Types of cladoceran species described by Sven Ekman in the Swedish Museum of Natural History, with redescription of *Daphnia cavicervix* Ekman, 1900 (Daphniidae, Anomopoda, Cladocera)

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**Abstract**

In the course of our examination of samples of Cladocera from South America and subantarctic islands in the collection of the Swedish Museum of Natural History, Stockholm, we found some type material of Sven Ekman, unrecognized earlier, as well as other samples described in his publications (Ekman 1900, 1905). A single specimen of *Pleuroxus scopuliferus* Ekman, 1900, apparently seen by its author, is re-deposited as the lectotype, while the neotype of this taxon earlier selected by Frey (1993) must be rejected according to ICZN (2000). *Daphnia cavicervix* Ekman, 1900 is redescribed based on numerous parthenogenetic, ephippial females and males, and lectotype and paralectotypes are selected. Some recent problems of systematics of *Daphnia* in South America are discussed.

**Keywords:** Anomopoda, Cladocera, Daphnia, South America, systematics, taxonomy

**Introduction**

Among cladoceran investigators at the end of the 19th and beginning of the 20th century, Sven Ekman was a remarkable person. He did not publish many articles (Ekman 1900, 1905), but, in contrast to many papers of that time, his descriptions of animals were relatively detailed. His contribution to study of the cladoceran fauna of the southernmost portion of the South American continent and subantarctic islands is specially well known. Predominantly, Ekman obtained samples for his investigations from E. Norenskiöld, one of the most famous travellers and investigators of the southern hemisphere of that time. Some of Ekman’s specimens were re-examined by Rühe (1914), and then the collection was lost to the attention of cladoceran investigators until Frey’s (1988) revision of subantarctic *Alona*, including *A. bucobensis* var. *subantarctica* Ekman, 1905. We became interested in Ekman’s samples through efforts to redescribe *Ilyocryptus brevidentatus* Ekman, 1905 (see Kotov et al. 2002). In the course of our examination of samples from the Swedish Museum of Natural History, Stockholm (SMNH), we found some type material of Sven Ekman, unrecognized earlier.

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The aim of this communication is to report on our examination of the author’s type material, and to redescribe *Daphnia cavicervix* Ekman, 1900, type material of which was found in SMNH. Although currently this genus attracts maximum attention of cladoceran investigators (i.e. Hebert and Finston 1996; Černý and Hebert 1999; Adamowicz et al. 2004), recent authors have focused predominantly on molecular studies, with small attention to taxonomy. At present the systematics of *Daphnia* is confusing, especially in non-Palaearctic regions (Fernando et al. 1987; Korínek and Villalobos 2003), and redescription of unjustifiably forgotten species from this genus is an important contribution to resolving current systematic problems of the genus.

**Methods**

Among samples in the Swedish Museum of Natural History, we found five tubes (numbers 1–5, below) containing identified specimens described by Ekman (1905). Tubes with *Alona bukobensis* var. *subantarctica* and *Ilyocryptus brevidentatus* were already marked as types in a partly typed and partly hand-written catalogue of the Museum. Two other (large) samples from Morro Chico, south Chile were apparently reported by Ekman (1900). One of them, labelled “Cladocera 33”, contained no cladocerans, only the remains of a large ostracod. The second tube, “Cladocera 34” (number 6, below), contained a mix of different species. It is very important to note that it was not an original sample, but just a subsample picked from the former, without mud, mineral particles or algae. Apparently Sven Ekman selected these specimens, so they were apparently seen by the author. This fact allows us the possibility to use these specimens for lectotype selection.

Animals were picked from the sample, placed on slides (in a drop of a glycerol–formaldehyde mixture) and studied under an optical microscope in toto. Then, an adult female and an adult male of *D. cavicervix* were dissected for analysis of appendages, with permission of the Collection Manager. Parts of these specimens were deposited on a series of slides as paralectotypes (under the same number for all series from each specimen). Drawings were prepared using a camera lucida attached to an Alphaphot compound microscope.

In this paper we apply to *Daphnia* a system of enumeration of setae, earlier suggested for chydorids (Kotov 2000) and macrothricids (Kotov and Hollwedel 2004). There are two rows of setae on the inner portion of limbs of all anomopods, termed differently by different authors (Cannon 1933; Alonso 1996; Paggi 1999; Benzie 2005). Here we use terms employed by Alonso (1996) who referred to these rows of setae as “anterior” and “posterior”. Anterior setae of (1) inner-distal limb portions and (2) distal armature of gnathobases are numbered here from distalmost to basalmost elements; posterior setae of the filter plates of the gnathobases are numbered by letters, also from distalmost to basalmost elements.

**Cladoceran samples of Sven Ekman found in SMNH**

1. SMNH 3615. *Alona bukobensis* var. *subantarctica* Ekman, 1905, a parthenogenetic female, lectotype, locality unclear.
2. SMNH 3616. *Alona bukobensis* var. *subantarctica* Ekman, 1905, a parthenogenetic female, paralectotype, locality unclear.
3. SMNH 5297. *Ilyocryptus brevidentatus* Ekman, 1905, five parthenogenetic females and six exuvia, syntypes, from localities 3–7 of Ekman (1905), mixed in the tube.
4. SMNH 32917. *Macrothrix cf. hirsuticornis*, seven females. Morånsjön lake at the Moränfjord, Cumberland Bay, South Georgia, coll. 18 May 1902 (locality 5 of Ekman 1905).

5. SMNH 32918. *Macrothrix cf. hirsuticornis*, 29 females. Port Stanley, Falklands, coll. 18 August 1902 (localities 6 and/or 7 of Ekman 1905).

6. SMNH Cladocera 34. “4068. Morro Chico, rännil, med smutsigt vatten”, collected by E. Nordenskiöld. Sample contained: *Daphnia cavicervix* Ekman, 1900, 81 females and males (all specimens removed from the sample as lectotype and paralectotypes, see below); *Scapholeberis spinifera* (Nicolet, 1848), three females and one male; *Simocephalus cf. vetulus*, 46 females and males; *Pleuroxus scopuliferus* Ekman, 1900, one female.

**Type material of Sven Ekman**

*Ilyocryptus brevidentatus* Ekman, 1905

*Ilyocryptus brevidentatus* Ekman 1905, p 5–7, Plate 1: Figure 1; Kotov et al. 2002, p 2–12, Figures 1–72.

Syntypes: five parthenogenetic females and six exuvia, from localities 3–5 and 6–7, mixed in tube SMNH 5297. It is not possible to select a lectotype, because Ekman, or a subsequent investigator, mixed all specimens from all localities in one tube.

**Type locality**

Not reported accurately; the species was described based on samples collected from South Georgia (localities 3–5 of Ekman 1905) and the Falkland Islands (localities 6–7).

**Comments**

This valid species was redescribed recently, and also found in the southernmost portion of the continental South America (Kotov et al. 2002).

*Alona bucobensis var. subantarctica* Ekman, 1905

*Alona bucobensis* var. *subantarctica* Ekman 1905, p 8–9.

*Alona weinecki* Studer, 1878 in Rühe 1914 p 53–55, Figure 18c, d; Frey 1988, p 1400–1407, Figures 57–104.

Lectotype: parthenogenetic female, SMNH 3615, selected by Frey (1988). Before Frey’s (1988) revision, there were, according to an old catalogue, three Ekman specimens in the collection of SMNH, mixed in a tube: a single specimen was taken from each of three different localities: locality 7 from the Falklands, and localities 3 and 5 from South Georgia. Frey (1988) recovered only two females, and designated one of them as the lectotype. Paralectotype: parthenogenetic female, SMNH 3616, selected by Frey (1988).

**Type locality**

Frey (1988) said that “although the lectotype origin is not certain, it is considered to derive from South Georgia”, but this thesis seems to be not well justified.
Figure 1. *Daphnia cavicervix* from unknown water body near Morro Chico, Chile. (A) Adult parthenogenetic female, lectotype; (B) its head; (C) juvenile female; (D) its head; (E) its postabdomen; (F) ephippial female; (G) sculpture of ephippium; (H) juvenile male, pre-reproductive instar; (I) its head; (J) adult male; (K) its head. Scale bars were not taken.
Comments

Ekman’s taxon is now regarded as a junior synonym of *Alona weinecki* Studer, 1878. See illustrations, expanded description and comments in the paper of Frey (1988).

**Pleuroxus scopuliferus** Ekman, 1900

*Pleuroxus scopuliferus* Ekman 1900, p 78–82, Plate 4: Figures 25–29; Frey 1993, p 163–171, Figures 69–99.

Lectotype (selected here): a single parthenogenetic female, length 0.70 mm, with two eggs found in the sample SMNH Cladocera 34 (4068), was re-deposited as the lectotype of this taxon, in a separate tube SMNH 5846. Label of the lectotype: “*Pleuroxus scopuliferus* Ekman, 1900, 1 ad. ♀ from Morro Chico, S Patagonia, Chile, LECTOTYPE”.

**Type locality**

Unknown water body near Morro Chico, km 146 of the highway 9, Punta Arenas–Puerto Natales, southern Chile (approximately 52°05′20″S, 71°22′27″W).

Comments

Frey (1993) said that he did not find any of Ekman’s material of this species, and selected a neotype from a pond in Parque National de los Torres del Paine (also in southern Chile), deposited in the Zoological Museum at Uppsala University, Sweden under number UU 21290a. According to Ekman (1900), he had many specimens (including males), but they were apparently lost, or at least are absent now from his collection in SMNH, as well as in Uppsala. However, we found a single female apparently seen by Sven Ekman, and fully agreeing with the species description. So, this female may be considered as a part of the type series, and it is designated here as lectotype of *P. scopuliferus* Ekman, 1900. The neotype ZMU 21290a earlier selected by Frey (1993) must be rejected (ICZN 2000), and the type locality of this species is Morro Chico.

**Daphnia (Daphnia) cavicervix** Ekman, 1900

*(Figures 1–5)*

*Daphnia cavicervix* Ekman 1900, p 62–65, Plate 3: Figures 1–7.

Not *Daphnia cf. cavicervix* in Brandlova et al. 1972, p 1393–1395, Figures 75–83.

Lectotype (selected here): an adult parthenogenetic female, 1.76 mm, in 90% alcohol, tube SMNH 5870. Label of the lectotype: “*Daphnia cavicervix* Ekman, 1900, 1 ad. ♀ from Morro Chico, S. Patagonia, Chile, LECTOTYPE”. Paralectotypes (selected here): 64 parthenogenetic females, nine ephippial females, two juvenile males and one adult male, in 90% alcohol, tube SMNH 5871; parts of a parthenogenetic female on nine slides, SMNH 5872; parts of an adult male on seven slides, SMNH 5873.

**Type locality**

Unknown water body near Morro Chico, km 146 of the highway 9 (Punta Arenas–Puerto Natales), Chile (approximately 52°05′20″S, 71°22′27″W). Ekman (1900) said of two localities where *D. cavicervix* was found: “Die Art ist bei Morro Chico in fließendem, schmutzigem Wasser und bei Rio Ruben in kleinen Tümpeln gefunden”. Any specimens
from the second locality are absent from SMNH, while the sample Cladocera 34 (4068) is apparently from the first locality, which now becomes the type locality as a result of the lectotype designation.

Emended diagnosis

Parthenogenetic female. Body widely rhomboid, dorsal margin of valves elevated above head, a depression between head and rest of body, postero-dorsal angle as a rounded projection. Rostrum with slightly bent tip, no crest on head. Fornix narrow, no secondary fornix. Valves with submarginally located setae of different size on different portions of the ventral margin. The first abdominal projection long, protruding basally and with bent tip, the second projection short, bent distally; the third one very short, rounded, the fourth segment completely lacking projections. Postabdomen subtriangular, postanal portion with about 10–11 paired teeth, some of them with bifid tips. Postabdominal claw with basal pecten consisting of seven to nine strong spines, the second pecten consisting of 9–10 longer spines, the third and fourth pectens with numerous fine setules. Antenna I short, partly fused with the posterior margin of head, with antennular sensory seta at base. ODL of limb I with a long seta armed distally with short setules, and a short seta; IDL with a single, long anterior seta. Endite 1 with a short anterior seta and four posterior setae. Exopodite V with a small distal and a large lateral setae, inner limb portion with a single, large seta.

Ephippial female. Dorsal margin of valves straight to slightly convex, postero-dorsal angle acute. Ephippium with two resting eggs, axes of which perpendicular to its dorsal margin, egg chambers well separated from each other.

Adult male. Body subovoid, dorsal margin of valves not elevated above head, depression between head and valves absent, postero-dorsal angle distinct, with a short caudal needle. Region of antenna I joint with a special depression, anteriormost head extremity as a low dome with a shallow supra-occular depression posteriorly to it. Valve with prominent antero-dorsal angle, a “step” in anterior third of ventral margin; long, numerous setae submarginally on inner face of valve at anterior and ventral margin. Abdomen with only two short projections. Postabdomen with gonopore opening subdistally near dorsal margin of postabdomen, without a genital papilla. Antenna I free, long, with series of fine setules; antennular sensory seta small, protruding for a distance of about 1.5–2 times its length from distal end of antenna I. Male seta on top of a low, distal projection. This seta long, bisegmented, its distal segment regularly curved, with setulated distal portion and with tip as a sharp hook. ODL of limb I with two minute setae, and a very large seta setulated distally; IDL with a short, bent copulatory hook. Inner-distal portion of limb II with distalmost endite bearing a modified hook-like anterior seta. Anterior seta on distalmost endite of limb III stiff, with specially short setules.

Size. Up to 1.80 mm.

Redescription

Adult parthenogenetic female

General. Body widely rhomboid in lateral view, relatively high (body height/length = 0.60–0.68), maximum height in middle of valves (Figures 1A, 2A). Dorsal margin of valves significantly elevated above head, regularly convex, a depression between head and rest of body. Postero-dorsal angle as a rounded projection, but without a trace of caudal needle.
Figure 2. *Daphnia cavicervix*, parthenogenetic female from unknown water body near Morro Chico, Chile. (A) Adult parthenogenetic female, lectotype; arrows show portions of ventral margin enlarged in (H–M); (B) postero-dorsal region; (C) reticulation on valves; (D, E) head and rostrum; (F) head shield, dorsal view; (G) labrum; (H–M) armature of ventral margin of valve; (N) postabdomen; (O, P) postabdominal claw in outer and inner view; (Q) juvenile female, second instar; (R, S) its postabdominal claw and abdominal projections. Scale bars: 0.1 mm.
vessel margin convex. A very fine reticulation on valves (Figure 2C). In anterior view, body compressed laterally, with a dorsal keel.

Head. Head relatively small, with a well-developed rostrum, its tip slightly bent; posterior margin of head inflated, regularly convex; ventral margin of head with a distinct depression (Figures 1B, 2D, E) (“supraocular depression” in Paggi 1999). No crest on head, large compound eye located near anteriormost extremity of head; minute ocellus located far from base of antenna I. Head shield elongated in dorsal view, with posteriormost extremity as acute angle, fornix narrow (Figure 2F), no secondary fornix.

Labrum. Labrum with a short, fleshy main body and a large, setulated distal labral plate (Figure 2G).

Valves. Valves subovoid, with submarginally located (on inner face of the valve) setae of different size in different portions of the ventral margin (Figure 2A, arrows show portions of ventral margin enlarged in Figure 2H–M), in middle of margin these setae longest (Figure 2I); only in posteriormost portion of ventral margin the setae are exactly marginal (Figure 2M).

Abdomen. Abdomen relatively long, consisting, in our opinion, of four segments (although their borders are not easily observable), with abdominal projections of different shape and size on three basal segments. The first (basalmost) projection long, protruding basally and with bent tip, almost lacking setules; the second (middle) projection short, bent distally, densely setulated; the third (distalmost) projection very short, massive, rounded and densely setulated; the fourth segment completely lacking projections, setulated (Figure 2N).

Postabdomen. Postabdomen subtriangular, tapering distally, with ventral margin almost straight and lacking setules. Anus located closer to the distal extremity of postabdomen than to its base, thus, preanal margin long, almost straight, with series of minute setules. Preanal angle not expressed, postanal angle smooth. Postanal portion conically narrowing distally, with about 10–11 paired teeth, some of them with bifid tips (this character was discussed by Ekman 1900), numerous series of setules laterally to the teeth.

Postabdominal seta. Postabdominal seta as long as preanal margin of postabdomen, bisegmented; its distal segment equal in size or somewhat shorter than basal one, and armed distally with long, delicate setules.

Postabdominal claw. Postabdominal claw massive, slightly bent in middle, with a pointed tip (Figures 2O). On outer side, four successive pectens along the dorsal margin: the first (basal) pecten consisting of seven to nine strong, thick spines, the second (sub-basal) pecten consisting of 9–10 longer spines, the third pecten as a short series of fine setules, the fourth pecten consisting of numerous fine setules and almost reaching the tip of the claw. On inner side there are two pectens: the first (basal) one short and consists of more robust and longer setules than the second one. A fine denticle in middle of ventral margin, in some specimens one or two additional denticles present more distally on ventral margin of the claw.

Antenna I. Antenna I short, partly fused with the posterior margin of head, narrowing distally. Antennular sensory seta slender, arising at base of antenna I (Figure 2E). Nine
aesthetascs of slightly different size, the shortest longer than antenna body, tips of aesthetascs projecting behind rostrum.

**Antenna II.** Antenna II long, tips of branches reach posterior third of body, tips of swimming setae reach posteriormost extremity of body. Coxal part with two short sensory setae of different size. Basal segment elongated, with a short distal spine at anterior face (Figure 3A, arrow), termed “outer apical spine” by Kořínek and Villalobos (2003), and clearly homologous with so-called “distal burrowing spine” in ilyocryptids and macrothricids (see Kotov et al. 2002; Kotov and Hollwedel 2004); a long distal sensory seta at posterior face (“inner apical seta” in Kořínek and Villalobos 2003). Numerous transverse series of fine setules on surface of the segment. Antennal branches elongated, four-segmented exopod slightly shorter than three-segmented endopod, all segments cylindrical, with numerous series of setules. Antennal formula: setae 0-0-1-3/1-1-3. Spines on apical segments rudimentary (Figure 3B–C). Spine on the second segment of exopod not found.

**Limb I.** Limb I with large, ovoid epipodite; accessory seta absent; outer distal lobe (Figure 3D: ODL), (proposed homology with the exopodite (Benzie 2005) seems to be dubious) with a long seta armed distally with short setules, and a short seta; inner distal lobe (Figure 3D: IDL), or endite 4, with a single, long anterior seta (Figure 3D: 1), bearing short setules. Endite 3 with a single, medium-sized anterior seta (Figure 3D: 2) and two posterior setae (Figure 3D: a, b). Endite 2 with a short anterior seta (Figure 3D: 3) and two posterior setae (Figure 3D, c, d). Endite 1 with a short anterior seta (Figure 3D: 4) and four posterior setae (Figure 3D: e–h). Two ejector hooks of remarkably different size. No maxillary process on limb base.

**Limb II.** Limb II with a globular epipodite (Figure 3E); distal portion as a large lobe bearing a large, soft, distal seta, and a large, soft, lateral seta (homology of this lobe with exopodite also seems to be dubious), four endites bearing five setae, and a rudimentary seta near gnathobase, the latter, marked by arrow in Figure 3E, is normally developed in moinids (Kotov et al. 2005), and is a homologue of so-called “beating seta” of ilyocryptids (see Kotov 1999; Kotov et al. 2002). Gnathobase with two clear rows of setae: four anterior setae (Figure 3E: 1–4) and 11 posterior setae of gnathobasic “filter plate” (Figure 3E: a–k).

**Limb III.** Limb III with a large, flat exopodite bearing four distal (Figure 3F: 1–4) and two lateral (Figure 3F: 5, 6) setae. Inner-distal portion of limb with four endites: endite 4 with a single posterior (Figure 3G: 1) and a single anterior (Figure 3G: a) seta; endite 3 with a single posterior (Figure 3G: 2) and single anterior (Figure 3G: b) seta; endite 2 with single anterior (Figure 3G: 3) and two posterior (Figure 3G: c, d) setae; endite 1 with single anterior (Figure 3G: 4) and four posterior (Figure 3G: e–h) setae. The rest of limb inner-distal portion as a singular large lobe, bearing 49 posterior soft setae on both left and right limb of the single dissected female, and a single, relatively long anterior seta (Figure 3G: 1) in its distal corner. This limb part probably represents a modified gnathobase III.

**Limb IV.** Limb IV with large, setulated pre-epipodite, large, ovoid epipodite (Figure 3H), large exopodite, similar to that of limb III, but somewhat more wide and short, also bearing four distal (Figure 3H: 1–4) and two lateral (Figure 3H: 5, 6) setae. Inner distal portion of
this limb with completely fused endites, distally with two specific setae of unclear homology (Figure 3I), the most part of limb inner margin is a gnathobase filter plate consisting of 35 and 36 posterior setae on limbs of the dissected female.

Limb IV. Limb IV with a large, setulated pre-epipodite, a large, subovoid epipodite, a triangular exopodite supplied with a small distal and a large lateral setae (Figure 3J: 1, 2). Inner limb portion as an ovoid flat lobe, with setulated inner margin and a single, large seta.
**Juvenile female**

Body lower as compared with adult (Figures 1C, 2Q), dorsal margin almost straight, depression between head and rest of body weak. Depression on ventral margin of head very shallow (Figure 1D). Postero-dorsal angle with a short caudal needle, bearing small, thin denticles along dorsal and ventral margins. First instar female has a distinct dorsal organ in posterior portion of head shield, unclear dorsal organ persists in second instar (Figure 2Q). First two pectens on postabdominal claw with teeth more thin and delicate as compared with adult female (Figures 1E, 2R). Abdomen with rudimentary dorsal projections (Figure 2S).

**Ephippial female**

In lateral view, body somewhat higher than in parthenogenetic female (body height/length=0.63–0.70) (Figures 1F, 4A). In contrast to parthenogenetic female, dorsal margin of valves almost straight or slightly convex, postero-dorsal angle acute. Dorsal wall of carapace additionally chitinized, forming a dorsal plate, lacking any spinules. Ephippium with two resting eggs, axes of which perpendicular to its dorsal margin, most part of ephippium additionally pigmented and covered with additional sculpture as polygonal cells elevated above surface of valve (Figures 1G, 4B, C). Egg chambers well separated from each other, with irregular sculpture on their surface (Figure 4D).

Figure 4. *Daphnia cavicervix* from unknown water body near Morro Chico, Chile. (A) Ephippial female; (B) sculpture of ephippium, marginal portion; (C) sculpture of ephippium, portion close to egg chamber; (D) sculpture on egg chamber; (E) juvenile male (pre-reproductive instar); (F) its antenna I; (G) distal portion of its limb I. Scale bars: 0.1 mm.
**Juvenile male**

Body shape similar to that of juvenile female, but rostrum reduced (Figures 1H, 4E), antenna I jointed with rostrum and supplied with a relatively short male seta (Figures 1I, 4F), limb I with long ODL seta and copulatory hook on IDL (Figure 4G).

**Adult male**

*General.* Body subovoid, more elongated as compared with female (body height/length = 0.53) (Figures 1J, 5A). Dorsal margin of valves slightly convex, not elevated above head, depression between head and valves absent, postero-dorsal angle distinct, with a short caudal needle.

*Head.* Head larger than that in female, posterior margin of head with a low prominence, rostrum small, region of antenna I joint with a special depression (Figures 1K, 5B). Anteriormost extremity completely occupied with optic vesicle, prominent anteriorly as a low dome with a shallow supra-ocular depression posteriorly to it. Eye large, ocellus small, but relatively larger than that in female.

*Valve.* Valve with distinctly prominent antero-ventral angle, a “step” in anterior third of ventral margin (Figure 5C); long, numerous setae submarginally on inner face of valve at anterior and ventral margin. Postero-ventral portion of valve with marginal denticles, short, setulated setae located submarginally on inner face of valve, rows of fine setules between these setae (Figure 5D, E). Small denticles present on caudal needle and closest portions of both ventral and dorsal margins.

*Abdomen.* Abdomen with only two short projections, while basalmost projection completely reduced (Figure 5F).

*Postabdomen.* Postabdomen shape and armature in general as in female, but preanal margin slightly concave. About 10–11 paired teeth distally. Gonopore opens subdistally near dorsal margin of postabdomen (Figure 5G), without a genital papilla. On outer surface of postabdominal claws, a basal pecten of fine setules, second pecten of six to seven teeth increasing in size distally, third pecten of six to seven large teeth, and distal pecten of fine, numerous setules.

*Antenna I.* Antenna I long, somewhat widening distally, slightly and regularly curved, with series of fine setules (Figure 5B, H, I); antennular sensory seta small, protruding for a distance of about 1.5–2 times its length from distal end of antenna I; aesthetasc of different size, largest aesthetasc longer than antenna I maximum diameter. Male seta (“flagellum” in Paggi 1999; Kořínek and Villalobos 2003) on top of a low, conical, distal (post-aesthetasc) projection. This seta long, bisegmented, its distal segment regularly curved, with setulated distal portion and with tip as a sharp hook.

*Limb I (Figure 5J).* ODL large, bearing two minute setae (Figure 5K), and a very large seta supplied with minute setules distally (Figure 5L); IDL with a short, bent copulatory hook (Figure 5M), its tip specially chitinized (Figure 5N), and two setae of different size; endite 3 with four setae (probably, two anterior setae among them), endite 2 with two posterior setae and a thick anterior seta, endite 1 as in female.
Figure 5. *Daphnia cavicervix*, adult male from unknown water body near Morro Chico, Chile. (A) Lateral view; (B) head; (C) dissected valve; (D, E) postero-ventral portion of valve; (F, G) postabdomen and its distal portion; (H, I) antenna I; (J) limb I; (K) ODL; (L) armature of seta of ODL₄; (M) IDL₄; (N) tip of copulatory hook; (O) inner-distal portion of limb II; (P) inner-distal portion of limb III. Scale bars: 0.1 mm.
Limb II. On inner distal portion, distalmost endite with a modified, hook-like, setulated anterior seta (Figure 5O), plus one among two soft setae setulated unilaterally along most part of length except of distalmost portion, setulated bilaterally.

Limb III. Anterior seta on distalmost endite (Figure 5P: 1) stiff, with specially short setules.

Size
Lectotype, adult parthenogenetic female 1.76 mm, juvenile and adult parthenogenetic females 0.88–1.80 mm (n=64), minimal reproductive size of female 1.41 mm; ephippial females 1.23–1.44 mm (n=9), juvenile males 0.74–0.77 mm (n=2), adult male 0.96 mm (n=1).

Distribution
Range of distribution unknown, because following its first description the species was forgotten. There is a chance that some records of D. pulex and D. obtusa from South America (Daday 1902; Harding 1955; Olivier 1962; Adamowicz et al. 2004; Benzie 2005) refer to misidentified D. cavicervix.

Taxonomical comments
Description of Daphnia cavicervix Ekman, 1900 was quite detailed to understand immediately that he described a specific South American member of D. (Daphnia) pulex-group, close to D. obtusa Kurz, 1874 emend. Scourfield, 1942. Species of this sub-group were subjects of several genetic investigations in North America (i.e. Kořínek and Hebert 1996; Černý and Hebert 1999). Hebert and Finston (1996) demonstrated that the North American D. obtusa is fragmented into three genetically isolated lineages showing largely allopatric distributions.

But D. cavicervix was never redescribed by subsequent authors, and forgotten in taxonomic literature on South America (Olivier 1962; Paggi 1998; Adamowicz et al. 2004; Benzie 2005). As a result, several obtusa-like species from the Americas were created without ideas on Ekman’s taxon (Harding 1955; Kořínek and Hebert 1996). Recently, Kořínek and Villalobos (2003) discussed differences of D. cavicervix from some other South American species. But their information on the former was based on Ekman’s (1900) description, which was quite detailed for the beginning of the 20th century, but lacking many details according to recent standards. As a result, some characteristic traits remained unknown until the present redescription. The full list of differences between American species is still incomplete due to the absence of information on limbs in the majority of species.

Brandlova et al. (1982) described “D. cf. cavicervix” from Canada, but this is another species keeping in mind its: (1) rudimentary rostrum of female and male; (2) very different shape of postabdominal projections both in female and male; (3) fine teeth in two basalmost pectens on postabdominal claws; (4) posteriormost extremity of valves not incorporated into ephippium; and (5) very long and thin antenna I of the male.
Discussion

The southernmost South America and the Andes have a specific fauna, different from the rest of this continent (Crisci et al. 1991; Humphries and Parenti 1999). The cladoceran fauna of this region is unique (Frey 1993), as well as the fauna of subantarctic islands (Frey 1988). This singularity helped Ekman, one of the pioneers of cladoceran studies in these regions, to find several valid species. Ekman demonstrated a very high rate of valid species/general number of described species.

Our re-examination of Ekman's samples was productive, resulting in the finding of some forgotten type materials and redescription of valid, but poorly studied species. Several recent authors (Villalobos 1994; Paggi 1998) suggested that the other Ekman species of Daphnia, D. commutata Ekman, 1900, is also valid. Unfortunately, no samples with this species were found, most probably its validity can be checked only by an examination of new samples from the type locality. Previously, investigators of South American Daphnia concentrated on the subgenus Daphnia (Ctenodaphnia) (Paggi 1999; Korinek and Villalobos 2003); our work has started re-investigations of “old” representatives of the subgenus Daphnia (Daphnia).

The present study demonstrates again the necessity to re-examine materials of old authors now kept in different museums. The collections of G. O. Sars, E. Daday, W. Lilljeborg, T. Stingelin are relatively “well explored” and catalogued. At the same time, other known materials, i.e. of E. A. Birge and J. Richard (incorporated into the D. G. Frey collection, Smithsonian Museum of Natural History, Washington, DC, USA; see Berner 1997), as well as some others, need to be accurately analysed.

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