digging soil, associated with *Odontotermes sp.* and *Synacanthotermes heterodon.*

844/1. « Km 17, affleurement rocheux, savane herbeuse, G.D., 25.IX.50 » workers collected in soil samples to depth of 15 cm.

1390. « II/nf/7″, savane paludicole, H.D.S., 15.III.51 » alates found at the bases of tufts of *Hyparrhenia* grass.

2232. « II/gc/4, savane herbeuse, H.D.S., 11.VIII.51 » six queens, of two species, from mushroom mounds of *Cubitermes sankurensis*, associated with *Ancistrotermes crucifer*, *Microcerotermes parvus* and *Coarctotermes tenebricus.*

3339. « II/gd/4, savane herbeuse, H.D.S., 21.IV.52 » workers collected with a Berlese funnel from soil below tufts of *Urelytrum* grass.

It is regretted that the present state of our knowledge of the African representatives of the genus *Anoplotermes* does not permit of the specific identification of the alates and queen in this collection. The soldier caste is absent in this genus.

Subfamily TERMITINAE.

8. — **Thoracotermes macrothorax** (SJÖSTEDT).

Eutermes macrothorax SJÖSTEDT, 1899, Ent. Nachr., **25** : 38.

3453. « Aka, galerie forestière dense, type guinéen, H.D.S., 14.V.52 » soldiers and workers from a cylindrical mound on the slopes of a narrow ravine, wooded and shady.

Distribution. — Described from Cameroun, *T. macrothorax* is known from Ghana, Nigeria, the former French Congo and Angola. It is widely distributed in the Congo, viz. Mukimbungu, Lukula, Kondue, Kasai, Sankuru, Stanleyville, Kamiemba, Makesia. The related *T. lusingensis* is found in Katanga and Angola, and *T. brevinotus* in Guinea.

9. — **Cubitermes antennalis** SJÖSTEDT.

Cubitermes antennalis SJÖSTEDT, 1924, Rev. Zool. Afr., **12** : 493.

233. « I/b/1, partie aérienne termitière en champignon, G.D., 25.I.50 » workers.

691/2. « I/o/1, savane au-delà de la Nagbarama, G.D., 12.VII.50 » workers from soil samples, beneath a *Nauclea* and 2 m from a termite mound, associated with *Synacanthotermes heterodon*.

1214. « Garamba/4, graminées courtes non brûlées, J.V., 3.II.51 » soldiers and workers collected by sweeping.

1408. « II/gd/4, savane herbeuse, H.D.S., 16.III.51 » alates, queen, soldiers and workers from a mushroom mound, « kakule », associated with *Microcerotermes parvulus* and ants.

2313. « II/fc/10, vestiges de galerie forestière ancienne, H.D.S., 23.VIII.51 » soldiers and workers obtained by Berlese funnel from the bark of a dead tree fallen on the ground and in the early stages of decomposition.

2317*b*. « II/gd/4, savane herbeuse brûlée, H.D.S., 26.VIII.51 » workers collected in soil and in grass tufts, associated with *Microtermes osborni*.

2492. « II/fd/4, savane herbeuse, H.D.S., 1.X.51 » queens, soldiers and workers from mushroom mounds; *Microtermes osborni* and *Microcerotermes parvulus* also present.

2736. « II/gd/4, savane herbeuse, H.D.S., 10.XI.51 » queens, soldiers and workers from a mound, with *Microcerotermes parvulus* present.

A nest is shown on Plate III, figure 2.

Distribution. — *C. antennalis* was described from Moto in Haut Uele. This material agrees closely with the detailed measurements and figures given by EMERSON (1928) for specimens from Garamba.

10. — **Cubitermes sankurensis** (WASMANN).

Cubitermes sankurensis WASMANN, 1911, Rev. Zool. Afr., **1** : 155.

115. « I/b/4, termitière, partie endogée, H.D.S., 18.I.50 » soldiers and workers obtained by sifting.

148. « I/b/1, termitière, G.D., 4.I.50 » soldiers, workers and nymphs, associated with ants.

177. « I/b/1, savane arborescente, termitière, H.D.S., 25.I.50 » soldiers, workers and nymphs.

431. « Km 17, sur terre apportée sur affleurement granitique, H.D.S., 18.IV.50 » soldiers and workers.

727/5. « I/o/1, savane herbeuse, le long de la rivière, G.D., 26.VII.50 » workers in soil sample, associated with *Odontotermes scrutor*.

1388. « II/nf/7, savane paludicole, Ndiwili, H.D.S., 15.III.51 » workers and nymphs from mushroom mounds.

1390. « II/nf/7, savane paludicole, H.D.S., 15.III.51 » soldiers and workers collected at base of tufts of *Hyparrhena*, associated with *Anoplotermes* alates.

1860. « II/gd/4, savane herbeuse, H.D.S., 5.VI.51 » alates flying at 1600 hours, after two hours continuous rain, sky obscured, light dim.

2232. « II/gc/4, savane herbeuse, H.D.S., 11.VIII.51 » numerous queens and nymphs from mushroom mounds, associated with *Ancistrotermes crucifer*, *Anoplotermes spp.*, *Coarctotermes tenebricus* and *Microcerotermes parvulus*.

3274. « II/gd/4, savane herbeuse, H.D.S., 1.IV.52 » alates, reproductives, soldiers and workers (vernacular « Kakule ») from small mushroom mounds (vernacular « Matuka »), associated with *Ancistrotermes crucifer* and *Coarctotermes tenebricus*.

A nest is shown on Plate III, figure 1.

Distribution. — Described from Sankuru, *C. sankurensis* is widely distributed in the Congo, viz. Bas-Congo : Mukimbungu, Boma, Kingoyi, Moanda, Matadi, Thysville; Moyen-Congo : Kisantu, Kimwenza; Kasai : Luluabourg; Uele : Garamba; Katanga : Sankisia. It is also recorded from Angola, at St. Antonio in the extreme north adjacent to the Bas-Congo province.

11. — **Basidentitermes aurivillii** (Sjöstedt).

Eutermes aurivillii Sjöstedt, 1897, Ent. Tidskr., **18** : 125.

783. « I/o/2, galerie humide, G.D., 25.VII.50 » soldiers and workers from soil samples, associated with *Anoplotermes sp.*, *Pseudacanthotermes militaris* and a new species of *Basidentitermes*.

807/2. « I/o/2, galerie humide, G.D., 6.IX.50 » soldiers and workers from soil samples, associated with *Microtermes osborni*.

841/1. « Nalugwambala, galerie humide, G.D., 25.IX.50 » soldiers and workers from soil samples taken at the foot of a large, active termite mound, associated with *Protermes hirticeps*.

841/2. As above, 10 m away from 841/1; soldiers and workers from soil samples, associated with *Microtermes osborni*.

844/2. « Km 17, affleurement rocheux, savane herbeuse, G.D., 25.IX.50 » soldiers and workers from soil samples.

3259. « II/gd/4, termitière morte en savane herbeuse, H.D.S., 15.III.52 » soldiers collected in an old mound of *Macrotermes natalensis* not yet

colonised by woody plants, associated with *Ancistrotermes crucifer*, *Odontotermes akengeensis*, *Microcerotermes parvulus* and *Microtermes osborni*.

Measurements of soldiers.	Major. mm.	Minor. mm.
Length of head and mandibles	2,73-2,91	2,13
Length of head	1,59	1,36
Width of head	1,38-1,50	1,09
Length of left mandible	1,41-1,46	1,00
Width of pronotum	0,64-0,68	0,36
Length of pronotum	0,30-0,32	0,23
Length of hind tibia	0,95-1,09	0,77

Distribution. — *B. aurivillii* was described from Cameroun and has been recorded from Ghana and Nigeria. It occurs also in Uganda.

12. — **Basidentitermes demoulini** n. sp.

(Figs. 5-7.)

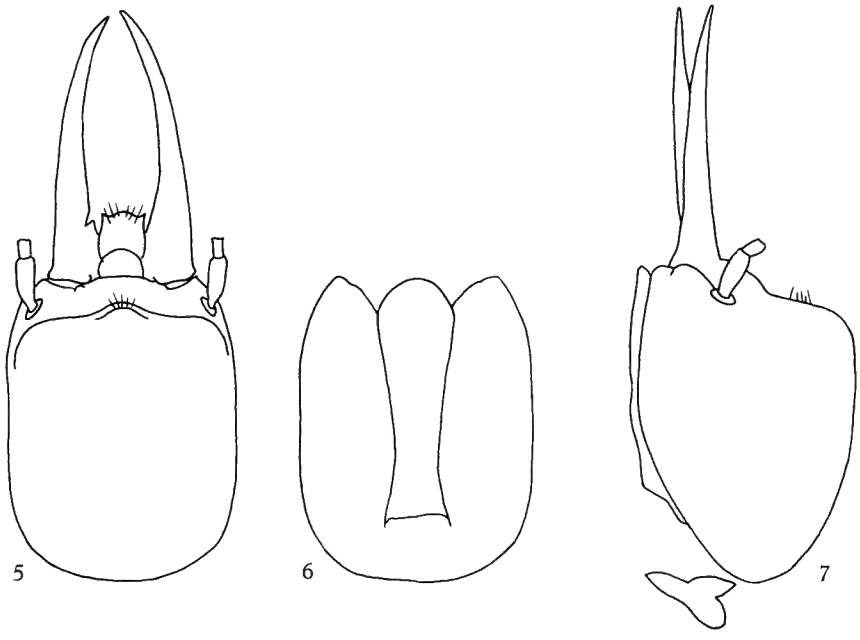
Soldier. — Head chestnut brown with black mandibles, brown antennae and pale yellow labrum. Pronotum, legs and abdomen ivory white.

Head more or less rectangular with parallel sides, anterior corners cut away and posterior margin flatly rounded; frontal area lightly sinuate with the fontanelle visible from above on a slight prominence just below the summit, and surrounded by pale bristles; labrum large with sides and anterior margin slightly convex, and projecting corners; mandibles long and slender with regular curve to tips; antennae with 14 segments, the basal segment large and remainder more or less equal in length apart from III and IV, which are shorter; gulamentum distinctive with anterior margin almost semi-circular and sides constricted towards the posterior third, in profile flat with abrupt ends.

Pronotum with curved anterior margin, only slightly notched, and posterior lobe much wider than anterior, flatly curved.

	Holotype. mm.	Range (5). mm.
Length of head and mandibles	3,09	2,73-3,09
Length of head	1,64	1,54-1,64
Width of head	1,28	1,23-1,28
Length of left mandible	1,54	1,50-1,56
Width of pronotum	0,59	0,50-0,59
Length of pronotum	0,32	0,32-0,36
Length of hind tibia	1,00	0,95-1,00

Compared with the other species of the genus *Basidentitermes* this differs in having a distinctly rectangular head, and in the shape of the gulamentum, particularly the rounded anterior margin. The head is distinctly narrower than *B. aurivillii* from the same locality.



FIGS. 5-7. — *Basidentitermes demoulini* n. sp.
Soldier : 5, Head; 6, Head from below; 7, Head in profile.

Holotype : soldier, Garamba : 783 « I/o/2, galerie humide, G.D., 25.VIII.50 » one of three soldiers collected in soil samples. In Institut des Parcs Nationaux du Congo.

Paratypes : two soldiers as above, associated with *Anoplotermes* sp. and *Basidentitermes aurivillii.*

741/3. « Km 17, petite forêt sèche, G.D., 2.VIII.50 » one soldier and a number of workers collected in soil samples and associated with *Microtermes garambae.*

841/3. « Nalugwambala, galerie humide, G.D., 25.IX.50 » one soldier in soil samples. In same collection and British Museum (Nat. Hist.).

13. — **Pericapritermes desaegeri** n. sp.

(Figs. 8-10.)

Soldier. — Head brownish-yellow, with a dark median longitudinal line; mandibles red-brown; abdomen ivory, with numerous golden bristles.

Head a narrow rectangle, about twice as long as wide, with flatly rounded posterior; lightly scattered with bristles; fontanelle visible as a slight prominence in a shallow depression of the frontal area; labrum a slightly asymmetrical rectangle, wider than long, with pointed corners; mandibles dissimilar, the right strongly folded upwards midway, the left flat, broad and pointed; antennae with 14 segments, the basal segment longer than II and III together, and IV the smallest; gulamentum very long and slender.

Pronotum small with strongly up-turned anterior lobes and entire posterior margin.

	Holotype. mm.	Range (4). mm.
Length of head and body	4,50	4,50
Length of head and mandibles	3,04	2,98-3,04
Length of head	2,05	1,90-2,05
Width of head	1,00	0,95-1,00
Length of left mandible	1,04	1,02-1,04
Width of pronotum	0,54	0,54-0,59
Length of pronotum	0,32	0,32
Length of hind tibia	0,73	0,73-0,77

Larger than *P. amplignathus* and smaller than *urgens* and *socialis*. The ratio of head length to width is greater than in the other species. The upward folding of the left mandible is more pronounced, resulting in comparative shortness. *Urgens* has a broader and deeper head; *amplignathus* has a more convex frontal area and proportionately larger labrum; *socialis* has a larger labrum and a less conspicuous fontanelle.

Worker. — Head pale yellow, near circular, with inflated clypeus and small epicranial depression; mandibles as figured, pale with contrasting dark tips and basal condyles; labrum wider than long with bluntly rounded tip; antennae with 13 or 14 segments.

	mm.
Length of head to anterior margin of clypeus	0,77
Width of head	0,77-0,82

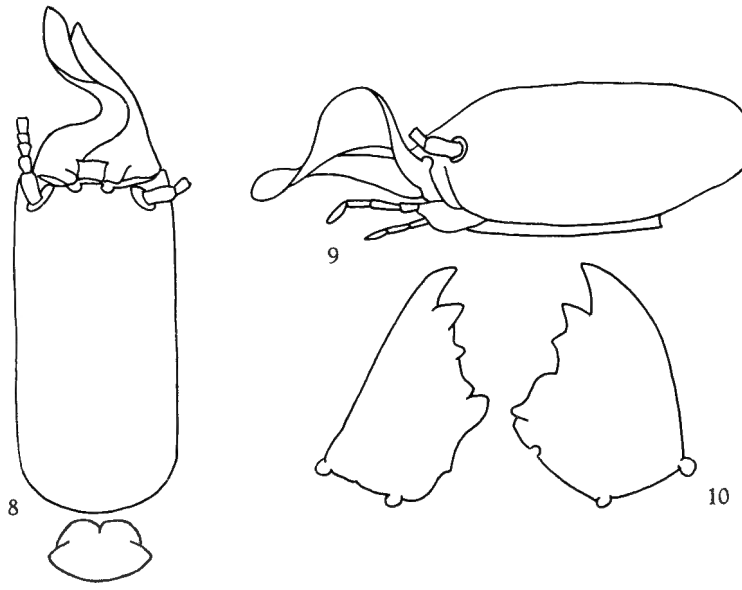
Holotype : soldier, Garamba : 836 « I/o/1, savane arbustive au pied d'un « Nguluza », G.D., 22.IX.50 » one of four soldiers and numerous workers obtained by digging soil, in association with *Microtermes osborni*, *Microtermes heterochilus* and *Macrotermes sp.* In Institut des Parcs Nationaux du Congo et du Rwanda.

Paratypes : the remaining of the material as above, in same collection and British Museum (Nat. Hist.).

14. — **Termes hospes** (SJÖSTEDT).

Eutermes hospes SJÖSTEDT, 1899, Ent. Tidskr., **20** : 278.

2982. « II/fd/17, galerie forestière, H.D.S., 3.I.52 » soldiers and workers from a nest of paper-like material in a hollow tree trunk.



FIGS. 8-10. — *Pericapritermes desaegeri* n. sp.
Soldier : 8, Head and pronotum; 9, Head in profile.
Worker : 10, Mandibles.

3775. « II/gc/9, galerie forestière très dégradée, H.D.S., 14.VII.52 » soldiers and workers from a carton nest (height 0,40 m, width 0,30 m) of irregular shape, in the hollow base of a tree. Soldiers few in number.

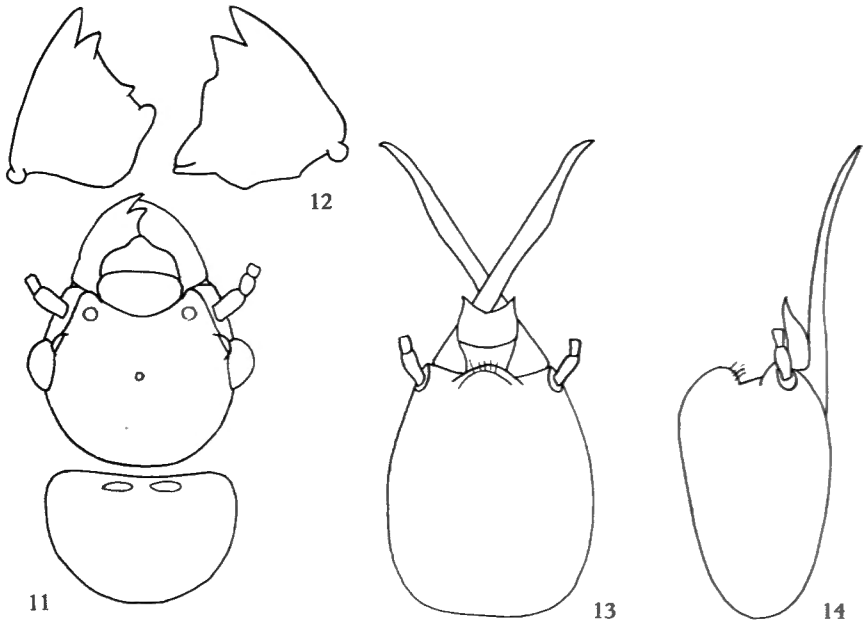
Distribution. — *Termes hospes* was described from Cameroun, and has subsequently been recorded from Guinea, Ghana and in the Congo, Mukimbungu and Sankuru.

15. — **Promirotermes pygmaeus** n. sp.

(Figs. 11-14.)

Imago, male. — Head, pronotum and wing scales dark brown, with numerous short pale setae; abdominal sternites and legs pale brown, with numerous setae.

Head semicircular behind the eyes, and contracting in front to the narrow clypeus; eyes small and protuberant; ocelli large, long-oval, a short diameter distant from the eyes; fontanelle small; clypeus small and slightly inflated; antennae brown, segment II slightly longer than either III, IV, or V, all of which are equal; mandibles dark brown with typical marginal teeth.



FIGS. 11-14. — *Promirotermes pygmaeus* n. sp.
Imago : 11, Head and pronotum; 12, Mandibles.
Soldier : 13, Head; 14, Head in profile.

Pronotum almost semicircular, anterior margin straight, sides curved evenly to the posterior.

Wings with strongly pigmented veins and dull brown membrane. (Wings of holotype incomplete.)

	mm.
Width of head including eyes	0,77
Diameter of eye	0,24
Diameter of ocellus	0,12 × 0,07
Distance of ocellus from eye	0,06
Width of pronotum	0,73
Length of pronotum	0,50
Length of hind tibia	1,14

Differs from *P. holmgreni* in being smaller and having ocelli long oval in shape.

Soldier. — Head yellow with dark brown mandibles; body and legs cream.

Head longer than broad, the sides convergent towards the front, posterior flatly rounded; in profile the frontal area is inflated to form a blunt protuberance overhanging the fontanelle, the head slopes to a shallow posterior; the fontanelle is surrounded by a dense ring of short setae; labrum large, wider than long, thick and up-turned, with sharp projecting corners and convex anterior margin; mandibles longer than the head, slender and slightly undulant with in-curved tips; antennae with 14 segments, III longer than II and as least as long as IV and V together.

Pronotum with large, strongly up-curved anterior lobe; the anterior margin without a median notch.

	Morphotype. mm.	Range. mm.
Length of head and mandibles	2,32	2,32-2,45
Length of head	1,14	1,05-1,14
Width of head	0,91	0,82-0,91
Length of left mandible	1,32	1,32-1,36
Width of pronotum	0,45	0,45-0,50
Length of pronotum	0,23	0,23-0,27
Length of hind tibia	0,95	0,86-0,95

Much smaller in size than other species already described; *holmgreni* in profile the head is deeper towards the posterior; *bellicosus* has a more broadly based frontal protuberance, red-brown mandibles and pear-shaped head, and the anterior margin of the pronotum is notched.

Worker. — Head pale brown, sides curved, posterior broadly rounded; clypeus flat; dark brown mandibles as figured.

Body elongate, ivory in colour.

	mm.
Length of head and body	2,75
Width of head	0,68
Length of hind tibia	0,41

Holotype : alate male, Garamba : 1408 « II/gd/4, savane herbeuse, H.D.S., 16.III.51 » from a mushroom mound of *Cubitermes antennalis*. In Institut des Parcs Nationaux du Congo et du Rwanda.

Morphotype : soldier as above.

Paratypes : 687 « I/a/1, savane de pente, G.D., 10.VII.50 » three soldiers and numerous workers collected in soil samples.

756/2. « I/a/1, savane de pente, G.D., 14.VII.50 » one soldier and numerous workers from soil samples.

760/2. « I/b/1, savane de pente à « Kiwe », G.D., 18.VIII.50 » one soldier and several workers from soil samples.

2493. « II/fd/5, savane herbeuse de vallée. H.D.S., 29.IX.51 » two soldiers from an old *Macrotermes* mound.

Paratype soldiers in the Institut des Parcs Nationaux du Congo et du Rwanda and the British Museum (Nat. Hist.).

16. — **Mucrotermes heterochilus** (SILVESTRI).

Procubitermes heterochilus SILVESTRI, 1914, Boll. Lab. Zool. Scuol. Sup. Agr. Portici, **9** : 113.

836. « I/o/1, savane arbustive au pied d'un « Nguluza », G.D., 22.IX.50 » soldiers and workers in soil samples, in association with *Microtermes osborni* and *Pericapritermes desaegeri*.

This species is recorded only from Dahomey.

Subfamily MACROTERMITINAE.

17. — **Pseudacanthotermes militaris** (HAGEN).

Termes militaris HAGEN, 1858, Linn. Entomol., **12** : 122.

783. « I/o/2, galerie humide, G.D., 25.VIII.50 » worker in soil sample.

1664. « II/gd/4, savane herbeuse, H.D.S., 5.V.51 » soldiers and workers.

2145. « II/gd/4, savane herbeuse, non brûlée, H.D.S., 6.VII.51 » reproductives, soldiers and workers from an old *Macrotermes* mound and associated with a number of other soil inhabiting species.

2493. « II/fd/5, savane herbeuse de vallée, H.D.S., 29.IX.51 » one major and one minor soldier taken from an old *Macrotermes* mound together with *P. spiniger*, *Ancistrotermes crucifer*, *Microcerotermes parvulus* and *Promirotermes pygmaeus*.

3317. « II/hd/4, savane herbeuse, H.D.S., 11.II.52 » one soldier from droppings of waterbuck.

Distribution. — This termite is widely distributed throughout Tropical Africa from Guinea to Kenya, and Angola to Nyasaland.

18. — **Pseudacanthotermes spiniger** (SJÖSTEDT).

Termes (*Acanthotermes*) *spiniger* SJÖSTEDT, 1900, Kungl. Sv. Vet. Akad. Hand., **34** : 65.

2492. « II/fd/4, savane herbeuse, H.D.S., 1.X.51 » minor soldiers and workers from the mushroom mounds of *Cubitermes antennalis*, together with a number of other species.

2493. « II/fd/5, savane herbeuse de vallée, H.D.S., 29.IX.51 » soldiers and workers from a dead mound of *Macrotermes natalensis*, associated with *Pseudacanthotermes militaris* and *Anoplotermes sp.*

3376. « Mont Embe, massif d'*Oxytenanthera*, H.D.S., 19.IV.52 » minor soldiers found constructing a tube of earth on a bamboo stem.

3883. « II/gd/10, termitière au bord d'un petit vallon, H.D.S., 10.IV.52 » 4 dealates associated with soldiers and workers of *Odontotermes scrutor.*

4061. « II/gd/4, savane herbeuse de pente, H.D.S., 18.IX.52 » soldiers and workers (vernacular « Alyi ») from a mound 1,30 m high and 8 m diameter, surmounted by a column 0,60 m high and 0,40 m in diameter.

A typical mound is shown on Plate I, figure 2.

Distribution. — Though widely distributed in Tropical Africa and frequently occuring with *P. militaris*, it is more restricted to damper areas than that species.

19. — **Synacanthotermes heterodon** (SJÖSTEDT).

Eutermes heterodon SJÖSTEDT, 1899, Ent. Nachr., **25** : 38.

370. « Mande, savane boisée dense, milieu humide, H.D.S., 5.IV.50 », soldiers and workers in the soil, attacking roots; no constructions above ground.

691/2. « I/o/1, savane au-delà de la Nagbarama, G.D., 12.VII.50 » soldiers and workers from soil samples taken beneath a *Nauclea*, associated with workers of *Cubitermes*.

697/2. « I/o/1, savane arbustive, G.D., 13.VII.50 » soldiers and workers from soil samples.

745/1. « I/o/1, savane de plateau postculturale, G.D., 5.VIII.50 » one soldier associated with *Microtermes osborni*, in soil samples.

756/3. « I/a/1, savane de pente, G.D., 14.VIII.50 » one soldier associated with *Microtermes osborni* in soil samples.

829. « I/a/1, savane arbustive, G.D., 19.IX.50 » soldiers and workers obtained by digging soil at base of a *Parinari*, associated with *Anoplotermes sp.* and *Odontotermes sp.*

2145*c*. « II/gd/4, savane herbeuse non brûlée, H.D.S., 6.VI.51 » queen, soldiers and workers from a dead *Macrotermes* mound.

Distribution. — Recorded from Cameroun.

20. — **Protermes hirticeps** SJÖSTEDT.

Protermes hirticeps SJÖSTEDT, 1924, Rev. Zool. Afr., **12** : 495.

841/1. « Nalugwambala, galerie humide, G.D., 29.IX.50 » a single soldier collected in soil samples, associated with *Basidentitermes aurivillii*.

The presence of a subterranean nest is indicated by small cones of earth on the surface, as in many species of *Odontotermes* (Plate II, fig. 1).

Distribution. — This species was described from Mukimbungu and has been recorded elsewhere in the Congo at St. Gabriel near Stanleyville and at Garamba.

21. — **Macrotermes bellicosus** (SMEATHMAN).

Termes bellicosus SMEATHMAN, 1781, Phil. Trans. Roy. Soc., **71** : 141.

277. « I/b/1, savane arborescente, G.D., 7.II.50 » soldiers and workers from a mound.

318. « I/a/1, savane arborescente, termitière vivante, H.D.S., 20.III.50 » soldiers and workers.

715. « I/o/1, savane, G.D., 21.VII.50 » soldiers and workers collected by digging soil.

733. « I/o/1, fond de cabane, G.D., 27.VII.50 » a minor soldier found while digging.

877. « Région de Bagbele, reines de termites, G.D., 6.X.50 » two queens.

2170. « II/ec/4, savane herbeuse, H.D.S., 30.VII.51 » reproductives, soldiers and workers from a nest beneath blocks of limonite, no mound.

3790. « PpK/8/9, galerie forestière, H.D.S., 15.VII.52 » minor soldiers and workers in a dead tree resting on the soil; galleries and outlets coated with red earth.

3883/*a*. « II/gd/4, savane herbeuse, H.D.S., 6.VII.52 » one male dealate collected in the upper part of the soil near a small dead mound, associated with *Odontotermes scrutor*.

Macrotermes bellicosus is widely distributed in Africa from the southern border of the Sahara down to the Limpopo River, and is absent only from areas of closed-canopy rain forest and land over 1550 m above sea level. The mounds vary in shape with the nature of the soil and the

intensity of the rainfall (HARRIS, 1961), and are a distinctive feature of deciduous floodlands and savannas. In areas of higher rainfall, as typified by the presence of *Pennisetum purpureum* (elephant grass), the mounds of *M. natalensis* tend to replace those of *M. bellicosus*. This does not mean that the latter species is absent, but that its nests are subterranean or in inconspicuous domed mounds.

These two species of *Macrotermes* are among the main instruments for keeping the upper layers of the soil in movement by their mound building and by the covered run-ways and earth sheets they construct to protect the workers in their search for dead wood as food. Their mounds provide specialised habitats for vegetation, and by influencing plant succession over wide areas play an important part in the development of the landscape.

22. — **Macrotermes natalensis** (HAVILAND).

Termes natalensis HAVILAND, 1898, J. linn. Soc. (Zool.), **26** : 383.

427. « I/o/1, G.D., XI.49 » one minor soldier.

555. « I/o/1, savane arborescente, H.D.S., 25.V.50 » reproductives, minor soldiers and workers. Local name « Bakpwa ».

677. « I, o/3, savane de pente, G.D., 7.VII,50 » major and minor soldiers collected in soil samples.

758. « I/o/1, savane de plateau à « Nguluza », G.D., 17.VII.50 » soldiers and workers found while digging soil.

785. « I/o/1, termitière, G.D., 25.VII.50 » soldiers, workers and nymphs.

875. « Région de Bagbele, 7.X.50 » reproductives, soldiers and workers.

880. « Région de Bagbele, G.D., 10.X.50 » two queens, two kings and numerous workers from royal cell.

1249. « II/id/4, savane herbeuse, H.D.S., 14.II.51 » dealates found on the surface of the ground.

1408. « II/gd/4, savane herbeuse, H.D.S., 16.III.51 » dealates collected in a mushroom mound of *Cubitermes antennalis*.

3598. « Iso III, forêt de *Isoberlinia*, H.D.S., 11.VI.52 » soldiers and workers from mounds.

Distribution. — *M. natalensis* occurs in Africa south of the Sahara as far as Natal. Like *M. bellicosus*, it is absent from closed-canopy forest and at higher altitudes. It does not penetrate as far into the drier savannas as *bellicosus*, preferring the moister elephant-grass country. Mounds commonly reach a height of 2 to 3 m, broadly conical or with a number of turrets.

Macrotermes spp.

The following samples, consisting only of workers, have not been identified to species :

756/2. « I/a/1, savane de pente, G.D., 14.VIII.50 » workers collected in soil samples, in association with *Microtermes osborni*.

836/4. « I/o/1, savane arbustive, G.D., 22.IX.50 » workers in soil samples.

841/4. « Nalugwambala, galerie humide, G.D., 25.IX.50 » workers in soil samples.

23. — **Odontotermes akengeensis** EMERSON.

(Figs. 15-17.)

Termes (*Termes*) *akengeensis* EMERSON, 1928, Bull. Amer. Mus. nat. Hist., **57** : 464.

525. « I/o/1, savane arborescente, H.D.S., 17.V.50 » alates, soldiers and workers; vernacular name « akasi ».

3259. « II/gd/4, termitière morte en savane herbeuse, H.D.S., 15.III.52 » dealate male and two workers from an old mound of *Macrotermes*, associated with *Microtermes osborni* and other species.

The presence of a subterranean nest is indicated by number of small earth cones covering shafts leading down to the nest (Plate II, fig. 2).

This species was described from soldiers taken from the stomach contents of a reptile, *Artholeptis variabilis*, at Akenge, Uele. There are no other records. This opportunity is taken to describe the winged adult.

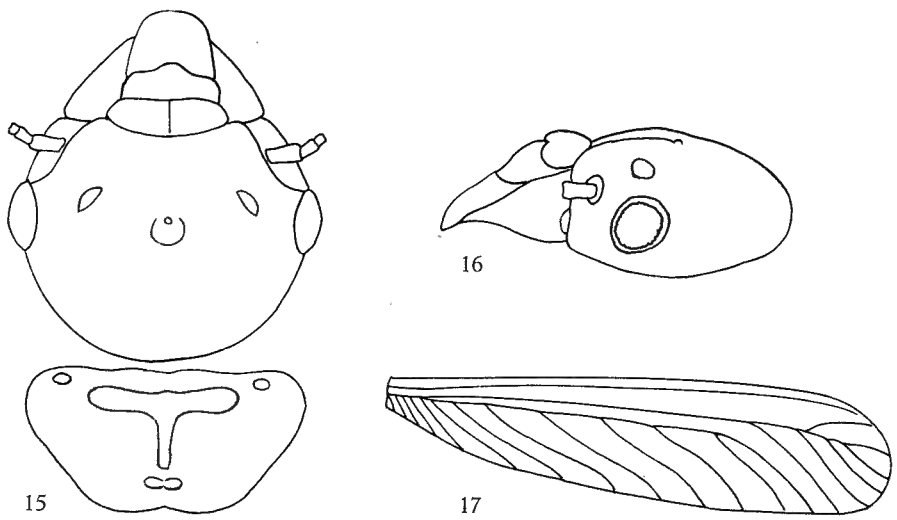
Imago, female. — Head rounded, red-brown with numerous pale setae, large irregular pale area around fontanelle; clypeus paler with dark median line; labrum similarly paler; antennae of 19 segments, III shorter than IV, II equal to III and IV together; ocelli oval with slightly pointed ends, a long diameter or more distant from the eyes.

Pronotum red-brown with paler T-shaped mark, anterior margin lightly sinuate, corners acute, posterior margin in two broad curves.

Thorax and abdomen with sclerites red-brown; wings with brown veins and pale brown membrane, without shorter branches of the radius-sector directed towards the wing tip, the common base of the medius and cubitus with five branches.

Male. — Generally as female, but slightly larger.

	Morphotype mm.	Range of 5 (both sexes). mm.
Total length including wings	29,00	—
Width of head including eyes	2,59	2,50-2,68
Diameter of eye	0,50	0,50-0,58
Ocellus, long diameter	0,28	0,25-0,30
Ocellus, short diameter	0,17	0,17-0,19
Distance of ocellus from eye	0,33	0,30-0,34
Width of pronotum	2,41	2,36-2,41
Length of pronotum	1,18	1,14-1,23
Length of hind tibia	2,50	2,45-2,73
Length of forewing	26,00	26,00
Width of forewing	6,40	6,40



FIGS. 15-17. — *Odontotermes akengeensis* EMERSON.
Imago : 15, Head and pronotum; 16, Head in profile; 17, Wing.

Differs from *fidens* and *scrutor* in having the ocelli at least their diameter distant from the eyes. *Aurora* is paler, with less contrasting clypeus.

Morphotype female. — Garamba : Camp de Bagbele, 17.V.50 (H. DE SAEGER). In the Institut des Parcs Nationaux du Congo et du Rwanda, paramorphotype in the British Museum (Nat. Hist.).

The following range of measurements was found in five soldiers from Garamba :

	mm.
Length of head and mandibles	3,09-3,23
Length of head	2,18-2,27
Width of head	1,54-1,59
Length of left mandible	1,14-1,18
Width of pronotum	1,18-1,23
Length of pronotum	0,64
Length of hind tibia	1,28-1,32

24. — **Odontotermes culturarum** SJÖSTEDT.

Odontotermes culturarum SJÖSTEDT, 1924, Rev. Zool. afric., **12** (4) : 492.

691/3. « I/o/1, savane au-delà de la Nagbarama, G.D., 12.VII.50 » soldiers and workers from soil samples, taken in hard soil at the foot of a *Vitex* bush, associated with workers of *Microtermes sp.*

Soldiers.

	Garamba. mm.	Tanganyika. mm.
Length of head and mandibles ...	4,36-4,50	4,60-5,05
Length of head	3,23-3,32	3,36-3,45
Width of head	2,36-2,50	2,45-2,85
Length of left mandible	1,50	1,64-1,73
Width of pronotum	1,72	1,68-1,91
Length of hind tibia	1,91	1,91-2,14

Distribution. — *O. culturarum* was described from Miombo in the Eastern Province of Tanganyika, in which country it has proved to be widely distributed. It has also been recorded by HARRIS from Uganda (1948), and by EMERSON from Congo, near Stanleyville (1928).

25. — **Odontotermes garambae** n. sp.

(Figs. 18-21.)

Imago, female. — Head, thorax and body segments dark brown; first and second sternites with a pale median spot on anterior margins; femora brown, tibiae paler distally, tarsi yellow with dark spines; wings brown.

Head with shallow, rounded posterior margin; clypeus with anterior margin narrowed, slightly inflated; eyes large and protruding; ocelli small, narrow oval, a long diameter distant from the eyes; fontanelle inconspicuous; antennae with 17 segments, III longer than IV.

Pronotum with anterior margin only slightly sinuate, corners obliquely cut-off, sides curving to short posterior margin with slight median notch.

	Holotype. mm.	Range. mm.
Width of head including eyes ...	2,50	—
Diameter of eye	0,59	—
Ocellus	0,22 × 0,12	—
Distance of ocellus from eye ...	0,22	—
Width of pronotum	2,13	2,13-2,18
Length of pronotum	1,18	1,18-1,28
Length of hind tibia	2,59	—
Length of forewing	18,40	—
Width of forewing	4,80	—

Close to *classicus*, this species differs in having distinctly smaller ocelli, in the pronotum having slightly straighter anterior and posterior margins and more angular sides, and in the angular posterior projections of the meso-notum. The reference specimens of *classicus* available are much paler than *garambae*, but this may be due to fading.

Soldier. — Head brownish-yellow; mandibles dark brown with paler bases; antennae pale brown. Thorax and abdomen pale yellow.

Head oval, narrowing slightly towards the anterior; mandibles long, robust, the left with a conspicuous marginal tooth one third of the length from the tip, the right smooth; labrum long and comparatively narrow; antennae with 17 segments, basal segment stout, III shortest, V slightly shorter than IV; gulamentum ribbon-like, broad, narrowing abruptly at anterior.

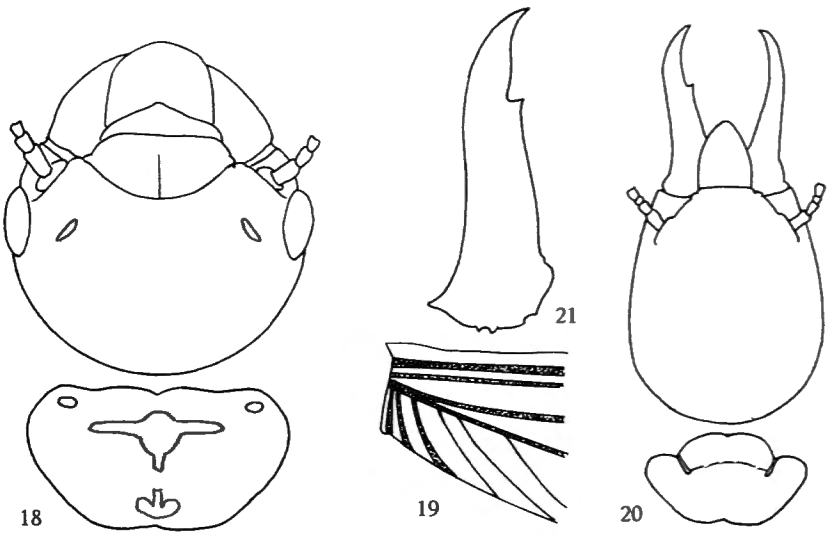
Pronotum saddle-shaped with large anterior lobes, posterior margin with median notch.

	Morphotype. mm.	Range (6). mm.
Length of head and mandibles	2,50	2,36-2,68
Length of head	1,41	0,36-1,64
Width of head	1,18	1,18-1,32
Length of left mandible	1,04	1,00-1,14
Width of pronotum	0,95	0,95-1,00
Length of pronotum	0,50	0,50
Length of hind tibia	1,14	1,14-1,28

Differs from *classicus* in the narrower, more pear-shaped head; the more distally situated marginal tooth on the left mandible; the almost parallel sides of the gulamentum; the absence of minor soldiers. *O. erra-*

ticus is distinctly larger. Examination of specimens from intermediate localities may eventually show that *garambae* and *erraticus* are forms of *classicus*.

Worker. — Two sizes of the worker caste are present, the larger having a head width of 1,50 mm and the smaller 0,95 mm; both with 17-segmented antennae.



FIGS. 18-21. — *Odontotermes garambae* n. sp.
Imago : 18, Head and pronotum; 19, Base of wing.
Soldier : 20, Head and pronotum; 21, Left mandible.

Holotype. — Alate female, Garamba : 3273 « II, gd/4, savane herbeuse, H. DE SAEGER, 1.IV.52 » In Institut des Parcs Nationaux du Congo et du Rwanda.

Morphotype. — Soldier, as above.

Paratypes in British Museum (Nat. Hist.). Described from numerous specimens.

Alates emerging from holes in the ground on day with rain; soldiers forming a protective ring some dozen centimetres wide around these holes; no mounds or other indication of subterranean nest.

26. — **Odontotermes scrutor** (SJÖSTEDT).

Termes scrutor SJÖSTEDT, 1907, Ent. Tidskr., **28** : 240.

727/3. « I/o/1, savane herbeuse le long de la rivière, G.D., 26.VII.50 » soldiers and workers in soil samples, associated with *Anoplotermes sp.*

727/5. As above. Soldiers and workers in soil samples associated with *Cubitermes sankurensis.*

757/4. « I/a/1, savane de pente, G.D., 14.VII.50 » soldiers and workers in soil samples associated with *Microtermes* and *Anoplotermes.*

3883*a*. « II/gd/4, savane herbeuse à *Loudetia*, H.D.S., 6.VIII.52 » soldiers and workers collected in the upper 10 cm of soil in the vicinity of a small dead mound.

Soldiers. — The following range of measurements was found in two of the series of soldiers :

	3883*a* (5). mm.	727/3 (4). mm.
Length of head and mandibles ...	2,45-2,50	2,23-2,73
Length of head	1,54-1,66	1,54-1,91
Width of head	1,14-1,23	1,09-1,23
Length of left mandible	0,95-1,00	0,77-0,95
Length of pronotum	0,86-0,91	0,86
Width of pronotum	0,41-0,50	0,41
Length of hind tibia	0,91	0,82-0,91

Distribution. — *O. scrutor* was described from Mukimbungu in Bas-Congo, since when no further records appear to have been published.

Odontotermes spp.

829/2. « I/a/1, savane arbustive, G.D., 19.IX.50 » workers not belonging to any of the above species, taken from soil with a wide variety of other organisms.

2717. « II/gd/4, savane herbeuse, H.D.S., 3.XI.51 » one worker collected on the surface of the ground.

3887. « II/gc/4, savane herbeuse, H.D.S., 7.VIII.52 » two dealates collected in the upper layers of the soil.

27. — **Ancistrotermes crucifer** (SJÖSTEDT).

Termes crucifer SJÖSTEDT, 1897, Ent. Tidskr., **18** : 123.

317. « I/a/1, vieille termitière morte de *Bellicositermes*, H.D.S., 20.III.50 » queen, soldiers and workers.

677/1. « I/o/3, savane de pente, G.D., 7.VII.50 » soldiers and workers in soil samples.

677/3 and 677/5. The same. Soldiers and workers in soil samples.

691/1. « I/o/, savane au-delà de la Nagbarama, G.D., 12.VII.50 » two soldiers in soil samples.

691/3. The same. Soldiers and workers in soil samples.

720/1. « I/a/3, savane herbeuse, G.D., 24.VII.50 » soldiers and workers in soil samples.

727/2. « I/o/1, savane herbeuse le long de la rivière, G.D., 26.VII.50 » one soldier in soil sample.

727/4. The same. Soldiers and workers in soil sample.

738. « I/o/1, savane arbustive sur le sentier, G.D., 15.V.50 » a worker.

741/1. « Km 17, petite forêt sèche, G.D., 2.VIII.50 » soldiers and workers in soil samples, associated with *Amitermes evuncifer* and *Anoplotermes sp.*

745/1. « I/o 1, savane de plateau postculturale, G.D., 5.VIII.50 » workers in soil samples associated with *Microtermes osborni* and *Synacanthotermes heterodon.*

745/2. The same. Soldiers and workers.

760/3. « I/b/1, savane de pente, G.D., 18.VII.50 » soldiers and workers in soil samples.

841/4. « Nalugwambala, galerie humide, G.D., 25.IX.50 » soldiers and workers in soil samples associated with *Coptotermes sjöstedti.*

906. « I/a/1, savane arborescente, H.D.S., 26.X.50 » soldiers and workers in soil, associated with *Amitermes evuncifer.*

1217. « II/f, savane herbeuse, H.D.S., 5.XII.50 » soldiers and workers in mound of *Trinervitermes auriterrae*, associated with *Microcerotermes parvus.*

1420. « II, gd/4, savane herbeuse, H.D.S., 19.III.51 » soldiers and workers from a soil sample.

2145*d*. « II/gd/4, savane herbeuse, termitière, H.D.S., 6.VII.51 » reproductives, soldiers and workers from a nest in a dead *Macrotermes* mound.

2145*e*. The same. A queen with soldiers and workers.

2170. « II/ec/4, savane herbeuse, H.D.S., 30.VII.51 » queen, soldiers and workers from a subterranean nest beneath blocks of limonite.

2232. « II/gc/4, savane herbeuse, H.D.S., 11.VIII.51 » reproductives and nymphs from a mushroom mound of *Cubitermes sankurensis*.

2317*d*. « II/gd/4, savane herbeuse, H.D.S., 26.VIII.51 » soldiers and workers in the soil.

2429. « II/fd/4, savane herbeuse, H.D.S., 1.X.51 » queen and two males from mounds of *Cubitermes antennalis*, together with five other species of termites.

2493. « II/fd/5, savane herbeuse de vallée, H.D.S., 29.IX.51 » soldiers and workers from old *Macrotermes* mound with four other species of termites.

2706. « II/fe/5, savane herbeuse de vallée, H.D.S., 2.XI.51 » soldiers and workers in soil.

3259. « II/gd/4, termitière morte en savane herbeuse, H.D.S., 15.III.52 » soldiers and workers from an old *Macrotermes* mound.

3274. « II/gd/4, savane herbeuse, H.D.S., 1.IV.52 » soldiers and workers from a mushroom mound of *Cubitermes sankurensis*.

4062. « II/gd/4, savane herbeuse de pente, H.D.S., 18.IX.52 » queen, soldiers and workers in a mound of *Pseudacanthotermes spiniger*, associated with *Microtermes osborni*.

4097. « II/gd/4, savane herbeuse, pente de vallon, H.D.S., 12.IX.52 » soldiers and workers from a mound.

Soldiers. — There are two distinct soldier castes. Measurements of individuals selected at random from 20 series gave the following ranges :

	Major soldier. mm.	Minor soldier. mm.
Length of head and mandibles ...	1,72-1,91	1,32-1,36
Width of head	1,09-1,28	0,73-0,82

Distribution. — *A. crucifer* is found from Senegal to Northern Angola and eastwards to the Central African Rift, in moist woodlands and savannas. In East Africa its place is taken by *A. latinotus*. Two other species have limited distributions in West Africa.

28. — **Microtermes osborni** Emerson.

Microtermes osborni Emerson, 1928, Bull. Amer. Mus. nat. Hist., **57** : 472.

683/1. « I/a/1, savane arbustive, G.D., 10.VII.50 » soldiers and workers from soil sample to a depth of 9 cm, in gallery forest along river Aka.

687/5, « I/a/1, savane de pente, G.D., 10.VII.50 » soldiers and workers in soil sample.

688/2. « I, a, 1, savane de pente, G.D., 10.VII.50 » soldiers from soil sample in copse of *Bauhinia*.

691/3. « I, o, 1, savane, G.D., 12.VII.50 » soldiers from soil sample, in hard limonite soil at foot of *Vitex*.

710. « I/o/1, savane, G.D., 19.VII.50 » worker from soil sample.

710/4 and 710/5 the same. Soldiers from soil samples.

723. « I/o/2, rivière sur barres granitiques, G.D., 26.VII.50 » workers.

727/1. « I/o/1, savane herbeuse, G.D., 26.VII.50 » soldiers and workers from soil samples associated with *Anoplotermes sp.*

741/2. « Km 17, petite forêt sèche, G.D., 2.VII.50 » soldiers and workers from soil samples.

741/3. The same.

745/1. « I/o/1, savane de plateau postculturale, G.D., 5.VIII.50 » soldiers and workers from soil samples.

756/1. « I/a/1, savane de pente, G.D., 14.VIII.50 » soldiers from soil samples.

756/2 and 756/3. The same. Associated with *Synacanthotermes heterodon* and *Promirotermes pygmaeus*.

757/1. « I/a/1, savane de pente, G.D., 14.VIII.50 » soldiers and workers from soil samples.

760/1. « I, b, 1, savane de pente, G.D., 18.VIII.50 » soldiers from soil sample.

760/2. The same. Soldiers and workers from soil sample.

807/1. « I, o/2, galerie humide, G.D., 6.IX.50 » soldiers and workers from soil samples.

807/2. The same.

836. « I/o/1, savane arbustive, G.D., 22.IX.50 » soldiers found when digging soil, associated with *Mucrotermes heterochilus*, *Pericapritermes desaegeri* and *Macrotermes sp.*

841/2. « Nalugwambala, galerie humide, G.D., 25.IX.50 » soldiers and workers from soil samples.

984. « I/o, ancien village, H.D.S., 18.IX.50 » soldiers in vegetable debris accumulated at base of flowering stem of oil palm.

1243. « II/gd/4, savane herbeuse, H.D.S., 12.II.51 » winged adults swarming at sunset, 48 hours after the first rain of the season, with soldiers and workers in attendance.

1420. « II, gd/4, savane herbeuse, H.D.S., 19.III.51 » soldiers and workers collected in moist sandy soil to depth of 10 cm.

1891. « II/gc/3, savane arbuste de vallée, H.D.S., 2.VI.51 » workers in fruits of *Kigelia*.

2005. « II/ed/9, galerie forestière dégradée, H.D.S., 22.VI.51 » one soldier obtained with Berlese funnel from decomposing fruits of *Sterculia*.

2144. « II/gd/4, savane herbeuse à ligneux rares, H.D.S., 6.VII.51 » soldiers and workers in dead branches of tree on termite mound.

2145. « II/gd/4, savane herbeuse, H.D.S., 6.VII.51 » soldiers and workers in dead *Macrotermes* mound.

2317*b*. « II/gd/4, savane herbeuse brûlée, H.D.S., 26.VIII.51 » nymphs collected on ground and in grass tufts.

2492. « II/fd/4, savane herbeuse, H.D.S., 1.X.51 » soldiers, workers and nymphs from mushroom mounds of *Cubitermes antennalis*, associated with many other species.

2571. « II/fd/17, galerie forestière, H.D.S., 21.IX.51 » workers in decomposing fruits of *Oncoba*.

2664. « II/fd/5, savane herbeuse de vallée, H.D.S., 25.X.51 » worker collected in soil.

2984. « II/gd/4, savane mise à feu le 20.XII.51, J.V., 4.I.52 » soldiers collected by Berlese funnel from material out of rodent burrows.

3238. « II/gd/4, marais, H.D.S., 11.III.52 » one alate taken with a net.

3259. « II/gd/4, termitière morte en savane herbeuse, H.D.S., 15.III.52 » soldiers and workers from an old *Macrotermes* mound.

3275. « II/gd/4, savane herbeuse, H.D.S., 1.IV.52 » alates emerging from a subterranean nest after a rainy morning. Vernacular name « Ambulumbayo ».

3330. « II/fd/17, galerie forestière, H.D.S., 24.IV.52 » soldiers and workers collected by Berlese funnel from dead branch on ground.

4016. « II/gd/4, savane herbeuse de pente, H.D.S., 18.IX.52 » queen from a mound of *Pseudacanthotermes spiniger*.

4062. The same. Soldiers and workers.

The measurements of imago and soldier castes given below extend the range given by EMERSON in his description. The presence of a minor soldier caste is indicated. This is to be found in many species of *Microtermes*. The head of the minor soldier is more oval than that of the major soldier, which varies towards the rectangular in some instances. Separation of the castes was easiest in those series where both occurred together.

Imago :	Females (4). mm.	Males (2). mm.	Type. mm.
Diameter of eye	0,30- 0,34	0,30-0,31	—
Width of head including eyes ...	1,23- 1,28	1,18	1,27
Ocellus	0,15 × 0,10	0,15 × 0,09	—
Distance of ocellus from eye	0,05- 0,06	0,07	—
Width of pronotum	1,09- 1,23	1,04-1,14	1,20
Length of pronotum	0,68- 0,73	0,70	0,66
Length of hind tibia	1,23- 1,32	1,28	1,33
Length of forewing	12,00-12,30	10,50	12,00
Width of forewing	2,50- 2,60	2,30	3,10
Antennal segments	XV	XV	XV

Soldier :	Major (6). mm.	Minor (7). mm.	Type. mm.
Length of head and mandibles ...	1,23-1,36	1,00-1,18	1,22-1,27
Length of head	0,77-0,91	0,59-0,77	—
Width of head	0,59-0,73	0,54-0,64	0,64-0,73
Length of left mandible	0,50-0,59	0,41-0,50	0,56
Width of pronotum	0,50	0,45	0,47-0,50
Length of pronotum	0,32	0,27-0,32	0,33
Length of hind tibia	0,45-0,54	0,36-0,54	0,58
Antennal segments	XII-XIII	XII-XIII	XIII

Distribution. — The type locality is St. Gabriel, near Stanleyville and EMERSON notes as an additional locality Niangara on the Uele River. *Microtermes osborni* has not been recorded elsewhere.

Subfamily NASUTITERMITINAE.

29. — **Coarctotermes tenebricus** (SILVESTRI).

Eutermes tenebricus SILVESTRI, 1915, Boll. Lab. Zool. gen. agr. Portici, **9** : 44.

2083. « II/gd/4, savane herbeuse à ligneux rares, H.D.S., 30.IV.51 » soldiers and workers.

2145*f*. « II/gd/4, savane herbeuse non brûlée, H.D.S., 6.VII.51 » soldiers, workers and larvae from an old *Macrotermes* mound.

2232. « II/gc/4, savane herbeuse, H.D.S., 11.VIII.51 » dealates from a mushroom mound of *Cubitermes sankurensis*.

2492. « II/fd/4, savane herbeuse, H.D.S., 1.X.51 » queen, soldiers, workers and dealates from a mushroom mound of *Cubitermes antennalis*.

3274. « II/gd/4, savane herbeuse, H.D.S., 1.IV.52 » soldiers and workers from small mushroom mounds of *Cubitermes sankurensis*.

Distribution. — *C. tenebricus* was described from Guinea. It occurs also in Nigeria and the southern Sudan. According to SILVESTRI it builds small mounds about 10 cm high and from 15 to 20 cm in diameter at the base.

30. — **Nasutitermes arborum** (SMEATHMAN).

Termes arborum SMEATHMAN, 1781, Phil. Trans Roy. Soc., **71** : 141.

698. « I/o/2, galerie humide, G.D., 13.VII.50 » soldiers and workers from rotten branches.
935. « I/o/2, galerie forestière, sous les écorces, H.D.S., 6.IX.50 » soldiers and workers.
1871. « II/hc/8, tête de source à boisement dégradé, H.D.S., 5.VI.51 » soldiers, workers and young stages from à parchment-like nest built among tree roots.

Distribution. — The spherical carton nests in trees built by *N. arborum* are widely known from Senegal to the Congo. It has previously been recorded from Mukimbungu in Bas-Congo.

31. — **Nasutitermes incurvus** (SJÖSTEDT).

Eutermes incurvus SJÖSTEDT, 1924, Rev. Zool. Afr., **12** : 41.

559. « I/c/2, arbres pourris, sous galerie, G.D., 26.V.50 » alates, soldiers and workers.

Distribution. — *N. incurvus* is recorded from a number of localities in the northern half of the Congo, from Kunungu, Lukula and Malela in Bas-Congo to Stanleyville and Avakubi in the north-east. It is found in Cameroun and Uganda.

32. — **Trinervitermes auriterrae** SJÖSTEDT.

Trinervitermes auriterrae SJÖSTEDT, 1926, Ark. Zool., **18** : 3.

177. « I/b/1, savane arborescente, H.D.S., 25.I.50 » soldiers and workers.
1217. « II/f, savane herbeuse, H.D.S., 5.XII.50 » soldiers, associated with *Microcerotermes parvus* and *Amitermes crucifer.*

Distribution. — This species has been recorded from Ghana and Uganda.

33. — **Trinervitermes carbonarius** SJÖSTEDT.

Trinervitermes carbonarius SJÖSTEDT, 1926, Rev. Zool. Afr., **14** : 158.

3877. « PFSK/7/3, savane arborescente de crête, H.D.S., 30.VII.52 » soldiers from a dome-shaped mound 40-50 cm high, in grey soil.

Distribution. — *T. carbonarius* is recorded from Mauda and Faradje in Orientale Province, and in adjoining Uganda.

34. — **Trinervitermes oeconomus** (TRÄGÅRDH).

Eutermes oeconomus TRÄGÅRDH, 1904, Res. Swedish Exped. White Nile, (12) : 23.

2492. « II/fd/4, savane herbeuse, H.D.S., 1.X.51 » soldiers and workers from mushroom mounds of *Cubitermes antennalis*, associated with a variety of other termites.

Distribution. — Originally described from Kaka in the southern Sudan, *T. oeconomus* has been recorded from Ghana, Nigeria and Uganda, and in the Congo from Mukimbungu.

NOTES ON TERMITES AS SOIL INSECTS.

The importance of the termite component in the soil macro-fauna of the Garamba National Park is shown by the results obtained from examination of soil samples. These samples were collected in 24 localities, representing 8 vegetation types, and in the majority of cases were obtained by taking a group of six soil cores of average depth 15 cm, each 1.125 cm³ in volume. The number of core groups taken in each locality varied from one to six. Full particulars of the localities where soil samples were taken is given in DE SAEGER (1956).

Termites were present in seven out of the eight vegetation types, in twenty-one out of twenty-four localities, and in fifty-five of the eighty-one core-series. Their relative position in the soil macro-fauna is shown in the totals of all core examinations :

Total volume of soil examined in 432 cores ...	486.000 cm³;
Total number of animals extracted	7.890;
Total number of insects	7.135;
Number of termites	5.976.

Termites form 75 per cent of the macro-fauna recovered.

The relative abundance of termites in the soil of the eight vegetation types examined is shown in Table 1. No termites were found in any of the 11 core-groups taken in three localities in « grassy savanna on sandy soil ». In the remaining seven vegetation types they were present in from 66 to 100 per cent of the core-groups. The number of species of termites found in each vegetation type ranged from 2 in « grassy savanna with rock outcrops » to 8 in « gallery forest ».

TABLE 1. — **Occurrence of Termites in Soil Cores.**

Local vegetation type	Localities	Core-groups		Termite species
		number	with termites	
1. Gallery forest	5	15	9= 60 %	9
2. Dry woodland	1	3	3=100 %	5
3. Wooded savanna	5	20	15= 75 %	7
4. Wooded savanna on slope	3	10	10=100 %	5
5. Wooded savanna on plateau	2	8	5= 60 %	3
6. Grassy savanna	3	8	7= 85 %	7
7. Grassy savanna with rock outcrops ..	2	6	5= 83 %	2
8. Grassy savanna on sandy soil	3	11	0	0

The number of species of termites represented in these soil samples was sixteen (the genus *Anoplotermes* could not be separated into species and is considered in this context as a single species). They are all termites which forage freely for food in the upper layers of the soil or on the surface of the ground. Table 2 gives a summary of their occurrence in the various localities.

Termite mounds are a feature of much of the African landscape, and in the Garamba National Park large columnar mounds of *Macrotermes natalensis* are common in areas of dry woodland and wooded grasslands (Plate I, fig. 1). The more rounded mounds of *Macrotermes bellicosus* are also to be found, and occasionally in the same areas the single columns of the related *Pseudacanthotermes spiniger* (Plate I, fig. 2). In the open grasslands, especially those areas which become seasonal swamps owing to the presence of a hard pan which impedes drainage, the small mushroom-shaped mounds of *Cubitermes sankuruensis* (Plate III, fig. 1), and the less regular mounds of *Cubitermes antennalis* (Plate III, fig. 2) are a common feature (Plate IV, fig. 1).

The small domed nests of *Trinervitermes carbonarius* and *T. auriterrae* resemble stones scattered on the ground in the wooded grassland. The dark coloured cylindrical mounds of *Microcerotermes parvulus* occur in the same area.

In the savanna there occur on the surface of the ground groups of small cones of earth, each of which covers a shaft leading down to the nest of *Odontermes akengeensis* below (Plate II, fig. 2).

TABLE 2. — **Distribution of Termite Species in Soil Samples.**

Vegetation types	Gallery forest	Dry woodland	Wooded savanna	Savanna on slope	Savanna on plateau	Grassy savanna	Savanna with rock outcrops	Savanna on sand	Total occurrences
Number of core-groups	15	3	20	10	8	8	6	11	
Termite species									
RHINOTERMITINAE									
Coptotermes sjöstedti	1	..	..	..	..	..	..	..	1
AMITERMITINAE									
Amitermes evuncifer	..	1	..	..	..	..	..	..	1
Anoplotermes spp.	2	1	3	3	..	..	2	..	11
TERMITINAE									
Basidentitermes aurivillii	4	..	..	..	..	..	1	..	5
Basidentitermes demoulini	2	1	..	..	..	..	..	..	3
Promirotermes pygmaeus	..	..	..	1	..	1	..	..	2
Cubitermes antennalis	..	..	1	..	..	..	..	..	1
Cubitermes sankuruensis	..	..	..	..	..	1	..	..	1
MACROTERMITINAE									
Pseudacanthotermes militaris	1	..	..	..	..	..	..	..	1
Synacanthotermes heterodon	..	..	2	..	1	1	..	..	4
Protermes hirticeps	1	..	..	..	..	..	..	..	1
Macrotermes natalensis	1	..	1	..	..	1	..	..	3
Odontotermes culturarum	..	..	1	..	..	..	..	..	1
Odontotermes scrutor	..	..	..	2	..	1	..	..	3
Ancistrotermes crucifer	1	1	5	2	1	2	..	..	12
Microtermes osborni	3	2	5	4	3	3	..	..	20

TABLE 3. — **Termites found in the mounds of other Termites.**

	Mounds of *Cubitermes antennalis*	Mounds of *Cubitermes sankuruensis*	Mounds of *Trinervitermes auriterrae*	Dead mounds of *Macrotermes*	Also present in soil samples
Anoplotermes spp.	..	+	..	..	+
Microcerotermes parvus	+	+	+	+	..
Basidentitermes aurivillii	..	..	..	+	+
Promirotermes pygmaeus	+	..	..	..	+
Pseudacanthotermes militaris	..	..	..	+	+
Pseudacanthotermes spiniger	+	..	..	+	..
Synacanthotermes heterodon	..	..	..	+	+
Macrotermes spp.	+	..	..	..	+
Odontotermes akengeensis	..	..	..	+	..
Ancistrotermes crucifer	+	+	+	+	+
Microtermes osborni	+	..	..	+	+
Trinervitermes auriterrae	..	+	..	..	+
Trinervitermes oeconomus	+	..	..	..	..
Coarctotermes tenebricus	+	+	..	+	..

Wherever there are trees, both in gallery forest and savannah, they are likely to be used to support an arboreal nest of *Microcerotermes fuscotibialis* or *Amitermes evuncifer* (Plate IV, fig. 2).

Termite mounds are frequently shared by a variety of animals, including ants and other species of termites which nest therein. « Dead » mounds of *Macrotermes* offer a suitable habitat for the establishment of new colonies of ground dwelling termites. Many species of termites are recorded from termite mounds, but it is by no means certain that they do not in fact occur widely below the surface of the level ground. Some collecting was done at Garamba of the animals occurring in the soil of a variety of mounds — « dead » mounds of *Macrotermes*, the mushroom shaped mounds of *Cubitermes antennalis* and *C. sankurensis* and the low domes of *Trinervitermes auriterrae*. Fourteen species of termites were found under these conditions and are listed in Table 3. Of these, eight were also found in soil cores

and may therefore be assumed to have regarded mounds as an extention of the ground. A further two species — *Pseudacanthotermes spiniger* and *Odontotermes akengeensis* — were collected from nests in the ground or are known to be normal subterranean species, though not actually found in soil samples here. *Trinervitermes auriterrae* is another species which makes independant mounds in the area. This leaves only three species which may be regarded as consistently inhabiting mounds made by other species of termites — *Microcerotermes parvus*, *Trinervitermes oeconomus* and *Coarctotermes tenebricus*.

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APPENDIX I

Vernacular (Zande) names for Termites.

akasi, *Odontotermes akengeensis* (525).
alyi, *Pseudacanthotermes spiniger* (4061).
ambulumbayo, *Microtermes osborni* winged adults (3275).
amatindi, *Amitermes evuncifer* (3996).

bakpwa, *Macrotermes natalensis* (555).
bamulikondo, *Odontotermes garambae* (3273).
bulumba, *Amitermes evuncifer* (906).

kakule, *Cubitermes sankurensis* (3274).

matuka, mound of *C. sankurensis* (3274).

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PLANCHES

INSTITUT DES PARCS NATIONAUX
DU CONGO ET DU RWANDA
Exploration du Parc National de la Garamba
Mission H. DE SAEGER (1949-1952)
Fasc. 42

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Fig. 1. — Mound of *Macrotermes natalensis* (HAVILAND), in dry *Isoberlinia* woodland, Iso III, I. VI. 1952.

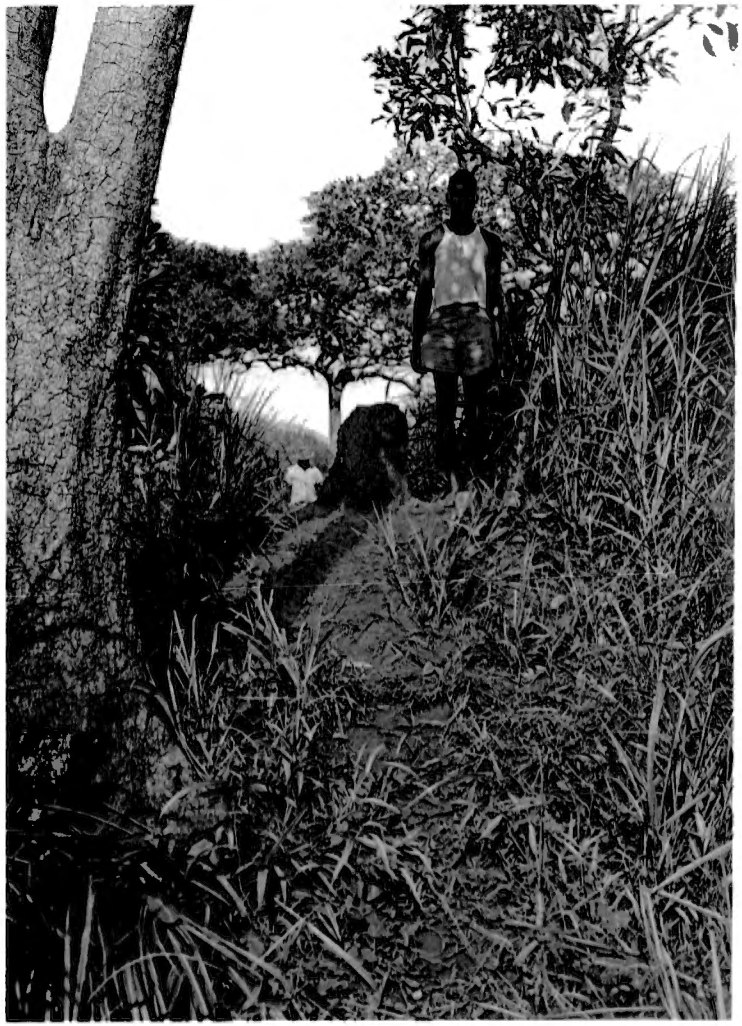

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Fig. 2. — Mound of *Pseudacanthotermes spiniger* (SJÖSTEDT), II/gd/4, 18. IX. 1952.

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Fig. 1. — Turrets on surface of ground above a nest of *Protermes hirticeps* (SJÖSTEDT). Ndelele, 27. III. 1952.

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Fig. 2. — Turrets on surface of ground above a nest of *Odontotermes akengeensis* (EMERSON). I/O/I, 17. V. 1950.

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Fig. 2. — Mound of *Cubitermes antennalis* SJÖSTEDT, in grassland, II/gd/A, 10. XI. 1951.

Photo H. DE SAEGER

Fig. 1. — Mushroom mound of *Cubitermes sankurensis* WASMANN. in grassland with rocky outcrops, K. 17, 18. IV. 1950.

Photo H. DE SAEGER

Fig. 1. — Grassland with mounds of *Cubitermes sankurensis* WASMANN. II/nf/7, 15. III. 1951.

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Fig. 2. — Arboreal nest of *Amitermes evuncifer* SILVESTRI. on trunk of *Afzelia*, I/a/3, 14. IV. 1950.

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