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Taxonomic revision of *Platypelochares* CHAMPION (Coleoptera: Limnichidae)

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Abstract

The Oriental genus *Platypelochares* CHAMPION (Coleoptera: Limnichidae) is revised. The two previously known species of the genus (*P. trifidus* CHAMPION from Myanmar, and *P. latimargo* CHAMPION from India) are re-described and illustrated. The genus *Wooldridgeus* SPANGLER is synonymised with *Platypelochares*. *Wooldridgeus perforatus* SPANGLER is transferred to *Platypelochares*. Two new species are described: *P. periculosissimus* from Thailand, Laos and Vietnam, and *P. petrus* from the Malay Peninsula. Two species groups are distinguished within the genus, according to external and genitalic characters.

Key words: Coleoptera, Limnichidae, Platypelochares, taxonomy, new species, Oriental region.

Introduction

The genus *Platypelochares* was described by CHAMPION (1923) for two species: *P. trifidus* CHAMPION from Myanmar (Burma), and *P. latimargo* CHAMPION from the Indian Himalayas.

Among unidentified limnichids in the collections of the NMW and the NHM we discovered several (described and undescribed) species of *Platypelochares* and compiled a taxonomic synopsis of the genus based on type studies and on the unidentified material of the NMW and NHM. After the manuscript had been submitted and the "final proof" had been corrected, we became aware of a very recent publication (SPANGLER 1999) in which a new limnichid genus and species, *Wooldridgeus perforatus*, was described and for which a new tribe, Wooldridgeini, had been erected. Although we had no opportunity to examine the type material of *Wooldridgeus perforatus* we can infer from the description that this species is definitely a member of the genus *Platypelochares*, belonging to one of the species represented in large numbers in the collections of the NMW and NHM.

Acknowledgements and acronyms

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- NHM Natural History Museum, London
- NMW Naturhistorisches Museum, Wien
- [hw] Handwritten label

Platypelochares CHAMPION

Platypelochares CHAMPION 1923: 272, Figs. 5, 5a. Wooldridgeus SPANGLER 1999: 181, Figs. 1-32. syn.n.

TYPE SPECIES: Platypelochares trifidus CHAMPION, by original designation.

DIAGNOSIS (see also description of *Wooldridgeus* by SPANGLER 1999): Habitus as in Fig. 1. Body broad, almost hemispherical, highly convex dorsally, flat ventrally. Upper surface black, ventral surface dark brown (teneral specimens may appear somewhat paler). Head vertical, retractile, deeply inserted in anterior emargination of prothorax, with a sharp carina bordering upper margin of eyes and clypeus. Eyes well developed, almost circular except for an anterior small indentation for insertion of antenna, not visible when head is retracted into pronotum. Antennae with 11 segments, 1 and 2 subcylindrical, 3 - 8 smaller, 9 - 11 abruptly widened into a loosely articulated club; segments 5 to 10 strongly asymmetrical (Fig. 2). Apical segment of maxillary palpi acuminate-ovate, asymmetrical. Prothorax very transverse, tri-sinuate at base, with a small indentation for reception of scutellum; lateral margins sharp, not bordered; anterior angles acutely produced for reception of head. Scutellum broadly triangular. Elytra very convex, with acutely-explanate lateral margin, regularly curved at apex. Hind wings well developed, approximately twice as long as elytra. Upper surface covered with uniform fine punctation, not forming regular striae in elytra. Surface between punctures shiny, with a very fine microreticulation. Upper surface covered with a fine deciduous pubescence.

Ventral surface with deep excavations for insertion of legs. Hypomeral ridge strongly developed and very transverse. Hypomera with a circular excavation covered with long setae, anterior to hypomeral ridge (Fig. 3). Prosternal process broad, regularly curved at apex, only partially visible when retracted into mesosternum (appearing subangulate at tip). Elytral epipleura very broad anteriorly, abruptly narrowed after the first abdominal sternite, which holds the excavation for reception of hind legs. Legs with all segments flattened; longitudinal excavated areas for insertion of adjacent segments bordered with carinae; meso- and metatarsus articulated with tibia preapically (see SPANGLER 1999: Figs. 18, 19). Last abdominal sternite with an apical excavation and a small dent in the middle (Fig. 4). Ventral surface with pubescence finer and shorter, but denser, than on upper surface.

With no apparent secondary sexual dimorphism.

Aedeagus with a very elongated base, parallel-sided. Parameres short and straight; lateral membranous expansions of different shape and size. Median lobe shorter than parameres (Figs. 5 - 9).

Female genitalia well developed and strongly sclerotized, with four acuminate valves (Figs. 10 - 11). Spermatheca well sclerotized (Figs. 12 - 13).

Tegmen well developed in males and females, bifurcated, with a flat expansion at both apices, fringed with long setae, with a narrow basal digitiform expansion.

DISCUSSION: *Platypelochares* has to be included in Limnichinae, due to its transverse hind coxae, five-segmented tarsi, absence of oblique ridge in the hypomera, and presence of excavated grooves in the ventral surface for the placement of the legs (BRITTON 1971, WOOLDRIDGE 1975). Among the subfamily, it is characterised by its antennal structure, explanate sides of elytra, very transverse hypomeral ridge, presence of a setiferous excavation in the hypomera, and structure of male and female genitalia. However, the phylogenetic relationships within subfamilies and genera of Limnichidae are still most poorly understood.

DISTRIBUTION: So far known from NW India to the Malay Peninsula and Borneo.

ECOLOGY: The only information available about the ecology of the species of the genus is taken from label data. In the original description CHAMPION (1923) did not give any detail of the habitat or the sampling method used to collect the specimens of P. trifidus and P. latimargo. As seen below, a number of specimens of different species have been collected at light, so it can be

assumed that they have good dispersal abilities. Specimens of some species were collected in forest litter or on river banks with gravel.

SPECIES GROUPS: Two species groups are distinguished within the genus, based on external morphology and male and female genitalia:

1. The *P. trifidus* group, including *P. trifidus*, *P. latimargo* and *P. periculosissimus*, with a transverse row of small tubercles on the pronotal disk (Fig. 1), regularly spaced and very uniform. Aedeagus with parameres well sclerotized, not flat, with more or less distinct membranous expansions in the inner side (Figs. 5 - 7). Wall of spermatheca with two well sclerotized plaques with a denticle in the middle, resembling a shark tooth (Fig. 12). Known from India to Vietnam and Laos (Fig. 14).

2. The *P. perforatus* group, including *P. perforatus* and *P. petrus*, without a row of small tubercles on the pronotum. Parameres wide and flat, poorly sclerotized, almost transparent (Figs. 8 - 9). Spermatheca without well developed sclerotized plaques (Fig. 13). Known from the Malay Peninsula and Borneo (Fig. 14).

It is interesting to note that other species within some other limnichid genera (e.g. *Phalachricus* SHARP) have a similar row of tubercles on the pronotum (WOOLDRIDGE 1982). Similar sclerotized structures in the spermatheca are also found in species of *Pelochares* MULSANT & REY (unpublished observations).

Platypelochares trifidus CHAMPION

Platypelochares trifidus CHAMPION 1923: 273.

TYPE LOCALITY: Toungoo, central Myanmar (Burma).

TYPE MATERIAL: Lectotype δ (NHM) (by present designation): "Type \ H.T.", "Platypelochares \ trifidus, Ch. [hw]", "Toungoo, \ Burma. \ G.Q.Corbett.", "Andrewes \ Bequest. \ B.M. 1922-221", "Platypelochares \ (n.gen.) \ trifidus, \ type [hw] Champ.", "E.M.M. 1923. \ Det. G. C. C.", and lectotype label. Re-mounted on a new card, with originally dissected antenna and maxilla with maxillary palpi glued besides the specimen. Paralectotypes (NHM): 1 ex., "Toungoo, \ Burma. \ G.Q.Corbett.", "Andrewes \ Bequest. \ B.M. 1922-221", "Platypelochares \ (n.gen.) \ trifidus, \ Champ.", "Platypelochares \ trifidus, Ch. [hw]", "Dryopsis \ longicornis \ Grouv [hw]", "E.M.M. 1923 \ Det. G.C.C.", glued upside down, with one leg, one mandible, and one maxilla and maxillary palpi glued besides the specimen; 1 δ , "Tharrawaddy, \ Burma. \ G.Q.Corbett.", "Andrewes \ Bequest. \ B.M. 1922-221", "Platypelochares \ I. B.M. 1923 \ Det. G.C.C.", glued upside down, with one leg, one mandible, and one maxilla and maxillary palpi glued besides the specimen; 1 δ , "Tharrawaddy, \ Burma. \ G.Q.Corbett.", "Andrewes \ Bequest. \ B.M. 1922-221", "Platypelochares \ I. B.M. 1922-221", "Platypelochares \ I. B.M. 1923 \ Det. G.C.C.", glued upside down, with one leg, one mandible, and one maxilla and maxillary palpi glued besides the specimen; 1 δ , "Tharrawaddy, \ Burma. \ G.Q.Corbett.", "Andrewes \ Bequest. \ B.M. 1922-221", "Platypelochares \ (n.gen.) \ trifidus, \ Champ.", "E.M.M. 1923. \ Det. G. C. C.".

ADDITIONAL MATERIAL EXAMINED:

MYANMAR: 1 o, "Toungoo [hw]", "H. E. Andrewes \ coll.. \ B.M. 1945-97"; 1 d, "Tharrawaddy \ Burma", "Dryopsis \ longicornis \ Grouv. [hw]", "H. E. Andrewes \ coll.. \ B.M. 1945-97". These two examples were found among the unidentified material in the Limnichidae collection of the NHM. They belong to the same series as the type material, but were not studied by CHAMPION (1923).

DIAGNOSIS: Length 1.75 - 1.80 mm (head not included), 1.85 - 1.90 mm (head included, in a natural position). Maximum width 1.60 - 1.65 mm. Very broad, with an almost perfectly semicircular shape. Pubescence short, with silvery or golden reflections depending on the specimen and the illumination. Antennal segments 3 - 8 elongated. Aedeagus as in Fig. 5, with a broad membranous expansion on the inner side of the parameres. Base very elongated, narrower at the middle. Walls of the spermatheca with two well sclerotized plaques with a medial denticle (similar to those of Fig. 12).

DISTRIBUTION: Known from two localities in central Myanmar: Toungoo and Tharrawaddy (Fig. 14).



Fig. 1: Platypelochares periculosissimus, habitus. Scale bar, 0.5 mm.

Figs. 2 - 4: *Platypelochares* spp., 2) antenna of *P. perforatus* (segments 3 - 11), 3) hypomera, with hypomeral ridge (hr) and setiferous excavation (se), of *P. periculosissimus*, 4) last abdominal sternite of *P. trifidus*. Scale bars, 0.25 mm.

Figs. 5 - 9: Aedeagus of *Platypelochares* spp., ventral view (traced from photographs), 5) *P. trifidus*, 6) *P. latimargo*, 7) *P. periculosissimus*, 8) *P. perforatus*, 9) *P. petrus*. Scale bar, 0.25 mm.

RIBERA & HERNANDO: Revision of Platypelochares (LIMNICHIDAE)

Platypelochares latimargo CHAMPION

Platypelochares latimargo CHAMPION 1923: 273.

TYPE LOCALITY: Almora, Uttar Pradesh, N India.

TYPE MATERIAL: Lectotype (NHM) (left specimen on a card with two individuals, by present designation): "C. Almora, $\$ Kumaon, $\$ India H.G.C.", "tarsi 5 joint $\$ Byrrhid [hw]", "Type $\$ H.T.", "Platypelochares $\$ latimargo, Ch. [hw]", "Specimen \land figured.", "Platypelochares $\$ (n.gen.) $\$ latimargo, $\$ Champ.", "E.M.M. 1923 $\$ Det G.C.C.", "Brit. Mus. $\$ 1923-24.", and lectotype label. Paralectotypes (NHM): 1 ex., same data as lectotype, glued on the same card (right specimen); 2 dd, 2 qq and 4 exs. distributed across 4 pins, same data as lectotype; 1 ex., "C. Almora Da. $\$ Kumaon U.P. $\$ Jan, 20 HGC.", "3314", "Platypelochares $\$ (n.gen.) $\$ latimargo, $\$ Champ.", "E.M.M. 1923 $\$ Det G.C.C.", "Brit. Mus. $\$ 1923-24."; 2 qq, "W. Almora $\$ Kumaon, U.P. $\$ India H.G.C.", "Platypelochares $\$ (n.gen.) $\$ latimargo, $\$ Champ.", "E.M.M. 1923 $\$ Det G.C.C.", "Brit. Mus. $\$ 1923-24."; 2 qq, "W. Almora $\$ Kumaon, U.P. $\$ India H.G.C.", "Platypelochares $\$ (n.gen.) $\$ latimargo, $\$ Champ.", "E.M.M. 1923 $\$ Det G.C.C.", "Brit. Mus. $\$ 1923 $\$ Det G.C.C.", "H.G.C. Champion Coll. $\$ B.M. 1953-156"; 1 d, "AT LIGHT", "Haldwani Divn. $\$ Kumaon U.P. $\$ Ine 23, H.G.C.", "4014", "Platypelochares $\$ (n.gen.) $\$ latimargo, $\$ Champ.", "E.M.M. 1923 $\$ Det G.C.C.", "Brit. Mus. $\$ 1923-24." (all sexed specimens are remounted on new cards with the genitalia glued onto them).

ADDITIONAL MATERIAL EXAMINED:

INDIA: 2 & &, 1 o, "INDIA \ Assam \ Jorhat \ 1970. On \ tea soil \ C.I.E. A3612 \ 501.6 [hw]", "Pres by \ Com inst Ent \ B M 1970-1", "Platypelochares \ trifidus \ Champ. [hw] \ R. Madge det. 1970" (NHM) (all three specimens are re-mounted on new cards with the genitalia glued onto them).

DOUBTFUL MATERIAL:

INDIA: 1 q, Karnataka, Shimoga District, Jog Falls, 26.IX.1991, leg. R. Schuh (NMW); 1 q, Maharashtra, Lonvala, 80 km E Bombay, 13.IX.1991, leg. R. Schuh (NMW).

MYANMAR: 1 9, Sagaing Division, Chattin Wildlife Sanctuary, Kinsan camp 13.X.1998, leg. H. Schillhammer (NMW).

DIAGNOSIS: Length 1.70 - 1.95 mm (head not included), 1.80 - 2.05 mm (head included, in a natural position). Maximum width 1.55 - 1.70 mm. Externally almost indistinguishable from *P*. *trifidus*, the only character we were able to find was the length of segments 3 - 8 of the antennae, which are shorter in this species (as noted by CHAMPION 1923). Other characters given by this author to distinguish both species were of limited use. Aedeagus as in Fig. 6, parameres more pointed than in *P. trifidus*, with a very reduced membranous expansion on their inner side. Base not narrowed in the middle. Walls of the spermatheca with two well sclerotized plaques with a medial denticle (similar to those of Fig. 12).

DISCUSSION: The three specimens from Assam are distinctly smaller than those of the type series, although identical in all morphological characters. Two females from South India and one female from Myanmar are considered to belong to this species due to the morphology of their genitalia, although with some doubts, mainly because of the absence of males from the same localities.

DISTRIBUTION: Known with certainty from NW India (Uttar Pradesh) and NE India (Assam), and doubtfully from S India (Karnataka), the Bombay area, and Myanmar (Fig. 14).

ECOLOGY: According to the labels, some specimens were collected at light, and others "on tea soil", suggesting that the species may occur in soil litter.

Platypelochares periculosissimus sp.n.

TYPE LOCALITY: Kanchanaburi, Thailand.

TYPE MATERIAL: Holotype δ (NMW): "W - THAILAND 1990 \ Kanchanaburi (1) \ am Licht \ leg. Jäch 26.11.", and holotype label. **Paratypes**: 5 exs., "Mountains, \ Tenasserim, \ Siam [Thailand] Border. \ Lat. N 12 40 to 14 10. \ Feb. to May., 1913", "K G. Gairdner. \ 1913-474", "Platypelochares \ trifidus \ Champion \ Det. DPWooldridge" (NHM); 1 ϱ , "W - THAILAND 1990 \ Kanchanaburi (4) \ am Licht \ leg. Jäch 30.11./1.12." (NMW); 2 $\delta\delta$, 2 $\varrho\varphi$, "N-THAILAND: Ch. Mai \ Chom Thong \ 24.-26.4.1991 \ leg. Pacholatko" (NMW); 1 δ , "THAIL. 12.12.90 \ Kao Chamao NP \ leg. Forster" (NMW); 1 δ "THAILAND. Mae Ping \ 19.-20.6.1991 \ leg.

DIAGNOSIS: Habitus as in Fig. 1. Length 1.7 - 2.0 mm (head not included), 1.8 - 2.1 mm (head included, in a natural position). Maximum width 1.3 - 1.6 mm. In general, distinctly narrower than the two preceding species, although some specimens have a similar width \ length ratio. Aedeagus as in Fig. 7, with very well developed membranous expansions along the whole length of inner side of parameres, clearly visible in lateral view. Female genitalia as in Figs. 10, 12. Wall of spermatheca with two well developed strongly sclerotized plaques, with an acute, very prominent denticle in the medial part (Fig. 12).

DISTRIBUTION: Myanmar, Thailand, Laos, and Vietnam (Fig. 14).

ECOLOGY: Unknown, a number of specimens were collected at light.

ETYMOLOGY: Periculosissimus (Latin), meaning very, very dangerous, in reference to the tooth-like structures of the female genitalia.

Platypelochares petrus sp.n.

TYPE LOCALITY: Perak, Malay Peninsula.

TYPE MATERIAL: Holotype δ (NHM): "MARDI [Malaysian Agricultural Research and Development Institute] M 6948 \ 10.5.82 \ Tax. Expe. [Taxonomic expedition, hw] \ [back side of the label] Black \ light [hw]", "WEST MALAYSIA \ Perak \ Sg [illegible word] \ [back side of the label] Blfe 22 [?] [hw]", "Press by \ Comm Ins Ent \ B.M. 1982-1", "C.I.E. COLL \ A. 14234", "Platypelochares \ trifidus \ Champ. [hw] \ det. R.B. Madge, 1982", and holotype label. Paratype (NHM): 1 δ , same data as holotype (both specimens are re-mounted on new cards with the genitalia and the abdomen glued onto them).

DOUBTFUL MATERIAL:

MALAYSIA: 1 ç, "MALAYSIA - Pahang/Johor \ Endau Rompin NP, 100m \ Selendang. 28.2.-12.3. \ leg. Strba & Hergovits 1995" (NMW).

DIAGNOSIS: Length 1.75 - 1.80 mm (head not included), 1.85 - 1.90 mm (head included, in a natural position). Maximum width 1.34 - 1.36 mm. Body slightly elongate, not hemispherical. Other characters similar to the preceding species. Aedeagus as in Fig. 9, parameters flattened, poorly sclerotized, with wide membranous lateral expansions on the inner side. Base strongly narrower towards middle.

DISCUSSION: The paratype is clearly teneral, with the aedeagus poorly sclerotized, and with a paler brown body colour. The female from Endau Rompin has genitalia close to those of P. *perforatus*, but with a narrower and more slender genital armour, and with smaller apical lamina in the tegmen. This specimen likely belongs to P. *petrus* due to geographical considerations, although this is not certain, and in consequence it is not designated as a paratype.

DISTRIBUTION: So far only known from the Malay Peninsula (Fig. 14).

ECOLOGY: Both type specimens were collected at light.

ETYMOLOGY: Named in reference to our friend Pedro (Petrus) Aguilera.



Figs. 10 - 13: Female genitalia of *Platypelochares* spp. (traced fom photographs), 10) *P. periculosissimus*, ovipositor, 11) *P. perforatus*, ovipositor, 12) *P. periculosissimus*, spermatheca with denticles (de), 13) *P. perforatus*, spermatheca. Scale bar, 0.25 mm.



Fig. 14: Geographical distribution of the species of *Platypelochares*. Doubtful records noted with question marks.

Platypelochares perforatus (SPANGLER) comb.n.

Wooldridgeus perforatus SPANGLER 1999: 182.

TYPE LOCALITY: 25 km E Telupid, Sabah, Borneo.

MATERIAL EXAMINED: $4 \ dsigma, 1 \ q$ and $6 \ exs.$, "MALAYSIA, Sarawak \ Mulu NP 3.3.1993 \ leg. M. Jäch (19)" (NMW); $1 \ dsigma, 5 \ exs.$, "SARAWAK: Gunong \ Mulu Nat. Park \ R.G.S. Exped. 1977-78 \ J.D.Holloway *et al.* \ B.M. 1978-206", "Site 7. January \ Long Pala (Base) \ 50m. 324450", "Alluvial / secondary \ forest. Aclunderstorey." (NHM); $4 \ exs.$, same data, collected at light (NHM); $1 \ exs.$, "SARAWAK: Gunong \ Mulu Nat. Park \ R.G.S. Exped. 1977-78 \ J.D.Holloway *et al.* \ B.M. 1978-206", "Site 17. March \ Nr. Long Melinau \ 50m. 313441 \ Kow secondary f. \ MV-on river banck." (NHM); $2 \ qq$, $5 \ exs.$, "SARAWAK: \ 4th Division \ Gn. Mulu NP.", "nr. Base \ Camp \ 50-100 m", "At light", "P.M. Harmond & \ J.E. Marshall \ v-viii. 1978 \ B.M. 1978-49" (NHM); $4 \ ds \ and 7 \ exs.$, "MALAYSIA, Sarawak \ Mulu NP (14 d) \ 3.-5.3.1993 \ leg. H. Zettel" (NMW); $2 \ ds \ q$, $q \ q$ and $9 \ exs.$, "SARAWAK (Borneo). \ ca 25 km E Kapit \ III.1994. Kodada leg." (NMW); $1 \ q$, "SABAH: Sook, \ 1500ft. 17m.SW \ Keningau, \ 15.viii.1977", "ex-gravel", "M.E.Bacchus \ B.M.1978-48" (NHM); $2 \ exs.$, "S9064 [hw]", "Doherty", "Borneo \ Peugaron [Pengaron, Kalimantan]", "Fry Coll. \ 1905.100.", "Platypelochares \ Det. DPWooldridge" (NHM); $3 \ exs.$, "Doherty", "Borneo \ Peugaron [Pengaron]", "Fry Coll. \ 1905.100.", "Platypelochares \ Det. DPWooldridge" (NHM); $1 \ ds \ 2 \ qq$ and $1 \ ex.$, "MALAYSIA: Sabah \ Crocker Range 17.6.1996 \ Mawar Waterfall env. (9c)", "vegetation debris \ and forest litter around \ fallen trees" (NMW) (all sexed specimens are re-mounted on new cards with the genitalia glued onto them).

DIAGNOSIS (see also SPANGLER 1999): Length 2.0 - 2.1 mm (head not included), 2.1 - 2.2 mm (head included, in a natural position). Maximum width 1.6 - 1.7 mm. Very broad, almost perfectly hemispherical. Pubescence apparently longer and denser than in the preceding species, with stronger golden reflections. Aedeagus as in Fig. 8, parameres very flattened, with wide membranous lateral expansions on the inner side. Membranous expansions with longitudinal rows of small denticles, clearly visible at 400x (not figured). Base regularly widened towards the inferior part, not narrower in the middle. Female genitalia as in Figs. 11, 13, spermatheca without sclerotized plaques (Fig. 13).

DISTRIBUTION: Borneo (Sarawak, Sabah and Kalimantan) (Fig. 14).

ECOLOGY: Several specimens were collected at light, others on river banks with gravel, and yet others in litter in the forest understorey.

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