

Contributions to the taxonomy of the genera *Pachysternum* and *Cyrtonion* (Coleoptera, Hydrophilidae, Sphaeridiinae)

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Abstract: *Pachysternum loxodonta* sp. n. from the Republic of the Congo and *Pachysternum sulawesicum* sp.n. from Sulawesi Island, Indonesia are described. The generic status of *Pachysternum sculpticolle* (Régimbart, 1907) is revised, the species is transferred to the genus *Cyrtonion* and its differences from *C. ghanense* Hansen, 1989 are discussed. Taxonomy of *Pachysternum* is discussed, dividing the genus prelusively into three species groups, one comprising all known Oriental and Eastern Palearctic species, and two comprising the Afrotropical species. Species with unclear positions within the genus *Pachysternum* or with questionable generic status are left as “Species incertae sedis”.

Key words: Taxonomy, Coleoptera, Hydrophilidae, *Pachysternum*, *Cyrtonion*, Afrotropical region, Oriental region.

Introduction

The genus *Pachysternum* Motschulsky, 1863 belongs to the tribe Megasternini of the subfamily Sphaeridiinae. Twenty-one species have been described (HANSEN, 1999; HEBAUER, 2002), but the genus has never been revised and some species are undescribed (e.g., HANSEN, 1990). During the preparation of a previous paper concerning this genus (FIKÁČEK & BOUKAL, 2004), I examined the material from both Afrotropical and Oriental regions deposited in the institutions listed below under Acronyms. This material contained two undescribed species. The genus was found to include species of rather variable morphology, as well as some species with unclear generic position and one species belonging to the genus *Cyrtonion* Hansen, 1989. In this contribution, two new species are described and the generic status of *Pachysternum sculpticolle* (Régimbart, 1907) is revised. In addition, some preliminary conclusions are drawn considering the higher taxonomy of *Pachysternum*.

Material and methods

This study is based on the examination of the specimens mentioned under “Material examined” in all species mentioned in the systematic part. Precise transcriptions of labels attached to type specimens are mentioned, using a slash (/) for dividing the rows on one label, and double-slash (//) for dividing of data on different labels. Material was examined using binocular microscope Olympus SD 30, figures were traced from photographs using the digital camera Olympus C-5060 attached to a binocular microscope Olympus SZX9. Drawings of aedeagophores were prepared from glycerine

preparations using a drawing tube attached to an Olympus BX40 microscope.

The morphological nomenclature follows FIKÁČEK & BOUKAL (2004) (see there for explanation of terms “preepisternal elevation of mesothorax”, “mesoventrite” and “metaventrite”). In the descriptions, elytral intervals are counted without the sutural one, whereas elytral series are counted including the sutural stria.

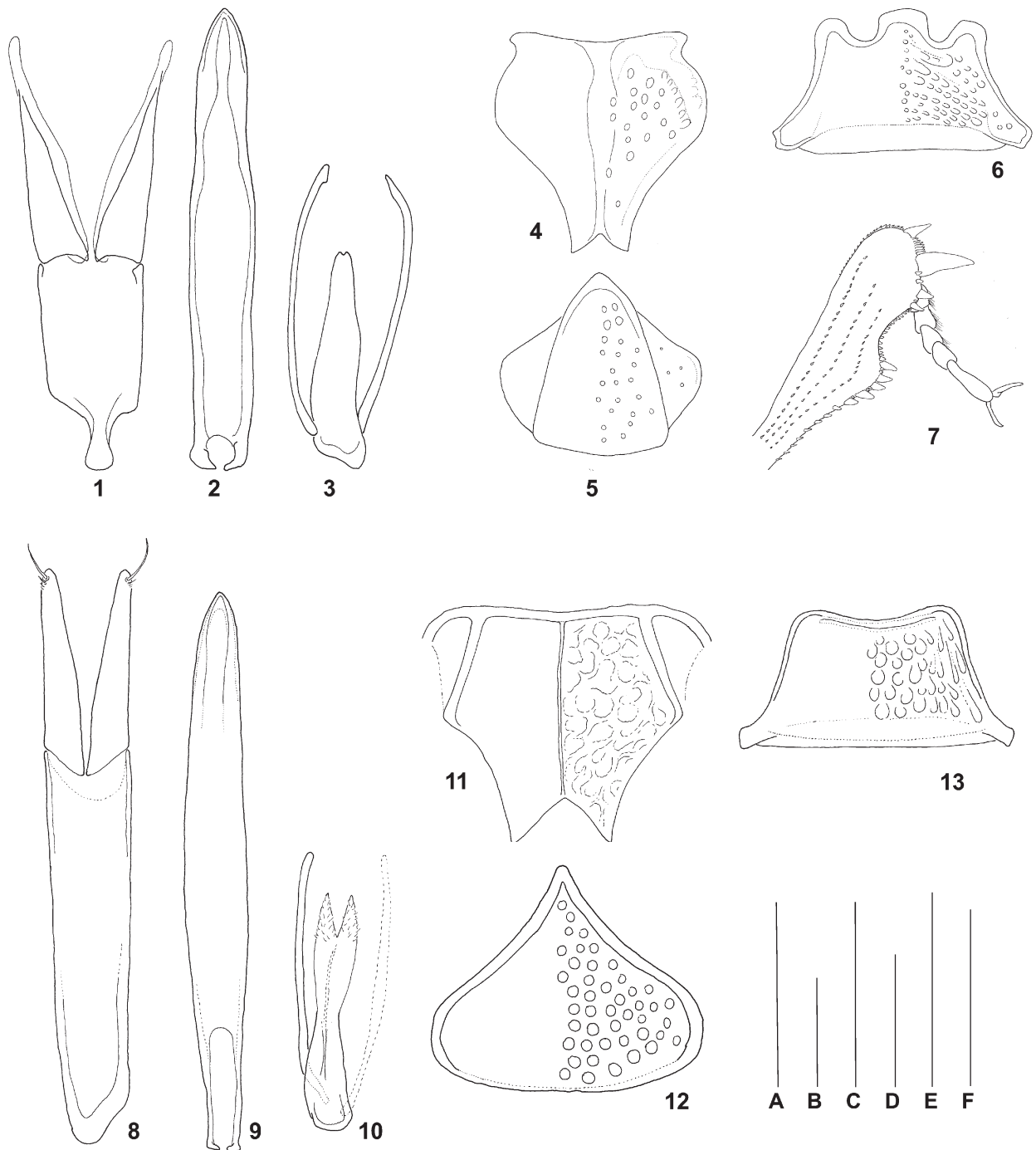
Distributional data mentioned in the list of the species assigned to *Pachysternum* are adopted from HANSEN (1999, 2004), HEBAUER (2002), HEBAUER & RYNDEVICH (2005) and FIKÁČEK & BOUKAL (2004).

Acronyms: ANIC – Australian National Insect Collection, Canberra (A. Slipinski); IRSN – Institut Royal des Sciences naturelles de Belgique, Bruxelles (A. Drumont, P. Limbourg); MFOC – coll. Martin Fikáček (Department of Zoology, Faculty of Science, Charles University, Prague); NHMW – Naturhistorisches Museum, Wien (M. A. Jäch, H. Schönmann, A. Komarek); TTMB – Magyar Természettudományi Múzeum, Budapest (Gy. Szél).

Pachysternum loxodonta sp. n. (Figs 1–7)

Description. Body broadly oval, highly convex. Length: 4.5–5.8 mm; width: 3.1–3.8 mm.

Coloration. Head, pronotum and elytra brown to piceous. Head only with very narrow paler stripe on the transverse ridge between eyes (“false frontal suture”). Apical part of elytra with large rather strongly delimited pale (reddish) spot, its margin going from c. apical 3/5 on interval 1, and to c. apical 1/3 on interval 9, forming a pale stripe on the deflexed lateral part of elytra (i.e. interval 10) reaching to half of elytral length. Mouthparts and antennae pale, reddish to testaceous,



Figs 1–13. *Pachysternum loxodonta* sp. n.: 1 – tegmen; 2 – median lobe; 3 – male sternite 9; 4 – prosternal plate; 5 – preepisternal elevation of mesothorax; 6 – mentum; 7 – right protibia and tarsus, dorsal view. *Pachysternum sulawesicum* sp. n.: 8 – tegmen; 9 – median lobe; 10 – male sternite 9; 11 – prosternal plate; 12 – preepisternal elevation of mesothorax; 13 – mentum. Scales 1 mm (A: Figs 1–3), 0.5 mm (C: Figs 6, 8–10; D: Fig. 7), 0.25 mm (B: Figs 4, 5; E: Fig. 11; F: Fig. 13).

antennal club slightly darker, reddish brown. Ventral side brown to reddish brown. Legs somewhat paler, reddish brown.

Head. Vertex rather fine and not very densely punctated, this punctation consisting of two sizes of punctures, larger ones uniformly mixed with smaller ones. Surface between punctures shining, without microsculpture. Frons (i.e. the part of head in front of

“false frontal suture”) with continuously curved blunt edge arising from the posterolateral part of the frons. Between “false frontal suture” and this edge with strong and rather dense punctation, punctures standing very close to each other, surface apparently rugose. Frons strongly deflexed in front of the edge, with moderately dense punctation consisting of punctures as large as the smaller punctures on vertex. Anterior margin with

distinct rim, angular in shape, with slightly concave median part. Antenna with 9 antennomeres. Mentum wider than long, with rugose surface, anterior margin trilobed, posteriorly with transverse blunt edge (Fig. 6).

Prothorax. Pronotum with very fine and loose punctation, consisting of two types of punctures, the larger ones sized as on the vertex, mixed uniformly with the smaller, much numerous and very fine punctures. Between punctures intensely shining, without microsculpture. Lateral part of pronotum deflexed, lateral margin (at the deflexed part) angular, with only very fine and nearly indistinct rim. Prosternum with sub-pentagonal plate medially (Fig. 4), bearing a median longitudinal carina and a rather deep posterior cleft. Surface of the prosternal plate moderately strongly and densely punctated, between punctures with reticular microsculpture. Antennal grooves deep and large, reaching lateral margin of prosternum.

Mesothorax. Elytron with 10 punctural series. Series 1 and 2 flat, not impressed, consisting of very small and fine punctures, only a bit larger than the punctation of elytral intervals. The punctation of basal part of elytral series becoming distinctly larger laterad, the series becoming also more impressed laterad, series 10 moderately impressed, consisting of very large and rather widely isolated punctures with diameter as large as the width of elytral interval 9. Punctures in all series becoming smaller posteriorly, series nearly indistinct apically. Series 1 to 5 arising close to elytral base, series 6, 8 and 9 shortened basally, arising at basal 1/4 of elytral length, series 7 and 10 arising subbasally. All series except of series 10 reaching apical part of elytra. Punctation of elytral intervals very fine and loose, consisting of two different sizes of punctures near suture. Punctation becoming uniform laterad and apicad, consisting of very fine and laterally nearly indistinct punctures. Between punctures intensely shining, without microsculpture. Lateral parts of elytra (c. interval 10) inflexed. Epipleura narrow, reaching from base to apex of elytra. Preepisternal elevation of mesothorax (Fig. 5) forming pentagonal plate, with two longitudinal carinae arising from anterior top and going to both posterior corners, limiting a triangular area medially. Surface of the elevation rugose, without microsculpture.

Metathorax. Metaventrite broadly contacting posterior margin of preepisternal elevation of mesothorax. Distinct femoral lines reaching from anterolateral corners to posteromedian part of metaventrite, becoming almost indistinct near posterior margin of metaventrite. Whole surface of metaventrite moderately strongly and densely punctated, the punctation becoming somewhat looser anteriorly and posterolaterad, interstices without microsculpture.

Legs. Protibiae flattened and widened proximally, its lateral margin strongly sinuated, anterolaterally with one rather long and stout spine, and some smaller spines, on the dorsal surface with three longitudinal rows of fine setae (Fig. 7). Meso- and metatibiae some-

what widened proximally, without any sinuation, proximally bearing numerous small spines. Protarsi somewhat shorter, meso- and metatarsi as long as tibiae.

Abdomen with five ventrites. Ventrite 1 with median longitudinal carina, bearing rather strong and moderately dense punctation anteriorly, punctures becoming much smaller posteriorly, totally missing on posterior margin. Surface between punctures microreticulate. Ventrites 2 to 5 ecarinate, with very fine and loose punctation on brightly shining surface without microsculpture.

Male genitalia (Figs 1–3). Parameres slightly longer than phallobase, continuously narrowed apicad, inner margin slightly convex in basal half. Phallobase with rather long posteriorly narrowed manubrium. Median lobe slightly longer than tegmen, nearly parallel-sided in whole length (except of basal half and apical fifth, here slightly narrowed), apically narrowed into a blunt apex, sinuated in shape in the lateral view. Sternite 9 continuously narrowed from base to apex.

Variability. On account of the low number of examined specimens, the variability of this species cannot be discussed here. All examined specimens are fully identical in all characters, they only vary in size (see the beginning of the description for details).

Material examined. Holotype: “Soil-Zoological Exp. / Congo-Brazzaville / Lefinie reservation / Nambouli river [ca. 3°00'S; 15°30'E] // 12.1.1964 No. 658 / sifted and singled / from elephant (sic!) excrement / leg. Endrödy-Younga”, male (dissected) (TTMB). **Paratypes:** same label data as holotype, 2 ♀♀ and 1 unsexed spec. (TTMB), 1 unsexed spec. (MFOC).

Etymology. Derived from latin name of African Elephant (*Loxodonta africana* Blumenbach, 1797) – this should indicate the size of the species as well as its biometrics (found in elephant excrements).

Differential diagnosis. This species belongs to the group of *Pachysternum* bearing a carinate prosternal plate and a distinctly sinuate lateral margin of protibia. In this character it differs from all other Afrotropical *Pachysternum*, because the other species have either not carinate prosternal plate (*P. impressum* Balfour-Browne, 1957, *P. capense* (Mulsant, 1844), *P. capillatum* d'Orchymont, 1942, *P. macarthuri* Balfour-Browne, 1948 and *P. brunneum* Balfour-Browne, 1951) or carinate prosternal plate but not sinuated lateral margin of protibiae (*P. wittei* Balfour-Browne, 1950, *P. gestroi* d'Orchymont, 1924, *P. sulcatum* Balfour-Browne, 1950, *P. villosum* (Régimbart, 1907), *P. burgeoni* (d'Orchymont, 1942) and *P. malcolmi* Balfour-Browne, 1980). Among the Oriental species, only *P. nigrovittatum* Motschulsky, 1863 and *P. nigratum* Jia, Wu et Pu, 1998 bears this combination of characters, but except of the different distributional pattern, these species are distinctly smaller in size and differ from *P.*

loxodonta sp. n. by general coloration and morphology of male genitalia.

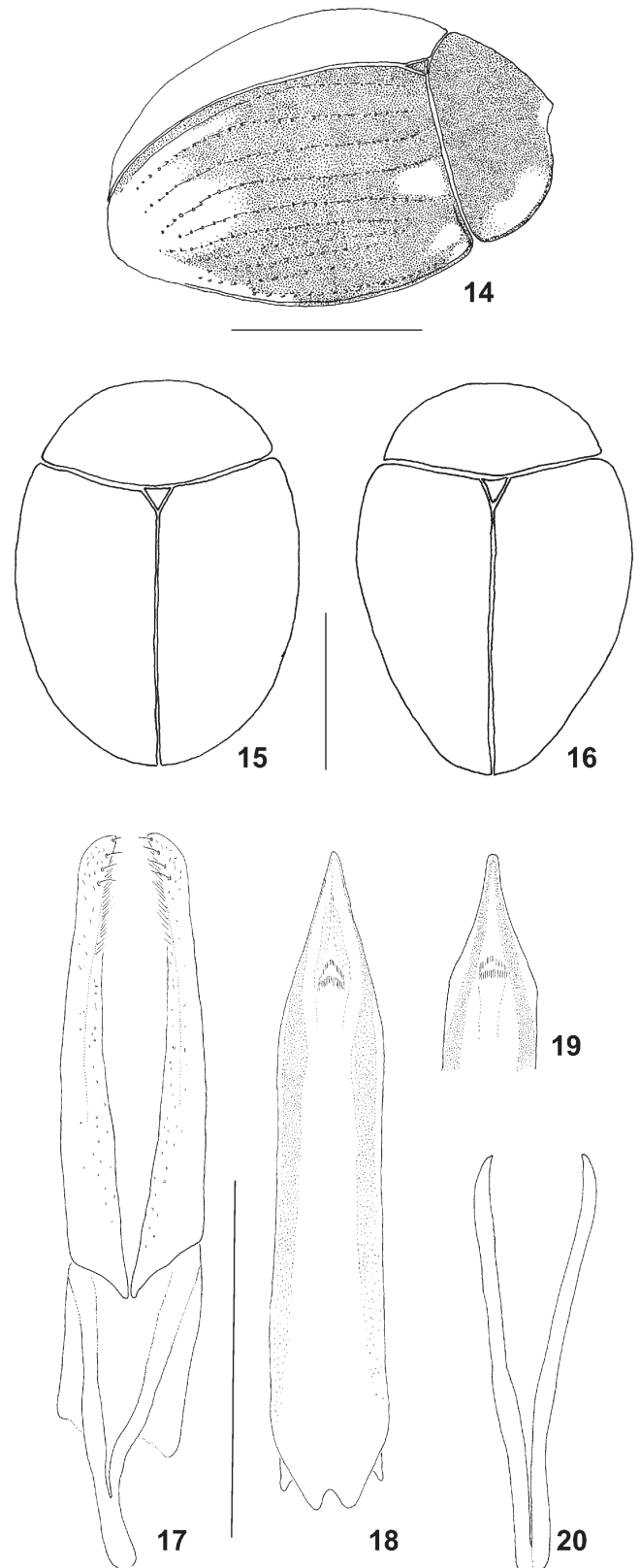
Pachysternum sulawesicum sp. n. (Figs 8–16)

Description. Body moderately convex, oval in male (Fig. 15), with marked elytral “shoulders” and somewhat more elongated and narrowed posterioriad in female (Fig. 16). Length: 2.5–3.6 mm; width: 1.5–2.2 mm.

Coloration (Fig. 14). Dorsal face largely dark reddish-brown. Head with clypeus, middle part of frons and pronotum laterally with rather large reddish spots along the anterior and lateral margins, posteriorly reaching nearly but not fully to the posterolateral pronotal angle. Scutellum with a little paler median part. Elytron with a pale reddish spot basally between elytral series 4 and 5 and another two closely associated spots basally in the humeral area. Apically with rather large, pale and not sharply limited trilobed apical spot reaching to apical third or half on intervals 1, 3 to 6 and 9 to 10; on the intervals 2 to 3 and 7 to 8 not extending so basad. Ventral side of body dark brown, with pale reddish ventral side of the head, inflexed parts of pronotum. Median parts of prosternal plate, preepisternal elevation of mesothorax, posterior margin of abdominal ventrites 1 to 4 and whole abdominal ventrite 5 paler. Mouthparts and antennae pale reddish, only antennal club slightly darker. Legs pale reddish, only with median and posterior parts of femora brown.

Head. Punctuation of vertex, frons and clypeus rather strong and moderately dense, only slightly looser near the incomplete transverse ridge between antennae. Interstices shining and flat, without microsculpture. Anterior margin of clypeus distinctly rimmed, angular, with slightly convex median part. Antenna with 9 antennomeres. Mentum wider than long with very large and closely aggregated punctures, merging anteriorly and laterally in longitudinal sulci, interstices flat, without microsculpture. Anterior margin of mentum slightly bilobed, posterior part of mentum with transverse blunt edge (Fig. 13). Gula present, narrow and widened posterioriad, postero-medially with a sharp longitudinal ridge.

Prothorax. Pronotum with rather strong and moderately dense punctuation consisting of two types of punctures, larger ones sized as on vertex, uniformly mixed with smaller, numerous and rather fine punctures. Along posterior margin with a row of larger and rather shallow punctures. Interstices shining, without microsculpture. Lateral part of pronotum deflexed, lateral margin (at the deflexed part) waved in shape, with very distinct bead. Prosternum medially with subpentagonal plate (Fig. 11), slightly roof-like, with only vaguely marked median longitudinal carina (but see variability!), and a deep posterior cleft. Surface of prosternal plate with rugose sculpture. Lateral parts of prosternal plate with an elevated rim. Antennal



Figs 14–20. *Pachysternum sulawesicum* sp. n.: 14 – coloration of dorsal side; 15 – body outline, male; 16 – body outline, female. *Cyrtonion ghanense*: 17 – tegmen; 18 – median lobe; 20 – male sternite 9. *Cyrtonion sculpticolle*: 19 – apical part of median lobe. Scale 1 mm (Figs 14–16), 0.5 mm (Figs 17–20).

grooves very deep and large, reaching lateral margins of prosternum.

Mesothorax. Scutellum triangular, bearing only a few fine punctures, surface flat and shining, without microsculpture. Elytron with 10 punctural series. Series 1–9 slightly impressed, series 10 rather strongly impressed; apically all series becoming not impressed and flat. Series 1 to 6 consisting of rather small and fine punctures not very larger than the punctation of elytral intervals and connected by a fine, sharply impressed stria; series 7, 8 and 10 consisting of punctures distinctly larger than those on elytral intervals and distinctly larger in the middle of the series, connected by only indistinctly impressed stria. Series 9 with punctures slightly smaller than in series 7, 8 and 10, the punctures not larger in the middle of the series and not connected by impressed stria. Series 1 to 5 and 10 arising close to elytral base, series 6 and 7 arising slightly more apicad than series 1 to 5, series 8 and 9 arising at c. basal sixth of elytral length. All series except series 10 reaching to apical area of elytra, serie 10 shortened, reaching apical third of elytral length. Interval punctation rather fine and loose, becoming rather looser and less distinct apicad; laterally with punctures becoming rasp-like. Surface between punctures without distinct microsculpture near scutellar shield, becoming distinctly mesh-like microsculptured laterad and apicad. Narrow lateral part of elytra (c. last elytral interval) inflexed, concealed in dorsal view. Epiplura rather narrow, reaching elytral apex. Ventral side of mesothorax with preepisternal elevation forming a subpentagonal flat plate without longitudinal carina, bearing rather strong and dense punctation, interstices with fine mesh-like microsculpture; with narrow bead on the margins (Fig. 12).

Metathorax. Metaventricle broadly contacting posterior margin of preepisternal elevation of mesothorax. Femoral lines distinct, reaching from anterolateral corners to posteromedian part of metasternum. Median part of metaventricle rather strongly and not very densely punctated; each puncture bearing long whitish seta; interstices flat and shining, without microsculpture. Laterally to femoral lines and in anterolateral corners of metaventricle with rugose surface.

Legs. Protibiae flattened and widened proximally, without any sinuation on lateral margin, bearing a row of short and strong spines on this margin and three rows of fine spines on dorsal surface. Meso- and metatibiae somewhat widened proximally, without any sinuation, proximally bearing numerous small spines. Pro-tarsi somewhat shorter, meso- and metatarsi as long as tibiae.

Abdomen with five ventrites, ventrite 1 with medial longitudinal carina, bearing very strong and dense punctation on the whole surface except of posterior margin. Ventrites 2 to 5 ecarinate with fine and loose punctation; interstices slightly to nearly indistinctly microsculptured.

Male genitalia (Figs 8–10). Phallobase c. twice as

long as parameres, 4.5 times as long as wide, basally without sclerotized manubrium. Parameres continuously narrowed apicad, apically bearing rather long and strong seta. Median lobe rather long and narrow, slightly widened in the median part. Sternite 9 with median part bilobed apically.

Variability. Though there were only 14 specimens of this species at my disposal, they show a rather wide variability in morphology of the prosternal plate and in the character of the microsculpture of the elytra and the ventral side of the body. The median longitudinal carina of the prosternal plate is differently developed in various specimens, being rather strong and distinct in some individuals, but nearly absent and indistinct in the others (including the holotype). This type of variability is rather remarkable within the genus *Pachysternum*, because the presence/absence of the median longitudinal carina on the prosternal plate is rather constant in all other examined species of the genus and was thus used as the taxonomically valuable character by previous authors. All examined specimens of *P. sulawesicum* are fully identical in most other characters and the reduction of the median carina of prosternum shows some intermediate states between very distinct and nearly absent. Therefore all specimens are considered conspecific. The microsculpture has been found to be slightly variable both on elytra, prosternal plate and preepisternal elevation of mesothorax. On elytra it is very vaguely developed and not reaching the mediobasal parts of the elytra in some specimens, but rather distinct and present nearly on the whole surface of the elytra in others.

Material examined. Holotype: “S – Sulawesi 1992 / Umg. Malino (27) / E Ujung Pandang [3°43' S; 119°46' E] / leg. Jäch 29.IV. // (♂)” male (dissected) (NHMW). **Paratypes:** same label data as in holotype, 1 spec. (NHMW); “S – Sulawesi 92 / Umg. Malino (27) / leg. Schödl 29.4.” 2 ♂♂, 3 ♀♀, 6 unsexed spec. (NHMW); “N-Sulawesi 1992 / Umg. Modindingo / NÖ Kotamobegu (12) / leg. Schödl 19.IV. // ♂”, 1 ♂ (NHMW).

Etymology. Derivated from the name of Sulawesi Island where the type specimens have been found.

Differential diagnosis. This new species differs from all known Oriental and east Palearctic *Pachysternum* species according to the coloration – *P. sulawesicum* sp. n. lacks the pale stripes on alternate elytral intervals (as in *P. cardoni* Orchymont, 1926 and *P. nigrovittatum* Motschulsky, 1863) or pale bases of elytral intervals 1 to 4 and the pale elytral apex (as in *P. stevensi* Orchymont, 1926), but bears distinct pale spots on the base of elytral interval 4, in the humeral area and on the elytral apex. Except of this character, specimens with apparently not carinate prosternal plate differ from all other Oriental and Palearctic species of the genus by the combination of not carinate prosternal plate and

outer margin of protibiae lacking the sinuation. Specimens with distinct median longitudinal carina on the prosternal plate are most similar to *P. stevensi*. From this species they can be easily distinguished according the coloration of elytra, with 3 isolated spots on elytral base in *P. sulawesicum* sp. n. but only one continuous spot in *P. stevensi* – for the drawing of the coloration of *P. stevensi* see SATÔ (1979), smaller and loosely distributed interval punctures on elytra and by serial punctures in the elytral series 1 to 5 being c. as large as the interval punctation on elytra (in contrast to very distinctly larger serial punctures in *P. stevensi*).

P. sulawesicum sp. n. can be distinguished from all Afrotropical species by morphology of the aedeagus, presence of sexual dimorphism, hairless surface of elytra, presence of two types of punctures in pronotal punctation and fully developed femoral lines.

Revision of the generic status of *Pachysternum sculpticolle*

Cyrtionion sculpticolle (Régimbart, 1907) comb. nov.

Cryptopleurum sculpticolle Régimbart, 1907

Pachysternum sculpticolle (Régimbart, 1907): BALFOUR-BROWNE (1958)

Pachysternum bullatum Balfour-Browne, in coll.: BALFOUR-BROWNE (1958)

Examined type material. Paratype: “Is. Fernando Poo / ‘Basile’ [3° 42’ N; 8° 48’ E] / 400–600 m.s.m. / VIII–IX. 1901 L. Fea (printed label) // sculpticolle (in handwritten) // Cotype (in handwritten) // Coll. A. d’Orchymont (pinted label) // Cryptopleurum / sculpticolle / Rég. / d’Gestro leg. 1921 (in handwritten) // Paratype (red printed label)” 1 ♂ (IRSN).

Note. The data of the examined specimens agree with those given by RÉGIMBART (1907) in the original description. However, in Régimbart’s paper the number of species and designation of holotype and paratypes is not mentioned. It may therefore be that the examined individual is in fact not a paratype specimen (as given on the label below it) and that the lectotype and paralectotypes of this species have to be designated. As I have not seen any specimens from Régimbart’s collection in Paris, it is not appropriate to designate the examined specimen as lectotype at the present time. This problem is still awaiting clarification.

Differential diagnosis. In all external characters this species fully corresponds with *C. ghanense* Hansen, 1989, differing from this species only by the shape of the median lobe, mainly in its apical part. In *C. sculpticolle* the general shape of the median lobe is narrower than in *C. ghanense*, and its apical part is rather more prolonged and narrower apically, with slightly concave subapical lateral margins (in *C. ghanense* the apex is

shorter, wider, with straight lateral margins (Figs 18, 19).

Remarks. The external morphology and the morphology of the male genitalia of this species show distinct differences from that of the representatives of the genus *Pachysternum*. The pronotum bears two submedian highly raised bulges anteriorly, the elytra have highly raised intervals widened into small bulges; the male genitalia have a partly reduced phallobase (as in Fig. 17) and the sternite 9 with fully reduced median part (as in Fig. 20). These differences in characters are apt to separate this species from the genus *Pachysternum*. This species fully corresponds in all generic features with *Cyrtionion ghanense* and is thus assigned to the genus *Cyrtionion*.

The partial reduction of the phallobase with fully missing posterolateral parts, as well as the fully reduction of the median part of the sternite 9 is rather unusual within the tribe Megasternini, and it is not present in any other genus as far as I have seen.

Cyrtionion ghanense Hansen, 1989

Examined type material. Paratype: “Ghana E. R. / MT. Atewa [6° 15’ N 0° 33’ W] / rainforest / R. W. Taylor, 17–20 Oct 68 // ANIC / Berlese / No. 126 // PARATYPE / Cyrtionion / ghanense / M. Hansen”, 1 ♂ (ANIC).

Additional examined material: Congo: Soil-Zoological Exp., Congo-Brazzaville, Sibiti, IRBO, rain forest, 25.XI. 1963, sifted fallen oilpalm fruits, leg. Endrödy-Younga, 1 ♂ (TTMB); Soil-Zoological Exp., Congo-Brazzaville, Bouenza, catarract, 30.XI.1963, sifted in float, leg. Endrödy-Younga, 1 ♂ (TTMB).

Differential diagnosis. See the differential diagnosis under *C. sculpticolle*.

Remarks. The slight difference in the shape of the apical part of the median lobe in *C. ghanense* and *C. sculpticolle* seems to be a rather poor character for separating these two species and it is rather possible that the difference in its shape is due to variability. However, because of the very few specimens at my disposal, I cannot discuss the variability of this character and for the time being it is therefore impossible to synonymize *C. ghanense* with *C. sculpticolle*. More material is needed to confirm the specific difference of these two species.

Preliminary conclusions on higher taxonomy of *Pachysternum*

From a taxonomical point of view, the situation within the genus *Pachysternum* illustrates the uncertain general contemporary concept of the whole tribe Megasternini. The genus was originally established by MOTSCHULSKY (1863) for two morphologically rather well defined species occurring in the Oriental region. Later, the generic concept was widened and applied

also to some Afrotropical species by ALLUAUD (1899). After that, *Pachysternum* was alternatively regarded either as subgenus of *Cryptopleurum* (KNISCH, 1921) or as a group with doubtful taxonomic status (ORCHYMONT, 1924). Later, it was again treated as a valid genus by both A. d'Orchymont and J. Balfour-Browne. Many additional species were provisionally assigned to this genus assuming that "the exact limits of the genus are not yet adequately defined" (BALFOUR-BROWNE, 1957). The genus *Pigrillum* was then synonymised with *Pachysternum* by BALFOUR-BROWNE (1980). In order to include the three species which were classified at this time as *Pigrillum*, the generic status of *Pachysternum* had to be widened once more. Recently, HANSEN (1991) performed a tribal-level revision of the Hydrophiloidea including the tribe Megasternini. In this work, the generic concept of *Pachysternum* was based on the examination of a restricted number of species ("*P. nigrovittatum* Motschulsky (ts), *P.* sp.* and various unidentified spp." (HANSEN, 1991, p. 274)). The concept of *Pachysternum* was narrowed again, and many of the species assigned to *Pachysternum* by previous authors began no longer fitted this concept, even if they are still listed in *Pachysternum* by HANSEN (1999). HANSEN (1989, 1991) applied this generic concept also to the material examined by him. The genus *Cyrtonion* with *C. ghanense* was established by HANSEN (1989) who was unaware that this species is in fact closely related to other species classified so far as *Pachysternum* (see above for revision of the generic status of this species and comments on the genus *Cyrtonion*). This situation demonstrates rather clearly that the generic revision made by HANSEN (1991) did not solve all the taxonomic problems within Megasternini and in some cases probably added some new ones.

The contemporary situation within the tribe Megasternini can be solved only by a phylogenetic analysis. For clarifying the taxonomic confusion within the genus *Pachysternum* and in order to prepare a phylogenetic study, I herewith propose preliminary species groups without taxonomic rank within the genus *Pachysternum*.

List of the species assigned to *Pachysternum* by HANSEN (1999)

(Explanations: * specimens not examined, data on morphology of the species taken from literature; ° species examined, but not male genitalia.)

Pachysternum nigrovittatum group:

- P. apicatum* Motschulsky, 1863, India, Indonesia, Malaysia, Vietnam
- P. cardoni* d'Orchymont, 1926, India
- ° *P. coomani* Orchymont, 1926, Vietnam
- P. curvatum* Orchymont, 1925, Philippines
- P. haemorrhoum* Motschulsky, 1866, China, Japan, Korea, Mongolia, Russia, Philippines

- P. haemorrhoum sibiricum* Kuwert, 1890, China, Mongolia, Russia
- P. nigrovittatum* Motschulsky, 1863, China, India, Singapore, Sri Lanka, Vietnam
- P. nigratum* Jia, Wu et Pu, 1998, China
- P. stevensi* Orchymont, 1926, China, India, Nepal, Vietnam
- P. sulawesicum* sp. n., Indonesia

Pachysternum capense group:

- ° *P. brunneum* Balfour-Browne, 1951, Yemen
- P. capense* (Mulsant, 1844), Comoros, Guinea, Kenya, Mascarene Is., ?Rwanda, South Africa, Tanzania, Togo; Canary Isl., Italy, Greece
- P. capillatum* Orchymont, 1942, Zaire
- P. loxodonta* sp. n., Congo
- P. macarthuri* Balfour-Browne, 1947, Kenya

Pachysternum villosum group:

- P. burgeoni* (d'Orchymont, 1942), Zaire
- P. villosum* (Régimbart, 1907), Cameroon, ?Gabon, Guinea

Species *incertae sedis* (with unclear position within *Pachysternum* or with questionable generic status)

- P. gestroi* Orchymont, 1924, Kenya, Zaire
- * *P. impressum* Balfour-Browne, 1957, Burundi
- * *P. keralense* Hebauer, 2002, India
- * *P. malcolmi* Balfour-Browne, 1980, Zaire
- * *P. sulcatum* Balfour-Browne, 1950, Rwanda
- * *P. wittei* Balfour-Browne, 1950, Zaire

Species not belonging to the genus *Pachysternum*:

- P. sculpticolle* (Régimbart, 1907) – belonging to the genus *Cyrtonion*, see above.

Comments. On the basis of the morphology of the male genitalia and the presence/absence of secondary sexual dimorphism in body shape, the species belonging to this genus according to the current concept (HANSEN, 1999) can be divided into two groups:

(a) Species from Oriental and eastern Palearctic regions: secondary sexual dimorphism in body shape present (see Figs 15, 16) – males with rounded body-shape, females with distinct "shoulders" on elytral base, elytra narrowing apicad; median lobe of aedeagus very long, slightly widened in median third of length; parameres much shorter than phallobase; phallobase rather long, with short and wide manubrium (as in Fig. 8).

(b) Species from Afrotropical Region and Europe: secondary sexual dimorphism in body shape missing; aedeagus with median lobe shorter and wider, parameres as long as phallobase or longer, phallobase short and wide, with rather long and strongly sclerotized manubrium (as in Fig. 1).

The correlation of the three characters (the two given above and the distribution of the species as the

third one) is rather remarkable. The examination of aedeagi of the Oriental and Eastern Palearctic species show that there are at most only minute interspecific differences in the morphology of the aedeagus. This can indicate that the Oriental and Eastern-Palearctic species form a distinct species group (*P. nigrovittatum* group) which is rather isolated from all species distributed in the Afrotropical region and in Europe. The only Oriental species which does not fit in this concept is *P. keralense*. I have not examined this species, however, its aedeagus (see HEBAUER, 2002, Fig. 22) differs in all aspects from the aedeagi of the remaining Oriental species described here. Therefore I include this species into the “Species *incertae sedis*” group.

The Afrotropical species (i.e. the group (b) mentioned above) assigned to the genus *Pachysternum* by HANSEN (1999) seem to be rather variable in regard to the external morphology and morphology of male genitalia as well. This is partly due to the possible incorrect generic position of some species (see the “Species *incertae sedis*” above). Taking these “questionable” species not into account, the Afrotropical species can be divided into two groups, which were recognized also by BALFOUR-BROWNE (1950): “*Pachysternum capense* group” corresponding with “Afrotropical *Pachysternum*” and “*Pachysternum villosum* group” corresponding with the species assigned by this author within the genus *Pigrillum* Knisch, 1921 (this genus was synonymized with *Pachysternum* by BALFOUR-BROWNE (1980) on the basis of absence of differential characters). To distinguish these two groups, the presence/absence of the long superficial pubescence and the shape of protibia are used (the members of *P. villosum* group bear distinct pubescence and entire, non-sinuated lateral margin of protibia). However, at least one undescribed species of *P. capense* group (in coll. the Natural History Museum, London) bears also sparse pubescence on elytra. This contradictory result demonstrates that more precise examination of all species is necessary for finding reliable differential characters of both groups.

Within “Species *incertae sedis*” are included those species whose position within *Pachysternum* is rather questionable, or which cannot be included in either of the three groups mentioned above. The reason for including *P. keralense* was already mentioned above. From the remaining species I have examined only specimens of *P. gestroi*, which do not fit the characters of the *P. nigrovittatum* species group and differ from the Afrotropical *Pachysternum* species by the following characters: body shape prolonged, moderately convex; head and pronotal punctation consisting of small star-like punctures of the same size; head with incomplete “false frontal suture”; protibiae not sinuated laterally. The remaining species are mentioned in the literature to be rather similar to *P. gestroi* or not fitting well the generic status of *Pachysternum*, thus they are included also in this group, even if they were not examined.

The reasons for excluding of *P. sculpticolle* from

the genus *Pachysternum* and its position inside of *Cyrtotonia* was already discussed above.

To sum up all these preliminary conclusions, it is probable that the genus *Pachysternum* according to the concept of HANSEN (1999) includes three species groups and some species whose generic position has to be re-examined. From the three species groups, one is formed by all known Oriental and Eastern Palearctic species except of *P. keralense* and is rather isolated from the other two groups. These are distributed in the Afrotropical region only, with *P. capense* (Mulsant, 1844) overlapping with W Europe (FIKÁČEK & BOUKAL, 2004; HEBAUER & RYNDEVICH, 2005). The relationships of all three groups, the differential diagnoses for both Afrotropical groups, the differential diagnosis distinguishing the genus *Pachysternum* from related genera as well as the generic positions of all species clustered under the name *species incertae sedis* group have to be examined.

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FAUNISTICAL NOTES

First faunistic records of chironomids (Diptera, Chironomidae) from Slovakia

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During the study of the macroinvertebrate fauna of the Hron River and man-made reservoirs in the Banská Štiavnica mine region (C Slovakia), chironomids were collected as pupal exuviae. Seven species of these were recorded in Slovakia for the first time. Material was sampled from the water surface along the river and lake banks with a 200 μm mesh net attached to a 1.5 m long pole. Exuviae were mounted in Berlese fluid on slides and identified by the author, using the key by LANGTON (1991) and LANGTON & VISSER (2003). Material is deposited in the working place of the author.

The last check-list of Slovak Chironomidae consisted of 351 valid species (BITUŠÍK, 2004). Meanwhile, information about nine species new to Slovakia have been published (HAMERLÍK, 2005). The updated chironomid list currently comprises 367 species after inclusion of the species mentioned below.

Arctopelopia barbatarsis (Zetterstedt, 1850)

Material examined: S Slovakia, Hron River, Kalná n. Hronom (48°12'04" N, 18°31'23" E), 157 m a.s.l., 3.VII.2003, 5 pupal exuviae, leg. P. Bitušík; S Slovakia, Hron River, Bíňa (47°55'15" N, 18°38'45" E), 3.VII.2003, 117 m a.s.l., 4 pupal exuviae, leg. P. Bitušík.

Remarks: Material was collected from the lowland section of the river.

Distribution: Europe and Near East (SÆTHER & SPIES, 2004).

Thienemannimyia pseudocarnea Murray, 1976

Material examined: S Slovakia, Hron River, Jur n. Hronom (48°07'47" N, 18°36'41" E), 142 m a.s.l., 30.V.2003, 1 pupal exuvium, leg. P. Bitušík.

Remarks: Pupal exuvium was found in the lowland section of the river.

Distribution: Species is known from Europe (SÆTHER & SPIES, 2004).

Psectrocladius (Psectrocladius) brehmi Kieffer, 1923

Material examined: C Slovakia, Štiavnické vrchy Mts, Červená studňa reservoir (48°28'08" N, 18°53'06" E), 787 m a.s.l., 31.V.2004, 1 pupal exuvium, leg. M. Čerňanská.

Remarks: Pupal exuvium was collected from small, shallow reservoir overgrown with macrophytes.

Distribution: Europe and North Africa (SÆTHER & SPIES, 2004).

Stictochironomus pictulus (Meigen, 1830)

Material examined: C Slovakia, Štiavnické vrchy Mts, Ottergrundská nádrž reservoir (48°27'41" N, 18°52'51" E), 801 m a.s.l., 31.V.2004, 3 pupal exuviae, leg. M. Čerňanská.

Remarks: Material was found in small, shallow reservoir.

Distribution: Holarctic distribution pattern (SÆTHER & SPIES, 2004)

Cladotanytarsus vanderwulpi (Edwards, 1929)

Material examined: S Slovakia, Hron River, Kalná n. Hronom (48°12'04'' N, 18°31'23'' E), 157 m a.s.l., 3.VII.2003, 1 pupal exuvium, leg. P. Bitušík; S Slovakia, Hron River, Jur n. Hronom (48°07'47'' N, 18°36'41'' E), 142 m a.s.l., 30.V.2003, 1 pupal exuvium, leg. P. Bitušík.

Remarks: Material was collected from the lowland section of the river.

Distribution: Palaearctic species (SÆTHER & SPIES, 2004)

Paratanytarsus grimmii (Schneider, 1885)

Material examined: C Slovakia, Štiavnické vrchy Mts, Krechsengrundská nádrž reservoir (48°25'39'' N, 18°50'53'' E), 740 m a.s.l., 31.V.2004, 1 pupal exuvium, leg. K. Buchláková.

Remarks: Species was found in small, shallow reservoir overgrown with macrophytes.

Distribution: worldwide: Holarctic, Australian and Neotropical regions (SÆTHER & SPIES, 2004).

Tanytarsus sylvaticus (van der Wulp, 1859)

Material examined: C Slovakia, Štiavnické vrchy Mts, Veľká Richňava reservoir (48°25'39'' N, 18°50'53'' E), 725 m a.s.l., 31.V.2004, 1 pupal exuvium; Malá Richňava reservoir (48°25'46'' N, 18°50'45'' E), 725 m a.s.l., 26.IV.2004, 3 pupal exuviae, leg. K. Buchláková.

Remarks: Pupal exuviae were collected both in deep, dimictic and shallow reservoirs Distribution: widely distributed in Europe (SÆTHER & SPIES, 2004).

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