

THE FAUNA OF AN ISLAND IN THE CHILKA LAKE.

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THE TERMITES OF BARKUDA ISLAND.

By F. SILVESTRI.

Dr. N. Annandale has carefully investigated the fauna of the small island Barkuda in the southern part of the Chilka Lake, and with the assistance of various specialists has already given an account of some part of this interesting collection. I have received the Termites and have found that they are represented by 10 species and 3 varieties of which 2 species with a subgenus and 3 varieties are described here as new; the others belong to species which have a wide distribution in South India.

My best thanks are due to Dr. N. Annandale for the very kind communication of this and other interesting material.

Genus **Odontotermes** Holmgr.

Subgenus **Euscaiotermes**, nov.

Miles. Caput antice parum angustatum, supra vix convexum, antennis 17-articulatis, labre paullum longiore quam latiore, mandibula laeva parte basali dente obtuse armata, parte distali excavatione magna, angule acute infere et dente obtuse supero limitata, affecta, parte apicali attenuata aliquantum curvata; mandibula dextera parte distali simplici inermi.

Pronotum lobe antice sat parvo.

Observatio. Subgenus hoc militis mandibulae laeva forma bene distinctum est.

Odontotermes (Euscaiotermes) primus, sp. nov.

(Fig. I.)

Miles. Corpus melleo-ochroleucum capite latericio mandibulis nigris. Caput c. 1/9 longius quam latius, antice parum angustatum supra parum convexum, setis nonnullis instructum, labro paullum longiore quam latiore, antice triangulari, lateribus convexis, supra setis 7+7 sat

¹ For Part I see *Rec. Ind. Mus.* XXII, pp. 313—422 (1921); for Part II see *ibid* XXIV, pp. 289—311 (1922).

longis instructo, antennis 17-articulatis articulo tertio quam secundus c. $\frac{1}{3}$ et quam quartus parum brevior, mandibulis vide fig. I, 3.

Pronotum lobi antici margine supero parum sinuato, margine postico vix sinuato, superficie setis nonnullis brevibus et brevioribus instructa; meso et metanoti margine postico subrecto, angulis laterali-
bus rotundatis.

Pedes primi paris bene setosi, tibiae calcare externo quam interna parum brevior, secundi paris tibia setis distalibus externis duabus quam ceterae parum robustioribus.

Abdomen setis sat longis, brevibus et brevioribus sat numerosis instructum. Cerci breviores parte distali conica.

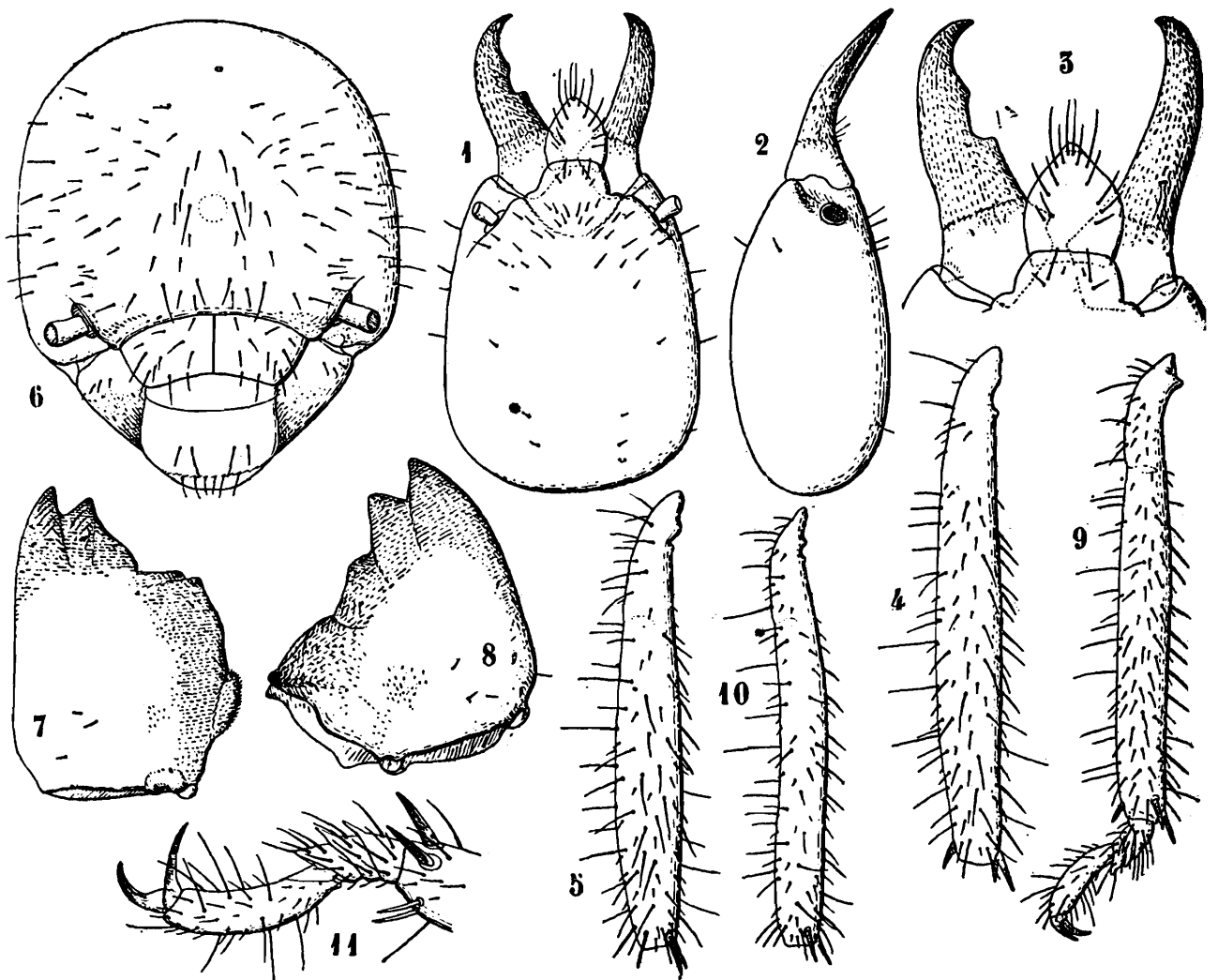


FIG. I.—*Euscaiotermes primus*: 1. militis caput pronum; 2. idem lateraliter inspectum; 3. ejusdem pars antica cum mandibulis prona; 4. militis tibia primi paris; 5. militis tibia secundi paris; 6. operarii caput pronum; 7, 8. ejusdem mandibulae; 9. operarii pes primi paris a tibia; 10. operarii tibia secundi paris; 11. tibiae ejusdem apex cum tarso et praetarsis.

Long. corp. 8 mm., long. capitis 2.85, ejusdem lat. 2.40, long. mandib. 1.60, antennarum 2, tibiae III, 2.2.

Operarius. Corpus ochroleucum capite ochraceo-ferrugineo, abdomine cibi contenti causa cinereo parum conspurcato.

Caput parum latius quam longius, clypeo bene inflato, ejusdem dimidia parte c. $\frac{1}{3}$ latiore quam longiore, fontanella ochroleuca circulari sat magna, antennis 19-articulatis, articulo secundo quam tertius

parum minus quam duplo longiore, articulo quarto quam tertius parum brevior et quam quintus parum-longiore, mandibulis vide fig. I, 7-8.

Pronotum lobi antici margine supero medio parum sinuato, margine postico ut idem mesonoti medio parum sinuato, metanoti margine postico medio vix sinuato.

Pedes et abdomen eisdem militis subsimilia.

Long. corp. 5.5 mm. long. capitis 1.62, ejusdem lat. 1.78, long. antennarum 2.70, tibiae III 1.85.

Habitat. Barkuda I. A few workers and a soldier under stone.

Subgenus **Odontotermes** Holmgr.

Odontotermes (O.) feae (Wasm.)

Winged specimens "swarming in middle of night," 12.vi.1920, and a few soldiers and workers collected among roots of a dead tree; a few workers found in interior of a dead tree-trunk.

This species is widely distributed in South India.

Odontotermes (O.) oblongatus Holmgr.

I refer to this species a few soldiers and workers collected in a dead tree-trunk.

The soldiers have the head (always without mandibles) 1.85 mm. long, 1.27 wide, with mandible 0.92 long, antennae 16-jointed with the fourth the shortest.

This species was hitherto recorded only with doubt from "Hinter Indien."

Subgenus **Cyclotermes** Holmgr.

Odontotermes (C.) obesus (Ramb.)

(Fig. II.)

This is the commonest species of Termite on Barkuda I. I refer to the typical form most of the specimens collected by Dr. Annandale.

Winged specimens collected on the 12th of June have the following dimensions :

Female : body with wings 27 mm. long, without wings 15, head 2.25 long, 2.15 wide between the eyes, the latter 0.75 in longitudinal diameter. Antennae of 19 joints of which the third is the shortest, about half as long as the second and a little shorter than the fourth.

Soldier major with head 1.34 long (without mandibles), 1.24 wide, mandibles 0.90 long, antennae 17-jointed with the third the shortest.

Soldier minor with head 0.97 long, 0.93 wide, mandibles 0.64 long, antennae 5-jointed with the third the shortest.

Between the forma major and forma minor there are intermediates.

The queen and a king of a nest collected by F. H. Gravely in Aug., 1909, have a lesser stature than the above: in the king the head (Fig. II, 2) is 2.15 long, 1.95 wide between eyes, the latter with a longitudinal diameter of 0.65.

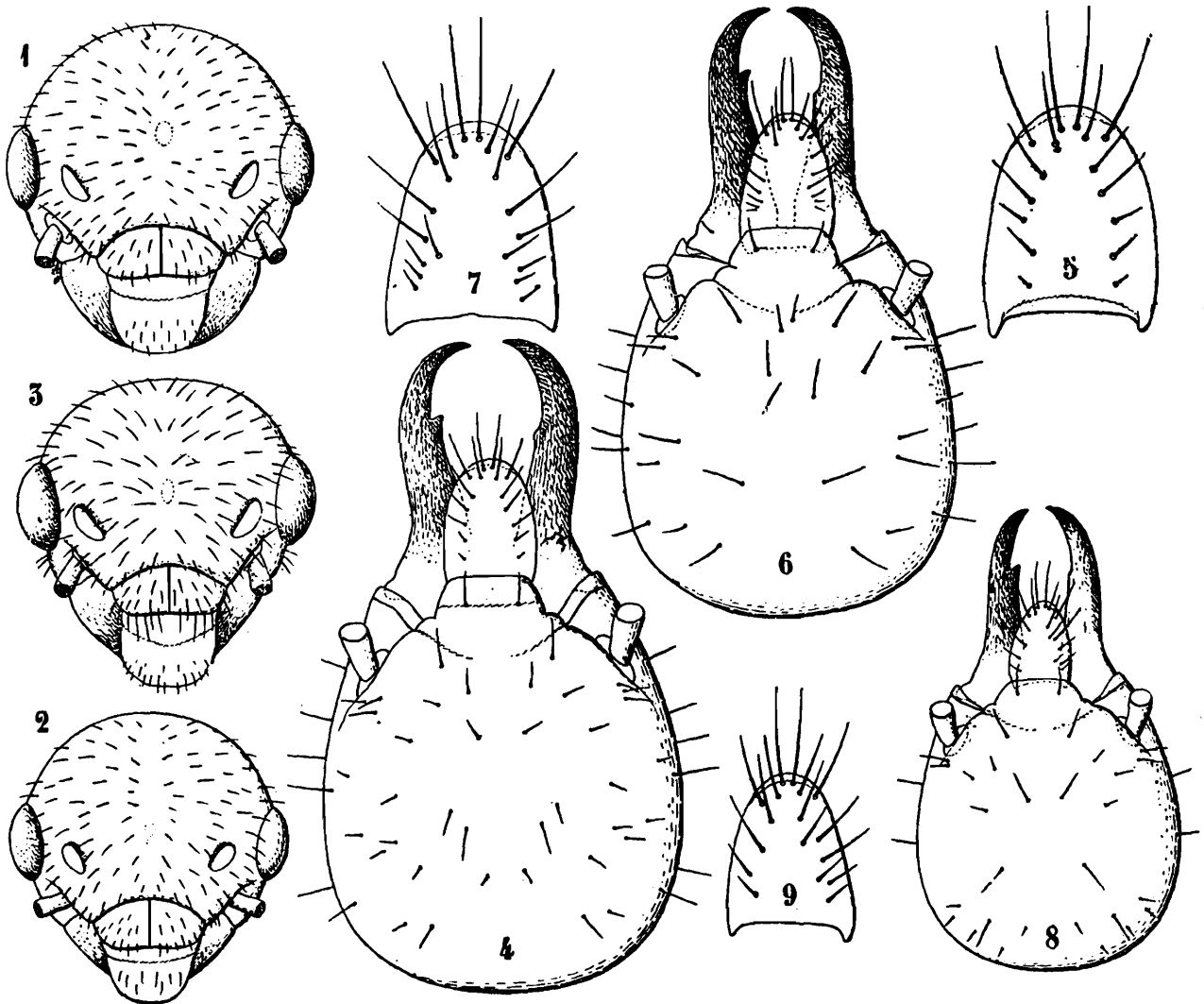


FIG. II.—1. *Odontotermes obesus*, forma typica: alati caput pronum; 2. *Odontot. obesus*, forma typica minor: regis caput pronum; 3. *Odontot. obesus* v. *oculatus*: reginae caput pronum; 4, 5. *Odontot. obesus*: militis maioris caput et ejusdem labrum; 6, 7. militis intermedii caput et ejusdem labrum; 8, 9. militis minoris caput et ejusdem labrum.

***Odontotermes obesus* (Ramb.) var. *oculatus*, nov.**

(Fig. II.)

In a nest opened by Dr. Annandale on Oct. 30th, 1920, he found a big queen 60 mm. long, which has the head 2.15 mm. long and 1.95 wide between the eyes. The eyes are bigger than in the typical form; they have a longitudinal diameter of 0.78 and are very distinctly more prominent. For this reason, and at any rate until we do know the variations of the widely distributed *Odontotermes obesus* more exactly, I regard the form as new.

The soldiers and workers are indistinguishable from those of the typical form.

Microtermes anandi Holmgr.

Few soldiers and workers in dead tree-trunk, numerous workers and few soldiers in galleries.

This species is widely distributed in South India.

Coptotermes heimi Weism.

Specimens were collected under the bark of a dead tree-trunk (*Ficus bengalensis*) lying on the ground. This species also is widely distributed in South India.

Coptotermes parvulus Holmgr.

A good number of specimens: workers and soldiers. This species was recorded hitherto only from the Bombay Presidency.

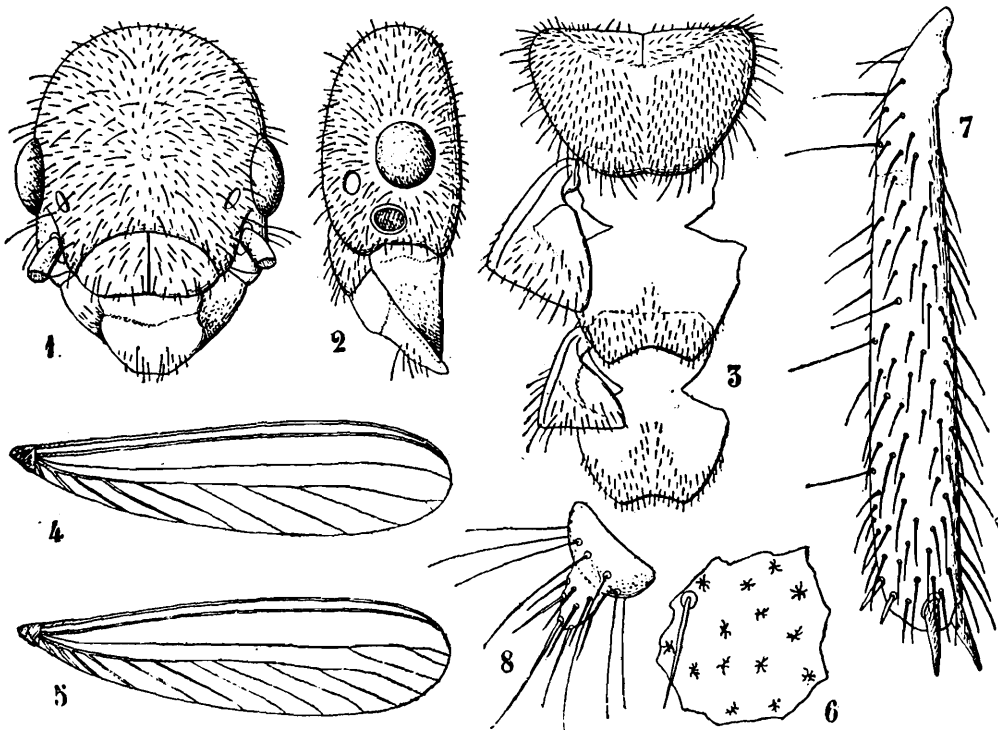


FIG. III.—*Microcerotermes annandalei*, femina: 1. caput pronum; 2. idem lateraliter inspectum; 3. thorax pronum; 4, 5. ala anterior et ala posterior; 6. alae particula multo ampliata; 7. tibia secundi paris; 8. cercus.

Microcerotermes annandalei, sp. nov.

(Figs. III, IV.)

Femina alata. Corpus castaneum ventre rufescente urosternorum maxima pro parte rufo-castanea.

Caput c. $\frac{2}{9}$ longius quam inter oculos latius, supra setis brevibus parum numerosis et setis brevioribus magis numerosis instructum, fenestra parva fusca, clypeo parum inflato, ejusdem dimidia parte paulum latiore quam longiore, oculis parvis bene convexis, ocellis parvis ab oculis quam ocelli diametros transversalis parum minus distantibus, antennis 14-articulatis articulo tertio quam secundus dimidio brevior et quam quartus c. $\frac{1}{3}$ brevior.

Pronotum quam caput cum oculis parum magis quam $\frac{1}{8}$ minus latum, antice breve tractu sursum vergente lateribus gradatim aliquan-

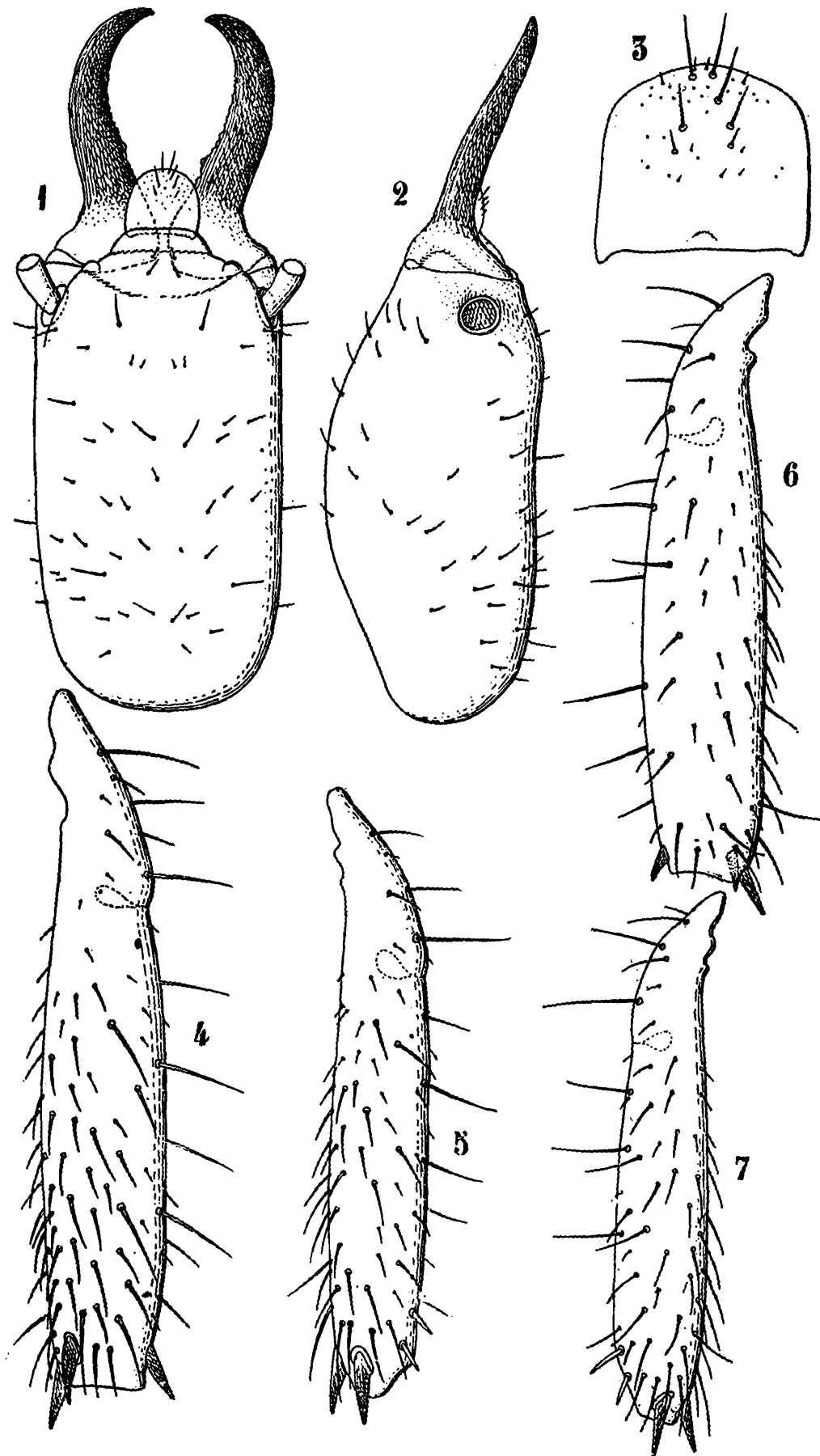


FIG. IV.—*Microcerotermes annandalei*, miles; 1. caput pronum; 2. idem lateraliter inspectum; 3. labrum; 4. tibia primi paris; 5. tibia secundi paris; 6. operarii tibia primi paris; 7. Operarii tibia secundi paris.

tum convergentibus, margine postico medio paullum sinuato, angulis posticis rotundatis; meso et metanotum lateribus partem posticam versus parum convergentibus, margine postico lato, mesonoti aliquantum, metanoti parum sinuato.

Alae superficie setis sparsis et tuberculis minimis 5-6 radiatis obsessa, venis vide fig. III, 4-5.

Pedes bene setosi, tibia secundi paris spinis duabus distalibus externis brevibus, sat robustis, approximatis.

Abdomen tergitis et sternitis setis brevioribus et brevissimis numerosis, nec non urosternitis setis nonnullis sat longis instructis, pleuris setis brevissimis obsessis. Cerci breviores setis vide fig. III, 8.

Long corp. cum alis 9, sine alis 5, long capitis 0.94, ejusdem lat. inter oculos 0.74, long. antennarum 1.30, alae anterioris 7.3, ejusdem lat. 1.9, long tibiae III, 1.

Miles. Corpus ochroleucum capite ochraceo vel ochraceo-latericio praesertim antice, mandibulis maxima pro parte nigris.

Caput rectangulare fere duplo longius quam latius, ante mediam frontem paullum concavum, antice descendens, labro paullum latiore quam longiore antice paullum convexo setis superis 5-6 brevibus et nonnullis brevissimis, mandibulis quam capitis longitudo fere dimidio brevioribus aliquantum arcuatis, margine interno irregulariter serrato, antennis 13-articulatis, articulo tertio quam secundus dimidio et quam quartus $1/3$ brevior.

Pronotum lobi antici margine supero medio aliquantum sinuato, superficie setis nonnullis sat longis, brevioribus et brevissimis instructa, mesonoti margine postico paullum, metanoti vix sinuato.

Pedes vide fig. IV, 4-5.

Abdominis tergita et sternita setis paucis sat longis, aliis brevioribus et setis brevissimis sat numerosis instructa.

Cerci parte distali parum elongata, subconica.

Long. corp. 5 mm., long. capitis 1.90, ejusdem lat. 1, long. mandibularum 1.04, antennarum 1.56, tibiae III, 0.90.

Operarius major. Corpus stramineum capite ochroleuco, abdomine cibi contenti causa plus minusve cinereo maculato.

Caput parum longius quam latius, supra setis brevibus sparsis et setis brevioribus sat numerosis instructum, fontanella sat parva, circulari, clypeo parum inflato, ejusdem dimidia parte subaeque longa atque lata, antennis 13-articulatis articulo tertio quam secundus dimidio et quam quartus parum brevior.

Pronotum lobi antici margine supero medio aliquantum sinuato, cetero thorace et abdomine eisdem militis similibus.

Pedes vide fig. IV, 6-7

Long. corp. 4.8 mm., long. capitis 1.15, ejusdem lat. 1.04, long. antennarum 1.18, tibiae III, 0.78.

Operarius minor. Long. corp. 4 mm., long. capitis 0.84, ejusdem lat. 0.78, long. antennarum 1.10, tibiae III, 0.70.

Antennae 13-articulatae eisdem operarii majoris similes.

Habitat. A small number of specimens was collected under bark of a dead tree-trunk, June 1920.

Observatio. Species haec ad *M. fletcheri* Holmgr. proxima est, sed statura minore et militis labri forma distincta.

***Eurytermes assmuthi* Wasm.**

Not having winged forms, I refer with some reserve to this species a number of nymphae, workers and a soldier collected from a bank of earth among roots of *Hemigyrosa canescens* (24-29·x·20), and a few specimens from small chambers at the roots of a fig tree (11·x·1920).

The nymphae, with alar paiths 2 mm. long, have the body 8 mm. long.

The soldier has head 1·82 mm. long, 1·17 wide with mandibulae 0·90 long, antennae of 14 joints, of which the third is a little shorter than the second and a little longer than the fourth.

In workers the head is 0·94 mm. wide.

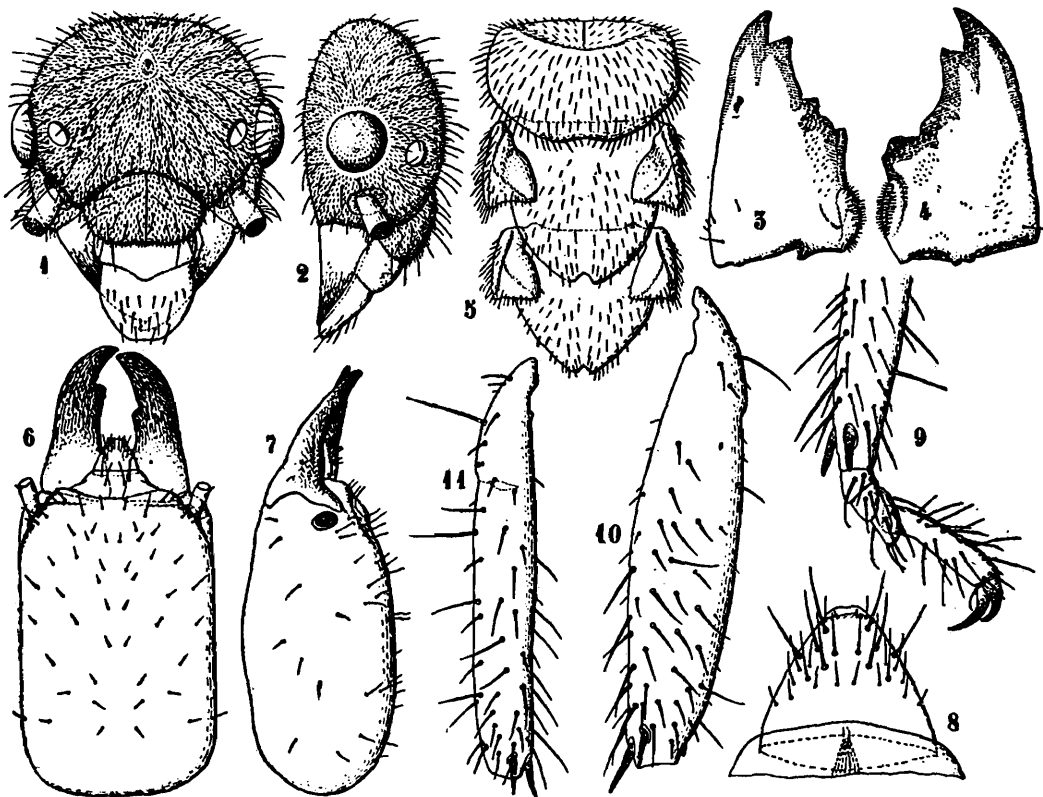


FIG. V.—*Eurytermes assmuthi* v. *modestior*, femina: 1. caput pronum; 2. idem lateraliter inspectum; 3, 4. ejusdem mandibulae; 5. thorax pronus; 6. militis caput pronum; 7. idem lateraliter inspectum; 8. ejusdem labrum; 9. militis pes tertii paris a tibiae parte distali; 10. operarii tibia primi paris; 11. operarii tibia secundi paris.

***Eurytermes assmuthi* Wasm. var. *modestior*, nov.**

(Fig. V.)

A small nest with very young queen and king, a number of workers and a soldier. The specimens from this nest are smaller than the typical form. The difference of size of worker and soldier may be related to the age of the nest, but the royal pair is smaller than in *Eurytermes ceylonicus* Holmgr. and the eyes larger than in *Eurytermes assmuthi* Wasm. from Kandala.

Queen. Length of body 6 mm., of head 0·96; width of the same between the eyes 0·90; length of antennae 1·72; of tibia III, 1·18,

Antennae composed of 15 joints of which the second is double the length of the third which is subequal to the fourth.

Soldier. Head 1.70 mm. long, 1.08 wide, mandible 0.78 long.

Antennae 14-jointed, second joint *ca.* 1/3 longer than third which is a little longer than fourth.

Worker. Head 0.84 mm. wide.

Capritermes obtusus sp. nov.

(Figs. VI, VII.)

Femina alata. Corpus castaneum capite, clypeo et labro rufis exceptis, et meso- et metanoti parte postica aliquantum obscurioribus, sternorum parte mediana cremaea vel ochroleuca, pedibus rufescentibus, alis fumosis.

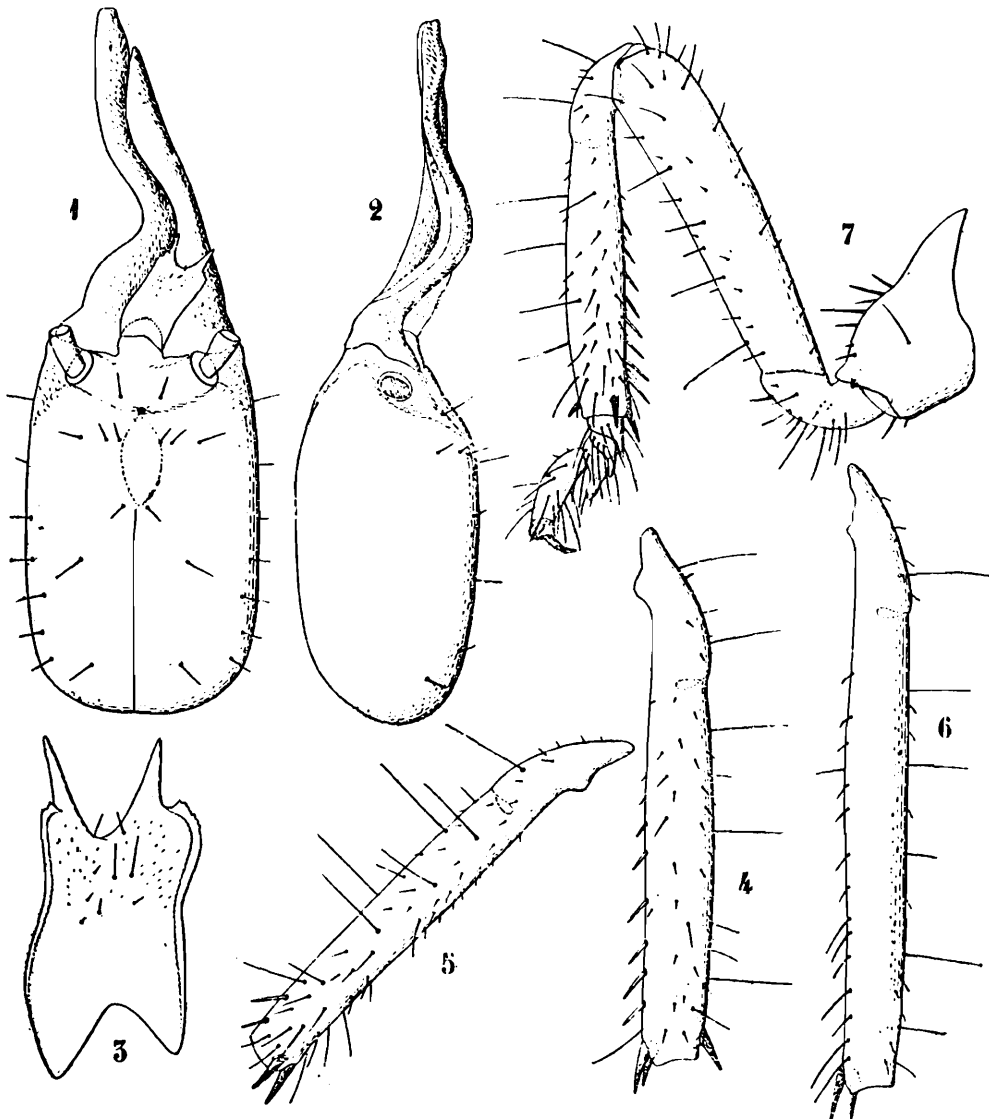


FIG. VI.—*Capritermes obtusus*, miles: 1. caput pronum; 2. idem lateraliter inspectum; 3. labrum; 4. tibia primi paris; 5. tibia secundi paris; 6. tibia tertii paris; 7. operarii pes primi paris.

Caput subaeque longum atque inter oculos latum, supra setis sat numerosis, sat longis et setis brevioribus magis numerosis instructum, fenestra parva angusta elongata quam ceterum caput pallidiore, clypeo

sat inflato, ejusdem dimidia parte subaeque longa atque lata, oculis parvis, bene convexis, ocellis ab oculis quam ocelli diametros transversalis parum magis distantibus, antennis 14-articulatis, articulo tertio secundum longitudine aequante, quam quartus c. $1/4$ longiore.

Pronotum quam caput cum oculis aliquantum (8.5 : 7) minus latum, antice brevi tractu sursum vergens, lateribus postico convergentibus, angulis rotundatis, margine postico medio parum sinuato; meso- et metanotum lateribus convergentibus, margine postico angulatim profunde inciso, angulis posticis plus minusve acutis.

Alae superficie tuberculis 6-7 radiatis obsessa et setis nonnullis brevibus sparsis instructa, venis vide fig. VI, 4-5.

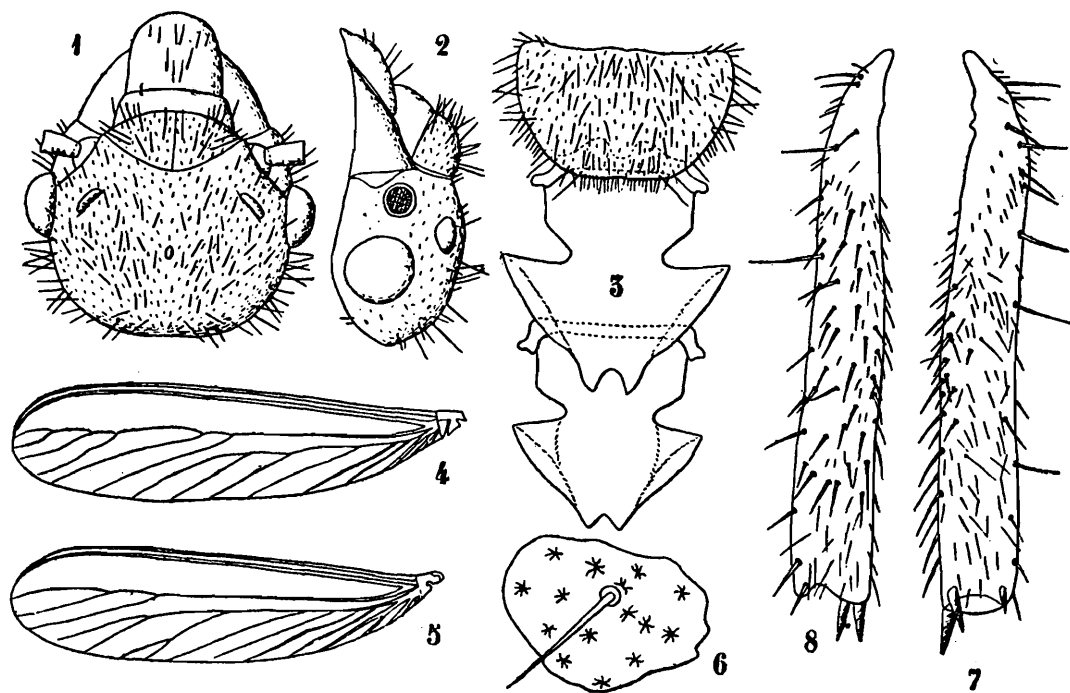


FIG. VII.—*Capritermes obtusus*, femina: 1. caput pronum; 2. idem lateraliter inspectum; 3. scuta thoracalia prona; 4, 5. ala superior et ala inferior; 6. alae particula multo ampliata; 7. tibia pedis primi paris; 8. tibia secundi paris.

Pedes primi paris tibia interne setis sat numerosis et sat robustis, calcare externo quam interno paullum brevior, secundi paris tibia setis spiniformibus duabus subapicalibus sat robustis, calcaribus bene evolutis.

Abdominis tergita et sternita setis brevibus sat numerosis (per sterna magis numerosis) et brevioribus pernumerosis instructa, pleuris setis brevioribus numerosis vestita.

Long. corporis cum alis 12 mm., sine alis 7, long. capitis 1.09, ejusdem lat. inter oculos 1.10, diametros long. oculi 0.28, long. antennarum 2, alae anticae 10, ejusdem lat. 2.6, long. tibiae III, 1.38.

Miles. Corpus cremeum capite ochraceo antice plus minusve ochraceo-ferrugineo, mandibulis nigris.

Caput c. $1/3$ longius quam latius, lateribus subparallelis, margine antico sublaterali obtuso, haud producto, fontanella perparva, glandula parva, dorso subplano, parte antica discendente, superficie setis paucis instructa, labro longo, a media basi ad medium marginem anticum,

menso, subaeque longo atque lato, antice profunde sinuato angulis attenuatis elongatis corniformibus, ad processuum anticorum basim externam minute et irregulariter inciso, mandibula laeva capitis longitudinem aequante, forma vide fig. VI, 1-2, antennis 14-articulatis, articulo tertio quam secundis fere $1/4$ brevior et quartum longitudine subaequante.

Pronotum quam caput parum minus quam dimidium minus latum, lobi antici margine supero medio vix inciso, setis nonnullis sat longis et aliis brevibus instructum, mesonoti margine postico paullum sinuato, metanoti margine postico subrecto angulis rotundatis.

Pedes primi paris coxis setis nonnullis brevioribus robustis, tibia interne setis robustis 6-7, calcare externo bene evoluto, secundi paris tibia spinis duabus distalibus externis attenuatis.

Abdomen setis sat longis, brevibus et brevioribus instructum.

Cerci breviores parte distali subconica.

Long. corp. 5.2 mm., long. capitis 2, ejusdem lat. 1.30, long. mandibulae laevae 2, antennarum 2.20, tibiae III, 1.20.

Operarius. Corpus cremeum capite ochroleuco abdomine cibi contenti causa cinereo.

Caput c. $1/10$ latius quam longius supra setis brevibus et brevioribus parum numerosis instructum, fontanella circulari sat magna, straminea, clypeo bene inflato ejusdem dimidia parte aequae longa atque lata, antennis 14-articulatis, articulo tertio quam secundus fere dimidio brevior et secundum longitudine subaequante.

Pronotum lobi antici margine supero rotundato, cetero thorace et abdomine eisdem militis similibus sed setis aliquantum brevioribus.

Pedes vide fig. VI, 7

Long. corp. 4 mm., long. capitis 0.92, ejusdem lat. 1.02, long. antennarum 1.40, tibiae III, 0.94.

Habitat. Barkuda I. A few specimens under stone on damp soil at base of small fig-tree (N. Annandale, 20.vii.1920). Many winged females with workers and soldiers (N. Annandale, 3.vi.22).

Observatio. Species haec a *C. longirostris* Wasm. militis capitis margine antico sublaterali obtuso distinctissima est.

Capritermes obtusus Silv. var. **abbreviatus**, nov.

(Fig. VIII.)

Miles. Long. corp. 4.5 mm., long. capitis 1.70, ejusdem lat. 1.15, long. mandibulae laevae 1.70, antennarum 1.95, tibiae III, 1.15.

Antennae 14-articulatae, articulo tertio quam secundus parum brevior et quartum longitudine subaequante.

Operarius. Long. corp. 4 mm., long. capitis 0.80, ejusdem lat. 0.97, long. antennarum 1.35, tibiae III, 0.85.

Antennae 14-articulatae, articulo tertio quam secundus c. $1/3$ brevior et quam quartus aliquantum longiore.

Habitat. Barkuda I., Chilka L., operarios nonnullos et militem.

Observatio. Varietas haec a forma typica statura distincte minore notanda est.

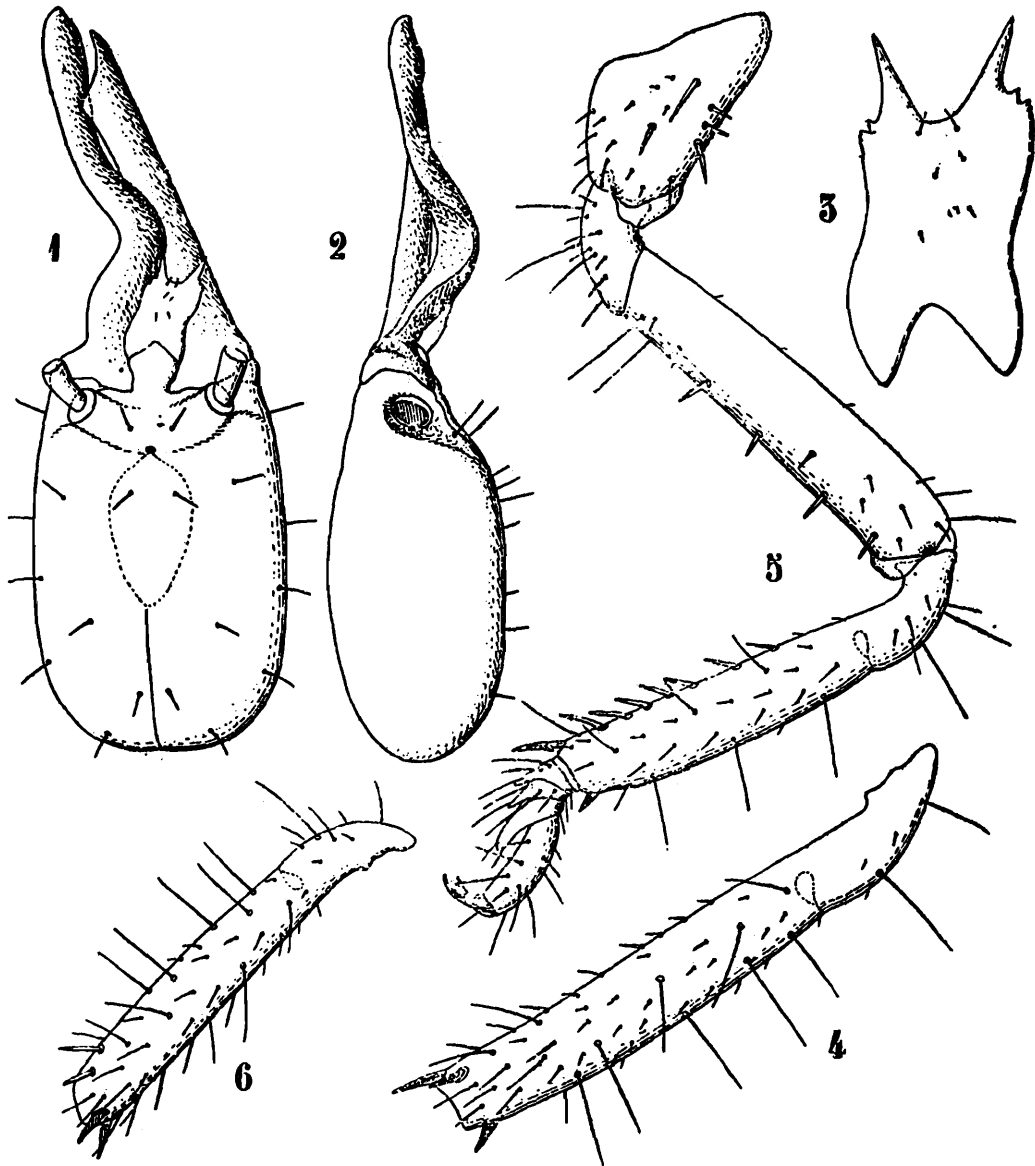


FIG. VIII.—*Capritermes obtusus* v. *abbreviatus*, miles: 1. caput pronum; 2. caput lateraliter inspectum; 3. labrum; 4. tibia primi paris; 5. operarii pes primi paris; 6. operarii tibia secundi paris.