



**PARTIAL GENERIC REVISION OF THE BEE TRIBE OSMIINI
(HYMENOPTERA: MEGACHILIDAE)**

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Abstract – In this partial revision of bees commonly placed in the tribe Osmiini, the *Hoplitis* subgenus *Hoplitis* is elevated to the generic rank. The other subgenera of the former genus *Hoplitis* are united with the genera *Anthocopa* and *Osmia* into the common genus *Osmia*. The genus *Hoplitis* s.str. is probably more closely related to *Chelostoma* than to *Osmia*.

Izvleček – Delna rodovna revizija čebel tribusa Osmiini (Hymenoptera: Megachilidae)

V delni reviziji čebel, ki jih navadno uvrščamo v tribus Osmiini, se podrod *Hoplitis* rodu *Hoplitis* dvigne na rodovno raven. Drugi podrodovi dosejanega rodu *Hoplitis* se združijo z rodovi *Anthocopa* in *Osmia* v skupen rod *Osmia*. Rod *Hoplitis* s.str. je verjetno bolj soroden rodu *Chelostoma* kot *Osmia*.

Introduction

Bees of the tribe Osmiini were classified in two genera, *Osmia* and *Heriades* (or *Eriades*) by BENOIST (1929), FRIESE (1898), DUCKE (1900), and SCHMIEDEKNECHT (1930). SCHLETTERER (1889) also recognized the genus *Chelostoma*. The genus *Osmia* s.l. was split by MICHENER (1941) into three bigger genera, *Anthocopa*, *Hoplitis* and *Osmia* s.s., and some smaller ones. But many European entomologists still include them all in *Osmia*. WARNCKE (1991) even united *Heriades* and *Chelostoma* with the large genus *Osmia*.

Discussion

Michener's classification was established almost entirely on the basis of the New World species. This is the reason, many Old World taxa were hard to classify: they were

intermediate forms. Michener recognized two tribes, both together forming the subfamily Osmiinae. The Heriadini and Osmiini were divided mainly by the structure of the thorax. An elongated thorax was the main character determining the tribe Heriadini. But, for example, an elongated thorax is also present in *Osmia cephalotes* Morawitz. This species belonged to the *Diceratosmia* by Michener's classification (1941) but was later included in *Osmia* s.s. by SINHA (1958). It is a member of the subgenus *Pyrosmia* Tkalcu by present classification. No one has ever disputed its status. But this species has a metanotum forming part of the dorsal surface and a propodeum with a clearly differentiated horizontal basal zone, all characteristics of Heriadini. Its parapsidal lines are long, linear, unlike that of other *Osmia* s.s. species. An elongated thorax is obviously not always a plesiomorphous character, as stated by Michener, but can also be an adaptation to a particular type of nesting behavior. Almost all species with an elongated thorax nest in narrow burrows in wood. The horizontal basal zone of the propodeum is, however, a plesiomorphous character (PETERS, 1978). But it was independently lost, for example, in Lithurgini, Anthidiini, and Megachilini.

Parapsidal lines are a good character dividing *Osmia* s.s. from related groups as long as the subgenus *Pyrosmia* is not taken into consideration. They are very variable in this group.

Another character, important in Michener's classification, was a longitudinal carina along the inner ventral angle of the posterior coxa. But the importance of this character was already disputed by SINHA (1958) who united the genera *Diceratosmia* and *Osmia*. MICHENER in 1966 proposed also the unification of the genera *Hoplitis* and *Anthocopa*.

Various spines on the terga and sterna of males are very unreliable characters as they are under strong selection pressure. They are used in fights between rival males, so they probably evolved independently in several not closely related groups.

It is evident that some new characters are needed for a successful classification of the bees commonly placed in the tribe Osmiini. The classification proposed here, is based primarily on the structure of the anterior margin of the clypeus. In the plesiomorphous state, present also in the closely related tribe Anthidiini, the clypeal margin has transparent membranous outgrowths in the laterodistal corners. Bristles arising from the underside of the posterior margin of the clypeus are oriented straight forward. This type of clypeal margin is present in several genera of the tribe Osmiini: *Chelostoma*, *Hofferia*, *Heriades*, *Protosmia*, and others. But in the genus *Osmia*, especially in females, membranous outgrowths are reduced and not obvious. Bristles, on the other hand, are oriented towards the centre and arranged in two or more distinct brushes. This type of clypeal margin is also represented in the genera *Anthocopa* and *Hoplitis*, except the nominate subgenus of the latter, as recognized by VAN DER ZANDEN (1988). In *Hoplitis* s. str., the clypeal margin is of the primitive type, which places this genus closer to *Chelostoma* than to *Osmia*, as is considered here. The biology of *Hoplitis* confirms the conclusions based on morphology. All species of *Hoplitis* whose biology is known use mud in the construction of their nests. *Hoplitis adunca* nests in burrows in wood and builds cell partitions of mud, just like species of the genus *Chelostoma*. Other species of *Hoplitis* build exposed mud nests, unique among bees of the tribe Osmiini (WESTRICH, 1990).

The following genera are revised in this article:

Hoplitis Klug, 1807, Mag. Insektenk., 6: 225.

Type species: *Apis adunca* Panzer

Species examined: *Hoplitis adunca* (Panzer), *H. anthocopoides* (Schenck), *H. loti* (Morawitz), *H. lepeletieri* (Perez), *H. manicata* (Morice), *H. jheringii* (Ducke), *H. pallicornis* (Friese), *H. ravouxi* (Perez).

Genus *Hoplitis*, as understood here, contains only the subgenus *Hoplitis* of Van der Zanden's classification (1988).

Osmia Panzer, 1806, Krit. Revis. Insekt. Dtsch., 2: 230.

Type species: *Apis bicornis* Linnaeus = *Apis rufa* Linnaeus

Species examined: *Osmia* (*Hoplosmia*) *croatica* Friese, *O.* (*Hoplosmia*) *spinulosa* (Kirby), *O.* (*Hoplosmia*) *bidentata* Morawitz, *O.* (*Hoplosmia*) *ligurica* Morawitz, *O.* (*Hoplosmia*) *scutellaris* Morawitz, *O.* (*Anthocopa*) *andrenoides* Spinola, *O.* (*Anthocopa*) *dalmatica* Morawitz, *O.* (*Anthocopa*) *tergestensis* Ducke, *O.* (*Alcidamea*) *leucomelana* (Kirby), *O.* (*Alcidamea*) *claviventris* Thomson, *O.* (*Alcidamea*) *tridentata* Dufour & Perris, *O.* (*Alcidamea*) *mitis* Nylander, *O.* (*Allosmia*) *rufohirta* Latreille, *O.* (*Cephalosmia*) *brevicornis* (Fabricius), *O.* (*Pyrosmia*) *cephalotes* Morawitz, *O.* (*Pyrosmia*) *submicans* Morawitz, *O.* (*Helicosmia*) *leaiana* (Kirby), *O.* (*Helicosmia*) *aurulenta* (Panzer), *O.* (*Osmia*) *mustelina* Gerstaecker, and others.

Genus *Osmia*, as understood here, includes the genera *Anthocopa* Lepeletier, 1825, *Hoplitis* without the nominate subgenus, *Metallinella* Tkalcu, 1966, and *Osmia* of Van der Zanden's classification. This genus could be split into several genera, but this would be premature. It is probably better to recognize several subgenera until some other characters are found.

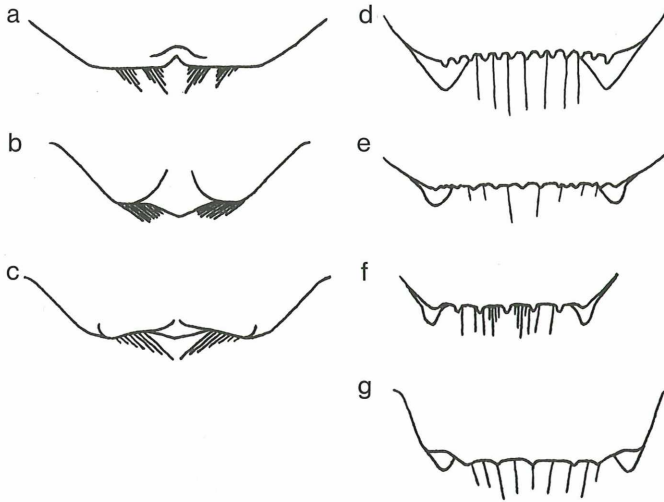


Fig. 1: Anterior margin of clypeus, a) *Osmia (Alcidamea) claviventris* Thomson, ♀; b) *Osmia (Hoplosmia) scutellaris* Morawitz, ♀; c) *Osmia (Pyrosmia) cephalotes* Morawitz, ♀; d) *Hoplitis adunca* (Panzer), ♀; e) *Protosmia glutinosa* (Giraud), ♀; f) *Chelostoma rapunculii* (Lepeletier), ♀; g) *Stelis phaeoptera* (Kirby), ♀ (Anthidiini).



Fig. 2: Some specimens of *Hoplitis lepeletieri* (Perez) resting in the remains of an old nest from the previous year. Photo by Andrej Gogala.

References

- Benoist, R.**, 1929: Les Heriades de la faune Francaise (Hymenoptera, Apidae). *Ann. Soc. ent. France*, 98: 131-141.
- Ducke, A.**, 1900: Die Bienengattung *Osmia* Latr. *Ber. nat.-med. Ver. Innsbruck*, 25: 1-323.
- Friese, H.**, 1898: Die Bienen Europas nach ihren Gattungen, Arten und Varietäten auf vergleichend morphologisch-biologischer Grundlage. Theil IV Verlag Lampe, Innsbruck.
- Michener, C.D.**, 1941: A generic revision of the American Osmiinae with descriptive notes on Old world genera. *Am. Midland Naturalist*, 26: 147-167
- Michener, C.D.**, 1966: A new species of *Anthocopa* from India. *Entomologist*, 99: 146-150.
- Peters, D.S.**, 1978: *Archeriades* gen.n., eine verhältnismässig ursprüngliche Gattung der Megachilidae (Hymenoptera: Apoidea). *Entomol. germ.*, 4: 337-343.
- Schletterer, A.**, 1889: Monographie der Bienen-Gattungen *Chelostoma* Latr. und *Heriades* Spin. *Zool. Jb. Syst.*, 4: 591-691.
- Schmiedeknecht, O.**, 1930: Die Hymenopteren Nord- und Mitteleuropas. 2. Aufl. Jena.
- Sinha, R.N.**, 1958: Subgeneric revision of the genus *Osmia* in the western hemisphere. *Kansas Univ. Sci. Bull.*, 39: 211-261.
- Van der Zanden, G.**, 1988: Beitrag zur Systematik und Nomenklatur der paläarktischen Osmiini, mit Angaben über ihre Verbreitung. *Zool. Meded.*, 62: 113-133.
- Warncke, K.**, 1991: Die Bienengattung *Osmia* Panzer, ihre Systematik in der Westpaläarktis und ihre Verbreitung in der Türkei. 7. Die Untergattung *Foveosmia* nov. *Linzer biol. Beitr.*, 23: 267-281.
- Westrich, P.**, 1990: Die Wildbienen Baden-Württembergs, 2. verb. Aufl. Ulmer, Stuttgart.

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