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REVISION OF THE PALEARCTIC SPECIES OF THE GENUS *OCHTHEBIUS* LEACH
I. THE SO-CALLED SUBGENUS *"BOTHOCHIUS"*
(Hydraenidae, Coleoptera)

by M.A. JÄCH

Abstract

Seventeen species, belonging to the so-called subgenus *"Bothochius"* REY are treated. There is no obvious evidence, that *"Bothochius"* forms a monophyletic taxon. The types of 8 species (*bifoveolatus* WALTL, *caucasicus* KUWERT, *grandipennis* FAIRMAIRE, *mongolicus* JANSSENS, *orientalis* JANSSENS, *pilosus* WALTL, *ragusae* KUWERT, *turkestanus* KUWERT) and 6 synonyms (*nigrinus* KNISCH, *volxemi* SHARP, *fluviatilis* GUILLEBEAU, *sericeus* MULSANT, *villosulus* KUWERT, *detritus* REY) were studies. Lectotypes are designated for all of these taxa, except for *turkestanus*. One new synonymy is established: *Ochthebius pilosus* (= *Ochthebius sericeus* syn.nov.). Four new species are described: *O.imbensimbi* sp.n., *O.klapperichi* sp.n., *O. sulpuris* sp.n. and *O.turcicus* sp.n. The male copulatory organs of all 17 species are figured. Some new ideas about illustrating *Ochthebius* aedeagi are introduced. The last sternites of females were thoroughly studied to enable distinction between some closely related species.

In 1886, C.REY erected the subgenus *Bothochius* (type-species by monotypy: *Ochthebius nobilis* VILLA), separating it from the subgenus *Hymenodes* MULSANT by two vage characters: 1) anterior border of labrum only slightly sinuous, instead of being profoundly excised and 2) elytra of male not covering the pygidium. Both characters have no justifiable bearing on the subgeneric phylogeny of *Ochthebius*. The labral excision displays a variety of clinal possibilities within the genus and the visibility of the pygidium depends solely on the individual state of extension of the abdominal segments, being genetically independent.

Subsequent authors (e.g. Ganglbauer, 1904 and Orchymont, 1942) accepted REY's new subgenus, redefining it by two additional characters: 1) elytral puncturation largely irregular and 2) body covered with long whitish hair . These characters are also not appropriate to solve phylogenetic questions on a subgeneric level. Irregular elytral punctu-

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ration, though being undoubtedly apomorphic in this genus, may have developed independently in several cases due to the genetic inconstancy of this character. For example, *Ochthebius pilosus* WALTL from Europe and northwestern Africa has the elytral punctures irregularly arranged, while in specimens from Egypt these punctures are quite properly disposed in regular striae. Other species (e.g. *O.punctatus* STEPHENS and *O.nobilis* VILLA) display a similar phenomenon, though less pronounced and obviously independent from geography. Two species from Nepal (probably still undescribed) closely resemble species like *O.nobilis* (and other *"Bothochius"*) in their general appearance, but have completely regular elytral striae. The conspicuous white body hairs are equally unfit to determine the phylogeny at the subgeneric level. Certain species (e.g. *cuprescens* GUILLEBEAU or *bifoveolatus* WALTL) possess these hairs, although they do not seem to be closely related to *O.nobilis* (due to aedeagal differences).

Other characters will have to be examined to decide whether *O.nobilis* and its allies do represent a valid subgenus or just a species group or a species complex. As long as this question is not solved, I regard these species as simple members of the subgenus *Ochthebius* s.str. (following PERKINS, 1980, in not accepting the subgenus *Hymenodes*).

In this survey I have included all species characterized by a combination of 3 characters: 1) labrum only slightly excised (exception: *O. mongolicus* JANSSENS), 2) elytral punctures usually not arranged in regular striae and 3) body surface covered with long whitish hairs. Altogether 19 Palearctic species are included:

1. *O.bifoveolatus* WALTL
   = *niger* KUWERT
   = *nigrinus* KNISCH
   = *volxemi* SHARP
2. *O.caucasicus* KUWERT
3. *O.flexus* PU
4. *O.grandipennis* FAIRMAIRE
5. *O.imbensimbi* sp.n.
6. *O.klapperichi* sp.n.
7. *O.lanuginosus* REICHE & SAULCY
8. *O.lobatus* PU
9. *O.mongolicus* JANSSENS
10. *O.nobilis* VILLA
    = *fluviatilis* GUILLEBEAU
11. *O.orientalis* JANSSENS
12. *O.pilosus* WALTL
    = *sericeus* MULSANT syn.nov.
13. *O.punctatus* STEPHENS
    = *hybernicus* CURTIS
    = *villosulus* KUWERT
14. *O.quadrifoveolatus* STEPHENS
    = *detritus* REY
15. *ragusae* KUWERT
16. *O.sulpuris* sp.n.
17. *O.turcicus* sp.n.
18. *O.turkestanus* KUWERT
19. *O.verrucosus* PU

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I was able to examine the types of most of these taxa (except: *lanuginosus, nobilis, punctatus, quadrifoveolatus, hybernicus* and the 3 spp. described by PU).
A number of species described by CHAMPION in the 1920's and placed in "*Bothochius*" by the same author is not included in this survey, because they possess regular elytral striae.

Inferring from morphology and ecolcgy, we can separate 2 species complexes. The first complex comprises species with apical half of pronotum truncate (see fig.1a), inhabiting mainly saline stagnant waters: *grandipennis, lanuginosus, pilosus, punctatus, turkestanus* (*punctatus*-complex). The species of the second complex, with sides of pronotum rounded (see fig.1b) and parameres more reduced, live in flowing waters: *caucasicus, imbensimbi, klapperichi, nobilis, quadrifoveolatus, ragusae, sulpuris, turcicus* (*nobilis*-complex). The remaining 4 species (*bifoveolatus, flexus, mongolicus, orientalis*) probably cannot be assigned to either of these complexes.

Aedeagus

As long as the homologies of the Hydraenid aedeagi are not yet fully understood, I follow Perkins (1980) in using a more descriptive terminology. Thus I avoid terms like "basal piece" and "median lobe", using "main piece" instead, which is phylogenetically neutral.

The main piece is usually strong, ventrally curved and straight, when observed in a ventral aspect (except *bifoveolatus*, which is also curved laterally); shape quite constant, hardly any populational or geographical variations observed. In closely related species the main piece is sometimes identical (e.g. *caucasicus* and *ragusae*). Basis of main piece asymmetrical. Short subapical bristles always present.

Distal lobe (= "terminal mobil piece" of PERKINS and "lobe articulé préterminal" of ORCHYMONT) is composed of stem, head, lateral membrance (seen only in ventral view), several groups of micropores and a ductus ejaculatorius. The head consists of a more strongly sclerotized basal part and an apical hyaline area. The border between the two areas is usually not sharply defined. The ductus ejaculatorius opens in the center of the hyaline area. The shape of the distal lobe and the pattern of sclerotization is diagnostic, but both can vary geographically (e.g. *ragusae*) or even intrapopulational (*sulpuris*), which sometimes makes determination of single specimens difficult.

Parameres next to the main piece; more or less symmetrical; left one usually slightly longer; apex not or only slightly and evenly widened. Only in *bifoveolatus* quite extensively and unsymmetrically widened. Apical setae usually short and inconspicuous, only in *bifoveolatus* longer. Micropores present near the base.

Aedeagal illustrations

The main problem in illustrating the aedeagus of *Ochthebius* undoubtedly derives from its asymmetrical configuration, which makes application of objective methods difficult, but especially necessary. The supposedly simple organ of *Ochthebius* has mislead various authors to

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neglect its intricate organization. But as a matter of fact, the simpler the aedeagus seems, the more attention should be paid to it.

The shape of the distal lobe (and to a lesser extent also of the main piece) depends largely on the orientation in which it is observed. Even the slightest rotation can alter its whole appearance. The distal lobe, which is mobile to some extent, has a special tendency towards figural alterations. Thus illustrating the lateral view of the main piece does not automatically imply that the distal lobe is depicted in an equally objectifiable lateral position (see fig. 4c).

The distal piece can be cylindrical or more or less flattened. In the second case, the distal piece should be drawn separately, showing it in an exact frontal view (with maximum outlines), as demonstrated in *O. flexus* (fig.14c) and *ragusae* (fig.20).

I have tried to figure the whole aedeagus in an exact lateral position. In most cases the ventral aspect of the apex is also illustrated. All observations should be made on aedeagi floating in a viscous and transparent liquid (e.g. lactic acid), allowing the rotation of the organ into different positions. All air bubbles, which are usually caught inside the organ must (!) be removed (e.g. by heating). Slide mounts are improper. They have led to the publication of doubtful aedeagus-illustrations by some recent authors.

It should always be kept in mind, that in some cases even the most accurate drawing cannot replace examination of reference material. To characterize a species, as many different populations as possible should be examined to define the variability and - equally important - constancy of the aedeagal structures.

Sexual dimorphism

Sexual differences are more or less confined to the last abdominal segments. Last sternite of ♂ modified, last tergite much narrower.

In a few cases I have observed that ♂♂ have the front margin of the labrum slightly upturned and that the microsculpture of the ♀♀ elytra is more pronounced (e.g. in some *quadrifoveolatus* from Morocco). But these characters are not reliable. The single ♀ of *Ochthebius turcicus* has the explanate margin of the elytra distinctly wider than the two males.

Determination of females

Females of some closely related species can be distinguished by their last sternites. The differences (shape, size) are, however, very vague and only applicable if well-determined reference material is available. In some cases I was unable to determine single females.

A tiny spermatheca is present in every species. I have not yet tested its diagnostic value.

Acknowledgement and abbreviations

The material used for this study was borrowed from the following institutions and private collections (abbreviations are used to refer to collections in the text):

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DEI Deutsches Entomologisches Institut, Eberswalde (L.Zerche)
ETHZ Eidgenössische Technische Hochschule, Zürich (W.Sauter)
HUB Museum der A.Humboldt Universität, Berlin (F.Hieke)
IESJ Inland Water Ecological Service, Jerusalem (R.Ortal)
ISNB Institut National des Sciences Naturelles, Bruxelles (L.Baert)
MGL Musée Guimet d'Histoire Naturelle, Lyon (J.Clary)
MHNG Museum d'Histoire Naturelle, Genève (I.Löbl)
MHNP Museum d'Histoire Naturelle, Paris (R.Cambefort)
MMB Musée Municipal de Brou, Bourg-en-Bresse (F.Poiret)
MNG Museum der Natur, Gotha (R.Bellstedt)
MTD Museum für Tierkunde, Dresden (R.Krause)
NMB Naturhistorisches Museum, Basel (M.Brancucci)
NMP Národni Museum v. Praze (J.Jelinek)
NMW Naturhistorisches Musem Wien
OLL Oberösterreichisches Landesmuseum, Linz (F.Gusenleitner)
TMB Termeszettudomanyi Muzeum, Budapest (O.Merkl)
TLFI Tiroler Landesmuseum Ferdinandeum, Innsbruck (G.Tarmann, M.Kahlen)
ZMH Universitets Zoologiska Museum, Helsingfors (H.Silfverberg)

CBG Coll.Bellstedt, Gotha
CFL Coll.Ferro, Lancenigo
CKL Coll.Kofler, Lienz
CPL Coll.Pretner, Ljubljana
CWW Coll.Wewalka, Wien

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Ochthebius bifoveolatus WALTL

Ochthebius bifoveolatus WALTL 1835: 66. - ORCHYMONT, 1935; 1942. - IENISTEA, 1978. - J. BALFOUR-BROWNE, 1978
Ochthebius volxemi SHARP 1877: 115. - ORCHYMONT, 1942
Ochthebius niger KUWERT 1887: 377 (= junior homonym of *niger* DALLE TORRE)
Ochthebius nigrinus KNISCH 1924: 19 (replacement name for *niger*) - ORCHYMONT, 1942.

Type-locality: Andalucia.
Type-material: One male in the NMW (lectotype by present designation): "Coll.Waltl/Hispania Ochthebius bifoveolatus WLTL.". I have no doubt about the authenticity of this specimen.

One male in the ISNB (lectotype of *O.volxemi* by present des.): "Ochthebius Volxemii Ind.Typ. D.S.Portimao von Volxem/Portimao/Coll.Camilie van Volxem/M.R.Belg./737/10269/Tape". According to ORCHYMONT (1942) this specimen is a syntype of *O.volxemi*. Undoubtedly it belongs to *O.bifoveolatus*.

A second male from the ISNB (lectotype of *O.nigrinus* by present des.): "Portimao/Coll.Camille van Volxem/737/M.R.Belg./10629/Type/Odontochthebius bifoveolatus - Waltl var.nigra Paulinoi Kuwert det." also belongs to *Ochthebius bifoveolatus*.

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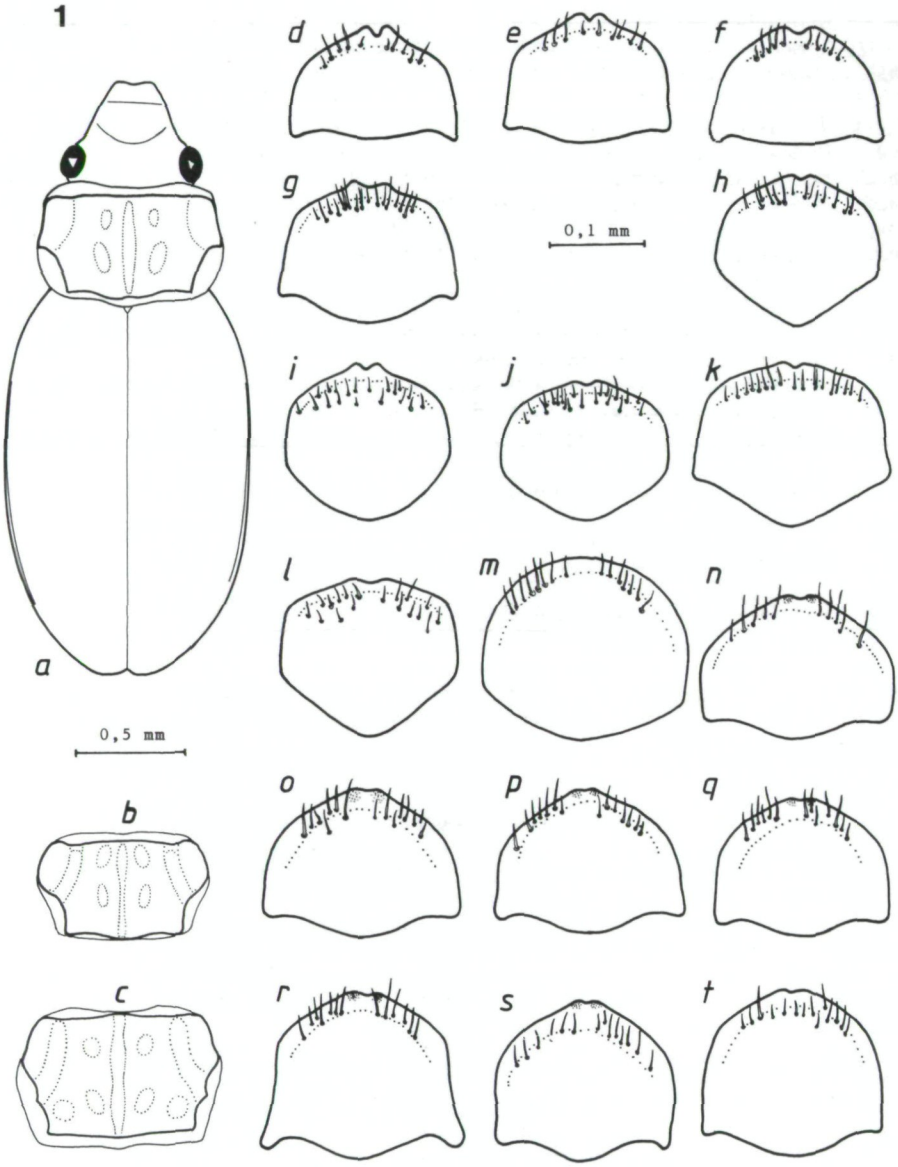

Fig. 1: Body outlines of *Ochthebius turkestanus* (a); pronotum of *O.nobilis* (b) and *O.bifoveolatus* (c); last sternum of females of *O.grandipennis* from Annabah, Algeria (d), Bizerte, Tunisia (e) and Batna, Algeria (f); last sternite of female (*O.grandipennis* or *punctatus*) from Cadiz, Spain (g); last sternite of female of *O.punctatus* from the Normandy (h), Sicily (i), Tunisia (j) and Switzerland (k); last sternite of female of *O.pilosus* from Algeciras, Spain (l); Last sternite of female of *O.turcicus* (m); last sternite of female *O.ragusae* from Turkey (n), Afghanistan (o), Turkey (p.) and Israel (q); last sternite of female of *O.caucasicus* from Kazakhstan (r,s) and Turkey (t).

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Morphology: This species is easily recognized by the wide pronotum (fig.1c) and by the conspicuous pronotal tooth situated at the basal third of the side margin, upon which KUWERT (1887a) created the new subgenus *Odontochthebius*.

The main piece of the aedeagus is bisinuous (in ventral aspect), Apex of parameres asymmetrical, with long hair.

Distribution (fig.24): Portugal, Spain, Morocco, Fuerteventura (first record).
Ecology: Unknown.

Ochthebius caucasicus KUWERT

Ochthebius caucasicus KUWERT 1887a: 389(377). - KNISCH, 1924. - ORCHYMONT, 1942; 1943. - JANSSENS, 1959b; 1960; 1962; 1967; 1971; 1981. - Ienistea, 1978

Type-locality: Caucasus
Type-material: Two specimens in the MHNP (Kuwert collection): "Kaukas. Schneider/Ex. Musaeo A.Kuwert 1894". Herewith I designate one male of these two specimens as lectotype of *O.caucasicus*.

Aedeagus (figs.2,3): Main piece like in *ragusae;* distal lobe cylindrical, without the ventral convexity of *ragusae* but usually with a gentle dorso-apical notch, which is absent in specimens from central Asia and Nepal.

Last sternite of ♀: Longer than in *ragusae* and *quadrifoveolatus;* apical notch less pronounced than in *punctatus, lanuginosus* and *grandipennis,* usually obsolete, with a pair of faintly sclerotized patches.

Diagnosis: This species is very similar to *ragusae* and *quadrifoveolatus;* females can be distinguished from both species by the last sternite. In addition I found that the microreticulation of the pronotum is usually much better developed in *caucasicus* than in *ragusae* (especially in material from Turkey). But I have also seen some strongly reticulated *ragusae* ♀♀ from Israel and central Asia.

Distribution (fig.23): Irano-Turanian species. Turkey to Nepal and Mongolia.
Ecology: Inhabits all kinds of running water, even thermal springs.

Ochthebius flexus PU

Ochthebius flexus PU 1958: 255

Type-locality: Lou-fong-tsouen, Yunnan Province.
Type-material: Holotype and 8 paratypes should be in the Sun Yatsen University, Canton. I was not able to examine typical material.

One male, which I collected in the Sun Kosi River near Lamosangu in Nepal (5.2.1980) agrees fairly well with the description of *O.flexus*: 1.8 mm long. Black, with a slight metallic sheen; legs, mouthparts and antennae brown. Body covered with long whitish hairs.Labrum truncate, front margin not excised; interocular foveae very large. Sides of anterior half of pronotum more or less parallel-sided; disc with median sulcus and two pairs of admedian foveae; disc smooth and shi-

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Fig. 2: Lateral view of aedeagus of *O. caucasicus* from Kazakhstan (a), Tadzhikistan (b), Caucasus, HT (c) and Mongolia (d).

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ning; ears strongly microsculptured. Puncturation of elytra irrgular and not very dense; punctures shallowly impressed.

Aedeagus (fig.14): Main piece stout and strongly curved; distal lobe large and flattened.

Distribution (fig.22): Yunnan, ? Nepal.

Ochthebius grandipennis FAIRMAIRE

Ochthebius grandipennis FAIRMAIRE 1879: 181. - KNISCH, 1924
Ochthebius sericeus sericeus, sensu auct. (not MULSANT) ORCHYMONT, 1942

Type-locality: Batnah in eastern Algeria.
Type-material: One female in the MHNP (lectotype by present des.): "grandipennis n.sp. Batna/ Type/ Museum Paris Collection Léon Fairmaire 1906".

When I first examined the single type of *grandipennis* I was pondering whether it would belong to *punctatus* or to *sericeus* auct. (not MULSANT). After intensive studies of the last sternite I can draw the following conclusions: The last sternite of the two species displays a subtle (statistical) difference, although its shape is quite variable. The apical notch provides no reliable distinguishing feature, it can be beak-like prominent or almost obsolete. The only difference lies in the shape of the proximal margin. It is strongly U- or V-shaped in punctatus and usually only gently rounded in *sericeus* sensu auctores. This makes the whole sternite to appear slightly longer in *punctatus* (fig.1h-k). In this character the female from Batna agrees completely with females from Annabah, Biskra or Cadiz (figs.1d-f). Thus I do not hesitate applying the name *grandipennis* FAIRMAIRE to the species hitherto known as *Ochthebius sericeus*.

In addition, I have seen only one specimen of *punctatus* from Algeria, but numerous specimens of *grandipennis* from at least 5 different Algerian localities.

Distribution (fig.24): Western Mediterranean. France, Spain, Algeria.

Ecology: Probalby like in *punctatus*. The two species were found associated in southern Spain (Cadiz).

Ochthebius imbensimbi sp.n.

Holotype ♂: Nepal 5.2.1980 Lamosangu N5 leg.M.JÄCH/ nördl.Kathmandu; deposited in the NMW.
Paratypes: 5 exs. from the same locality; 3 exs.: Nepal 17.2.1981 Hetauda Umg. leg.M.Jäch N18; 1 ex.: NO.Afghan.1953 J.Klapperich/ Nuristan, 1200 m Bashgul, 20.IV./Paratypus Ochthebius orientalis Janssens/ Paralectotypus Ochth.orientalis Janssens des M.Jäch 1987; NMW and TMB.

2.1-2.3 mm long. Black, with a feeble cupreous sheen. Legs, antennae and mouthparts brown. Body coverd with whitish hairs. Labrum only slightly excised; puncturation of head dense. Pronotum rather convex (from side to side); surface distinctly microreticulated; disc with a

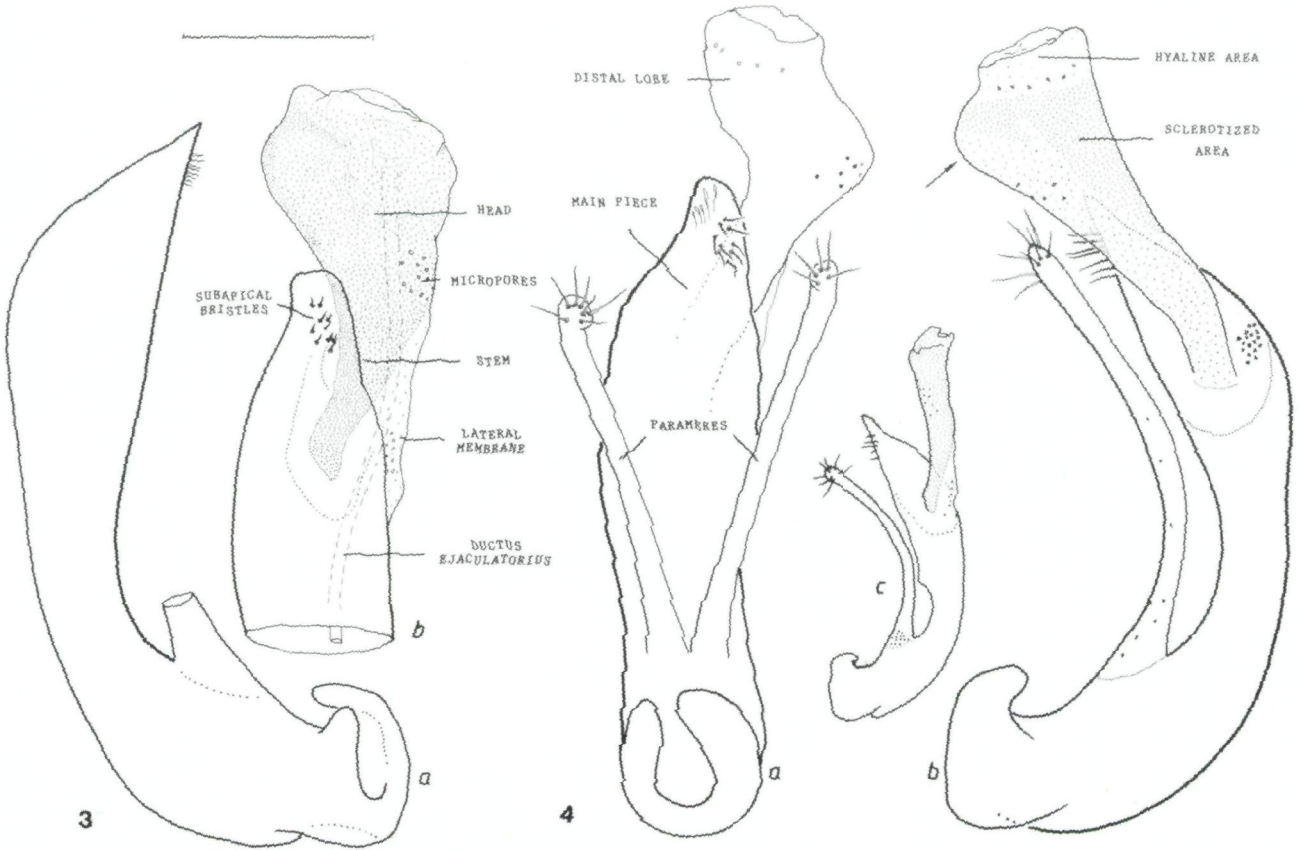

Fig. 3: Aedeagus of *Ochthebius caucasicus*; lateral view of main piece (a) and ventral aspect of apex (b). Scale: 0,1 mm.
Fig. 4: Aedeagus of *O. ragusae*; a: ventral view; b: lateral view; c: lateral view of a specimen (not to scale) from Sicily with slightly distorted distal lobe, which is thus seen in a ventral position.

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straight median groove and two pairs of admedian foveae; front margin with a small postocular tooth; sides rounded in anterior half. Elytra microreticulated; puncturation irregular and dense; punctures small. Sexes alike.

Aedeagus (fig. 6): Distal lobe with characteristic triangular shape.

Ochthebius imbensimbi can easily be distinguished from other species by the combination of the following characters: sides of pronotum rounded; upper surface microreticulated; sides of pronotum deflexed.

Distribution (fig. 22): Afghanistan to Nepal.

Etymology: Named for my friend Rainer Imbensimb, promising Austrian artist.

Ochthebius klapperichi sp.n.

Holotype ♂: NO.Afghan. 1953 J.Klapperich/ Nuristan, 1300 m Bashgultal, 24.V./ Paratype/ E.Janssens det. 1968 Ochthebius (Bothochius) orientalis Janssens/ Paralectotypus Ochthebius orientalis des M.Jäch 1987; ISNB.
Paratype ♂: Chaubattia 25.5. 1900 - 2100 m/ India U.P. 1981 M.Brancucci; NMB.

2.1 mm long. Very similar to *O.ragusae* (and other related species). Black; labrum nearly entire; sides of anterior half of pronotum rounded; body surface smooth and shining, covered with whitish hairs;elytral puncturation irregular.

Aedeagus (fig.5).

To be distinguished from *ragusae* by the pronotum, being more strongly convex from side to side (ears deflexed).

Distribution (fig.22): Afghanistan, Uttar Pradesh.

Etymology: Named for the collector of the holotype, J.Klapperich.

Ochthebius lanuginosus REICHE & SAULCY

Ochthebius lanuginosus REICHE & SAULCY 1856: 353. - KNISCH, 1924. - ORCHYMONT, 1940a, 1942. - JANSSENS, 1959a; 1960. - GUEORGUIEV, 1970. - IENISTEA, 1978.

Type-locality: Athens, Greece.
Type-material: I was unable to find any type material in the MHNP (coll.Marseul, coll.Fairmaire, coll.Bedel) and MNG. Despite this fact I have no doubt about the identity of this species.

Diagnosis: *Ochthebius lanuginosus* is closely related to *Ochthebius grandipennis*, clearly differing from it by the aedeagus: distal lobe with dorso-apical convexity in lanuginosus, straight in grandipennis (see fig.18,19).

Distribution (fig.24): Eastern Mediterranean. Vicariad of *O.grandipennis*. Italy,Albania, Greece, Turkey, Cyprus, Israel.

Ecology: Seems to prefer saline stagnant waters.

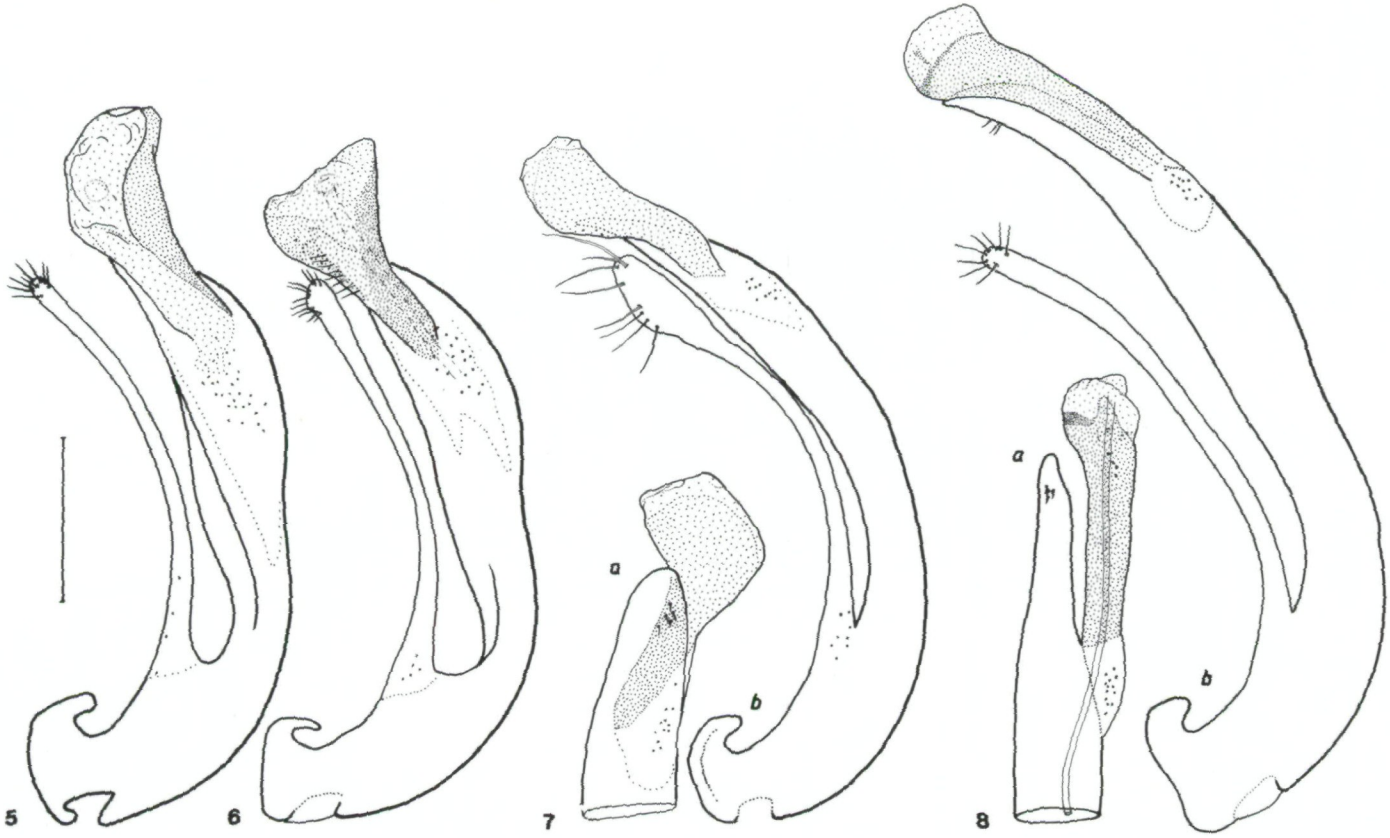

Fig. 5-8: Aedeagi of *O. klapperichi* (5), *O. imbensimbi* (6), *O. bifoveolatus* (7a: ventral aspect of apex, 7b: lateral view) and *O. mongolicus* (8a: ventral view of apex; 8b: lateral view).

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Ochthebius lobatus PU

Ochthebius lobatus PU 1958: 256.

Type-locality: Chungking, Sichuan Province.
Type-material: Holotype and 27 paratypes should be deposited in the Sun Yatsen University, Canton. Despite several efforts, I was unable to see any type-material.

Distribution: Sichuan.

Ochthebius mongolicus JANSSENS

Ochthebius mongolicus JANSSENS 1967: 58; 1971 . - BELLSTEDT, 1982

Type-locality: Bajanchongor aimak, Mongolia.
Type-material: Three syntypes were designated in the original description by the author. Of these, 1 ♂ is deposited in the ISNB and belongs to a different species: *O.caucasicus*. The two others (also males) are housed in the TMB; one of these I herewith designate as lectotype of *Ochthebius mongolicus* JANSSENS: "Mongolia, Bajanchongor aimak, Tujn gol, 1250 m bei somon Bogd Exp. Dr.Z.Kaszab, 1964/ Nr.195 25.VI.1964/ Prép.Micr. No 81654/ Type/ E. Janssens det., 1966 Ochthebius (Bothochius) mongolicus n.sp." I removed the aedeagus from the microscopic slide and glued it onto the same lable with the beetle. The aedeagus of the paralectotype seems to be lost. I could not find the microscopic slide (No 81655) in the TMB. The TMB contains also two females of *mongolicus* from the type-locality, determined by Janssens as *Ochthebius caucasicus*.

Aedeagus: see fig.8

The strongly emarginate labrum and the deviating shape of the pronotum separate *Ochthebius mongolicus* from all other species treated herein.

Distribution (fig.22): Southern Mongolia.

Ecology: Lives in salt-marshes, (BELLSTEDT, 1982).

Ochthebius nobilis VILLA

Ochthebius nobilis VILLA 1835: 48. - KNISCH, 1924. - ORCHYMONT, 1928; 1942. - HORION, 1949. - CHIESA, 1959. - FRANZ, 1970. - GUEORGUIEV, 1971. - LOHSE, 1971. - IENISTEA, 1978; 1982. - PIRISINU, 1981. - BALDARI et al., 1983.
Ochthebius fluviatilis GUILLEBEAU 1896: 240. - KNISCH, 1924.

Type-locality: "Italy"
Type-material: The types, which were deposited in Milano, have probably been destroyed (C.Leonardi, in litt.). The DEI contains one old specimen: "nobilis Vill./ Alp.Lar.Vill./ ex.Coll.Heyden", which might be syntypical. Another specimen (♂) from the MHNG: "nobilis Italia Villa/ Coll.Jurine" might also represent a syntype. The NMW contains one female (lectotype of *Ochthebius fluviatilis* by present des.): "Viviers/ Guillebeau Frankreich/ Ochthebius fluviatilis Guilb.". Three paralectotypes in the MMB:"Viviers/fluviatilis Guilleb./Coll.Guilleb."; "Viviers"; "Mt.Cenis".

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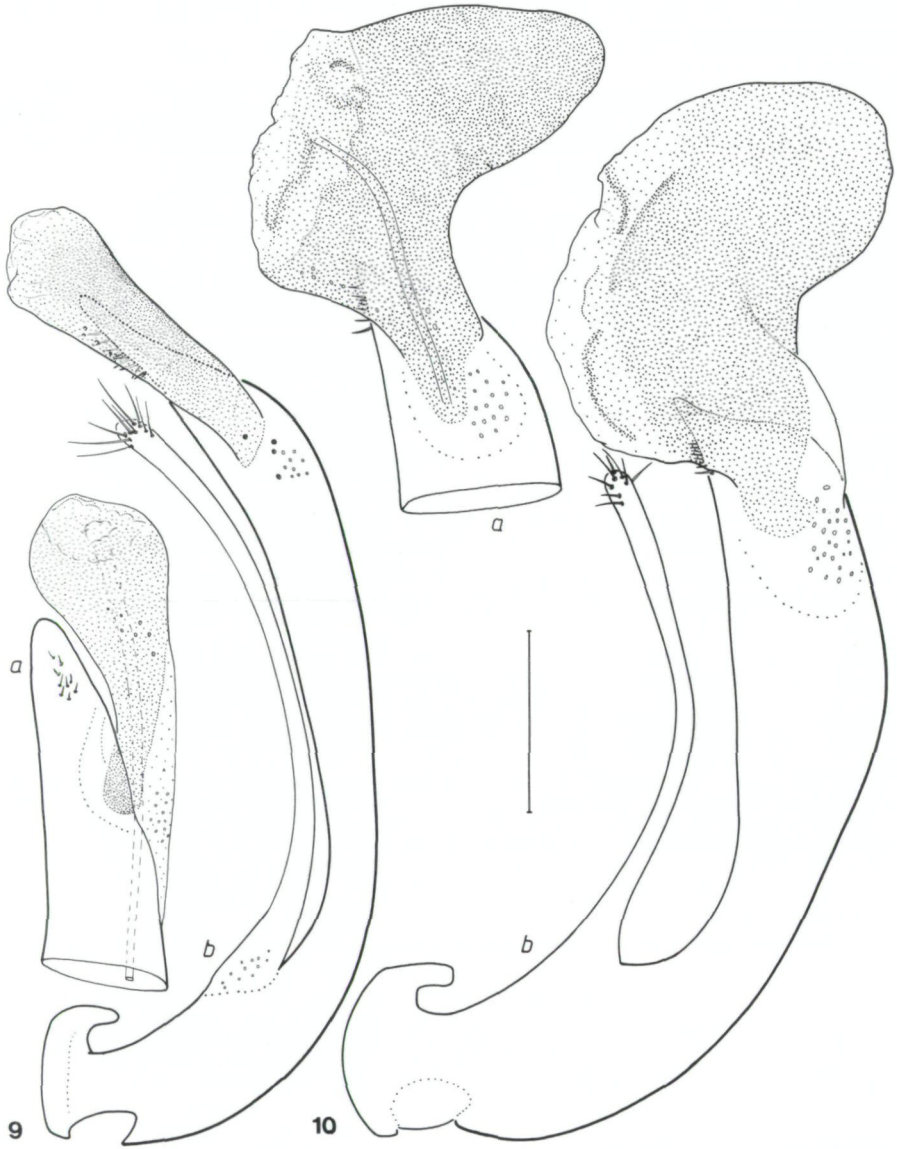

Fig. 9: Aedeagus of *O.turcicus* (a: ventral view of apex; b: lateral view).

Fig.10: Aedeagus of *O.sulpuris* (a: lateral view of apex; b: lateral view of a different specimen from the same population).

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Aedeagus (fig.11): with typical sinuous distal lobe, which cannot be mistaken for any other species.

Females of *ragusae* are somewhat difficult to distinguish from females of *nobilis*. I dissected 30 *nobilis* ♀♀ from different localities and 10 *ragusae* ♀♀ from 5 different Italian and French localities in order to find significant differences in the last sternite. A small but usually definite notch is present in *nobilis* (only rarely obsolete, e.g. in some specimens from Upper Austria, Wels), but absent in most of the examined specimens of *ragusae*. The elytral puncturation can be quite regular in some specimens of *nobilis*, whereas it is always irregular in *ragusae*. The most reliable distinguishing feature is provided by the pronotum. In *nobilis* the pronotum is characteristically convex (from side to side), the lateral groove considerably deeper. The pronotum looks narrower and more cordiform than in *ragusae*. Direct comparison, with well-determined reference material is necessary to recognize these differences.

Distribution (fig.21): Mainly found in the Alps. Some isolated Mediterranean populations.

Ecology. Found along streams and rivers.

Ochthebius orientalis JANSSENS

Ochthebius orientalis JANSSENS 1962: 5

Type-locality: Bashgul Valley, northeastern Afghanistan.
Type-material: Of the 40 syntypes mentioned in the original description, only 15 were retrieved. Of these 15 specimens, 8 belong to other species (see under *imbensimbi* and *klapperichi*).
Lectotype ♀ (by present des.): "NO Afghan. 1953 J.Klapperich/ Nuristan, 1300 m Bashgultal, 24.V./ Paratype"; in TMB.
Five paralectotypes in the TMB, 7 paralectotypes in the ISNB and 2 paralectotypes in the Frey museum, Tutzing, represent 3 different species.

Aedeagus (fig.13).

Distribution (fig. 22): Afghanistan to Nepal.

Ecology: Running water.

Ochthebius pilosus WALTL

Ochthebius pilosus WALTL 1835: 65. KNISCH, 1924. - ORCHYMONT; 1942. - CHIESA, 1959. - J.BALFOUR-BROWNE, 1978. - IENISTEA, 1978. - AUDISIO & ANGELICI, 1984.
Ochthebius sericeus MULSANT 1844: 374 (= syn.nov.)

Type-locality: Andalusia
Type-material: Lectotype ♂ (by present des.): "Coll.WALTL/ Hispania Ochthebius pilosus Waltl"; in MNW.

In the MGL (coll.Dejean) I found two pins in front of a lable (fixed at the ground of an insect box) saying: "Ochthebius sericeus mihi h.in Aegypt D.Klug". The first pin carries only a single elytron, the rest of the specimen probably being lost. I could not find it in the box.

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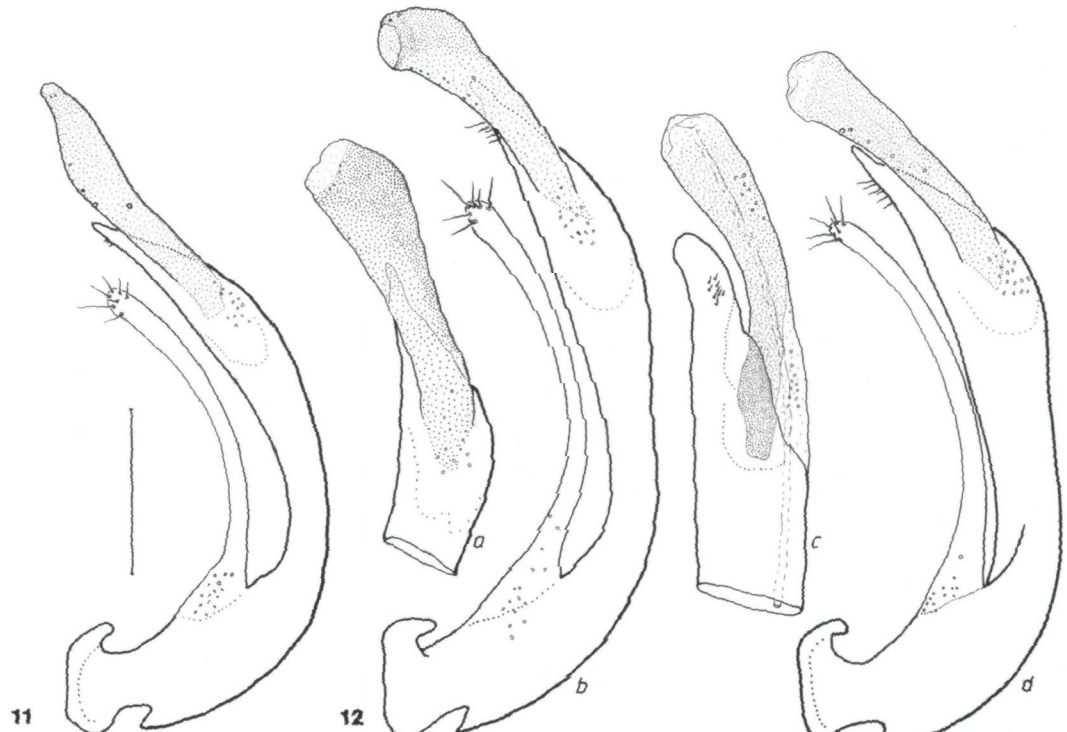

Fig. 11: Lateral view of aedeagus of *O. nobilis* (Austria).
Fig. 12: Aedeagus of *O. quadrifoveolatus*. a: lateral view of apex of a specimen from Kilis, Turkey; b: lateral view of a specimen from Tazenakht, Morocco; c: ventral view of apex of specimen from Saudi Arabia; d: lateral view of specimen from Saudi Arabia, with slightly distorted distal lobe (the typical sinuosity cannot be seen in this position).

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The second pin carries a male of *Ochthebius pilosus* and one label: "D. Schüppel". I designate this specimen as LT of *O.sericeus*. Four specimens in the AHB: "Nr.49311/ Aegypt.Ehrbg./ sericeus Dj.Muls.", also belonging to *pilosus*, might be additional syntypes.

Morphology: Specimens from Europe and northwestern Africa with very coarse elytral punctures, usually not arranged in regular striae. Specimens from Egypt with almost regular elytral striation and with elytral punctures being rather small, like in *punctatus* and *grandipennis*. Due to the extraordinary variability of the external features of *pilosus*, I was not always able to distinguish ♀♀ from *punctatus*. Only in typical cases the elytral punctures of *pilosus* are much larger than in *punctatus*. Last sternites of ♀♀ more or less identical.

Aedeagus (fig.17): characterized by its straight main piece; parameres rather strongly enlarged apically.

Distribution (fig.24): Western Mediterranean. France, Spain, Algeria, Egypt, Corsica, Sardinia. Also recorded from Sicily and the Toscana (Audisio, et al., 1984). I have seen one ♂ with doubtful locality label: "Anglia".

Ecology: Unknown.

Ochthebius punctatus STEPHENS

Ochthebius punctatus STEPHENS 1829: 117. - KNISCH, 1924. ORCHYMONT, 1942. HORION, 1949. - F.BALFOUR-BROWNE, 1958; 1962. - CHIESA, 1959. - ANGUS, 1965. - BRAKMAN, 1966. - IENISTEA, 1978; 1982.- LOHSE, 1971. - J.BALFOUR-BROWNE, 1978. - FERRO, 1979. - PIRISINU, 1981.
Ochthebius hybernicus CURTIS 1829: 250. - KNISCH, 1924.
Ochthebius villosulus KUWERT 1887a: 394. - KNISCH, 1924. - ORCHYMONT; 1942.

Type-locality: Bristol or Glamorganshire
Type-material: The 2 syntypes of *O.punctatus* are probably deposited in the BMNH. I have not seen the types of *Ochthebius hybernicus*, which are probably housed in the National Museum, Melbourne. Inferring from the original description and the accompanying illustration, I have no doubt about the synonymy established by KNISCH (1924). The TMB contains 2 syntypes (♂♂) of *Ochthebius villosulus*: 1) "Tunisi dint. 1881 G.e L.Doris/ Coll.Reitter/ pilosus Rttr.", 2) "Tunis 1881 Doria/ Coll. Reitter". I herewith designate the first specimen as lectotype.

Distribution (fig.21): Atlanto-Mediterranean element. Great Britain, Ireland, France, Spain, Algeria, Tunisia, Italy. Recorded from the Netherlands (Zuid-Holland) by Brakman (19666). ? Switzerland, ?FRG, ? Austria.

Ecology: Inhabits mainly brackish water (ANGUS, 1965).

Ochthebius quadrifoveolatus WOLLASTON

Ochthebius quadrifoveolatus WOLLASTON 1854: 91. - KNISCH, 1924. - ORCHYMONT, 1929; 1935; 1938; 1940b; 1942. - J.BALFOUR-BROWNE, 1978.
Ochthebius detritus REY 1884: 269. - KNISCH, 1924. - ORCHYMONT, 1929.

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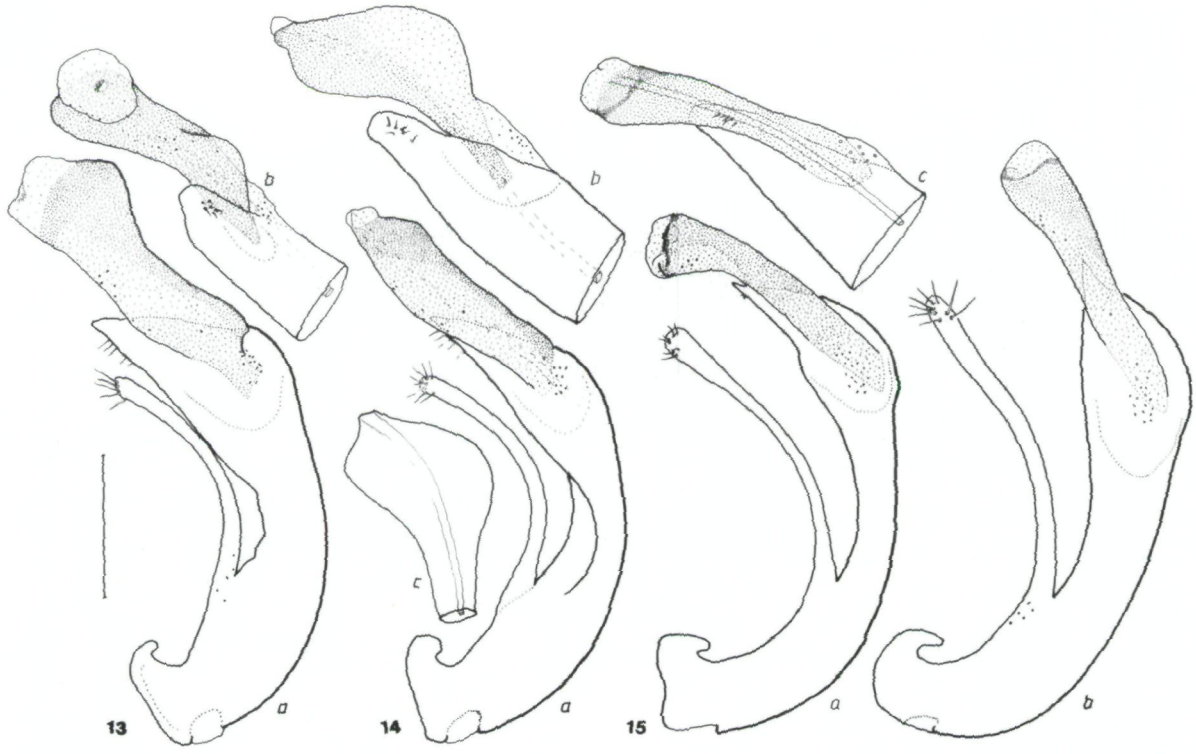

Fig. 13: Aedeagus of *O. orientalis*; a: lateral view; b: ventral view of apex.
Fig. 14: Aedeagus of ? *O. flexus*; a: lateral view; b: ventral view of apex; c: maximum outlines of distal lobe.
Fig. 15: Aedeagus of *O. turkestanus* (HT), a: lateral view; b: same, slightly different orientation; c: ventral view of apex.

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Type-locality: Madeira.
Type-material: I did not see the types from the BMNH. The NHMP contains 1 ♂: "Type Wollaston/ Museum Paris 1922 Coll.Bedel", which might be a syntype. Lectotype of *Ochthebius detritus* (by present des.): "Biskra/ Museum Paris O.detritus Rey Coll. J.Burgeois 191", deposited in the MHNP (coll.Puton). I could not trace out the remaining syntypes (coll.Pandellé).

Aedeagus (fig.12) is characterized by the long and sinuous apex of the main piece and by the distal lobe, which is characteristically curved when opbserved from a certain angle.

Females are sometimes difficult to distinguish from females of *ragusae*. Last sternite like in *ragusae*, sometimes slightly longer. Microreticulation of pronotum and elytra more developed in *quadrifoveolatus*, puncturation of elytra more dense, elytra slightly longer. Specimens from Saudi Arabia (2.2 mm - 2.5 mm long) deviate in having a more coarse elytral puncturaion, which is usually arranged in more regular rows. The surface of elytra and pronotum is smooth, almost without microreticulation. Last sternite of female slightly longer (almost like in *caucasicus*). Despite these external differences, the aedeagus is more or less identical, except that the distal lobe is slightly distorted.

Distribution (fig.23): Spain, Morocco, Algeria, Tunisia, Egypt, Saudi Arabia, Turkey, ? Great Britain. Cape Verde Islands (ORCHYMONT, 1940b).

Ecology: Inhabits running water.

Ochthebius ragusae KUWERT

Ochthebius ragusae KUWERT 1887b: 44. - KNISCH, 1924. - ORCHYMONT; 1940a; 1942. - CHIESA, 1959. - ANGELINI & FERRO, 1974. - IENISTEA, 1978. - PIRISINU, 1981.

Type locality: Sicily
Type-material: Lectotype ♂ (by present des.): "Ex Musaeo Kuwert 1894/ Ragusae Kuw. Sicilia"; in MHNP. I could not trace out the two remaining syntypes.

Aedeagus (figs.4,20): Distal lobe quite variable, but easily recognized by the ventral convexity.

Some specimens of *ragusae* have the anterior half of the pronotum almost parallel-sided (like in species of the *punctatus* complex). But they are easily distinguished from *lanuginosus*, because the area behind the pronotal ears is not so abruptly constricted.

Distribution (fig.20): France, Italy Yugoslavia, Greece, Turkey, Cyprus, Egypt, Israel, Saudi Arabia, Soviet Union, Iran, Afghanistan.

Ecology: Inhabits running water.

Ochthebius sulpuris sp.n.

Holotype ♂: "TR 3.6.1987 Yüksekova leg.Jäch (55)/ Holotypus Ochthebius sulpuris sp.n. det.M.Jäch 1987"; in NMW.

Fig. 16: Aedeagus of *O. punctatus*, a: specimen from Gerona; b: ventral view of apex of same specimen; c: specimen from Cadiz.
Fig. 17: Aedeagus of *Ochthebius pilosus*, a: specimen from Egypt; b: ventral view of same specimen; c: specimen from Andalucia (HT).

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Paratypes: 49 exs. from the same locality; in NMW.

Type-locality: Mineral spring, ca. 25 km nw of Yüksekova (Hakkari Province).

2.4 - 2.6 mm long. Black, young specimens with a slight metallic or cupreous sheen; legs, antennae and mouthparts brown. Body covered with conspicuous whitish hairs.Labrum almost entire, only slightly excised. Body shape agrees fairly well with that of other Turkish species, such as *ragusae*, *caucasicus* and *quadrifoveolatus*. Pronotum shining or reticulated. Elytral puncturation usually coarser than in the above mentioned species. In a few cases the elytral punctures are arranged in almost regular series. Last abdominal sternite of ♀ like in *ragusae* and *quadrifoveolatus*. Females of these 3 species are very difficult to distinguish.

Aedeagus (fig.10)with a large distal lobe, which is quite variable, even within one population.

Etymology: The mineral spring, where the species was collected, obviously contains sulphur (lat.: sulpur, -uris).

Ochthebius turcicus sp.n.

Holotype ♂: "TR (Fethiye) Dalaman-Fethiye leg.Wewalka 25.7.1983"; in NMW.
Paratypes (♂ + ♀): "TURQUIE: Gümüshane Erzincan-Kelkit 2100 m 4.VI.1986/ Besuchet-Löbl-Burckhardt"; in MHNG.

2.3 - 2.5 mm long. Black, shining; legs, antennae and mouthparts brown. Body covered with whitish hairs.Labrum slightly excised apically. Microreticulation of pronotum distinct (holotype) or partly reduced (paratypes); sides of pronotum rounded in anterior half. Puncturation of elytra irregular (holotype) or partly arranged in regular series (paratypes). Explanate margin of elytra of the female distinctly wider than in the two males. Last tergite of ♀ with small apical excision; last sternite larger, wider and more rounded than in *caucasicus* (see fig. 1m).

Aedeagus (fig.9): main piece longer and more slender than in related Turkish species (*caucasicus*, *ragusae*, *quadrifoveolatus*); distal lobe long.

Females of *O.turcicus* can be immediately recognized by the wide explanate margin of the elytra. Males differ from the 3 above-mentioned species only by the aedeagus.

Distribution (fig.21): Turkey.

Ecology: Inhabits running water.

Ochthebius turkestanus KUWERT

Ochthebius turkestanus KUWERT 1892: 102. - KNISCH, 1924

Type-locality: Alai mts. (Kirghizia or Tadzikistan).
Type-material: Holotype ♂ (by monotype): "Alai Schröder/ Kuw.vid/ Coll. DEI Eberswalde"; in DEI.

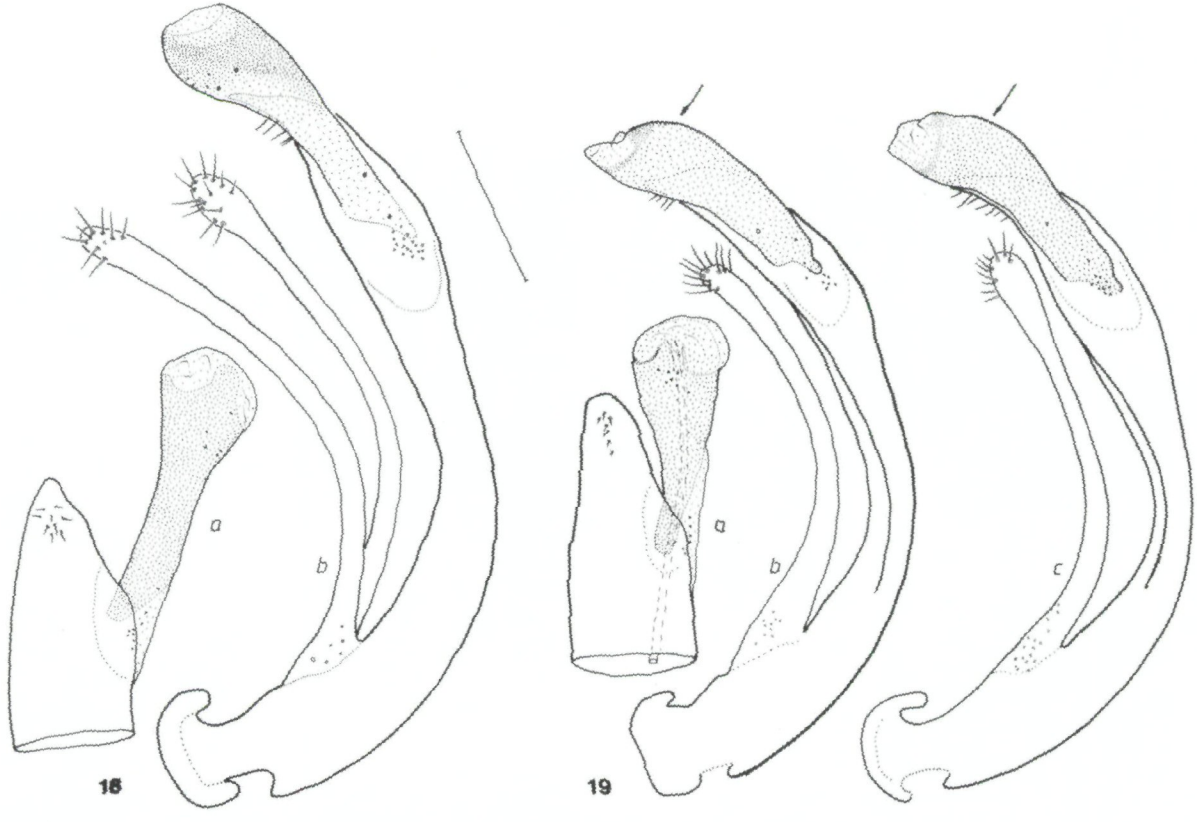

Fig. 18: Aedeagus of *Ochthebius grandipennis*, a: ventral view of specimen from Cadiz; b: same, lateral view.
Fig. 19: Aedeagus of *Ochthebius lanuginosus*, a: ventral view of specimen from Kefallinia; b: same, lateral view, c: specimen from Cyprus.

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Description of the holotype: 2.3 mm long. Elytra brown, pronotum and head dark brown, legs yellow. Surface covered with whitish hairs. Labrum almost entire, with a small median notch. Clypeus sparsely punctured, reticulation confined to sides; frontoclypeal suture evenly arcuate; frons densely punctured, with large interocular foveae and a smaller basomedial one; microreticulation not pronounced; one pair of ocelli present. Pronotum with a straight median groove and two admedian foveae; lateral fossula and basolateral impression shallow; microreticulation confined to the impressions; sides almost parallel in anterior half, then abruptly constricted, forming a sharp dented angle. Elytra with ca. 12 irregular rows of punctures between suture and shoulder; punctures rather small and very dense (like in *lanuginosus*); a strong seta emerges from each puncture; explanate margin only slightly developed.

Aedeagus: see fig.15.

In *lanuginosus*, which is very similar to *turkestanus*, the sides of the pronotum (anterior to the excision) are usually very slightly rounded and less straight.

Distribution (fig.22): Central Asia.

Ecology: Unknown.

Ochthebius verrucosus PU

The species was mentioned by PU (1958). I have neither seen the original description nor could I get any material.

Material examined

Ochthebius bifoveolatus - PORTUGAL: Lagos (ISNB); Portimao (ISNB); Faro (NMW, DEI, ISNB); Cea, leg.Simon (DIE). SPAIN: Andalucia, Chiclana, 1890, leg.Korb (ISNB); Algeciras, coll.Hauser (NMW); Cadiz (NMW); Canary Isl., Fuerteventura (NMW). MOROCCO: Rabat, 4.5.1926, leg.Lindberg (NMW, ZMH, ISNB); Mogador (Essaouria), 12.2.1961, leg.Meinander (ZMH); Salines de Zima, 31.1.1983, leg.Thery (CBG).

Ochthebius caucasicus - TURKEY: Baskale, 2600 m, 5.6.1987, leg.Jäch (NMW); Kizilcahamam, leg. Weirather (NMG, NMW). IRAN: Elburs, Lashkarak Valley, 2200 m, 5.11.1961, leg.Klapperich (CFL). SOVIET UNION: Armenia: Caucasus, Araxes Valley, leg.Leder (NMW, TMB); Vedi, 16.4.1958, leg.Lindberg (ZMH); Kazakhstan: Aulie Ata (= Dzhambul), (NMW, TMB); Tadzhikistan: Gissar, 1898, leg.Hauser (NMW). MONGOLIA: Bajanchongor aimak, 4 km s. of somon Zinst, Tujn gol, 1480 m, 26.6.1964, leg.Kaszab (TMB); Bajanchongor aimak, Tujn gol, 1250 m, 25.6.1964, leg.Kaszab (TMB, ISNB). AFGHANISTAN: Doab, 7.10.1957 (ISNB); Hindukush, Salang, Valley, Ejan, 2050 m, 11.10.1952, leg.Klapperich (TMB). TIBET: Mangsaka, 8.1906, 1♀(ISNB). NEPAL: Tatopani (at Tibetan border), hot spring, 2.3.1981, leg.Jäch (NMW). FRANCE: France, leg.Schramm (ISNB) - doubtful locality.

Ochthebius grandipennis - FRANCE: Gallia merid., Reitter/ Leder (NMW, NMP, ISNB); France, leg.Guillebeau (NMW). SPAIN: Elche, leg.Strobl (ISNB); Cadiz, Sierra del Pinar, 1000 m, 10.5.1960, leg.Besuchet (NMW, NHMG); Andalucia, coll.Leonhard (DEI). ALGERIA: Oran, La Senia (NMW,

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TMB); Teniet el Haad, leg.Desbrochers (ISNB); Bone (= Annabah). 1889, leg.Desbrochers (ISNB); Biskra, (ISNB, NMW); El Kantara, 31.3.1981, leg.Pierotti (CFL).

Ochthebius lanuginosus - ITALY: Roma, leg.Luigioni (NMW, HUB); Monte Gargano, 1907, leg.Hilf (DEI, NMW). ALBANIA: Valona (= Vlore), (NMW, ISNB, CPL). GREECE: Corfu (NMW, ISNB, ZMH); Kefallinia, leg.Paganetti (NMW); Parnassos (NMW); Attika, leg.Oertzen (NMW); Athens, Phaleron, coll.Leonhard (DEI); Marathon, 30.7.1939, leg.Lindberg (ZMH); Evboia, Aidhipsos, 16.5.1959, leg.Janssens (ISNB); Evboia, Nea-Lampsaki, 18.5.1957, leg.Janssens (ISNB); Crete, leg.Paganetti (NMW, ISNB); Lesbos, Mytilini, 24.4.1933, leg.Orchymont (ISNB); Lesbos, Aphalon, 10.5.1933, leg.Orchymont (ISNB). TURKEY: Izmir, leg.Orchymont (ISNB, NMW); Tuz Gölü, 21.5.1987, leg.Jäch (NMW); Prov.Mersin, Taurus, Bolkar daglari, leg.Bodemeyer (NMP). CYPRUS: Famagusta, leg.Ball (ISNB); Larnaka, leg.Ball (ISNB); Troodos, 20.6.1939, leg.Lindberg (ISNB, ZMH). ISRAEL: Lac.Genez. (= Lake Tiberias), leg.Sahlberg, 1 ♀ (ZMH). AUSTRIA: Wien (= Vienna), leg.Moczarski (ZMH) - doubtful locality.

Ochthebius mongolicus - MONGOLIA: Gobi, salt pond, 1.6.1976. leg. Zimmermann (CBG, NMW).

Ochthebius nobilis - FRANCE: Dep. Haute Savoie: Chamonix (NMP); Dep. Alpes Maritimes: Lantosque, leg.Sainte Claire-Deville (ISNB); Nice, Le Paillon (ISNB, CPL); Dep. Drome: Nyons, leg.Fauvel (ISNB); Dep. Ain: Viviers, leg. Guillebeau (NMW, MMB); Corsica: Vizzavona, 5.1928, leg. Maran (NMP). ITALY: Pustertal (HUB); Rovereto (NMW, DEI); Panaveggio, leg.Schuster (NMW); Tolmezzo, 4.1914, leg.Pretner (CPL); Sexten (NMW, DEI), Raibl (= Cave del Predil), 1928, leg.Springer (CPL); Calabria, Antonimina, 1905, leg.Paganetti (TMB). SWITZERLAND: Genf: Allondon,18. 9.1955 (MHNG); Vallais, Gietroz, leg.Toumayeff (MHNG); Graubünden: Münstertal, Santa Maria, 1400 m, 19.6.1953, leg.Lindberg (ZMH). FRG: Munich (HUB); Murnau, Eschenlohe, leg. Ihssen (HUB); Berchtesgaden (DEI). AUSTRIA: Vorarlberg: Feldkirch, coll.Konschegg (NMW); Frastanz, 14.4.1934, leg.Moosbrugger (NMW); Bludenz (HUB, NMW); Bregenz, leg.A. J.Müller (ISNB); Tyrol (north): Reutte, leg.Knabl (NMW); Welsberg, leg.Ganglbauer (NMW); Elmen/Lech. 20.10.1941, leg.Lechleitner (CKL); Axams, leg.Knabl (CKL); Tyrol (east): N.Mauern/Isel, 11.6.1984 and 22.7.1960, leg.Kofler (CKL); Schloßbrücke/Isel, 19.5.1965, leg.Kofler (CKL); Weiherburg, 28.7.1937 (CKL); Ainet, 3.8.1971, leg.Kofler (CKL); Carinthia: Gailtaler Alpen, coll.Leonhard (DEI); Upper Austria: Wels, Traun Au (NMW). Yugoslavia: Dalmatia (NMW, NHMG). GREECE: Peloponnesos, Hagios Vlasos, 1.5.1930, leg.Orchymont (ISNB).

Ochthebius orientalis - INDIA: Uttar Pradesh, Chaubattia, 25.5.1981, 1900 - 211 m, leg.Brancucci (NMB, NMW). NEPAL: Dahran, 12.2.1981, leg. Jäch (NMW).

Ochthebius pilosus - GREAT BRITAIN: Anglia m (DEI). FRANCE: Rhône; coll.F.Müller (DEI); Gallia mer., coll.Kaufmann (NMW); Corsica (NMW, HUB). SPAIN: Elche, leg.Strobl (ISNB); Sevilla, coll.Kraatz (DEI); Algeciras, coll.Hauser (NMW); Is.Baleares (DEI); Menorca, Playa Tirant Nou, leg.Franz (NMW). ITALY: Sardegna: Flumentoreio, 5.1986, leg.Solari (HUB); San Antioco (DEI). ALGERIA: Oran, La Senia (TMB); Miliana (NMW); Constantine (NMW). EGYPT: Dekhelah (ISNB, NMW).

Ochthebius punctatus - GREAT BRITAIN: Clacton (NMB). IRELAND: coll. Kraatz (DEI). FRANCE: Dep.Manche: Cap de la Hague, 23.6.1913, leg.

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Orchymont (ISNB); Moidrey, leg.Fauvel (ISNB); Dep.Finistère: Roscoff, leg.Fauvel (ISNB; NMW); Morlaix, leg.Hervé (NMW); Dep.Pas de Calais: Calais (ZMH); Dep.Calvados: Isigny-sur-Mer, leg.Fauvel (ISNB); Dep. Vendée: leg.Fauvel (ISNB); Dep.Herault: Montpellier (ISNB); Dep.Gard: Aiguesmortes (TMB); Dep.Bouches du Rhon: Aix, Provence, leg.Tisson (TMB); Camargue, 5.1980, leg.Zwick (NMW); Camargue, 25.3.1913, leg. Liebmann (DEI); Marseille, leg.Abeille (NMW); Dep.Loire inf.: Le Croisic, leg.Deville (NMW); Dep.Var: Hyeres, leg.Fauvel (ISNB); Provence, Frejus (NMW, DEI, HUB); Corsica: Aleria, leg.Leonhard (DEI). SPAIN: Gerona, Costa Brava, Rosas, 6.1966, leg.Budeberg (NMW); Barcelona, Catalonia, Sitges, 22.10.1922, leg.Liebmann (DEI, NMW); Elche, leg. Strobl (NMW); Algeciras, leg.Breit (NMW); Cadiz, Sierra del Pinar, 1100 m, 10.5.1960, leg.Besuchet (MHNG, NMW). ITALY: Roma (NMW); Dint. Roma, leg.Luigioni (HUB); L.S.Giovanni, Gargano (NMW); Mte Gargano (ISNB); Grottaglie, Murgie, leg.Paganetti (NMW); Sicily, Catania, leg. Rottenberg (ISNb, DEI); Sicily, leg.Liebmann (DEI); Sardinia: Santadi, leg.Dodero (HUB, ISNB); Oristano, leg.Minozzi (ISNB); Flumentorgiu, 1894, leg.Solari (NMW); Terra Nova, leg.Paganetti (NMW). ALGERIA: Edough (ISNB). TUNISIA: Bizerte (NMW, ISNB); Matir, leg.Sahlberg (ZMH); Tunis, Lac Sedjoumi, 1.5.1907 (ISNB). In addition I have seen some single females from Switzerland (Geneva, ETHZ; Vaud, Yverdon, MHNG), Germany (Bavaria, NMW) and Austria (Styria, NMW), which probably also belong to *Ochthebius punctatus*.

Ochthebius quadrifoveolatus - GREAT BRITAIN: Anglia, leg.Jekel (ZMH). SPAIN: Murcia: (ZMH); Malaga: Ronda, leg.Alluaud (ISNB); Katheder (DEI);Granada: Maitena, Rio Xenil, 18.9.1935, leg.Orchymont (ISNB); Pityusen, leg. Polatzek (NMW); Madeira: Rib.Joao, leg.Orchymont (ISNB); Sao Vicente, 2.7.1957, leg.Lindberg (ZMH); Porto Santo, leg. Franz (NMW); Canary Islands: Gran Canaria, Fuerteventura, Tenerife, Gomera, all leg.Polatzek (NMW); Gran Canaria: Artenara, leg.Franz (NMW); Pozo de las Nieves, leg.Franz (NMW); Aldea, S.Nicolas, 1.3. 1949, leg.Lindberg (ZMH); Maspalomas, 9.3.1950, leg.Lindberg (ZMH); Fuerteventura: Gran Tarajae, 15.3.1949, leg.Lindberg (ZMH); Pajara, 10.3.1949, leg.Lindberg (ZMH); Gomera: leg.Platzek (ISNB); Valle Hermingua, 18.3.1950, leg.Lindberg (ZMH); Tenerife: Adeje, 24.2.1950, leg.Lindberg (ZMH); Anogo Baila dero, 700 m, 23.4.1950, leg.Lindberg (ZMH) Valle de masca, 13.5.1947, leg.Lindberg (ZMH). La Palma: El Paso, 26.5.1947, leg.Lindberg (ZMH); Caldera near Tenerra, 24.5.1947, leg.Lindberg (ZMH): MOROCCO: Khouribga, El-khatouat, 800m, 12.4.1985, leg.Wewalka (CWW, NMW); Qued, N'Fis, 1500-1700 m, 5.6.1934, leg. Ball (ISNB); Kasba Goundasa, 1300 m, 26.6.1934, leg.Ball (ISNB); Marrakesh, Vallée de l'Ourika, 700 m, 16.4.1985, leg.Wewalka (CWW, NMW); Marrakesh, Tizi-n-Test, 2000 m, 18.4.1985, leg.Wewalka (CWW, NMW); Tizi n'Test, 26.6.1943, leg.Ball (ISNB); Telouet, leg.Thery (ISNB); Quarzazate, n. Tazenakht, 1600 m, 6.4.1985, leg.Wewalka (CWW, NMW); Quarzazate, Ait Benhaddu, 1200 m, 6.4.1985, leg.Wewalka (CWW, NMW); Boumalne, Todra, 1200 m, 7.4.1985, leg.Wewalka (CWW, NMW); Mogador (Essaouria), 12.2.1961, leg.Meinander (ZMH); Oued Noun, 20.2.1961, leg.Meinander (ZMH); Sidi Chiker, 17.4.1982, leg.Thery (NMW, CBG). ALGERIA: Ain Sefra, leg.De Vauloger (MHNP); Biskra, leg.Simon (MHNP); Djebel Metilli, Georges d'El, 5.1954, leg.Fagel (ISNB); Bou Saada (MHNP, TMB, ISNB); Hoggar, 3.1928 (MHNP); Hoggar, Idedès, 7.4.1928 (ISNB) Hoggar, Idedès, 7.4.1928 (ISNB); Hoggar, Agnelmane, Sakkarasen, leg. Peyerimhoff (ISMB). TUNISIA: Ain Draham, leg.Bodemeyer (NMP); Gafsa, leg.Bo-

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demeyer (DEI). EGYPT: Cairo, coll.Henon (MHNP). SAUDI ARABIA: Ash Sharay, 23.9.1973, leg.Büttiker (NMB, NMW); Wadi Wajj, sw.Taif, 1800 m, 4.10.1979, leg.Büttiker (NMB, NMW); Wadi Marba, Khamis, 2050 m, 17.4. 1976, leg.Wittmer & Büttiker (NMB, NMW); Wadi Nimar, 1500 m, 20.5. 1983, leg.Büttiker (NMB); Adana, 1650 m, 6.10.1980, leg.Büttiker (NMB). TURKEY: Kilis, 26.5.1987, leg.Jäch (NMW); Amanos Mts., 24.5. 1987, leg.Jäch (NMW).

Ochthebius ragusae - FRANCE:Dep.Alpes Maritimes: St.Jean la Rivière, 7.6.1922, leg.Ochs (CPL); Nice, leg.St.Claire-Deville (ISNB); Luceram, 9.1934, leg. Ochs (ISNB). ITALY: Emilia: Zatta, 29.7.1905, leg.Fiori (HUB); Roma (NMW); Calabria: Antonimina, leg.Paganetti (DEI); Gerace, leg.Paganetti (NMW); Sicily: Palermo (HUB); Failla (NMW); Messina, Bauso, 23.6.1919, leg.Vitale (CPL). YOUGOSLAVIA: Macedonija: Babuna, Pesti,17.5.1963, leg.Gogala (CPL). GREECE: Mt.Athos, Karyes, 28.5. 1959, leg.Janssens (ISNB); Pindos, Koridallos, 1.11.1973, leg.Ferro (CFL); Attika, 16.4.1922, leg.Liebmann (DEI); Phaleron, 1909 (HUB); Kreta, leg.Sahlberg (ZMH, HUB); Naxos, leg.Orchymont (ISNB); Paros, leg.Orchymont (ISNB); Lesbos, Agiasos, leg.Malicky (NMW); Chios, leg. orchymont (ISNB); Kizilcahamam, leg.Weirather (MHNG); Burdur, Celtikcibeli, 1250 m, 7.1973, leg.Osella (CFL); Nigde, Ciftehan, 3.9.1981, leg.Jäch (NMW); Mersin, Namrun, 22.8.1981, leg.Jäch (NMW); Hizan, 8.6. 1987, leg.Jäch (NMW); Gümüshane, Erzincan-Kelkit, 2100 m, 4.6.1986, leg.Besuchet, Löbl & Burkhardt (MHNG); Erzerum, Askale, 16.7.1973, leg.Wewalka (CWW, NMW); Baskale, Güzeldere Pass, 5.6.1987, leg.Jäch (NMW). CYPRUS: Kzavaskernyia, 4.9.1932, leg.Ball (ISNB); Troodos, Tzi Koutona, 25.10.1932, leg.Ball (ISNB); Larnaka, 12.11.1932, leg.Ball (ISNB); Kythrea, 1.11.1932, leg.Ball (ISNB); Madon, 1.11.1932, leg. Ball (ISNB); Athalassa, 24.6.1939, leg.Lindberg (ZMH). LEBANON: Tripoli, 4.1965 (NMW). ISRAEL: Berekhat Zefira, 7.4.1981, leg.Wewalka (CWW, NMW); En Zafzafa, 17.4.1981, leg.Wewalka (CWW, NMW); En Avdat, 16.3.1985, leg.Jäch (NMW); En Aqev, 14.3.1985, leg.Jäch (NMW); En Saharonim, 3.5.1981, leg.Ortal (IESJ); Elat, N.Eteq, 2.8.1985, leg. Jäch (NMW). EGYPT: Sinai: Ein el-Queidrat, Q.Barnea, 28.6.1981, leg.Herbst (IESJ); Ein Furtaga, 8.3.1976, leg.Margalit (NMW); Ein Shatan, 17.11. 1981, leg.Herbst (IESJ); Wadi Tubug, 25.6.1976, leg.Margalit (NMW); Ein Hagie, 28.8.1969, leg.Margalit (NMW); St.Katharina, very small spring, 28.3.1986, leg.Jäch (NMW); Shellal, O.Feiran (MHNP, NMW). SAUDI ARABIA: Wadi Naqben, 1050 m, 27.4.1981, leg.Büttiker (NMW, NMB), SOVIET UNION: Armenia: Caucasus, leg.Leder, Reitter (NMW, ZMH); Georgia: Mleti, leg.Sahlberg (NMW). Tadzhikistan: Hissar (= Gissar), leg. Hauser (NMW). IRAN: Khorazan, Emamgholi, 15.7.1974, leg.A.Senglet (MHNG). AFGHANISTAN: Doab, 7.10.1957 (ISNB); Hindukush,Salang Valley, Ejan 2050 m, 11.10.1952, leg.Klapperich (ISNB, NMW, TMB).

Zusammenfassung

Siebzehn Arten der sogenannten Untergattung *"Bothochius"* werden eingehend behandelt. Es gibt keinen offensichtlichen Beweis für die Monophylie von *"Bothochius"*. Die Typen von 8 verschiedenen Arten (*bifoveolatus, caucasicus, grandipennis, mongolicus, orientalis, pilosus, ragusae* und *turkestanus*) und 6 Synonymen (*nigrinus, volxemi, fluviatilis, sericeus, villosulus* und *detritus*) wurden untersucht. Lectotypen wurden festgelegt. *Ochthebius sericeus* wird als Synonym von *O.pilosus*

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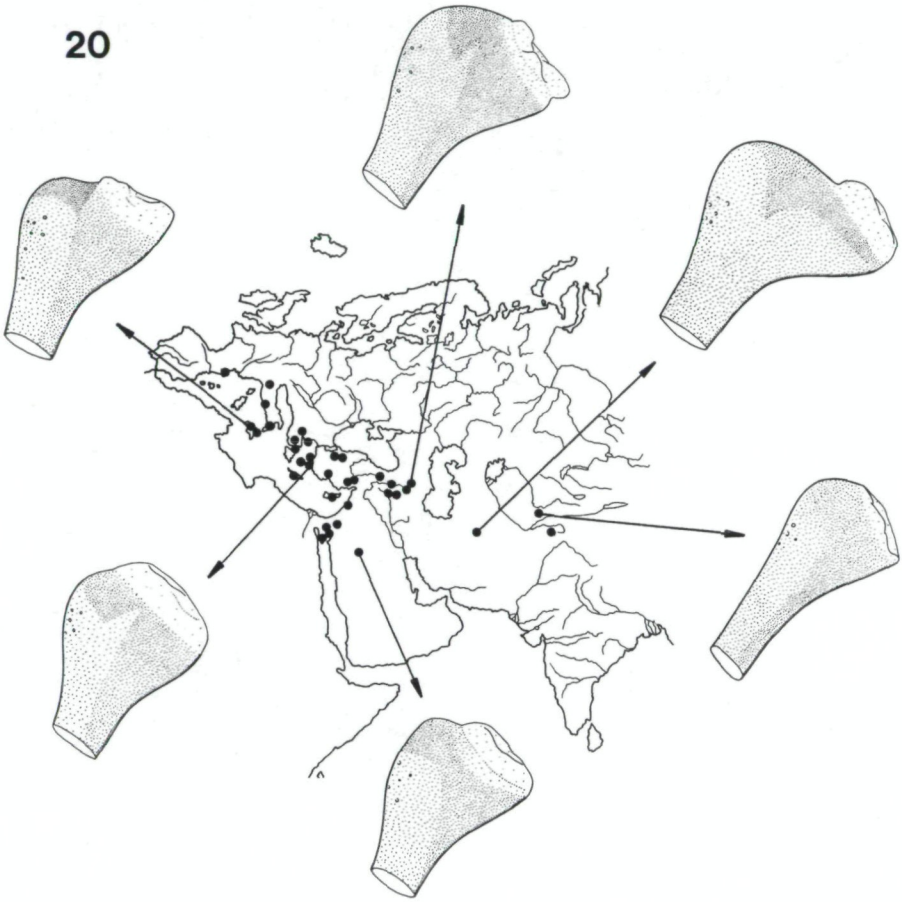

Fig.20: Geographical distribution of *O.ragusae*, showing aedeagal variation.

eingezogen. Vier neue Arten werden beschrieben: *O.imbensimbi* sp.n., *O. klapperichi* sp.n., *O.sulpuris* sp.n. und *O.turcicus* sp.n. Die männlichen Kopulationsorgane von allen 17 Arten sind abgebildet. Einige neue Ideen über die Darstellung von Genitalien werden vorgestellt. Die letzten Sternite der Weibchen wurden genau untersucht, um die Unterscheidung einiger nah verwandter Arten zu ermöglichen.

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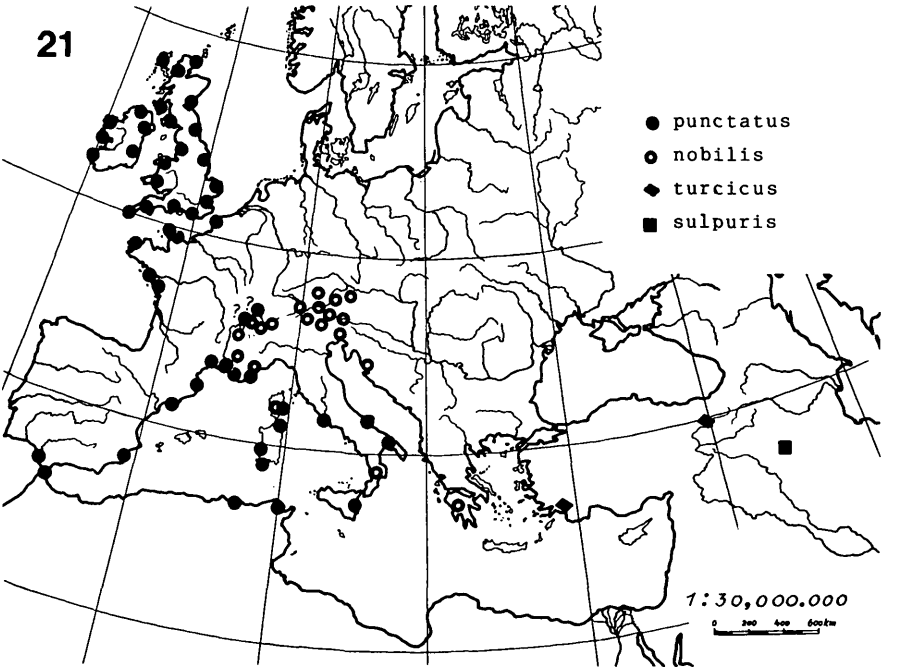

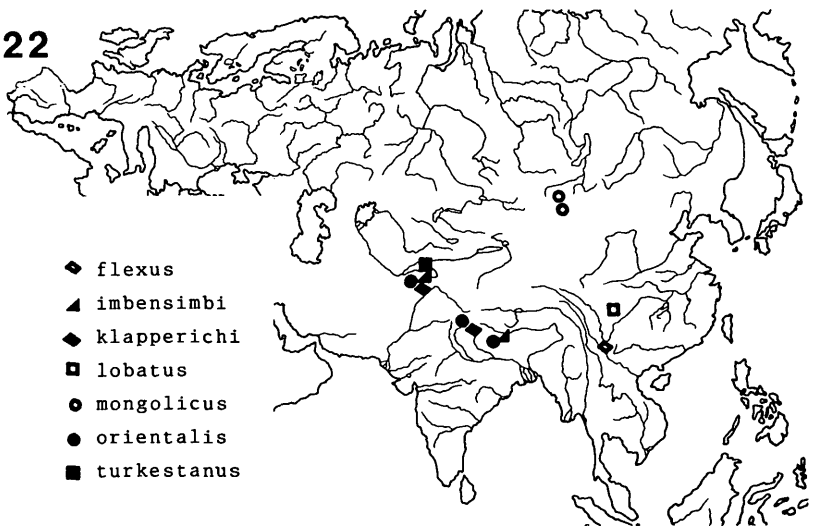

Fig.21: Geographical distribution of *O.punctatus*, *O.nobilis*, *O.turcicus* and *O.sulpuris*.

Fig.22: Geographical distribution of *O.flexus*, *O.imbensimbi*, *O.klapperichi*, *O.lobatus*, *O.mongolicus*, *O.orientalis* and *O.turkestanus*.

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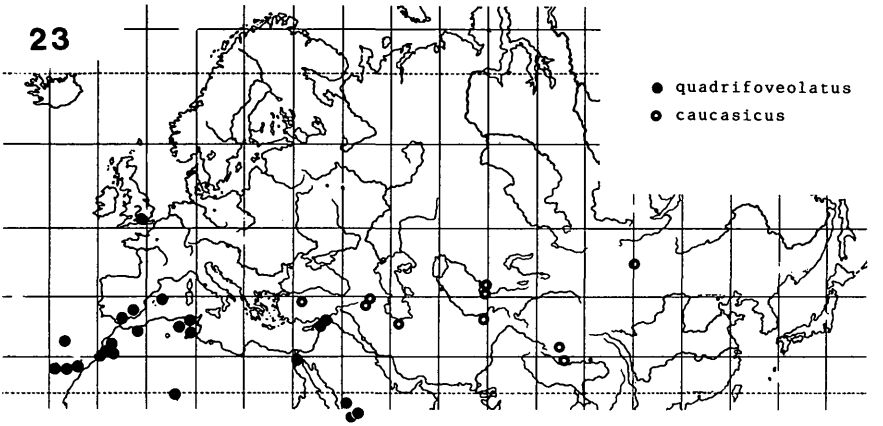

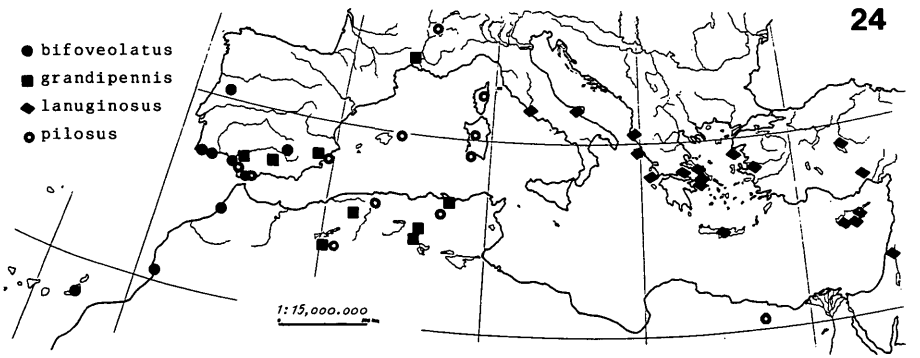

Fig.23: Geographical distribution of *O.quadrifoveolatus* and *O.caucasicus*.

Fig.24: Geographical distribution of *O.bifoveolatus*, *O.grandipennis*, *O. lanuginosus* and *O.pilosus*.

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