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Notes on Aloninae Dybowski & Grochowski, 1894 *emend.* Frey, 1967 (Cladocera: Anomopoda: Chydoridae): 3. *Alona iheringula* nom. nov. instead of *A. iheringi* Sars, 1901, with comments on this taxon

Заметки о подсемействе Aloninae Dybowski & Grochowski, 1894 *emend.* Frey, 1967 (Cladocera: Anomopoda: Chydoridae): 3. *Alona iheringula* nom. nov. вместо *A. iheringi* Sars, 1901, с комментариями по поводу этого таксона

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КЛЮЧЕВЫЕ СЛОВА: Cladocera, Anomopoda, Chydoridae, Aloninae, таксономия, nomen novum, неотропическая зона, Южная Америка.

ABSTRACT. *Alona iheringi* Sars, 1901 (Cladocera: Anomopoda: Chydoridae: Aloninae), being a separate Neotropical taxon from *A. costata*-group, is a junior homonym of *Alona davidi* var. *iheringi* Richard, 1897. We suggested *Alona iheringula* nom.nov. to replace the invalid Sars' name. Differences between male of this species and other species of *costata*-group are described.

РЕЗЮМЕ. *Alona iheringi* Sars, 1901 (Cladocera: Anomopoda: Chydoridae: Aloninae), специфический неотропический таксон из группы *A. costata*, является младшим омонимом *A. davidi* var. *iheringi* Richard, 1897. Мы предлагаем название *Alona iheringula* nom. nov. для замещения невалидного названия Сарса. Описаны отличия самца *A. iheringula* nom. nov. от самцов других видов группы *costata.*

Dr H. von Ihering collected in vicinities of São Paulo (Brazil) a sample of dried mud and sent it to G.O. Sars, one of the most famous cladocerologists for all history of crustacean investigations. Sars [1901] hatched from this mud a series of Neotropical species, including a new species of *Alona*, named by him as *Alona iheringi* Sars, 1901. The description was quite detailed in standards of that time [Sars, 1901: 49-51]: "Specific Characters. — Female. Carapace, seen laterally, oval quadrangular in form, greatest height somewhat in front of the middle, posterior extremity obtusely truncate, with the upper corner sub-obsolete, lower broadly rounded, dorsal margin boldly arched in front, ventral almost straight. Head somewhat procumbent, with the dorsal margin slightly arched, rostral projection not much produced. Surface of shell quite smooth, without the slightest trace of the usual longitudinal striae, lower edges of valves minutely setiferous. Ocellus rather large, though a little smaller than the eye, and placed somewhat nearer to it than to the tip of the rostrum. Antennulae and antennae of normal appearance. Lip-plate large and evenly curved below. Caudal part rather strongly built, and somewhat narrowed distally, dorsal edge below the anal orifice very slightly curved, and armed on each side with about 10 strong denticles, lateral denticles absent, supra-anal projection well marked, lower corner somewhat produced and narrowly rounded, caudal claws strong, with a well-marked denticle at the base. — Male somewhat smaller than female; with the head more erect, and the carapace slightly widening behind. Caudal part very unlike that of female, conical in form, gradually tapering distally, supra-anal projection obsolete, marginal denticles much reduced, caudal claws ratlier small, spermatic ducts prolonged in front of the latter to 2 digitiform processes. Colour pale yellowish. Length of adult female 0.42 mm., of male 0.34 mm."

But Sars did not know that his taxon is a junior homonym of *A. davidi* var. *iheringi* Richard, 1897. Sinev [2001] demonstrated (based on Sars' type material) that

it is a good species, not a junior synonym of *A. rustica* Scott, 1895 as was presumed before [Smirnov, 1971]. A new name, *Alona iheringula* nom. nov., is given to this taxon below, instead of "*Alona iheringi*". Also, adult male, not studied previously by Sinev [2001], is described.

Alona iheringula nomen novum instead of *A. iheringi* Sars, 1901

Figs 1–8.

Alona iheringi Sars, 1901: 49–51, pl. 9: figs 2, 2a–c; Smirnov, 1971: 361 (jun. syn. of *A. rustica* Scott, 1895); Sinev, 2001: 114–118, figs 1–25.

Not *Alona davidi* var. *iheringi* Richard, 1897: 294–296, figs 42–43; Smirnov, 1971: 368–370, figs 427, 430–431 (*davidi* subsp. *iheringi*).

LECTOTYPE. Adult parthenogenetic ♀ in 70% alcohol, tube F12336a, at the collection of G. O. Sars in Zoological Museum of the Oslo University, Norway, selected for *A. iheringi* Sars, 1901 by Sinev [2001].

TYPE LOCALITY. Vicinities of São Paulo, Brazil.

PARALECTOTYPES. Listed by Sinev [2001]: 6 adult parthenogenetic ♀♀ and 5 juvenile ♀♀, tube F12336b; two dissected parth. ♀♀, slides F12336c-d, at the same collection;

Not listed by Sinev [2001]: 2 parth. ♀♀, slide GOS F 22908a; 2 parth. ♀♀, slide GOS F 22908b; 2 parth. ♀♀, slide GOS F 22908c; 2 parth. ♀♀, slide GOS F 22908d; 2 parth. ♀♀, slide GOS F 9101; adult ♂, slide GOS F9130.

The second portion of slides was not studied by Sinev [2001] and not placed to the list of paralectotypes of *A. iheringi* Sars, 1901, but it is apparently a part of the type series, and must be included to the list of paralectotypes according to paragraph 72.1.1. of ICZN [2000]).

ETYMOLOGY. As *A. iheringi* Sars, 1901, replaced here, our new name is also dedicated to Dr H. von Ihering, well-known investigator of South America, who supplied G. O. Sars [1901] with material on this species.

DIAGNOSIS (modified after Sinev [2001]). PARTHENOGENETIC FEMALE. Body ovoid, length about 1.5–1.6 times maximum height (Fig. 1). Dorsal margin regularly arched from rostrum to completely smooth postero-dorsal angle, posterior margin convex, postero-ventral angle widely rounded, without denticles, ventral margin concave, with marginal setae significantly differentiated in size. Head shield elongated, with posterior margin broadly rounded, rostrum short and rounded. Three major head pores with narrow connection between them, central pore located significantly closer to posterior pore, all pores of same size, PP = 0.5–0.7 IP. Lateral head pores as transverse splits, with shallow pockets below, located about 0.4-0.6 IP distance from midline, at level of central major pore, length of lateral pores less than 0.4 IP. Labrum of moderate size, labral keel broad, rounded, with blunt apex and two clusters of setules on posterior margin of keel. Postabdomen wide, narrowing distally, length about 2.2–2.4 height, dorsal margin with distal part about 3–3.2 times longer than preanal one (Fig. 2). Preanal margin longer than anus straight, preanal angle prominent, postanal angle well defined. Postanal margin about 1.5 times longer than anal one. Distal margin convex, rounded angle between distal and dorsal margins, inflated basis of claws bordered from distal margin by a clear incision. Nine-ten well-developed marginal denticles, 3–5 groups of marginal setules on anal margin. 10–12 lateral fascicles of short, delicate setules, central setae of each fascicle longest; additional row of 2–3 fasciles between lateral fasciles and marginal setules in preanal region. Postabdominal claw of moderate length, 1.5 times longer than preanal portion of postabdomen. Basal spine ca. 0.25 as short as claw. Antenna I elongated, with nine estetascs, two of them 1/3–1/4 longer than others, all aestetascs projecting beyond anterior margin of the head shield. Antennal formula, setae 0-0-3/1-1-3, spines 1-0-1/0-0-1. Seta on basal segment of endopod thin, not projecting beyond tip of distal segment. Spine on basal segment of exopod shorter than middle segment. Spines on apical segments little shorter than apical segments. IDL of trunk limb I with three setae, the first one thin, the others long, well-developed. Short anterior stiff setae on endites 2 and 3 of limb I. Exopodite III with seven setae, first, second and fifth setae from distal end subequal in length, 3 times longer than others. Exopodite IV with six setae. Exopodite V divided into two lobes, with four setae. Epipodites IV and V with long, finger-like processes 2 times longer than epipodite. Trunk limb VI present as a rounded, setulated lobe.

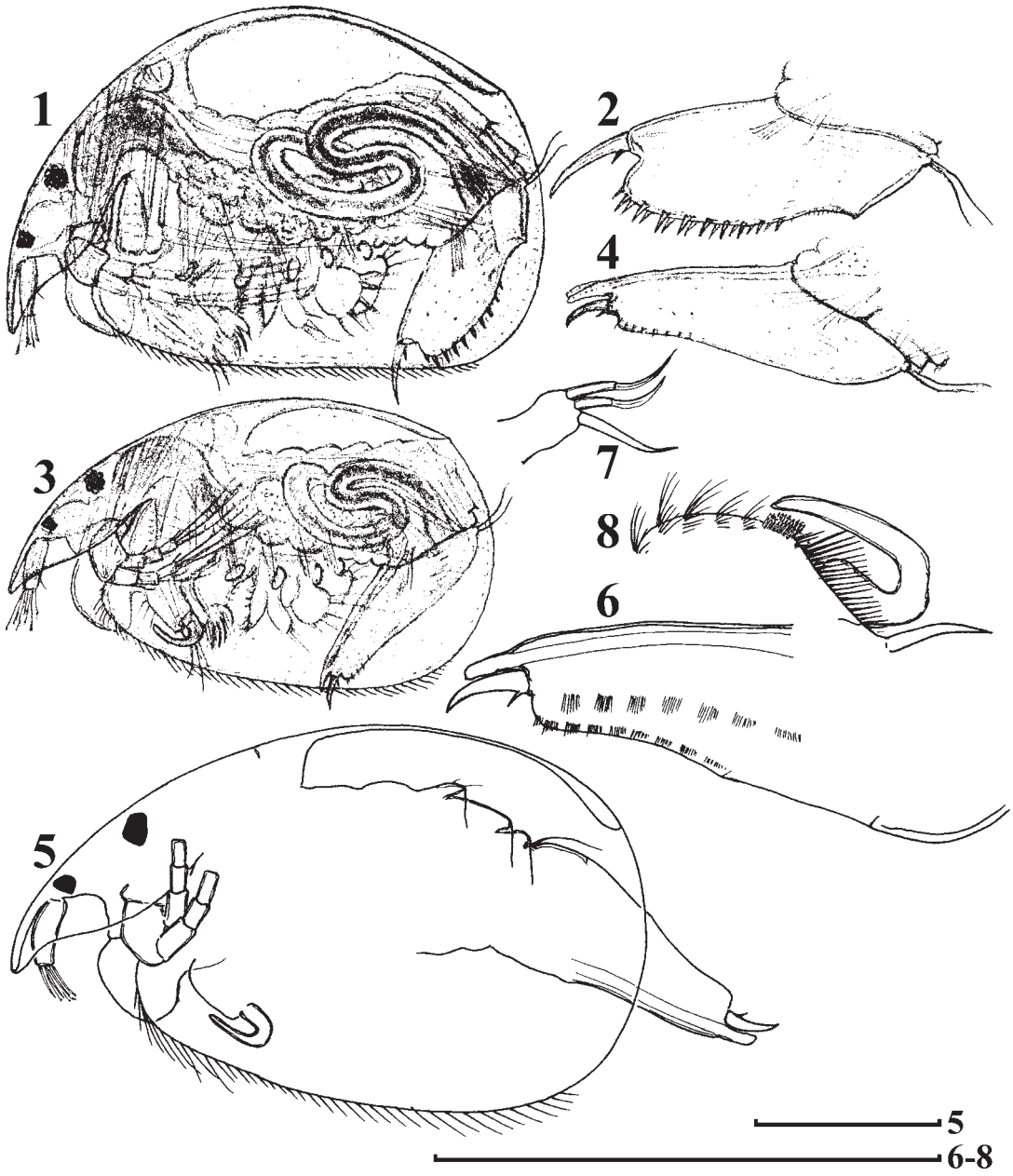
MALE. Body elongated, length about 1.7 times maximum height (Figs 3, 5). Postabdomen elongated, narrowing distally, with length about 3-4 times height in middle (Figs 4, 6). Ventral margin slightly convex, preanal margin short, corved, preanal angle not defined, postanal angle poorly expressed, postanal margin concave, dorso-distal angle rounded, distal surface short, although well-expressed. Gonopores at the end of a single, thick, finder-like penis protruding "above" (dosally to) postabdominal claws, with length 2/3-3/4 claw length. Clusters of short, robust setules in place of marginal postanal denticles; lateral fascicles of setules somewhat shorter than those in female. Postabdominal claws short, with basal spine c.a. 1/4-1/3 claw length. Limb I with IDL supplied with two bisegmented setae as in female, and unsegmented male seta, while smallest seta of IDL absent (Fig. 7), seta of copulatory brush thick, as long as male seta of IDL, copulatory brush with long, stout setules distally, and short, robust setules basally, copulatory hook U-shaped, long (Fig. 8).

LENGTH. Parthenogenetic ♀ 380–450 μm; adult ♂ 340 μm.

TAXONOMICAL COMMENTS. *A. davidi* var. *iheringi* Richard, 1897 was regarded as a valid subspecies of *A. davidi* Richard, 1895 by Smirnov [1971] and then synonymised with *A. diaphana* King, 1853 by Frey [1991]. Recently Sinev *et al*. [2002] demonstrated that *A. davidi* and *A. diaphana* are two separate species, and replaced both species to the genus *Leberis* Smirnov, 1989, while Richard's [1895] taxon was found a member of this genus also, and a junior synonym of *L. davidi*.

Different recent generic position of *Alona davidi* var. *iheringi* Richard, 1897 and *Alona iheringi* Sars, 1901 suggests nothing for their homonymy. According to the paragraph 57.1. of ICZN [2000], "the principle of Honomyny applies to species-group names that are or are deemed to be spelled identically [Art. 58] and are published originally or subsequently in combination with the same generic name...". So, subsequent generic position of two taxa is not important.

A. davidi var. *iheringi* Richard, 1897 is a tri-nomen, and must be accepted as an available taxon of subspecies rank according to paragraph 45.6.4. of ICZN [2000], so, a taxon of species-group. Also, it cannot be "forgotten" and replacing by a junior synonym or homonym (i. e. *A. iheringi* Sars, 1901) according to paragraph 23.9.1.2. of ICZN [2000], because (1) *A. davidi* var. *iheringi* Richard, 1897 was discussed by subsequent authors of the 20th century, i. e. Smirnov



Figs 1–8. *Alona iheringula* nom. nov. from vicinities of São Paulo, Brazil (type series of *A. iheringi* Sars, 1901): 1–2 — adult ♀ and its postabdomen; 3–4 — adult ♂ and its postabdomen [after Sars, 1901], note the mistakenly drawn paired penis on postabdomen; 5–8 — adult ♂, its postabdomen, IDL I and copulatory brush of limb I. Scales: 5–6 — 100 μm; Sars [1901] did not supply his pictures, represented here as Figs 1–4 with scales.

Рис. 1–8. *Alona iheringula* nom.nov. из окрестностей Сан Пауло, Бразилия (типовая серия *A. iheringi* Sars, 1901): 1–2 — взрослая ♀ и ее постабдомен; 3–4 — взрослый ♂ и его постабдомен [по: Sars, 1901], постабдомен ♂ ошибочно изображен с парным пенисом; 5–8 — взрослый ♂, его постабдомен, внутренняя дистальная доля и копулятивная щетка его первой ноги. Масштаб: 5–6 — 100 μm; Sars [1901] не снабдил масштабными линейками свои рисунки, воспроизведенные здесь как Рис. 1–4.

[1971] suggested that this is a valid subspecies of *A. davidi* Richard, 1895; (2) we will never find references to rarely discussed *A. iheringi* Sars, 1901 as a possibly valid taxon in "at least 25 works, published by at least 10 authors in the immediately preceding 50 years". So, *A. iheringi* Sars, 1901 is a junior homonym of *A. davidi* var. *iheringi* Richard, 1897, and no arguments *contra* this opinion were found. Sars' taxon has no junior synonyms (see expanded synonymy for all alonines in the monograph of Smirnov [1971]), so there are no difficulties for replacement of this name by the nomen novum (paragraph 60.3. of ICZN [2000]). Our *A. iheringula* nom. nov. is suggested to replace this invalid name.

Discussion

Sinev [2001] already demonstrated that *A. iheringula* nom. nov. belongs to *A. costata* species group, and specially close *to A. rustica* Scott, 1895. A non-cosmopolitanism is characteristic for this group, each continent is inhabited by an especial species (or more than one species) [Sinev, 1999, 2001]. An other Neotropical species from this group is a specific *A. hudeci* Sinev, 1999. It is interesting, that the latter was also suggested as a nomen novum instead of "*A. rusticoides* n. sp." in Hudec [1998], which was a junior homonym of *A. rusticoides* Smirnov & Timms, 1983.

Our study of male of *A. iheringula* nom. nov. demonstrated again the importance of male characters for the systematics of *A. costata*-group. Male of *A. iheringula* nom. nov. has relatively long penis, well-expressed distal surface of postabdomen, and no inflated basis for postabdominal claws (in contrast to *A. costata* Sars, 1862 and *A. setigera* Brehm, 1931), specially short setules on postanal margin of postabdomen (in contrast to *A. rustica* Scott, 1895 and *A. bicolor* Frey, 1965). Sars [1901] mistakenly stated, that the adult male of *A. iheringula* has paired penises, like males of *Leydigia*, (see Fig. 4), but we found that it has a single penis, like other species of *costata*-group [Sinev, 1999].

Richard [1897] and Sars [1901] were pioneers in the study of alonine cladocerans in the Neotropical zone. Unfortunately, many subsequent publications were obviously less detailed that their articles. Only after Smirnov's [1971] global revision of Chydoridae, a new period in the chydorid investigations started. The main directions of recent publications are a redescription of both "traditional" and neglected species of previous authors and a re-evaluation of their status. Taxonomical study of Neotropical fauna of the Cladocera is an example of accurate systematics, when authors are concentrated on the re-study of previously described taxa, with reference to type materials, instead of establishing of dubious new taxa, as it takes place recently, for example, in "Asian" cladoceran systematics. As a result, now the Neotropical fauna of the Chydoridae becomes to be among best studied in the world.

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