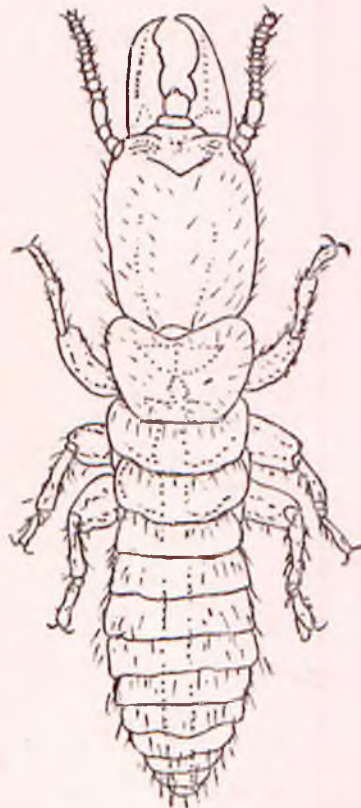


KEYS TO THE GENERA OF ETHIOPIAN TERMITES



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CROP PROTECTION & REGULATORY DEPARTMENT
MINISTRY OF AGRICULTURE



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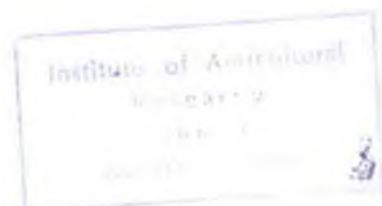
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KEYS TO THE GENERA OF ETHIOPIAN TERMITES

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INTRODUCTION

Termites are social insects that are found throughout the tropics and subtropics. So far, 61 species belonging to 25 genera and 4 families have been recorded in Ethiopia (Cowie et al., 1990). However, only very few of these are regarded as pests of agricultural crops, forestry, rangelands or wooden structures such as houses, grain stores and fences. The rest are harmless either feeding on dead plant materials, soil organic matter or herbivore dung. Therefore, before any termite control measure is undertaken, it is important to determine whether a species of termite is a pest or not. The mere presence of termites does not justify control measures. The next important step is correct identification of the termite pest to select appropriate control measures. Without such vital information any control measure undertaken would be unjustified.

Termite identification is generally based on the alates (winged-form) or soldier characters. Alates are found only at certain times of the year during swarming. As a result they are not widely used, but soldier castes which are found throughout the year are more commonly used in termite identification. This identification key is, therefore, based on soldier characters and the major morphological characters used in the identification of soldiers are shown in Figure 1.

For identification purposes, 10 - 15 specimens preferably major soldiers, for the species that have two types of soldiers, need to be collected and preserved in 80 % alcohol. The specimens are first identified to the family level using the family key provided and then to the genus level. Identification key for species is not included since it is very difficult and for many genera has not been worked out. Similarly, keys for the identification of soldierless termites are not also included since this also requires special equipment and expertise for the dissection of digestive tubes. Moreover, the soldierless termites are not pests since they feed entirely on soil organic matter.

This key is primarily prepared to assist plant health clinic staff of the Ministry of Agriculture in the identification of termites of agricultural importance in their regions. The key could also be used by anyone interested in the identification of Ethiopian termites. The illustrations included in this key are reproduced from Webb (1961), Bouillon and Mathot (1965) and Natural Resources Institute (NRI) unpublished training materials as a supplement to the dichotomous key. If, however, samples cannot be identified using the key provided or confirmation is needed, they can be sent to Shola Crop Protection Laboratory of the Ministry of Agriculture.

KEY TO THE FAMILIES OF ETHIOPIAN TERMITES BASED ON THE
SOLDIER CASTE

1. Fontanelle absent; pronotum with anterior margin concave, flat or if saddle shaped well pigmented eyes present 2

- Fontanelle present, but undetectable in some Termitidae in which case pronotum is saddle-shaped but pigmented eyes are absent 3

2. Cerci 2 segmented; antennae with 19 or fewer segment Kalotermitidae

- Cerci 3 or more segmented; antennae with more than 22 segments Hodotermitidae

3. Pronotum flat, with anterior margin straight or concave Rhinotermitidae

- Pronotum saddle shaped Termitidae

HODOTERMITIDAE

Only one genus (Hodotermes) is reported in Ethiopia, and therefore key is not provided.

KEY TO THE GENERA OF KALOTERMITIDAE

1. Pigmented compound eyes present; pronotum without median anterior lobe Epicalotermes
(Fig. 2)

- Pale, unpigmented eyes present; pronotum large and kidney shaped with sides evenly rounded into the posterior margin Neotermes
(Fig. 3)

KEY TO THE GENERA OF RHINOTERMITIDAE

1. Mandibles without marginal teeth Coptotermes
(Fig. 4)
- Mandibles with marginal teeth 2
2. Left mandible with 5 or more
marginal teeth; right mandible
with 3 marginal teeth Psammotermes
(Fig. 5)
- Left mandible with small teeth;
right mandible without teeth;
labrum sinously curved either
side towards the very small
projecting tip Heterotermes
(Fig. 6)

KEY TO THE GENERA OF TERMITIDAE

1. Head drawn out into long conical
tube; mandibles reduced Trinervitermes
(Fig. 7)
- Head not drawn out into long
conical tube; mandibles well
developed 2
2. Pronotum with 2 spines
projecting from the anterior
edge Pseudacanthotermes
(Fig. 8)
- Pronotum without spines 3
3. Labrum more or less tongue shaped,
rounded or pointed with or without
hyaline tip 4
- Labrum of various shapes, square,
emarginate or trilobed without
hyaline tip 10
4. Mandibles with one or several teeth 5
- Mandibles without teeth 7
5. Left mandible with several teeth,
right mandible with one tooth;
small species Synacanthotermes
(Fig. 10)
- Left mandible with one tooth 6

6. Left mandible with a very robust forwardly directed tooth; right mandible with relatively small tooth Odontotermes (Fig. 9)
- Left mandible with small tooth; small species Microtermes (Fig. 13)
7. Labrum with hyaline tip; large species Macrotermes (Fig. 11)
- Labrum without hyaline tip; small species 8
8. Head long and rectangular; mandibles thick with minute serrations along inner margin Microcerotermes (Fig. 12)
- Head rounded, mandibles slender without serrations along inner margin 9
9. Mandibles strongly curved inwards at tip; antennae 15 segmented Ancistrotermes (Fig. 14)
- Mandibles curved in lightly at tip; antennae 12 to 14 segmented Microtermes (Fig. 13)
10. Mandibles sickle shaped Amitermes (Fig. 15)
- Mandibles not sickle shape 11
11. Front of the head drawn forward into a small nose which lies partly over the labrum; small species Angulitermes (Fig. 16)
- Front of the head not as above 12
12. Labrum forked, deeply bilobed Cubitermes (Fig. 17)
- Labrum not deeply bilobed 13
13. Left mandible bent Pericapritermes (Fig. 18)
- Left mandible not bent ; labrum longer than broad with concave tip Termes (Fig. 19)

MAJOR FEATURES OF TERMITE FAMILIES

1. Kalotermitidae

The Kalotermitidae are commonly known as dry - wood termites, as they live and feed entirely on woody materials without any contact with the soil. Such feeding habits restrict their damage entirely to woody perennial plants such as tea, coffee and citrus. They are represented by two genera in Ethiopia namely Neotermes and Epicalotermes: however, their pest status is not known.

2. Hodotermitidae

The Hodotermitidae are known as harvester termites. They feed mainly on grass and grass litter which they collect during the night or cooler hours of the day. Occasionally, they may feed on non - graminaceous plant materials and herbivore dung. So far only one genus, Hodotermes has been recorded in Ethiopia, but its pest status is not known.

3. Rhinotermitidae

The family Rhinotermitidae consists of several species that could feed on tree stumps and logs. Three genera namely Coptotermes, Heterotermes and Psammotermes have been recorded in Ethiopia. Their pest status is not known; however, elsewhere they are reported as pests of non - staple food crops such as tree crops, sugar cane and tea.

4. Termitidae

The family Termitidae are known as higher termites. Their major characteristic feature is lack of symbiotic intestinal protozoans. They contain 76% of the genera and over 85% of termite species so far described in Ethiopia. The family Termitidae also consists of 4 subfamilies namely Apicotermitinae, Termitinae, Nasutitermitinae and Macrotermitinae. The family Macrotermitinae, also known as the fungus-growing termites contains the major pest species of agricultural importance.

Table 1. Termite species recorded in Ethiopia

Family	Species
subfamily	
Kalotermitidae	Neotermes aridus Wilkinson N. erythraeus Silvestri N. superans Silvestri Epicalotermes aethiopicus Sjostedt
Hodotermitidae	Hodotermes erithreensis Sjostedt H. mossambicus (Hagen)
Rhinotermitidae	Coptotermes amanii (Sjostedt) Heterotermes aethiopicus (Sjostedt) Psammotermes hybostoma Desneux
Termitidae	
Termitinae	Amitermes acinacifer Sands A. evuncifer Silvestri A. lombergianus (Sjostedt) A. messinae Fuller A. sciangallorum Ghidini A. somaliensis Sjostedt A. spinifer Silvestri A. unidentatus (Wasmann) Angulitermes nilensis Harris Cubitermes zavattarii Ghidini Microcerotermes parvulus (Sjostedt) M. parvus (Haviland) Pericapritermes sp. Termes heteraspis (Silvestri)
Apicotermitinae	Adaiphrotermes sp. nr. scapheutes Sands Alyscotermes trestus Sands Astalotermes sp. Astratotermes sp. nr. pacatus (Silvestri) Ateuchotermes rastratus Sands Firmitermes abyssinicus (Sjostedt) F. tripolitanus (Sjostedt)
Nasutitermitinae	Trinervitermes dispar (Sjostedt) T. geminatus (Sjostedt) T. occidentalis (Sjostedt) T. oeconomus (Tragardh) T. rapulum (Sjostedt) T. togoensis (Sjostedt)

Table 1. (Continued)

Family	Subfamily	Species
Termitidae (Continued)		
	Macrotermitinae	Ancistrotermes crucifer (Sjostedt) A. latinotus (Holmgren) A. periphraasis Sjostedt Macrotermes subhyalinus (Rambur) M. herus (Sjostedt) Microtermes aethiopicus Barnett et al. M. magnocellus (Sjostedt) M. neghelliensis Ghidini stat.nov. M. tragardhi (Sjostedt) Microtermes sp. nr. vadschaggae (Sjost.) Odontotermes anceps (Sjostedt) O. badius (Haviland) O. boranicus (Ghidini) O. bottegoanus (Sjostedt) O. classicus (Sjostedt) O. ebeni (Sjostedt) O. maledictus (Ghidini) O. mediocris (Sjostedt) O. montanus (Harris) O. rectanguloides Sjostedt O. rothschildianus (Sjostedt) O. smeathmani (Fuller) O. somaliensis (Sjostedt) Pseudacanthotermes militaris (Hagen) Synacanthotermes sp. nr. zanzibarensis (Sjost.)

Source: Cowie et al. (1990)

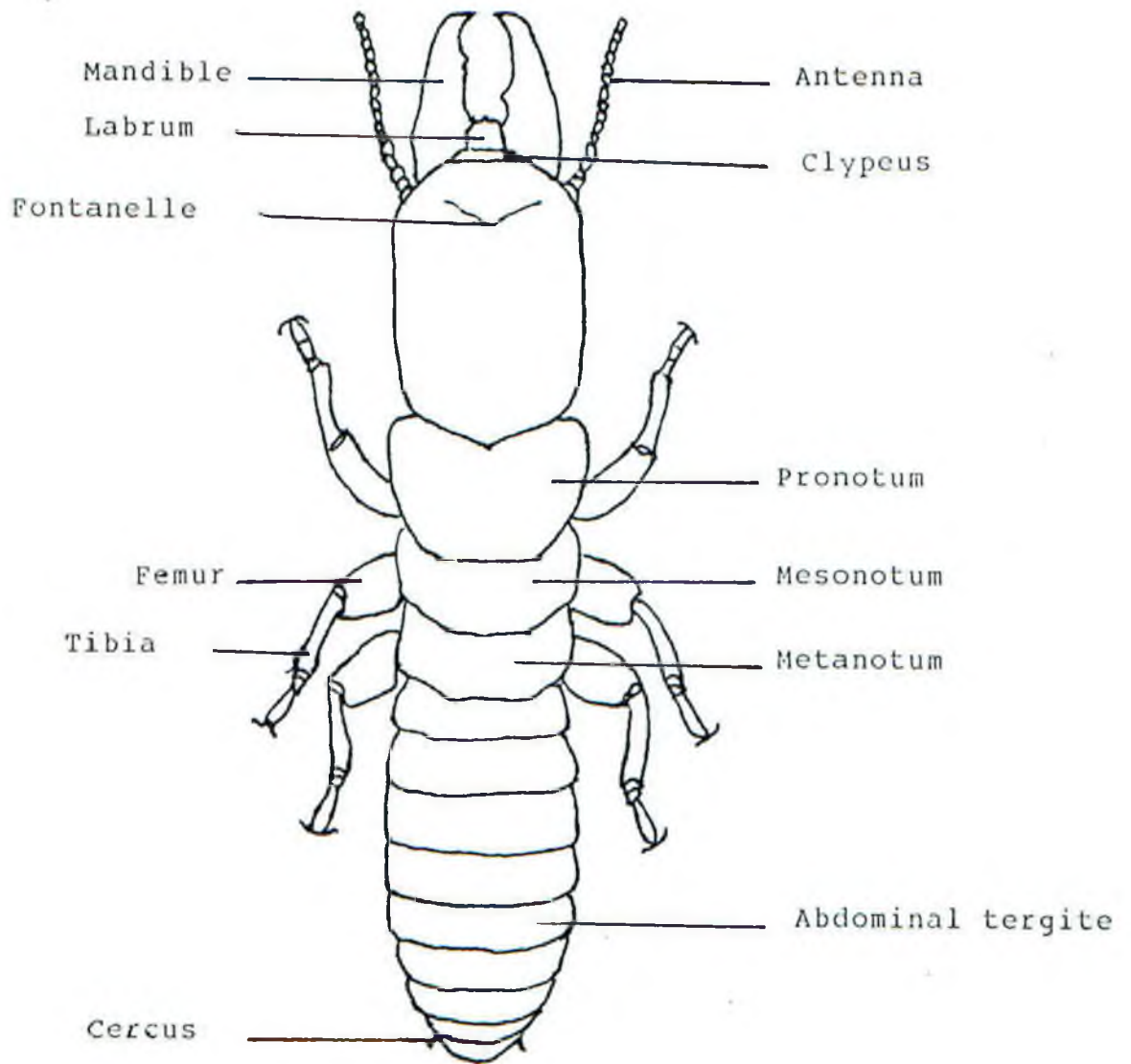


Fig. 1 Dorsal view of soldier caste

KALOTERMITIDAE



Fig. 2 Epicalotermes

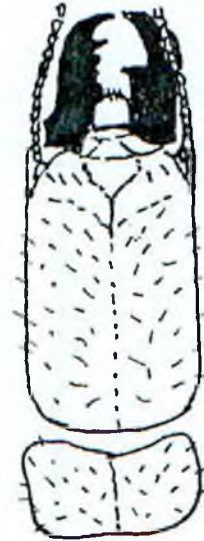


Fig. 3 Neotermes

RHINOTERMITIDAE



Fig. 4 Coptotermes



Fig. 5 Psammotermes



Fig. 6 Heterotermes

TERMITIDAE

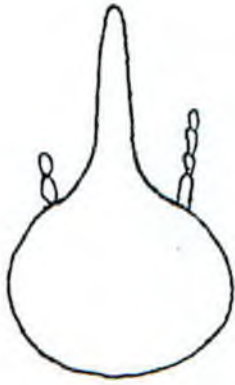


Fig. 7 Trinervitermes



Fig. 8 Pseudacanthotermes



Fig. 9 Odontotermes

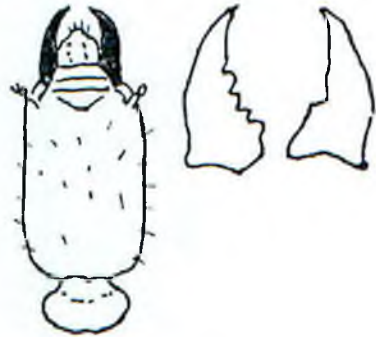


Fig. 10 Synacanthotermes

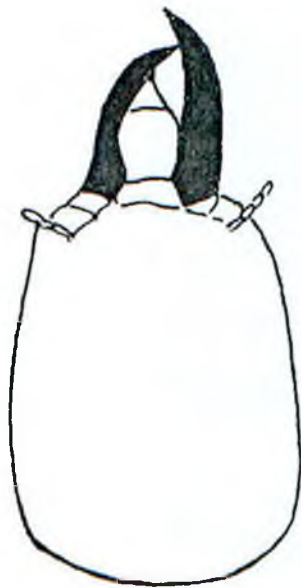


Fig. 11 Macrotermes



Fig. 12 Microcerotermes



Fig. 13 Microtermes

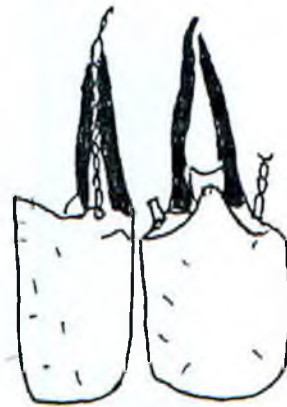


Fig. 14 Ancistrotermes



Fig. 15 Amitermes

lateral
view



dorsal
view

Fig. 16 Angulitermes



Fig. 17 Cubitermes



Fig. 18 Pericapritermes



Fig. 19 Termes

GLOSSARY

Anterior	- Front; in front of
Bilobed	- Having two lobes
Castes	- The various forms of matured individuals such as workers, soldiers, queens, etc.
Cercus (Pl., cerci)	- One of a pair of appendages at the end of abdomen (Fig. 1)
Concave	- Hollowed out; the interior of a sphere
Conical	- Cylindrical, with a flat base, tapering to a point
Emarginate	- Notched; with an obtuse, rounded or quadrate section cut from a margin
Fontanele	- A small depressed, pale spot on the front of the head between the eyes (Fig. 1)
Forked	- Having fork or forklike end
Hyaline	- Transparent or partly so
Labrum	- The upper lip, lying just below the clypeus (Fig. 1)
Lobe	- Any prominent rounded process
Mandible	- Jaws; one of the anterior pair of the paired mouthpart structures (Fig. 1)
Marginal teeth	- teeth on the inner side of a mandible
Pigmented	- Colored
Posterior	- Hind or rear
Pronotum	- The upper or dorsal surface of the prothorax
Robust	- Stout or thickened
Serration	- A tooth along the edge like a saw
Sinous	- Undulating; curved in and out
Spine	- A thornlike outgrowth of the cuticle
Trilobed	- Having three lobes

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