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A provisional list of the Balkan ants (Hym. Formicidae) with a key to the worker caste. II. Key to the worker caste, including the European species without the Iberian.

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In this work a key to the worker caste of more than 280 ant species (Hym. Formicidae) of Europe without Spain is provided. It has been worked out by the means of new collections by the authors (1983–85) and out of material from the KUTTER and the FOREL collections at Egg and Geneva respectively. A synonymic list and notes on the distribution of these species are presented in the first part (AGOSTI & COLLINGWOOD 1987).

INTRODUCTION

The material has been collected during the years 1983–85 towards a fauna of the Balkans. To encourage collectors and facilitate recording, a synonymic list (AGOSTI & COLLINGWOOD 1987) and keys to the worker caste have been prepared. Both list and keys are of provisional nature as some of the earlier records are doubtful and in many cases correct synonymy has not been established and must await further revisionary studies. Only keys to the worker caste are possible at that time, since males and females are still unknown for many of the species groups apart from *Myrmica, Lasius* and *Formica.* Both list and keys include species known to exist on the Balkans or expected to be there. Additionally the European species (without the Iberian) have been included in order to provide keys to a larger part of Europe, for the first time. Out of 319 taxa listed in the first part, a few have been omitted from the keys where specimens have not been available for examination and original descriptions have been inadequate to distinguish them clearly. The key to *Epimyrma* spp. has been prepared by BUSCHINGER. To save space, and because of its provisional nature, illustrations are presented for those genera and species groups, which are neither available in KUTTER (1977) nor in COLLINGWOOD (1979). Otherwise we refer to COLLINGWOOD and KUTTER; C (No. of figure) and K respectively. Additional keys for parts of Europe, based on modern taxonomy are those of ARNOLDI & DLUSSKY (1978; European part of the USSR), BERNARD (1968; France), BOLTON & COLLINGWOOD (1975, Britain), BOVEN (1986; Benelux), COLLINGWOOD (1978; Iberian Peninsula), COLLINGWOOD (1979; Fennoscandia and Denmark) and KUTTER (1977; Switzerland). A catalogue for the Italian species is provided by BARONI URBANI (1971). It is hoped that collectors will point out defects in the keys and provide additional records so that a fuller and more accurate text can be prepared in due course.

AMENDMENTS OF THE SYNONYMIC LIST

Myrmicinae, Myrmicini:
Myrmica hellenica FOREL 1913 (not FINZI 1926!) bon. sp. (SEIFERT, in. lit.), recorded from Bulgaria, Greece, and Yugoslavia.

Myrmicinae, Leptothoracini:
Myrmoxenus gordiagini RUZSKY 1902, recorded from Yugoslavia (BUSCHINGER & al. 1983).

Formicinae, Formicini:
Cataglyphis italica (EMERY) 1906 n. stat. *(Myrmecocystus cursor ssp. italica)*
Proformica kaszabi DLUSSKY 1969 (not *P.* [=*Polyergus*] *kaszabi*)

ABBREVIATIONS, MEASUREMENTS AND INDICES

Alitrunk Length (AL): The diagonal length of the alitrunk in profile from the point at which the pronotum meets the cervical shield to the posterior base of the metapleuron.

C. Figure in COLLINGWOOD 1979

Cephalic Index (CI): $\frac{HW \times 100}{HL}$

Clypeal Notch Index (CNI): $\frac{CND \times 100}{CNW}$

Clypeal Notch Depth (CND): Measured from the midpoint of a transverse line spanning anteriormost projecting points of the clypeus to the posteriormost of the concavity.

Clypeal Notch Width (CNW): Measured between the two anteriormost projecting points of clypeus.

Eye Length (EL): The maximum length of the eye.

Face Index (FI): $\frac{EL \times 100}{HW}$

Head Length (HL): The length of the head proper, excluding the mandibles, measured in a straight line from the mid-point of the anterior clypeal margin to the mid-point of the occipital margin, in full-face view, ignoring any projecting teeth which may be present on the clypeus. In species where the occipital margin or the clypeal margin (or both) is concave the measurements taken form the mid-point of a transverse line spanning the anteriormost or posteriormost projecting points respectively.

Head Width (HW): The maximum width of the head in full-face view, measured below the eyes.

K: Figure in KUTTER 1977.

Pedicel Index (PI): $\frac{PW \times 100}{PPW}$

Petiole Width (PW): The maximum width of the petiole, mesured in dorsal view.

Postpetiole Index (PPI): $\frac{PPW \times 100}{HW}$

Postpetiole Width (PPW): The maximum width of the postpetiole, measured in dorsal view.

Scape Index (SI): $\frac{SL \times 100}{HW}$

Scape Length (SL): The maximum straight line length of the antennal scape excluding the basal constriction of neck close to the condylar bulb.

KEYS

Key to subfamilies

1 Pedicel with 2 distinct segments—the petiole and postpetiole (Fig. 5) . 2
– Pedicel with a single node or scale (Figs. 1, 13, 15, 24) rarely of two, but in this case the frontal carinae are very close set and do not cover the insertions of the antennae 3
2(1) Minute to large ants; clypeus almost always prolonged between the distinctly separated frontal carinae (Fig. 19), if frontal carinae closely set then nevertheless covering the insertions of the antennae; female castes with a functional sting; pupae not enclosed in a cocoon . . . . . **Myrmicinae** (p. 265)
– Small, long, slender ants (Fig. 11), depressed; frontal carinae closely set not covering the insertions of the antennae (Fig. 10); maxillary palpae one jointed; yellowish; hypogaeic driver ants . . **Leptanillinae** (p. 263)
3(2) Female castes with a projecting sting; first and second gaster tergite separated by a distinct constriction (Fig. 15, 18) (Pupae always enclosed in a cocoon) . . . . . **Ponerinae** (p. 264)
– Gaster without a projecting sting. First and second tergite not separated by a constriction, rarely forming a distinct postpetiole 4
4(3) Petiole nodiform (Fig. 13); workers eyeless; head rectangular, with the frontal carinae closely set, not covering the insertions of the antennae (Fig. 12) . . . . . **Dorylinae** (p. 264)
– Petiole squamiform or nodiform, sometimes reduced and if nodiform head always with distinct eyes; head shape variable 5
5(4) Apex of gaster with cloacal aperture a transverse slit not fringed with hairs (Fig. 3); clypeus extends backward between the frontal ridges (Fig. 23); pupae always naked; gastral tergites seen from above 4 in female castes, 5 in males . . . . . **Dolichoderinae** (p. 278)
– Cloacal aperture round, fringed with hairs (Fig. 4); clypeus does not extend backward between the frontal ridges (Fig. 2); pupae in most genera normally enclosed in a cocoon; gastral tergites seen from above 5 in female castes, 6 in males . . . . . **Formicinae** (p. 279)

Leptanillinae

Leptanilla revelierei EMERY (Figs. 10, 11)

Dorylinae

Key to species

1 Pedicel consisting of two segments . . . . *Aenictus rhodiensis* MENOZZI
– Pedicel consisting of one segment (Figs. 12, 13) . . . . . *Dorylus fulvus* (WESTWOOD)

Ponerinae

Key to genera and species

1 Dorsum of second segment strongly arched with the gaster apex pointing forward (Fig. 18) . . . . . *Proceratium* . . . 2
– Dorsum of gaster not arched; apex of gaster directed posteriorly (Fig.5) 4
2(1) Mandibles triangular with a row of minute denticles following to blunt apical teath, masticatory and basal border forming a right angle (Fig. 16); clypeus not projecting (Fig. 16); carinae on the gula short, not reaching the middle between occipital foramen and the preoral cavity (Fig. 8); propodeum distinctly marginated between the blunt denticles; petiole squamiform; . . . . . *P. numidicum* SANTSCHI
– Mandibles elongate triangular with two strong apical and at least two blunt smaller basal denticles separated by a distinct gap, masticatory border curving into the basal border (Fig. 17); clypeus with a distinct median projection (Fig. 17); gula without carinae; propodeum between denticles not marginated; petiole nodiforme (Fig. 18) 3
3(2) Clypeal projection acute; first gastric segment less than twice as long as the petiole . . . . . *P. melinum* (ROGER)
– Clypeal projection truncated; first gastric segment at least as long as the petiole . . . . . *P. algiricum* FOREL
4(1) Petiole cylindrical, broadly attached to the basal face of the gaster without a free posterior face (Fig. 15); mandibles long and narrow with a row of denticles from base to apex (Fig. 14) . . . . . *Amblyopone* . . . 5
– Petiole separated from gaster with a distinct free posterior face; mandibles broadly triangular (C 17, K 25) 6
5(4) Palpal formula 4 : 3; eyes minute, corresponding to one ommatidium; metasternum unarmed; body length (exclusively mandibels) 3.7–4.2 mm (Figs. 14, 15) . . . . . *A. denticulatum* (ROGER)
– Palpal formula 5 : 3; eyes distinct; metasternum armed with a distinct spine; body length > 5.8 mm . . . . . *A. impressifrons* (EMERY)
6(4) Mandibles strongly denticulate (K 29); eyes very minute or absent; extensor surface of middle tibiae with a row of outstanding bristles (K 27) . . . . . *Cryptopone ochraceum* (MAYR)
– Mandibles with small denticulae becoming progressively more minute or effaced towards base (K 17); extensor surface of middle tibiae without bristles 7
7(6) Petiole with a toothlike ventral process directed forwand (C 18, K 14); maxillary palps two segmented . . . . . *Ponera coarctata* (LATREILLE)
– Petiole with ventral surface simple without a toothlike process (C 17); Maxillary palps with one segment . . . . . *Hypoponera* . . . 8

8(7) Scape not reaching the occiput; frontal furrow continued as a fine median line towards the posterior border of the head (K 21; C 17). . . . . *H. punctatissima* (ROGER)

– Scape reaches occiput; frontal furrow not continuing beyond frontal ridges (K 20) . . . . . *H. eduardi* (FOREL)

Myrmicinae

Key to genera

1 Postpetiole attached to dorsum of first gaster segment (C88, K155); gaster broadly cordiform from above . . . . . *Crematogaster* (p. 272)

– Postpetiole attached medioventrally to first gaster segment; gaster shape more or less pyriform seen from above 2

2(1) Antennae with 4 or 6 segments; head elongate cordiform (Fig. 31) . . 3

– Antennae with 10 or more segments; head shape otherwise 5

3(2) Mandibles elongate, slender (K 344), apex of mandibles terminating in a simple large tooth; labrum protrudes between mandible insertions; head relatively broad; antennae 4 segmented . . . . *Epitritus argiolus* EMERY

– Mandibles short, broadly triangular; antennae 6 segmented 4

4(3) In dorsal view, closed mandibles separated from clypeal border by a conspicious transverse gap (Fig. 34) . . *Trichoscapa membranifera* (EMERY)

– In dorsal view, base of mandibles concealed by overlapping clypeal margin (Fig. 31) . . . . . *Smithistruma baudueri* (EMERY)

5(2) Antennae 10 segmented terminating in a distinct 2 segmented club . . 6

– Antennae 11 or 12 segmented; antennal club of 3 or more segments or indistinct 7

6(5) Clypeus anteriorly emarginate, with one median hair (C 85, K 195); propodeum smoothly rounded (C 86, K 196) . . . . . *Solenopsis* (p. 273)

– Clypeus anteriorly emarginate, with two projecting hairs medially (Fig. 21); meso- and metapleuron reticulate; propodeum angulate or dentate (Fig. 22) . . . . . *Oligomyrmex oertzenti* FOREL

7(5) Eyes large, pointed anteroventrally, placed forward near mandibles insertions (Fig. 44) 8

– Eyes rounded placed at or near mid line of head 9

8(7) Antennae 11 segmented . . . . . *Oxyopomyrmex krueperi* FOREL

– Antennae 12 segmented . . . . . *Goniomma* spp.

9(7) Mandibles falcate narrowing to pointed; apex without teeth (C 108, K 328) . . . . . *Strongylognathus* (p. 278)

– Mandibles triangular with broad masticatory border 10

10(9) Head underneath with two strong longitudinal carinae; anterior margin of clypeus bidentate; petiole quadrangular in profile (C 90, K 167) . . . . . *Myrmecina graminicola* (LATREILLE)

– Head not carinate ventrally; clypeal border evenly rounded without teeth; petiole peaked or rounded in profile 11

11(10) Postpetiole with a ventral lobe or angular process (C 103, C 105, K 209) 12

– Postpetiole without a distinct ventral projection 18

12(11) Mandibles exceptionally broad, without teeth; head relatively massive, quadrangular (C 104, K 299) . . . *Harpagoxenus sublaevis* (NYLANDER)

– Mandibles normal with 5 or more distinct teeth; head more or less oval 13

13(12) Antennae 12 segmented 14

– Antennae 11 segmented 16

14(13) Without distinct antennal fossae; generally minute ocelli present; subpetiolar process conical, acute . . . . . *Myrmoxenus gordiagini* RUZSKY

– Distinct round or longitudinal antennal fossae; frontal carinae distinct 15

15(14) Head subrectangular; antennal fossae longitudinal; body shining and slender; subpetiolar process a distinct spine (K 270) . . . . . *Chalepoxenus muellerianus* FINZI

– Body sculptured; subpetiolar process a blunt ventral expansion (C 71; K 276); workerless parasite (C 69, K 114) . . . . . *Sifolinia karavajevi* (ARNOLDI)

16(13) Petiole and postpetiole with blunt swollen projections (K 278) . . . . . *Epimyrma* (p. 276)

– Postpetiole with sharp forward directed tooth-like process (K 282) . . 17

17(16) Workerless parasite; body dorsum with stout hairs; head finely sculptured . . . . . *Leptothorax* (p. 273)

– Head and body smoothly shining; body dorsum with scattered acute hairs; (C 102, C 103) . . . . . *Formicoxenus nitidulus* (NYLANDER)

18(11) Postero-lateral border of clypeus raised to a sidge in front of antennal insertions (C 111, K 309); pronotum of workers angled anterolaterally in European species (C 110, K 314) . . . . . *Tetramorium* (p. 277)

– Clypeal borders not raised; pronotum rounded anterolaterally in European species 19

19(18) Antennae with 3 apical segments enlarged to form a distinct club (C 79, C 82, K 152) 20

– Antennae without a distinct club or with 4 or 5 apical segments forming a slender or somewhat indistinct club 23

20(19) Clypeus bicarinate; propodeum unarmed (C 81, K: numberless Fig. on page 94) . . . . . *Monomorium* (p. 272)

– Clypeus smooth or striated; propodeum distinctly dentate or spined 21

21(20) Dimorphic species–large workers are broad headed with mandibles having two apical teeth widely separated from small basal tooth (C 78, K 152); small workers have long oval heads with multidentate mandibles (C 79, K 153) . . . . . *Pheidole* (p. 271)

– Monomorphic species with workers all of even size; mandibles with five teeth decreasing in size from apex to base 22

22(21) Alitrunk without hairs; postpetiole distinctly wider than long in dorsal view (Fig. 43) . . . . . *Cardiocondyla* (p. 276)

– Alitrunk with numerous short to long, clavate to acute erect hairs; postpetiole width > ⅔ petiole width in dorsal view (K 258) . . . . . *Leptothorax* (p. 273)

23(19) Workerless parasite-queen has gaster with a broad longitudinal channel mediodorsally (C 107, K 181), a medially indented clypeus and small weak mandibles without teeth (K 182) . *Anergates atratulus* (SCHENCK)

– Gaster without a longitudinal channel; anterior border of clypeus entire; mandibles robust and strongly toothed 24

24(23) Polymorphic species, large workers have broad heads increasing in width allometrically; all workers and queens have broadly rounded mandibles (Fig. 26) . . . . . *Messor* (p. 270)

– Monomorphic, all workers of even size; mandibles triangular not broadly rounded (Fig. 25) 25

25(24) Tibial spurs distinctly pectinate (K 65) 26

– Mid and hind tibial spurs imple 27

26(25) Propodeum strongly dentate or spined (Fig. 20) . . . *Myrmica* (p. 267)

– Propodeum unarmed (K 31) . . . . . *Manica rubida* (LATREILLE)

27(25) Clypeus longitudinally bicarinate; frontal ridges close set (C 72, K 118); eyes in worker caste exceptionally small (C 74, K 119) . . . . . *Stenamma* (p. 268)

– Clypeus not bicarinate; frontal ridges separated by about ⅓ head width; eyes moderately large (K 129) . . . . . *Aphaenogaster* (p. 269)

Keys to species

Myrmica

1 Antennal scape long and slender, gently curved near the base (K 45); frontal triangle smooth and shining 2

– Antennal scape sharply curved near the base (C 35) or distinctly angled with or without a toothlike or lamellar extension at the bend (C 37, C 41); frontal triangle partly or wholly sculptured 3

2(1) Petiole in profile with large truncate dorsal area, posteriorly with a distinct step to its junction with the postpetiole (C 26, K 44); infraspinal area transversely striate; petiole nodes rugose; propodeal spines as long as the distance between their tips . . . . . *ruginodis* NYLANDER

– Petiole in profile with dorsal surface a small rounded dome or narrowly truncate, sloping down without a distinct step to its junction with the postpetiole (C 25, K 43). Infraspinal area smooth without striae; petiole nodes shining without coarse sculpture; propodeal spines shorter than the distance between their tips . . . . . *rubra* (L.)

3(1) Antennal scapes abruptly curved near the base but never sharply angled and without a lamellar outgrowth or thickening at the bend (C 35, K 104) 4

– Antennal scapes distinctly angled near the base with or without a lamellar extension or toothlike process at the bend 7

4(3) Head and alitrunk including clypeus and frontal triangle coarsely sculptured with longitudinal rugae; propodeal spines strong but rather blunt (K 105), subparallel seen from above . . . . *sulcinodis* NYLANDER

– Body sculpture finely striate or rugulose; frontal triangle with striae or sculpture at apex only; spines pointed and divergent apically 5

5(4) Frontal triangle fully striated; scape angulate near the base (Fig. 19) . . . . . *hellenica* FOREL

– Frontal triangle striate or sculptured at apex only; scape curved properly near the base 6

6(5) Head longer than broad with wide frons about ½ head width; petiole smooth, in profile simply angled without dorsal truncation; postpetiole cubical . . . . . *rugulosa* NYLANDER

– Head not longer than broad; frons narrower with diverging frontal lobes; petiole striated with a distinct short truncated dorsum; postpetiole higher than long in profile . . . . . *gallienii* BONDROIT

7(3) Antennal scape with a distinct transverse flange appearing as a toothlike projection in profile (C 40, C 41, K 96, Fig. 27) 8

– Antennal scape simply angled or with a lateral outgrowth or lamella at the bend (C 36–39, K 111) 11

8(7) Frons narrow ¼ head width or less with small narrow diverging lobes . 9

– Frons about ⅓ head width; frontal lobes broad and less divergent . . 10

9(8) Antennal process a massive rounded flange; frons very narrow, less than ⅐ head width (Fig. 27) . . . . . *ravasinii* FINZI

– Antennal process much less massive; frons about ¼ head width (C 40, K 94, C 31) . . . . . *schencki* EMERY

10(8) Large species TL over 4.8 mm; dorsal profile of altitrunk without or with very slight metanotal impression; petiole thick with rounded dorsum (Fig. 5); propodeal spines shorter than the distance between their tips; scape process a small tooth . . . . . *deplanata* EMERY

– Size generally smaller TL less than 4.8 mm; metanotal impression distinct; propodeal spines long and sharp; petiole with anterior and dorsal faces meeting at a sharp edge (C 32, K 52); scape process variable . . . . . *lobicornis* NYLANDER

11(7) Antennal scape with a well developed lateral extension at the bend, sometimes massive ("var. lonae") (C 39, K 88); petiole a flattened dome (C 34) . . . . . *sabuleti* MEINERT

– Antennal scape sharply angled or with an inconspicuous lamina at the bend (C 36–38); petiole either truncate dorsally (C 33) or rounding from the front edge to its junction with the postpetiole (C 30) 12

12(11) Frons very narrow, less than ⅓ head width; frontal laminae widely divergent (K 101); petiole narrowly rectangular from above (K 102) . . . . . *slovaca* SADIL

– Frons broader, usually at least ⅖ head width; petiole dorsum only slightly or not longer than wide 13

13(12) Postpetiole more or less cubical from above and only slightly higher than long in profile; dorsum of petiole rounding posteriorly without a distinct step to its junction with the postpetiole (C 30) . . *specioides* BONDROIT

– Postpetiole distinctly higher than long in profile (K 920) 14

14(13) Petiole with a reduced or rounded dorsal surface, anterior face strongly concave, posteriorly rounding its junction with the postpetiole (Fig. 20); appendage hairs fine and subdecumbent; upper part of clypeus and base of frontal triangle smooth and shining . . . . . *vandeli* BONDROIT

– Petiole high with a distinct truncate dorsum in profile forming a step to its junction with the postpetiole (C 333, K 92); appendage hairs stout and suberect; clypeus and frontal triangle generally fully striate 15

15(14) Antennal scape not distinctly flattened; frons les than × 0.4 HW across eyes . . . . . *scabrinodis* NYLANDER

– Antennal scape flattened; frons more than × 0.4 HW . . . . . *stangeana* RUZSKY

Stenamma

1 Scape and tibiae with outstanding hairs . . . . . *petiolatum* EMERY

– Scape and tibiae with short adherent hairs only 2
2(1) Dorsum and petiole a flattened convex dome . . . . . *sardoa* EMERY
– Petiole high with a sharply rounded dome 3
3(2) Eyes exceptionally large, about × 0.17 HW . . . . . sp. 1
– Eyes minute, about × 0.10 HW 4
4(3) Dorsum of head striate to occiput; smaller species (2.5–3.1 mm) . . . . . *striatula* EMERY
– Striae restricted to front part of head; larger species (3.3–3.6 mm) . . . . . *westwoodii* WESTWOOD

Aphaenogaster

1 Occiput elongated, collarshaped; body shining black . . *cecconii* EMERY
– Head otherwise 2
2(1) All funiculus segments at least twice as long as broad (K 127) 3
– At least second funiculus segment quadrate or scarcely longer than broad (K 128) 16
3(2) Propodeal spines long and curved to the horizontal, longer than the distance between their tips. (Gaster distinctly shining with or without superficial sculpture) . . . . . *spinosa* EMERY
– Propodeal spines various, not longer than the distance between their tips; in profile view straight, dorsally not curved 4
4(3) Gaster tergites at least in part finely and densely striate 5
– Gaster mainly smooth, sculpture if present restricted to basal part of first gaster tergite 11
5(4) Propodeum angulate without spines . . . . . *inermis* EMERY
– Propodeal spines distinct, clearly projecting from propodeal outline . 6
6(5) Propodeal spines as long as the distance between their tips 7
– Propodeal spines more dentiform, shorter than the distance between their tips 8
7(6) Petiole nodes brilliant without sculpture, propodeal dorsum with transverse striae . . . . . *simonellii* (EMERY)
– Petiole nodes with some sculpture at least at sides; propodeal dorsum without transverse striae . . . . . *ionia* B. URBANI
8(6) Petiole low and rounded in profile 9
– Petiole high with rounded peak and strongly concave anterior face . 10
9(8) Propodeal dorsum with longitudinal striae; petiole nodes sparsely sculptured . . . . . *campana* EMERY
– Propodeal dorsum without striae; petiole dorsum shining without sculpture . . . . . *semipolita* (NYLANDER)
10(8) Propodeum with fine transverse striae; petiole nodes brilliant without sculpture . . . . . *balcanica* (EMERY)
– Propodeum without striae; petiole finely sculptured . *picena* B. URBANI
11(4) Head shape ovoid narrowing posteriorly (Fig. 28); colour reddish to reddish brown 12
– Head more cordate, occipital outline in dorsal view straight to weakly convex (Fig. 29); colour shining black to blackish brown 15
12(11) Gaster smooth and brilliant 13
– Gaster with basal area of first gaster tergite sculptured 14
13(12) Body colour entirely reddish yellow; head dorsum smooth or with faint superficial sculpture at most . . . . . *splendida* (ROGER)

– Colour dark reddish brown; head with distinct punctulate sculpture . . . . . *muelleriana* WOLF

14(13) Body colour entirely reddish; head distinctly striate . . . *festae* EMERY

– Colour dark reddish brown, head with close punctulate sculpture . . . . . *ovaticeps* (EMERY)

15(11) Alitrunk strongly sculptured; petiole nodes always with some sculpture; colour shining black; body hairs long up to 0.2 mm . *obsidiana* (MAYR)

– Alitrunk with pronotum weakly sculptured; petiole nodes with occasional punctulae only; colour brownish black; body hairs shorter up to 0.15 mm . . . . . *gibbosa* (LATREILLE)

16(2) Second and third funiculus segments distinctly quadrate 17

– Third funiculus segment at least slightly longer than broad 19

17(16) Large, reddish species with well developed propodeal spines; head striate . . . . . *finzii* MUELLER

– Small, pale species with reduced or absent propodeal armature; head mainly smooth 18

18(17) Propodeum angled without spines . . . . . *pallida* (NYLANDER)

– Propodeum with distinct, short denticles . . . . . *lesbica* FOREL

19(16) Body and appendage hairs very long; postpetiole with a small ventral spine (strongly developed in queen caste) . . . . . *sp. 1*

– Body hairs not excessively long; postpetiole without a ventral spine . 20

20(18) First funiculus segment twice as wide as second; head and alitrunk strongly longitudinally rugulose . . . . . *sp. 2*

– First funiculus segment of approximately the same width as second; head smooth or with dilute sculpture 21

21(20) Funiculus segment two slightly but distinctly longer than broad; antennal scape long, SI 120–130; propodeal spines short dentate; body sturdy, firmly shining, yellowish red 22

– Antennal scapes relatively short, SI 100–115; funiculus segment two nearly quadrate; propodeal spines sharp; body slender 24

22(21) Head completely covered with reticulate sculpture . . . . *crocea* ANDRE

– Head mainly smooth and shining 23

23(22) Propodeum with distinct longitudinal sculpture at sides and faintly cross striate on dorsum . . . . . *holtzi* EMERY

– Propodeum with indistinct sculpture smooth and shining . *sicula* EMERY

24(21) Appendage hairs decumbent on extensor surfaces . . . . . *subterranea* (LATREILLE)

– Tibiae and scapes with suberect hairs . . . . . *subterraneoides* (EMERY)

Messor

1 Ventral surface of head with conspicuous long J shaped hairs (psammophore) (Fig. 30) 2

– Ventral surface of head with numerous mostly short hairs of uneven length not forming a distinct psammophore (K 137) 9

2(1) Body colour uniformely dark 3

– At least alitrunk reddish contrasting with dark gaster 5

3(2) Long pale hairs evenly distributed over whole body including occiput and gaster dorsum . . . . . *aralocaspius* (ARNOLDI)

– Hairs on occiput and dorsum of first gaster tergite very few or absent . 4

4(3) Postpetiole short and narrowly rounded in profile . *bouvieri* BONDROIT
– Postpetiole thick with bluntly rounded dorsum in profile . . . . . *ebeninus* FOREL
5(2) First gaster tergite with numerous dorsal hairs; occipital hairs often extending round lateral margin of head . . . . . *denticulatus* K. UGAMSKI
– First gaster tergite bare or with a few occasional hairs at most 6
6(5) Propodeum distinctly dentate . . . . . *dentatus* THOME
– Propodeum bituberculate or obliguely angled, not dentate 7
7(6) Head and alitrunk more or less bright red; smaller species HW < 2.5 mm . . . . . *minor* ANDRE
Head and gaster dark, alitrunk reddish to brownish red; larger species, HW > 2.5 mm 8
8(7) Occiput with at least six hairs on each side of the median line; pronotum smoothly rounded in dorsal view . . . . . *caducus* (MOTSCHULSKY)
– Occiput with four or fewer hairs on each side of the median line; pronotum dorsally somewhat flattened with lateral protuberant bosses . . . . . *concolor* THOME
9(1) Pronotum bluntly margined at sides; base of scape expanded into a broad rounded lobe; head and alitrunc bright read . . . . . *oertzeni* FOREL
– Pronotum not margined; base of scape with a triangular prominence 10
10(9) Sides of head with projecting hairs from the occipital corners to the clypeal border 11
– Sides of head with sparse or no hairs 13
11(10) Metasternal process thick, in ventral view appearing as a pair of broad blunt triangles separated by a median groove (Fig. 32); SI < 87 . . . . . *muticus* (NYLANDER)
– Metasternal process narrow, in ventral view appearing as a pair of raised lamellae (Fig. 33); SI > 87 12
12(11) Large species, HW of large workers > 2.6 mm; first funiculus segment longer than 2nd plus 3rd; propodeum of large workers distinctly angulate to dentate . . . . . *orientalis* (EMERY)
– Smaller species, HW of large workers < 2.4 mm; first funiculus segment shorter than 2nd plus 3rd; propodeal dorsum rounds oliquely to declivous face . . . . . *structor* (LATREILLE)
13(10) Base of scape with triangular prominence about × 2 width of scape at midlength; head and alitrunk reddish to bright red . *sultanus* SANTSCHI
– Base of scape only very slightly wider than width of scape at midlength; alitrunk brownish or dark concolorous with gaster 14
14(13) Propodeal outline angulate to bituberculate . . . *capitatus* (LATREILLE)
– Propodeal outline obliquely rounded . . . . . *barbarus* (L.)

Pheidole

1 Promesonotal outline broken by a distinct mesonotal ridge; in all workers funiculus segments two, three and four longer than broad; major workers have head striated to occiput and postpetiole twice as wide as long . . . . . *teneriffana* FOREL
– Promesonatal outline smooth without a distinct mesonotal prominence (C 76–77, K 148); funiculus segments two three and four not longer than

broad; dorsum of head of major workers smooth above eye level (K 152), postpetiole less than 1.5 × as wide as long 2
2 Propodeal spines prominent (C 76–77) . . . . . *megacephala* (F.)
– Propodeal spines minute or absent (K 148) . . . *pallidula* (NYLANDER)

Crematogaster

1 Petiole quadrate in dorsal view, sides subparallel; antennal club two segmented . . . . . *sordidula* (NYLANDER)
– Petiole trapezoidal narrowing from front to rear in dorsal view (C 89, K 156); antennal club three segmented K 157 2
2(1) Dorsum of alitrunk smooth without a prominent keel; pronotum strongly rounded in profile view 3
– Dorsum of alitrunk sculptured with a distinct longitudinal keel on the mesonotum 4
3(2) Body colour evenly greyish brown to black . . . . . *auberti* EMERY
– Head and gaster reddish, gaster darker . . . . . *jehovae* FOREL
4(3) Propodeal spines very short, dentate . . . . . *laestrygon* EMERY
– Propodeal spines strongly developed (C 88, K 155) 5
5(4) Head, alitrunk and petiole nodes clear red . . . . . *schmidti* (MAYR)
– At least postpetiole dark above 6
6(5) Occipital border of head emarginate; eyes placed in the middle of head . . . . . *lorteti* FOREL
– Occipital border of head slightly rounded (K 157); eyes placed near the occipital corner 7
7(6) General colour unevenly reddish brown with some darker markings, occasionally entirely black . . . . . *ionia* EMERY
– Head and pronotum clear red, generally contrasting with much darker rear body; (C 88, K 155–157) . . . . . *scutellaris* (OLIVIER)

Monomorium

1 Antennal club with the first segment shorter than the second and both together not longer than the third (ultimate) segment 2
– Antennal club with the first and second segments subequal, together longer than the third (ultimate) segment 3
2(1) Colour dark brown to black, sculpture smooth and shining . . . . . *monomorium* BOLTON
– Colour pale yellowish brown, sculpture dense and matt; (C 81–83, K 176, unnumerated Fig. on p. 94 in KUTTER 1977) . . . *pharaonis* (L.)
3(2) Ventral surface of head with numerous hairs; antennal club slender; two distinct castes the soldiers distinctly broadheaded 4
– Ventral surface of head with few hairs or none; antennal club distinct . 5
4(3) Head and alitrunk yellowish red; . . . . . *dentigerum* (ROGER)
– Head, altirunk and gaster dark reddish brown . . . . . *baal* WHEELER
5(3) Head and alitrunk red contrasting with black gaster 6
– General body colour brownish or dark 7
6(5) Propodeum with a distinct longitudinal furrow . . . . . *phoenicium* AGOSTI & COLLINGWOOD
– Propodeum simple with posterior margin sharply excarinate at most . . . . . *bicolor* EMERY

7(5) Whole body evenly brownish; queen has swollen petioles . . . . . *creticum* EMERY

– Alitrunk lighter than head or gaster; queen of normal shape with slender petiole nodes 8

8(7) Head and gaster with dilute sculpture, somewhat shining; mesopropodeal impression relatively deep . . . . . *salomonis* (L.)

– Head and gaster finally sculptured and dull . . . . . *subopacum* SMITH

Solenopsis

1 Body hairs long and abundant; sides of head distinctly curved (C 85, K 196); clypeal teeth distinct (C 85, K 195); size of the large workers 2.2–3 mm, either one or two size classes; (C 86, K 196) . . . . . *fugax* (LATREILLE)

– Body hairs sparse; size smaller, not exceeding 2 mm; sides of head straight 2

2(1) Head elongate, mesopropodeal furrow indistinct . . . . . *wolfi* EMERY

– Head short 3

3(2) Head rectangular; mesopropodeal furrow deep and distinct; centre clypeal teeth short and blunt . . . . . *latro* FOREL

– Head with rounded sides below the eyes . . . . . *sp. 1*

Leptothorax

1 Antennae 11 segmented 2

– Antennae 12 segmented 5

2(1) Scapes and tibiae with outstanding hairs; (C 92, K 202, K 205) . . . . . *acervorum* (F.)

– Scapes and tibiae with decumbent hairs or none 3

3(2) Small slender species, TL 1.7–2.3 mm with yellow alitrunk and sharp propodeal spines (K 228; K 232) . . . . . *flavicornis* EMERY

– Reddish brown larger species TL 2.5–3.7 mm; propodeal spines short and blunt (C 93, K 203, K 204) 4

4(3) Distinctly bicoloured with head and gaster darker than alitrunk; petiole a sharply peaked rounded dome (C 93, K 204) . . . . . *muscorum* (NYLANDER)

– Uniform brownish; petiole has a short truncate dorsum (K 203, K 212) . . . . . *gredleri* MAYR

5(1) Petiole large, dome-like, above as wide as 4/5 postpetiole width (Fig. 38); spines long and slender 6

– Petiole angled (Fig. 39, 41), steeply rounded (Fig. 40) or shortly truncate in profile (Fig. 36, 37), narrower than 4/5 postpetiole width 7

6(5) Colour evenly black; integument shining between widely spaced coarse rugae . . . . . *rottenbergi* (EMERY)

– Body bicoloured, head and gaster dark redbrown, alitrunk and petioles dull red to yellowish red; sculpture generally widely reticulate, frons longitudinally striate, chagrination between the striae indicated; head and alitrunk somewhat shining . . . . . *semiruber* ANDRE

7(5) Alitrunk with a distinct metanotal furrow (Fig. 36, 38–40) or at least with a shallow concavity (K 267) 8

– Alitrunk without dorsal metanotal impression (Fig. 37, 41) 19

8(7) Profile of alitrunk deeply impressed (K 267), distinctly waisted from above 9
– Metanotal furrow shallow (Fig. 39); alitrunk not or scarcely waisted from above 12
9(8) Unicolorous dark 10
– Yellow species with dark patches 11
10(9) Colour dark brownish black; head sculpture strong; propodeal spine distinctly curved in profile; scape not longer than head width . . . . . *nigrita* EMERY
– Colour shining brown; head sculpture weak; propodeal spines straight in profile; scape distinctly longer than head width . . . . . *sp. 1*
11(9) Petiole sharply angulate in profile (K 267) . . . . . *recedens* (NYLANDER)
– Petiole a small rounded dome . . . . . *rogeri* EMERY
12(8) Robust species; antennal clubs, head and gaster dark, anterior and dorsal faces of petiole meeting at a distinct angle 13
– Slender species with head and gaster not uniformly dark; petiole peaked or rounded; anterior and dorsal faces not forming a distinct angle; antennal clubs pale 14
13(12) Head, alitrunk and petioles distinctly, densely reticulate, longitudinal striation only indicated; body unicolorous dark yellowish brown; general appearance dull; spines short, triangulate (Fig. 39) . . . . . *carinthiacus* BERNARD
– Head and alitrunk longitudinally striate, reticulation indicated; at least frons smooth and shining; spines distinct, sides subparallel (Fig. 40) . 15
14(13) Alitrunk paler than head or gaster . . . . . *kraussei* BONDROIT
– Unicolorous dark . . . . . *angustulus* (NYLANDER)
15(13) Overall colour pale brown with darker head an gaster . . . . . *sordidulus* MUELLER
– Overall colour yellowish; gaster in part infuscate 16
16(15) Propodeal spines extremely short (Fig. 36); dorsal hair length of alitrunk ⅔ of hind tibial width, hairs blunt; alitrunk slightly waisted; longitudinal striae of head and alitrunk moderate with an indicated regulation; head without a smooth, shining median field; gaster in part infuscate . . . . . *graecus* FOREL
– Propodeal spines moderately long 17
17(16) Propodeal spines longer than petiole width; metanotal furrow distinct (K 250); gaster unicolorous or with at last a darker band on the first gastric tergite . . . . . *parvulus* (SCHENCK)
– Propodeal spines about as long as or slightly shorter than petiole width 16
18(17) Slender species; metanotal furrow very distinct; gaster without a dark band; petiole broad relative to postpetiole PI nearly 80 . . . . . *lichtensteini* BONDROIT
– Metanotal furrow shallow (C 96, K 249); gaster usually with a dark band on at least the first segment; petiole narrow relative to postpetiole, PI 60 . . . . . *nylanderi* (FOERSTER)
19(7) Antennal clubs pale unicolorous with rest of funiculus 20
– Antennal clubs darker than rest of funiculus 27
20(19) Petiole in profile with a short truncate dorsum; epinotum without spines but distinctly marginated and angulated (Fig. 37); dorsal hairs of alitrunk

as long as hind tibial width small; alitrunk bright yellowish . . . . . *bulgaricus* FOREL

– Petiole dorsum in profile angled or rounded, propodeum with distinct spines 21

21(20) Clypeus bicarinate with shallow concavity between (Fig. 35) . . . . . *clypeatus* (MAYR)

– Clypeus partly striate or smooth but not bicarinate (K 239) 22

22(21) Length 2 mm; shining yellow, gaster darker . . . *massiliensis* BONDROIT

– Length 2,4 mm or more, colour various 25

23(22) Petiole slender, sharply peaked in profile; body colour pale shining yellow; (K 237–240) . . . . . *luteus* FOREL

– Petiole more massive, rounded or angled in profile; bicoloured or distinctly coloured species 24

24(23) Petiole in profile with dorsal and anterior faces meeting at a distinct right angle . . . . . *rabaudi* BONDROIT

– Petiole sharply peaked or rounded in profile 25

25(24) Alitrunk pale brown, head and gaster darker; head short, not longer than broad, brilliant without sculpture dorsally . . . . . *leviceps* EMERY

– Head and alitrunk unicolorous pale brown or yellow; head longer than broad, sculptured 26

26(25) Propodeal spine straight; petiole crest somewhat rounded in profile . . . . *tristis* BONDROIT

– Propodeal spines long and curved; petiole sharply peaked in profile (K 253, 254) . . . . . *racovitzai* BONDROIT

27(19) Propodeal spines reduced to very short triangular teeth 28

– Propodeal spines well developed, projecting clear of propodeum (K 219) 29

28(27) Antennal clubs black, alitrunk yellow, head sides rounded from above (K 241, 244) . . . . . *nadigi* KUTTER

– Antennal clubs pale brown, unicolorous with alitrunk; headsides subparallel from above (K 226) . . . . . *corticalis* (SCHENCK)

29(27) Propodeal spines long and curved 30

– Propodeal spines moderate, straight or short (K 226, 260) 31

30(29) Colour pale brown; petiole long with a truncate dorsum (K 219, K 220) . . . . . *affinis* MAYR

– Colour yellowish with dark banded gaster; petiole short and peaked in profile (C 98, K 233) . . . . . *interruptus* (SCHENCK)

31(29) Colour uniformly brownish to black 32

– Distinctly bicoloured species 35

32(31) Petiole sharply angulate in profile (*exilis*-group) 33

– Petiole rounded dorsally or with very small truncated dorsum 34

33(32) Colour pale brown to brown, head distinctly sculptured . *exilis* EMERY

– Colour brownish black to black; head shining with very superficial sculpture . . . . . *specularis* EMERY

34(32) Propodeal spines short and upright, $< \times 0.2$ HW; head sculptured . . . . *laestrygon* SANTSCHI

– Propodeal spines long and sharp, $> \times 0.2$ HW; head brilliant without sculpture . . . . . *splendidiceps* B. URBANI

35(31) Gaster with a clear dark band (K 258); antennal clubs pale dark brown (C 100) . . . . . *unifasciatus* (LATREILLE)

– Gaster with apical area dark but not in the form of a distinct band (K 59); antennal club dark brown to black 36

36(35) Head dorsum completely dark contrasting with yellow alitrunk . . . . . *melanocephalum* EMERY

– Head incompletely infuscate 37

37(36) Alitrunk yellowish; femora unicolorous pale with rest of legs (C 99, K 259, 260, 263) . . . . . *tuberum (F.)*

– Alitrunk reddish yellow; femora slightly infuscate (K 246) . . . . . *nigriceps* MAYR

Epimyrma

1 Workerless; females black; in profile mesonotum and pronotum continuous . . . . . *corsica* (EMERY)

– Workers present; female brown to yellowish coloured; in profile mesonotum higher than pronotum 2

2(1) Thoracic hairs long and acute; petiole and gaster unicolorous brown, posterior gastric tergite margins rarely somewhat darker (Social parasite of *L. recedens*) . . . . . *kraussei* EMERY

– Thoracic hairs shorter; basal part of gaster yellowish, posterior margins of thoracal segments dark (s. p. of *L. unifasciatus, L. interruptus, L. affinis* etc.) . . . . . *ravouxi* ANDRE

Cardiocondyla

1 Head with punctulate sculpture, not striated 2

– Head striated in part as well as punctulate 6

2(1) Petiole wider than long in dorsal view; postpetiole very wide relative to head, PPI > 75 . . . . . *elegans* EMERY

– Petiole circular or oval in dorsal view, PPI < 70 3

3(2) Colour including head light yellowish brown; sculpture of head smooth and shining with only scattered micropunctures . . . . . *uljanini* EMERY

– Colour dark brown or bicoloured with head and gaster darker than alitrunk 4

4(3) Whole body dark; head densely punctured; propodeal spines very short . . . . . *nigra* FOREL

– Bicoloured; head punctulate but sculpture more dilute, shining 5

5(4) Alitrunk dull red, postpetiole dorsum dark; petiole about as wide as long . . . . . *bulgarica* FOREL

– Alitrunk including postpetiole bright reddish; petiole narrower than wide . . . . . *batesi* FOREL

6(1) Propodeal spines well developed . . . . . *sahlbergi* FOREL

– Propodeal spines blunt tubercules, not pointed (Fig. 42) 7

7(6) Petiole about as wide as long in dorsal view (Fig. 43), in profile distinctly higher than postpetiole (Fig. 42) . . . . . *stambuloffii* FOREL

– Petiole narrower than long in dorsal view; in profile not higher than postpetiole . . . . . *bogdanovi* RUZSKY

Tetramorium

1 Frontal carinae extended backwards as longitudinal ridges almost to occipital margin (C 113); body colour yellowish to reddish brown 2
– Frontal carinae short; body colour variable 3
2(1) Dorsum of alitrunk and petiole nodes coarsely rugulose; body hairs long and numerous (C 113) . . . . . *bicarinatum* (NYLANDER)
– Alitrunk finely rugulose with numerous punctures; body hairs short and sparse . . . . . *simillimum* (SMITH)
3(1) Occiput with fine striae which are completely transverse (Fig. 49) . . . . . *meridionale* EMERY
– Occiput either with longitudinal (Fig. 47) or divergent striae or it is smooth (Fig. 48) 4
4(3) Head finely sculptured or smooth and shining at least at sides (Fig. 48, K 316) 5
– Head coarsely sculptured throughout (Fig. 47, K 314) 10
5(4) Colour brownish black; alitrunk without sculpture . . . . . *sahlbergi* AGOSTI & COLLINGWOOD
– Colour yellowish to pale brown; alitrunk sculptured at least in part . . 6
6(5) Dorsum of head without sculpture, shining . . . . . *lucidulum* EMERY
– Dorsum of head rugose or sculptured in part 7
7(6) Occiput and petiole nodes rugose and sculptured . . . . . *hippocratis* AGOSTI & COLLINGWOOD
– Occiput and dorsum of nodes smooth 8
8(7) PPI > 45 . . . . . *diomedaeum* AGOSTI & COLLINGWOOD
– PPI < 40 9
9(8) Head striae diverge at the occipital face; colour yellowish brown . . . . . *punicum* (SMITH)
– Head striae remain parallel to occipital border; colour variable but usually reddish brown (K 316) . . . . . *semilaeve* ANDRE
10(4) At least centre dorsum of petiole nodes smooth 11
– Nodes more or less sculptured over whole surface 13
11(10) Postpetiole with concentric striae; petiole usually with a few rugae . . . . . *forte* FOREL
– Dorsum of nodes smooth and shining 12
12(11) Colour uniformely dark (queen pronotal angle obscured from above [K 310]) (C 110) . . . . . *caespitum* (L.)
– Mid body brownish contrasting with dark gaster (queen pronotal angles visible from above K 312) . . . . . *impurum* FOERSTER
13(10) PI > 80 (84–86) 14
– PI < 80 (71–78) 15
14(13) Propodeal spines broadly dentate, upturned; dorsum of propodeum distinctly concave posteriorly (Fig. 45); queen postpetiole has rounded sides . . . . . *chefteki* FOREL
– Propodeal spines acute; propodeum without distinct dorsal concavity (Fig. 46); queen postpetiole is very wide with angled sides . . . . . *ferox* RUZSKY
15(13) Whole dorsum including nodes coarsely sulcate; striae on occiput divergent (queen pronotal angles visible from above) . . . . . *sp. 1*

– Nodes weakly or irregularly sculptured; striae continue approximately parallel to the occipital border (queen pronotum obscured from above) . . . . . *moravicum* KRATOCHVIL

Strongylognathus

1 Back of head deeply excised with pronounced occipital angles . . . . . *testaceus* SCHENCK
– Back of head straight or with very slightly concave occiput . . . . . (*huberi* group) . . . 2
2(1) Petiole in profile bluntly rounded . . . . . *alboini* FINZI
– Petiole in profile with anterior face concave meeting dorsal face at a rounded angle 3
3(2) Postpetiole more or less cubical in profile 4
– Postpetiole with dorsoventral axis longer than anteroposterior axis . . 7
4(3) Propodeal dorsum nearly straight in profile . . . . . *alpinus* WHEELER
– Propodeal dorsum rounded and convex in profile 5
5(4) In dorsal view petiole longer than broad . . . . . *insularis* B. URBANI
– In dorsal view petiole not longer than wide 6
6(5) Occipital border mildly concave in dorsal view . . *dalmaticus* B. URBANI
– Occipital border almost straight in dorsal view . . *destefanii* B. URBANI
7(3) Clypeus and petiole nodes completely smooth and shining . . . . . *cecconii* B. URBANI
– Frontal laminae striate with 2 or 3 striae extending over clypeal margin; petiole nodes feebly striate and punctulate . . . . . *huberi* FOREL

Dolichoderinae

Key to genera

1 Integument hard and sculptured; alitrunk deeply impressed in front of propodeum which is carried backwards to a sharply angled projection (K 348) . . . . . *Dolichoderus (Hypoclinea) quadripunctatus* (L.)
– Integument soft; profile of alitrunk without (K 373) or with a shallow mesopropodeal impression, propodeum smoothly rounded or obtuse at most (Fig. 24) 2
2(1) Ocelli present and distinct (K 373); dorsal outline of alitrunk not interrupted by mesopropodeal impression . . . . . *Liometopum microcephalum* (PANZER)
– No ocelli; mesopropodeal impression present (Fig. 24) 3
3(2) Petiole nodal, concealed by overhanging gaster (Fig. 24) . . . . . *Tapinoma* (p. 025)
– Petiole scale well developed, more or less inclined, standing clear from the gaster 4
4(3) Mesoepinotal furrow deep and distinct (C 20); palpal formula 6/4 . . . . . *Iridomyrmex humilis* (MAYR)
– Without or with a distinct mesoepinotal furrow (K 353); palpal formula 4/3 . . . . . *Bothriomyrmex* (p. 025)

Bothriomyrmex

1 Mesopropodeal furrow braking profile outline of alitrunk at an acute angle (K 353) 2
– Mesopropodeal furrow shallow, at most breaking profile outline of alitrunk at an obtuse angle 5
2(1) Head and alitrunk yellowish brown, contrasting with dark gaster . . . . . *corsicus* SANTSCHI, *gallicus* EMERY
– Head nearly as dark as gaster 3
3(2) Mesonotal dorsum flat; petiole with anterior face straight . . . . . *menozzii* EMERY
– Mesonotal dorsum rounded; petiole with anterior face convex 4
4(3) Dorsum of propodeum raised with dorsal and basal faces forming a rounded right angle in profile; head relatively short – CI 91–94; head and alitrunk concolorous brown . . . . . *gibbus* SOUDEK
– Dorsum of propodeum less raised and dorsal face rounding evenly into the basal face; head relatively long – CI 85–88; head always and often whole body dark . . . . . *adriacus* SANTSCHI
5(1) Whole body pubescent; head longer than wide – CI 86–88; Scape about as long as head width – SI = 100 . . . . . *meridionalis* (ROGER)
– Head and alitrunk bright yellowish brown with very sparse pubescence; CI = 100; SI = 90 . . . . . *syrius* FOREL

Tapinoma

1 CNI < 100, semicircular (Fig. 23) . . . . . *ambiguum* EMERY
– CNI > = 100 2
2 CNI = 100 (C23); funiculus segments short (C22) . . . . . *erraticum* (LATREILLE)
– CNI > 150; funiculus segments long . . . . . *simrothi* KRAUSSE

Formicinae

Key to genera

1 Antennal insertions set at a distance behind clypeal margin (Fig. 65); antennal and clypeal fossa separated; metapleural gland orifice absent . . . . . *Camponotus* (p. 282)
– Antennal insertions set close to clypeal margin (Figs. 51, 57, 59, 61, 63); antennal and clypeal fossa confluent; metapleural gland orifice present 2
2(1) Antennae 11 segmented 3
– Antennae 12 segmented 5
3(2) Propodeum bidentate (Fig. 52); petiole incised or bidentate in frontal view; slender, small ants, TL > 0.7 mm . . . . . *Acantholepis* (p. 281)
– Propodeum unarmed; petiole simply rounded, minute ants, TL < 0.6 mm 4
4(3) Head subquadrangular (Fig. 55); eyes reduced; palpal formula 4/3; clypeus a narrow band; length 2.5–2.8 mm; yellowish coloured; subterranean . . . . . *Acropyga palaearctica* MENOZZI
– Head sides converging towards mandibels (Fig. 51); eyes with at least a few ommatidiae; palpal formula 6/4; clypeus covering most of the closed mandibels (Fig. 50) . . . . . *Plagiolepis* (p. 280)

5(3) Mandibles falcate, sharply pointed (C 267, K 627; C 268, K 622). . . . . *Polyergus rufescens* (LATREILLE)

– Mandibles coarsely dentate with broad masticatory border 6

6(4) Propodeal spiracle circular or broadly oval, set close to posterior margin of propodeum (Fig. 53); ocelli in worker caste absent, vestigial or very small 7

– Propodeal spiracle elongate oval or slit-like, set away from posteriors margin of propodeum (Fig. 54); ocelli present and distinct in all castes 9

7(6) Eyes at or in front of midlength of sides of head (Fig. 59); petiole inclined forward, overhung by first gastric tergite (Fig. 58); scape without erect pilosity; SI > 200 . . . . . *Paratrechina jaegerskjoeldi* (MAYR)

– Eyes at or in front of midlength of head (Fig. 57); petiole squamiform or nodiform, if overhung by first gastric tergite then scape with outstanding hair (Fig. 56); SI < 140 8

8(6) Alitrunk strongly constricted between mesonotum and propodeum (Fig. 56); metanotal spiracles prominent; maxillary palps as long as head width; scapes much longer than head width . . *Prenolepis nitens* (MAYR)

– Alitrunk not strongly constricted (C 124, K 484); maxillary palps shorter than head length; scapes as long or only slightly longer than head width; metanotal spiracles not prominent . . . . . *Lasius* (p. 281)

9(6) Petiole a broad node (Fig. 60) or a thickened scale; posterior of maxilla with long curved hairs . . . . . *Cataglyphis* (p. 284)

– Petiole a thin scale; posterior of maxilla without long curved hairs. . .10

10(9) Mandibles with denticles evenly decreasing in size from apex to base (Fig. 6); funiculus segments 2 and 3 short, together about as long as first (Fig. 62) . . . . . *Proformica* (p. 288)

– Mandibles with third and fifth denticles shorter than second and fourth respectively (Fig. 7) funiculus segments 2 and 3 long, together much longer than first . . . . . *Formica* (p. 285)

Plagiolepis

1 Workerless parasite, body length (female) 1.2–1.3 mm (K 378–K380) . . . . . *xene* STAERCKE

– Workers always present; body length (female) > 3 mm 2

2(1) Funiculus segments 2 and 3 quadrate, subequal, each clearly shorter than 4th 3

– Funiculus segment 2 transverse or quadrate much shorter than 3rd or 4th which are subequal 4

3(2) Femora dusky; queens have the funiculus dark . *obscuriscapa* SANTSCHI

– Appendages evenly pale greyish or yellow . . . *pygmaea* (LATREILLE)

4(2) Antennal scape relatively long–SI 107–110 . . . . . *schmitzii* FOREL

– Antennal scape shorter, SI about 100 5

5(4) Body colour yellowish brown, funiculus segment 2 broader than long . . . . . *pallescens* FOREL

– Body colour shining black; funiculus segment 2 quadrate (C 158) . . . . . *vindobonensis* LOMNICKI

Acantholepis

1 Colour of alitrunk mainly or entirely dark 2
– Colour of alitrunk mainly or entirely reddish 5
2(1) Alitrunk brilliant appendages exceptionally long; antennal scapes nearly × 2 head width – SI > 190 . . . . . *splendens* KARAWAJEW
– Alitrunk with some sculpture; antennal scapes shorter SI < 170 3
3(2) Alitrunk and head closely sculptured, appearance almost matt (Fig. 52) . . . . . *karawajewi* AGOSTI & COLLINGWOOD
– Alitrunk smooth but with some sculpture; petiole distinctly toothed . . 4
4(2) Part of midbody usually with a small patch of red, pronotum sculptured . . . . . *frauenfeldi* (MAYR)
– Hole body black, pronotum smooth . . . . . *nigra* EMERY
5(1) Alitrunk clear shining red; head and appendages mainly reddish . . . . . *caucasica* SANTSCHI
– Head and legs dark in part; petiole with sharp spine like teeth; alitrunk faintly cross striate . . . . . *melas* EMERY

Lasius

1 Colour of body shining black; head large relative to alitrunk, broadly cordate with a distinct posterior emargination (C 137) . . . . . *fuliginosus* (LATREILLE)
– Colour greyish or brownish black, bicoloured or yellow; occipital border broadly convex, straight or slightly emarginate 2
2(1) FI < 17; colour normally yellow or brownish yellow 3
– FI > 20; colour greyish or brownish black or somewhat bicoloured with alitrunk paler than gaster 14
3(2) Petiole nodal (C 155, K 479), dorsal crest in front view strongly convex (K 480), genal margins rounding sharply into close set mandible insertions (C 153, K 478) 4
– Petiole distinctly tapered in side view (C 143, K 501); genal margins gently rounding to wide set mandible insertions (C 145, K 507) 5
4(3) Antennal scapes and appendages with short close suberect hair (C 153, C 155) . . . . . *carniolicus* MAYR
– Antennal scapes and tibiae with close pubescence only . *reginae* FABER
5(3) Tibiae and antennal scapes with short suberect hairs, sometimes few in numbers but always present, standing clear of general pubescens . . . 6
– Front tibiae and scapes pubescent only without suberect hairs 9
6(5) Scapes and tibiae elliptical in cross section not markedly flattened; petiole relatively wide with slight dorsal emargination (C 140, K 502; C 139) . . . . . *umbratus* (NYLANDER)
– Scapes and tibiae flattened with thin front edge; petiole scale relatively high and narrow either straight sided or ovoidal (C 144, K 503) 7
7(6) Dorsum of petiole steeply rounded . . . . . *jensi* SEIFERT
– Petiole dorsum flat or slightly emarginate, sides straight subparallel . 8
8(7) Body pubescence long but sparse especially on gaster which is distinctly shining; (K 503) . . . . . *rabaudi* (BONDROIT)
– Body pubescence short and thick obscuring gaster sculpture (C 143) . . . . . *meridionalis* (BONDROIT)

9(5) Body hairs very short and sparse, erect hairs on gaster about ⅓ or less maximum hind tibial width (C 149–150) . . . . . *mixtus* (NYLANDER)

– Body hairs longer; gaster hairs at least ⅕ maximum hind tibial width 10

10(9) Genae and hind tibiae with some suberect hairs (petiole deeply emarginate) . . . . . *distinguendus* (EMERY)

– Genae and tibiae without suberect hairs 11

11(10) Petiole high and deeply incised (C 148, K 486); large monomorphic species TL more than 4.0 mm 12

– Petiole low and wide, only weakly emarginate, straight or convex dorsally. Either small monomorphic or polymorphic with large and small workers in same nest, mean TL generally below 4 mm 13

12(11) Body hairs sparsely distributed, gaster hairs restricted to fringe along tergite margins; petiole scale narrowly rounded with deep rounded incision (C 148, K 486; C 147, K 484, 485) . . . . . *bicornis* (FOERSTER)

– Body hairs profuse over whole dorsum including gaster (K 490); petiole scale with angular incision (K 492; K 491, K 493) . . . *affinis* (SCHENCK)

13(11) Generally polymorphic species with variably sized workers; FI > 15 (K 467, K 469), mean ommatidia number around 40; male mandible with one subapical tooth; (C 124–126, K 471) . . . . . *flavus* (F.)

– Smaller monomorphic species; FI < 15 (K 468), mean ommatidia number around 20; male mandible denticulate . . . . . *mypos* (FOREL)

14(2) Scapes and front tibiae with numerous suberect hairs 15

– Scapes and front tibiae bare or with occasional hairs only 16

15(14) Alitrunk distinctly lighter (reddish yellow) than head or gaster; scape hairs more scattered and oblique (K 448, K 449) . . . . . *emarginatus* (OLIVIER)

– Uniformely greyish black or sometimes reddish brown; scape hairs crowded (K 440, K 452) . . . . . *niger* (L.)

16(14) Head and alitrunk paler than dark gaster; scapes and tibiae always bare; frontal furrow distinct (C 131, K 461; K 460) . . . *brunneus* (LATREILLE)

– Unicolorous greyish black sometimes paler; hind tibiae at least with occasional hairs; frons obscured by pubescence 17

17(16) Petiole scale with dorsum straight or mildly emarginate; occipital hairs not extending round towards eyes (K 451) . . . . . *alienus* (FOERSTER)

– Petiole scale convex dorsally; occipital hairs more profuse extending round towards eyes . . . . . *sp. 1*

Camponotus

1 Front of head obtusely angled, truncated (K 436); sides of clypeus subparallel, propodeum conical, workers strictly dimorphic (K 434, K 436). . . . . *truncatus* (SPINOLA)

– Front of head continuing same plane as rest, not truncate; clypeus trapezoidal (K 429) 2

2(1) Dorsal surface of propodeum meeting declivitous caudal part at a distinct angle (Fig. 64, K 423) 3

– Dorsum of propodeum smoothly rounding into declivitous caudal part (Figs. 66, 67, K 404) 11

3(2) Whole body opaque, gastric sculpture minutely reticulate 4
– At least gaster distinctly shining, gastric scultpute finely transversally striate or smooth 5
4(3) Propodeum prolonged posteriorly into broad tooth-like processes (Figs. 64, 65) . . . . . *kiesenwetteri* (ROGER)
– Propodeum with dorsal and declivitous faces meeting at a sharp angle but not prolonged into tooth-like processes . . . . . *libanicus* ANDRE
5(3) Mesopropodeal impression very slight or effaced, at least in the smaller worker caste 6
– Mesopropodeal impression a deep furrow in all worker castes (K 423) 7
6(5) Alitrunk and most of head reddish, gaster black; sculpture finely striate and shining . . . . . *vogti* FOREL
– Uniformly black; sculpture nearly smooth to distinctly transversally striate, shining to matt . . . . . *gestroi* EMERY
7(4) Colour uniformly dark 8
– Bicoloured with the alitrunk at least in part, paler than the gaster . . . 9
8(7) Propodeal dorsum in part horizontal in profile; males with few, scattered outstanding hairs on scapes, occiput, dorsum of alitrunk and propleurae . . . . . *atricolor* (NYLANDER)
– Propodeal dorsum convex, propodeum forming mostly a distinct, separated cube; males with many outstanding hairs on scapes, occiput, dorsum of alitrunk and propleurae . . . . . *piceus* (LEACH)
9(7) Head dark, brownish, contrasting with reddish alitrunk . . . . . *dalmaticus* (NYLANDER)
– Head and promesonotum reddish to brownish red 10
10(9) Body hairs abundant, disposed evenly over head and alitrunk . . . . . *candiotes* EMERY
– Middle area of alitrunk with sparse hairs . . . . . *lateralis* (OLIVIER)
11(2) Clypeus broadly rounded not projected forward beyond the genal margins (K 389) 12
– Clypeus projecting as a subrectangular plate forward beyond the genal margin (K 408) 16
12(11) Clypeus with a wide notch in the middle of the front border (K 420) . 13
– Clypeus without a median notch 14
13(12) Body hairs rather sparse, none projecting on the genae (C 114, K 420, K 421; C 115, K 417) . . . . . *fallax* (NYLANDER)
– Body hairs profuse, abundant on genae . . . . . *tergestinus* MUELLER
14(12) Dull black; gaster thickly covered with bristles and a long appressed pubescence (C 118, K 404, K 405; C 116–120) . . . . . *vagus* (SCOPOLI)
– Alitrunk reddish at least in part; gaster with few hairs (K 391) 15
15(14) Gaster with only sparse pubescence, shining; basal part of first tergite bright yellowish red to dark red . . . . . *ligniperdus* (LATREILLE)
– Gaster rather dull with surface sculpture and longer pubescence; alitrunk dull red . . . . . *herculeanus* (L.)
16(11) Gaster thickly pubescent; large, dark, matt species with front half of gaster orange yellow . . . . . *cruentatus* (LATREILLE)
– Femorae and tibiae with thin pubescence shining or somewhat shining 17

17(16) Femora and tibiae with long raised pubescence and/or erect hairs on extensor surfaces 18
– Femora and tibiae without raised pubescence or hairs on extensor surfaces, dorsum of alitrunk with widely spaced long covering of hairs . 21
18(17) Bicoloured with mid body more or less reddish in the soldier and yellowish in the worker caste . . . . . *samius* FOREL
– Body colour uniformely dark 19
19(18) Body shining; white, clavate hairs; TL < 2.5 mm; in nest of *C. aethiops* . . . . . *universitatis* FOREL
– Body opaque; TL of major worker > 3.5 mm 20
20(19) Genae bare or with an occasional hair at most . . . . . *ionius* EMERY
– Genae with many projecting hairs; Fig. 66 . . . . . *laconicus* EMERY
21(17) Genae with a number of projecting hairs 22
– Genae without projecting hairs 26
22(21) Tibiae without a row of bristles on the inner surface, tibiae in cross-section approximately circular . . . . . *jaliensis* FOREL
– Tibiae with a row of bristles on the inner surface; tibiae more or less compressed 23
23(22) Hind tibiae strongly compressed with a distinct longitudinal groove . . . . . *barbaricus* EMERY
– Hind tibiae weakly compressed, without a longitudinal groove . . . 24
24(23) Body concolorous dark, reddish black to black; sometimes leg yellowish . . . . . *aethiops* (LATREILLE)
– Bicoloured with at least midbody yellowish in part 25
25(24) Larger species (TL > 3.5 mm; HW > 2.3 mm); SW-Europe . . . . . *pilicornis* (ROGER)
– Smaller species (TL < 3.3 mm; max HW < 2.0 mm); . . *oertzeni* FOREL
26(21) Gula with a number of long hairs 27
– Gula bare or with two hairs, sometimes a few near foramen 30
27(26) Hind tibiae without a row of bristles, head and alitrunk concolour yellowish (S-Italy) . . . . . *nylanderi* EMERY
– Hind tibiae with a row of bristles 28
28(26) Alitrunk yellowish, darker in large workers, sculpture dilute . . . . . *baldacii* EMERY
– Alitrunk reddish or dark; gaster uniformely brown black 29
29(28) Body distinctly matt and sculptured . . . . . *cecconii* EMERY
– Body with dilute sculpture shining . . . . . *sylvaticus* OLIVIER
30(25) Body shining, hairs sparse, colour mainly testaceous, soldiers with a yellowish head . . . . . *turcestanus* ANDRE
– Head and promesonotum infuscate, at least in the soldier caste distinctly bicoloured with a darker head (Fig. 67) . . . . . *sanctus* FOREL

Cataglyphis

1 Bicoloured species with the head and alitrunk red and the gaster black; petiole nodiform (Figs. 60, 61) . . . . . *nodus* BRULLE
– Uniformely brownish black to black, sometimes appendages yellowish; petiole squamiform 2
2(1) Larger species, TL of major workers > 2.7 mm; appendage colour mainly black to dark brown 3

– Smaller species, TL < 2.6 mm; appendage colour yellowish 5

3(2) Genae bare; scape without erect hairs; declivitous face of gaster without erect hairs; hind femorae with appressed pubescence only . . . . . *aenescens* (NYLANDER)

– Genae and scapes with erect hairs 4

4(3) First gastric tergite with more than five hairs; occiput and genae with numerous hairs, hairs of different length . . . . . *cursor* FONSCOLOMBE

– First gatric tergite with less than five hairs; occiput with less than ten erect, curved hairs of even length . . . . . *piliscapa* FOREL

5(2) Scape with erect hairs, hind femorae with appressed pubescence only; body colour at least somewhat yellowish . . . . . *hellenica* FOREL

– Scape without erect hairs; hind femorae with decumbent to suberect pubescence; body colour brownish black . . . . . *italica* EMERY

Formica

1 Bicoloured species, alitrunk red or with varying amounts of dark brown or blackish patches, at least genae and part of metapleurae reddish . . 2

– Body colour evenly greyish black to black 20

2(1) Anterior margin of clypeus emarginate or with a distinct median notch (C 222, K 617) . . . . . *sanguinea* LATREILLE

– Anterior margin of clypeus broadly rounded and entire 3

3(2) Head flattened posteriorly with deep concave posterior border (Fig. 2) 4

– Head evenly rounded posteriorly; occipital border convex, straight or very weakly concave (K 557–560) 10

4(3) Eyes with distinct microscopic or short hairs 5

– Eyes without visible hairs at ordinary magnification 6

5(4) Two suberect hairs on the sides of the ocellar triangle; clypeus with scattered outstanding hairs; front coxae with many scattered outstanding hairs; gaster allover with outstanding hairs (Fig. 1) . . *exsecta* NYLANDER

– Ocellar triangle without two suberect hairs; Clypeus with few hairs anteriorely; front coxae with few hairs distally caudad; first outstanding hairs on the gaster on the third tergite . . . . . *bruni* KUTTER

6(4) CI about 100, with smoothly rounded occipital corners 7

– CI < 100, with sharp occipital corners 8

7(6) Scattered suberect hairs present on all gaster tergites; maxillary palp as long or longer than half head length . . . . . *suecica* ADLERZ

– Hairs present on ultimate gaster tergites only, maxillary palpae shorter than half head length . . . . . *naefi* KUTTER

8(6) Suberect hairs present on all gaster tergites; anterior border of clypeus with two rows of projecting hairs . . . . . *forsslundi* LOHMANDER, *nemoralis* DLUSSKY

– Dorsal hairs restricted to third to fifth gaster tergite 9

9(8) Gaster and occiput moderately shining; front coxae with few hairs distally caudad; hind tibiae at least on the flexor side in the distal part with a row of outstanding bristles . . . . . *pressilabris* NYLANDER

– Gaster and occiput finely sculptured and dull; front coxae rarely with outstanding hairs; hind tibiae with at most three bristles apically . . . . . *foreli* BONDROIT, *goesswaldi* KUTTER

10(3) Frontal triangle dull; terminal segment of maxillary palpae as long as penultimate segment 11
– Frontal triangle reflecting light; terminal segment of maxillary palpae shorter than penultimate segment 17
11(10) Head and frontal triangle coarsely sculptured, matt black; CI = 100; antennal scape stout, overreaching occipital margin by about ¼ of its length . . . . . *uralensis* RUZSKY
– Head with at least genal margins and clypeus reddish; CI < 100; antennal scape slender overreaching occipital margin by ⅓ or more by its length 12
12(11) Whole body including gula and posterior margin of head with numerous projecting hairs 13
– Gula and posterior margin of head entirely without hairs 16
13(11) Mid body yellowish brown distinctly paler than dorsum of head and gaster; outstanding hairs around occipital margin do not extend beyond eye level . . . . . *imitans* RUZSKY
– Reddish colour if present unevenly distributed over head and alitrunk; in full dorsal view fringing hairs project around genal margins towards mandible insertions 14
14(13) Extensor surface of femora and tibiae with numerous projecting hairs; on genae at least 20 insertions of semierect hairs visible in full frontal view . . . . . *selysi* BONDROIT
– Extensor surface of femora and tibiae with an occasional projecting hair at most; on genae less than 15 insertions of semierect hairs visible in full frontal view . . . . . sp. 2
15(8) Upper surface of scale and dorsum of promesonotum with several to many forward inclined projecting hairs (C 197) . . *rufibarbis* FABRICIUS
– Dorsal body hairs either absent or, if present, few, short and upright . 15
16(15) Midbody red with 2 to 3 pairs of short pronotal bristles; alitrunk bright red . . . . . *glauca* RUZSKY
– Sides of alitrunk apart from sutures predominantly dark, sometimes red spots expanded but always dull red; few short clavate hairs may be present on the pronotum (C 193) . . . . . *cunicularia* LATREILLE
17(10) SI of large workers > 100 (C 225); second and third funiculus segments twice as long as broad; (C 224) . . . . . *truncorum* FABRICIUS
– SI < 100; funiculus segments always less than twice as long as broad . 17
18(17) Whole of alitrunk dorsum with conspicuous hairs 19
– Dorsum of alitrunk with a few short hairs mainly on promesonotum or bare 23
19(18) Gaster pubescent and dull; dark patch on promesonotum normally dense and well defined 20
– Gaster moderately shining; dark patch on promesonotum if present not dense or well defined 21
20(19) Occiput always densely hairy; longest body hairs at least 0.1 × head width . . . . . *nigricans* EMERY
– Occipital pilosity variable, sometimes hairs short and inconspicuous (C 261); longest body hairs less than 0.1 × head width; (C 256) . . . . . *pratensis* RETZIUS
21(19) Occiput and legs conspicuously hairy (C 254); eyes strongly haired (C 249) . . . . . *lugubris* ZETTERSTEDT

– Occiput normally entirely bare or with occasional short hairs only (C 247); eye hairs short and inconspicuous 22

22(21) Frons dull with close microsculpture . . . . . *sp. 1*

– Sculpture of frons dilute with centre line somewhat shining; (C 229, C 234) . . . . . *rufa* L.

23(18) Occiput normally with a fringe of short projecting hairs (C 247), sometimes bare; eye hairs are short but always present and distinct; from above mesopleurae always have projecting hairs; (C 242). . . . . *aquilonia* YARROW

– Occiput never with projecting hairs (C 241); eyes hairless; in dorsal view mesopleurae have two or three projecting hairs at most (C 236) . . . . . *polyctena* FOERSTER

24(1) Occiput with a fringe of projecting hairs (K 547) 25

– Occiput entirely bare 28

25(20) Extensor surface of femora and tibiae with projecting hairs (K 546) . . . . . *selysi* BONDROIT

– Extensor surface of femora and tibiae with an occasional hair at most 26

26(25) On genae more then seven insertions pits of semierect hairs visible in frontal view, extending from occipital margin to well below eye level . . . . . *sp. 2*

– On genae, at most seven projecting hairs visible in frontal view . . . 27

27(26) Propodeum with some scattered lateral hairs, petiole scale with several hairs . . . . . *cinerea* MAYR

– Propodeum mainly bare, petiole scale with one or two hairs . . . . . *lefrancoisi* BONDROIT

28(24) Gaster shining black with very dilute pubescence 29

– Gaster with close but not dense pubescence 31

29(23) Head and alitrunk finely sculptured and somewhat dull; petiole crest emarginate; promesonotum and gula entirely bare . *gagatoides* RUZSKY

– Whole body shining black; petiole crest rounded or flat; pronotum with long hairs or occasional short hairs 30

30(29) Pronotum with long pointed forward curving hairs; propodeum angled in profile (C 184, K 521, K 523, K 525) . . . . . *transkaucasica* NASSONOV

– Pronotum with occasional short hairs only; propodeum with dorsal and basal faces smoothly rounded (K 520; K 518, K 524) . *gagates* LATREILLE

31(28) Promesonotum bare or with one or two occasional hairs only (C 176) . . . . . *fusca* L.

– Promesonotum with stout bristles 32

32(31) Gula with two or three pairs of hairs . . . . . *cinereofusca* KARAVAIEV

– Gula always entirely bare (C 182) . . . . . *lemani* BONDROIT

Proformica

1 Head long, CI < 90 1

– Head short, CI > 90 2

2(1) Pubescence thick over whole body; scapes without hairs . *korbi* EMERY

– Pubescence thin, middle of second tergite pubescent hairs are shorter than their interspace; scapes with occasional long hairs 3

3(2) SI 85–92; body hairs numerous – about 20 visible on alitrunk profile . . . . . *sp. 1*

– SI 96–112; alitrunk hairs present but few 4

4(3) First gaster tergite bare or with one or two occasional short hairs; frons distinctly striate, extending over middle dorsum of head (Figs. 62, 63) . . . . . *striaticeps* (FOREL)

– First gaster tergite with several long hairs, never bare; frons finely striate, mid dorsum of head brilliant with scattered punctures only (West mediter.) . . . . . *nasuta* NYLANDER

5(1) Body shining with very sparse pubescence, head without striae; scapes long SI ≅ 100 . . . . . *nitida* K. UGAMSKI

– Body more or less thickly pubescent; head coarsely striate throughout; SI 84–94 6

6(5) Scapes and gula without hairs . . . . . *kobachidzei* ARNOLDI

– Scapes with occasional erect hairs, gula with several hairs 7

7(6) Pubescence relatively thin; queen scutum shining, alitrunk × 1.6 or less combined length of scutum and scutellum . . . . . *kaszabi* DLUSSKY

– Pubescence thick; queen scutum pubescent and dull, alitrunk × 1.8 or more combined length of scutum and scutellum . *pilosiscapus* DLUSSKY

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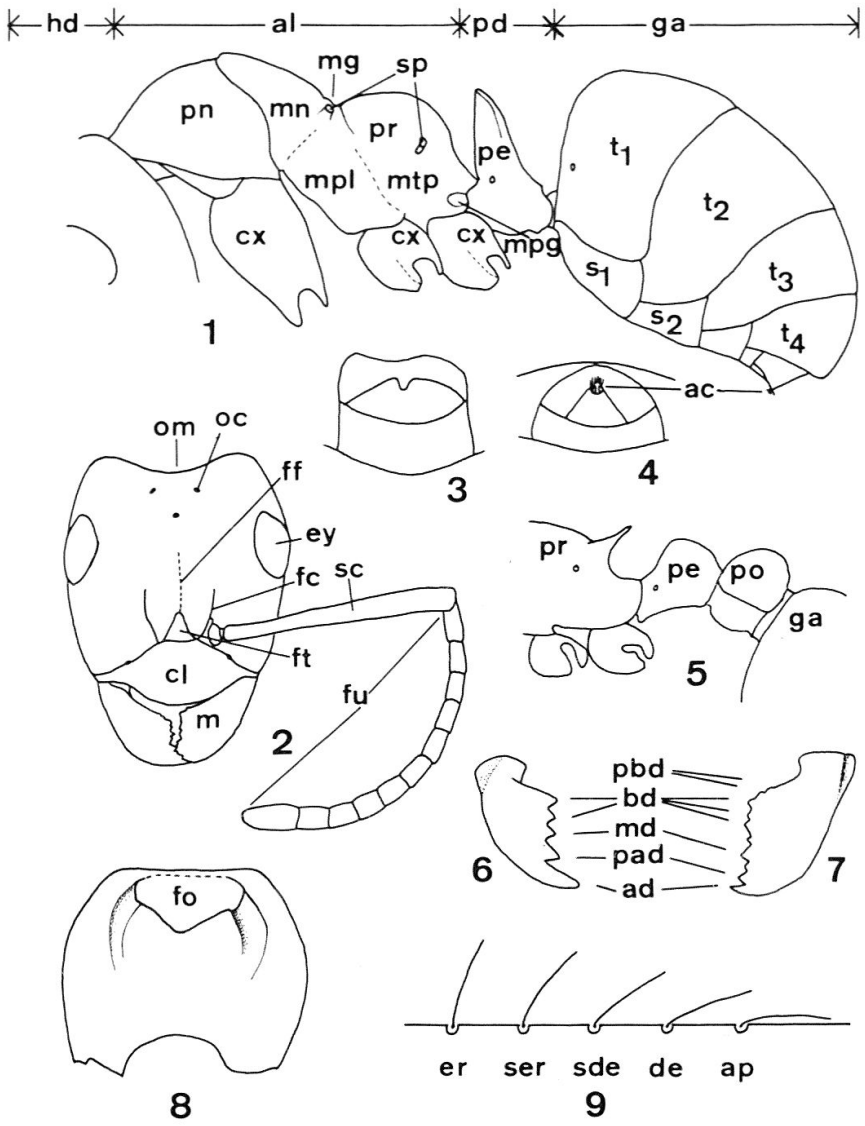
Additionally to all the previously named collegues we wish to thank Dr. Bernhard Seifert (Görlitz), who commented on *Myrmica hellenica* and *gallienii* and Yvonne Migliaretti who helped with the English. Finally we want to stress that the authors take the hole responsability for list and keys.

ZUSAMMENFASSUNG

Vorläufige Liste der Ameisen (Hym. Formicidae) des Balkans mit einem Schlüssel zur Arbeiterinnenkaste. II. Schlüssel zur Arbeiterinnenkaste, einschliesslich der Europäischen Arten (ohne Iberische). – Über 280 Arten von 48 Gattungen aus sieben Unterfamilien der Familie Formicidae aus dem Europäischen Raum (ohne Spanien) sind ausgeschlüsselt. Die Arbeit basiert auf Neufunden der Jahre 1983–85 und auf Material der Sammlungen KUTTER (Egg) und FOREL (Muséum d'Histoire Naturelle, Genève). Angaben zur Verbreitung der Arten sind im ersten Teil dieser Arbeit aufgeführt (AGOSTI & COLLINGWOOD 1987).

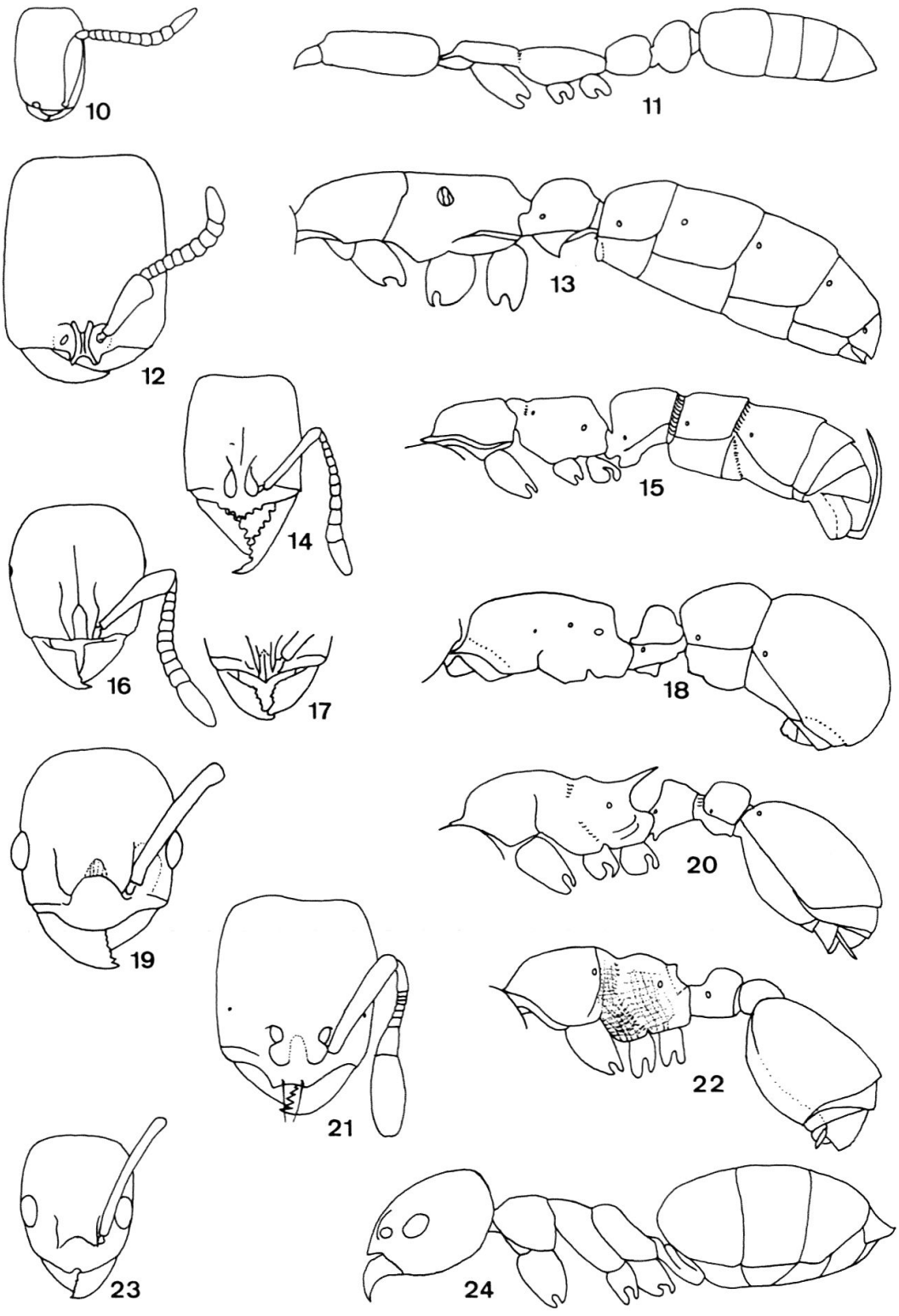
REFERENCE COLLECTIONS

Voucher specimen are in the collections of the authors and of the Department of Entomology, Swiss Federal Institute of Technology, CH-8092 Zürich (Switzerland).

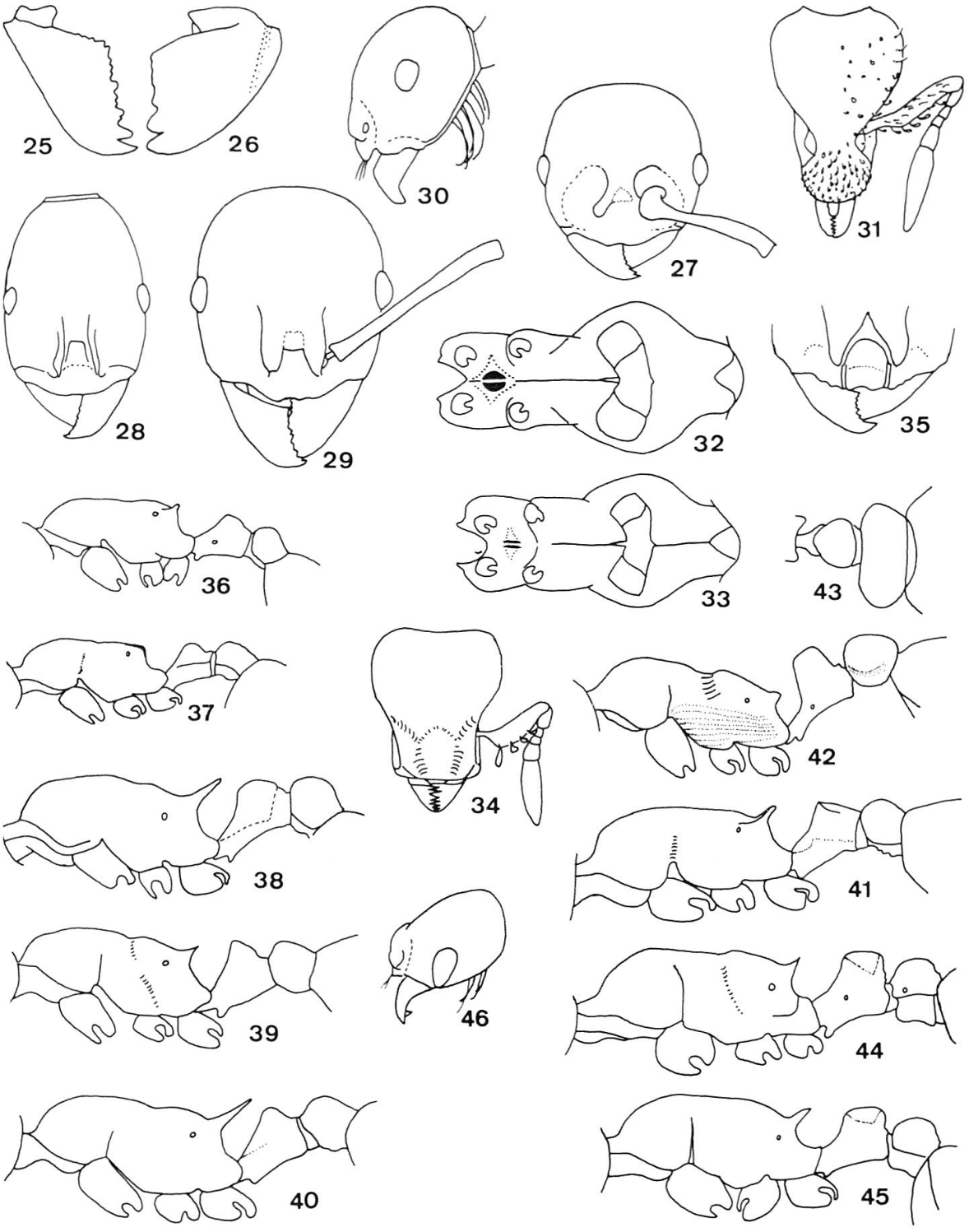


Figs. 1–9. Outline drawings of: (1) lateral view of *Formica exsecta,* worker; (2) frontal view of the same; (3) ventral view of gaster of *Dolichoderinae* sp., worker; (4) ventral view of gaster of *Formicinae* sp.; (5) lateral propodeum, petiole and postpetiole of *Myrmica deplanata;* (6) mandibel of *Proformica* sp.; (7) mandibel of *F. exsecta;* (8) ventral view of the head (gula) of *Proceratium numidicum;* (9) nomenclature used to describe inclination of pilosity with respect to the cuticular surface; modified after Bolton and Collingwood (1975) and Wilson (1955).

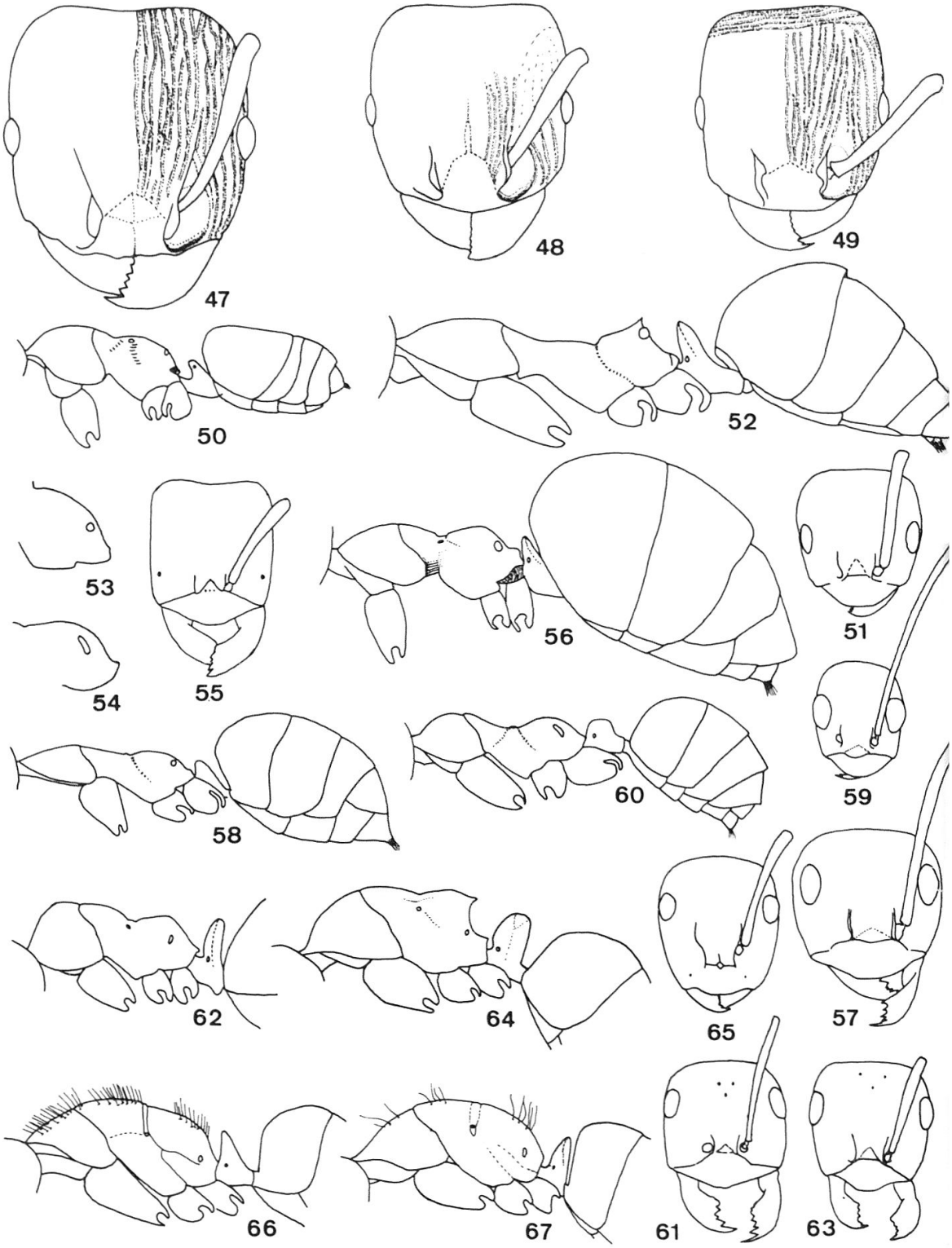
ac. acidopore
ad. apical denticel
al. alitrunk
ap. appressed
bd. basal denticel
cl. clypeus
cx. coxa
de. decumbent
er. erect
ey. eye
fc. frontal carinae or lobe
ff. frontal furrow
fo. foramen occipitalis
fr. frons
ft. frontal triangle
fu. funiculus of antenna
ga. gaster
hd. head
m. mandibel
mb. masticatory border
md. median denticel
mg. metanotal groove
mn. mesonotum
mpg. metapleural gland
mpl. mesopleuron
mtp. metapleuron
oc. ocellus
om. occipital margin
pad. preapical denticel
pba. prebasal denticel
pd. pedicel
pe. petiole
pn. pronotum
po. postpetiole
pr. propodeum
s. sternite
sc. scape of antennae
sde. subdecumbent
ser. suberect
sp. spiracle
spp. subpetiolar process
t. tergite



Figs. 10–24. Outline drawings of: (10) head of *Leptanilla revlierii* (Leptanillinae); (11) lateral view o the same; (12) head of *Dorylus fulvus* (Dorylinae); (13) lateral view of the same; (14) head of *Amblyo pone denticulatum* (Ponerinae); (15) lateral view of the same; (16) head of *Proceratium numidicun* (Ponerinae); (17) clypeus and mandibels of *P. melinum;* (18) lateral view of the same; (19) head o *Myrmica hellenica* (Myrmicinae); (20) lateral view of *Myrmica vandeli;* (21) head of *Oligomyrmex* sp. (22) lateral view of the same; (23) head of *Tapinoma ambiguum* (Dolichoderinae); (24) lateral viev of the same.



Figs. 25–46. Outline drawings of: (25) mandibel of *Aphaenogaster* spp.; (26) mandibel of *Messor* spp.; (26) head of *Myrmica ravasinii;* (27) head of *Aphaenogaster jonia;* (29) head of *A. obsidiana;* (30) lateral head of *Messor concolor;* (31) head of *Smithistruma baudueri;* (32) ventral alitrunk of *Messor muticus;* (33) ventral alitrunk of *M. structor;* (34) head of *Trichoscapa membranifera;* (35) clypeus of *Leptothorax clypeatus;* (36) lateral alitrunk and pedicel of *L. graecus,* Cotypus; (37) lateral alitrunk and pedicel of *L. bulgaricus,* Cotypus; (38) lateral alitrunk and pedicel of *L. semiruber;* (39) lateral alitrunk and pedicel of *L. carinthiacus,* Cotypus; (40) lateral alitrunk and pedicel of *L. angustulus;* (41) lateral alitrunk and pedicel of *L. exilis;* (42) lateral alitrunk and pedicel of *Cardiocondyla stambuloffi,* Cotypus; (43) dorsal view of pedicel of same; (44) alitrunk and pedicel of *Tetramorium chefteki,* Typus; (45) lateral alitrunk and pedicel of *T. ferox;* (46) lateral head of *Oxyopomyrmex* sp.



Figs. 47–67. Outline drawings of: (47) Head of *Tetramorium ferox;* (48) head of *T. sahlbergi,* Typus; (49) head of *T. meridionale;* (50) lateral view of *Plagiolepis* sp.; (51) head of *Pl.* sp.; (52) lateral view of *Acantholepis karawajewi,* Cotyp; (53) propodeum to show position and shape of spiracles of a typical *Lasiini* sp.; (54) the same in *Formicini* sp.; (55) head of *Acropyga palearctica,* modified after MENOZZI 1936; (56) lateral view of *Prenolepis nitens;* (57) head of the same; (58) lateral view of *Paratrechina longicornis;* (59) head of the same; (60) lateral view of *Cataglyphis nodus;* (61) head of the same; (62) lateral alitrunk and petiole of *Proformica striaticeps;* (63) head of the same; (64) lateral alitrunk and petiole of *Camponotus kiesenwetteri;* (65) head of the same; (66) lateral alitrunk and petiole of *C. laconicus;* (67) lateral alitrunk and petiole of *C. sanctus.*

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