

## A new aberrant species of the genus *Pacrillum* from Nepal (Hydrophilidae: Sphaeridiinae: Megasternini)

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**Abstract.** *Pacrillum cycrilloideum* sp. nov. from the Nepalese Himalaya is described as an aberrant species superficially resembling the representatives of the Neotropical genus *Cycrillum* Knisch, 1921 in some external characters. The generic placement within the genus *Pacrillum* Orchymont, 1941 is discussed in detail.

**Key words.** Hydrophilidae, Sphaeridiinae, Megasternini, *Pacrillum cycrilloideum*, new species, Nepal, Himalaya

### Introduction

*Pacrillum* Orchymont, 1941 is a small sphaeridiine genus containing only three species – *Pacrillum chinense* Orchymont, 1941, *P. manchuricum* Orchymont, 1941, and *P. insulare* Orchymont, 1941. All three species are very similar in their morphology, differing from each other by the coloration of the dorsal surface, appearance of the lateral elytral series and by the male genitalia (HOSHINA & SATÔ 2004). They occur in the Oriental Region (China, Nepal, Philippines) as well as in the East-Palaearctic (China, Japan) (HANSEN 1999, 2004; HEBAUER 2002; HOSHINA & SATÔ 2004).

Recently, the second author found a very odd-looking representative of the tribe Megasternini in the material of Museum für Tierkunde in Dresden (Germany), resembling in many aspects the Neotropical genus *Cycrillum* Knisch, 1921. Closer examination showed that this new species shares the diagnostic characters of *Pacrillum*. In this paper, we describe the species and discuss the systematic position and relationships to *Pacrillum* and *Cycrillum*.

### Material and methods

The study is based on the examination of the specimens listed under Type material below, as well as on additional material of related taxa housed in the collections of both authors.

Label data are cited precisely, using a slash (/) for separating rows on one label, and double-slash (//) for separating data on different labels. Specimens were examined using the binocular microscope Olympus SD 30. Drawings of the male genitalia were prepared from glycerine mounts using a drawing tube attached to an Olympus BX40 microscope; the ventral side drawing was prepared using an ocular grid mounted on the stereomicroscope MBS-10; the microsculpture drawings were traced from a photograph. Morphological nomenclature follows KOMAREK (2004) and FIKÁČEK & BOUKAL (2004).

## Taxonomy

### *Pacrillum cyrilloideum* sp. nov.

(Figs 1-7)

**Type locality.** Nepal, Annapurna Himalaya, 19 km NW of Pokhara, 28°18'57" N, 83°49'59" E, 2100 m a.s.l.

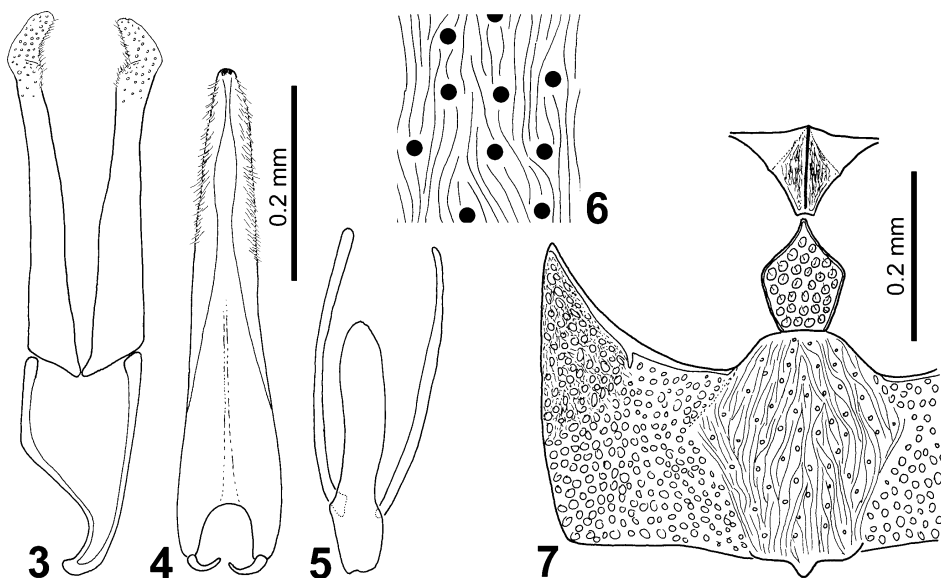
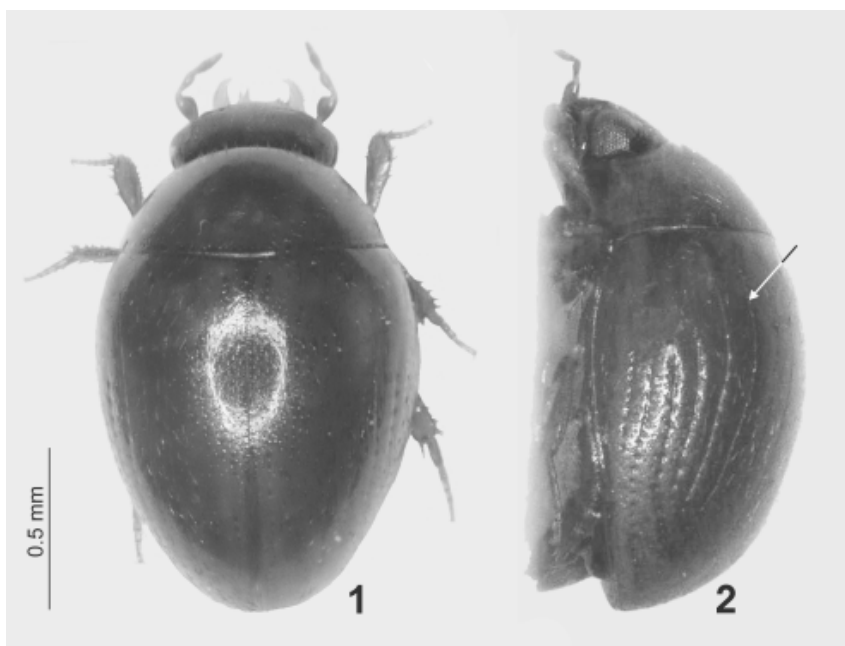
**Type material.** HOLOTYPE: ♂, 'NEPAL, Annapurna S-Himal / westl. Mardi Himal, nördl. / Bhichok/Deurali [= Deorâli] 2100m / N 28°18'57 E 83°49'59 / 10.V.2001 leg. O. Jäger'. PARATYPES: 1 spec., 'NEPAL, Annapurna Reg./ Siklis mts. (n. Pokhara)/ Nyauli-Kharka, small / stream, 2400-2500m / 22.IV.1996, leg. O. Jäger'; 1 spec., 'Nepal-Himalaya 1995 / Annapurna Mts. leg.: / Fabrizi, Schmidt, Jäger // Sikles Mts. 29. VII. / überh. Garlang 2000m'. All specimens bear the red type label 'HOLOTYPE [respectively PARATYPE] / *Pacrillum* / *cyrilloideum* sp. nov. / Fikáček & Hebauer / det. 2005'. All type specimens are deposited in the collection of the Museum für Tierkunde, Dresden (Germany).

**Diagnosis.** Head black, remaining dorsal surface reddish to piceous; dorsal surface sparsely pubescent; pronotum with microsculpture consisting of fine longitudinal furrows; elytral series 3 to 5 developed as punctures not differing from elytral punctuation and connected by a fine line; elytral series 7 shortened basally; preepisternal elevation of mesothorax only indistinctly pubescent.

**Description.** Body strongly convex. Length: 1.45-1.50 mm (holotype 1.50 mm); width: 0.90-1.00 mm (holotype 1.00 mm).

**Coloration.** Head black, pronotum and elytra reddish to piceous; ventral surface dark reddish; mouthparts, antennae and legs reddish.

Head sparsely pubescent with moderately strong but very sparse punctuation; interstices with strong microsculpture consisting of fine transverse furrows. Space between antennal bases with incomplete transverse ridge. Clypeus angulate, narrowly rimmed on anterior margin. Mentum strongly narrowing anteriorly, anterior margin slightly convex, surface with extremely fine and sparse punctuation, interstices with fine mesh-like microsculpture. Ventral tentorial pits distinct, socket-like. Antennae with 8 antennomeres, scapus long, slightly bent and slightly swollen apically, ca. 3x as long as pedicel; antennomere 3 as long as pedicel; antennomeres 4 and 5 very short; antennomeres 6 to 8 forming large, well-defined compact club. Apex of maxillary palpomere 1 strongly and asymmetrically swollen; palpomeres 2 and 3 slender, of equal length.



Figs. 1-7. *Pacrillum cycrilloideum* sp. nov. 1-2 – habitus of paratype. 1 – dorsal view; 2 – lateral view (the arrow shows a fine line of elytral series). 3-5 – male genitalia of holotype. 3 – tegmen; 4 – median lobe; 5 – sternite 9. 6 – microsculpture of pronotal interstices. 7 – ventral surface of paratype (from above: median part of prosternum, preepisternal elevation of mesothorax, and metaventre).

Prothorax. Pronotum transverse, narrowing anteriorly. Punctuation sparse, consisting of small but very distinct setiferous punctures. Interstices with fine, very distinct microsculpture consisting of oblique lines directed laterally from posterior margin of pronotum. Lateral parts of pronotum deflexed, lateral margins rounded, narrowly rimmed. Prosternum with median part highly raised and bearing strong longitudinal carina, without posterior notch; lateral part very narrow in front of procoxae. Antennal grooves distinctly defined, large, reaching lateral margin.

Mesothorax. Scutellar shield longer than wide, bearing a few extremely fine punctures. Elytra with series 1 (i.e. sutural series) and 2 absent; series 3 to 5 very fine, developed as fine sharp line connecting punctures of same appearance as on elytral intervals, nearly reaching elytral base, not impressed; series 6 similar to previous ones but shallowly impressed posteriorly, with serial punctures slightly larger on intervals; series 7 to 10 with all punctures larger than those in intervals; series 7 not reaching elytral base, distinctly impressed; series 8 to 9 distinctly impressed at midlength of elytra, reaching only anterior third of elytra; series 10 reduced, not impressed, consisting of only a few large punctures. Elytral intervals flat near suture, becoming slightly convex laterad. Interval punctuation rather sparse, consisting of small but sharply impressed setiferous punctures; interstices without microsculpture, shiny. Epipleura very narrow, reaching from elytral base to level of metathorax. Preepisternal elevation obtusely pentagonal, ca twice as long as wide, widely contacting metaventricle, with dense punctuation consisting of coarse and sharply impressed punctures, each bearing a very short seta. Grooves for perception of procoxae well developed, shallow.

Metathorax. Metaventricle with elevated median pentagonal area bearing rather sparse punctuation consisting of moderately sized and sharply impressed punctures, interstices with microsculpture consisting of fine longitudinal lines. Lateral parts of metaventricle with very dense punctuation consisting of punctures slightly larger than those on median area and without microsculpture. Femoral lines reduced to very short vestiges on anterior margin of metathorax. Hind wings not examined.

Abdomen with ventrite 1 strongly carinate medially, bearing dense, coarse punctures. Remaining abdominal ventrites not carinate, bearing fine and sparse punctuation.

Legs quite short, femora as long as tibiae; tibiae slightly widened distally, bearing numerous small but stout spines on their inner and especially outer margins; fore tibiae rounded, without apical or subapical excision; tarsi with strong but fine spines ventrally, bearing a few long hairs dorsally; fore and middle tarsi ca as long as tibiae; hind tarsus distinctly longer than hind tibia.

Male genitalia. Parameres ca twice as long as phallobase, poorly sclerotized and slightly widened apically, bearing numerous pore-like sensilla in apical fourth, inner margins of apices with fine pubescence. Phallobase with large asymmetrical basal projection. Median lobe ca. as long as phallobase and parameres combined, narrowing from base to rounded apex; its sides bearing fine but dense pubescence in apical third; corona not developed; base with two strong hook-like projections. Sternite 9 tongue-like medially.

**Differential diagnosis.** Although superficially similar to the species of the genus *Cyrcillum*, *P. cyrcilloideum* sp. nov. shares all basic diagnostic characters of *Pacrillum* used by HANSEN (1991) in his identification key to the megasternine genera. From the remaining species of

*Pacrillum* it differs by a microsculpture consisting of longitudinal furrows present on the pronotum and the metaventre (interstices of the pronotum and the metaventre are smooth in the remaining species) and elytral series 3-5 consisting of small punctures connected by a fine line and thus distinguishable from the interval punctation (series 3-5 are not distinguishable from the interval punctation in the remaining species). Its dark head and paler pronotum and elytra can resemble *P. manchuricum* or paler specimens of *P. chinense*, of which the latter has been collected at the same locality as the new species.

**Variability.** We found no noticeable variability apart from coloration (reddish to dark piceous) in the three type specimens.

**Etymology.** The name reflects the similarity with the representatives of the Neotropical genus *Cyrrillum*.

**Bionomy.** All three specimens were collected on edges of stagnant waters (buffalo pools in a forest and agricultural landscape, localities 'Bhichok/Deurali' and 'überh. Garlang') or slowly running waters (small drying-up stream in a well-preserved forest, locality 'Nyauli-Kharaka') (O. JÄGER, pers. comm.). Sifting samples were taken in the type locality; this limited data suggest that the new species is hygropetric or aquatic, inhabiting edges of both stagnant and running waters. It thus differs from the other species of the genus *Pacrillum* which live in leaf litter and other decaying plant matter not associated with water bodies, and are collected by sifting or using urea traps (H. HOSHINA, pers. comm.).

**Distribution.** So far known only from three localities in the Kaski district (Western Region, central Nepal).

## Discussion

The Neotropical genus *Cyrrillum* contains one described species, *C. strigicolle* (Sharp, 1882) occurring in Central America, and one or two undescribed species from Florida and Brazil (M. FIKÁČEK, unpubl. data). The characters shared by *P. cyrrilloideum* sp. nov. and *Cyrrillum* are as follows: (1) dorsal surface of pronotum longitudinally chagrined; (2) punctures of elytral series 3 to 5 connected by a fine line; (3) elytral intervals slightly convex laterally; and (4) preepisternal elevation of mesothorax with densely arranged punctures bearing only indistinct hairs. All these characters clearly distinguish the new species from the known *Pacrillum* species. However, these surface structures are probably highly variable and/or adaptive (e.g. the presence of a fine longitudinal microsculpture on pronotum in *Cryptopleurum subtile* Sharp, 1884, suggests that this character is convergent in different taxa).

On the other hand, *P. cyrrilloideum* sp. nov. shares the following character states with *P. chinense*: (1) angulate clypeus; (2) transversely chagrined dorsal surface of head; (3) mentum strongly narrowing anteriorly; (4) rounded sides of pronotum; (5) elytral series 1 and 2 reduced; (6) elytral series 7 shortened basally; (7) elytral series 10 shortened apically; (8) femoral lines reduced; and (9) median plate of mesoventrite separated from lateral parts and bearing different punctation. These characters clearly distinguish the new species from the known representatives of *Cyrrillum* and we thus place it into *Pacrillum*. Some of these characters are supposedly more stable (especially the absence of the femoral lines and the presence of a defined median part on the metaventre) because they might reflect internal anatomo-

my and/or mating behaviour and are constant in most known megasternine genera. Moreover, character 2 is not uniform within *Pacrillum* as other species lack the chagration of the head (HOSHINA & SATÔ 2004). The placement is further corroborated by the geographic distribution of both genera.

The position of *P. cyrilloideum* sp.nov. within the genus remains unclear; the contemporary knowledge of the megasternine phylogeny is very poor and allows to distinguish only a few generic groups which are moreover not supported by any phylogenetic analysis. For this reason, we also regard the establishment of a new genus or subgenus for the new species as unfounded; a proper phylogenetic analysis is needed to resolve the relationship of *P. cyrilloideum* sp. nov. to other species of *Pacrillum* and establish the synapomorphy of the shared traits.

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### References

- FIKÁČEK M. & BOUKAL M. 2004: *Pachysternum capense*, new genus and species for Europe and actualized key to genera and subgenera of European Sphaeridiinae (Coleoptera: Hydrophilidae). *Klapalekiana* **40**: 1-12.
- HANSEN M. 1991: The Hydrophiloid Beetles. Phylogeny, classification and a revision of the genera (Coleoptera: Hydrophiloidea). *Biologiske Skrifter* **40**: 1-367.
- HANSEN M. 1999: *World Catalogue of Insects. Volume 2. Hydrophiloidea (s.str.) (Coleoptera)*. Apollo Books, Stenstrup, 416 pp.
- HANSEN M. 2004: Family Hydrophilidae Latreille, 1802. Pp. 44-68. In: LÖBL I. & SMETANA A. (eds.): *Catalogue of Palaearctic Coleoptera. Volume 2. Hydrophiloidea – Histeroidea – Staphylinoidea*. Apollo Books, Stenstrup, 942 pp.
- HEBAUER F. 2002: Hydrophilidae of Northern India and Southern Himalaya (Coleoptera: Hydrophilidae). *Acta Coleopterologica* **18**: 3-72.
- HOSHINA H. & SATÔ M. 2004: First record of the genus *Pacrillum* (Coleoptera: Hydrophilidae) from Japan, with redescription of *P. manchuricum*. *Entomological Review of Japan* **59**: 233-239.
- KOMAREK A. 2004: Taxonomic revision of *Anacaena* Thomson, 1859. I. Afrotropical species (Coleoptera: Hydrophilidae). *Koleopterologische Rundschau* **74**: 303-349.