

Revision of the Palaearctic rove beetles of the genus *Megarathrus* Curtis (Coleoptera: Staphylinidae: Proteininae)

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Megarathrus from the Palaearctic region, Japan excluded, are revised to include 23 species, four of which are described as new: *M. uhligi* sp. n., *M. wollastoni* sp. n., *M. zekorum* sp. n. and *M. zerchei* sp. n.. *Megarathrus franzi* Scheerpeltz is a junior subjective synonym of *M. stercorarius* Mulsant and Rey. *Megarathrus bellevoeyi* Saulcy replaces *M. affinis* Miller which is a junior primary homonym of *M. affinis* Stephens. *Megarathrus depressus* (Paykull) has been misinterpreted. Subsequent authors referred to this species as *M. sinuatocollis* (Lacordaire), while they referred to *M. prosseni* Schatzmayr as *M. depressus* (Paykull). A neotype is designated for *M. denticollis* (Beck), and lectotypes are designated for *M. bellevoeyi* Saulcy, *M. chobauti* Fauvel, *M. dentipes* Bernhauer, *M. depressus* (Paykull), *M. fennicus* Lahtinen, *M. franzi* Scheerpeltz, *M. nigrinus* Sahlberg, *M. nitiduloides* (Lacordaire), *M. nitidulus* Kraatz, *M. prosseni* Schatzmayr, *M. rufescens* Stephens, *M. sahlbergi* Münster, *M. serrula* Wollaston, *M. stercorarius* Mulsant and Rey and *M. strandi* Scheerpeltz. Descriptions are provided and diagnostic characters are figured for all species occurring in the treated area, except for *M. conspirator* Cuccodoro, *M. impressicollis* Eppelsheim, *M. japonicus* Sharp and *M. montanus* Sawada, which have been dealt with in detail recently elsewhere. A key to the Palaearctic *Megarathrus*, except for species found only in Japan, is provided.

KEYWORDS: Staphylinidae, Proteininae, *Megarathrus*, taxonomy, Palaearctic realm.

Introduction

The genus *Megarathrus* is the most important group of the Proteininae in terms of species and ecological diversity. Together with *Metopsia* Wollaston, 1854 and *Proteinus* Latreille, 1796 it forms the tribe Proteinini, which is supported by the presence of apomorphic female gonocoxites fused in a single gonocoxal plate with deep emarginations for large styli (Steel, 1966; Newton and Thayer, 1995). *Megarathrus* shares in common with *Metopsia* the pronotum and elytra uneven and punctate, and the presence of parameres fused to the aedeagal median lobe, but lacks the median vertexal ocellus which characterises the latter genus.

Megarathrus have been inadequately treated taxonomically by previous students and many problems remained unsolved. Thus, some common European species, including the type species *M. depressus* (Paykull), have been consistently misidentified.

The present paper treats the Palaearctic members of the genus, except for those

found only in Japan, which are dealt with by Cuccodoro (1996b). It follows studies on the Afrotropical and North American faunas (Cuccodoro and Löbl, 1995, 1996). Data on extensive collections from Southeast Asia and the Neotropical Region will be treated in later works.

Taxonomic history

The genus *Megarathrus* was erected simultaneously by Curtis (1829) and Stephens (1829a, 1829b), almost 170 years ago. The name *Megarathrus* refers to an older unpublished name proposed by Kirby. The first genus description was given by Stephens (1834), who included *Staphylinus depressus* Paykull, 1789, which is thus the oldest species name in the group, as well as eight additional species. These are all currently placed in synonymy or assigned to other genera.

In the literature, *Megarathrus* is alternatively attributed either to Stephens (1829a, b or 1834) (Scheerpeltz, 1933; Tottenham, 1949; Lohse, 1964; Stecl, 1966; Kloet and Hincks, 1977) or Curtis (1829) (Blackwelder, 1952; Hatch, 1957; Sawada, 1962; Arnett, 1968; Newton and Thayer, 1992). Since both authors credited the genus to Kirby, early authors, such as Westwood (1838), Erichson (1839, 1840), Chapuis and Candèze (1853), Kraatz (1857), Thomson (1861) and Rye (1868) cited Kirby as the author. The first to discuss the problem of the authorship of the genus was Blackwelder (1952), who gave preference to Curtis over Stephens. According to the ICZN (1985: Art. 24(b)), the name *Megarathrus* has to be credited to Curtis.

The type species of *Megarathrus*, *Staphylinus depressus* Paykull, was designated subsequently by Westwood (1838). Erichson (1839, 1840) transferred to *Megarathrus* several European species and infraspecific forms described by Illiger (1794), Olivier (1795), Gravenhorst (1806), Gyllenhal (1813), Bock (1817) and Lacordaire (1835) in *Omalium*, *Phloeobium*, *Silpha* and *Staphylinus*. He also recognised the relationship/similarity of *Megarathrus* to *Proteinus*, dissociated the group from 'Omaliidae' in which it had been placed by Stephens (1829b), and proposed the new group Proteinini to accommodate *Proteinus*, *Megarathrus*, 'Phloeobium' and some other, unrelated taxa. Subsequent authors (Redtenbacher, 1849, 1856; Ganglbauer, 1895; Johansen, 1914; Palm, 1948; Lohse, 1964) mainly follow this classification, but Tikhomirova (1973) did not recognise the Proteininae.

Since the middle of the 18th century, the history of the study of *Megarathrus*, like that of many other groups, consists of a more or less continuous accumulation of new data. By 1994, almost 80 new species and subspecies had been recognised worldwide, and keys had been provided for European (Scheerpeltz, 1947; Lohse, 1964), Japanese (Sawada, 1962), Indian (Cameron, 1930), Nepalese (Coiffait, 1976), African (Cameron, 1950) and Northwest American species (Hatch, 1957). The characters used in the various taxonomic papers on the genus varied little. The male genitalia have been included in diagnoses since Lahtinen (1938), but described only superficially. The taxonomic value of the body contours have been overestimated frequently (Cameron, 1930; Scheerpeltz, 1947; Sawada, 1962) especially those of the pronotum, despite bilateral asymmetry in some individuals (Figs 17i, 39i).

To date, no attempt has been made to examine the extensive collections housed in museums, to revise the old type material, and to analyse the available data. Thus, the nomenclature is partly based on misinterpretations of ancient names (*M. depressus*), the taxa are poorly defined, the knowledge of their distribution is fragmentary and their relationships are unknown.

Natural history

Adults of *Megarathrus* occur in a wide range of habitats (plantations, savannas, forests, swamps) at elevations ranging from sea level to over 4000 m, with a preference for temperate and moist climate. They usually come from sifted samples, but are also collected by other means, especially in traps (carrion, dung, malaise, meat, pan, window and flight interception). According to locality labels, they have been found in moss, carrion and dung of various mammal species, on and under bark of logs, under stones, on and in fungi, in humus, flood debris and other rotting vegetable matter. Generally, they occur on decaying organic material, with a preference for soft fungal fruit-bodies (Crowson, 1955; Lawrence, 1989).

Information on habitats of the species is generally incomplete. However, label data from the examined material show that the species differ in their ecological requirements. *Megarathrus denticollis*, *M. depressus*, *M. prosseni* and *M. nitidulus* appear to be euryoek species occurring in very diverse habitats and support highly variable climatic conditions. Other species exhibit narrower climatic tolerance. *Megarathrus affinis* obviously prefers warm temperate climate, while *M. stercorarius* seems to require montane/subalpine conditions. Some species, such as *M. chobauti*, *M. longicornis* and *M. maronitus*, are obtained exclusively from humus and other decaying vegetable matter.

The genus is considered saprophagous or mycophagous (Crowson, 1981; Hammond and Lawrence, 1989), but exact diet is uncertain because examination of the guts content revealed no information (Newton, 1984; Leschen, 1993). The diet of the proteinines may also include filter and/or fluid feeding and, occasionally, predation (Cuccodoro, 1995). Under particular conditions, members of the genus appear to gather water from the substrate and to load it onto the dorsum. The water droplet may cover the head, pronotum and elytra, and attain twice the size of the insect (Cuccodoro, 1996a). The significance of this peculiar behavioural pattern, known as 'water loading' behaviour (Cuccodoro, 1995), remains uncertain.

Almost all species of *Megarathrus* possess fully developed metathoracic wings, which are usually three to four times as long as the elytra, and are capable of flight. The very few exceptions are *M. montanus*, in which the size of the wings is occasionally reduced, and the three Southwest Palaeartic species *M. chobauti*, *M. maronitus* and *M. serrula*, which have the wings slightly shorter than the elytra. Flight activity/efficiency seems to be best developed in species occurring in carrion, animal droppings and rotting fungi, such as *M. denticollis*, *M. depressus* and *M. prosseni*.

Sound production organs and aggregative behaviour have not been recorded in the subfamily. However, notable non-genital sex-linked characters are generalised within the Proteinini, suggesting complex interactions between individuals. Couples of *Megarathrus* have never been observed *in copula*. The tenent setae situated on the ventral surface of the first protarsomere in many *Megarathrus* species indicate that copulation takes place with the male on the back of the female, and serves to give the copulating male a good grip on the dorsum of the female (Crowson, 1981). The male bears usually peg-like setae (Hammond, 1972) on the ventral surface of the legs, may have enlarged femora, and often bowed and sometime toothed tibia. These features may give the male a stronger grasp during copulation, but may also enable stimulation of mechano-receptors of the female, or act as signals in hypothetical courtship patterns (Hammond, 1972).

Information on the larvae is available only for the European *M. denticollis*, *M. depressus* (identified by Kemner as *M. sinuaticollis*) and *M. prosseni* (identified by

Kemner as *M. depressus*) (Kemner, 1925; Kasule, 1966; Steel, 1966). They have been found in carrion and on *Polyporus sulphureus*, and may feed on spores or micro-organisms (Kemner, 1925; Kasule, 1966). The larvae belonging to these species are 3.0–3.7 mm long and may be distinguished from other staphylinid larvae by the following set of characters: head with six stemmata on each side; cranium with two valves which do not meet ventrally; maxillary mala very long and slender, curved downward; anterior margin of eighth abdominal sternite modified; urogomphi two-segmented, lacking specialised setae; second segment of urogomphi considerably more than twice as long as first segment. Steel (1966) observed that the larvae tapped the substrate with their long downcurved maxillary mala almost continuously as they walk.

Kemner (1925) reported that larvae captured between 14th August and 15th September pupated three to nine days after their capture. The pupae are whitish and about as long as the adult, and the pupal stage lasted five to eleven days. Larvae have also been collected in June by Kasule (1966).

Eggs have been found in some of the dissected females, usually in a pair, situated next to each other in the posterior portion of the abdomen. They are about 0.6 mm long and 0.2 mm in diameter, pale, oblong, slightly rugose and apparently without chorion structure.

The label data of the adult of North American (Cuccodoro and Löbl, 1996) and British species (Hammond, in press) indicate that their maximum of occurrence spans usually over a relatively short period from May to August, but *M. bellevoeyi* and *M. americanus* Sachse, 1852 have an unusually low summer occurrence suggesting several distinct phenologies within the genus.

Material and methods

The present study is based exclusively on adults. Unless specified, the material mentioned in the text has been examined.

One of the aims of the study is to provide a sound basis for the taxonomy of the group. Therefore, an effort has been made to revise the type material of the previously described species. Additional material has been selected to provide basic data on the distribution of the respective species, with strong restrictions as far as the European species are concerned. These have been recorded in a large number of faunistic and other papers, and are currently a subject of interest to numerous coleopterists working on local faunas. Common European species which have been misinterpreted are in the literature consistently recorded under the same incorrect names. Therefore, their records usually can be used.

The material examined (4337 specimens) is from the following collections; the acronyms are as under records:

BMNH = The Natural History Museum, London.

BPBM = Bernice P. Bishop Museum, Honolulu.

CAS = California Academy of Sciences, San Francisco.

CNCI = Canadian National Collection of Insects, Ottawa.

DEI = Deutsches Entomologisches Institut, Eberswalde.

FMNH = Field Museum of Natural History, Chicago.

GRPC = G. de Rougemont private collection, London.

HFPC = H. Franz private collection, Mödling.

ISNB = Institut Royal des Sciences Naturelles de Belgique, Brussels.

MIING = Muséum d'histoire naturelle, Geneva.

MHNL = Musée Guimet d'histoire naturelle, Lyon.

MNHN = Muséum National d'Histoire Naturelle, Paris.

MSNM = Museo Civico di Storia Naturale, Milan.

NHMW = Naturhistorisches Museum, Vienna.

NIIRS = Naturhistoriska Riksmuseet, Stockholm.

PWPC = P. Wunderle private collection, Mönchengladbach.

SEMK = Snow Entomological Museum, University of Kansas, Lawrence.

VAPC = V. Assing private collection, Hannover.

VGPC = V. Gusarov private collection, St. Petersburg.

ZMHB = Museum für Naturkunde der Humboldt-Universität, Berlin.

ZMUH = Helsingfors Universitet Naturhistoriska Centralmuseet, Helsinki.

ZMUL = Museum of Zoology, University, Lund.

ZMUT = Zoological Museum, University, Turku.

ZSMC = Zoologische Sammlung des Bayerischen Staates, München.

The following species names are based on untraceable or inexistent type material, and are unidentifiable by their descriptions:

affinis Stephens, 1834: 331 (*Megarthus*). Original material not located in the collections of Stephens and Kirby, housed in the BMNH.

denticolle Beck, 1817: 26 (*Omalium*). Original material destroyed.

denticollis var. *minimus* Bruce. (*Megarthus*). Original material not traced.

emarginatus Stephens 1834: 332 (*Megarthus*). Original material not located in the collections of Stephens and Kirby, housed in the BMNH.

macropterum Gravenhorst 1806: 215 (*Omalium*). Original material destroyed during the Second World War.

marginatus Stephens 1834: 331 (*Megarthus*). Original material not located in the collections of Stephens and Kirby, housed in the BMNH.

marginicolle Lacordaire 1835: 492 (*Phloebium*). Original material not located in the collections of Boisduval and Lacordaire, housed in ISNB and in MNHN, respectively.

pusillus Stephens 1834: 333 (*Megarthus*). Original material not located in the collections of Stephens and Kirby, housed in the BMNH.

sinuatocolle Lacordaire 1835: 495 (*Phloebium*). Original material not located in the collections of Boisduval and Lacordaire, housed in ISNB and in MNHN, respectively.

thomsoni Varenus 1891: 22 (*Megarthus*). Original material not traced, absent from the collection of Varenus, housed in the ZMUL.

Megarthus denticollis is a name currently used for a distinct European species. In the interest of stability in nomenclature, and according to the ICZN (1985: art. 75), a neotype is designated. The specimen represents a species identified as *M. denticollis*, conform to the conception in current taxonomic literature, such as Palm (1948) and Lohse (1964). For details see section on type material of this species.

The remaining names are either currently placed in synonymy (i.e. *affinis*, *emarginatus*, *macropterum*, *marginatus*, *marginicolle*, *pusillus*, and *sinuatocolle*) or have been ignored by most authors (*thomsoni*). We prefer to consider these names *nomina dubia* and not to designate arbitrarily for each of them a neotype, and treat them consequently.

For detailed examination, specimens were dissected, cleared in 0.1 N potassium hydroxide and mounted in Eukit or Canada balsam on acetate slides, or stored in microvials in glycerine. Drawings were made using a drawing tube.

Morphological terms are used generally according to Blackwelder (1936) and Naomi (1987–1990). The term frons, as used in the present study, refers to the area anterior of the U-shaped impression, the vertex to the area behind. The abdominal sternites and tergites are numbered according to their origin, i.e. the first visible sternite is the third morphological sternite. The measurements and ratios are defined as follows: length of specimens=interval from middle of anterior pronotal margin to inner apical angle of elytron (hence independent of abdominal contraction); width of specimens=maximum pronotal width; AL=antennal length/pronotal length; EL=elytral sutural length/pronotal length; ET=elytral sutural length/shortest interval between sutural margin and lateral edge of elytron in dorsal view; FW=shortest interval between sutural margin and outer apical angle of elytron in dorsal view/shortest interval between sutural margin and humeral angle of elytron in dorsal view; EY=interval between posterior ocular margin and apex of frons in dorsal view/interval between anterior and posterior ocular margins in dorsal view; GT=posterior width of gula/median length of gula; GW=width of neck/posterior width of gula; HW=maximum pronotal width/interval between posterior ocular margins in dorsal view; ML=median metasternal length/median mesosternal length; MP=length of segment 4 of maxillary palpus/length of segment 3 of maxillary palpus; PT=maximum pronotal width/pronotal length; SP=maximum width of abdominal sternite 8/width of basal projection; TPF=interval between basal angle and tip of medioapical projection of female abdominal tergite 8/lateral length of medioapical projection of female abdominal tergite 8 (the absence of that projection is indicated as 'abs').

An attempt has been made to keep the text as concise as is reasonable. Hence, complete descriptions are given for a selected number of species, while the remaining species are compared to these. In absence of convincing synapomorphies defining species groups, the species are arranged alphabetically.

The locality data are recorded according to labels except that elevations are given uniformly in metres, and major administrative units are given in English. The distribution of most of the western Palaearctic species, unlike that of species from other areas, is given in summary form. For common species data are partly compiled from Jakobson (1908), Winkler (1925), Porta (1926, 1949), Lindroth (1960), Horion (1963), Tikhomirova (1973) and Silfverberg (1992).

Under synonymy, only primary sources and references pertaining to the nomenclature and/or status of taxa are given.

Taxonomy

Megarthritis possesses a large array of morphological characters which may be used for taxonomic purpose. Particularly reliable are the antennal shape and vestiture pattern, the shape of the prohypomeron, the relative size of the omaline-type modified area of the eighth abdominal sternite, the male sexual characters on the head and legs, the form of the female abdominal tergite 8, and the sclerified structures associated with the female genital segment.

Males *Megarthritis* can be distinguished from females by the divided abdominal tergite 9, which is visible in ventral view.

Both sexes are keyed together and secondary sexual characters are used when they are necessary to separate the species. No exoskeletal characters have been found to identify with reliability the female of *M. longicornis* from that of *M. wollastoni*.

and only characters pertaining to the males are provided to separate these two species.

Key to species

- 1 Antennomere 5 without short and dense pubescence 2
- Antennomere 5 with short and dense pubescence 8
- 2 Antennomere 6 without short and dense pubescence 3
- Antennomere 6 with short and dense pubescence 5
- 3 Temples angulate in dorsal view *M. conspirator* Cuccodoro
- Temples convex in dorsal view (Fig. 1f, g) 4
- 4 Anteromedian portion of frons with setae orientated forward *M. serrula* Wollaston
- Anteromedian portion of frons with setae orientated backward *M. muronitus* Fagel
- 5 Male with anterior frontal edge not raised; female abdominal tergite 8 without apical projection (Fig. 5e, g) 6
- Male with anterior frontal edge strongly raised, horn-like; female abdominal tergite 8 with an apical projection (Fig. 3f, h) 7
- 6 Prosternum with median ridge absent *M. chobauti* Fauvel
- Prosternum with median ridge present *M. zerchei* sp. n.
- 7 Male with apical portion of aedeagus evenly concave ventrally (Fig. 16e)
- *M. longicornis* Wollaston
- Male with apical portion of aedeagus angulate ventrally (Fig. 34e) *M. wollastoni* sp. n.
- 8 Maxillary palpi with segment 4 1.5 × as long as segment 3 *M. montanus* Sawada
- Maxillary palpi with segment 4 2 × as long as segment 3 9
- 9 Temples strongly convex in dorsal view (Fig. 1k) 10
- Temples flattened, or weakly convex, in dorsal view (Fig. 1d, h) 11
- 10 Elytra 2 × as long as pronotum *M. impressicollis* Eppelsheim
- Elytra 1.6–1.7 × as long as pronotum *M. uhligi* sp. n.
- 11 Head markedly darker than pronotum 12
- Head not markedly darker than pronotum 13
- 12 Basal portion of male metatibia bearing peg-like setae (Fig. 14i); female genital segment with a small dorsal sclerite (Fig. 15c) *M. hemipterus* (Illiger)
- Basal portion of male metatibia lacking peg-like setae (Fig. 8h); female genital segment with a large dorsal sclerite (Fig. 9c) *M. dentipes* Bernhauer
- 13 Male protrochanter bearing a peg-like seta (Fig. 30e); female abdominal tergite 8 without apical projection (Figs 13f, 31g) 14
- Male protrochanter lacking peg-like setae; female abdominal tergite 8 with an apical projection (Figs 11f, 7f) 15
- 14 Lateral edges of pronotum sinuate (Fig. 13i) *M. fennicus* Lahtinen
- Lateral edges of pronotum angular (Fig. 31h) *M. strandi* Scheerpeltz
- 15 Male metatibia flat and wide (Fig. 6d); female with abdominal tergite 8 which is 3.0–4.0 × as long as its apical projection *M. denticollis* (Beck)
- Male metatibia different; female with abdominal tergite 8 which is 6.0–10.0 × as long as its apical projection 16
- 16 Lateral edges of pronotum angular (Fig. 11e) 17
- Lateral edges of pronotum sinuate, or subangulate (Fig. 29h) 19
- 17 Male metatibia without peg-like setae; female with coxites flattened dorsoventrally (Fig. 3a, b)
- *M. bellevoeyi* Sauley

- Male metatibia with peg-like setae; female with coxites not flattened dorsoventrally (Fig. 11a, b) 18
- 18 Male metatibia bearing peg-like setae grouped to form a field (Fig. 10d); female with apical projection of abdominal tergite 8 narrow (Fig. 11h) *M. depressus* (Paykull)
- Male metatibia bearing peg-like setae arranged in a single row (Fig. 22c); female with apical projection of abdominal tergite 8 broad (Fig. 23f) *M. nigrinus* Sahlberg
- 19 Abdominal sternite 8 upto 3.0 × as wide as its basal projection 20
- Abdominal sternite 8 more than 3.0 × as wide as its basal projection 21
- 20 Male metatibia slightly notched; female genital segment without internal sclerites *M. japonicus* Sharp
- Male metatibia deeply notched (Fig. 24d); female genital segment with two semicircular internal sclerites (Fig. 25c) *M. nitidulus* Kraatz
- 21 Male with peg-like setae of metatibia not grouped subapically (Fig. 24d); female with valvifers tapering in lateral view (Fig. 25b) *M. stercorarius* Mulsant and Rey
- Male with peg-like setae of metatibia grouped subapically to form a field (Fig. 18d); female with valvifers abruptly narrowed basally in lateral view (Fig. 19b) 22
- 22 Male metatrochanter lacking peg-like setae (Fig. 25h); female with dorsobasal portion of valvifers pigmented (Fig. 25a) *M. prosseni* Schatzmayr
- Male metatrochanter bearing peg-like setae (Fig. 36c); female with dorsobasal portion of valvifers hyaline (Fig. 37f) *M. zekorum* sp. n.

***Megarthus bellevoeyi* Saulcy**
(Figs 1b, 2a-h, 3a-i)

Megarthus affinis Miller 1852: 28, nec *Megarthus affinis* Stephens, 1834: 333.
Megarthus bellevoeyi Saulcy, 1862: 69.

Type material. *Megarthus affinis*: 1 ♂ from 'Wien' and bearing an unrecodable label has been located in the NHMW as possible original specimen of *M. affinis* Miller; as the name is a primary junior homonym, we prefer not to designate that specimen as a lectotype. *Megarthus bellevoeyi*: 3 ♂ syntypes were located in the Saulcy collection housed in MNIIN. One is designated here as lectotype, the two remaining are paralectotypes.

Additional material. Four hundred and fifty-nine specimens in BMNH, CNCI, FMNH, MHNG, NHMW, ZMHB, ZMUL and ZMUH.

Distribution. *Megarthus bellevoeyi* occurs in Europe, North Africa, Middle East and Caucasus (BMNH), and, apparently disjunctly, in Far East Russia (Vladivostok). *Megarthus bellevoeyi*, which is usually recorded as *M. affinis* Miller, is apparently absent from North Europe.

Biology. Found in old logs, leaf litter, compost and other decaying vegetational debris. More details on life history and phenology in Hammond (in press).

Description. Similar to *M. depressus* from which it differs as follows: Length 1.0–1.5 mm; width 0.6–0.9 mm. Antenna as in Fig. 3d. Pronotum as in Fig. 3g. Scutellum as in Fig. 1b. Median processes of abdominal sternites 2–3 as in Fig. 3i. Ratios: EL 1.6–1.8; EW 1.1–1.2; EY 2.5–2.7; PT 1.9–2.1; SP 2.6–3.4; TPF 4.2–5.0.

Male. Frontoclypeal area, metasternum, protarsomere 5 and abdominal sternites 4–6 unmodified. Protarsomere 1 with tenent setae. Metafemur as long as mesofemur (Fig. 2e). Metatibia longer than mesotibia (Fig. 2c). Metatarsomere 1 about as long as combined length of metatarsomeres 2–4. Peg-like setae absent from protrochanter, protibia, metatrochanter, metafemur and metatibia; arranged in a single row on

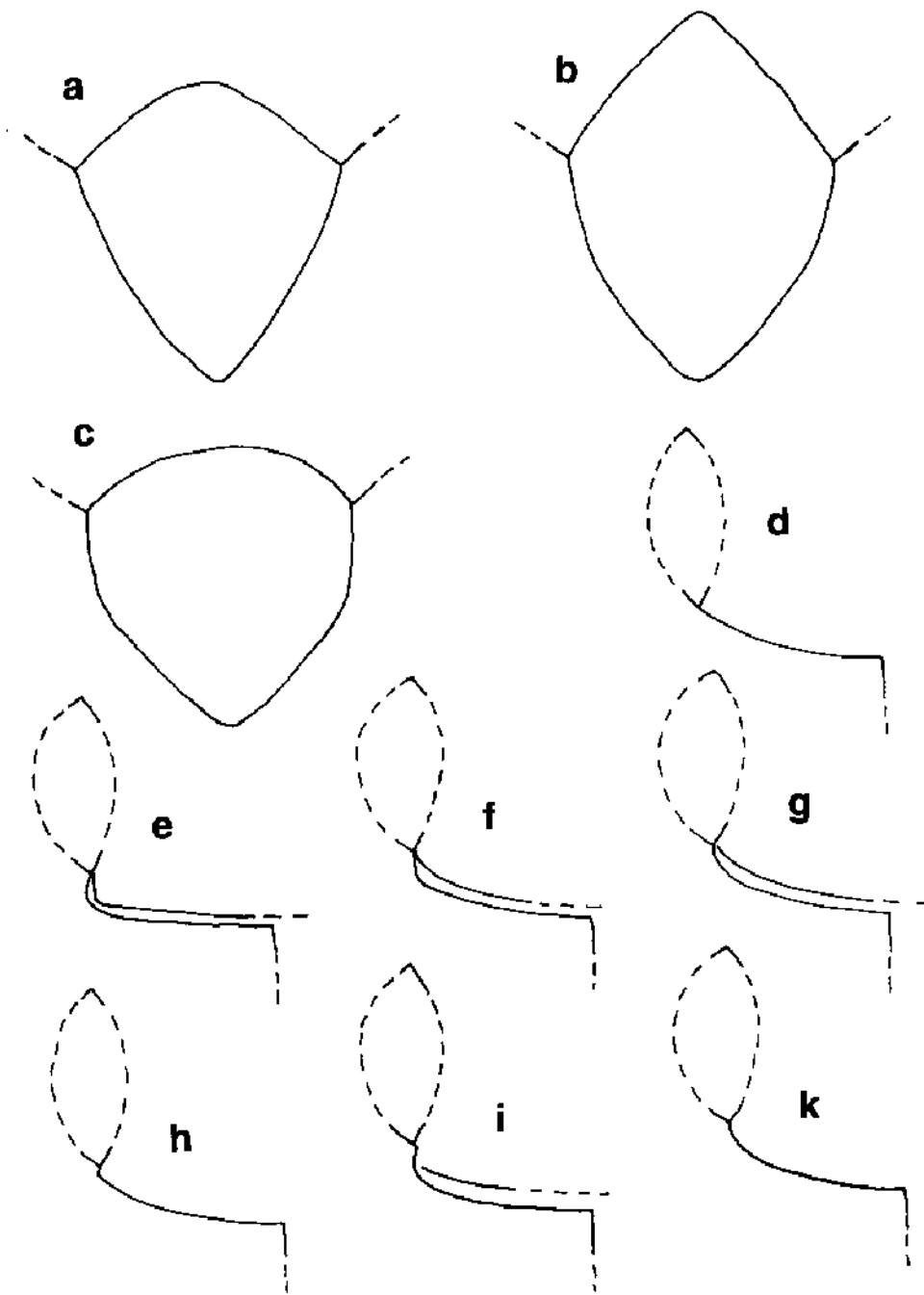


FIG. 1. Scutellum: (a-c) temple and occipital ridge: (d-k) schematic (a, d). *Megarthritis stercorarius*; (b) *M. bellevoeyi*; (c, f) *M. chobauti*; (e) *M. longicornis*; (g) *M. serrula*; (h) *M. nitidulus*; (i) *M. zerchei*; (k) *M. uhligi*.

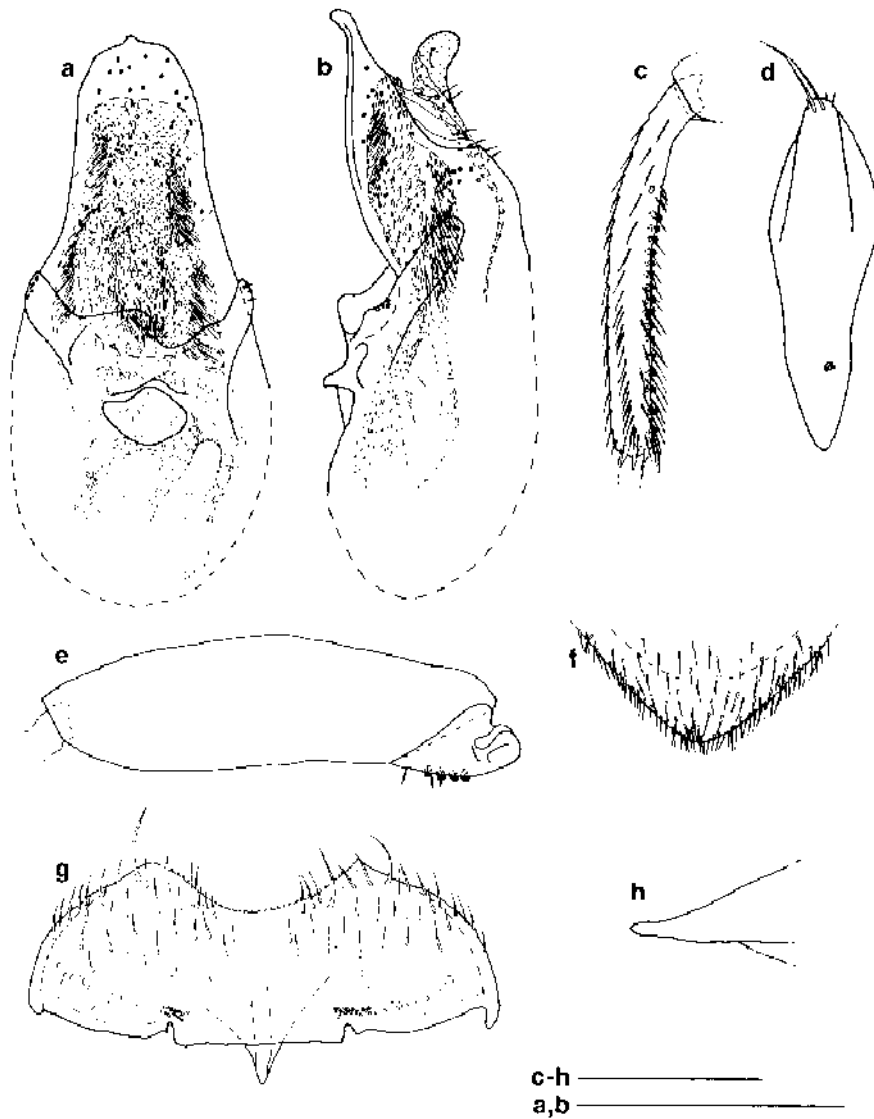


FIG. 2. *Megarthus bellevoeyi*, male: (a, b) aedeagus, ventral and lateral; (c) mesotibia; (d) abdominal sternite 9; (e) mesofemur and mesotrochanter; (f, h) apex of abdominal tergite 8, dorsal and lateral; (g) abdominal sternite 8. Scale bars = 0.2 mm.

mesotrochanter (Fig. 2c) and mesotibia. Apex of abdominal tergite 8 as in Fig. 2f, h. Sternite 8 as in Fig. 2g. Sternite 9 (Fig. 2d) bearing a small subbasal protuberance. Aedeagus as in Fig. 2a, b.

Female. Apical projection of abdominal tergite 8 as in Fig. 3f, h. Sternite 8 as in Fig. 3e. Genital segment as in Fig. 3a–c.

Comments. In *M. bellevoeyi*, as in most of the Palaearctic species, the head is abruptly narrowed just behind the eyes. It may be distinguished by the unmodified male metalibia and, in female, by the presence of an apical projection of abdominal

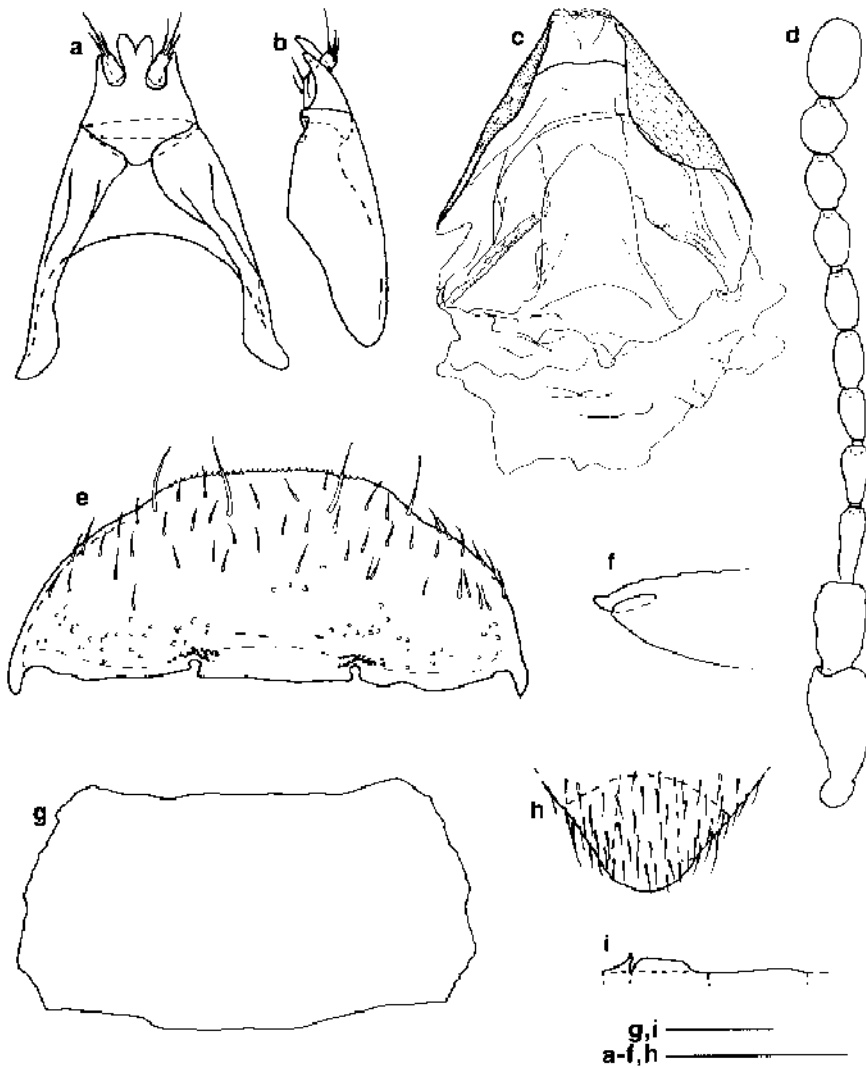


FIG. 3. *Megarthus bellevoyei*: (a-c) female, genital segment, sternites (a) dorsal, (b) lateral and tergites (c) ventral; (d) antenna; (e) female, abdominal sternite 8; (f, h) female, apex of abdominal tergite 8, lateral and dorsal; (g) pronotum; (i) median processes of abdominal sternites 2-4 (left to right), schematic. Scale bars=0.2 mm.

tergite 8, in combination with the coxites flattened dorsoventrally. See comments under *M. depressus*.

***Megarthus chobauti* Fauvel**
(Figs 1c, f, 4a-k, 5a-i)

Megarthus chobauti Fauvel, 1902: 170.

Type material. LECTOTYPE ♂: 'Yakouren, Kabylie, L. Puel (manuscript)/Coll. et det. Fauvel, *Megarthus chobauti* Fauv., R.I.Sc.N.B. 17.479/Syntype', ISNB.

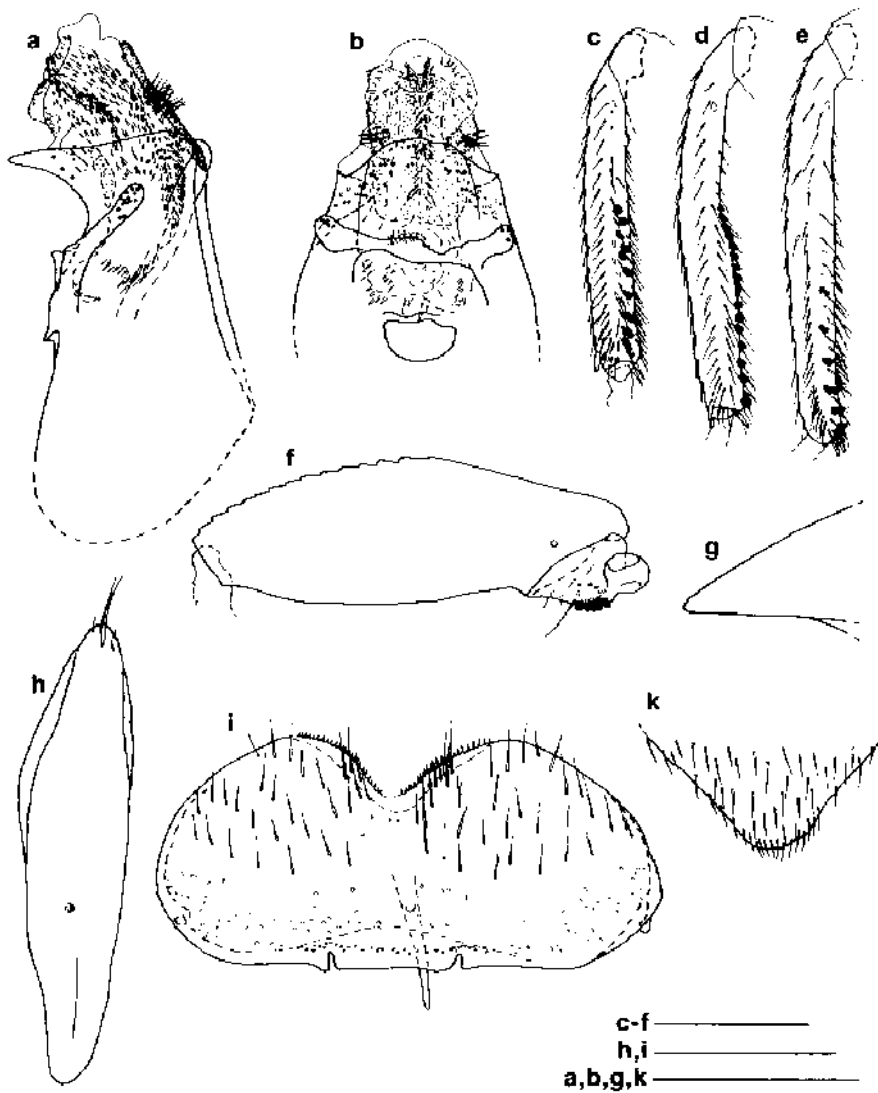


FIG. 4. *Megarthus chobauti*, male: (a, b) aedeagus, lateral and ventral (apical portion); (c) protibia; (d) mesotibia; (e) metatibia; (f) mesofemur and mesotrochanter; (g, k) apex of abdominal tergite 8, dorsal and lateral; (h) abdominal sternite 9; (i) abdominal sternite 8. Scale bars = 0.2 mm.

PARALECTOTYPES (9): same data as lectotype, 1 ♂ in ISNB; 'Bou-Berak, près Dellys, 6-11 mai 1901, Dr A. Chobaut/Coll. et det. Fauvel, *Megarthus chobauti* Fauv., R.I.Sc.N.B. 17.479/Syntype', 1 ♀ in ISNB; 'Bou-Berak, près Dellys 5 (manuscript)/*chobauti* Fvl. (manuscript)/R.I.Sc.N.B. 17.479, Coll. et det. Fauvel/Syntype', 1 ♀ in ISNB; 'Bou Berak, Kabylie L. Pucl/O. Leonhard/*Megarthus chobauti* Fvl Type [manuscript]/Syntype' 1 ♂ and 4 ♀ in DEI; 'Bougie, 17-22 mai 1901, Dr A. Chobaut/Coll. et det. Fauvel, *Megarthus chobauti* Fauv., R.I.Sc.N.B. 17.479/Syntype', 1 ♀ in ISNB, by present designation.

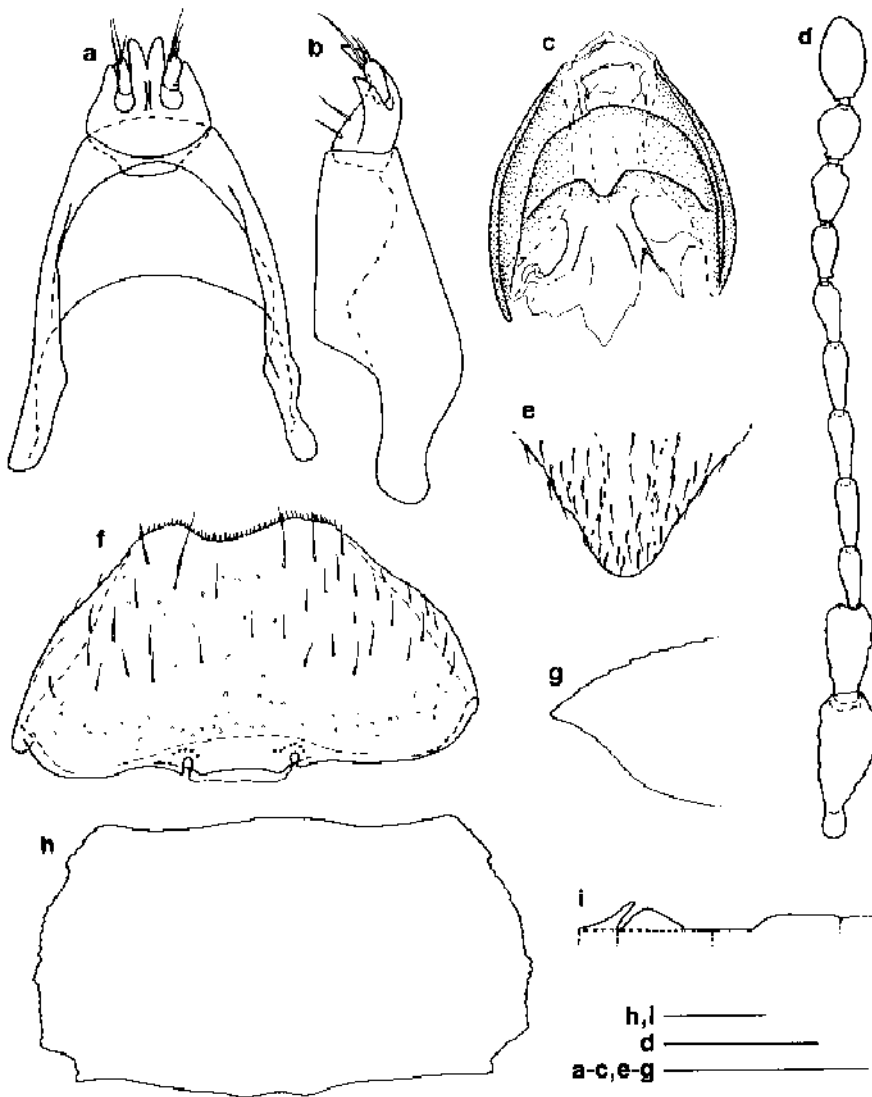


FIG. 5. *Megarthus chobauti*: (a-c) female, genital segment, sternites (a) dorsal, (b) lateral and tergites (c) ventral; (d) antenna; (e, g) female, apex of abdominal tergite 8, dorsal and lateral; (f) female, abdominal sternite 8; (h) pronotum; (i) median processes of abdominal sternites 2-4 (left to right), schematic. Scale bars—0.2 mm.

Additional material. Two hundred and eighty-four specimens in BMNH, DEI, FMNH, ISNB, MHNG, ZMHB and ZMUL.

Distribution. Algeria. The species is brachypterous and is apparently restricted to Kabylia.

Biology. Found in oak forests, under the bark of old logs, in rotting wood, forest leaf litter and other decaying vegetable debris.

Description. Length 1.2–1.5 mm; width 0.8–1.0 mm. Body and appendages uniformly red-brown. Dorsal pubescence fairly uniform, becoming denser near median pronotal groove and on humeral area. Anteriomedian portion of frons with setae

orientated backward. Elytral setae curved, recumbent. Metasternal setae as long as prosternal setae, becoming denser anteriorly. Abdominal pubescence parallel, uniform. Punctuation coarse on anterior portion of hypomerion and posteriomedian portion of metasternum. Frons raised above level of vertex, forming a ridge above clypeus; frontal ridge sharp, low in middle, conspicuous laterally. Anterior frontal edge evenly convex. Frontal impression shallow. Eye strongly convex, with highest point reaching level of vertex; supra-ocular margin sinuate in dorsal view. Temple and occipital ridge as in Fig. 1f; occipital ridge absent medially, arcuate laterally. Submentum strongly convex. Antenna (Fig. 5d) without patches of sensilla; scape not flattened; antennomeres 3–4 slightly asymmetrical; short and dense pubescence present on antennomeres 6–11. Pronotum (Fig. 5h) weakly convex in frontal view, with mesal portion fairly straight in lateral view. Pronotal disc with depressions deep along lateral edge, shallow beside median groove; median groove shallow, parallel-sided. Hypomerion ridge present anteriorly, oblique. Median prosternal ridge absent; anterior prosternal margin bordered by a regular row of conspicuous longitudinal ridges. Protrochanter lacking transverse ridge. Mesosternum with lateral portion of prepectal ridge sinuate, bifid. Scutellum as in Fig. 1c. Elytron not narrowed basally; base abruptly inclined. Humeral callus low. Elytral disc without swellings, shallowly depressed along lateral edge; lateral edge finely carinate, straight, or weakly convex, in dorsal view; sutural area straight in lateral view; apical margin straight, or convex, near suture; inner apical angle obtuse. Metasternum with femoral line arcuate in middle; median ridge absent, or present posteriorly, fine and low; transverse ridge parallel to posterior edge of metasternum. Abdominal tergite 3 slightly transversely vaulted. Sternites 2 and 3 with median processes as in Fig. 5i, process of sternite 3 straight. Sternite 4 with basal portion flat, strongly transversely vaulted at disc. Ratios: AL 1.9–2.1; EL 1.4–1.6; ET 1.7–1.8; EW 1.1–1.2; EY 2.6–3.0; GF 2.2–2.4; GW 1.7–1.9; HW 1.7–1.8; ML 1.4–1.6; MP 1.8–2.1; PF 1.8–2.0; SP 4.0–4.5; TPF abs.

Male. Frontoclypeal area, metasternum, protarsomere 5 and abdominal sternites 4–6 unmodified. Protarsomere 1 without tenent setae. Metafemur as long as mesofemur (Fig. 4f). Metatibia (Fig. 4c) longer than mesotibia (Fig. 4d). Metatarsomere 1 about as long as combined length of metatarsomeres 2–4. Peg-like setae absent from protrochanter, metatrochanter and metafemur; arranged in a single row on mesotrochanter (Fig. 4f) and arranged in one or two rows on protibia (Fig. 4c), mesotibia and metatibia. Apex of abdominal tergite 8 as in Fig. 4g, k. Sternite 8 as in Fig. 4i, Sternite 9 (Fig. 4h) bearing a very small subbasal protuberance. Acdeagus as in Fig. 4a, b.

Female. Abdominal tergite 8 (Fig. 5e, g) lacking apical projection. Sternite 8 as in Fig. 5f. Genital segment as in Fig. 5a–c.

Comments. *Megarthus chobauti* may be easily distinguished by the male protibia with peg-like setae.

Megarthus conspirator Cuccodoro

Megarthus conspirator Cuccodoro, 1996b: 481.

Distribution. *Megarthus conspirator* is known from Japan and Far East Russia.

Comments. *Megarthus conspirator* may be distinguished from other Euro-Asian continental species by the conspicuously angulated temples.

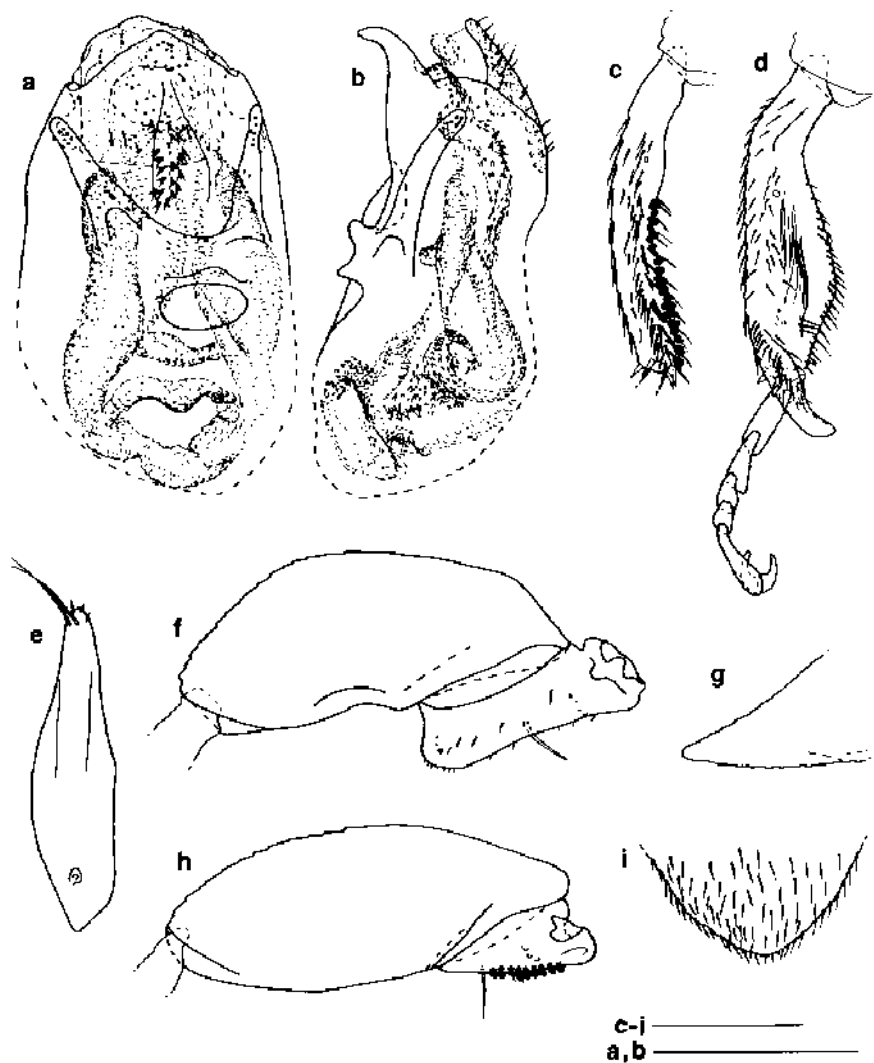


FIG. 6. *Megarthus denticollis*: male; (a, b) aedeagus, ventral and lateral; (c) mesotibia; (d) metatibia and metatarsus; (e) abdominal sternite 9; (f) metafemur and metatrochanter; (g, i) apex of abdominal tergite 8, lateral and dorsal; (h) mesofemur and mesotrochanter. Scale bars = 0.2 mm.

Megarthus denticollis (Beck)
(Figs 6a-i, 7a-k)

Omalium denticolle Beck, 1817: 26.

Megarthus denticollis; Erichson, 1840: 906.

Megarthus rufescens Stephens 1834: 331.

Type material. *Omalium denticolle*: The collection of Beck has been destroyed (M. Uhlig, personal communication). Beck based his description on material from

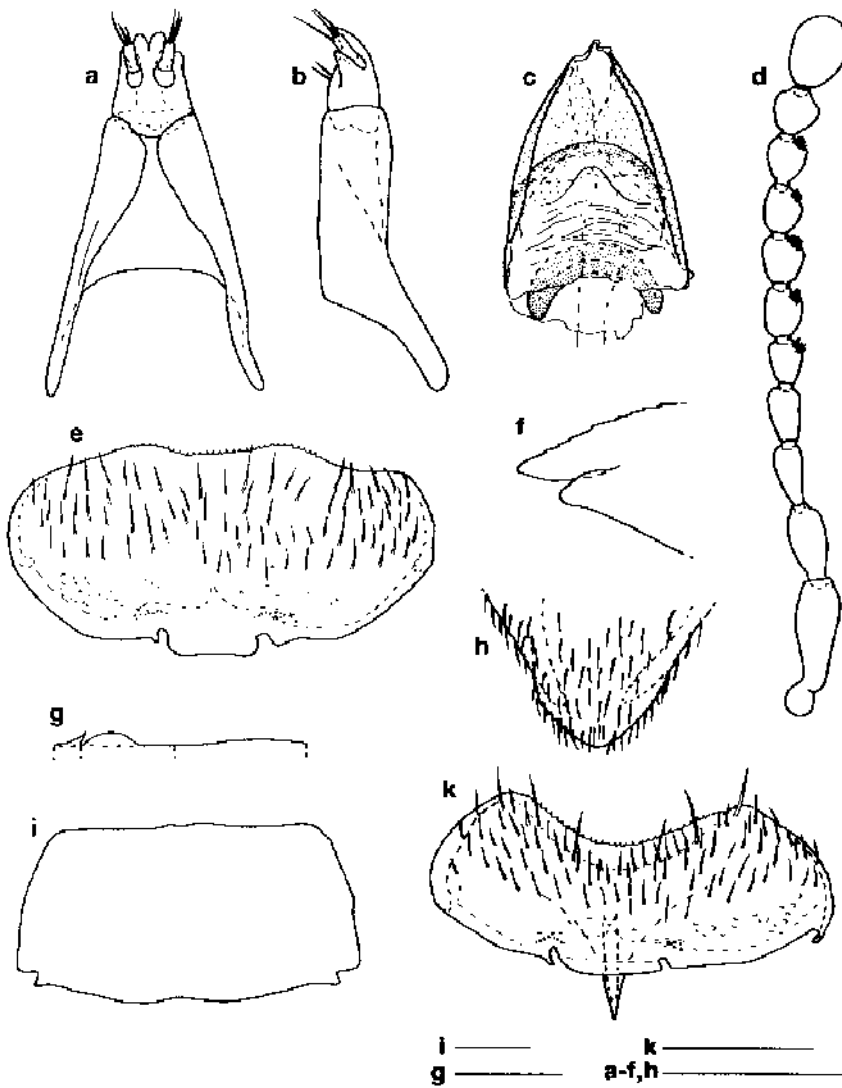


FIG. 7. *Megarthus denticollis*: (a-c) female, genital segment, sternites (a) dorsal, (b) lateral and tergites (c) ventral; (d) antenna; (e) female, abdominal sternite 8; (f, h) female, apex of abdominal tergite 8, lateral and dorsal; (g) median processes of abdominal sternites 2-4 (left to right), schematic; (i) pronotum; (k) male, abdominal sternite 8. Scale bars = 0.2 mm.

Bavaria, but gave no information useful for identification. In the interests of nomenclatural stability, a male labelled 'München Umg., Engl. Garten Heu, 27.10.1956, E. Bezzel/*Megarthus denticollis* Beck, det. H. Freude 1958', deposited in ZSMC is designated as neotype, and accordingly labelled. The characters of this specimen correspond to those given in Erichson (1840), who first transferred *O. denticolle* in *Megarthus*, and to the usual conception of this species name. *Megarthus rufescens*:

1 original ♂ has been located in the collection of Stephens housed in BMNH. It is presently designated as lectotype and accordingly labelled.

Additional material. Eight hundred and fifty-two specimens from BMNH, CNCL, FMNH, MHNG, ZMIIB, ZMUH, ZMUL and ZSMC.

Distribution. *Megarthritis denticollis* is distributed throughout most of the Palaeartic region, including Altai and Japan. It is apparently absent from the southern Mediterranean area. The record from Syria (Winkler, 1925) requires confirmation.

Biology. Found on gilled fungi, in dung, leaf litter and other decaying vegetable matter. More details on life history and phenology in Hammond (in press).

Description. Length 1.2–1.5 mm; width 0.8–1.0 mm. Body predominantly dark brown, head, metasternum and sutural margins of elytra darkened, appendages paler; antennomeres 1–4 paler than antennomeres 5–11. Dorsal pubescence fairly uniform, becoming somewhat denser near apical margin of abdominal tergite 7. Anteromedian portion of frons with setae orientated backward. Elytral setae straight, recumbent. Metasternal setae shorter than prosternal setae, becoming sparser posteromedially. Abdominal pubescence parallel, uniform on sternites 4–7, but with a pair of long subapical setae on each sternite. Punctuation coarse on anterior portion of hypomeron; posteromedian portion of metasternum impunctate. Frons slightly raised above level of vertex, forming a blunt ridge above clypeus. Anterior frontal edge evenly convex. Frontal impression obsolete. Eye strongly convex, with highest point below level of vertex. Temple similar to that in Fig. 1d. Occipital ridge indistinct. Submentum convex. Antenna (Fig. 7d) with patches of sensilla on antennomeres 6–10; scape not flattened; antennomere 3 somewhat asymmetrical, antennomere 4 strongly asymmetrical; short and dense pubescence present on antennomeres 5–11. Pronotum (Fig. 7i) weakly convex in frontal view, with mesal portion fairly straight in lateral view. Pronotal disc with shallow depressions along posterior portion of lateral edge and beside median groove; median groove shallow, parallel-sided. Hypomeral ridge absent. Median prosternal ridge absent; anterior prosternal margin bordered by an irregular row of fine longitudinal ridges. Prothorax lacking transverse ridge. Mesosternum with lateral portion of prepectal ridge straight, bifid. Scutellum similar to that in Fig. 1b. Elytron not narrowed basally; base gradually inclined. Humeral callus low. Elytral disc with low swellings, shallowly depressed along lateral edge; lateral edge finely carinate, straight in dorsal view; sutural area straight, or weakly convex, in lateral view; apical margin straight, or convex, near suture; inner apical angle obtuse. Metasternum with femoral line arcuate in middle; median ridge present posteriorly, fine and low; transverse ridge parallel to posterior edge of metasternum. Abdominal tergite 3 almost flat. Sternites 2 and 3 with median processes as in Fig. 7g, process of sternite 3 straight. Sternite 4 flat. Ratios: AL 1.6–1.8; EL 1.6–1.8; ET 1.7–2.0; EY 2.5–2.7; GT 1.9–2.2; GW 1.8–2.0; HW 1.6–1.8; ML 1.6–1.7; MP 1.5–1.7; PT 1.8–2.0; SP 3.6–4.7; TPF 3.4–3.8.

Male. Frontoclypeal area, metasternum, protarsomere 5 and abdominal sternites 4–6 unmodified. Protarsomere 1 with tenent setae. Metafemur (Fig. 6f) about as long as mesofemur (Fig. 6h). Metatibia (Fig. 6d) longer than mesotibia (Fig. 6c). First metatarsomere 1.3–1.5 × as long as combined length of metatarsomere 2–4. Peg-like setae absent from protibia, metatrochanter (Fig. 6f), metafemur and metatibia; arranged in a single row on mesotrochanter (Fig. 6h) and grouped to form a field on mesotibia. Apex of abdominal tergite 8 as in Fig. 6g, i. Sternite 8 as in Fig. 7k. Sternite 9 (Fig. 6e) bearing a small subbasal protuberance. Aedeagus as in Fig. 6a, b.

Female. Abdominal tergite 8 (Fig. 7f, h) with apical projection. Sternite 8 as in Fig. 7g. Genital segment as in Fig. 7a–c.

Comments. *Megarthus denticollis* is the only European species which has the metatibiae flat and wide, and very stout metafemora in male. In addition, the shape of the pronotum is diagnostic.

***Megarthus dentipes* Bernhauer**
(Figs 8a–k, 9a–i)

Megarthus dentipes Bernhauer, 1938: 17.

Type material. LECTOTYPE, ♂: 'Nordwestl. China, Chinkiang, Coll. Reitter/*dentipes* Brh. Cotypus *Megarthus* [manuscript]' in FMNH. PARALECTOTYPES (2): same data as lectotype, 1 ♀ in FMNH and 1 ♂ in NHMW, by present designation.

Additional material (2). China, Zhejiang, Tienmushan, 29.iv.1993 (G. de Rougemont) 1 ♂, 1 ♀ in GRPC and MHNG.

Distribution. *Megarthus dentipes* is known only from China.

Biology. Unknown.

Description. Similar to *M. hemipterus* from which it differs as follows: antenna as in Fig. 9d; pronotum as in Fig. 9h. Sternites 2 and 3 with median processes as in Fig. 9i. Ratios: EL 1.5–1.7; EY 2.3–2.4; ML 1.5–1.8; PT 2.0–2.2; SP 3.2–3.6, TPF abs.

Male. Frontoclypeal area, metasternum, protarsomere 5 and abdominal sternites 4–6 unmodified. Protarsomere 1 with tenent setae. Metafemur (Fig. 8d) shorter than mesofemur (Fig. 8c). Metatibia (Fig. 8h) as long as mesotibia (Fig. 8g). Metatarsomere 1 about as long as combined length of metatarsomeres 2–4. Metatrochanter (Fig. 8d) bearing 1–3 peg-like setae. Peg-like setae absent from protrochanter, protibia (Fig. 8b) and metafemur; arranged in a single row on mesotibia, in two rows on mesotrochanter (Fig. 8c) and grouped to form a field on metatibia. Apex of abdominal tergite 8 as in Fig. 8i, k. Sternite 8 as in Fig. 8e. Sternite 9 lacking subbasal protuberance. Aedeagus as in Fig. 8a, f.

Female. Abdominal tergite 8 (Fig. 9e, g) without apical projection. Sternite 8 as in Fig. 9f. Genital segment as in Fig. 9a–c.

Comments. *Megarthus dentipes* and *M. hemipterus* may be distinguished from other Palaeartic congeners by having the head markedly darker than the body. These two species differ in sexual characters.

***Megarthus depressus* (Paykull)**
(Figs 10a–h, 11a–i)

Staphylinus depressus Paykull, 1789: 70.

Megarthus depressus; Curtis, 1829: 28.

Type material. *Staphylinus depressus*: two original specimens (♂, ♀) have been located by B. Gustafsson in the collection of Paykull, housed in NHRS: the ♂ is presently designated and accordingly labelled as lectotype, the ♀ as paralectotype.

Additional material. Eight hundred and thirty specimens from BMNH, BPBM, CNCI, DEL, FMNH, MIING, ZMHB, ZMUII, ZMUL and ZSMC.

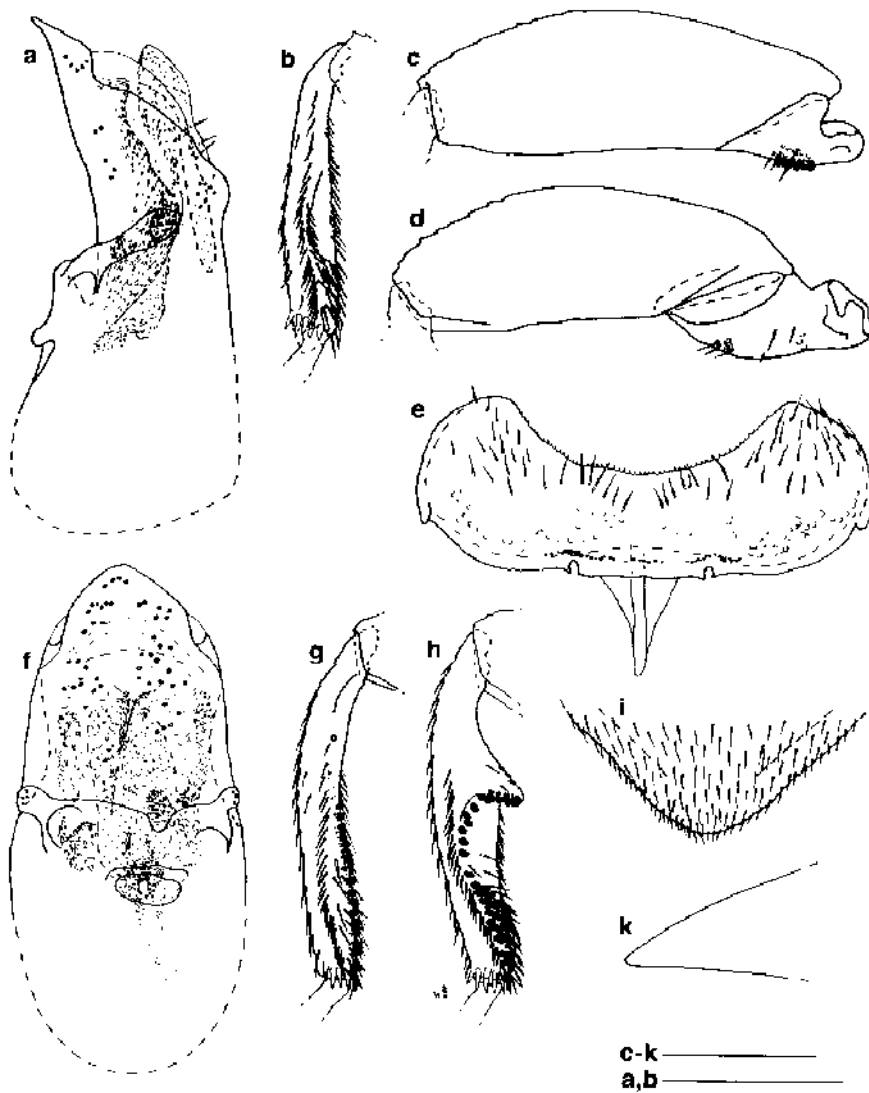


FIG. 8. *Megarthus dentipex*, male: (a, f) aedeagus, lateral and ventral; (b) protibia; (c) mesofemur and mesotrochanter; (d) metafemur and metatrochanter; (e) abdominal sternite 8; (g) mesotibia; (h) metatibia; (i, k) apex of abdominal tergite 8, dorsal and lateral. Scale bars = 0.2 mm.

Distribution. *Megarthus depressus* is distributed throughout most of the Palaeartic region (including Caucasus and Sikhote-Alin) but appears absent from the southern Mediterranean area and from Japan. Records of the species from North America refer to *M. angulicollis*, which has been incorrectly placed in synonymy of *M. sinuatocollis* (Lacordaire) (see comments and Material and methods).

Biology. Found in dung, rotted fungi, moss, leaf litter, grass cuttings and other decaying vegetable matter. More details on life history and phenology in Hammond (in press).

Description. Length 1.2–1.5 mm; width 0.8–1.0 mm. Body predominantly dark brown, sutural margins of elytra darkened, appendages paler. Dorsal pubescence

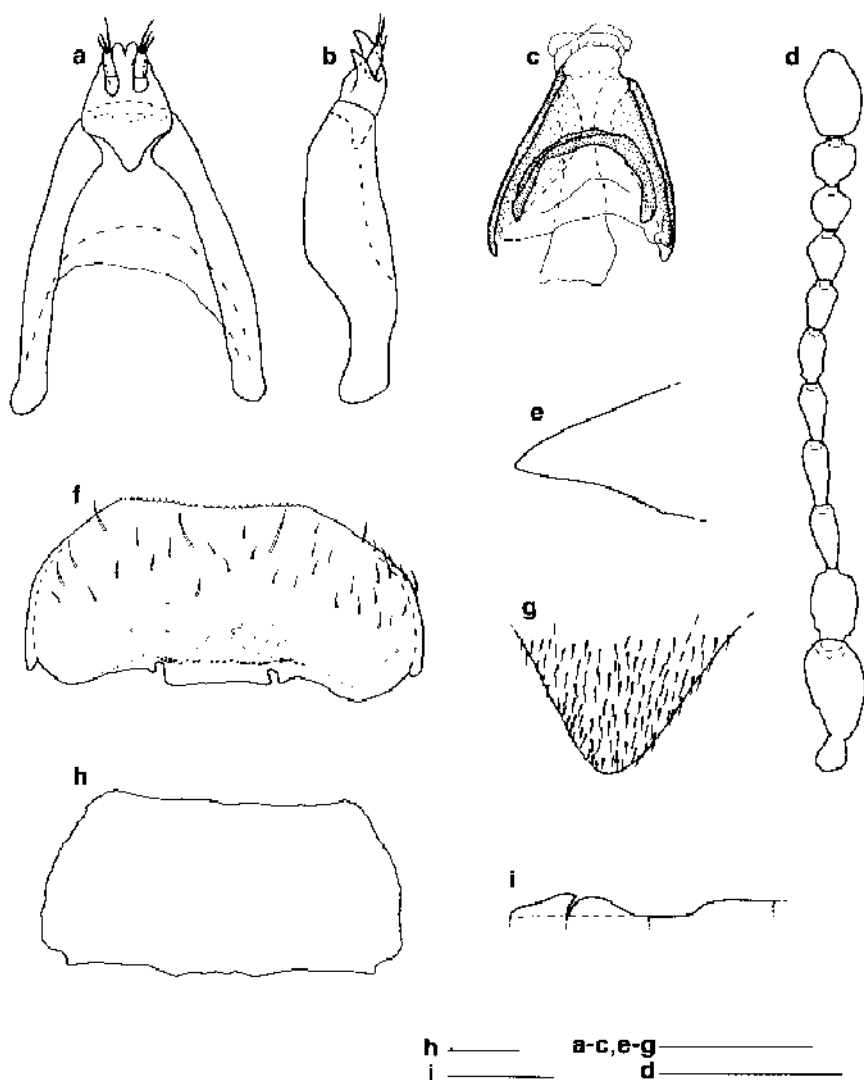


FIG. 9. *Megarthus dentipes*: (a-c) female, genital segment, sternites (a) dorsal, (b) lateral and tergites (c) ventral; (d) antenna; (e, g) female, apex of abdominal tergite 8, lateral and dorsal; (f) female, abdominal sternite 8; (h) pronotum; (i) median processes of abdominal sternites 2-4 (left to right), schematic. Scale bars=0.2 mm.

fairly uniform. Anteriomedian portion of frons with setae orientated backward. Flytral setae straight, recumbent. Metasternal setae shorter than prosternal setae, becoming sparser posteriomedially. Abdominal pubescence parallel, uniform on sternites 4-7, but with a pair of long subapical setae on each sternite. Punctuation fine on anterior portion of hypomeron; posteriomedian portion of metasternum impunctate. Frons raised above level of vertex, forming a blunt ridge above clypeus. Anterior frontal edge evenly convex. Frontal impression shallow. Eye strongly convex, with highest point slightly below, or reaching, level of vertex; supra-ocular margin sinuate in dorsal view. Temple similar to that in Fig. 1d. Occipital ridge indistinct. Submentum flat, or weakly convex. Antenna (Fig. 11d) without patches

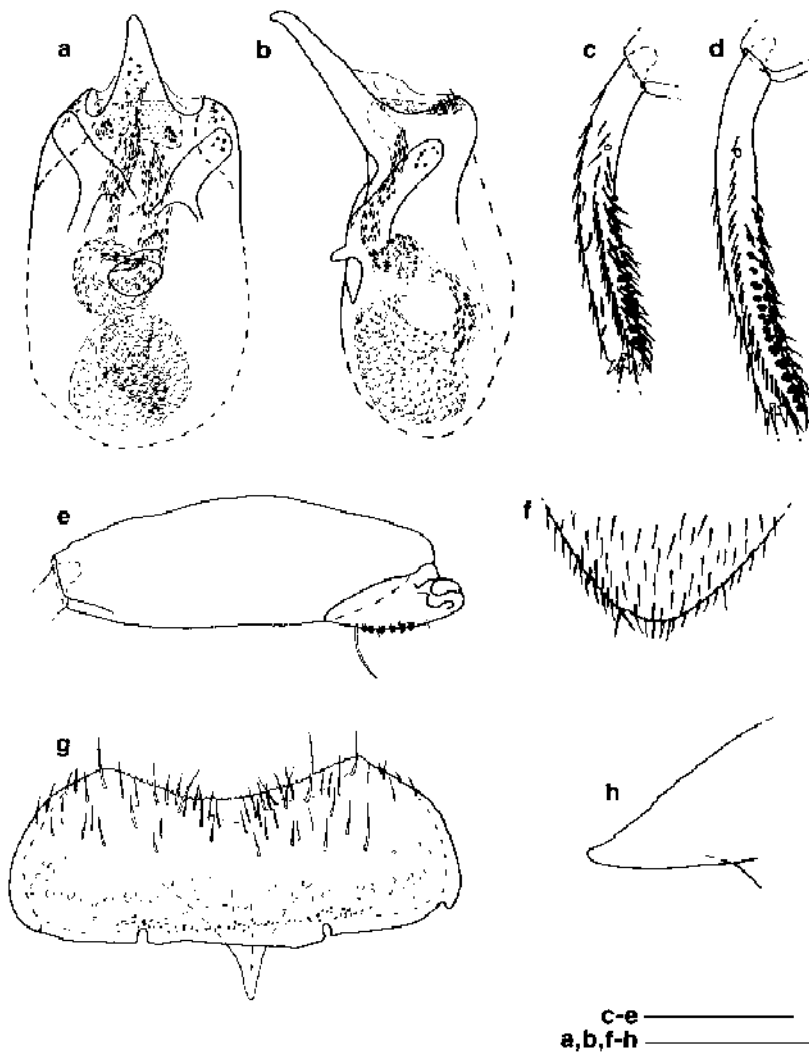


FIG. 10. *Megarthus depressus*, male: (a, b) aedeagus, ventral and lateral; (c) mesotibia; (d) metatibia; (e) mesofemur and mesotrochanter; (f, h) apex of abdominal tergite 8, dorsal and lateral; (g) abdominal sternite 8. Scale bars = 0.2 mm.

of sensilla; scape not flattened; antennomeres 3-4 slightly asymmetrical; short and dense pubescence present on antennomeres 5-11. Pronotum (Fig. 11e) weakly convex in frontal view, with mesal portion fairly straight in lateral view. Pronotal disc with shallow depression along lateral edge; median groove shallow, parallel-sided. Hypomerall ridge absent. Prosternal median ridge absent; anterior prosternal margin bordered by a regular row of fine longitudinal ridges. Prothrochanter lacking transverse ridge. Mesosternum with lateral portion of prepectal ridge straight, bifid. Scutellum similar to that in Fig. 1a. Elytron not narrowed, or weakly narrowed basally; base gradually inclined. Humeral callus low. Elytral disc with low swellings, shallowly depressed along lateral edge; lateral edge finely carinate, straight, or weakly convex, in dorsal view; sutural area straight, or weakly convex, in lateral view; apical

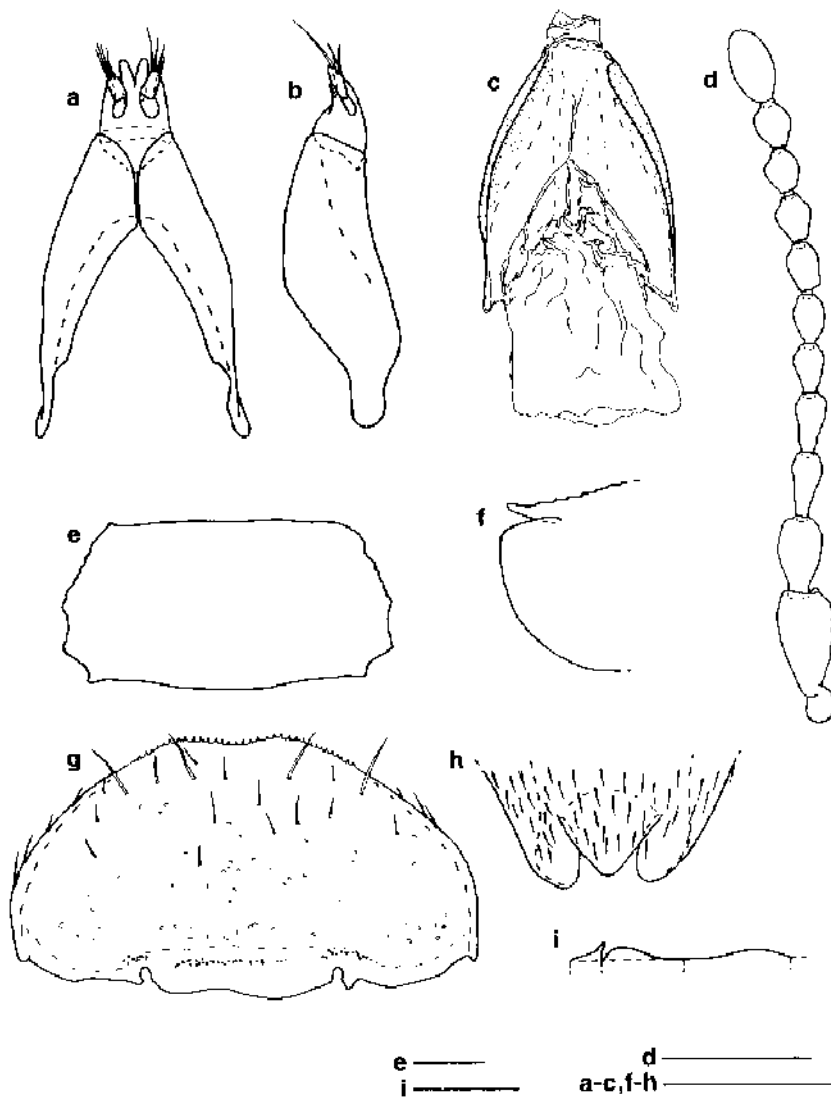


FIG. 11. *Megarthrus depressus*: (a-c) female, genital segment, sternites (a) dorsal, (b) lateral and tergites (c) ventral; (d) antenna; (e) pronotum; (f, h) female, apex of abdominal tergite 8, lateral and dorsal; (g) female, abdominal sternite 8; (i) median processes of abdominal sternites 2-4 (left to right), schematic. Scale bars—0.2 mm.

margin straight, or convex, near suture; inner apical angle rectangular, or obtuse. Metasternum with femoral line arcuate in middle; median ridge present posteriorly, fine and low; transverse ridge parallel to posterior edge of metasternum. Abdominal tergite 3 almost flat. Sternites 2-3 with median processes as in Fig. 11i, process of sternite 3 straight. Sternite 4 with basal portion flat, slightly transversely vaulted at disc. Ratios: AL 1.8-2.0; EL 1.6-1.8; ET 1.7-1.9; EW 1.2-1.3; EY 2.6-3.0; GT 2.1-2.3; GW 1.6-1.8; HW 1.6-1.8; ML 1.6-1.8; MP 1.4-1.6; PT 2.0-2.1; SP 2.4-2.6; TPF 4.5-5.0.

Male. Frontoclypeal area, metasternum, protarsomere 5 and abdominal sternites 4-6 unmodified. Protarsomere 1 with tenent setae. Metafemur longer than meso-

femur (Fig. 10c). Metatibia (Fig. 10d) longer than mesotibia (Fig. 10c). Metatarsomere 1 about as long as combined length of metatarsomeres 2-4. Peg-like setae absent from protrochanter, protibia, metatrochanter and metafemur; arranged in a single row on mesotrochanter (Fig. 10e), grouped to form a field on mesotibia and metatibia. Apex of abdominal tergite 8 as in Fig. 10f, h. Sternite 8 as in Fig. 10g. Sternite 9 lacking a subbasal protuberance. Aedeagus as in Fig. 10a, b.

Female. Abdominal tergite 8 (Fig. 11f, h) with apical projection. Sternite 8 as in Fig. 11g. Genital segment as in Fig. 11a-c.

Comments. Since the description, the species name *depressus* has been incorrectly used for a distinct species to which we refer as *M. prosseni*. Most authors (Kraatz, 1868; Fauvel, 1872; Sahlberg, 1876; Ganglbauer, 1895; Reitter, 1909; Kemner, 1925; Portevin, 1929; Bruce, 1931; Palm, 1948; Hatch, 1957; Horion, 1963; Lohse, 1964) referred this species as *M. sinuaticollis* (Lacordaire), or as *M. sinuaticollis* which is a misspelling.

Megarthritis bellevoeyi, *M. depressus*, *M. nigrinus* and *M. strandi* differ from other species which have the head abruptly narrowed just behind the eyes by the shape of the pronotum. Within these species, *M. depressus* may be easily distinguished by the pattern of the peg-like setae on male metatibia and, in female, by the shape of the apical projection of the abdominal tergite 8.

Megarthritis fennicus Lahtinen
(Figs 12a-k, 13a-i)

Megarthritis fennicus Lahtinen, 1938: 254.

Type material. LECTOTYPE ♂: 'Alajärvi, E. K. Lahtinen / #4052 / Typus / *Megarthritis fennicus* n. [manuscript] det. E. K. Lahtinen', ZMUT. Paralectotypes (5): 'Alajärvi, E. K. Lahtinen / #4051 / Cotypus', 1 ♀ in ZMUH: same data, but '#5443 / *Megarthritis fennicus* n. sp. [manuscript] det. E. K. Lahtinen', 1 ♀ in ZMUH; 'Alajärvi, E. K. Lahtinen, 19.vi.1937 / #4047' 1 ♂ in ZMUT; same data, but '#4048' 1 ♀ in ZMUT; 'Ruissalo, E. K. Lahtinen / Cotypus' 1 ♂ in ZMUT, by present designation.

Additional material. Sixty-nine specimens in BMNH, MHNG, NIIMW, ZMIIB, ZMUH and ZMUL.

Distribution. *Megarthritis fennicus* occurs in North Europe and, apparently disjunctly, in Siberia (SW of the Lake Baikal, NHMW).

Biology. Recorded from dead fish and human excrement (Lahtinen, 1938).

Description. Length: 1.1-1.2 mm; width: 0.7-0.8 mm. Body predominantly blackish, elytra and appendages paler, sutural margins of elytra somewhat darkened. Dorsal pubescence fairly uniform. Anterior median portion of frons with setae orientated backward. Elytral setae straight, recumbent. Metasternal setae shorter than prosternal setae, becoming sparser posteriorly. Abdominal pubescence parallel, uniform on sternites 4-7, but with a pair of long subapical setae on each sternite. Punctuation fine on anterior portion of hypomeron; posterior median portion of metasternum impunctate. Frons raised above level of vertex, forming a blunt ridge above clypeus. Anterior frontal edge weakly convex in middle, oblique laterally. Frontal impression shallow, or indistinct. Eye strongly convex, with highest point somewhat below level of vertex; supra-ocular margin sinuate in dorsal view. Temple similar to that in Fig. 1d. Occipital ridge indistinct. Submentum weakly convex. Antenna

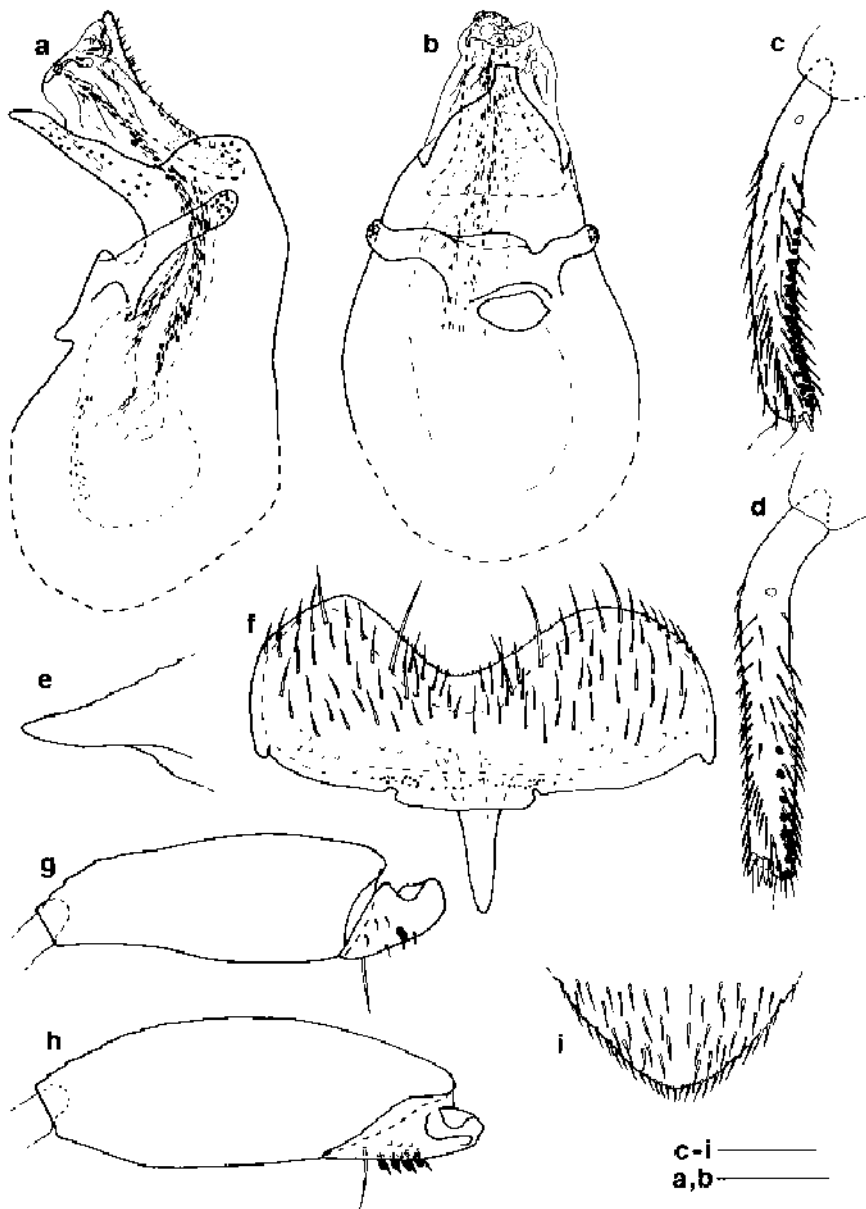


FIG. 12. *Megarthus femicus*, male: (a, b) aedeagus, ventral and lateral; (c) mesotibia; (d) metatibia; (e) metafemur and metatrochanter; (f, g) apex of abdominal tergite 8, lateral and dorsal; (h) mesofemur and mesotrochanter; (i) abdominal sternite 8; (k) protrochanter and profemur. Scale bars = 0.2 mm.

(Fig. 13d) with patches of sensilla on antennomeres 6–9; scape not flattened; antennomeres 3–4 somewhat asymmetrical; short and dense pubescence present on antennomeres 5–11. Pronotum (Fig. 13i) weakly convex in frontal view, with mesal portion fairly straight in lateral view. Pronotal disc with shallow depression along posterior portion of lateral edge; median groove shallow, parallel-sided.

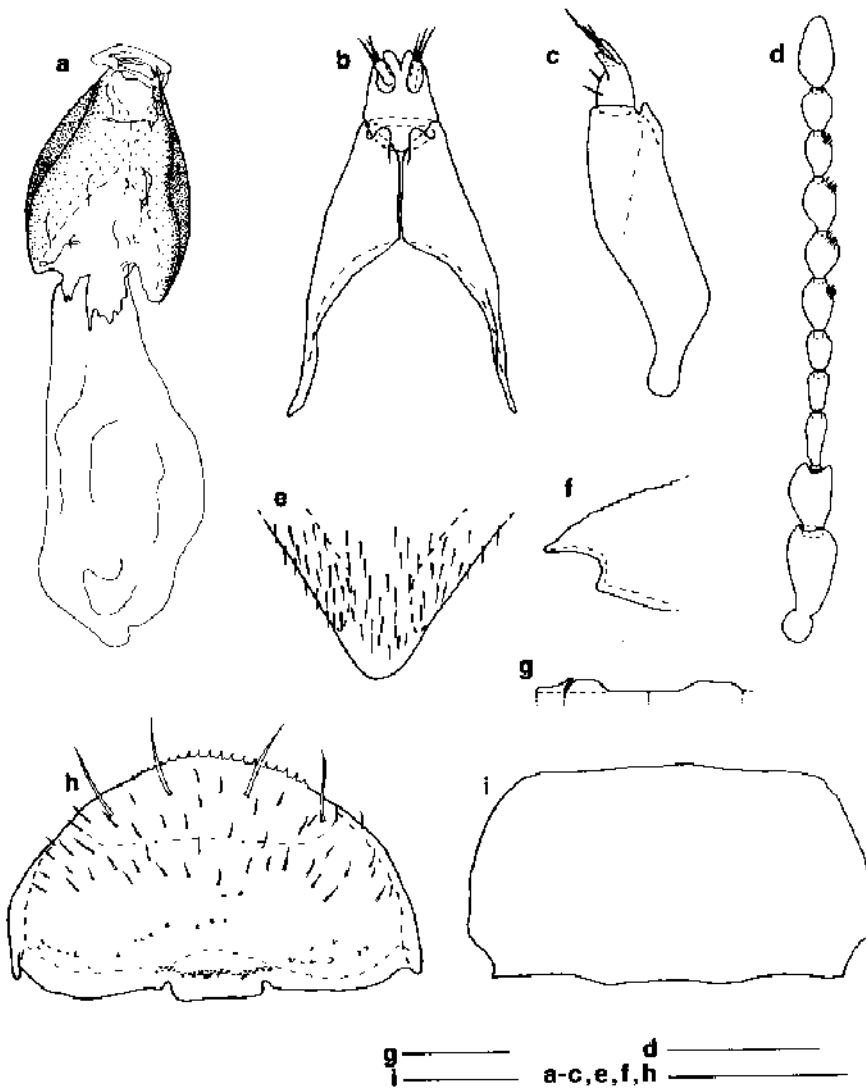


FIG. 13. *Megarathrus fenicus*: (a c): female, genital segment, tergites (a) ventral, sternites (b) dorsal and (c) lateral; (d) antenna; (e, f) female, apex of abdominal tergite 8, dorsal and lateral; (g) median processes of abdominal sternites 2-4 (left to right), schematic; (h) female, abdominal sternite 8; (i) pronotum. Scale bars=0.2 mm.

Hypomeral ridge absent. Prosternal median ridge absent; anterior prosternal margin not bordered by longitudinal ridges. Protrochanter lacking transverse ridge. Mesosternum with lateral portion of prepectal ridge straight, bifid. Scutellum similar to that in Fig. 1a. Elytron not narrowed basally; base gradually inclined. Humeral callus low. Elytral disc without swellings, shallowly depressed along apical portion of lateral edge; lateral edge finely carinate, weakly convex in dorsal view; sutural area almost straight in lateral view; apical margin straight near suture; inner apical angle obtuse. Metasternum with femoral line arcuate in middle; median ridge present posteriorly, fine and low; transverse ridge parallel to posterior edge of metasternum.

Abdominal tergite 3 slightly transversely vaulted. Sternites 2 and 3 with median processes as in Fig. 13g, process of sternite 3 straight. Sternite 4 with basal portion flat, slightly transversely vaulted at disc. Ratios: AL 1.8–2.0; EL 1.5–1.6; ET 1.6–1.7; EW 1.2; EY 2.3–2.5; GT 2.0; GW 1.7–1.8; HW 1.5–1.6; ML 1.5–1.6; MP 1.5–1.7; PT 1.8–1.9; SP 4.1–4.5; TPF abs.

Male. Frontoclypeal area, metasternum, protarsomere 5 and abdominal sternites 4–6 unmodified. Protarsomere 1 with tenent setae. Metafemur (Fig. 12k) about as long as mesofemur (Fig. 12h). Metatibia (Fig. 12d) somewhat longer than mesotibia (Fig. 12c). Metatarsomere 1 about as long as combined length of metatarsomeres 2–4. Protrochanter bearing a peg-like seta. Metatrochanter without peg-like seta, or with a single peg-like seta. Peg-like setae absent from metafemur; arranged in a single row on mesotrochanter (Fig. 12h) and metatibia, grouped to form a field on mesotibia. Apex of abdominal tergite 8 as in Fig. 12f, g. Sternite 8 as in Fig. 12i. Sternite 9 lacking subbasal protuberance. Aedeagus as in Fig. 12a, b.

Female. Abdominal tergite 8 (Fig. 13c, f) lacking apical projection. Sternite 8 as in Fig. 13h. Genital segment as in Fig. 13a–c.

Comments. *Megarthus feneticus* and *M. strandi* are the only Palaearctic members of the genus which possess peg-like setae on the male protrochanter. These two species differ in other sexual characters.

***Megarthus hemipterus* (Illiger)**
(Figs 14a–i, 15a–k)

Silpha hemiptera Illiger, 1794: 597.

Staphylinus melanocephalus Olivier, 1795: 38.

Megarthus hemipterus; Erichson, 1839: 645.

Phloebium nitiduloides Lacordaire, 1835: 493.

Megarthus heteropus Sawada, 1962: 12.

Type material. *Silpha hemiptera*: no specimens in ZMIIB could be reliably recognised as the type material; see comments. *Staphylinus melanocephalus*. Original material possibly in MHNI, but not traceable. *Phloebium nitiduloides*: two syntypes have been located in the collection Lacordaire in MNHN by N. Berti: a male, labelled 'Vernon 1831 [Lacordaire's handwriting, N. Berti personal communication]', is presently designated as lectotype and accordingly labelled, and a female, labelled '#67 / *Phloebium nitiduloides* [Lacordaire's handwriting, N. Berti personal communication]' is paralectotype.

Additional material. Two hundred and fifty-seven specimens from BMNH, DEI, FMNH, MHNG, ZMIIB and ZMUL.

Distribution. *Megarthus hemipterus* occurs throughout most of the Palaearctic region, including Far East Russia and Japan (Cuccodoro, 1996b). It is apparently absent from the Mediterranean area.

Biology. Found in carrion, leaf litter, old fungi and various decaying vegetable matter. More details on life history and phenology in Hammond (in press).

Description. Length 1.3–1.6 mm; width 0.9–1.1 mm. Body pale brown, or red-brown, head blackish, sutural margins of elytra darkened, appendages somewhat paler. Dorsal pubescence fairly uniform, becoming somewhat denser near apical margin of tergite 7. Anteromedian portion of frons with setae orientated backward. Elytral setae straight, recumbent. Metasternal setae shorter than prosternal setae.

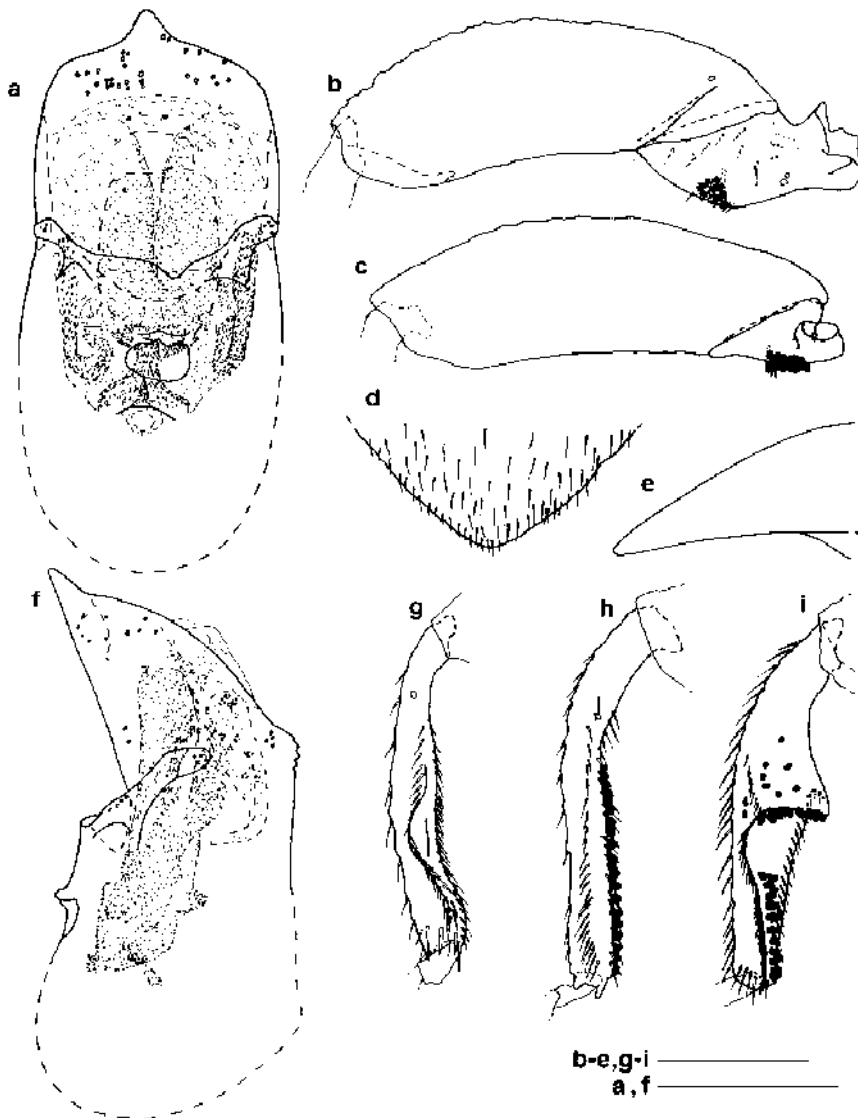


FIG. 14. *Megarthus hemipterus*, male: (a, f) aedeagus, ventral and lateral; (b) metafemur and metatrochanter; (c) mesofemur and mesotrochanter; (d, e) apex of abdominal tergite 8, dorsal and lateral; (g) protibia; (h) mesotibia; (i) metatibia. Scale bars = 0.2 mm.

fairly uniform. Abdominal pubescence somewhat converging on tergite 4, uniform on sternites 4-7, but with a pair of long subapical setae on each sternite. Punctuation fine on anterior portion of hypomeron; posteriomedian portion of metasternum impunctate. Frons raised above level of vertex, forming a ridge above clypeus; frontal ridge sharp, even. Anterior frontal edge evenly convex. Frontal impression shallow. Eye strongly convex, with highest point reaching level of vertex. Temple as in Fig. 1d. Occipital ridge indistinct. Submentum almost flat. Antenna (Fig. 15g) without patches of sensilla; scape flattened; antennomeres 3-4 slightly asymmetrical;

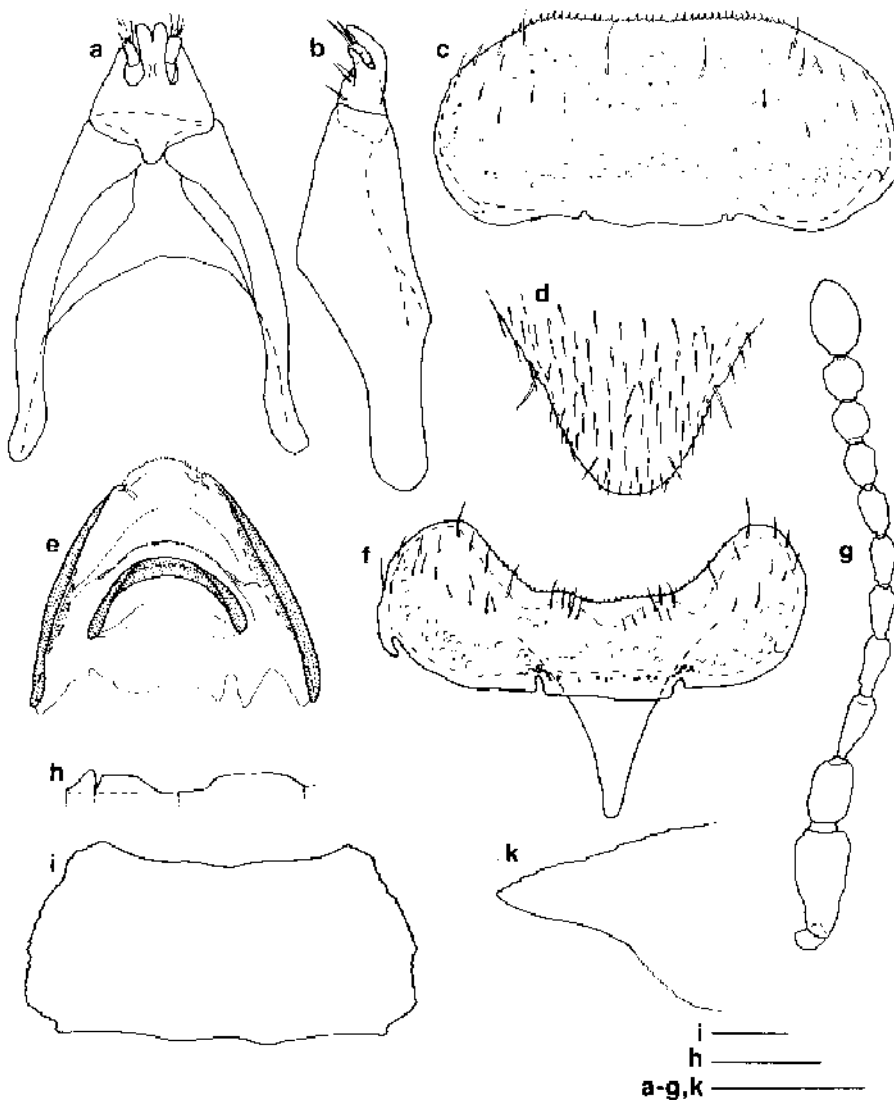


FIG. 15. *Megarthus hemipterus*: (a, b, e) female, genital segment, sternites (a) dorsal, (b) lateral and tergites (e) ventral; (c) female, abdominal sternite 8; (d, k) female, apex of abdominal tergite 8, dorsal and lateral; (f) male, abdominal sternite 8; (g) antenna; (h) median processes of abdominal sternites 2-4 (left to right), schematic; (i) pronotum. Scale bars = 0.2 mm.

short and dense pubescence present on antennomeres 5-11. Pronotum (Fig. 15i) weakly convex in frontal view, with mesal portion fairly straight in lateral view. Pronotal disc with shallow depression along lateral edge; median groove shallow, parallel-sided. Hypomerical ridge absent. Median prosternal ridge present anteriorly, fine and straight; anterior prosternal margin bordered by a regular row of fine longitudinal ridges. Protochanter lacking transverse ridge. Mesosternum with lateral portion of prepectal ridge sinuate, bifid. Scutellum similar to that in Fig. 1b. Elytron weakly narrowed basally; base abruptly inclined. Humeral callus low. Elytral disc

with low swellings, shallowly depressed along lateral edge; lateral edge conspicuously carinate, straight, or weakly convex, in dorsal view; sutural area weakly arcuate in lateral view; apical margin straight, or weakly convex, near suture; inner apical angle obtuse. Metasternum with femoral line arcuate in middle; median ridge present posteriorly, fine and low; transverse ridge parallel to posterior edge of metasternum. Abdominal tergite 3 slightly transversely vaulted. Sternites 2 and 3 with median processes as in Fig. 15h, process of sternite 3 straight. Sternite 4 with basal portion flat, slightly transversely vaulted at disc. Ratios: AL 1.6-1.8; EL 1.6-1.8; ET 1.6-1.9; EW 1.2-1.3; EY 2.4-2.5; GT 1.8-2.1; GW 1.8-2.0; HW 1.7-1.9; ML 1.5-1.9; MP 1.6-1.8; PT 2.1-2.4; SP 3.0-3.6; TPF abs.

Male. Frontoclypeal area, metasternum, protarsomere 5 and abdominal sternites 4-6 unmodified. Protarsomere 1 with tenent setae. Metafemur (Fig. 14b) as long as mesofemur (Fig. 14c). Metatibia (Fig. 14i) as long as mesotibia (Fig. 14h). Metatarsomere 1 about as long as combined length of metatarsomeres 2-4. Peg-like setae absent from protrochanter, protibia (Fig. 14g) and metafemur; arranged in a single row on mesotibia, in two rows on mesotrochanter (Fig. 14c), and grouped to form a field on metatrochanter (Fig. 14b) and metatibia. Apex of abdominal tergite 8 as in Fig. 14d, e. Sternite 8 as in Fig. 15f. Sternite 9 lacking a subbasal protuberance. Aedeagus as in Fig. 14a, f.

Female. Abdominal tergite 8 (Fig. 15d, k) without apical projection. Sternite 8 as in Fig. 14c. Genital segment as in Fig. 14a, b, c.

Comments. This is the only European species which has the head markedly darker than the thorax and elytra. This character has been clearly stated in the original descriptions of *Silpha hemiptera* and *Staphylinus melanocephalus*, and makes the species identifiable, despite of absence of type material. According to Scheerpeltz (1931), *M. thomsoni* has the same colour pattern. However, no material or other source is known to support his statement. See also discussion under *M. dentipes*.

Megarthritis impressicollis Eppelsheim

Megarthritis impressicollis Eppelsheim, 1893: 67.

Distribution. *Megarthritis impressicollis* occurs in Russia (Sajan) and, apparently disjunctly, in Japan.

Comments. *Megarthritis impressicollis* has been dealt in detail recently (Cuccodoro, 1996b). It can be easily distinguished from the congeners by the pale colour of the body, the lateral pronotal edges arcuate and the clytral suture flattened.

Megarthritis japonicus Sharp

Megarthritis japonicus Sharp, 1874: 99.

Additional material (3): 'Norwestl. China / Chinkiang Col. Reitter / *japonicus* Shp?la.oseunior [unreadable] det. Bernhauer' 1 ♂ in FMNH; 'Manchuria Chandaochedzi, viii. 18 / *japonicus* Shp Alexandrov [manuscript] det. Bernhauer' 1 ♂ in FMNH; 'B. v. Bodemeyer, Sibiria orient., Schipka-Gora / *nitidulus* Kr. det. Bernhauer' 1 ♀ in FMNH.

Distribution. *Megarthritis japonicus* is distributed in Far East Russia (Vladivostok and Sakhalin, DE1), China and Japan.

Comments. *Megarthus japonicus* differs from other species with the head abruptly narrowed just behind the eyes, *M. nitidulus* excepted, by the broad basal projection of the abdominal sternite 8. It may be distinguished from *M. nitidulus* by the sexual characters. More details on taxonomy and distribution in Cuccodoro (1996b).

Megarthus longicornis Wollaston
(Figs 1e, 16a-i, 17a-k)

Megarthus longicornis Wollaston, 1854: 615.

Type material. HOLOTYPE ♂: The single original male, labelled 'The Madeira Is. T. V. Wollaston. BM. 1855-7 / *Megarthus longicornis* Type Woll [handwritten]' has been located by P. M. Hammond in the collection of Wollaston in BMNH; according to the description, it is labelled as holotype.

Additional material. Fifty-three specimens in BMNH, DEI, HFPC, MIING and VAPC.

Distribution. Madeira. *Megarthus longicornis* is apparently endemic to this island. Material assigned to this species from the Canary Is. belongs to *M. wollastoni*.

Biology. Found in vegetable debris.

Description. Length 1.2-1.4 mm; width 0.8-1.0 mm. Body uniformly dark brown, sutural margins of elytra darkened, appendages paler; antennomeres 1-4 paler than antennomeres 5-11. Dorsal pubescence fairly uniform. Anteromedian portion of frons with setae orientated backward. Elytral setae straight, recumbent. Metasternal setae shorter than prosternal setae, becoming sparser posteromedially. Abdominal pubescence parallel, uniform on sternites 4-7, but with a pair of long subapical setae on each sternite. Punctuation fine on anterior portion of hypomeron and posteromedian portion of metasternum. Frons weakly raised above level of vertex, forming a ridge above clypeus; frontal ridge sharp, even. Frontal impression shallow. Eye strongly convex, with highest point below level of vertex; supra-ocular margin straight in dorsal view. Temple similar as in Fig. 1e. Occipital ridge indistinct in middle, angulate laterally. Submentum weakly convex. Antenna (Fig. 17c) without patches of sensilla; scape not flattened; antennomere 3 slightly asymmetrical, antennomere 4 symmetrical; short and dense pubescence present on antennomeres 6-11. Pronotum (Fig. 17i) weakly convex in frontal view, with mesal portion fairly straight in lateral view. Pronotal disc with shallow depression along lateral edge; median groove shallow, parallel-sided. Hypomeron with a transverse row of pits; hypomerall ridge absent. Median prosternal ridge absent; anterior prosternal margin bordered by a regular row of fine longitudinal ridges. Prothrochanter lacking transverse ridge. Mesosternum with lateral portion of prepectal ridge straight, or sinuate, bifid. Scutellum similar to that in Fig. 1a. Elytron not narrowed basally; base gradually inclined. Humeral callus low. Elytral disc with low swellings, shallowly depressed along apical portion of lateral edge; lateral edge finely carinate, straight, or sinuate in dorsal view; sutural area straight, or weakly convex, in lateral view; apical margin straight, or convex, near suture; inner apical angle obtuse. Metasternum with femoral line arcuate in middle; median ridge absent, or present posteriorly, fine and low; transverse ridge parallel to posterior edge of metasternum. Abdominal tergite 3 slightly transversely vaulted. Sternites 2 and 3 with median processes as in Fig. 17g, process of sternite 3 straight. Sternite 4 flat. Ratios: AL

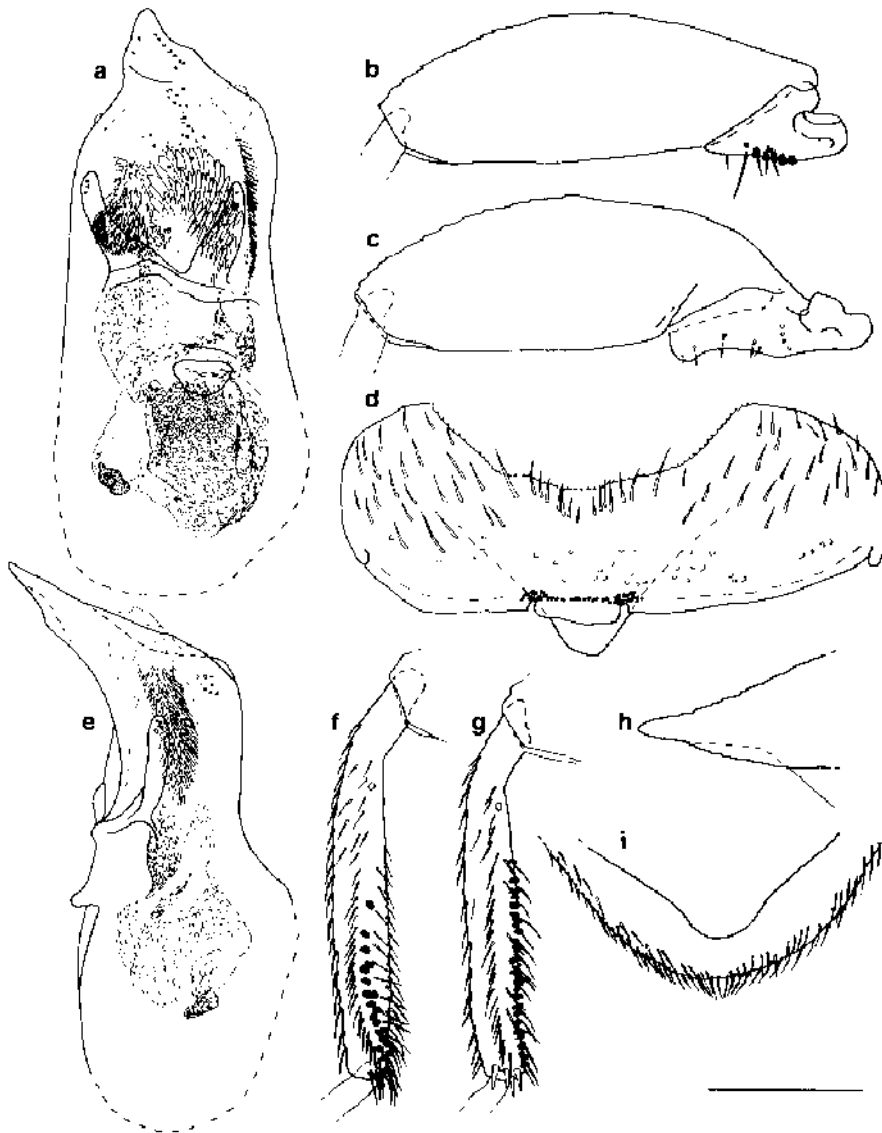


FIG. 16. *Megarthrus longicornis*, male: (a, e) aedeagus, ventral and lateral; (b) mesofemur and mesotrochanter; (c) metafemur and metatrochanter; (d) abdominal sternite 8; (f) metatibia; (g) mesotibia; (h, i) apex of abdominal tergite 8, lateral and ventral. Scale bars = 0.2 mm.

2.1-2.3; EL 1.5-1.7; ET 1.9-2.1; FW 1.1-1.2; EY♀ 2.5-2.7; GT 1.9-2.2; GW 1.6-1.8; HW 1.5-1.7; ML 1.4-1.7; MP 1.6-1.8; PT 1.9-2.1; SP 6.0-9.0; TPF 3.1-3.8.

Male. Metasternum, protarsomere 5 and abdominal sternites 4-6 unmodified. Anterior frontal edge strongly raised, horn-like. Protarsomere 1 with tenent setae. Metafemur (Fig. 16c) about as long as mesofemur (Fig. 16b). Metatibia (Fig. 16f) longer than mesotibia (Fig. 16g). Metatarsomere 1 about as long as combined length of metatarsomeres 2-4. Peg-like setae absent from protrochanter, protibia, metatrochanter and metafemur; arranged in a single row on mesotrochanter (Fig. 16c).

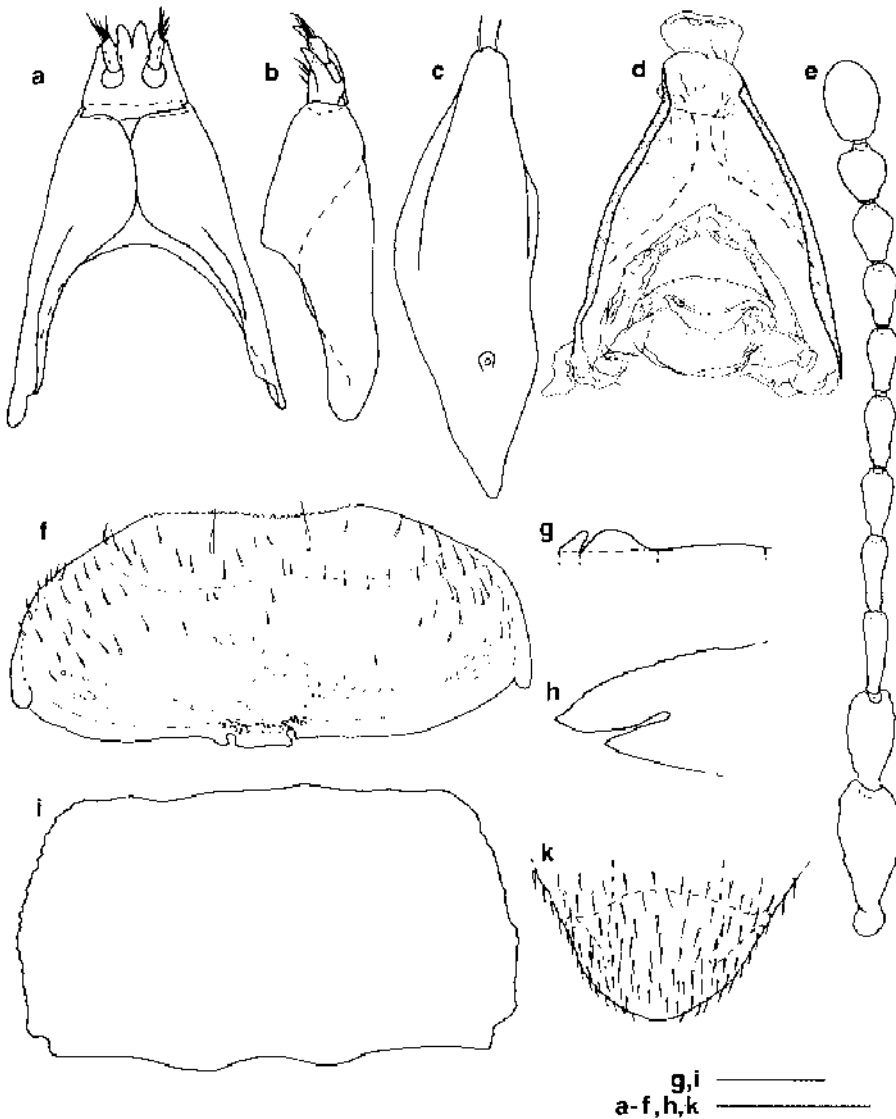


FIG. 17. *Megarthus longicornis*: (a, b, d) female, genital segment, sternites (a) dorsal, (b) lateral and tergites (d) ventral; (c) male, abdominal sternite 9; (e) antenna; (f) female, abdominal sternite 8; (g) median processes of abdominal sternites 2-4 (left to right), schematic; (h, k) female, apex of abdominal tergite 8, dorsal and lateral; (i) pronotum. Scale bars = 0.2 mm.

in two rows on mesotibia, and grouped to form a field on metatibia. Apex of abdominal tergite 8 as in Fig. 16h, i. Sternite 8 as in Fig. 16d. Sternite 9 (Fig. 17c) bearing a small subbasal protuberance. Aedeagus as in Fig. 16a, c.

Female. Anterior frontal edge evenly convex. Abdominal tergite 8 (Fig. 17h, k) with apical projection. Sternite 8 as in Fig. 17f. Genital segment as in Fig. 17a, b, d.

Comments. *Megarthus longicornis* and *M. wollastoni* may be distinguished from other Palearctic congeners by having the frontal margin strongly raised in the male. These two species differ in the aedeagal shape.

Megarathrus maronitus Fagel
(Figs 18a i, 19a i)

Megarathrus maronitus Fagel, 1968: 190.

Type material. HOLOTYPE ♂: Lebanon, Nabeh Safa, 1000 m, v.1966 (G. Fagel) ex humus at root of *Cistus*. ISNB. PARATYPES (41): same data as holotype, 1 ♂ in BMNH, 3 ♂ and 9 ♀ in ISNB; same data, but ex damp moss, 1 ♀ in BMNH, 15 ♂ and 12 ♀ in ISNB.

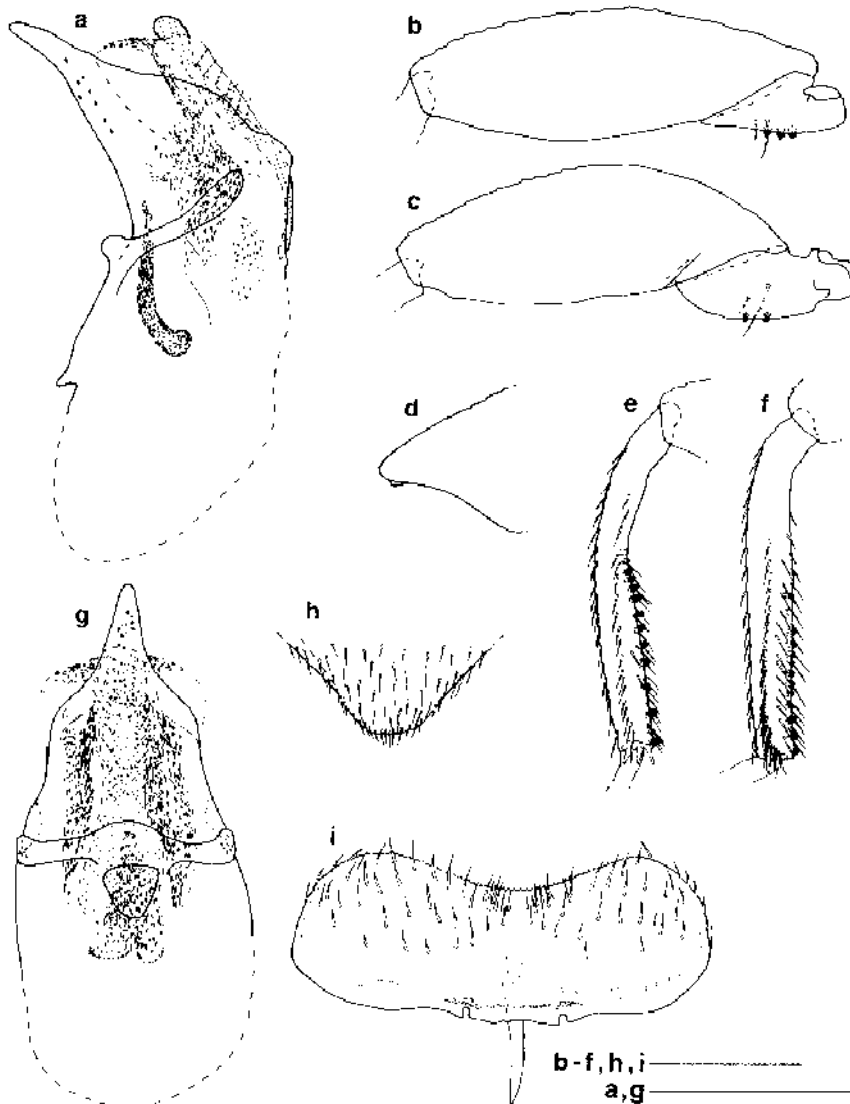


FIG. 18. *Megarathrus maronitus*, male: (a, g) aedeagus, lateral and ventral; (b) mesofemur and mesotrochanter; (c) mesofemur and mesotrochanter; (e) mesotibia; (f) metatibia; (i) abdominal sternite 8. Scale bars—0.2 mm.

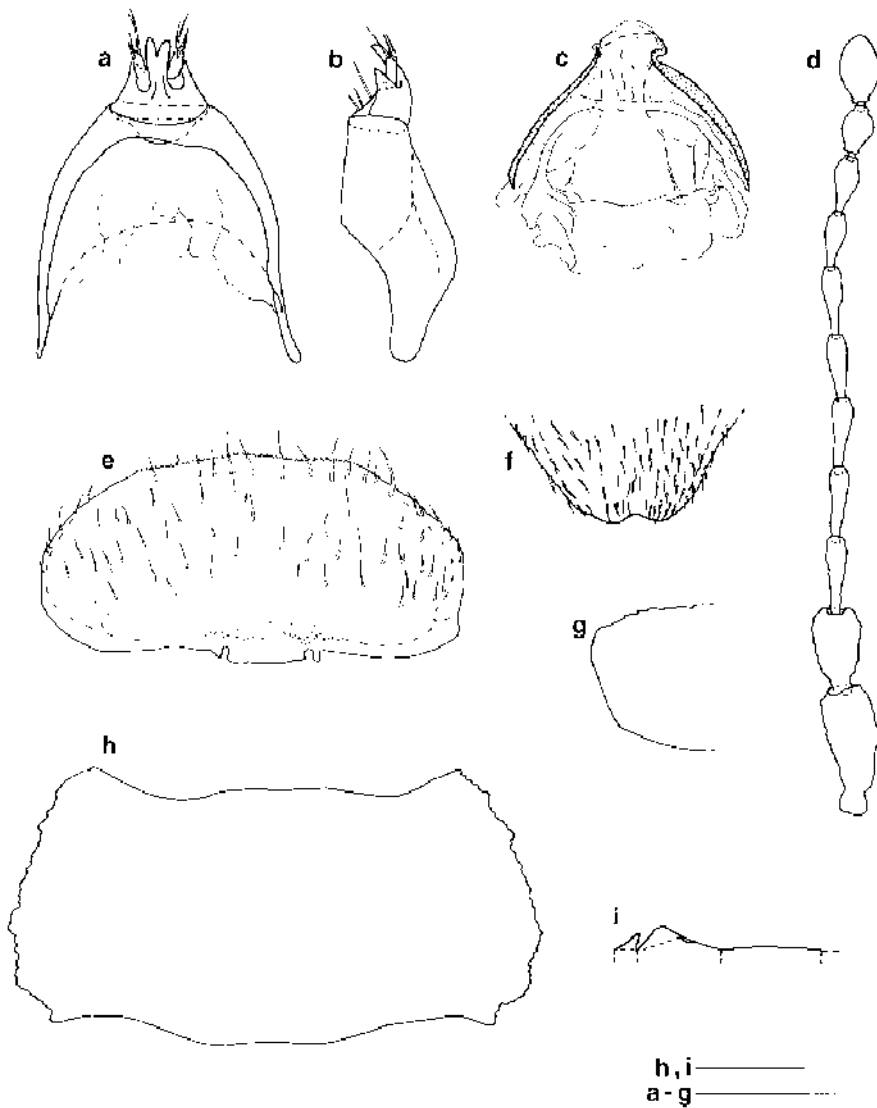


FIG. 19. *Megarthus maronitus*: (a-c) female, genital segment, sternites (a) dorsal, (b) lateral and tergites (c) ventral; (d) antenna; (e) female, abdominal sternite 8; (f, g) female, apex of abdominal tergite 8, dorsal and lateral; (h) pronotum; (i) median processes of abdominal sternites 2-4 (left to right), schematic. Scale bars—0.2 mm.

Additional material (4). Lebanon, near Damour, 28.iii.1975 (Besuchet) ex alluvional debris near river, 2 ♂ and 2 ♀ in MHNG.

Distribution. *Megarthus maronitus* is known only from Lebanon. The species is brachypterous and has likely a strongly restricted areal.

Biology. Found in vegetable debris.

Description. Similar to *M. chobauti* from which it differs as follows: Length 1.1-1.4 mm; width 0.9-1.0 mm. Frontal impression deep. Eye with highest point raised above level of vertex. Submentum weakly convex. Antenna as in Fig. 19d; short and dense pubescence present on antennomeres 7-11. Pronotum as in Fig. 19h.

Elytral disc deeply depressed along lateral edge. Sternites 2 and 3 with median processes as in Fig. 19i, process of sternite 3 bifid. Sternite 4 almost flat. Ratios: FL 1.4–1.5; ET 1.4–1.5; EY 2.7–3.0; GT 2.1–2.3; HW 1.7–1.9; PT 1.9–2.1; SP 4.5–5.0; TPF abs.

Male. Frontoclypeal area, metasternum, protarsomere 5 and abdominal sternites 4–6 unmodified. Protarsomere 1 without tenent setae. Metafemur (Fig. 18c) somewhat shorter than mesofemur (Fig. 18b). Metatibia (Fig. 18f) as long as mesotibia (Fig. 18e). Metatarsomere I about as long as combined length of metatarsomeres 2–4. Peg-like setae absent from protrochanter, protibia, and metafemur; arranged in a single row on mesotrochanter (Fig. 18b), mesotibia, metatrochanter (Fig. 18c) and metatibia. Apex of abdominal tergite 8 as in Fig. 18d, h. Sternite 8 as in Fig. 18i. Sternite 9 lacking subbasal protuberance. Aedeagus as in Fig. 18a, g.

Female. Abdominal tergite 8 (Fig. 19f, g) without apical projection. Sternite 8 as in Fig. 19e. Genital segment as in Fig. 19a–c.

Comments. See discussion under *M. serrula*.

Megarthritis montanus Sawada

Megarthritis montanus Sawada, 1962: 14.

M. montanus subangulatus Sawada, 1962: 14.

Additional material (11). 'Chikuanshan, S. Mandschur.' 1 ♀ in FMNH; Russia, Primorskiy Kray, Ussuriysky Zapovednik, 33 km SE Ussuriysk <43°37' N; 132°18' E> 300 m, 12.vi.1993 (L. Zerche) 1 ♂ in DEI; same data, but Anisimovka, 70 km E Vladivostok <43°11' N; 132°41' E> 250 m, 5.vi.1993, 2 ♀ in DEI; same data, but Sikhote-Alin, Biol. Stat. 30 km SE Chuguyevka <44°05' N; 134°2' E> 650 m, 31.v.1993, 1 ♂ in MHNG; same data, but 1.vi.1993, 1 ♂ in DEI; same data, but Oblachnaya, 56 km SE Chuguyevka <43°45' N; 134°5' E> 2.vi.1993, N-Hang, 3 ♀ in DEI and 2 ♀ in MHNG.

Distribution. *Megarthritis montanus* occurs in Far East Russia, China and Japan.

Comments. *Megarthritis montanus* is characterised by having the frons evenly deflected toward the clypeus. More details on taxonomy and distribution in Cuccodoro (1996b).

Megarthritis nigrinus Sahlberg

(Figs 20a–h, 21a–i)

Megarthritis sinuaticollis var. *nigrinus* Sahlberg, 1876: 225.

Megarthritis sinuaticollis var. *nigrino*; Münster, 1912: 279 (incorrect spelling).

Megarthritis sahlbergi Münster 1912: 279.

Megarthritis nigrinus; Hellen, 1924: 89.

Type material. *Megarthritis nigrinus*: LECTOTYPE, ♀: Finland, Porjeguba, Ryska Lappmarken, 8.viii.1870 (J. Sahlberg) #1088, ZMUH, by present designation. *Megarthritis sahlbergi*: LECTOTYPE ♂: 'Lakselv, Pors. Münster, 08 / O. Leonhard / *Megarthritis sahlbergi* Mönst. n. sp.' DEI; PARALECTOTYPES (5): same data as lectotype, 1 ♂ and 2 ♀ in DEI; 'Norway bor., S Varanger, 04, Münster / #236 / *Sahlbergi*, ?Staudgr. [handwritten]' 1 ♂ in BMNH and 1 ♀ in DEI, by present designation.

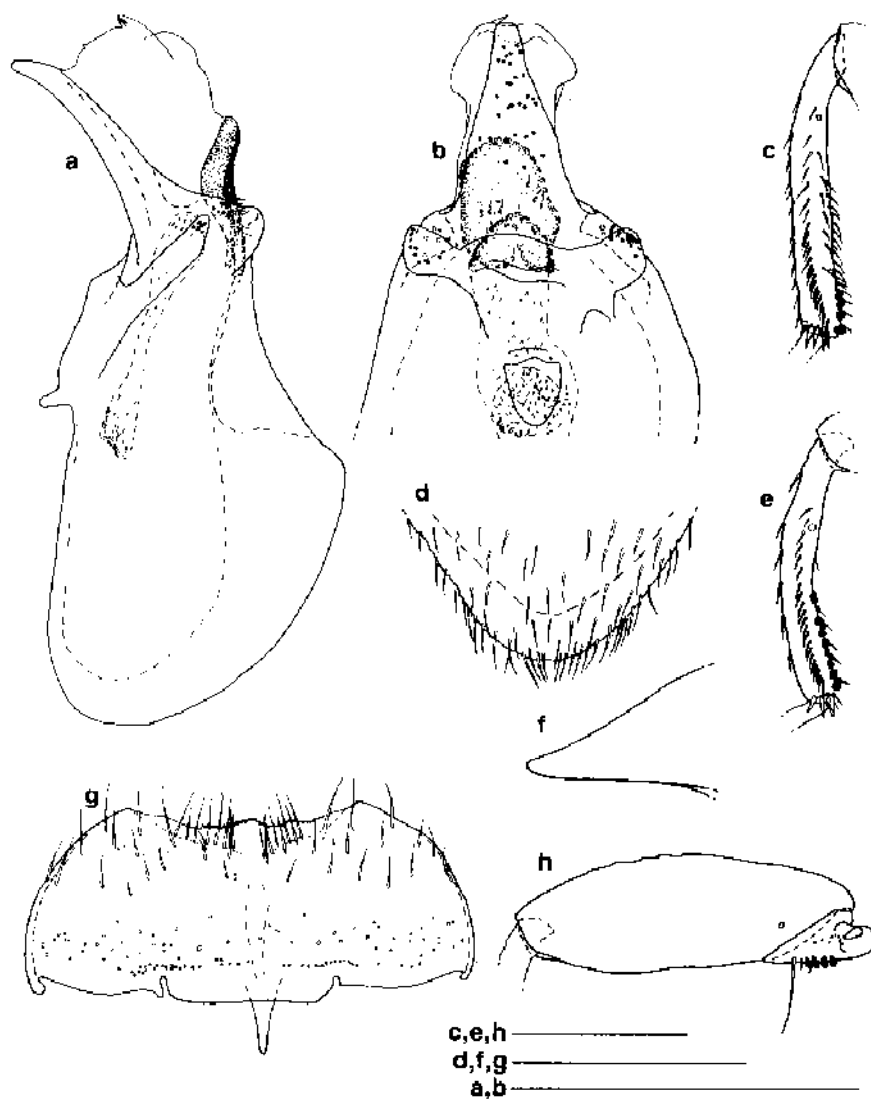


FIG. 20. *Megarthus nigrinus*, male: (a, b) aedeagus, lateral and ventral (apical portion); (c) metatibia; (d, f) apex of abdominal tergite 8, dorsal and lateral; (e) mesotibia; (g) abdominal sternite 8; (h) mesofemur and mesotrochanter. Scale bars = 0.2 mm.

Additional material. Thirty-seven specimens in BMNH, FMNH, MHNG, NHMW, ZMHB, ZMUH and ZMUL.

Distribution. *Megarthus nigrinus* occurs in North Europe and, apparently disjunctly, in Transbaikal Russia (8 km E Tchita, Pjestschanka, NIIMW).

Biology. Recorded from fungi (Muona and Viramo, 1995) and decaying meat, and swept on vegetation (Kuusinen, 1933).

Description. Similar to *M. depressus* from which it differs as follows: length 1.0–1.3 mm; width 0.6–0.9 mm. Anterior frontal edge weakly convex in middle, oblique laterally. Antenna (Fig. 21d) with patches of sensilla on antennomeres 6–10; antennomere 3 slightly asymmetrical, four strongly asymmetrical. Pronotal disc

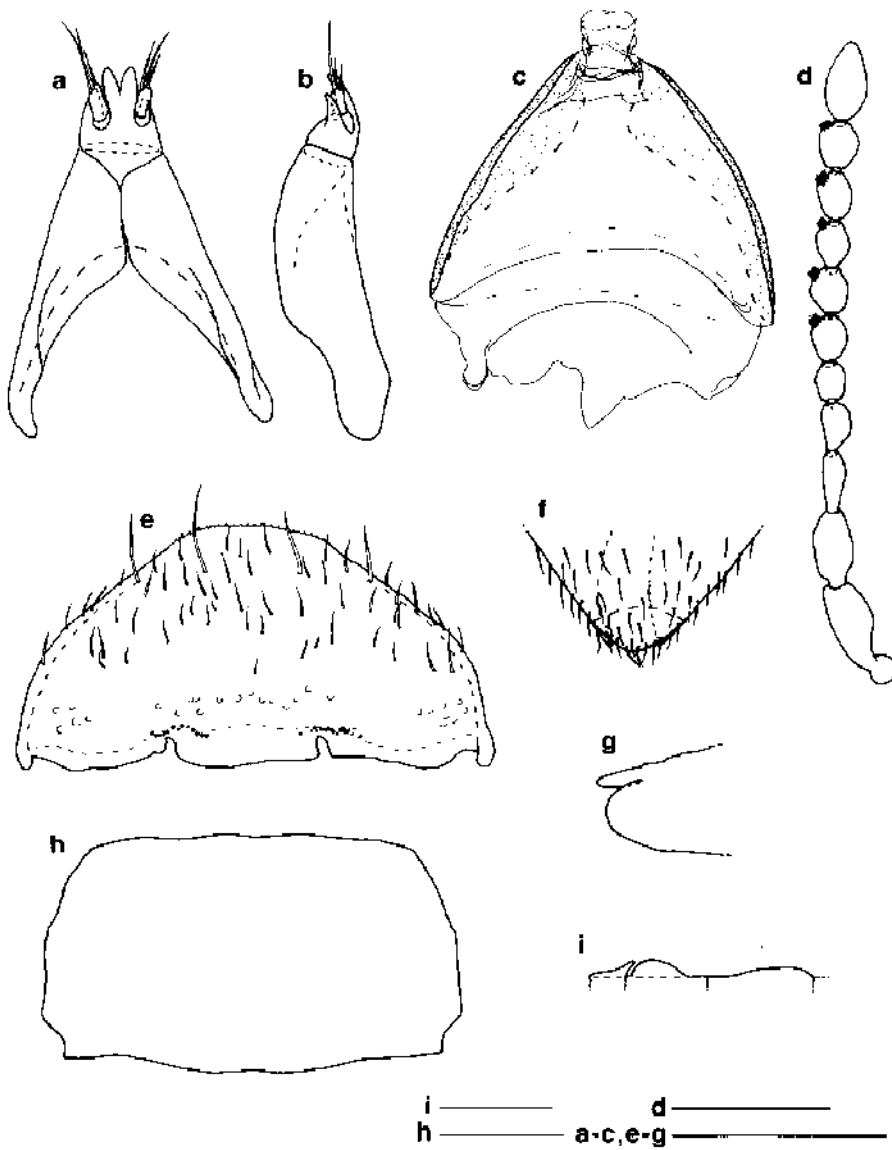


FIG. 21. *Megarthritis nigrinus*: (a-e) female, genital segment, sternites (a) dorsal, (b) lateral and tergites (c) ventral; (d) antenna; (e) female, abdominal sternite 8; (f, g) female, apex of abdominal tergite 8, dorsal and lateral; (h) pronotum; (i) median processes of abdominal sternites 2-4 (left to right), schematic. Scale bars = 0.2 mm.

(Fig. 21h) with shallow depression along posterior portion of lateral edge. Flytron not narrowed basally; lateral edge straight in dorsal view; inner apical angle obtuse. Sternites 2-3 with median processes as in Fig. 21i. Ratios: EY 2.3-2.5; HW 1.6-1.7; PT 1.8-1.9; SP 2.7-3.5; TPF 6.0-7.5.

Male. Frontoclypeal area, metasternum, protarsomere 5 and abdominal sternites 4-6 unmodified. Protarsomere 1 with tenent setae. Metafemur as long as mesofemur (Fig. 20h). Metatibia (Fig. 20c) longer than mesotibia (Fig. 20e). Metatarsomere 1 about as long as combined length of metatarsomeres 2-4. Peg-like setae absent from

protrochanter, protibia, metatrochanter and metafemur; arranged in a single row on mesotrochanter (Fig. 20h) and metatibia, and grouped to form a field on mesotibia. Apex of abdominal tergite 8 as in Fig. 20d, f. Sternite 8 as in Fig. 20g. Sternite 9 lacking subbasal protuberance. Aedeagus as in Fig. 20a, b.

Female. Abdominal tergite 8 (Fig. 21f, g) with apical projection. Sternite 8 as in Fig. 21e. Genital segment as in Fig. 21a, b.

Comments. *Megarthritis nigrinus* can be easily distinguished from closely related species (see discussion under *M. depressus*) by the shape of the aedeagus and, in female, the shape of the apical projection of the abdominal tergite 8. It resembles *M. uhligi*, which differs by convex temples.

***Megarthritis nitidulus* Kraatz**
(Figs 1h, 22a-i; 23a-i)

Megarthritis nitidulus Kraatz, 1857: 1028.

Type material. LECTOTYPE, ♀: a single female syntype labelled 'Mollenfalde / Riehl / *nitidulus* mihi' has been located in the collection of Kraatz, housed in DEI. It is presently designated as lectotype and accordingly labelled.

Additional material. Eighty-four specimens from Europe in BMNH, CNCL, FMNH, MHNG, ZMHB, ZMUL and ZSMC; 10 specimens from Baikal area (BMNH), Far East Russia (including Sakhalin, DEI) and Mongolia (CNCL).

Distribution. *Megarthritis nitidulus* is distributed throughout most of the Palaearctic region. It is apparently absent from the Mediterranean area, Caucasus and Japan.

Biology. Found in carrion, dung, moss, grass cutting, leaf litter and other rotting vegetable debris. It may be attracted by dung of wild mammals (Muona and Viramo, 1995).

Description. Length 1.2-1.5 mm; width 0.8-1.0 mm. Body predominantly dark brown, or blackish, sutural margins of elytra darkened, appendages paler; antennomeres 1-4 paler than antennomeres 5-11. Dorsal pubescence fairly uniform. Anteromedian portion of frons with setae orientated backward. Elytral setae straight, recumbent. Metasternal setae shorter than prosternal setae, becoming sparser posteromedially. Abdominal pubescence parallel, uniform on sternites 4-7, but with a pair of long subapical setae on each sternite. Punctuation fine on anterior portion of hypomeron; posteromedian portion of metasternum impunctate. Frons weakly raised above level of vertex, forming a blunt ridge above clypeus. Anterior frontal edge evenly convex. Frontal impression shallow, or indistinct. Eye moderately, or strongly convex, with highest point below level of vertex; supra-ocular margin sinuate in dorsal view. Temple as in Fig. 1h. Occipital ridge indistinct. Submentum weakly convex. Antenna (Fig. 23d) with patches of sensilla on antennomeres 5-9; scape not flattened; antennomere 3 slightly asymmetrical, 4 strongly asymmetrical; short and dense pubescence present on antennomeres 5-11. Pronotum (Fig. 23h) weakly convex in frontal view, with mesal portion almost straight in lateral view. Pronotal disc with shallow depressions along posterior portion of lateral edge and beside median groove; median groove shallow, parallel-sided. Hypomeral ridge absent. Median prosternal ridge absent; anterior prosternal margin bordered by an irregular row of fine longitudinal ridges. Protrochanter lacking transverse ridge. Mesosternum with lateral portion of prepectal ridge straight, bifid. Scutellum similar to that in Fig. 1b. Elytron not narrowed basally; base

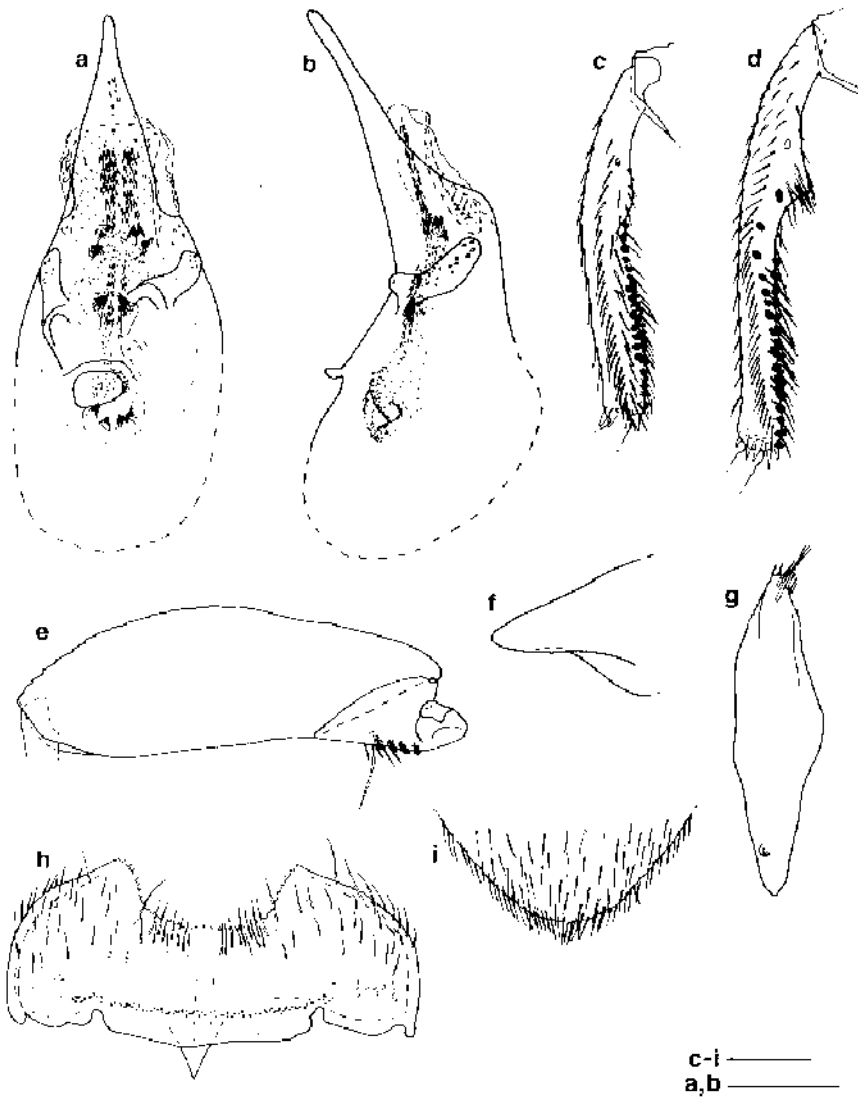


FIG. 22. *Megarthritis nitidulus*, male: (a, b) aedeagus, ventral and lateral; (c) mesotibia; (d) metatibia; (e) mesolemur and mesotrochanter; (f, i) apex of abdominal tergite 8, lateral and dorsal; (g) abdominal sternite 9; (h) abdominal sternite 8. Scale bars = 0.2 mm.

gradually inclined. Humeral callus low. Elytral disc with low swellings, shallowly depressed along apical portion of lateral edge; lateral edge finely carinate, slightly convex in dorsal view; sutural area slightly convex in lateral view; apical margin straight, or convex, near suture; inner apical angle rectangular, or obtuse. Metasternum with femoral line arcuate in middle; median ridge present posteriorly, fine and low; transverse ridge parallel to posterior edge of metasternum. Abdominal tergite 3 flat, or slightly transversely vaulted. Sternites 2 and 3 with median processes as in Fig. 23i, process of sternite 3 straight. Sternite 4 with basal portion flat, slightly transversely vaulted at disc. Ratios: AL 1.8 2.0; EL 1.7 1.8; ET 1.9 2.1; EW

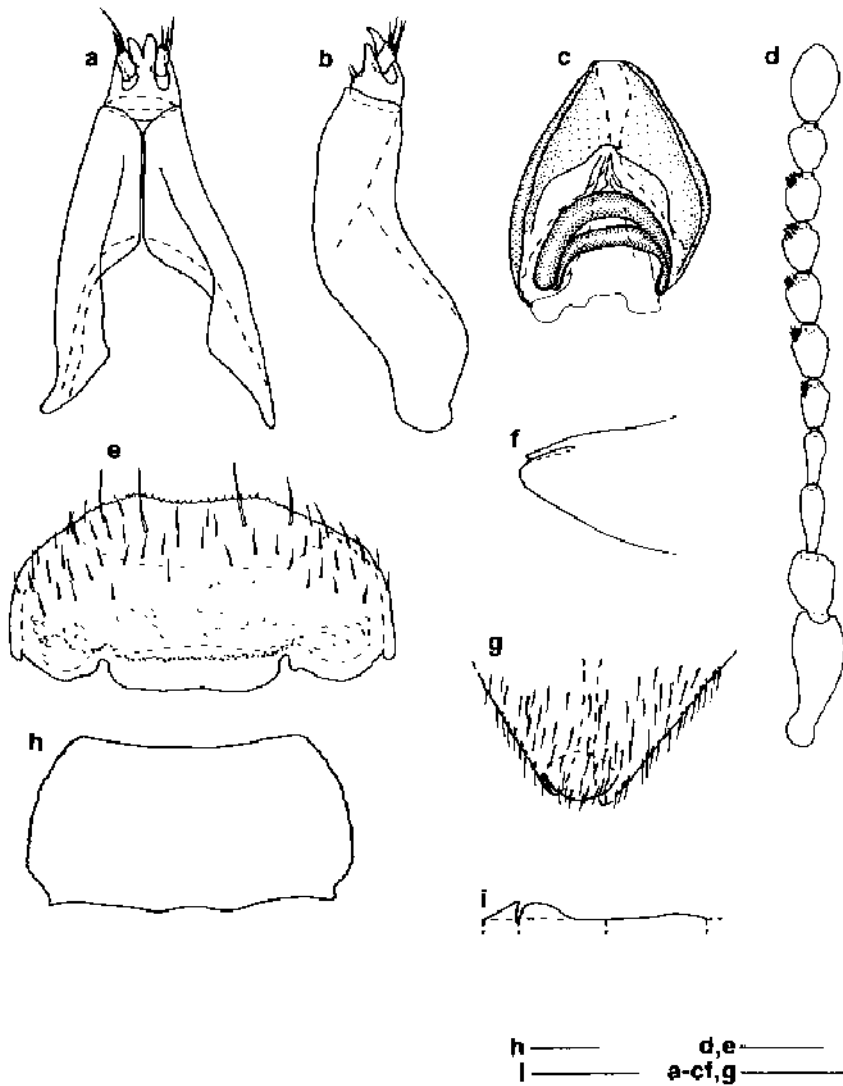


FIG. 23. *Megarthrus nitidulus*: (a-c) female, genital segment, sternites (a) dorsal, (b) lateral and tergites (c) ventral; (d) antenna; (e) female, abdominal sternite 8; (f, g) female, apex of abdominal tergite 8, lateral and dorsal; (h) pronotum; (i) median processes of abdominal sternites 2-4 (left to right), schematic. Scale bars = 0.2 mm.

1.1-1.2; EY 2.6-2.7; GT 2.0-2.2; GW 1.7-1.8; HW 1.6-1.9; ML 1.5-1.7; MP 1.5-1.7; PT 1.9-2.0; SP 1.9-2.5; TPF 7.0-8.5.

Male. Frontoclypeal area, metasternum, protarsomere 5 and abdominal sternites 4-6 unmodified. Frontal pubescence parallel. Protarsomere 1 with tenent setae. Metafemur as long as mesofemur (Fig. 22c). Metatibia (Fig. 22d) longer than mesotibia (Fig. 22c). Metatarsomere 1 somewhat shorter than combined length of metatarsomeres 2-4. Metatrochanter and metafemur with upto 3 peg-like setae. Peg-like setae absent from protrochanter and protibia; arranged in a single row on mesotrochanter (Fig. 22c); grouped to form a field on mesotibia and metatibia. Apex of

abdominal tergite 8 as in Fig. 22f, i. Sternite 8 as in Fig. 24h. Sternite 9 bearing a small subbasal protuberance (Fig. 22g). Acdeagus as in Fig. 22a, b.

Female. Frontal pubescence converging. Abdominal tergite 8 (Fig. 23f, g) with apical projection. Sternite 8 as in Fig. 23e. Genital segment as in Fig. 23a, c.

Comments. See discussion under *M. japonicus*.

Megarthus prosseni Schatzmayr
(Figs 24a-i, 25a-k)

Megarthus prosseni Schatzmayr, 1904: 212.

Type material. LECTOTYPE, ♀: Austria, Carinthia, Dobratschgebiet, Villach, Teufelsgraben, 8.ix.1903 (A. Schatzmayr) MSNM, by present designation.

Additional material. Nine hundred and six specimens in BMNH, CNCI, FMNH, HFPC, MHNG, NMHW, SEMK, ZMHB, ZMUH and ZMUL.

Distribution. *Megarthus prosseni* is widely distributed in most of the western part of the Palaeartic region. It is apparently absent from the southern Mediterranean area. Records from Siberia and Far East Russia (Jakobson, 1908; Horion, 1963) are to be confirmed.

Biology. Found in dung, grass cuttings and other decaying plant matter. More details on life history and phenology in Hammond (in press).

Description. Length 1.0–1.4 mm; width 0.6–0.9 mm. Body predominantly blackish, elytra and appendages paler, sutural margins of elytra darkened. Dorsal pubescence fairly uniform, becoming sometimes denser near apical margin of abdominal tergite 7. Anteromedian portion of frons with setae orientated backward. Elytral setae straight, recumbent. Metasternal setae shorter than prosternal setae, uniform, or becoming sparser posteriomediaally. Abdominal pubescence parallel, uniform on sternites 4–7, but with a pair of long subapical setae on each sternite. Anterior portion of hypomerion and posteromedian portion of metasternum impunctate. Frons raised above level of vertex, forming a blunt ridge above clypeus. Anterior frontal edge evenly convex. Frontal impression shallow, or indistinct. Eye moderately, or strongly convex, with highest point below, or reaching, level of vertex; supra-ocular margin sinuate in dorsal view. Temple similar to that in Fig. 1d. Occipital ridge indistinct. Submentum weakly convex. Antenna (Fig. 25d) with patches of sensilla on antennomeres 6–9; scape not flattened; antennomere 3 slightly asymmetrical, antennomere 4 strongly asymmetrical; short and dense pubescence present on antennomeres 5–11. Pronotum (Fig. 25i) weakly convex in frontal view, with mesal portion fairly straight in lateral view. Pronotal disc not depressed, or with shallow depression along posterior portion of lateral edge; median groove shallow, parallel-sided. Hypomerion absent. Median prosternal ridge absent; anterior prosternal margin bordered by an irregular row of fine longitudinal ridges. Protrochanter lacking transverse ridge. Mesosternum with lateral portion of prepectal ridge straight, bifid. Scutellum similar to that in Fig. 1a. Elytron not narrowed basally; base gradually inclined. Humeral callus low. Elytral disc with low swellings, flat along lateral edge; lateral edge finely carinate, straight in dorsal view; sutural area almost straight in lateral view; apical margin straight, or convex near suture; inner apical angle obtuse. Metasternum with femoral line arcuate in middle; median ridge present posteriorly, fine and low; transverse ridge parallel to posterior edge of metasternum. Abdominal tergite 3 almost flat. Sternites 2 and 3 with median pro-

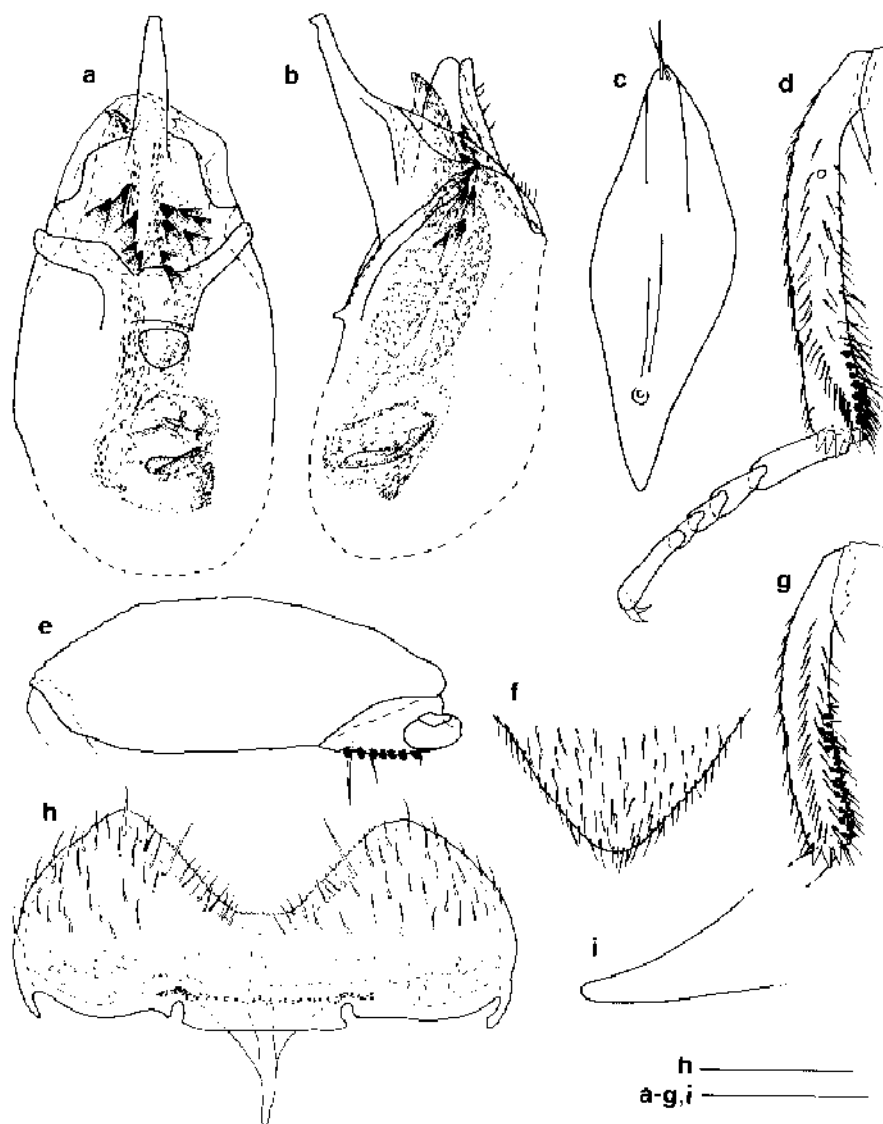


FIG. 24. *Megarthus prosseni*, male: (a, b) aedeagus, ventral and lateral; (c) abdominal sternite 9; (d) metatibia; (e) mesofemur and mesotrochanter; (f, i) apex of abdominal tergite 8, dorsal and lateral; (g) mesotibia; (h) abdominal sternite 8. Scale bars = 0.2 mm.

cesses as in Fig. 25g, process of sternite 3 straight. Sternite 4 with basal portion flat, slightly transversely vaulted at disc. Ratios: AL 1.8–2.0; EL 1.6–1.9; ET 1.7–1.9; EW 1.2–1.3; EY 2.5–2.8; GT 2.1–2.3; GW 1.6–1.8; HW 1.5–1.8; ML 1.6–1.8; MP 1.4–1.7; PT 1.8–2.1; SP 2.8–4.0; TPF 8.0–10.0.

Male. Frontoclypeal area, metasternum, protarsomere 5 and abdominal sternites 4–6 unmodified. Frontal pubescence parallel. Protarsomere 1 with tenent setae. Metafemur (Fig. 25h) longer than mesofemur (Fig. 24e). Metatibia (Fig. 24d) longer than mesotibia (Fig. 24g). Metatarsomere 1 about as long as combined length of metatarsomeres 2–4. Peg-like setae absent from protrochanter, protibia, metatro-

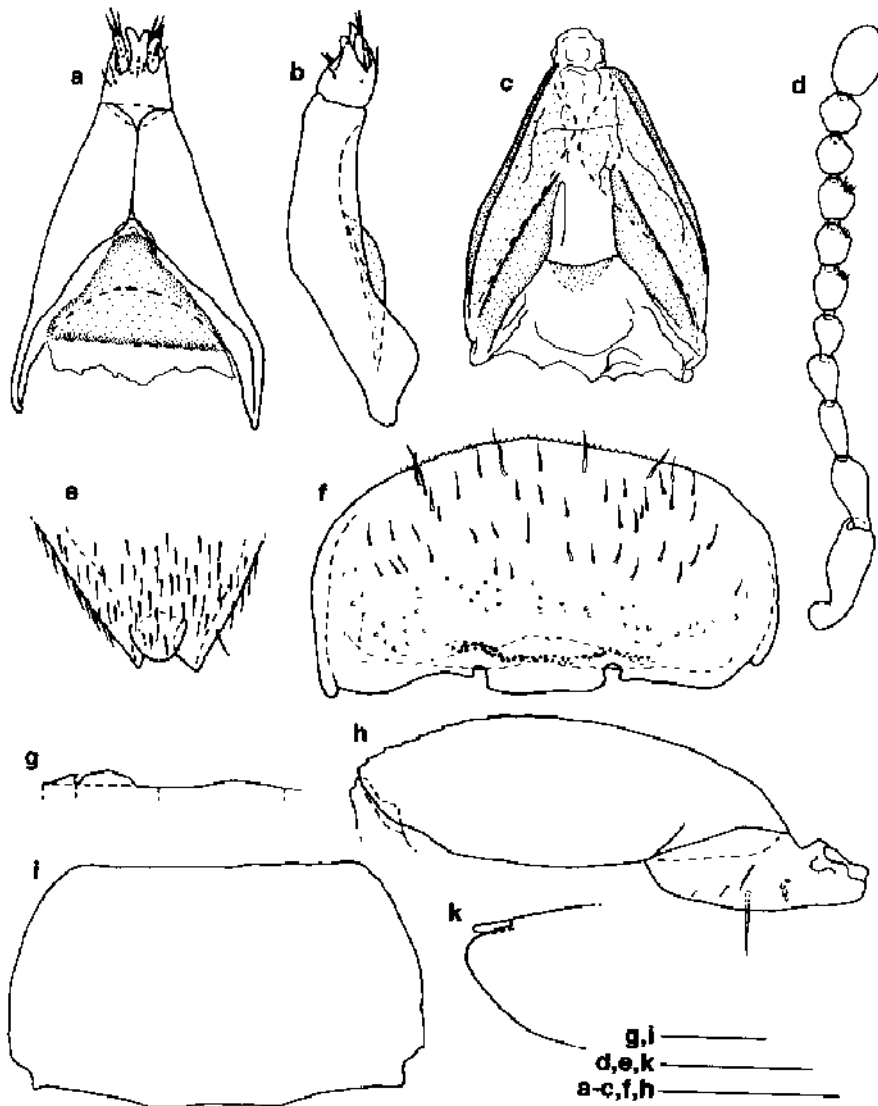


FIG. 25. *Megarathrus prosseni*: (a-c) female, genital segment, sternites (a) dorsal, (b) lateral and tergites (c) ventral; (d) antenna; (e, k) female, apex of abdominal tergite 8, dorsal and lateral; (f) female, abdominal sternite 8; (g) median processes of abdominal sternites 2-4 (left to right), schematic; (h) male, metafemur and metatrochanter; (i) pronotum. Scale bars = 0.2 mm.

chanter and metafemur; arranged in a single row on mesotrochanter (Fig. 24c), in two rows or grouped to form a field on mesotibia and metatibia. Apex of abdominal tergite 8 as in Fig. 24f, i. Sternite 8 as in Fig. 24h. Sternite 9 (Fig. 24c) bearing a small subbasal protuberance. Aedeagus as in Fig. 24a, b.

Female. Frontal pubescence converging. Abdominal tergite 8 (Fig. 25e, k) with apical projection. Sternite 8 as in Fig. 25f. Genital segment as in Fig. 25a-c.

Comments. This is a common species referred as *M. depressus* by most authors (Fauvel, 1872; Ganglbauer, 1895; Horion, 1963; Kemner, 1925; Kuusinen, 1933;

Lohse, 1964; Palm, 1948; Portevin, 1929; Reitter, 1909). The observation of the 'water loading' behaviour in Cuccodoro (1995) refers also to this species.

Megarthus fennicus, *M. japonicus*, *M. nitidulus*, *M. prosseni*, *M. stercorarius* and *M. zekorum* differ from the other species which have the head abruptly narrowed behind the eyes (see discussion under *M. bellevoeyi*) by the lateral edges of pronotum sinuate, or subangulate. Within them, *M. prosseni* and *M. zekorum* may be distinguished by the pattern of the peg-like setae on the male metatibia and, in female, by the shape of the valvifers, in combination with the narrow basal projection of the abdominal sternite 8. These two species differ notably in the shape of the aedeagi and male metatrochanters.

Megarthus serrula Wollaston
(Figs 1g, 26a-h, 27a i)

Megarthus serrula Wollaston, 1865, App.: 76.

Type material. Three syntypes (2 ♂, 1 ♀) have been located by P. M. Hammond in the collection of Wollaston, housed in BMNH. They are mounted on small cards marked with a red stripe. According to Wollaston's collection code, the red stripe should indicate they are from Gran Canaria instead of Gomera, as mentioned in the description (apparently mislabelled, P. M. Hammond personal communication). One male is presently designated as lectotype and accordingly labelled, the other two are paralectotypes.

Additional material. One hundred and forty-nine specimens in BMNH, DEI, HFPC, MHNG and VAPC.

Distribution. Canary Is.: Gomera, Hierro and La Palma. *Megarthus serrula* is a micropterous species apparently endemic to these islands.

Biology. Found in vegetable debris or with fish-baited traps.

Description. Similar to *M. chobauti* from which it may be distinguished as follows: Length 1.0–1.2 mm; width 0.9–1.0 mm. Dorsal pubescence fairly uniform, becoming denser along median pronotal groove. Anteromedian portion of frons with setae orientated forward. Frontal impression deep medially, shallow laterally. Eye with highest point raised above level of vertex; supra-ocular margin sinuate in dorsal view. Temple as in Fig. 1g. Occipital ridge straight medially, arcuate laterally. Submentum weakly convex. Antenna as in Fig. 27d, antennomere 3 slightly asymmetrical, antennomere 4 symmetrical; short and dense pubescence present on antennomeres 7–11. Pronotal disc (Fig. 27h) with deep depression along lateral edge, flat beside median groove. Mesosternum with lateral portion of prepectal ridge angulate, bifid. Elytral disc without swellings, deeply depressed along lateral edge. Sternites 2 and 3 with median processes as in Fig. 27i. Sternite 4 with basal portion flat, slightly transversely vaulted at disc. Ratios: AL 1.8–2.0; EL 1.0–1.3; ET 1.2–1.3; FW 1.2; FY 2.8–3.3; GT 2.4–2.6; GW 1.8–2.0; ML 1.0–1.2; PT 2.1–2.3; SP 5.5–6.5; TPF abs.

Male. Frontoclypeal area, metasternum, protarsomere 5 and abdominal sternites 4–6 unmodified. Protarsomere 1 lacking tenent setae. Metafemur (Fig. 26c) somewhat longer than mesofemur (Fig. 26b). Metatibia longer than mesotibia (Fig. 26f). Metatarsomere 1 about as long as combined length of metatarsomeres 2–4. Peg-like setae arranged in a single row on mesotrochanter (Fig. 26b), mesotibia and meta-

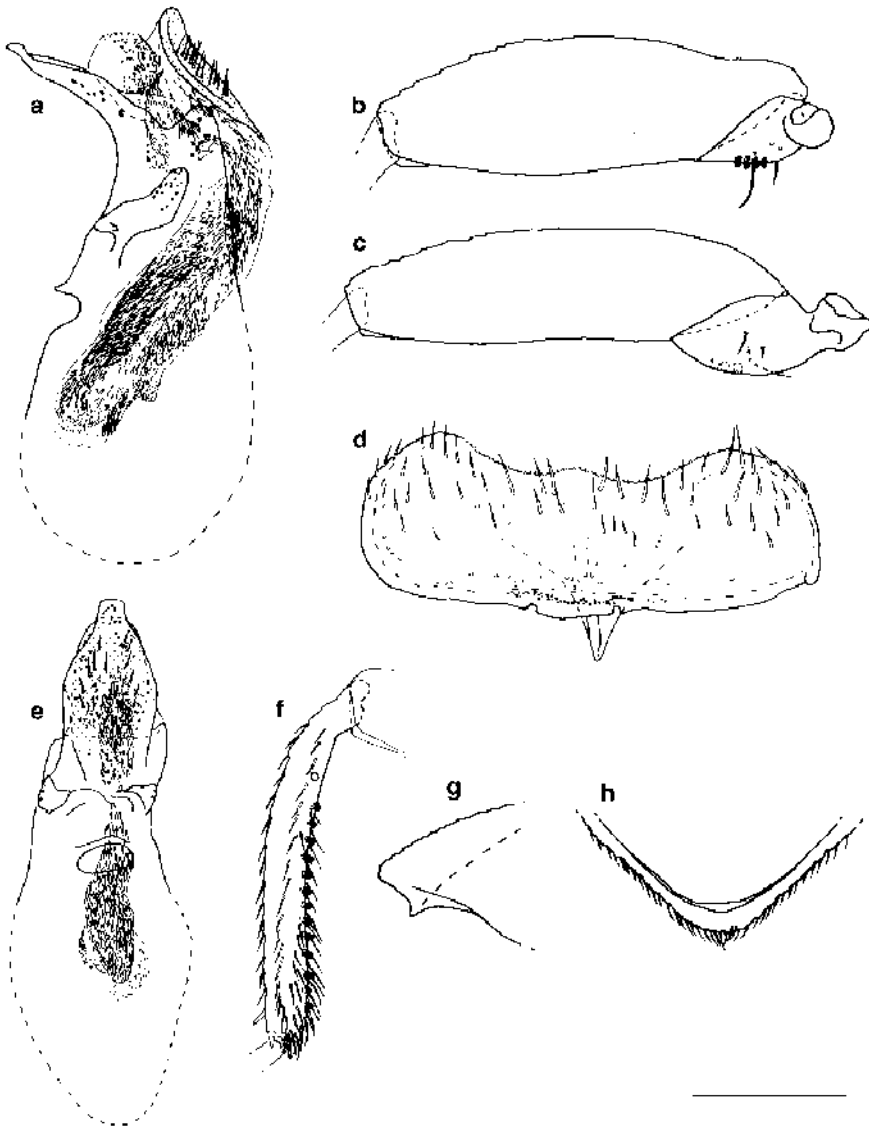


FIG. 26. *Megarthritis serrula*, male: (a, e) aedeagus, lateral and ventral; (b) mesofemur and mesotrochanter; (c) metafemur and metatrochanter; (d) abdominal sternite 8; (f) mesotibia; (g, h) apex of abdominal tergite 8, lateral and ventral. Scale bars = 0.2 mm.

trochanter (Fig. 26c), absent from protrochanter, protibia, metatrochanter and metafemur. Apex of abdominal tergite 8 as in Fig. 26g, h. Sternite 8 as in Fig. 26d. Sternite 9 lacking subbasal protuberance. Aedeagus as in Fig. 26a, e.

Female. Abdominal tergite 8 (Fig. 27f, g) lacking apical projection. Sternite 8 as in Fig. 27e. Genital segment as in Fig. 27a-c.

Comments. Only two Palaeartic species (*M. maronitus* and *M. serrula*) possess the elytra less than $1.6 \times$ as long as wide. *Megarthritis serrula* is characterised by the frontal pubescence orientated forward.

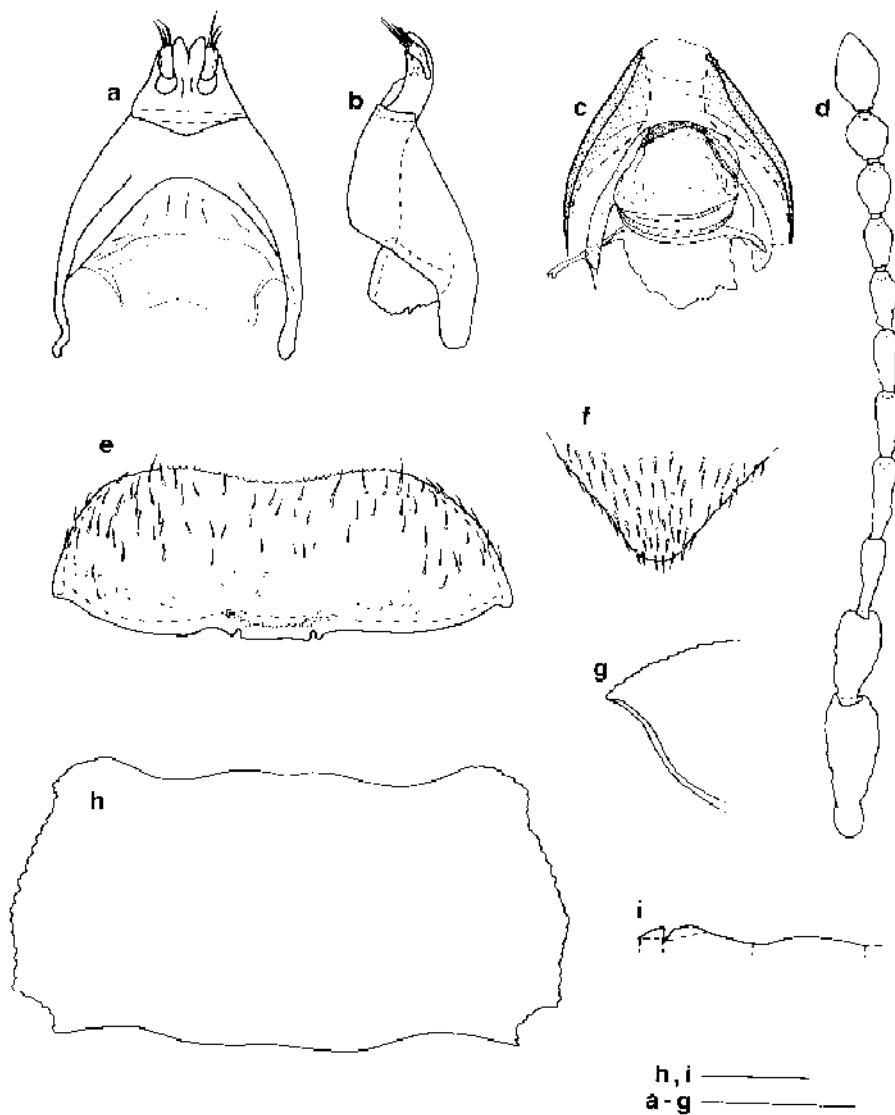


FIG. 27. *Megarthus serrula*: (a-c) female, genital segment, sternites (a) dorsal, (b) lateral and tergites (c) ventral; (d) antenna; (e) female, abdominal sternite 8; (f, g) female, apex of abdominal tergite 8, dorsal and lateral; (h) pronotum; (i) median processes of abdominal sternites 2-4 (left to right), schematic. Scale bars=0.2 mm.

Megarthus stercorarius Mulsant and Rey
(Figs 1a, d, 28a-k, 29a-i)

Megarthus stercorarius Mulsant and Rey, 1878: 238.

Megarthus franzi Scheerpeltz 1947: 252, *syn. n.*

Type material. *Megarthus stercorarius*: three specimens (2 ♂, 1 ♀) labelled 'H. Pyr.' and one male bearing the same data but 'Pandellé' have been located by J. Clary in the collection of Rey, housed in MHNL. One male labelled 'H. Pyr.' is

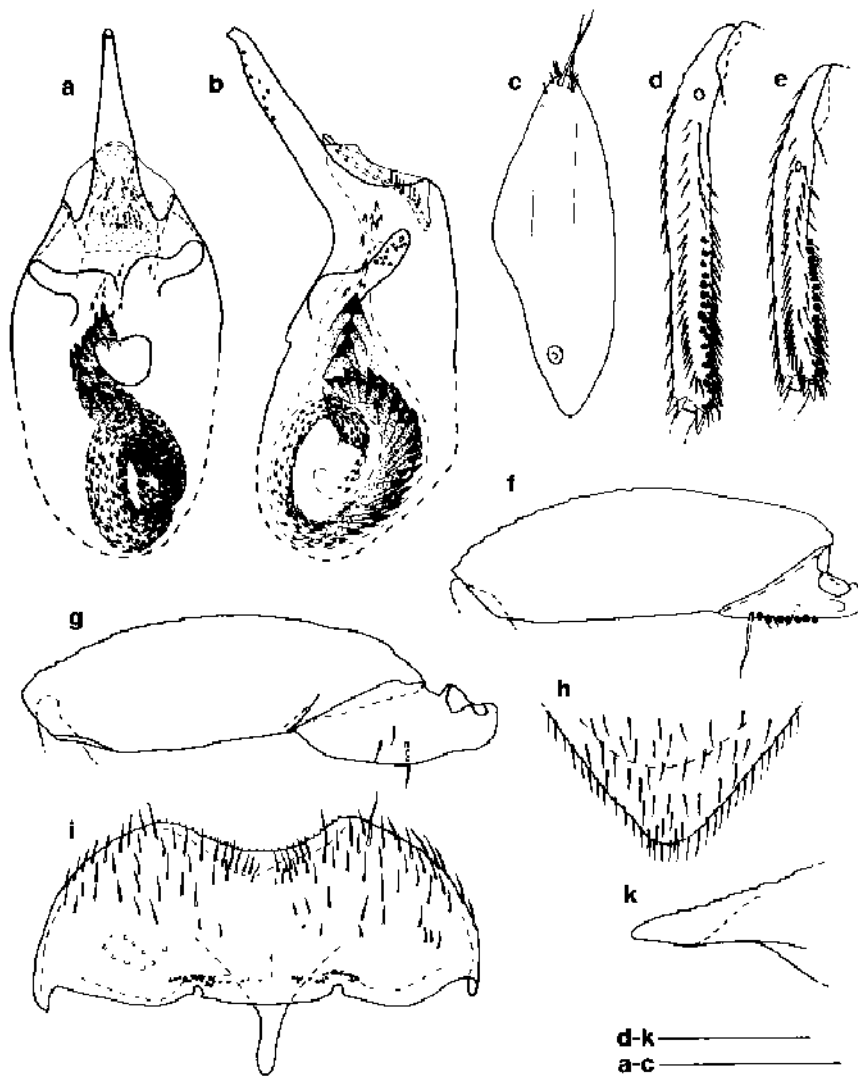


FIG. 28. *Megarthus stercorarius*, male: (a, b) aedeagus, ventral and lateral; (c) abdominal sternite 9; (d) metatibia; (e) mesotibia; (f) mesofemur and mesotrochanter; (g) metafemur and metatrochanter; (h, k) apex of abdominal tergite 8, dorsal and lateral; (i) abdominal sternite 8. Scale bars—0.2 mm.

presently designated and labelled as lectotype, the other three specimens are paralectotypes. *Megarthus franzi*: LECTOTYPE, ♂: Austria, Kärnten, Hohe Tauern, Sonnblick-Gruppe, Fleißgasthof, 7.viii.1937 (H. Franz) ex rotted fungi, G98, NHMW; PARALECTOTYPES (6): same data as lectotype, 3 ♂, 2 ♀, NHMW; Austria, Kärnten, Karawanken, Obir (E. Meschnigg) 1 ♂, NHMW, by present designation. *Additional material*. Ninety-seven specimens in BMNH, CNCL, FMNH, MIING, MHNL, NHMW and ZMHB.

Distribution. *Megarthus stercorarius* occurs apparently disjunctly in the Pyrenees, Alps, Carpathians and Caucasus (Abkhasia, VGPC; Kabardino-Balkaria, VGPC; Stavropol Krai, BMNH).

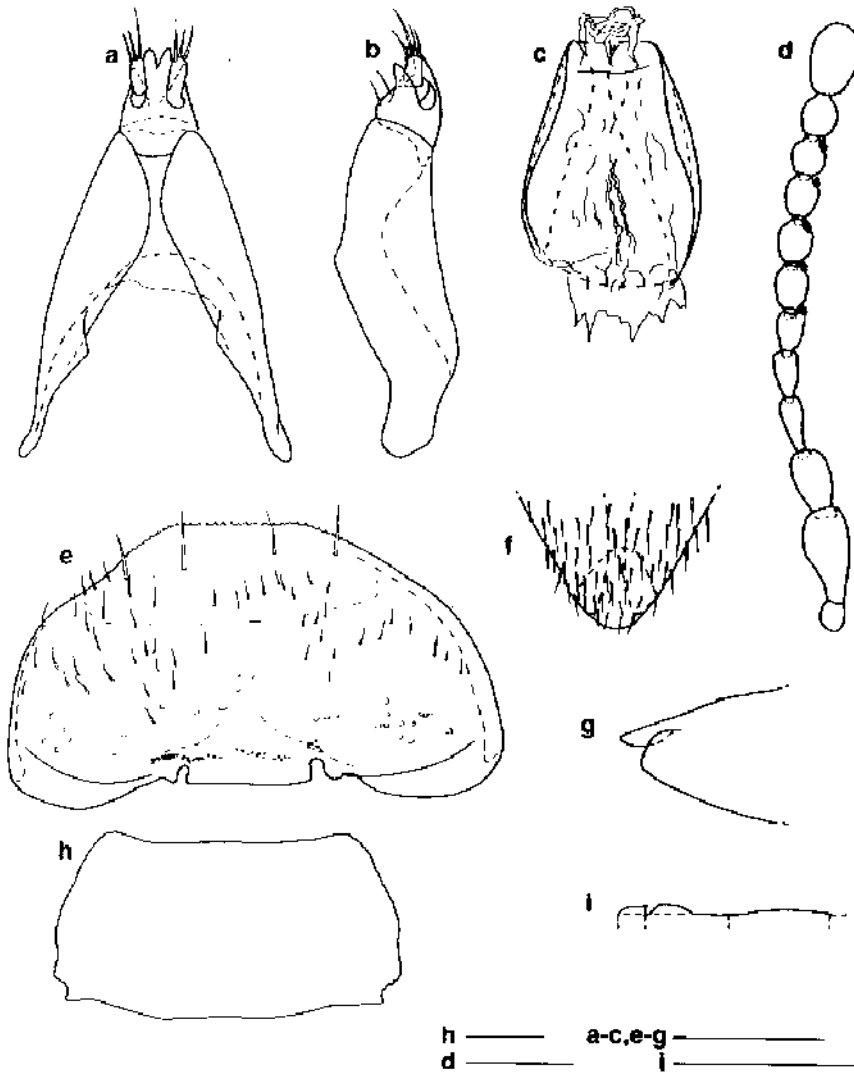


FIG. 29. *Megarthus stercorarius*: (a c) female, genital segment, sternites (a) dorsal, (b) lateral and tergites (c) ventral; (d) antenna; (e) female, abdominal sternite 8; (f, g) female, apex of abdominal tergite 8, dorsal and lateral; (h) pronotum; (i) median processes of abdominal sternites 2-4 (left to right), schematic. Scale bars = 0.2 mm.

Biology. Found in vegetable debris, carrion and dung.

Description. Similar to *M. prosseni* from which it differs as follows: Length 1.2-1.5 mm; width 0.8-1.0 mm. Dorsal pubescence fairly uniform, on elytra sparser, becoming denser near humeral area. Metasternal setae becoming sparser posteriomediaally. Punctuation fine on anterior portion of hypomeron. Frons in level of, or weakly raised above level of vertex. Eye with highest point below level of vertex. Antenna (Fig. 29d) with patches of sensilla on antennomeres 5-9. Pronotum as in Fig. 29h. Anterior prosternal margin not bordered with longitudinal ridges. Apical clytral margin straight near suture. Sternites 2 and 3 with median processes

i
g
a
r.

as in Fig. 29i. Ratios: EL 1.6–1.7; ET 1.8–1.9; EY 2.3–2.5; GT 2.0–2.2; GW 1.8–2.0; HW 1.7–1.8; PT 1.9; SP 3.3–4.0; TPF 7.0–9.0.

Male. Frontoclypeal area, metasternum, protarsomere 5 and abdominal sternites 4–6 unmodified. Frontal pubescence fairly parallel. Protarsomere 1 with tenent setae. Metafemur (Fig. 28g) longer than mesofemur (Fig. 28f). Metatibia (Fig. 28d) longer than mesotibia (Fig. 28e). Metatarsomere 1 about as long as combined length of metatarsomeres 2–4. Peg-like setae absent from protibia, metatrochanter (Fig. g) and metafemur; arranged in a single row on mesotrochanter (Fig. 28f), in 1–2 rows on metatibia, and grouped to form a field on mesotibia. Apex of abdominal tergite 8 as in Fig. 28h, k. Sternite 8 as in Fig. 28i. Sternite 9 (Fig. 28c) bearing a small subbasal protuberance. Aedeagus as in Fig. 28a, b.

Female. Frontal pubescence converging. Abdominal tergite 8 (Fig. 29f, g) with apical projection. Sternite 8 as in Fig. 29e. Genital segment as in Fig. 29a–c.

Comments. *Megarthritis stercorarius* differs from similar species (see discussion under *M. prosseni*) by the shape of the aedeagus and, in female, the shape of the valvifers.

The shape of the ventral wall of the aedeagus, and the number and pattern of metatibial peg-like setae are slightly variable in this species.

Megarthritis strandi Scheerpeltz
(Figs 30a–k, 31a–i)

Megarthritis strandi Scheerpeltz, 1931: 185.

Type material. LECTOTYPE, ♂: Norway, Vestfold, Asker, W Oslo Fjord (A. Strand) NHMW, by present designation.

Additional material. Forty-one specimens in BMNH, FMNH, MHNG, ZMUH and ZMUL.

Distribution. *Megarthritis strandi* is apparently restricted to North Europe.

Biology. Recorded from carrion and swept on vegetation (Kuusinen, 1933).

Description. Length 0.8–1.0 mm; width 0.5–0.7 mm. Body predominantly dark brown, or blackish, elytra and appendages paler, sutural margins of elytra darkened. Dorsal pubescence fairly uniform. Anteromedian portion of frons with setae orientated backward. Elytral setae straight, recumbent. Metasternal setae shorter than prosternal setae, uniform, or becoming sparser posteriomediaally. Abdominal pubescence parallel, uniform on sternites 4–7, but with a pair of long subapical setae on each sternite. Punctuation fine on anterior portion of hypomeron; posteriomedian portion of metasternum impunctate. Frons raised above level of vertex, forming a blunt ridge above clypeus. Anterior frontal edge evenly convex. Frontal impression shallow, or indistinct. Eye moderately convex, with highest point below level of vertex; supra-ocular margin sinuate in dorsal view. Temple similar to that in Fig. 1d. Occipital ridge indistinct. Submentum weakly convex. Antenna (Fig. 31d) without patches of sensilla; scape not flattened; antennomeres 3–4 slightly asymmetrical; short and dense pubescence present on antennomeres 5–11. Pronotum (Fig. 31h) weakly convex in frontal view, with mesal portion fairly straight in lateral view. Pronotal disc with shallow depression along posterior portion of lateral edge; median groove shallow, parallel-sided. Hypomeral ridge absent. Median prosternal ridge absent; anterior prosternal margin bordered by an irregular row of fine longitudinal ridges. Protrochanter with transverse ridge. Mesosternum with lateral portion of

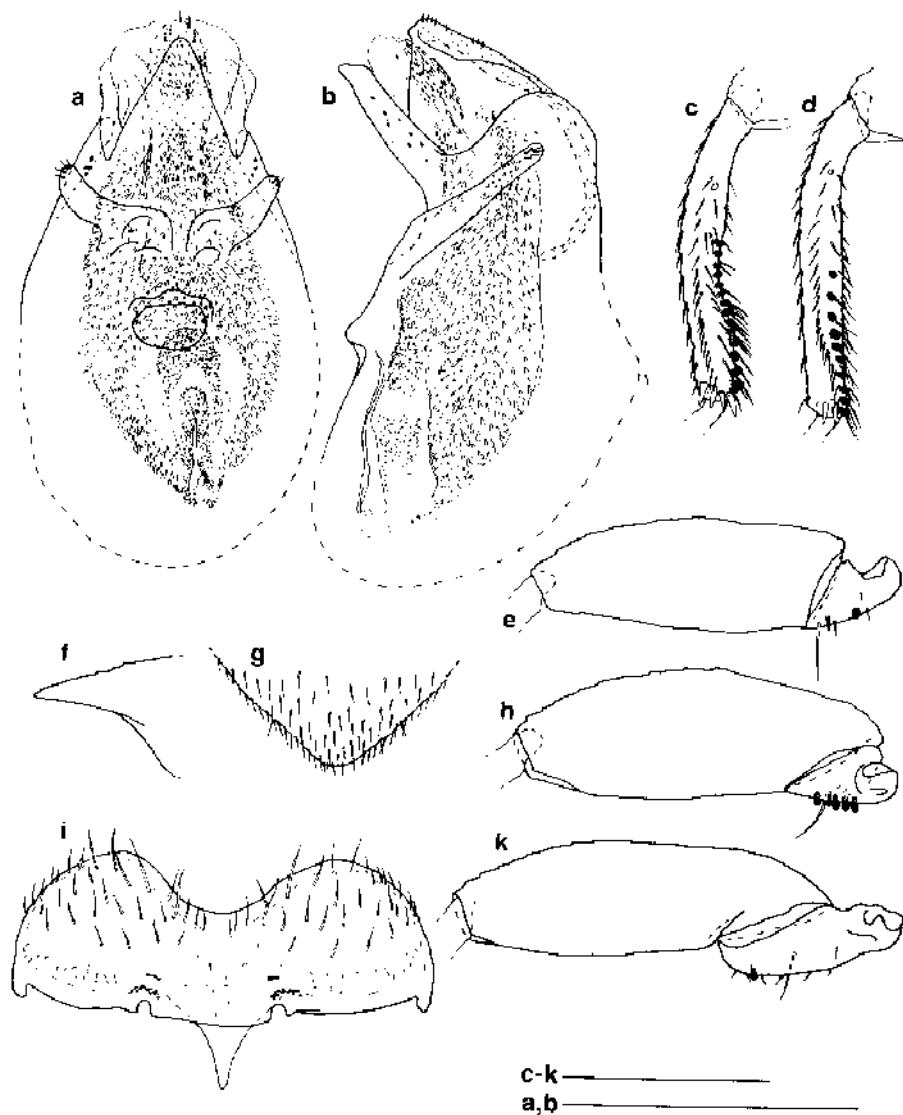


FIG. 30. *Megarthus strandi*, male: (a, b) aedeagus, ventral and lateral; (c) mesotibia; (d) metatibia; (e) profemur and protrochanter; (f, g) apex of abdominal tergite 8, lateral and dorsal; (h) mesofemur and mesotrochanter; (i) abdominal sternite 8; (k) metafemur and metatrochanter. Scale bars=0.2 mm.

prepectal ridge straight, bifid. Scutellum similar to that in Fig. 1b. Elytron not narrowed basally; base gradually inclined. Humeral callus low. Elytral disc lacking swellings, with shallow depression along lateral edge; lateral edge finely carinate, straight in dorsal view; sutural area almost straight in lateral view; apical margin straight, or convex near suture; inner apical angle obtuse. Metasternum with femoral line arcuate in middle; median ridge absent, or present posteriorly, fine and low; transverse ridge parallel to posterior edge of metasternum. Abdominal tergite 3 slightly transversely vaulted. Sternites 2 and 3 with median processes as in Fig. 31i,

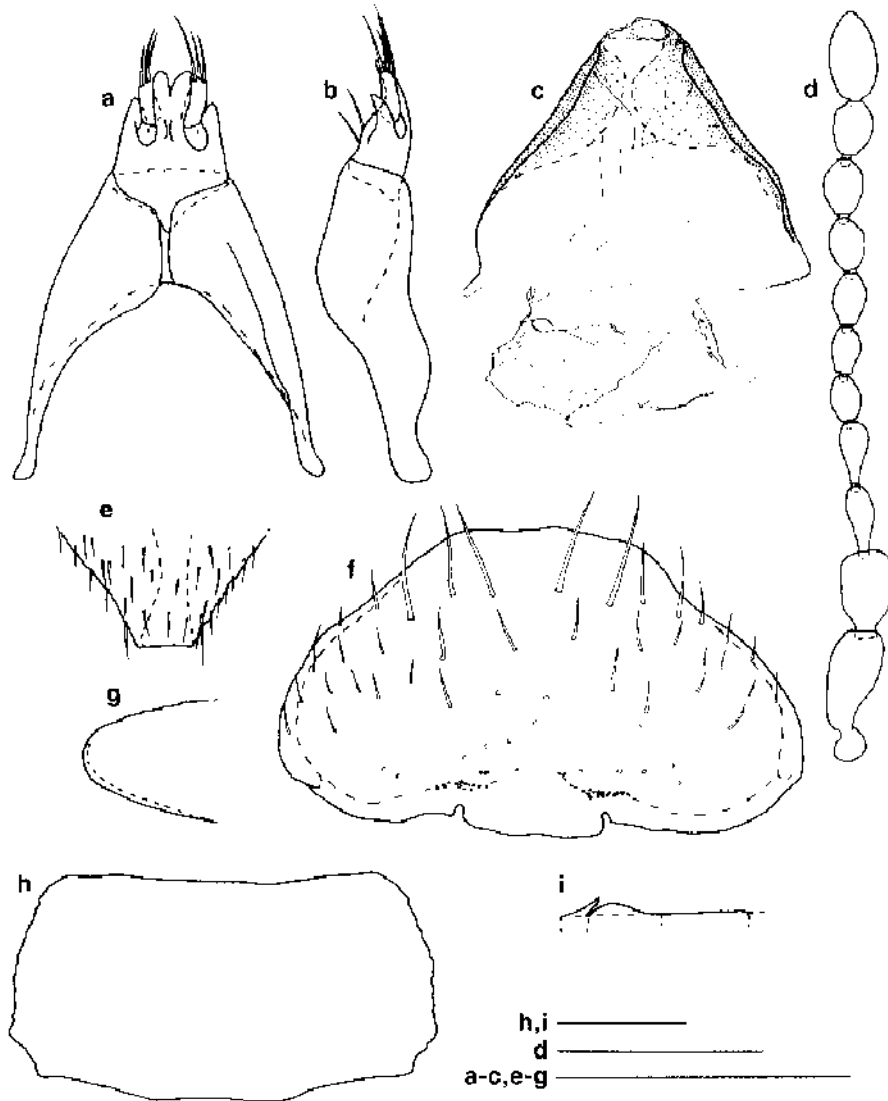


FIG. 31. *Megarthus strandi*: (a-c) female, genital segment, sternites (a) dorsal, (b) lateral and tergites (c) ventral; (d) antenna; (e, g) female, apex of abdominal tergite 8, dorsal and lateral; (f) female, abdominal sternite 8; (h) pronotum; (i) median processes of abdominal sternites 2-4 (left to right), schematic. Scale bars = 0.2 mm.

process of sternite 3 straight. Sternite 4 flat. Ratios: AL 1.8-2.1; EL 1.6-1.7; ET 1.6-1.9; EW 1.1-1.3; EY 2.2-2.3; GT 1.9-2.1; GW 1.7-1.8; HW 1.5-1.6; ML 1.6-1.8; MP 1.7-2.0; PT 1.9-2.0; SP 3.3-3.8; TPI abs.

Male. Frontoclypeal area, metasternum, protarsomere 5 and abdominal sternites 4-6 unmodified. Protarsomere 1 with tenent setae. Metafemur (Fig. 30h) about as long as mesofemur (Fig. 30k). Metatibia (Fig. 30d) about as long as mesotibia (Fig. 30c). Metatarsomere 1 somewhat shorter than combined length of metatarsomeres 2-4. Protrochanter (Fig. 30e) bearing a peg-like seta. Metatrochanter (Fig. 30k) bearing 1-3 peg-like setae. Peg-like setae absent from protibia and met-

afemur, arranged in a single row on mesotrochanter (Fig. 30h) and metatibia, and in two rows on mesotibia. Apex of abdominal tergite 8 as in Fig. 30f, g. Sternite 8 as in Fig. 30i. Sternite 9 lacking subbasal protuberance. Aedeagus as in Fig. 30a, b. *Female*. Abdominal tergite 8 (Fig. 31e, g) without apical projection. Sternite 8 as in Fig. 31f. Genital segment as in Fig. 31a, c.

Comments. See discussions under *M. depressus* and *M. fennicus*.

Megarthus uhligi sp. n.
(Figs 1k, 32a-h, 33a-i)

Type material. Holotype ♂: 'Altai Sibir. / 582. / ♂ / *Megarthus v. nigrinus* / Lokay det. / *Megarthus nigrinus* I. Sahlb. 2896 [handwritten]' CAS. PARATYPES (6). 'Altai Sibir. / 2896 [handwritten] / *Megarthus v. nigrinus* / Lokay det.' 1 ♀ in CAS; same data, but '♂' 1 ♂ in MHNG; 'Centr. Altai, leg. Leder [handwritten] / Chicago NHMus M. Bernhauer Collection' 1 ♀ in FMNH and 1 ♀ in MHNG; same data, but '*nigrinus* Shlb det. Bernhauer' 1 ♀ in FMNH; 'Central Altai, leg. Leder [handwritten] / *sahlbergi* Mönst? [handwritten] / *depressus*? Gvh Centralasien [unreadable] ?audinger [handwritten] / Chicago NHMus M. Bernhauer Collection' 1 ♂ in FMNH.

Distribution. *Megarthus uhligi* is apparently endemic to the Altai.

Biology. Unknown.

Description. Similar to *M. depressus* from which it differs as follows: Length 1.2-1.3 mm; width 0.7-0.8 mm. Anterior frontal edge weakly convex in middle, oblique laterally. Temple as in Fig. 1k. Occipital ridge indistinct. Antenna as in Fig. 33d; scape flattened; antennomere 3 slightly asymmetrical, four strongly asymmetrical. Pronotum as in Fig. 33i. Elytron not narrowed basally. Sternites 2-3 with median processes as in Fig. 33g, process of sternite 3 straight. Ratios: EL 1.5-1.7; ET 1.5-1.7; EW 1.1-1.2; EY 2.8-3.0; GT 1.8-2.2; GW 1.8-1.9; HW 1.5-1.6; MP 1.6-1.8; PT 1.9-2.0; SP 2.6-3.2; TPF 5.4-6.7.

Male. Frontoclypeal area, metasternum, protarsomere 5 and abdominal sternites 4-6 unmodified. Protarsomere 1 with tenent setae. Metafemur about as long as mesofemur (Fig. 32c). Metatibia (Fig. 32d) longer than mesotibia (Fig. 32c). Metatarsomere 1 about as long as combined length of metatarsomeres 2-4. Peg-like setae absent from protrochanter, protibia, metatrochanter and metafemur; absent or arranged in a single row on mesotrochanter (Fig. 32e); arranged in a single row on mesotibia, except near apex where they are grouped to form a field; arranged in a single row on metatibia. Apex of abdominal tergite 8 as in Fig. 32f, h. Sternite 8 as in Fig. 32g. Sternite 9 lacking a subbasal protuberance. Aedeagus as in Fig. 32a, b. *Female*. Abdominal tergite 8 (Fig. 33f, h) with apical projection. Sternite 8 as in Fig. 33c. Genital segment as in Fig. 33a, c.

Comments. *Megarthus uhligi* resembles *M. nigrinus* in the characters on legs in male, but has a different aedeagal shape and convex temples. See discussion under *M. nigrinus*.

Etymology. The species is named in honor of our colleague Manfred Uhlig, Berlin.

Megarthus wollastoni sp. n.
(Figs 34a-i, 35a-k)

Type material. HOLOTYPE ♂: Canary Is., HIERRO; El Golfo, 800-1000 m, 8.iii.1983

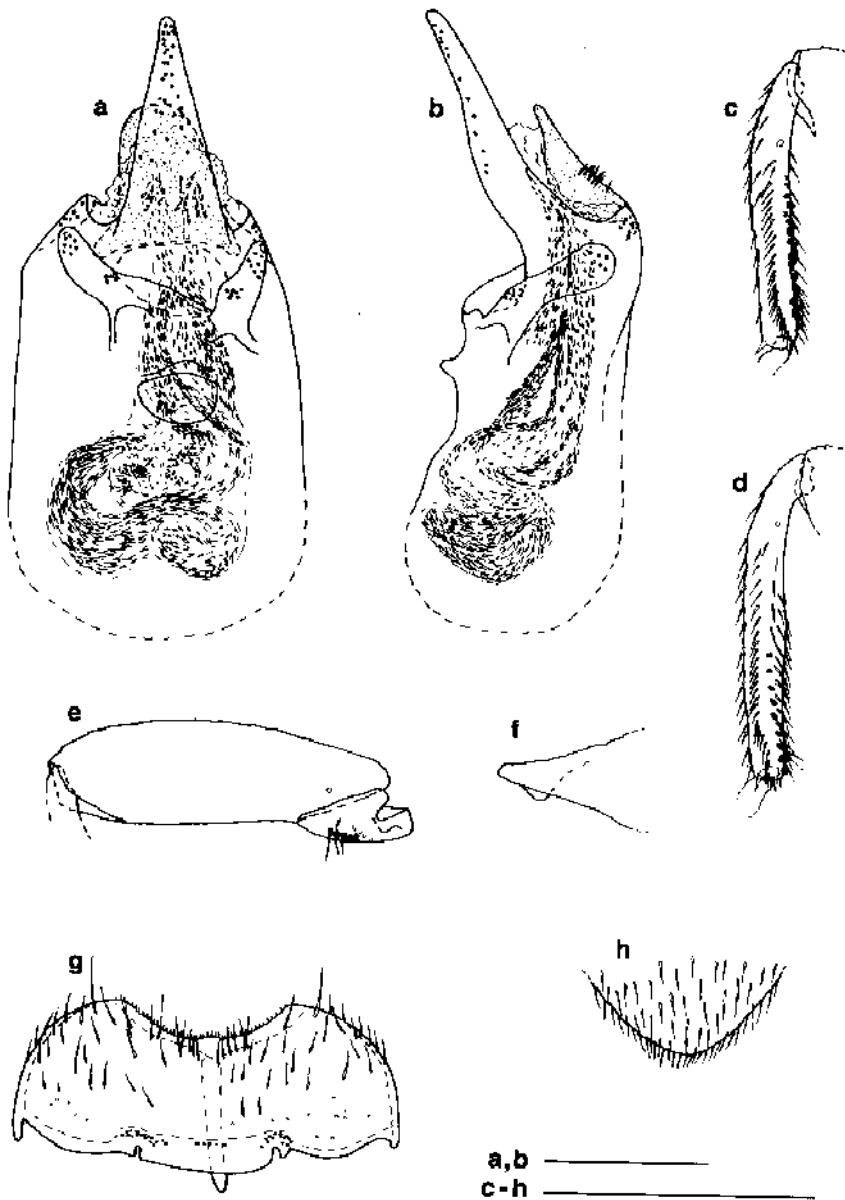


FIG. 32. *Megarathrus uhligi*, male: (a, b) aedeagus, ventral and lateral; (c) mesotibia; (d) metatibia; (e) mesofemur and mesotrochanter; (f, h) apex of abdominal tergite 8, lateral and ventral; (g) abdominal sternite 8. Scale bars = 0.2 mm.

(C. Besuchet) 8b, MHNG. PARATYPES (315). Same data as holotype. 15 ♂, 8 ♀ in MHNG, 1 ♂ and 1 ♀ in ZMUL and 1 ♂ in ZMUL; same data, but 1000 m. 6.iii.1983. #5, 1 ♀ in MHNG; same data, but (H. Franz) Sp 1320, ex laurel forest, 1 ♂ in HFPC; Canary Is. (T. V. Wollaston) 2 ♂, 2 ♀ in BMNH. GOMERA, El Cedro (H. Franz) Sp 1065-66, 2 ♀ in HFPC and 1 ♀ in MHNG; same data, but 1703, 1 ♂ in HFPC and 1 ♂ in MHNG; near Epina, 500 m, 26.x.1990 (P. Wunderle) ex moist

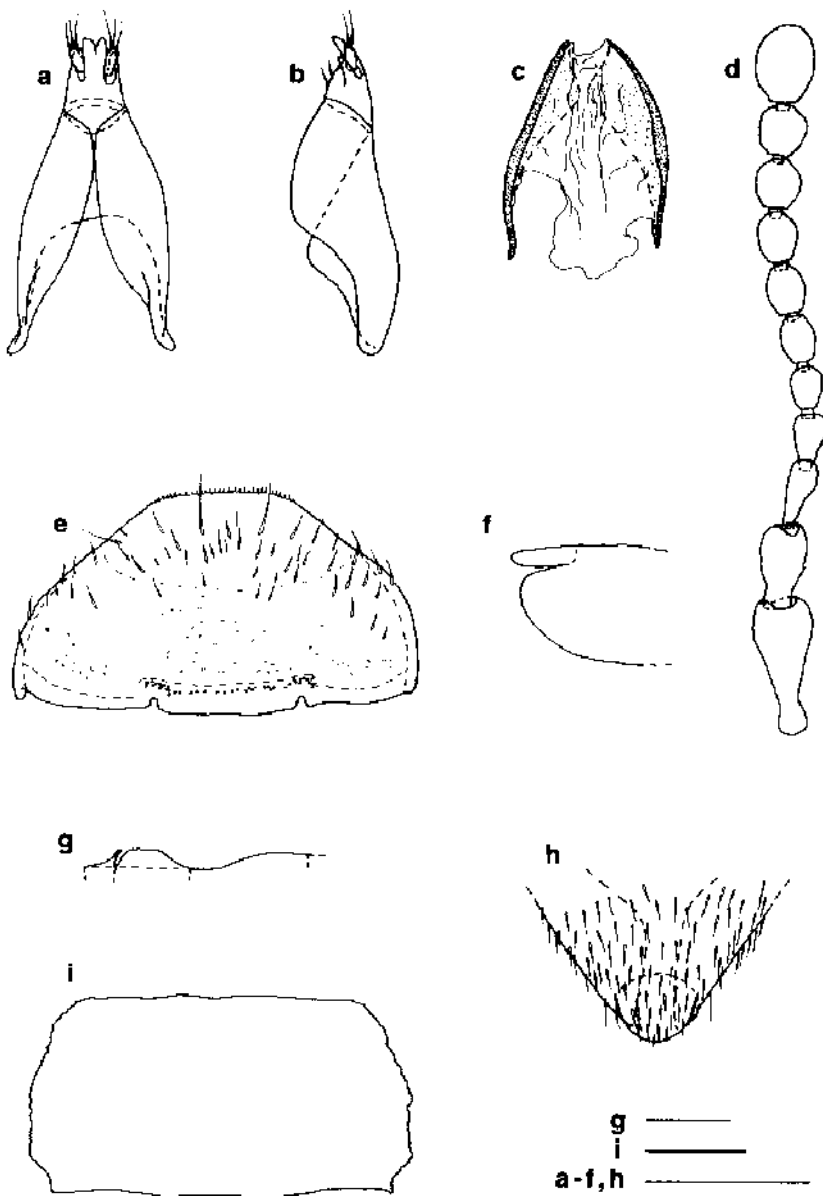


FIG. 33. *Megarthrus uhligi*: (a-c) female, genital segment, sternites (a) dorsal, (b) lateral and tergites (c) ventral; (d) antenna; (e) female, abdominal sternite 8; (f, h) female, apex of abdominal tergite 8, lateral and dorsal; (g) median processes of abdominal sternites 2-4 (left to right), schematic; (i) pronotum. Scale bars—0.2 mm.

site, 2 ♂, 1 ♀ in PWPC and 1 ♂, 1 ♀ in MHNG; same data, but Chorros de Epina, 800 m, 27.x.1990, ex vegetable debris under stone, 5 ♂, 3 ♀ in PWPC and 2 ♂, 2 ♀ in MHNG; same data, but near Arure, 900 m, 5.xi.1990, ex moss, in open area, 2 ♂, 2 ♀ in PWPC; same data, but Valle Gran Rey, Barranco de Arure, 250 m, 29.x.1990, 4 ♂, 3 ♀ in PWPC and 1 ♂, 1 ♀ in MHNG; same data, but La Laguna alta, Fayal-Brezal, 1300 m, 30.x.1990, 2 ♀ in PWPC and VAPC; Valle Gran Rey, 18-22.ii.1992

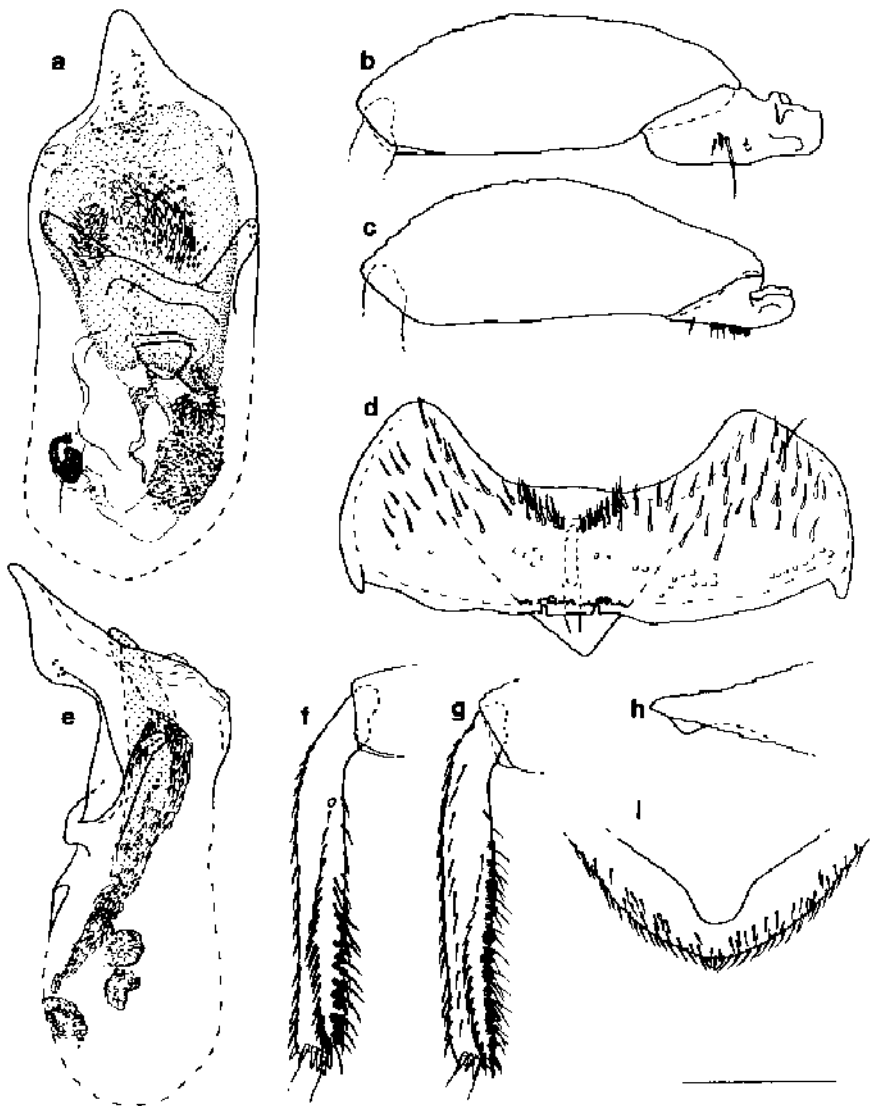


FIG. 34. *Megarthus wollastoni*, male: (a, e) aedeagus, ventral and lateral; (b) metafemur and metatrochanter; (c) mesofemur and mesotrochanter; (d) abdominal sternite 8; (f) mesotibia; (g) metatibia; (h, i) apex of abdominal tergite 8, ventral and lateral. Scale bars—0.2 mm.

(Hieke and Wendt) 1 ♂, 1 ♀ in ZMHB. GRAN CANARIA (T. V. Wollaston) 1 ♂, 1 ♀ in BMNH; 3.iv.1925 (Uytenboogaart) 66, 1 ♀ in FMNH; Barranco de Firgas (H. Franz) Sp 1092-94, 1 ♂ in HFPC and 1 ♂ in MHNG; Las Lagenlas (T. V. Wollaston) 1 ♂, 1 ♀ in BMNH; Las Palmas (T. V. Wollaston) 1 ♀ in BMNH; Madrelagua, 1000 m, 26-29.iii.1988 (Balke and Hendrich) ex temporary pond, 19 ♂, 23 ♀ in SEMK; same data, but 26.iii.1988, 6 ♂, 13 ♀ in SEMK; same data, but Barranco de Madrelagua <28°02'N, 11°53'20"W> 1000 m, 6.iii-2.iv.1987, 7 ♂, 6 ♀ in ZMHB; same data, but Teror, 740 m, 10 ♂, 9 ♀ in ZMHB; same data, but Barranco de Tirajana <27°55'30"N, 11°53'30"W> 900 m, 1 ♀ in ZMHB; Teror, Las

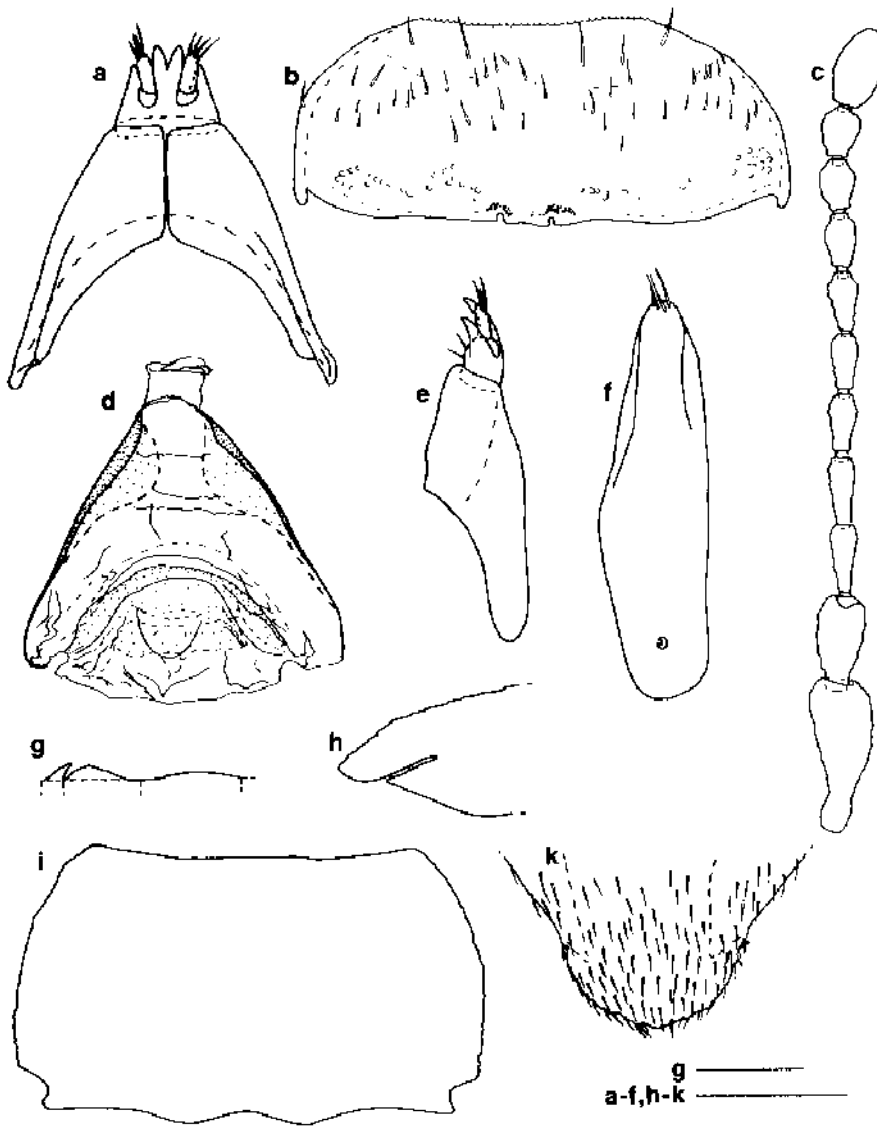


FIG. 35. *Megarthus wollastoni*: (a, d, e) female, genital segment, sternites (a) dorsal, (e) lateral and tergites (d) ventral; (b) female, abdominal sternite 8; (c) antenna; (f) male, abdominal sternite 9; (g) median processes of abdominal sternites 2-4 (left to right), schematic; (h, k) female, apex of abdominal tergite 8, lateral and dorsal; (i) pronotum. Scale bars—0.2 mm.

Huertillas, 750 m, 19.iii.1996 (Sprick) 4 ♂, 4 ♀ in VAPC; same data, but Mt. Osorio (Behne) 12 ♂, 11 ♀ in DEI and 7 ♂, 7 ♀ in MHNG; Barranco de Tenteniguada, San Mateo, El Rincolan, 1050 m, 16.iii.1996 (Sprick) 3 ♂, 2 ♀ in VAPC; same data, but (Behne) 2 ♂, 2 ♀ in DEI; Moja, 2.iii.1994 (Hengmuth) 1 ♂ in VAPC; near Moya (H. Franz) X 1191, ex laurel forest, 2 ♂, 1 ♀ in HFPC and 1 ♂, 1 ♀ in MHNG; same data, but sp 1335, 1 ♂, 1 ♀ in HFPC. HIERRO, 1 ♂, 1 ♀ in BMNH; Amoco,

900 m, 7.iii.1983 (C. Besuchet) #6b, 2 ♀ in MHNG; San Andres, 1 ♀ in VAPC; Valverde, 1 ♂ in VAPC. LANZAROTE (T. V. Wollaston) 1 ♂ in BMNH. LA PALMA, Fuente de la Zarza (H. Franz) Sp 1109, 1 ♀ in IIFPC; same data, but Los Tilos, Sp 1191, 1 ♂ in IIFPC; Cumbre nueva, Upper side, Fayal-Brezal, 1 km S Tunnel, 1050 m, 18.iii.1992 (L. Zerche) 2 ♂ in DEI. TENERIFFA (T. V. Wollaston) 1 ♂, 1 ♀ in BMNH; 30.ix.1965 (Benick) 2 ♂ in MHNG; Agua Garcia (K. M. Heller) 1 ♀ in FMNH; same data, but Madre del Agua, 900 m, 9.vii.1995 (L. Zerche) Laurisilva, 1 ♀ in DEI; Ate Verde?, 2.x.1965 (G. Benick) ex pigeon faeces, 1 ♀ in PWPC; Cumbre, 1600–1800 m (H. Franz) Sp 1059, 1 ♂, 2 ♀ in IIFPC; El Bailadero, 700 m, 11.iii.1983 (C. Besuchet) #12, 1 ♂ in MHNG; same data, but #13, 1 ♀ in MHNG; same data, but 900 m, 3.iv.1992 (V. Assing) 3, 1 ♂ in VAPC; Esperanza Forest, 1250 m, 12.vi.1992 (V. Assing) 1 ♂ in VAPC; same data, but 13.iv.1992 (L. Zerche) 3 ♀ in DEI; Icod de los Vinos, 500 m, 7.iv.1992 (V. Assing) 16, 1 ♂, 1 ♀ in VAPC; same data, but 600 m (P. Wunderle) 1 ♂ in PWPC; same data, but near Icod, 500 m, ex pine, 2 ♂ in PWPC; La Orotava, 11.iv.1976 (S. Vit) T/I, ex log of heath, 1 ♂ in MHNG; Orotava Valley, Aguamansa, 1050 m, 2.iv.1992 (L. Zerche) 1 ♂, 1 ♀ in DEI; same data, but above Aguamansa, 1150 m, 12.iv.1992, Pine forest, 1 ♂ in DEI; Los Realojos, 13.iv.1976 (S. Vit) 2 ♀ in MHNG; same data, but 500 m, 11.iv.1992 (V. Assing) 27, 1 ♀ in VAPC; Las Mercedes, 11.iv.1976 (S. Vit) ex leaf litter, 1 ♀ in MHNG; same data, but 1000 m, 27.ix.1965 (G. Benick) 2 ♂, 1 ♀ in PWPC and 4 ♂ in VAPC; same data, but Anaga, 4.iv.1992, 750 m (L. Zerche) Laurisilva, 1 ♂, 2 ♀ in DEI; same data, but 3.iv.1992 (V. Assing) 7, 1 ♂, 2 ♀ in VAPC; Monte de Las Mercedes, 23.iv.1976 (S. Vit) T/I, ex leaf litter, 2 ♂ in MHNG; same data, but (H. Franz) Sp 1037, 1 ♂, 6 ♀ in HFPC; Anaga, Pico del Ingles, 950 m, 13.iv.1992 (P. Wunderle) 1 ♂ in PWPC; Pico del Ingles, 16.iii.1972 (H. Meybohm & H. Fülcher) 1 ♂, 1 ♀ in MHNG; Ruigomez, 900 m, 12.iii.1983 (C. Besuchet) #14, 1 ♂, 2 ♀ in MHNG; Teide, N Hang, 1000–1600 m (H. Franz) Sp 1036, 5 ♂, 2 ♀ in HFPC; Teno, Mte de Aguas, W Erjos, 900 m, 8.iv.1992 (L. Zerche) Laurisilva, 1 ♂ in DEI; Teno, W Erjos, 850 m, 10.iv.1992 (P. Wunderle) 1 ♂, 2 ♀ in PWPC; same data, but 900 m, 8.iv.1992 (V. Assing) 18, 1 ♂ in VAPC; same data, but 10.iv.1992, 26, 1 ♀ in VAPC.

Distribution. *Megarathrus wollastoni* is apparently endemic to the Canary Is.

Biology. Found in vegetable debris and faeces.

Description. Similar to *M. longicornis* from which it differs as follows: antenna as in Fig. 35c. Pronotum as in Fig. 35i. Abdominal sternites 2 and 3 with median processes as in Fig. 35g; sternite 4 slightly transversely vaulted. Ratios: AL 1.9–2.1. *Male.* Metasternum, protarsomere 5 and abdominal sternites 4–6 unmodified. Anterior frontal edge strongly raised apically, horn-like. Protarsomere 1 with tenent setae. Metafemur (Fig. 34b) somewhat shorter than mesofemur (Fig. 34c). Metatibia (Fig. 34f) about as long as mesotibia (Fig. 34g). Metatarsomere 1 about as long as combined length of metatarsomeres 2–4. Peg-like setae absent from protrochanter, protibia, metatrochanter (Fig. 34b) and metafemur; arranged in a single row on mesotrochanter (Fig. 34c), in two rows on mesotibia, and grouped to form a field on metatibia. Apex of abdominal tergite 8 as in Fig. 34h, i. Sternite 8 as in Fig. 34d. Sternite 9 (Fig. 35f) bearing a small subbasal protuberance. Aedeagus as in Fig. 34a, c.

Female. Anterior frontal edge evenly and finely carinate, evenly convex. Abdominal tergite 8 (Fig. 35h, k) with apical projection. Sternite 8 as in Fig. 35b. Genital segment as in Fig. 35a, d, e.

Comments. See discussion under *M. longicornis*.

Etymology. The species is named in honor of its first collector, T. Vernon Wollaston.

Megarthus zekorum sp. n.
(Figs 36a-i, 37a-k)

Type material. HOLOTYPE ♂: 'Pjestschanka, 8 km öst. Tschita, Transbaikalien / H.

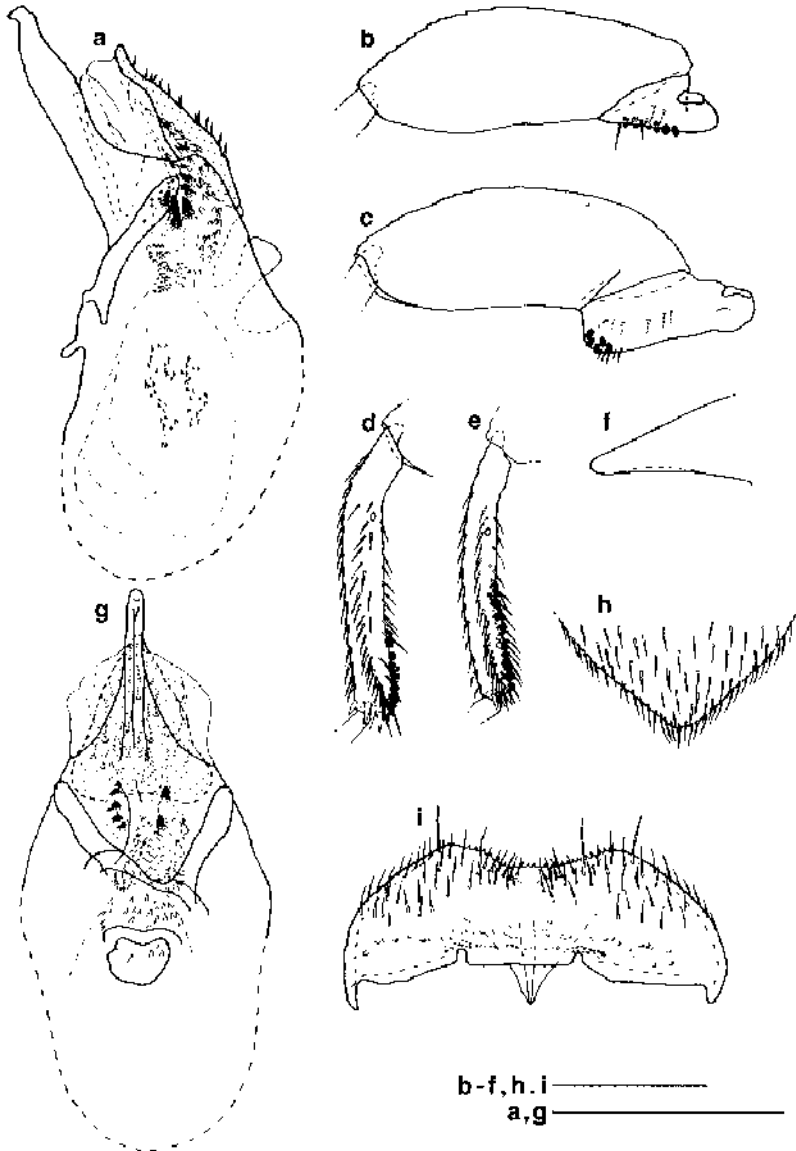


FIG. 36. *Megarthus zekorum*, male: (a, g) aedeagus, lateral and ventral; (b) mesofemur and mesotrochanter; (c) metafemur and metatrochanter; (d) metatibia; (e) mesotibia; (f, h) apex of abdominal tergite 8, lateral and dorsal; (i) abdominal sternite 8. Scale bars = 0.2 mm.

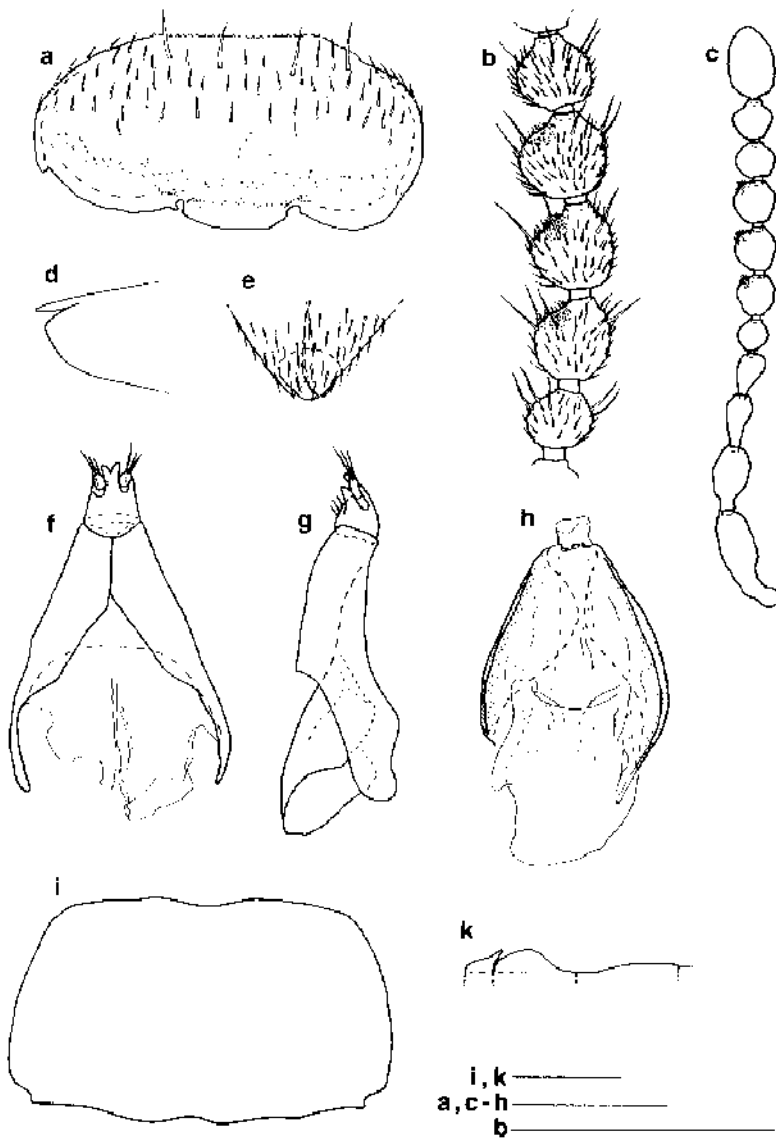


FIG. 37. *Megarathrus zekorum*: (a) female, abdominal sternite 8; (b) antennomeres 5-9; (c) antenna; (d, e) female, apex of abdominal tergite 8, lateral and dorsal; (f-h) female, genital segment, sternites (f) dorsal, (g) lateral and (h) ventral; (i) pronotum; (k) median processes of abdominal sternites 2-4 (left to right), schematic. Scale bars = 0.2 mm.

Frieb leg., 1918-1920 / Typus *Megarathrus Friebi* O. Scheerpeltz / ex coll. Scheerpeltz' NIIMW. PARATYPES (8): same data as holotype, 1 ♀ in BMNH, 1 ♀ in MHNG, 1 ♂ and 1 ♀ in NHMW; same data, but 'Tschita' 1 ♂ in BMNH; 'Centr. Altai, leg. Leder' 1 ♂ in FMNH and 1 ♂ in MHNG; 'Baikal, Tunkun Sajan, Bang, Haas' 1 ♂ in FMNH.

Distribution. *Megarathrus zekorum* occurs in Russia: Altai, Sajan and Transbaikal regions.

Biology. Unknown.

Description. Similar to *M. prosseni* from which it differs as follows: Length 1.0–1.5 mm; width 0.6–0.8 mm. Antenna (Fig. 37b, c) with patches of sensilla on antennomeres 6–8. Pronotum as in Fig. 37i. Scutellum similar to that in Fig. 1b. Inner apical angle of clytron rectangular, or obtuse. Abdominal sternites 2 and 3 with median processes as in Fig. 37k. Ratios: AL 1.6–2.0; EY 2.5–2.8; HW 1.4–1.7; PT 1.8–1.9; SP 3.2–3.8.

Male. Frontoclypeal area, metasternum, protarsomere 5 and abdominal sternites 4–6 unmodified. Frontal pubescence subparallel. Protarsomere 1 with tenent setae. Metafemur (Fig. 36c) about as long as mesofemur (Fig. 36b). Metatibia (Fig. 36d) longer than mesotibia (Fig. 36e). Metatarsomere 1 about as long as combined length of metatarsomeres 2–4. Peg-like setae absent from protrochanter, protibia and metafemur; arranged in a single row on mesotrochanter (Fig. 36b), and grouped to form a field on mesotibia, metatrochanter (Fig. 36c) and metatibia. Apex of abdominal tergite 8 as in Fig. 36f, h. Sternite 8 as in Fig. 36i. Sternite 9 lacking subbasal protuberance. Aedeagus as in Fig. 36a, g.

Female. Abdominal tergite 8 (Fig. 37d, e) with apical projection. Sternite 8 as in Fig. 37a. Genital segment as in Fig. 37f, h.

Comments. See discussion under *M. prosseni*.

Megarthus zerchei sp. n.

(Figs 1i, 38a–h, 39a–k)

Type material. HOLOTYPE ♂: Russia, Primorskiy Kray, Sikhote-Alin, Biol. Stat. 30 km SE Chuguyevka, 44°05' N 134°12' E, 1.vi.1993, 650 m, leg. I. Zerche in DEI. PARATYPES (19). Same data as holotype, 3 ♂, 5 ♀ in DEI and 2 ♂, 2 ♀ in MHNG; same data, but 31.v.1993, 1 ♂, 4 ♀ in DEI and 1 ♂, 1 ♀ in MHNG.

Distribution. Far East Russia. *Megarthus zerchei* is apparently endemic to the Sikhote-Alin range.

Biology. Unknown.

Description. Length 1.2–1.5 mm; width 0.9–1.0 mm. Body uniformly dark brown, sutural margins of elytra darkened, legs somewhat paler. Dorsal pubescence fairly uniform. Anteromedian portion of frons with setae orientated backward. Elytral setae curved, recumbent. Metasternal setae as long as prosternal setae, uniform. Abdominal pubescence converging on tergite 4–6, uniform on sternites 4–7, but with a pair of long subapical setae on each sternite. Punctuation coarse on anterior portion of hypomeron and posteromedian portion of metasternum. Frons raised above level of vertex, forming a ridge above clypeus; frontal ridge sharp, fine in middle, conspicuous laterally. Anterior frontal edge evenly convex. Frontal impression deep. Eye almost hemispherical, with highest point reaching level of vertex; supra-ocular margin sinuate in dorsal view. Temple and occipital ridge as in Fig. 1i. Submentum strongly convex. Antenna (Fig. 39d) without patches of sensilla; scape not flattened; antennomeres 3–4 symmetrical; short and dense pubescence present on antennomeres 6–11. Pronotum (Fig. 39i) strongly convex in frontal view, with mesal portion weakly convex in lateral view. Pronotal disc with depressions deep along lateral edge and shallow beside median groove; median groove shallow, parallel-sided. Hypomeral ridge present anteriorly, oblique. Median prosternal ridge conspicuous, Y-shaped; anterior prosternal margin bordered by a regular row of conspicuous longitudinal ridges. Protrochanter lacking transverse ridge.

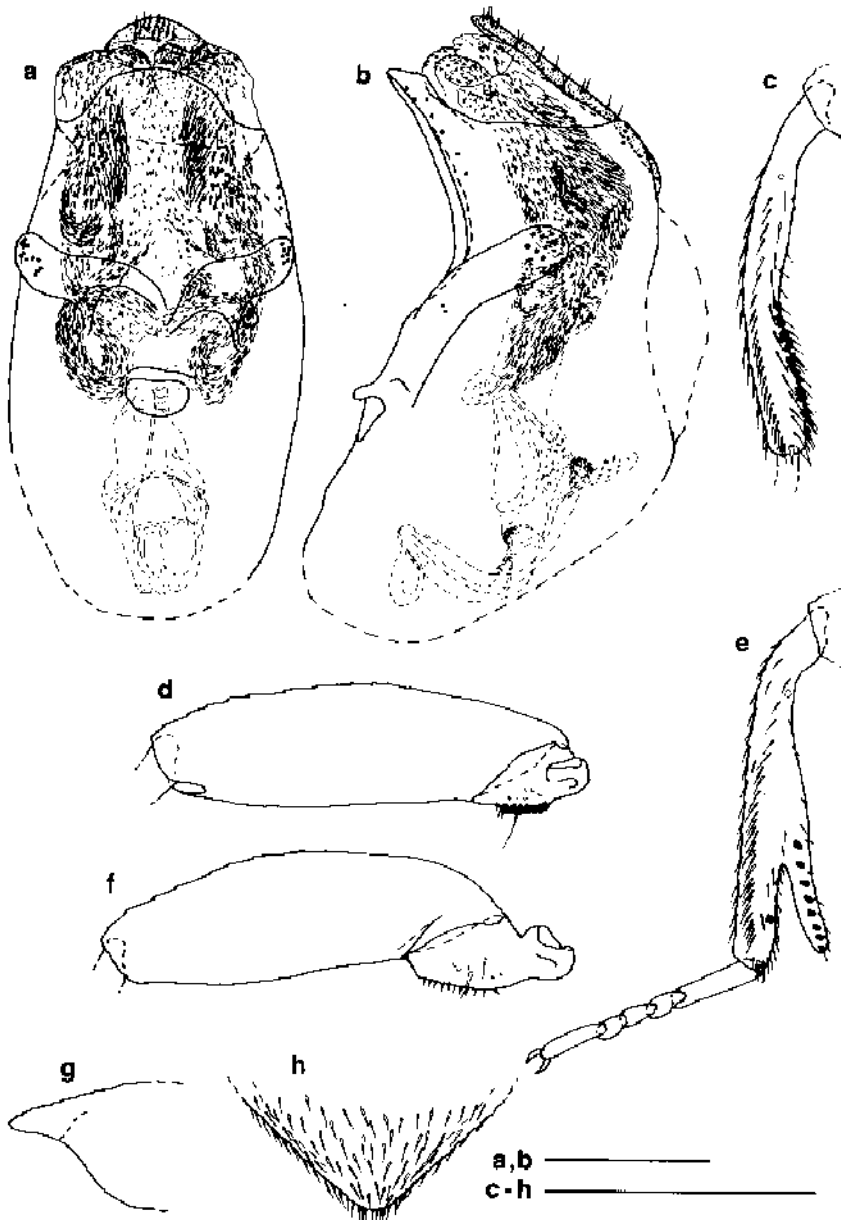


FIG. 38. *Megarathrus zerchei*, male: (a, b) aedeagus, ventral and lateral; (c) mesotibia; (d) mesofemur and mesotrochanter; (e) metatibia; (f) metafemur and metatrochanter; (g, h) apex of abdominal tergite 8, lateral and dorsal. Scale bars = 0.2 mm.

Mesosternum with lateral portion of prepectal ridge angulate, bifid. Scutellum similar to that in Fig. 1b. Elytron not narrowed basally; base gradually inclined. Humeral callus low. Elytral disc with low swellings, shallowly depressed along lateral edge; lateral edge finely carinate, straight, or sinuate, in dorsal view; sutural area straight basally and strongly arcuate apically in lateral view; apical margin straight, or convex, near suture; inner apical angle obtuse. Metasternum with femoral line

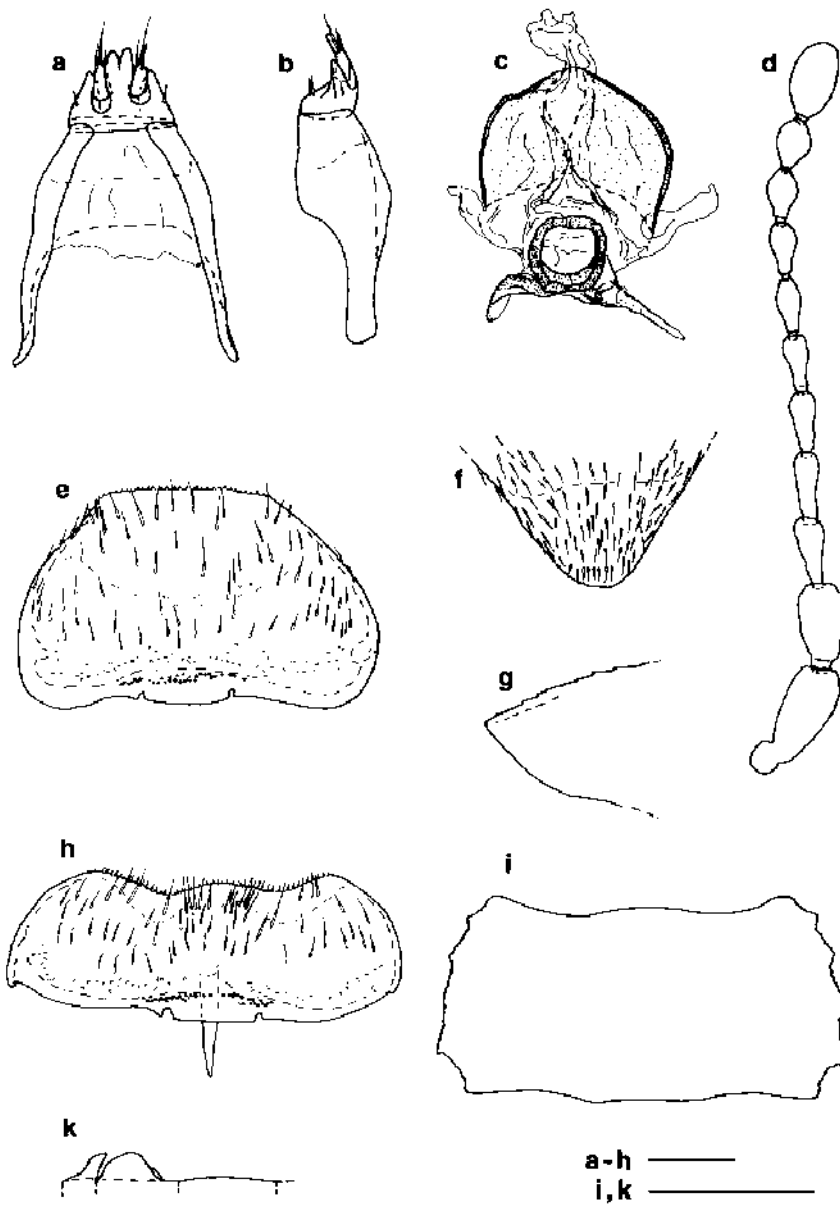


FIG. 39. *Megurthrus zerehei*: (a-c) female, genital segment, sternites (a) dorsal, (b) lateral and tergites (c) ventral; (d) antenna; (e) female, abdominal sternite 8; (f, g) female, apex of abdominal tergite 8, lateral and dorsal; (h) male, abdominal sternite 8; (i) pronotum; (k) median processes of abdominal sternites 2-4 (left to right), schematic. Scale bars = 0.2 mm.

arcuate in middle; median ridge present posteriorly, fine and low; transverse ridge parallel to posterior edge of metasternum. Abdominal tergite 3 slightly transversely vaulted. Sternites 2 and 3 with median processes as in Fig. 39k, process of sternite 3 trifold. Sternite 4 with basal portion flat, slightly transversely vaulted at disc. Ratios:

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AL 1.9-2.2; EL 1.7-1.8; ET 1.9-2.0; EW 1.1-1.2; EY 2.9-3.1; GT 2.3-2.5; GW 1.8-2.0; HW 1.8-1.9; ML 1.5-1.7; MP 1.9-2.1; PT 2.0-2.2; SP 4.1-4.5; TPF abs.

Male. Frontoclypeal area, protarsomere 5, metasternum and abdominal sternites 4-6 unmodified. Protarsomere 1 lacking tenent setae. Mesofemur (Fig. 38d) longer than metafemur (Fig. 38f). Mesotibia (Fig. 38c) somewhat longer than metatibia (Fig. 38e). Metatarsomere 1 about 1.5 × as long as combined length of metatarsomeres 2-4. Peg-like setae absent from proibia, protrochanter, metatrochanter and metafemur; arranged in a single row on mesotrochanter (Fig. 38d) and metatibia; arranged in two rows on mesotibia. Apex of abdominal tergite 8 as in Fig. 38g, h. Sternite 8 as in Fig. 39h. Sternite 9 without subbasal protuberance. Aedeagus as in Fig. 38a, b.

Female. Abdominal tergite 8 (Fig. 39f, g) without medioapical projection. Sternite 8 as in Fig. 39e. Genital segment as in Fig. 39a, c.

Comments. *Megarathrus zerchei* differs from other species possessing short and dense pubescence on antennomeres 6-11 (*M. chobauti*, *M. longicornis* and *M. wollastoni*) by the shape of the male metatibia and, in female, by the presence of an annular sclerite on the genital segment. It resembles *M. calcaratus* Coiffait, from Nepal, and *M. parallelus* Sharp, from Japan, which have different sexual characters.

Etymology. The species is named in honor of its collector, Lothar Zerche, Eberswalde.

Discussion

Presently, thirty-three species of *Megarathrus* are known from the Palaearctic realm (Appendix), but ten are exclusive to Japan and are not discussed here (Table 1). Five species (*M. chobauti*, *M. maronitus*, *M. longicornis*, *M. serrula* and *M. wollastoni*) are confined to areas with a Mediterranean type of climate and have a strongly restricted distribution. Six species (*M. bellevoeyi*, *M. denticollis*, *M. depressus*, *M. hemipterus*, *M. nitidulus* and *M. stercorarius*) are widely distributed in Europe. Except for *M. stercorarius*, their range extends to Far East Russia and/or to China and Japan. *Megarathrus stercorarius* appears to be confined to the Pyrenees, Alps, Carpathians and Caucasus, and exhibits a disjunct distribution. Three species (*M. fennicus*, *M. nigrinus* and *M. strandi*) are northern, one species (*M. prosseni*) is western, the remaining (*M. conspirator*, *M. dentipes*, *M. impressicollis*, *M. montanus*, *M. uhligi*, *M. zekorum* and *M. zerchei*) are eastern in distribution. *Megarathrus wollastoni* and *M. serrula* are endemics of the Canary Is., and *M. longicornis* of Madeira. The genus appears to be absent from cremic Central Asia, and is, with eight species, notably well represented in northern Europe.

The European *Megarathrus*, including *M. wollastoni* and *M. longicornis*, and the east Asian *M. uhligi* and *M. zekorum*, share with most of the Afrotropical and Nearctic species the presence of tenent setae on protarsomeres in male. The Canarian *M. serrula* and the South Mediterranean *M. chobauti* and *M. maronitus* lack short and dense pubescence on the antennomere 5 and possess partially fused female valvifers, a combination of characters found in several species from Himalaya and Japan. *Megarathrus montanus* is linked with the Nearctic *M. arcuatus* and *M. smetanai* by the ninth abdominal sternite with a large subbasal protuberance in male and the apical margin of the eighth abdominal tergite fringed in female. *Megarathrus zerchei* shares apomorphic female genitalia with the Nepalese *M. calcaratus* and the Japanese *M. parallelus*, and *M. conspirator* share such characters with the Japanese *M.*

Table 1. Distributional pattern of the Palearctic *Megarhirus* based on examined material, species exclusive for Japan excluded (bold numbers = total number of species in a given area; number in parenthesis = number of species unique to a given area).

species	areas										Trans- baikal Russia	North East China	Far East Russia	Japan	
	Canary Islands	Madeira	North Africa	Levant	British Isles	Central and South Europe	Fenno- scandia	Caucasus	Altai						
<i>M. bellevoeyi</i>			X	X	X	X		X					X		
<i>M. chobauti</i>			X										X		
<i>M. conspirator</i>					X	X	X		X				X		X
<i>M. denticollis</i>					X	X	X								X
<i>M. dentipes</i>					X	X	X						X		X
<i>M. depressus</i>					X	X	X						X		X
<i>M. fennicus</i>					X	X	X						X		X
<i>M. hemipterus</i>					X	X	X						X		X
<i>M. impressicollis</i>													X		X
<i>M. japonicus</i>													X		X
<i>M. longicornis</i>													X		X
<i>M. macronotus</i>		X											X		X
<i>M. monianus</i>				X									X		X
<i>M. nigrinus</i>										X			X		X
<i>M. nitidulus</i>									X	X			X		X
<i>M. prosseni</i>									X	X			X		X
<i>M. serrula</i>															
<i>M. strandi</i>		X													
<i>M. uhligi</i>															
<i>M. wolfastoni</i>		X											X		X
<i>M. zekorian</i>															
<i>M. zerchei</i>															
23	2 (2)	1 (1)	2 (1)	2 (1)	5 (0)	7 (0)	8 (1)	4 (0)	3 (1)	8 (0)	5 (1)	8 (1)	6 (+10)		

conformis, *M. constrictus* and *M. convexus*. The affinities of *M. impressicollis* are unclear.

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Appendix

Checklist of species names of the Palaeartic *Megarthus*, Japanese species included (valid names in bold characters).

- affinis* Miller, 1852.
affinis Stephens, 1834.
aino Cuccodoro, 1996.
bellevoyei Sauley, 1862.
chobauti Fauvel, 1902.
conformis Sawada, 1962.
conspirator Cuccodoro, 1996.
constrictus Cuccodoro, 1996.
convex, misspelling.
convexus Sharp, 1874.
corticalis Sharp, 1889.
denticollis (Beck, 1817).
dentipes Bernhauer, 1938.
depressus (Paykull, 1789).
emarginatus Stephens, 1834.
fennicus Lahtinen, 1938.
franzi Scheerpeltz, 1947.
hemipterus (Illiger, 1795).
heteropus Sawada, 1962.
impressicollis Eppelsheim, 1893.
incubifer Cuccodoro, 1996.
japonicus Sharp, 1874.
longicornis Wollaston, 1854.
macropterus (Gravenhorst, 1806).
marginatus Stephens, 1834.
marginicollis (Lacordaire, 1835).
maronitus Fagel, 1968.
melanocephalus (Olivier, 1795).
minimus Bruce, 1931.
montanus Sawada, 1962.
nigrinus Sahlberg, 1876.
nitiduloides (Lacordaire, 1835).
nitidulus Kraatz, 1857.
parallelus Sharp, 1874.
prosseni Schatzmayr, 1904.
pusillus Stephens, 1834.
rufescens Stephens, 1834.
sahlbergi Münster, 1912.
sawudai Cuccodoro, 1996.
scriptus Sharp, 1889.
sevrula Wollaston, 1865.
shibatai Sawada, 1962.
sinuaticollis, misspelling.
sinuaticollis (Lacordaire, 1835).
stercorarius Mulsant and Rey, 1878.
strandii Scheerpeltz, 1931.
subangulatus Sawada, 1962.
subparallelus Sawada, 1962.
thomsoni Varenus, 1891.
uhligi sp. n.
wollastoni sp. n.
zekorum sp. n.
zerchei sp. n.

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