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New records of water mites (Acari: Hydrachnidia) from the Western Himalaya and description of three new species from Asia

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Abstract

New material of water mites (Acari: Hydrachnidia) from the Uttarakhand State of India is reported, including a new species, *Kongsbergia indica* **sp. nov.** (Aturidae), and new records of the species *Sperchon garhwalensis* Kumar, Kumar & Pešić, 2007, *Sperchon indicus* Kumar, Kumar & Pešić, 2007, and *Atractides indicus* Pešić & Smit, 2007. Moreover, in the light of the newly discovered male of *Torrenticola turkestanica* (Sokolow, 1926), populations from South Korea and Thailand formerly assigned to the latter species are here attributed to two new species, i.e., *T. wonchoeli* **sp. nov.** and *T. rangareddyi* **sp. nov.**, respectively.

Key words: Acari, Hydrachnidia, Himalayas, new species, new records, running waters

Introduction

Recently we described four new water mite species from the Uttarakhand State of India (Pešić et al. 2019). This material was collected from two localities situated in Garhwal Himalayas, the western part of the Himalaya range which stretches from 29 to 31°N latitude and 78 to 80°E longitude. The new material from Uttarkhand was collected by the junior author from October to December 2018. Almost 94% of the collected specimens belong to *Sperchon indicus* Kumar, Kumar & Pešić, 2007, while another four species represent less than 6%. This paper aims to present acarological results of the aforementioned survey and enlarge our knowledge on the presence and distribution of water mites of the Indian Himalayas.

Overviews of the water mite research in India and Himalaya region are given in Pešić et al. (2012, 2019). Faunistic data on the water mite fauna of Uttarkhand State were published by Kumar and Dobriyal (1992) Kumar et al. (2006, 2007), Pešić et al. (2007a, b), Pešić and Panesar (2008a, b), Smit and Pešić (2008), Pešić and Ranga Reddy (2009), Pešić et al. (2010), and Pešić et al. (2019). One species new to science described in this paper increases the total species number reported from Uttarakhand State to 28. Moreover, two species new for science are described from South Korea and Thailand, respectively.

Material and Methods

All material was collected in streams of Uttarakhand State in India by the third author and was fixed in ethanol 70%. Later on, water mites were transferred to Koenike-fluid and dissected as described

elsewhere. Morphological nomenclature follows Gerecke *et al.* (2016). The holotypes of *Kongsbergia indica* **sp. nov.** and *Torrenticola rangareddy* **sp. nov.** and all non-type material will be deposited in Naturalis Biodiversity Center, Leiden (RMNH). The holotype and paratype of *Torrenticola wonchoeli* **sp. nov.** is deposited in the National Institute of Biological Resources, Korea (NIBR).

The composition of the material is given as: males/females/deutonymphs. All measurements are given in μm . The following abbreviations are used: Ac-1 = first acetabulum; Cx-I = first coxae; Cxgl-IV = coxoglandularia 4; Dgl-4 = dorsoglandularia 4; dL = dorsal length; H = height; I-L-4-6 = fourth-sixth segments of first leg; L = length; Lgl-4 = lateroglandularia 4; IL = lateral length; mL = medial length; P-1-P-5 = palp segment 1-5; prefr = praefrontalia; postoc = postocularia; RMNH = Naturalis Biodiversity Center, Leiden; S-1 = proximal large ventral seta at I-L-5; S-2 = distal large ventral seta at I-L-5; Vgl-1 = ventroglandularia 1; vL = ventral length; W = width.

Systematic part

Family Torrenticolidae Piersig, 1902

Genus *Torrenticola* Piersig, 1896

Torrenticola turkestanica (Sokolow, 1926)

(Figs. 1A–D, 2A)

Material examined

India, Uttarakhand State, Pauri Garhwal, RiLG-02 stream Randi Gad near Masan Gaon village, loc. #2, 30°07'21" N, 78°41'29" E, 19.xi.2018 leg. P. Bahuguna 1/0/0, dissected and slide mounted (RMNH).

Compared material

"*Torrenticola* cf. *turkestanica*" 2 ♀, Uttarakhand State, Garhwal Himalayas, Khanda Gad stream, near Srinagar Garhwal town, leg. N. Kumar & K. Kumar.

Description

Male—Idiosoma oval (dorsal shield L/W ratio 1.3); dorsal shield with a colour pattern as illustrated in Fig. 2A; gnathosomal bay U-shaped, proximally pointed; Cxgl-4 subapical; medial suture line of Cx-II+III moderately long; posterior suture lines of Cx-IV medially starting from genital field at a 45° angle to main body axis, distinctly extending posteriorly beyond posterior margin of genital field; excretory pore and Vgl-2 well away from the line of primary sclerotization, excretory pore on the level of Vgl-2; ejaculatory complex with well-developed anterior keel and distal and proximal arms; gnathosoma with a curved ventral margin; P-2 and P-3 with a subrectangular ventrodiscal projection, P-2 ventral seta relatively long, P-4 stocky with a well developed ventral tubercle ending in two tips separated by a concavity, bearing one longer and three shorter setae (Fig. 1D).

Measurements—Idiosoma (ventral view: Fig. 1B) L 656, W 486; dorsal shield (Figs. 1A, 2A) L 538, W 416, L/W ratio 1.29; dorsal plate L 513; shoulder plate L 150–153, W 50–54, L/W ratio 2.8–3.1; frontal plate L 106–108, W 44–45, L/W ratio 2.40–2.43; shoulder/frontal plate L 1.39–1.44. Gnathosomal bay L 128, Cx-I total L 234, Cx-I mL 106, Cx-II+III mL 94; ratio Cx-I L/Cx-II+III mL 2.2; Cx-I mL/Cx-II+III mL 2.5. Genital field L/W 145/116, ratio 1.26; distance genital field-excretory pore 125, genital field-caudal idiosoma margin 178. Gnathosoma vL 244, chelicera L 288; palp total 275, dL/H, dL/H ratio: P-1, 28/28, 1.0; P-2, 83/51, 1.63; P-3, 55/47, 1.17; P-4, 88/30, 2.9;

P-5, 21/11, 1.9; L ratio P-2/P-4 0.95. dL of I-L-2-6: 53, 66, 78, 94, 97; I-L-6 H 36; dL/H I-L-6 ratio 2.7.

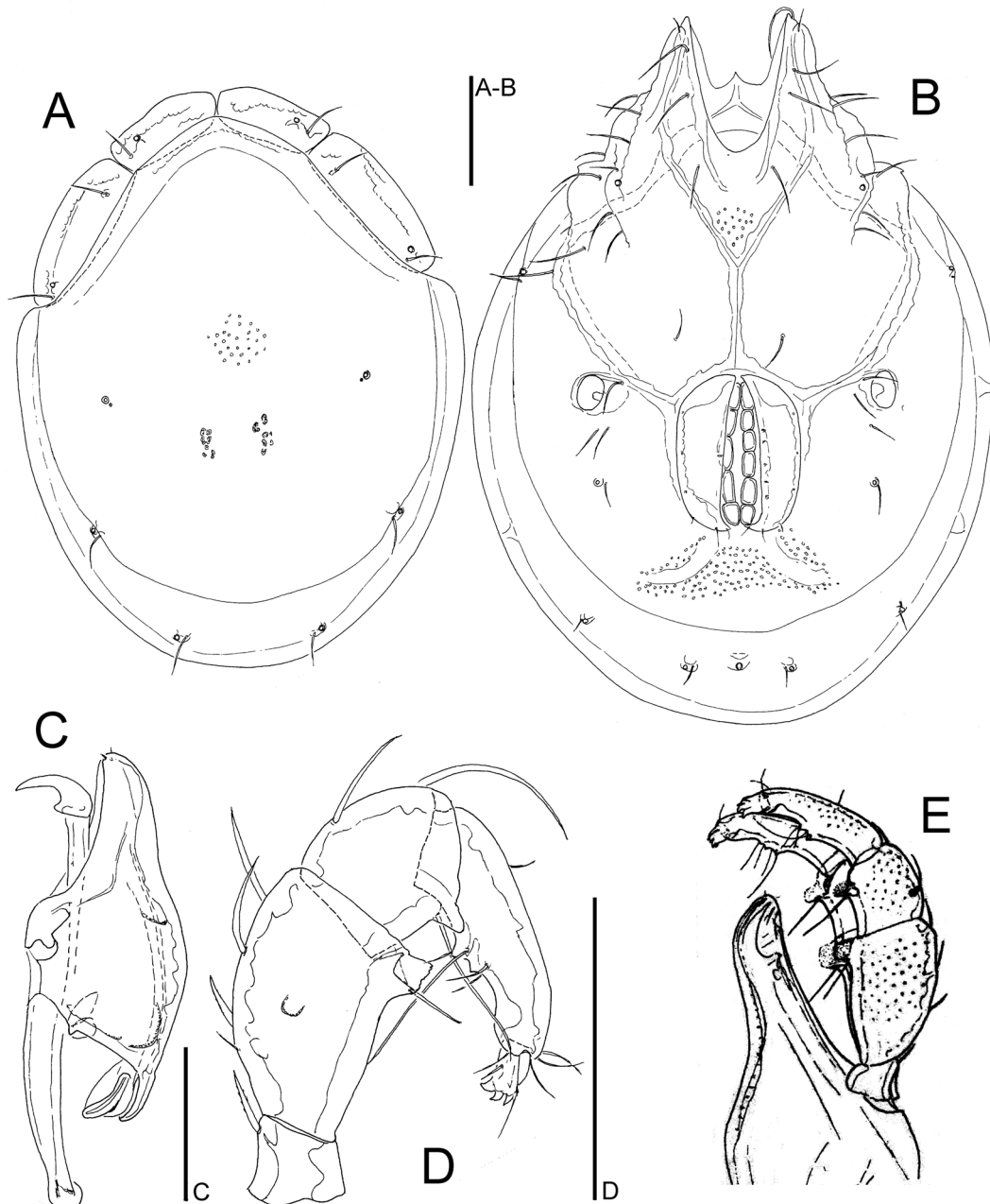


FIGURE 1. A–D *Torrenticola turkestanica* (Sokolow, 1926), male, Uttarakhand, stream Randi Gad: A = dorsal shield; B = idiosoma, ventral view; C = gnathosoma and chelicera; D = palp, medial view. E = holotype female, re-drawn from Sokolow (1926): palps. Scale bars = 100 μ m.

Remarks

With respect to the general morphology of the palp, the single male from Randi Gad stream agrees well with female specimens from Uttarakhand State assigned by Pešić *et al.* (2007) to *Torrenticola turkestanica* (Sokolow, 1926). This species was described and illustrated by Sokolow

(1926) on the basis of a single female collected from a river near Tashkent, Uzbekistan. Later on, Sokolow reported a male from a mountain stream in Tadjikstan (Sokolow 1948) but he did not give illustrations of the collected specimen. The holotype of *T. turkestanica* is probably lost as it is not found in Sokolow's collection in the Zoological Institute of St. Petersburg (Denis Tumanov pers. comm). This species was rediscovered by Pešić *et al.* (2007) who reported two females from Garhwal Himalaya. Later on, Pešić and Smit (2009) reported more specimens from Thailand (see discussion under *Torrenticola rangareddy* **sp. nov.**) and Pešić *et al.* (2013) described and illustrated specimens provisionally assigned to *T. turkestanica* from South Korea (see discussion under *T. wonchoeli* **sp. nov.**).

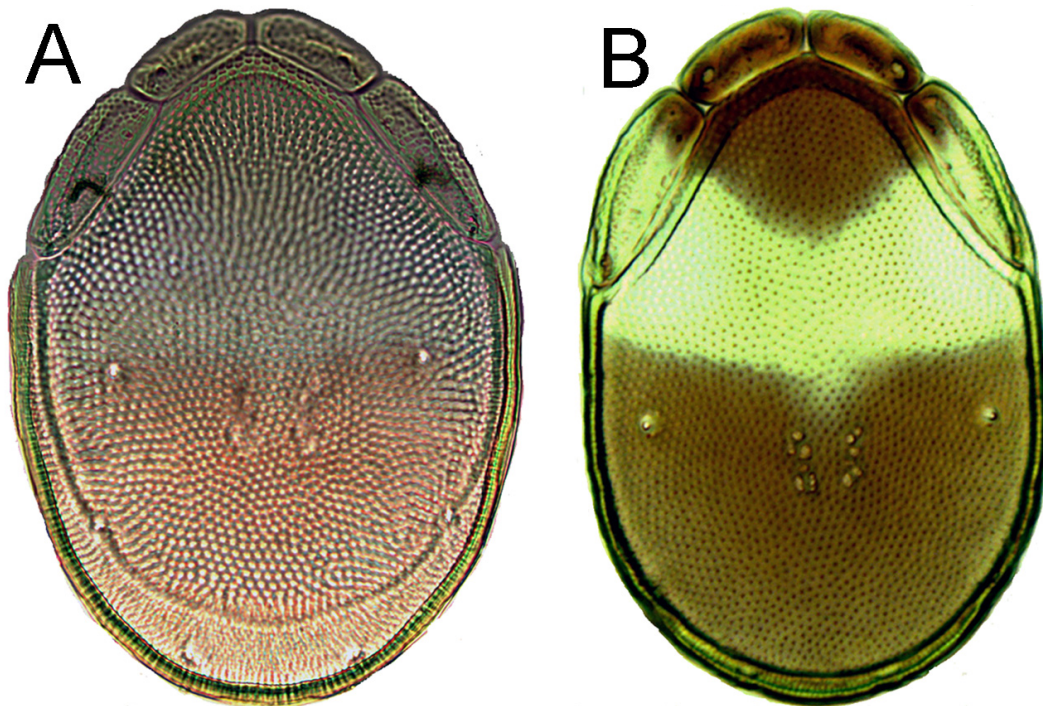


FIGURE 2. Photographs of dorsal shields: A = *Torrenticola turkestanica* (Sokolow, 1926), male, stream Ranga Rad. B = *T. wonchoeli* **sp. nov.**, male holotype, River Inje, Korea (from Pešić *et al.* 2013).

Torrenticola turkestanica belongs to a group of species characterized by the presence of subrectangular ventrodiscal projections on P-2 and P-3. This group includes *Torrenticola turkestanica* (Sokolow, 1926) (Uzbekistan, Tadjikistan; Sokolow 1926), *T. irana* Pesic & Saboori, 2006 (Iran; Pešić *et al.* 2006), *T. japonica* Imamura, 1953 (Japan; Imamura 1953), *T. wonchoeli* **sp. nov.** (South Korea) and *T. rangareddy* **sp. nov.** (Thailand). The specimens from Garhwal Himalayas match well Sokolow's (1926) description in the shape of the palp, with a ventrodiscal projection of P-2 clearly set off from the ventral margin of the segment (see Fig. 4E in Sokolow 1928). However, as stated by Pešić *et al.* (2007), more material from the type locality (and probably designation of a neotype) is needed to clarify the taxonomy of this species. Moreover, the identity of populations from Garhwal Himalayas, which are about 1500 km far away from the type locality, should be tested with the application of molecular techniques in case data are available from the type locality.

Distribution. Uzbekistan, Tadjikistan, India (Pešić *et al.* 2007; this study).

***Torrenticola rangareddy* Pešić & Smit sp. nov.**

Synonymy. *Torrenticola turkestanica* Pešić & Smit (2009: p. 191, fig. 5), nec Sokolow, 1926.

Type material

Holotype male (ZMA.ACA.P.32378), Thailand, stream W of Bankrang Camp, Kaeng Krachan NP, 12°48.106' N, 99°26.786' E, 30.xi.2007 leg. Smit, described and illustrated by Pešić & Smit (2009) in fig. 56–57, 59–60, 62, dissected and slide mounted. Paratypes (RMNH): 5/0/0, same data as holotype; 4/2/0, Thorntip Waterfall, Kaeng Krachan NP, 12°50.952' N, 99°18.498' E, 29.xi.2007 leg. Smit, one female dissected and slide mounted (ZMA.ACA.P.32376), described and illustrated by Pešić & Smit (2009) in figs. 58, 61–63.

Additional material

See Pešić and Smit (2009) as *T. turkestanica* (Sokolow, 1926).

Diagnosis

Idiosoma small in size (L 530 in male, 640 in female) and elongated-oval (dorsal shield L/W ratio 1.3–1.4); P-2 ventral seta short; female genital field small (L/W < 150/130 µm).

Description

Male and female as described and illustrated by Pešić and Smit (2009) from Thailand and assigned to *Torrenticola turkestanica* (Sokolow, 1926).

General features (from Pešić & Smit 2009)—Idiosoma elongated-oval (dorsal shield L/W ratio 1.3–1.4); gnathosomal bay U-shaped, proximally pointed; Cxgl-4 subapical; suture lines of Cx-IV distinctly extending posteriorly beyond posterior margin of genital field, laterally curved; excretory pore and Vgl-2 away from the line of primary sclerotization; gnathosoma with a curved ventral margin (Fig. 59 in Pešić & Smit 2009); P-2 and P-3 with a subrectangular, ventrodistal projection, P-2 ventral seta short, P-4 stocky with a well developed ventral tubercle ending in two tips separated by a concavity, bearing one longer and three shorter setae (see Pešić & Smit 2009, figs. 62–64). *Male*—Idiosoma L/W 531/372; medial suture line of Cx-II+III relatively short (Cx-II+III ml 86; ratio Cx-I/Cx-II+III mL 2.4); genital field with obtuse, but distinct anterior angles; ejaculatory complex with well developed anterior keel and distal and proximal arms, see Pešić & Smit 2009 fig. 60). *Female*—Idiosoma L/W 638/425; Cx-II+III medial 68, Cx-I L/Cx-II+III mL 3.5; genital field L/W 139/125, ratio 1.1 (see Fig. 61 in Pešić & Smit 2009).

Etymology

The species is named after Dr Yenumula Ranga Reddy (Acharya Nagarjuna University, India) in appreciation of his work on the Indian aquatic fauna.

Discussion

Pešić and Smit (2009) were aware that specimens from Thailand assigned to *Torrenticola turkestanica* differ from the original description in the length of P-2 ventral seta, but considered this phenomenon as a case of intraspecific variability. Pešić *et al.* (2003) suggested that populations from Thailand very likely represent an undescribed species. The populations from Thailand here assigned to *Torrenticola rangareddy* sp. nov. can be separated from the material in this study and from Sokolow's original description of *T. turkestanica* by a much shorter ventral seta on P-2 (see Pešić & Smit 2009, figs. 62–64). Moreover, the female of the new species differs in smaller dimensions of idiosoma, L < 650 (780 in holotype and specimen from Garhwal, data from Sokolow 1926 and Pešić *et al.* 2007, respectively) and genital field (L/W 185/180 in type specimen, 175/153 µm in specimen from Garhwal, data from Sokolow 1926 and Pešić *et al.* 2007, respectively).

Distribution. Thailand.

***Torrenticola wonchoeli* Pešić & Smit sp. nov.**

(Fig. 2B)

Synonymy. *Torrenticola turkestanica* Pešić *et al.* (2013: p. 38, fig. 10, 11G–H), nec Sokolow, 1926.

Type material

Holotype male (NIBRIV0000268852), South Korea, CR3 River Inje, 38°03.961'N, 128°10.516' E, 225 m asl., 8.x.2012, Pešić & Karanović, described and illustrated by Pešić *et al.* (2013, fig. 10A–D), dissected and slide mounted. Paratype (NIBR): one female, same data as holotype, described and illustrated by Pešić *et al.* (2013) in fig. 10E, dissected and slide mounted.

Diagnosis

Idiosoma elongated (dorsal shield L/W ratio 1.5–1.6); dorsal shield with colour pattern as illustrated in Fig. 4F; P-2 ventral seta long.

Description

Male and female as described and illustrated by Pešić *et al.* (2013) from South Korea as *Torrenticola turkestanica* (Sokolow, 1926).

General features (from Pešić *et al.* 2013)—Idiosoma elongated (dorsal shield L/W ratio 1.5–1.6); dorsal shield with colour pattern as illustrated in Fig. 11 G–H in Pešić *et al.* 2013 and Fig. 3F; Cxgl-4 subapical; P-2 ventral margin convex, P-2 and P-3 with a subrectangular, apically serrated ventrodistal projection, P-2 ventral seta long (see Figs. 10C–D in Pešić *et al.* 2013), P-4 stocky with well developed ventral tubercle bearing one long and three short setae. *Male*—Idiosoma L/W 700/441; medial suture line of Cx-II+III moderately long (L 97); genital field subrectangular in shape, ejaculatory complex with well-developed anterior keel and distal and proximal arms; excretory pore and Vgl-2 located on the margin of primary sclerotization (see Fig. 10A in Pešić *et al.* 2013). *Female*—Idiosoma L/W 781/494, Cx-II+III medial 47; genital field L/W 169/151; posterior suture line of Cx-IV curved and well evident; genital field excretory pore and Vgl-2 away from the line of primary sclerotization (see Fig. 10E in Pešić *et al.* 2013).

Etymology

The species is named after Dr Wonchoel Lee (Hanyang University, Seoul) in appreciation of his study of the aquatic fauna of South Korea.

Discussion

As mentioned by Pešić *et al.* (2013), the assignment of specimens from South Korea to *Torrenticola turkestanica* was based on the non-proved identity with alternative species. The latter authors compared Korean specimens from the Inje River with the original description of the female of *T. turkestanica* and found a difference in a broader genital field of the type specimen. In the light of the newly discovered male of *T. turkestanica* of this study, the differences of the specimens from South Korea in comparison to the original description of *T. turkestanica* cannot be attributed to a geographical variability and warrants the erection of a new species, *Torrenticola wonchoeli* sp. nov. It can be distinguished from *T. turkestanica* due to the characteristic colour pattern of the dorsal shield (Fig. 2B), and a more elongated idiosoma in both sexes (L/W ratio 1.5–1.6).

Distribution. South Korea; known only from the *locus typicus*.

Family Sperchontidae Thor, 1900

Genus *Sperchon* Kramer, 1877

***Sperchon indicus* Kumar, Kumar & Pešić, 2007**

Material examined

India, Uttarakhand State, Rudraprayag Garhwal, KG-01 stream Kyunja Gad near Pingalpani village, 30°25'38" N, 79°06'53" E, 28.x.2018, leg. P. Bahuguna, 15/0; KG-02 stream Kyunja Gad near Naguri village, 30°25'35" N, 79°06'26" E, 28.x.2018, leg. P. Bahuguna, 10/12/0; KG-04 stream Kyunja Gad near Ajaypur village, 30°25'40" N, 79°05'54" E, 1.xi.2018, leg. P. Bahuguna, 10/0; KG-05 stream Kyunja Gad near Chandrapuri, 30°25'36" N, 79°04'27" E, 1.xi.2018, leg. P. Bahuguna, 6/9/2; Pauri Garhwal: LG-02 stream Randi Gad near Sandal, 30°06'31" N, 78°37'07" E, 10.x.2018, leg. P. Bahuguna, 1/5/0; LG-05 stream Randi Gad near Masan Gaon village, loc. #1, 30°08'28" N, 78°41'29" E, 10.x.2018, leg. P. Bahuguna, 4/3/2; RiLG-02 stream Randi Gad near Masan Gaon village, loc. #2, 30°07'21" N, 78°41'29" E, 19.xi.2018, leg. P. Bahuguna, 12/15/1; RiLG-05 stream Randi Gad near Masan Gaon village, loc. #3, 30°07'35" N, 78°41'26" E, 19.xi.2018, leg. P. Bahuguna, 4/5/0; AKG-02 stream Randi Gad near Devi Mandir Gahad, loc. #1, 30°07'50" N, 78°44'42" E, 4.xii.2018, leg. P. Bahuguna, 20/0; AKG-05 stream Randi Gad near Devi Mandir Gahad, loc. #2, 30°07'40" N, 78°44'26" E, 4.xii.2018, leg. P. Bahuguna, 0/10/0.

Distribution

India: Uttarakhand State (Kumar *et al.* 2007; Pešić *et al.* 2019); Bhutan (as "*Sperchon cf. indicus*" in Pešić & Smit 2007).

***Sperchon garhwalensis* Kumar, Kumar & Pešić, 2007**

Material examined

India, Uttarakhand State, Pauri Garhwal, AKG-05 stream Randi Gad near Devi Mandir Gahad, loc. #2, 30°07'40" N, 78°44'26" E, 4.xii.2018, leg. P. Bahuguna, 3/2/0 (2/0/0 mounted, RMNH).

Compared material

Sperchon garhwalensis, Holotype ♀, Uttarakhand State, Khanda Gad stream, leg. N. Kumar & K. Kumar (RMNH)¹.

Remarks

This species was described by Kumar *et al.* (2007) on the basis of two female specimens collected in a tributary of Alaknanda River in Uttarakhand State. Later on, Zhang and Jin (2010) described a male from a stream at an altitude of 1188 m in Hubei Province, China. The specimens from the stream Randi Gad match well the original description and the only difference was found in dc-2 fused in the male but close to each other in the female.

Distribution. India: Uttarakhand State (Kumar *et al.* 2007; this study); China (Zhang & Jin 2010).

1. As stated in the original description (Kumar *et al.* 2007) the holotype was about to be deposited in the Museum of the Natural History in Podgorica, Montenegro. However, the conditions for depositing type material in this museum are very poor, not allowing a safe accommodation and therefore the first author of the species (VP) decided later on to transfer the type material to Naturalis Biodiversity Center, Leiden.

Family Hygrobatidae Koch, 1842

Genus *Atractides* Koch, 1837

***Atractides (Atractides) indicus* Pešić & Smit, 2007**

Material examined

India, Uttarakhand State, Rudraprayag Garhwal, KG-01 stream Kyunja Gad near Pingalpani Village, 30°25'38" N, 79°06'53" E, 1.xi.2018, leg. P. Bahuguna 1/0/0.

Distribution. India: Uttarakhand State (Pešić *et al.* 2019; this study).

Family Aturidae Thor, 1900

Genus *Kongsbergia* Thor, 1899

***Kongsbergia (Kongsbergia) indica* Pešić & Smit sp. nov.**

(Figs. 3–5)

Synonymy. *Kongsbergia (Kongsbergia) rucira* (Pešić *et al.* 2019: p. 78), nec *K. rucira* (Cook, 1967).

Type material

Holotype male (RMNH), dissected and slide mounted, India, Uttarakhand State, Pauri Garhwal, LG-02 stream Randi Gad near Sandal, 30°06'31" N, 78°37'07" E, 10.x.2018, leg. P. Bahuguna. Paratypes: one male, one female, same data as holotype, dissected and slide mounted (RMNH).

Compared material

"*Kongsbergia rucira*", ♀, Uttarakhand State, Randi Gad stream, 30°6'28,26" N, 78°37'30,68" E, 1- xii-2017, leg. P. Bahuguna (RMNH).

Diagnosis

Dorsal shield with four pairs of strong setae associated with accompanying glandularia. *Male*—P-2 less inflated; IV-L-5 ventral margin in centre convexly protruding bearing a strong and pointed medioventral seta, the distoventral seta stout and pointed. *Female*—P-4 short, L ratio P-2/P-4 0.89, stout, L/H ratio 2.2.

Description

Colour yellowish brown, idiosoma margin between Dgl-1 straight, lateral margins slightly convex, posterior margins rounded; lateral eyes with black pigment dots. Dorsal shield with numerous longitudinal wrinkles in lateral area, setae Dgl-1 strong and long, in addition three pairs of strong, thickened setae associated with accompanying glandularia in anterior half of the dorsal shield (Fig. 3A). Excretory pore in dorsal position. Suture Cx-I/II distinct, not reaching the medial line. Genital field with 50–70 pairs of acetabula covering the posterolateral venter (Fig. 3B). Palp with a strong sexual dimorphism. *Male*—IV-L-4 with several pectinate setae at distal margin; IV-L-5 ventral margin with a basal kink, in centre weakly convexly protruding bearing a short proximoventral seta and a strong, curved and pointed medioventral seta, the distoventral seta stout and pointed, several pectinate setae near distal margin (Fig. 3C). Gonopore in terminal position on ventral surface. Palp: stout, P-2 dorsal margin convex, ventral margin proximally with a narrow projection, distally with a longitudinal groove flanked by a lateral lamella and a blunt medial hump, P-4 stout, maximum H at the base of proximoventral seta, proximoventral seta longer and stouter than distoventral seta (Figs. 3E–F). *Female*—P-2 less stout, ventral margin nearly straight with the medial pointed projection located near the centre and a small rounded hump in proximal half (Figs. 5B–D).

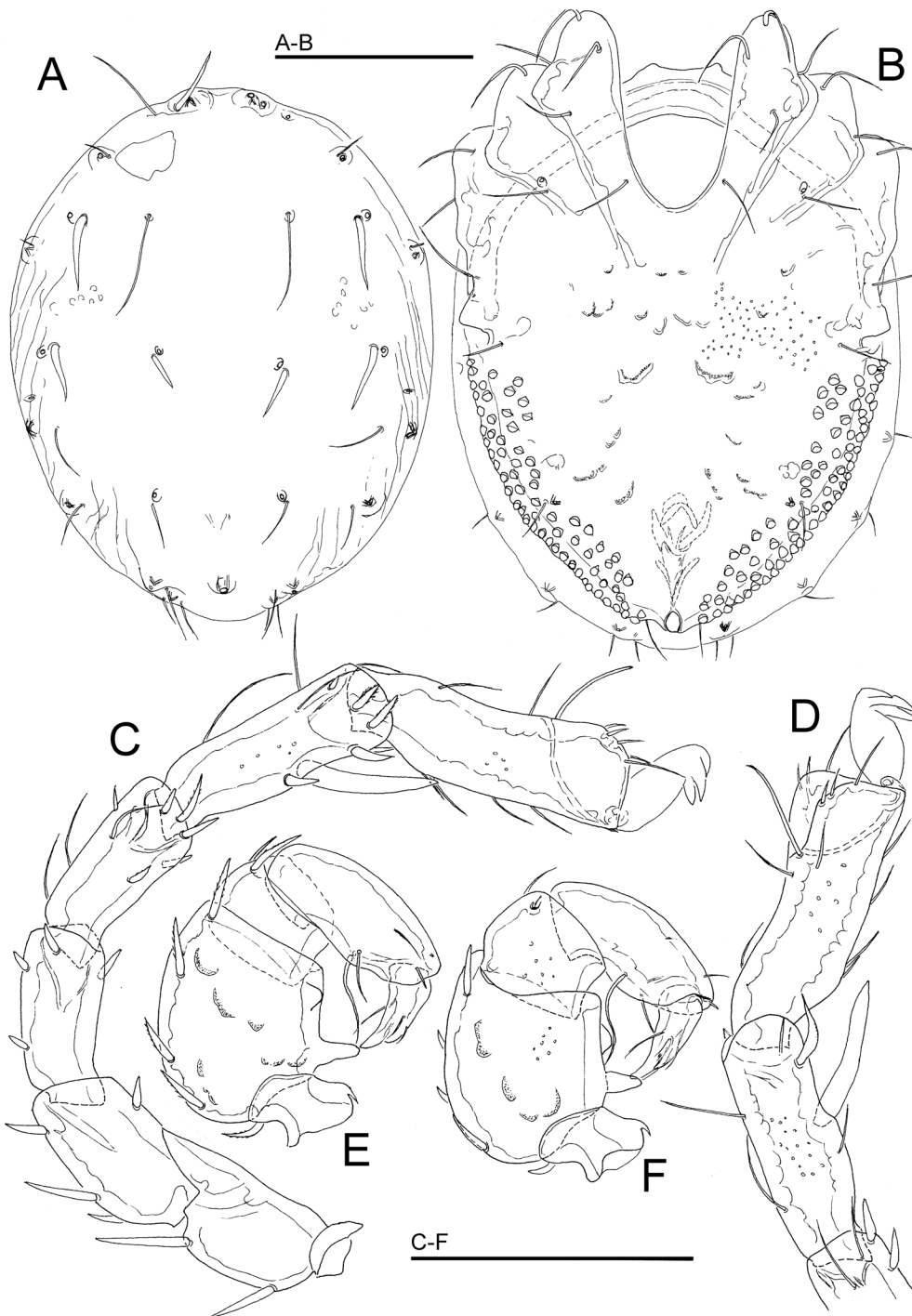


FIGURE 3. *Kongsbergia indica* sp. nov., male holotype, Uttarakhand, stream Randi Gad: A = dorsal view; B = ventral view; C = IV-L; D = IV-L-5 and -6; E-F = palp. Scale bars = 100 μ m.

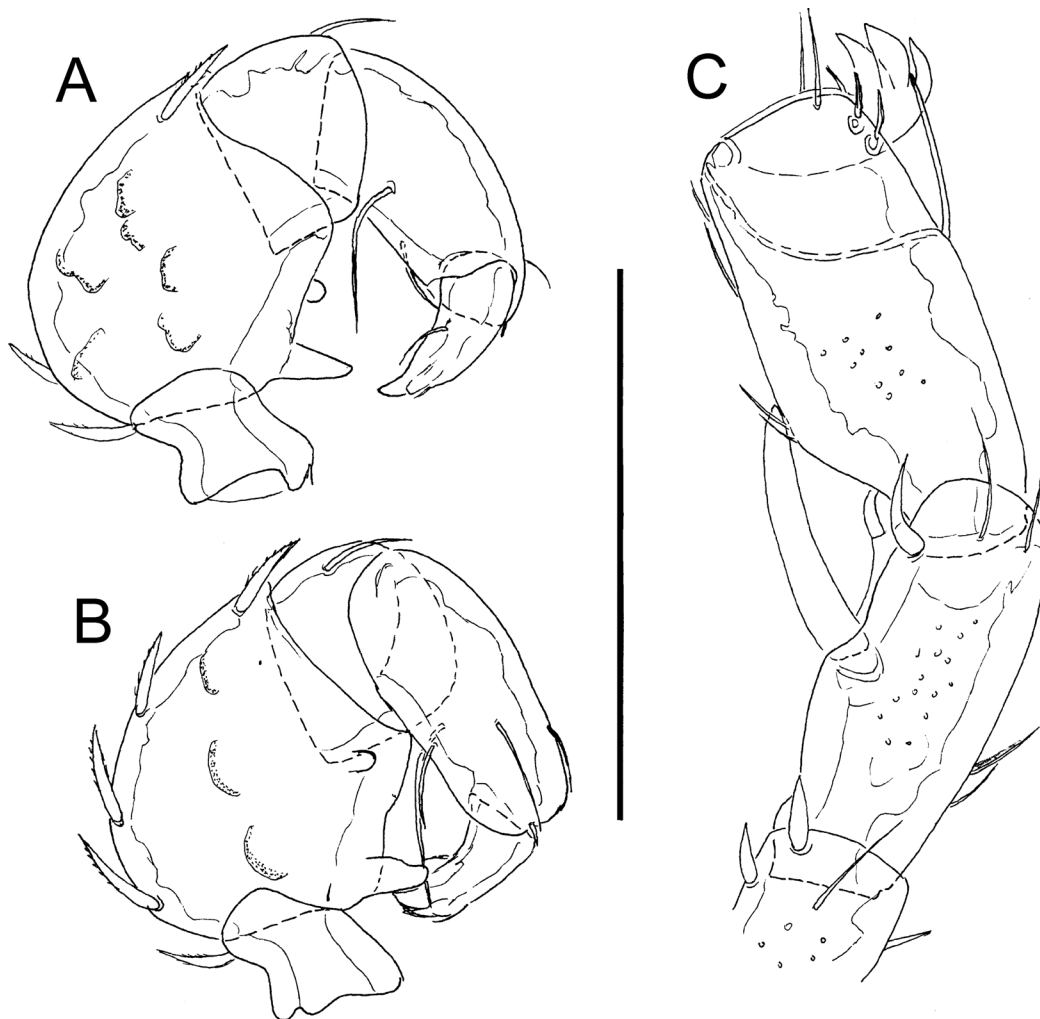


FIGURE 4. *Kongsbergia indica* sp. nov., male paratype, Uttarakhand, Randi Gad Stream: A–B = palp; C = IV-L-5 and -6. Scale bar = 100 μ m.

Measurements. Male (holotype, in parentheses some measurements of paratype)—Idiosoma L 322 (298), W 227 (213); gnathosomal bay L 98 (81), Cx-III W 227 (209); gonopore L/W 11 (14)/8 (9). Palp: palp total L 246 (204); dL/H, dL/H ratio: P-1, 20/22, 0.93 (19/19, 1.0); P-2, 80/58, 1.38 (66/50, 1.33); P-3, 38/43, 0.87 (28/36, 0.78); P-4, 71/30, 2.39 (58/26, 2.27); P-5, 37/16, 2.35 (33/14, 2.33); L ratio P-2/P-4 1.13 (1.15). Gnathosoma vL 94; chelicera total L 134, L basal segment 92, claw 46. Legs: dL of I-L: 40, 58, 48, 53, 66, 84; L/H I-L-6 ratio 2.8; dL of IV-L: (56), (61), (55), (59), (75), (95); L/H IV-L-5 ratio (2.2); L/H IV-L-6 ratio (2.44).

Female—Idiosoma L 333, W 248; gnathosomal bay L 75, Cx-III W 230; egg maximum diameter 164. Palp: palp total L 199; dL/H, dL/H ratio: P-1, 19/20, 0.93; P-2, 52/38, 1.38; P-3, 30/30, 1.0; P-4, 58/26, 2.24; P-5, 40/16, 2.56; L ratio P-2/P-4 0.89. Legs: dL of I-L-2-6: 34, 36, 41, 52, 76; L/H I-L-6 ratio 2.55; dL of IV-L-2-6: 50, 47, 54, 69, 95; L/H IV-L-5 ratio 2.6; L/H IV-L-6 ratio 3.2.

Etymology

The species is named for its occurrence in India.

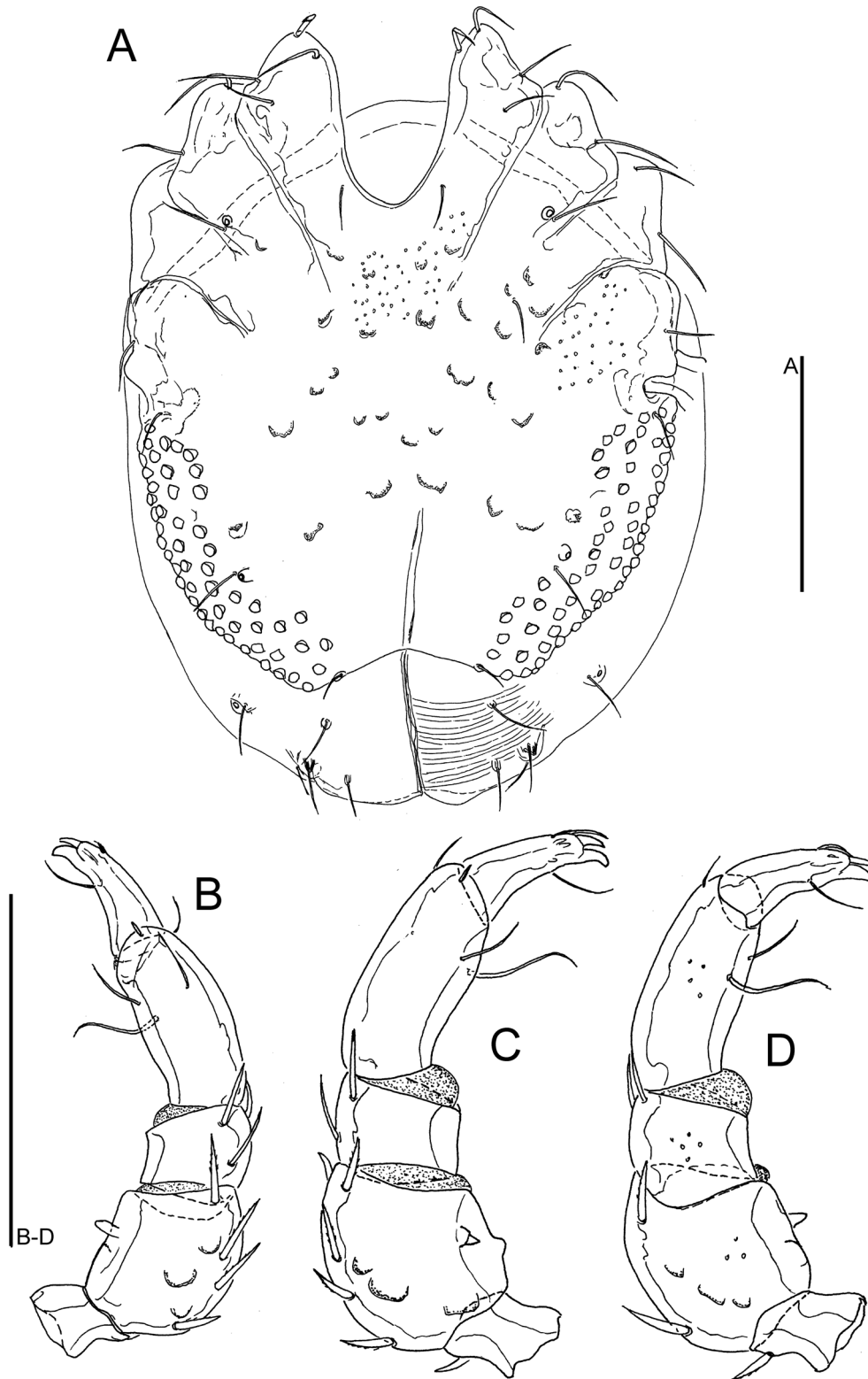


FIGURE 5. *Kongsbergia indica* **sp. nov.**, female, Uttarakhand, Randi Gad Stream: A = ventral view; B–D = palp. Scale bars = 100 μ m.

Discussion

In the shape and setation of the male IV-L (IV-L-5 in centre weakly convex, bearing a strong, weakly curved and pointed medioventral seta, the distal seta shorter and curved), the new species is similar to *Kongsbergia variabilis* Cook, 1967, known from Maharashtra State of India (Cook 1967). As mentioned by Cook (1967) the latter species exhibits a great variation in the size of palps and IV-L (see under Remarks). From the new species, *Kongsbergia variabilis* can be separated by the presence of simple setae on the dorsal shield (see Cook 1967: fig. 737). Moreover *K. variabilis* differs in having a generally more inflated P-2 and IV-L-4 distoventrally projecting (for variation in IV-L-4 see Cook 1967, fig. 738).

Females found together with the male of *Kongsbergia indica* **sp. nov.** are most similar to *K. rucira* Cook, 1967 (Maharashtra State) in the rather short and stout P-4 (L/H ratio about 3.0, calculated from the figure, Cook 1967, fig. 728). The females of the latter species can be separated by the presence of simple, unmodified setae on dorsal shield (see Cook 1967: fig. 731). The female of *Kongsbergia variabilis* differs noteworthy in the shape of the palp, with P-4 slender (L/H ratio about 4.0, calculated from figure 741, Cook 1967) and nearly as long as P-2+3.

Remarks

The new species shows variation in the size of the segments of palp (see Figs. 3E–F and Figs. 4A–B) and fourth leg, especially of IV-L-6 (as illustrated in Figs. 3C–D and Fig. 4C). The same pattern was observed by Cook (1967) in *Kongsbergia rucira* and *K. variabilis*. He found that a great variation in appendage size is correlated with much smaller variations in the idiosoma size. Moreover Cook (1967) presented two hypotheses aimed at explaining the size variation in *Kongsbergia*. In his first hypothesis “genetic control stops nymphal growth at a certain size resulting in an adult of a definite size”. In his second hypothesis the size of deutonymphs is determined by the available food resulting consequently in size difference in the adults.

Distribution. India; known only from the *locus typicus* in Uttarakhand State.

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