

Notes on the genus *Oxysternus* Dejean, 1834 (Coleoptera: Histeridae) with special references to its systematic position

Sławomir MAZUR

Department of Forest Protection and Ecology, WULS,
Nowoursynowska 159, bld 34, 02-776 Warszawa, Poland;
e-mail: Sławomir.mazur@wl.sggw.pl

Taxonomy, tribes, systematic position, Coleoptera, Histeridae, Histerinae, *Oxysternus*

Abstract. The systematic position of the genus *Oxysternus* Dejean, 1834 is analyzed and discussed. This genus together with the genera *Placodes* and *Plaesius* compose a very distinctive group that might be treated as a tribe within Histerinae.

INTRODUCTION

The genus *Oxysternus* was first time proposed by P. F. Dejean who in the 2nd edition of his catalogue (1834: 129) used this name in combination with a single species, *Hister maximus* Linnaeus, 1767. According to the rules of the International Code of Zoological Nomenclature (Art. 68.3) this is a valid designation of the type-species by monotypy and Dejean should be regarded as an author of the name *Oxysternus*.

Erichson (1834: 98) adopted the name *Oxysternus* and gave a full description of the genus, placing it in the first group (“die erste Gruppe”) together with *Hololepta* Paykull and *Phylloma*: Erichson (= *Eutidium* Lewis, 1903): pages 85-86.

This conception was followed by other coleopterologists: Lacordaire (1854: 249), Marseul (1857: 149), Bickhardt (1916: 23) and, finally, by the author (Mazur, 1997: 52). All these authors classified the genus *Oxysternus* among the “*Hololepta* group” treated as a subfamily (Bickhardt) or as a tribe (Mazur).

As primarily defined (Erichson, 1834: 85) the first group includes the species “... bei denen der Kopf vergestreckt ist (das Prosternum hat keinen vordern Lappen)”. These features were repeated in the latter works: Marseul (1857: 149); Hololeptiens: “Tête non retractile, toujours visible en dessous. - Bouche fermée par le menton, saillant au devant du prosternum”, Bickhardt (1916: 23); Hololeptinae: “... Der Kopf ist wagrecht vorgestreckt, die Mandibels sind lang, sichelförmig. ... Die Kehle is frei, nicht vom Prosternum bedeckt”.

According to these coleopterologists the porrect head, horizontal in repose, is unique among the histerids and they opposed the subfamily Hololeptinae to the remaining subfamilies.

It was Reichardt (1941: 33) proved a closer relationship between Histerinae and Hololeptinae on a base of wing venation and placed Hololeptinae next to Histerinae. Some years later Wenzel (1944: 53) dropped Hololeptinae to the tribal level: “... the Histerinae include the Hololeptinae of other authors. The latter seem to be very closely related to the

Platysomini [= Platysomatini] and would seem best placed next to them as a separate tribe". This solution has been generally accepted by other coleopterologists (Kryzhanovskij & Reichardt, 1976; Vienna, 1980; Newton & Thayer, 1992; Mazur, 1997; Bousquet & Laplante, 2006).

When examining the structure of the antennal club De Marzo and Vienna (1982) found a close relationship between Hololeptini, Platysomatini and the genus *Omalodes* Erichson (transferred from Platysomatini to a new tribe, Omalodini, by Kryzhanovskij, 1972: 19). In all these taxons the antennal club has two sutures strongly inwardly directed, more or less V-shaped (Figs 2, 11). These sutures are complete (Omalodini) or interrupted medially (Hololeptini, Platysomatini). Additionally, De Marzo and Vienna (1982: 87-88) gave a key to separate Hololeptini and Platysomatini. Hololeptini may be separated, among others, from Platysomatini by a presence of subhumeral fossette confluent with subhumeral stria, visible from above and by 1st abdominal sternite being not longer than 3rd one.

The author (Mazur, 1990: 751) also proposed a trial of separation of the tribes of the subfamily Histerinae, emphasizing the structure of the antennal club: with two oblique, V-shaped sutures (Hololeptini, Omalodini, Platysomatini) or antennal sutures straight, if at all (Exosternini, Histerini).

Thus, the tribes Hololeptini, Omalodini and Platysomatini constitute a very closely related group, differing from the tribes Exosternini and Histerini not only by V-shaped antennal sutures but also by the presence of deep, S-shaped groove on foretibia.

SYSTEMATIC ANALYSIS

A question that should be resolved is the classification of the genus *Oxysternus* among the tribes of Histerinae, mentioned above. In order to answer this question there will be done an analysis based on selected external and internal features which may be considered as characteristic of particular tribes or genera. The following examples have been used as a comparative material:

Oxysternus maximus (called "*Oxysternus*")

Plaesius javanus Erichson, *P. ellipticus* Marseul, *P. asperimargo* Lewis, *P. (Hyposolenus) laevis* Lewis (called "*Plaesius*")

Placodes senegalensis (Paykull), *P. opacus* Lewis (called "*Placodes*")

Iliotona cacti (LeConte) (called "*Iliotona*")

Platysoma compressum (Herbst), *Platylister cambodjensis* (Marseul), *Silinus mirabilis* (Lewis) (called "*Platysomatini*")

Hololepta aequalis (Say), *H. quadriformis* Marseul, *H. (Leionota) yucateca* (Marseul), *Eutidium exutum* (Lewis) (called "*Hololeptini*")

Omalodes omega (Kirby), *O. foveola* Erichson, *Lewisister excellens* Bickhardt (called "*Omalodini*").

The selected features are as follows:

Head porrect, horizontal in repose. Present only in Hololeptini (Fig. 10) and *Oxysternus* (Fig. 1).

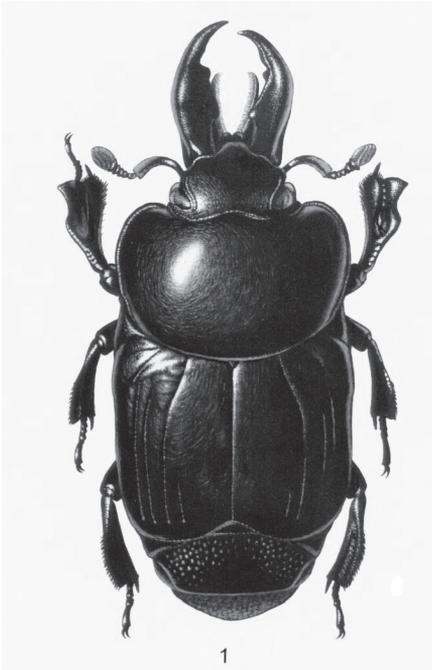


Fig. 1. *Oxysternus maximus*, habitus.

Sutures of antennal club.

- a) complete. Omalodini, *Placodes* (Fig. 24), *Plaesus* and *Oxysternus* (Fig. 2).
- b) interrupted medially. Platysomatini and Hololeptini (Fig 11).

Prosternal lobe short, not covering the gular part of head.

a) prosternal lobe not carinate, rounded or truncate anteriorly. Hololeptini (*Hololepta*, *Eutidium*)

b) prosternal lobe carinate, acutely produced anteriorly. *Iliotona*, *Oxysternus* (Fig. 3).

Prosternal lobe long, covering the gular part. This feature present in Platysomatini, Omalodini, in *Plaesus* and *Placodes* (Fig. 26).

Mesosternum deeply emarginate anteriorly. Met in *Plaesus*, *Placodes* (Fig. 26) and *Oxysternus* (Fig. 3).

Elytra without subhumeral fossette confluent with subhumeral stria. Platysomatini, Omalodini, *Placodes*, *Plaesus* and *Oxysternus* (there also is any subhumeral stria in *Oxysternus*).

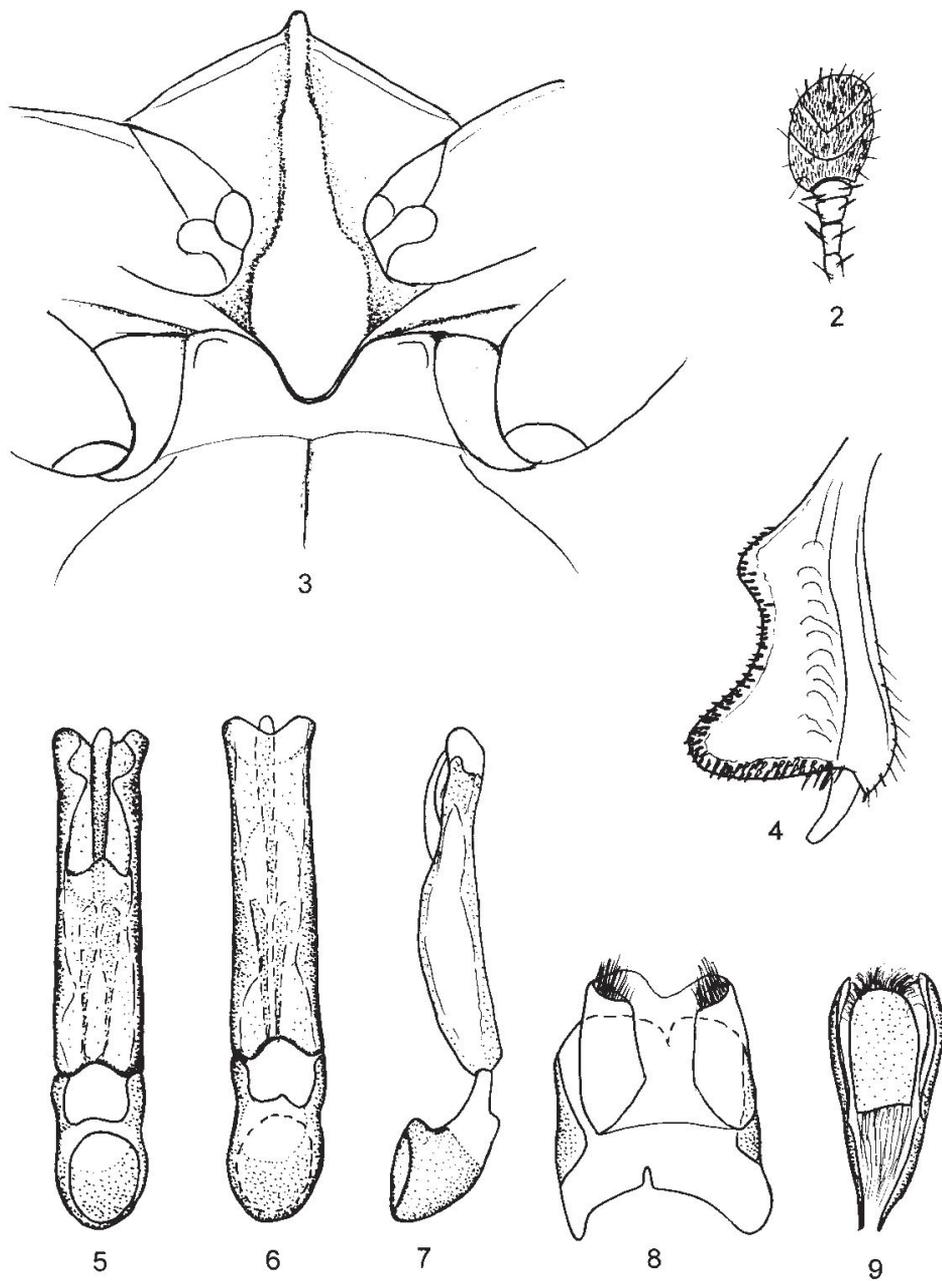
All tibiae denticulate (Fig. 10). Typical feature for Omalodini, Platysomatini and Hololeptini (including *Iliotona*).

Foretibia strongly bidentate (Fig. 1), its ventral surface covered with short spinules at outer margin (Figs 4, 25). Only in *Oxysternus*, *Placodes* and *Plaesus*.

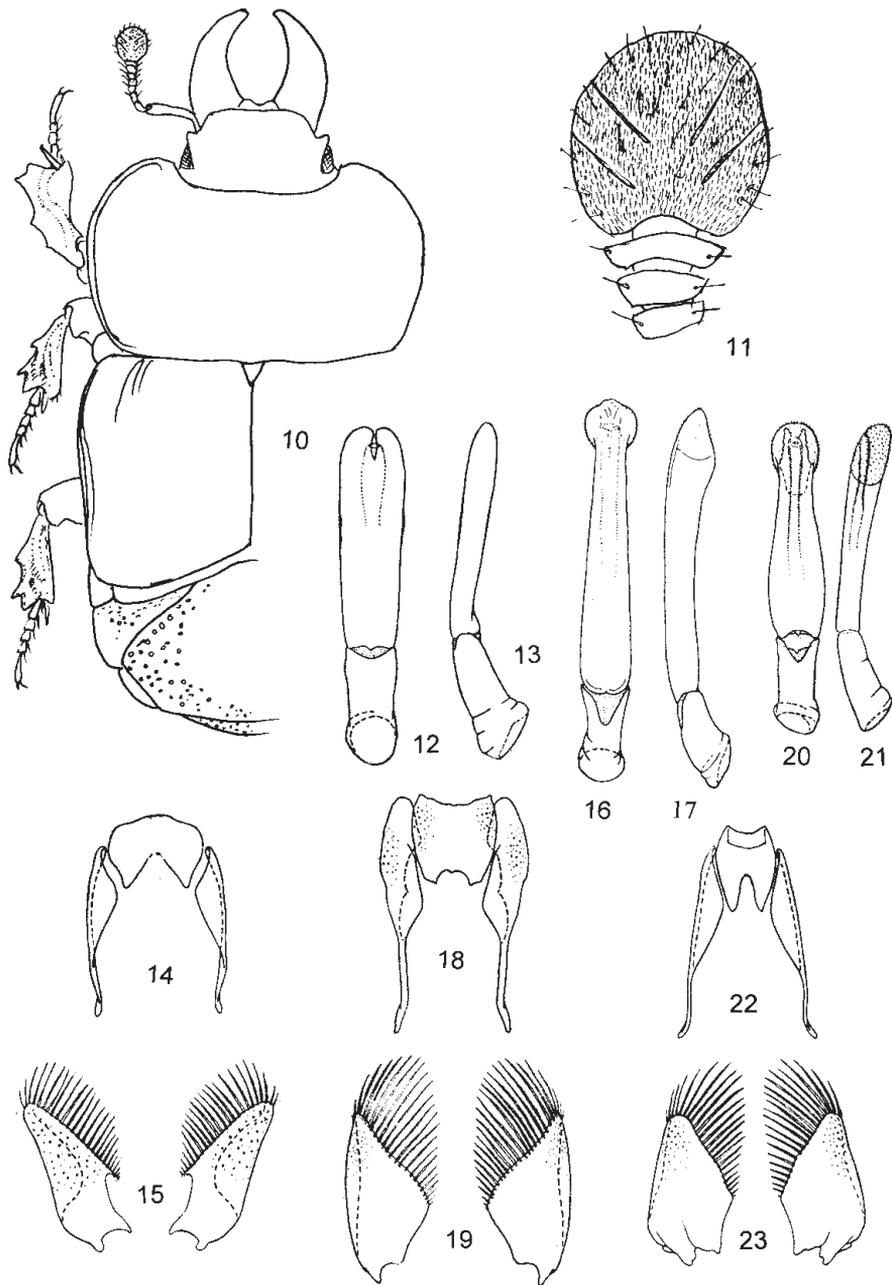
First abdominal sternite not longer than the 3rd one. Typical feature (synapomorphy?) for all the Hololeptini.

First abdominal sternite the longest, longer than 3rd one. Omalodini, Platysomatini, *Placodes*, *Plaesus*, *Oxysternus*.

Eighth sternite with long hairs on caudal margin (Figs 15, 19, 23). The feature for the first



Figs 2-9. *Oxysternus maximus*; 2- antennal club; 3- pro- and mesosternum; 4- foretibia, ventrally; 5- aedeagus, ventrally; 6- aedeagus, dorsally; 7- aedeagus, laterally; 8- 8th segment; 9- 9th and 10th tergites.



Figs 10-23. Morphological details of *Hololeptini*; 10- *Hololepta* sp., upper side, 11- *H. quadriformis*, antennal club; 12-23: genital structure of the male; 12-15: *Hololepta aequalis*; 16-19: *H. (Leionota) yucateca*; 20-23: *Iliotona cacti*; 12, 13, 16, 17, 20, 21: aedeagus; 14, 18, 22: 9th and 10th tergites; 15, 19, 23: 8th sternite; 12, 16, 20: dorsally; 13, 17, 21: laterally.

time described by Ôhara (1991: 103) as typical for *Hololepta*. Apart from *Hololeptini* it is being met in *Oxysternus* (Fig. 8), in some *Omalodini* (*Omalodes*, Fig. 30; *Lewisister*, Fig. 31) as well as, though to a lesser degree, in some *Plaesius* (Fig. 29).

10th tergite divided into two lobes. *Placodes* (Fig. 27), *Plaesius* and some *Platysomatini*.

10th tergite not divided. *Oxysternus* (Fig. 9), majority of *Platysomatini*, *Hololeptini* (Figs 14, 18, 22).

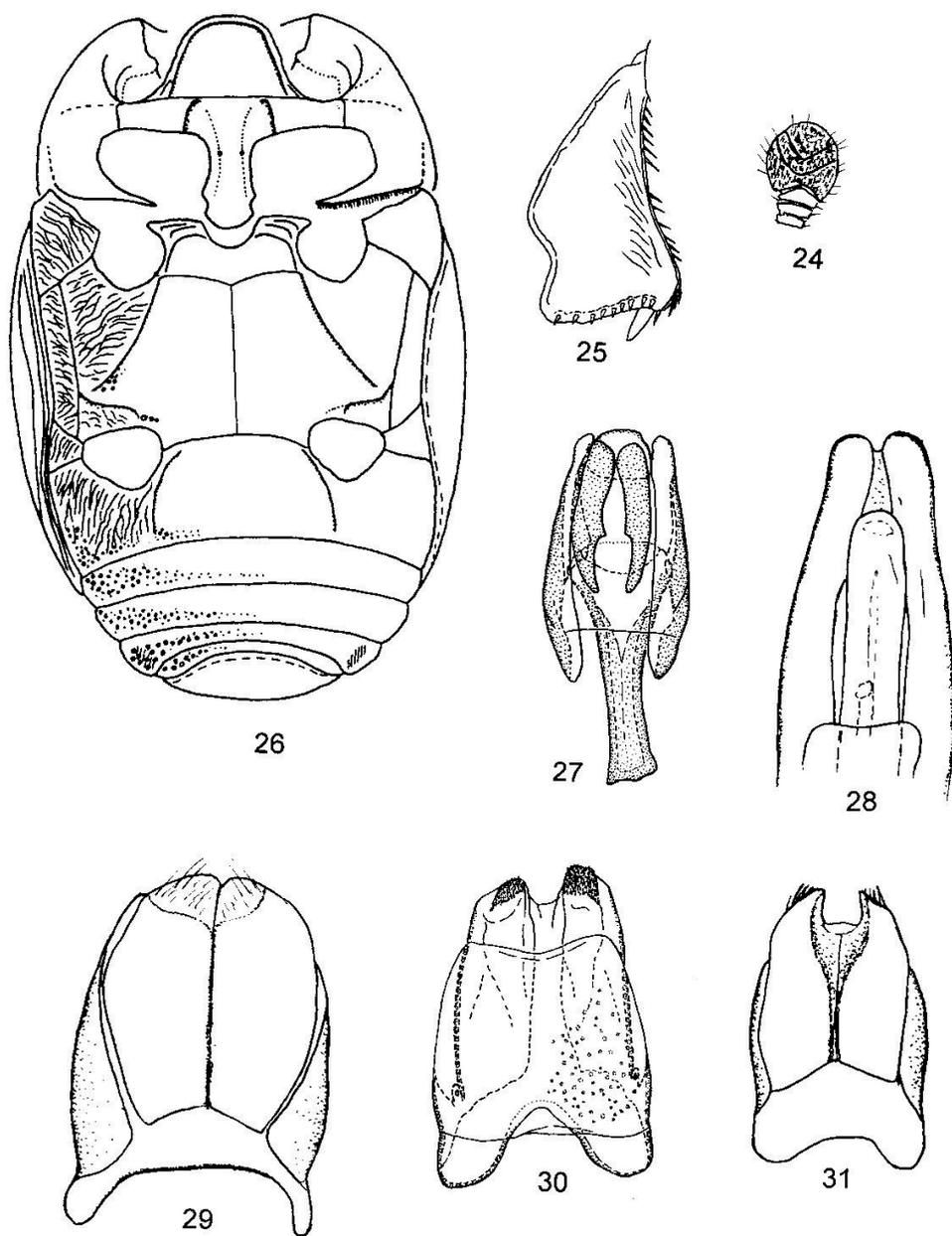
Parameres not fused on ventral surface apically. Rarely occurring feature, being met in *Oxysternus* (Figs 5-7), some species of *Placodes* and *Plaesius* (Fig. 28) and in *Iliotona* (Figs 20-21). In the remaining *Hololeptini* the parameres are completely fused (Figs 12-13, 16-17). As a result of this analysis one may say that the genus *Oxysternus* occupies an intermediate position between the tribes *Hololeptini* and *Omalodini* (3 features in common). Same level of relation we may find with the genus *Iliotona* (3 features). Its relations with *Platysomatini* are rather weak (2 features). The strongest relations can be observed between *Oxysternus*, *Placodes* and *Plaesius* (7 features in common).

REMARKS AND CONCLUSIONS

The genus *Oxysternus* nicely illustrates the difficulties with classification within the subfamily *Histerinae*. This genus is actually classified in the tribe *Hololeptini* whereas the genera *Placodes* and *Plaesius* belong to *Platysomatini* although there is no reason to keep longer such a placement. Ślipiński & Mazur (1999: 229), presenting a new concept of the phylogeny of *Histeridae* based on cladistic analysis, proposed to reject a subdivision of *Histerinae* into the tribes because, on the one hand, *Exosternini* cannot be cladistically defined and, on the other, *Omalodini* as compared with *Platysomatini* and *Hololeptini* represents plesiomorphic states of the antennal club structure and cannot be defined as a monophyletic taxon. Nevertheless, the genera *Oxysternus* and *Plaesius* were ever located mutually very near at the top of the cladogram, much further than that of *Hololepta*, *Omalodes* or *Platysoma* (Ślipiński & Mazur, 1999, figs 41-47). On the contrary, Caterino & Vogler (2002: 408), using DNA markers in their analysis of the phylogeny, did not propose any specific taxonomic changes at present, but would recommend that the more traditional taxonomy of Mazur (1997) be followed until a truly comprehensive phylogeny can be established.

So, accepting the “Ślipiński-Mazur” classification we may propose a leaving the *Oxysternus* within the subfamily *Histerinae* without a tribal subdivision. Accepting the “Caterino-Vogler” point of view we meet new problems. The heart of the matter is that the *histerids* show a tremendous range of forms, reflecting various degrees of adaptation to the niche in which they live. This adaptation makes still almost impossible to find a natural relationship between particular genera and species. Many characters used for classification can be also found as parallelism within unrelated groups, e.g. the extreme flattening which occurs in those species that live under bark.

According to De Marzo & Vienna (1982: 88) the antennal structure of *Platysomatini* and *Hololeptini* can be regarded as a recent evolutionary event, composing an efficient scenting apparatus for locating damaged parts of trees/or for discovering preys under bark, while a rather primitive condition of the club articulation seems to be those of *Omalodes*, *Oxysternus*, *Placodes* and *Plaesius*.



Figs 24-31. *Placodes senegalensis*; 24- antennal club, 25- foretibia, ventrally; 26- upper side; 27- 9th and 10th tergites; 28- *Plaesius ellipticus*, apex of aedeagus; 29- 8th segment; 29- *Plaesius asperimargo*; 30- *Omalodes omega*; 31- *Lewisister excellens*.

Anyway, the genera *Oxysternus*, *Placodes* and *Plaesius* compose a very distinctive group in both, morphology and biology [the species of *Oxysternus* and *Plaesius* are known as predators of the palm weevil - *Rhynchophorus palmarum* Linnaeus (*Oxysternus*) and the banana weevil - *Cosmopolites sordidus* Germar (*Plaesius*)] which might be treated as a separate tribe within Histerini but a thorough morphological study is needed before a satisfactory classification can be derived.

ACKNOWLEDGEMENTS. The author would like to express his sincere thanks to Oldřich Kapler (Říčany u Prahy, Czech Republic), for having enabled to publish an excellent drawing of *Oxysternus maximus* painted by Jan Kobylák (Prague, Czech Republic).

REFERENCES

- BICKHARDT H. 1916: Histeridae, pp. 1-112. In: WYTSMAN P. (ed.): *Genera Insectorum*, fasc. 166a. La Haye: M. Nijhoff.
- BOUSQUET Y. & LAPLANTE S. 2006: Coleoptera Histeridae. In: *The insects and arachnids of Canada, part 24*. Ottawa: NRC Research Press, xiii + 485 pp.
- CATERINO M. S. & VOGLER A. P. 2002: The phylogeny of the Histeroidea (Coleoptera: Staphyliniformia). *Cladistics* 18: 394-415.
- DEJEAN P. F. M. A. 1834: *Catalogue des coléoptères de la collection de M. le comte Dejean*. Paris: Méquignon-Marvis Père et Fils, 176 pp.
- DE MARZO L. & VIENNA P. 1982: Osservazioni morfologiche e ultrastrutturali su un particolare apparato di senso delle clave antennali di Platysomini e Hololetini (Coleoptera, Histeridae) e considerazioni sistematiche. *Entomologica* 17: 79-89.
- ERICHSON W. F. 1834: Uebersicht der Histeroides der Sammlung. *Jahrbücher der Insectenkunde* 1: 83-208.
- KRYZHANOVSKIJ O. L. 1972: On the taxonomy of extra-Palaearctic Histeridae (Coleoptera). *Entomologica Scandinavica* 3: 19-25.
- KRYZHANOVSKIJ O. L. & REICHARDT A. N. 1976: *Zhuki nadsemeystva Histeroidea (semeystva Sphaeritidae, Histeridae, Synteliidae)*. In: *Fauna SSSR. Zhestkokrylye, V, vyp.4*. Leningrad: Izdatelstvo Nauka, 434 pp.
- LACORDAIRE J. T. 1854: *Historie naturelle des insectes. Genera des coléoptères ou exposé methodique et critique les genres proposés jusqu'ici cet ordre d'insectes. Tome deuxième*. Paris: Libraire Encyclopedique de Roret, 548 pp.
- MARSEUL S. A. 1857: Essai monographique sur la famille des histérides (Suite). *Annales de la Société Entomologique de France* (3) 5: 109-167, 397-516.
- MAZUR S. 1990: Notes on Oriental and Australian Histeridae (Coleoptera). *Polskie Pismo Entomologiczne* 59: 743-759.
- MAZUR S. 1997: A Word catalogue of the Histeridae. *Genus, Supplementum* 1997, 373 pp.
- NEWTON A. F., JR. & THAYER M. K. 1992: Current classification and family-group names in Staphyliniformia (Coleoptera). *Fieldiana, Zoology* 61: 1-92.
- ÔHARA M. 1991: Redescription of the Japanese species of the genus *Hololetia* (Coleoptera, Histeridae), Part I. *Elytra* 19: 101-110.
- REICHARDT A. 1941: Sem. Sphaeritidae i Histeridae (chast' 1). In: *Fauna SSSR, Nasekomye zhestkokrylye, V, 3*. Moskwa-Leningrad: Izdatelstvo Akademii Nauk SSSR, xii + 419 pp.
- ŚLIPIŃSKI S. A. & MAZUR S. 1999: *Epuraeosoma*, a new genus of Histerinae and phylogeny of the family Histeridae (Coleoptera, Histeroidea). *Annales Zoologici* 49: 209-230.
- VIENNA P. 1980: Coleoptera Histeridae. In: *Fauna d'Italia, XVI*. Bologna: Officine Grafiche Calderini, ix + 386 pp.
- WENZEL R. L. 1944: On the classification of the histerids beetles. *Fieldiana, Zoology* 28: 51-151.

Received: 20.8.2008

Accepted: 30.8.2008