New records of water mites (Acari: Hydrachnidia) from the Western Himalaya with the description of four new species

Vladimir Pešić, Harry Smit, Pankaj Bahuguna

Systematic & Applied Acarology 24(1): 59–80 (2019) ISSN 1362-1971 (print)
http://doi.org/10.11158/saa.24.1.5 ISSN 2056-6069 (online)

Article http://zoobank.org/urn:lsid:zoobank.org:pub:CCAB6A48-AADA-4435-AF83-7AC08AA6BA50

New records of water mites (Acari: Hydrachnidia) from the Western Himalaya with the description of four new species

VLADIMIR PEŠIĆ[1], HARRY SMIT[2] & PANKAJ BAHUGUNA[3]

[1]*Department of Biology, University of Montenegro, Cetinjski put b.b., 81000 Podgorica, Montenegro. E-mail: vladopesic@gmail.com*

[2]*Naturalis Biodiversity Center, P.O. Box 9517, 2300 RA Leiden, The Netherlands. E-mail: harry.smit@naturalis.nl*

[3] *Department of Zoology, A.P.B. Govt. P.G. College Agustyamuni, Pin No-246421. Rudraprayag,Uttarakhand, India. E-mail:pankajpaurii@gmail.com*

Abstract

New records of water mites (Acari: Hydrachnidia) from the Uttarakhand State of India are presented. Four species, i.e. *Torrenticola uttarakhandensis, T. chatterjeei* (Torrenticolidae), *Atractides indicus* and *Hygrobates dobriyali* (Hygrobatidae) are described as new to science. The first description of the female and deutonymph of *Sperchon indicus* Kumar, Kumar & Pešić, 2007 is given. *Atractides* cf. *incertus* Lundblad, 1969 is reported as new for the fauna of India.

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

Introduction

The Himalaya extends over 2,400 km length across India, Nepal, Bhutan, China, and Pakistan. In India this mountain range extends from Jammu and Kashmir in the West to Arunachal Pradesh in the East. According to Rodgers *et al*. (2000) the Indian Himalayas includes two biogeographic zones, (1) the Trans Himalaya zone is infact an extension of the Tibetan Plateau, and (2) the Himalaya zone that includes the group of ranges that lies south of the Great Himalaya (the main range) and comprises the Siwalik Ranges and Lesser Himalayan Ranges. The Himalaya zone is divided into four biotic provinces (Rodgers *et al*. 2002), i.e., North-West Himalaya (the parts of Himachal Pradesh and Jammu and Kashmir), West Himalaya (Uttarakhand and some area of Himachal), Central Himalaya (hills of Darjeeling in West Bengal and Sikkim), and East Himalaya (Arunachal Pradesh).

The first publication on water mites from the Indian Himalayas was published by Charles Walter in 1928. Later on, papers on water mites from the Indian Himalayas were published by Lundblad (1934), Vitzthum (1942) and Cook (1967). After a long pause the research on water mites started again in the last decade of 20th century (Kumar & Dobriyal 1992, Panesar & Gerecke 1994) and especially in the first decade of 21th century by a series of papers published by Panesar (2004), Kumar *et al*. (2006, 2007), Pešić *et al*. (2007a, b), Pešić & Panesar (2008a,b), Pešić & Gerecke (2008), Smit & Pešić (2008) and Pešić & Ranga Reddy (2009). All these papers and the water mite species recorded were compiled in the checklists of water mites of India published in 2010 (Pešić *et al.* 2010). In addition a paper on two rare water mites species from the Indian eastern Himalayan was published (Pešić *et al.* 2012).

Material examined in the present study was collected by the junior author (P.B.) during his survey in Uttarakhand state of India. He collected water mites at the two sites: Randi Gad stream located in Pauri Garhwal district and Kyunja Gad stream located in the district Rudraprayag (Garhwal). Both localities are situated in Garhwal Himalayas, a western part of the Himalaya range that stretches from 29 to 31°N latitude and 78 to 80°E longitude known. This region belongs to West Himalaya biogeographic zone characterized by the dominance of cold and draught resistant vegetation (Rodgers *et al.* 2002).

This paper aims to present acarological results of his survey and enlarge our knowledge on presence and distribution of water mites in the Indian Himalayas.

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). Holotypes of the new species and all non-type material will be deposited in in Naturalis Biodiversity Center, Leiden (RMNH).

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; lL = 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 uttarakhandensis* Pešić & Smit sp. nov.**
(Figs. 1A–G, 3A)

Type series. Holotype male (RMNH), dissected and slide mounted, India, Uttarakhand State, Randi Gad stream, 30°6'28,26"N, 78°37'30,68"E, 1-xii-2017 leg. P. Bahuguna. Paratypes (RNHN): same site and data as holotype, 2/0/0.

Diagnosis. Dorsal shield with colour pattern as illustrated in Fig. 3A; Cxgl–4 shifted posterior to margin of Cx-I/II, near insertion of I-L; P-2 and P-3 ventrodistal protrusions bluntly pointed; P-4 tubercles widely separated.

Description. *Male*—Idiosoma roundish (dorsal shield L/W ratio 1.29); dorsal shield with colour pattern as illustrated in Fig. 3A; gnathosomal bay U-shaped; Cxgl–4 posterior at margin of Cx-I/II, near insertion of I-L (Fig. 1C, arrow); medial suture line of Cx-II+III short; suture line of Cx-IV distinct, medially starting from posterior margin of genital field in a right angle to the main idiosoma axis; genital field subrectangular in shape; ejaculatory complex conventional in shape (with well-developed anterior keel and proximal arms—Fig. 1G); excretory and Vgl–2 pore slightly away from the line of primary sclerotization, excretory pore on the level with Vgl–2; gnathosoma with curved

ventral margin (Fig. 1F); P-2 longer than P-4, P-2 ventral margin straight or slightly concave, P-2 and P-3 ventrodistal protrusions bluntly pointed and cone-shaped, P-4 with well developed ventral protuberances, ending in two tips separated by a concavity (Figs. 1D–E).

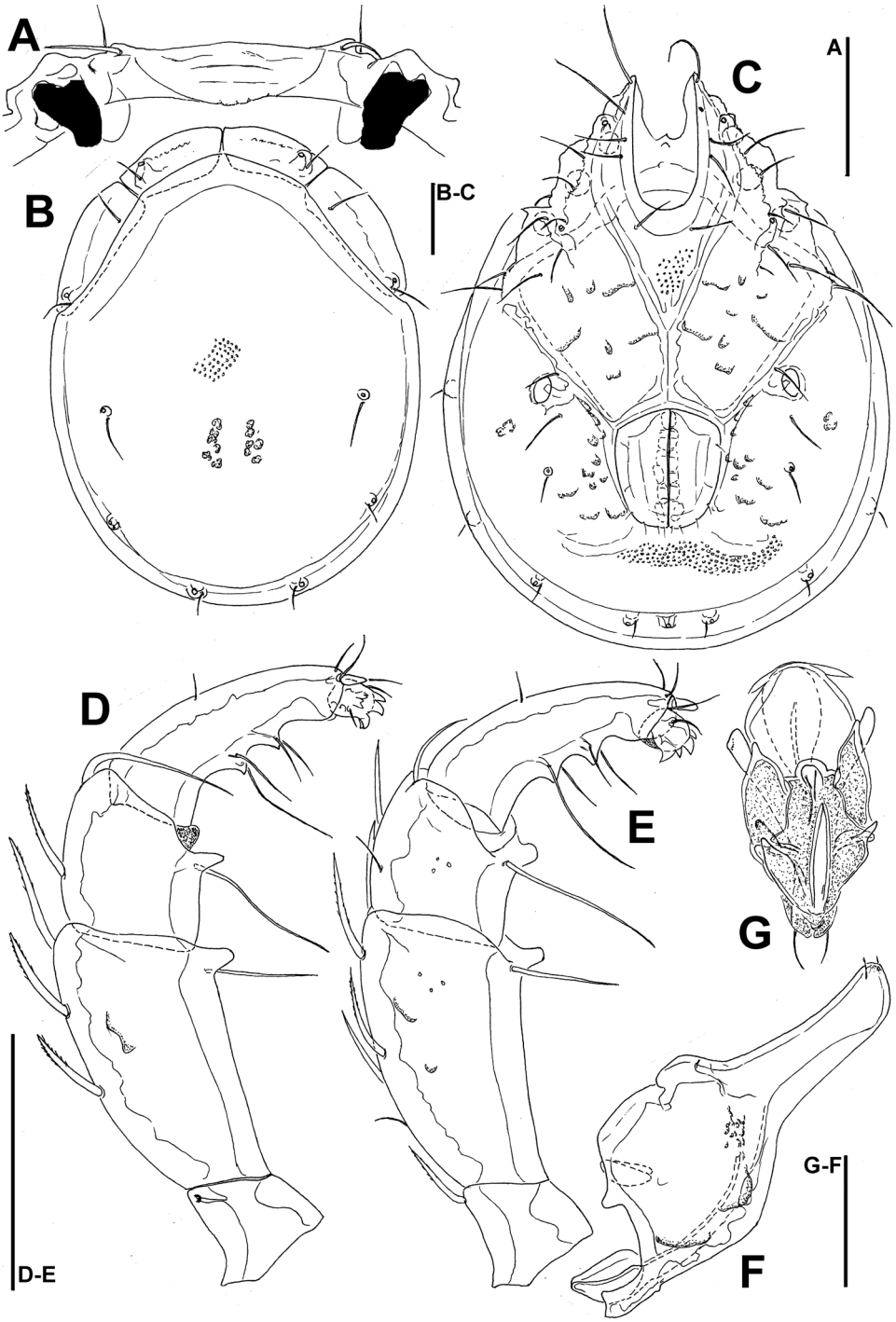


FIGURE 1. *Torrenticola uttarakhandensis* sp. nov., male, Uttarakhand, Randi Gad Stream: A = frontal margin of idiosoma, dorsal view; B = dorsal shield; C = idiosoma, ventral view; D = palp, medial view; E = palp, lateral view; F = gnathosoma; G = ejaculatory complex. Scale bars = 100 μm.

Measurement—Idiosoma (ventral view: Fig. 1C) L 820, W 644; dorsal shield (Figs. 1B, 3A) L 678, W 527, L/W ratio 1.29; dorsal plate L 644; shoulder plate L 203–213, W 73–78, L/W ratio 2.72–2.78; frontal plate L 156–158, W 66, L/W ratio 2.38–2.41; shoulder/frontal plate L 1.29–1.36. Gnathosomal bay L 202, Cx–I total L 366, Cx-I mL 164, Cx-II+III mL 103; ratio Cx-I L/Cx-II+III mL 3.6; Cx-I mL/Cx-II+III mL 1.59. Genital field L/W 172/147, ratio 1.17; ejaculatory complex L 216; distance genital field-excretory pore 141, genital field-caudal idiosoma margin 175. Gnathosoma vL 338, chelicera L 406; palp total 339, dL/H, dL/H ratio: P-1, 39/38, 1.04; P-2, 113/61, 1.85; P-3, 63/55, 1.14; P-4, 103/33, 3.14; P-5, 21/15, 1.37; P-2/P-4 ratio 1.09. dL of I-L-2-6: 79, 105, 117, 127, 120; I-L-6 H 41; dL/H I-L-6 ratio 3.0.

Female—Unknown.

Etymology. Named after its occurrence in Uttarakhand.

Remarks. The new species is most similar to *Torrenticola birmana* (Lundblad, 1941). Both species have an elongated gnathosoma and Cxgl–4 is shifted posterior to I–L insertion. The new species from Randi Gad Stream can be separated from *T. birmana* by the different colour pattern of the dorsal shield (see Lundblad 1967, fig. 11 for *T. birmana*) and P-4 tubercles are widely separated. Moreover, the projections of P-2 and P-3 in *T. uttarakhandensis* are not pointed as in *T. birmana* (see Wiles 1997, fig. 6h).

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

***Torrenticola chatterjeei* Pešić & Smit sp. nov.**
(Figs. 2A–G, 3B)

Type series. Holotype male (RMNH), dissected and slide mounted, India, Uttarakhand State, Randi Gad stream, 30°6'28,26"N, 78°37'30,68"E, 1-xii-2017 leg. P. Bahuguna.

Diagnosis. Characters of the *Torrenticola ungeri* species group (shoulder platelets fused or partially fused with dorsal plate, Cxgl–4 posterior to Cxgl–2); frontal plates fused to each other; ventral margins of P-3 and -4 without fine serration.

Description. *Male*—Idiosoma slightly elongate (dorsal shield L/W ratio 1.2); shoulder platelets fused to dorsal plate, but suture line visible; frontal plates fused to each other (Fig. 3B), but suture line visible; area of primary sclerotization of the dorsal plate with two dorsoglandularia (Fig. 2B); gnathosomal bay U-shaped, proximally rounded; Cxgl–4 posterior to Cxgl–2; medial suture line of Cx-II+III relatively short; posterior suture lines of Cx-IV starting at a right angle from genital field; genital field subrectangular in shape; ejaculatory complex conventional in shape (with well developed anterior keel and proximal arms—Fig. 3G); excretory pore slightly posterior to Vgl–2; pore; gnathosoma ventral margin curved, rostrum well developed (Fig. 3F); P-2 ventral margin slightly curved, ventrodistal protrusion slender; ventral margins of P-2, -3 and -4 without fine serration; P-4 with well developed ventral tubercles, bearing one longer, and three shorter setae (Figs. 2D–E).

Measurements—Idiosoma (ventral view: Fig. 2C) L 503, W 428; dorsal shield (Figs. 2B, 3B) L 444, W 357, L/W ratio 1.24; dorsal plate L 423; frontal plate L 153. Gnathosomal bay L 94, Cx-I total L 209, Cx-I mL 116, Cx-II+III mL 63; ratio Cx-I L/Cx-II+III mL 3.3; Cx-I mL/Cx-II+III mL 1.84. Genital field L/W 113/95, ratio 1.18; ejaculatory complex L 150; distance genital field-excretory pore 100, genital field-caudal idiosoma margin 117. Gnathosoma vL 233, chelicera L 272; palp total 237, dL/H, dL/H ratio: P-1, 29/27, 1.09; P-2, 73/36, 1.3; P-3, 47/36, 1.3; P-4, 72/27, 2.7; P-5, 16/12, 1.4; P-2/P-4 ratio 1.02. dL of I-L-2-6: 46, 64, 78, 84, 92; I-L-6 H 30; dL/H I-L-6 ratio 3.1.

Female—Unknown.

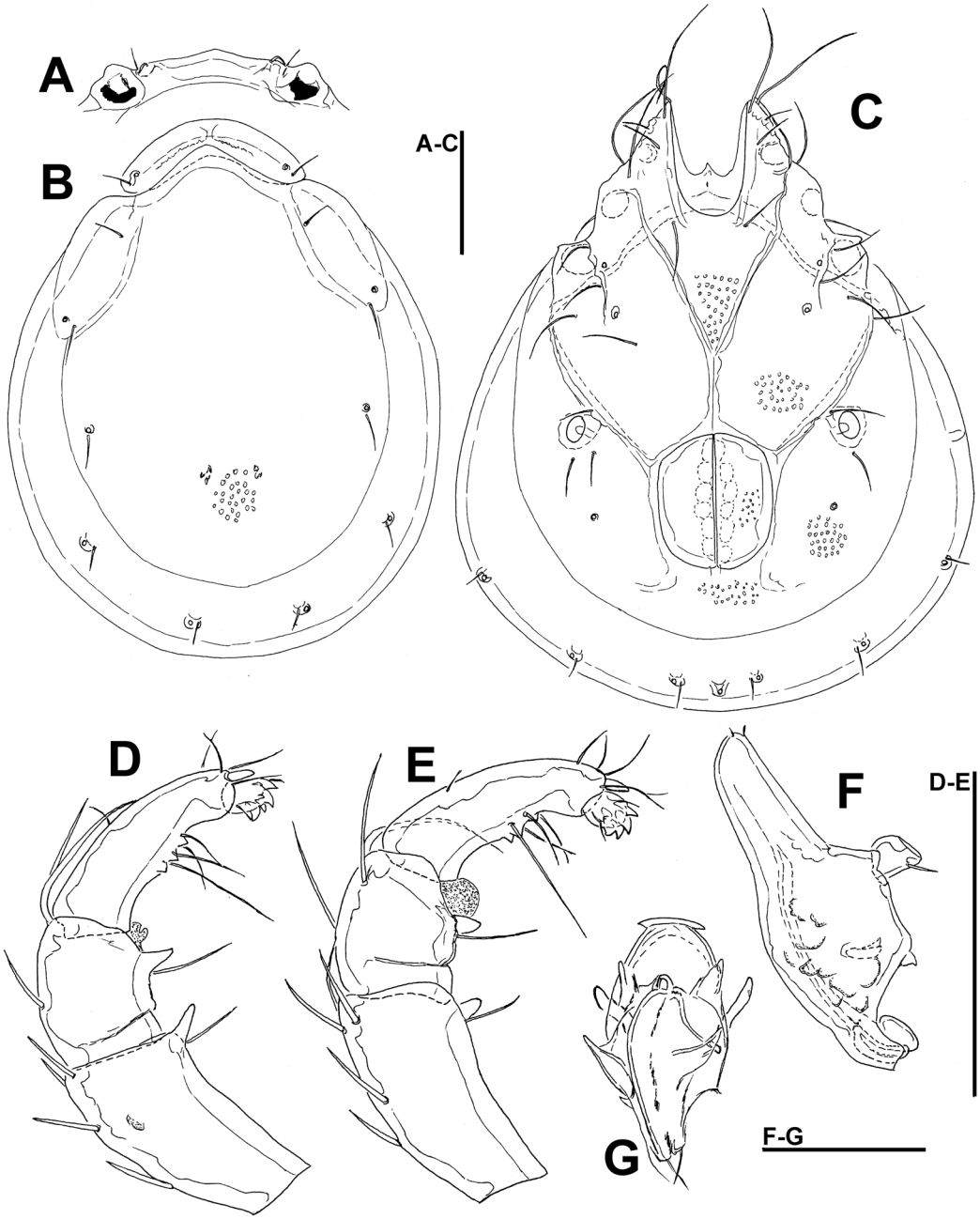


FIGURE 2. *Torrenticola chatterjeei* sp. nov, male, Uttarakhand, Randi Gad Stream: A = frontal margin of idiosoma, dorsal view; B = dorsal shield; C = idiosoma, ventral view; D = palp, medial view (P-1 lacking); E = palp, lateral view (P-1 lacking); F = gnathosoma; G = ejaculatory complex. Scale bars = 100 μm.

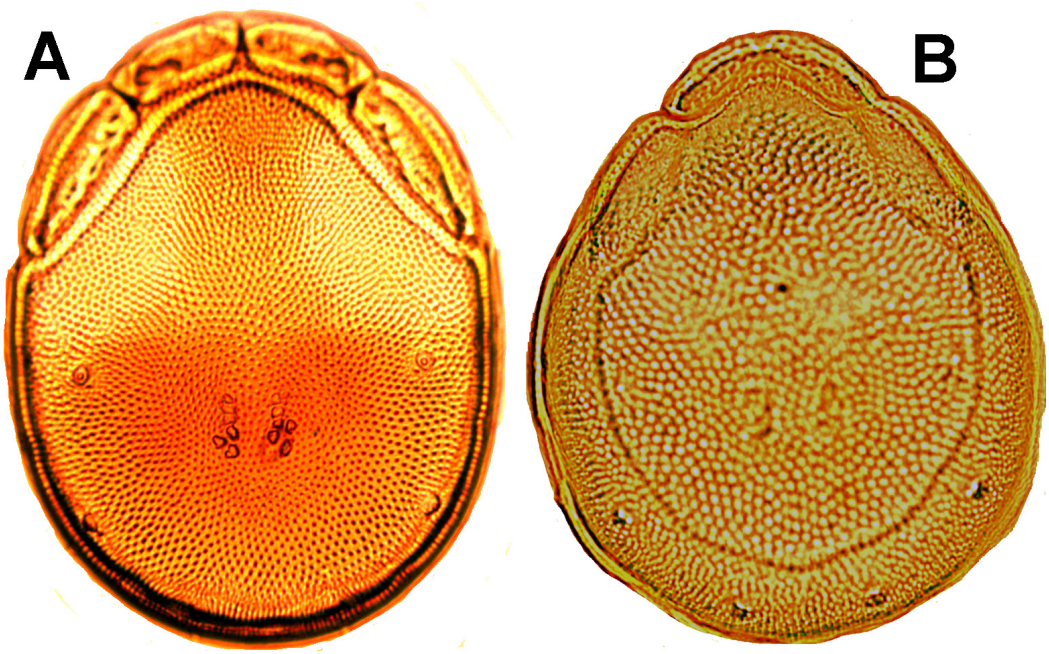
Etymology. Named after Dr Tapas Chatterjee in appreciation of his work on water mite fauna of India.

Remarks. The new species belong to the *Torrenticola ungeri*—species complex. This species group is characterized by having a dorsal shield with the shoulder platelets fused or partially fused with the dorsal plate and Cxgl–4 posterior to Cxgl–2. So far, six species in Asia have been assigned

to this group, i.e., *Torrenticola occulta* Lundblad, 1971 (Java; Lundblad 1971), *T. ussuriensis* (Sokolow, 1940) (Far East of Russia, Japan, Korea; Pešić *et al*. 2011, 2013), *T. microdentifera* Cook, 1967 (India: Maharashtra; Cook 1967), *T. taiwanicus* Pešić et al., 2011 (Taiwan; Pešić *et al*. 2011), *T. ungeri* (Szalay, 1927) (Western Palaearctic) and *T. episce* Pešić et al., 2013, found in the gut contents of the fish *Botia dario* from Assam, India (Pešić *et al*. 2013). The new species can be distinguished from all abovementioned species by the fused frontal platelets.

The lack of ventral serrations on P-3 and P-4, makes the new species similar to *Torrenticola occulta, T. taiwanicus* and *T. ussuriensis*. *Torrenticola occulta*, described on the basis of a single juvenile male from Java (Lundblad 1971), differs in having a very slender and relatively longer P-4 (see: Lundblad 1971, fig. 12). *Torrenticola ussuriensis* and *T. taiwanicus* can be separated by the characteristic colour pattern on dorsal shield, the posterior suture line of Cx-IV extending more beyond posterior margin of genital field and P-4 more stocky (see Pešić *et al*. 2011).

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



FIGURES 3. Photographs of dorsal shields: **A** *Torrenticola uttarakhandensis* sp. nov., male holotype. **B** *T. chatterjeei* sp. nov., male holotype.

Genus *Monatractides* K. Viets, 1926

Monatractides (*Monatractides*) cf. *oxystomus* (K. Viets, 1935)

(Fig. 4A–G)

Material examined. India, Uttarakhand State, Randi Gad stream, 30°6'28,26"N, 78°37'30,68"E, 1-xii-2017 leg. P. Bahuguna 0/1/0 (mounted, RMNH).

Compared material. *Monatractides oxystomus* (K. Viets, 1935), Lectotype ♀, SMF 4361, Java, Tjibodas, 1400 m, Kali Tjiwalen, 13.7.1929.

Description. *Female*—Idiosoma oval (dorsal shield L/W ratio 1.2); shoulder plates elongated (shoulder/frontal plates L ratio 1.6–1.8); frontal margin medially concave between large

anterolaterally pointed apodemes (Fig. 4A); Cxgl-4 located far anteriorly, near tips of Cx-I; gnathosomal bay V-shaped, three pairs of knob-like protrusions at its lateral margins (Fig. 4C); suture lines of Cx-IV distinct, originating posterior to genital field, laterally curved; genital field pentagonal (Fig. 2E); excretory pore and Vgl–2 well separated from the line of primary sclerotization, Vgl-2 posterior to excretory pore; gnathosoma elongated with long dorsal apodemes, rostrum truncated (Fig. 4G); distal margin of P-3 and P-4 medially and laterally with several pointed extensions; P-4 with two ventral setae, one very long and away from distal edge (Fig. 4D–E).

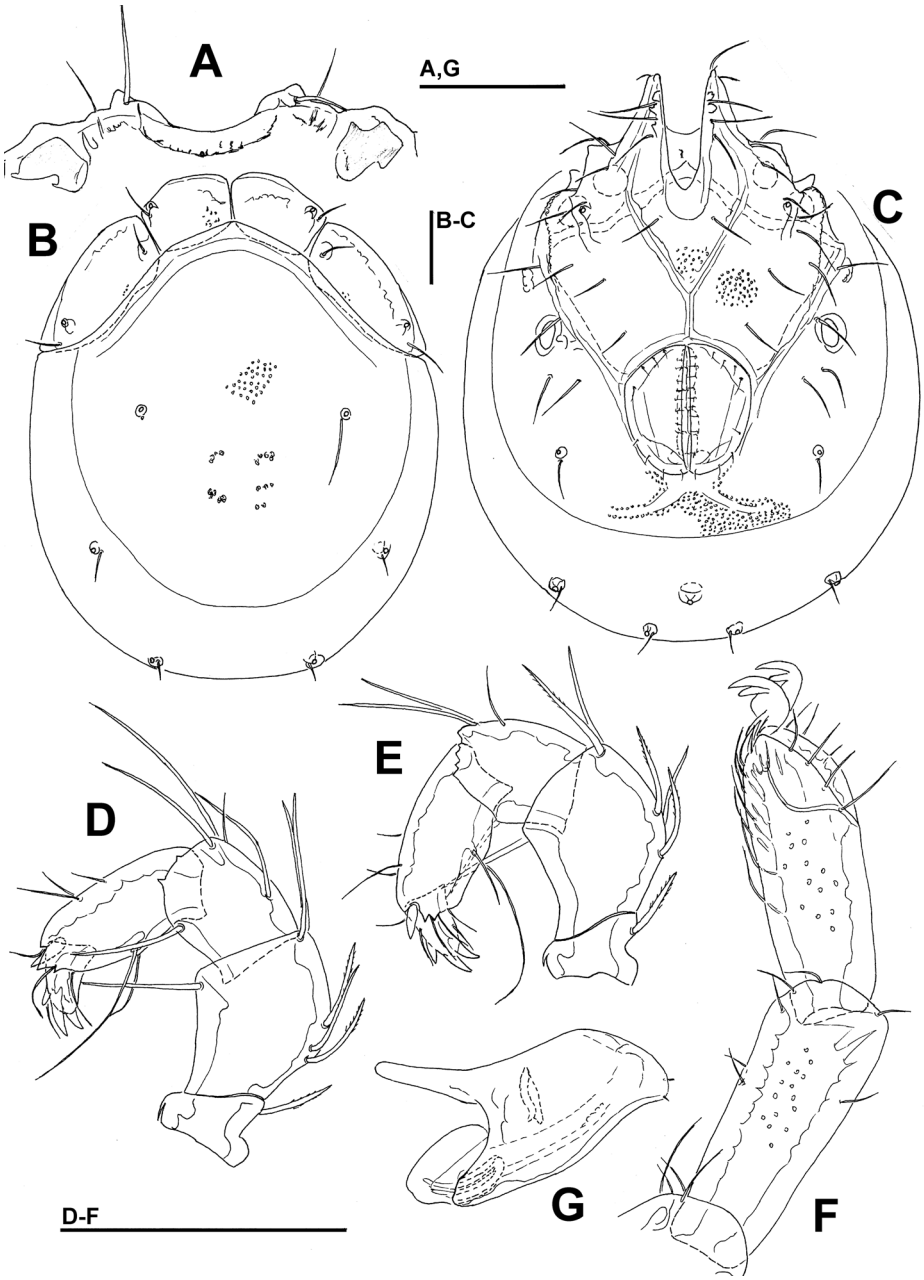


FIGURE 4. *Monatractides* cf. *oxystomus* (K. Viets, 1935), female, Uttarakhand, Randi Gad Stream: A = frontal margin of idiosoma, dorsal view; B = dorsal shield; C = idiosoma, ventral view; D = palp, lateral view; E = palp, medial view; F = I-L-5 and -6; G = gnathosoma. Scale bars = 100 μm.

Measurements—Idiosoma (ventral view: Fig. 4C) L 797, W 638; dorsal shield (Fig. 4B) L 713, W 575, L/W ratio 1.24; dorsal plate L 646; shoulder plate L 226–236, W 94–103, L/W ratio 2.3–2.4; frontal plate L 134–138, W 94–97, L/W ratio 1.38–1.47; shoulder/frontal plate L 1.64–1.76. Gnathosomal bay L 163, Cx-I total L 306, Cx-I mL 144, Cx-II+III mL 66; ratio Cx-I L/Cx-II+III mL 4.6; Cx-I mL/Cx-II+III mL 2.2. Genital field L/W 181/178, ratio 1.02; distance genital field-excretory pore 178, genital field-caudal idiosoma margin 239. Gnathosoma vL 167; palp total 229, dL/H, dL/H ratio: P-1, 25/31, 0.82; P-2, 62/48, 1.27; P-3, 45/36, 1.26; P-4, 63/31[basal 25], 2.0[2.5]; P-5, 34/17, 2.0; P-2/P-4 ratio 0.99. dL of I-L-2-6: 84, 91, 106, 105, 102; I-L-6 H 37; dL/H I-L-6 ratio 2.8; dL of IV-L: 111, 127, 136, 166, 186, 180.

Remarks. Due to the presence of knob-shaped protrusions at the margin of the gnathosomal bay, the presence of denticles on the distal margins of P-3, one very long ventral seta at P-4, a pointed, V-shaped capitular bay and the posterior medial region behind the genital field bluntly pointed, the specimen from Randi Gad Stream fits the morphology of *Monatractides oxystomus* (K. Viets, 1935). This species was originally described from Sumatra (K. Viets 1935), based on two females. Lundblad (1971) described the male from Central Java. Recently, Pešić & Smit (2014) designed a lectotype of *Monatractides oxystomus* (K. Viets, 1935) and reported the species from Borneo.

The specimen from Uttarakhand agrees well in measurements with the female from Thailand (see Pešić & Smit 2009) differing from the type series of *Monatractides oxystomus* (in parentheses, data taken from Pešić & Smit 2014) in generally larger dimensions (idiosoma L 677–744, genital field L/W 145–153/133–137, palp total L 172–195). Therefore, our identification is tentative and for clarifying the taxonomic state of the population from Uttarakhand State, finding of a male, and probably application of molecular techniques will be necessary.

Distribution. Sumatra ("*Atractides oxystomus*" K. Viets 1935), Java ("*Torrenticola oxystoma*" Lundblad 1971), Thailand (Pešić & Smit 2009b), Borneo (Pešić & Smit 2014).

Family Sperchontidae Thor, 1900

Genus *Sperchon* Kramer, 1877

Sperchon indicus Kumar, Kumar & Pesic, 2007

(Figs. 5A–F, 6A–C, 9A–B)

Material examined. India, Uttarakhand State, Randi Gad stream, 30°7'8,62"N, 78°35'18,73"E, 28-xi-2017 leg. P. Bahuguna 25/25/1; ibid., 30°6'28,26"N, 78°37'30,68"E, 2-xii-2017 leg. P. Bahuguna 12/4/5; Kyunja Gad stream, 30°25'37,56"N, 79°4'20,55"E, 26-xii-2017 leg. P. Bahuguna 39/13/5 (1/1/1 mounted, RMNH).

Compared material. *Sperchon indicus*, Holotype ♀, Uttaranchal State, Khanda Gad stream, leg. N. Kumar & K. Kumar (RMNH)[1].

General features. Adults—Dorsum with eight muscle attachment plates, following the terminology of Bader & Spasgozarian (1980) from anterior to posterior (Figs. 5A, 9A): medially, (1) round praefrontalia, (2) rather large plates consisting of fused postfrontalia, postocularia and dc-1,

1. As stated in the original description (Kumar *et al*. 2007) the holotype and paratypes were planned 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.

(3) small dc-2 located close to each other in female (Fig. 9A) but fused in male (Fig. 5A), (4-5) rather large dc-3 and dc-4, (6–8) moderately large, round platelets dl-1-3 located at the levels of interspace dc-1/2, dc-3, and interspace dc-3/4, respectively. Cx-I+II medially separated; Cx-III with a glandular opening (Cxgl-4). Excretory pore sclerotized (Fig. 5A). Palp slender, P-4 with very small ventral peg setae (Figs. 5C, 9B). III/IV-L-3-5 with numerous pinnate dorsal setae (Fig. 5F). Deutonymph—Provisional genital field with two pairs of Ac (Fig. 6B).

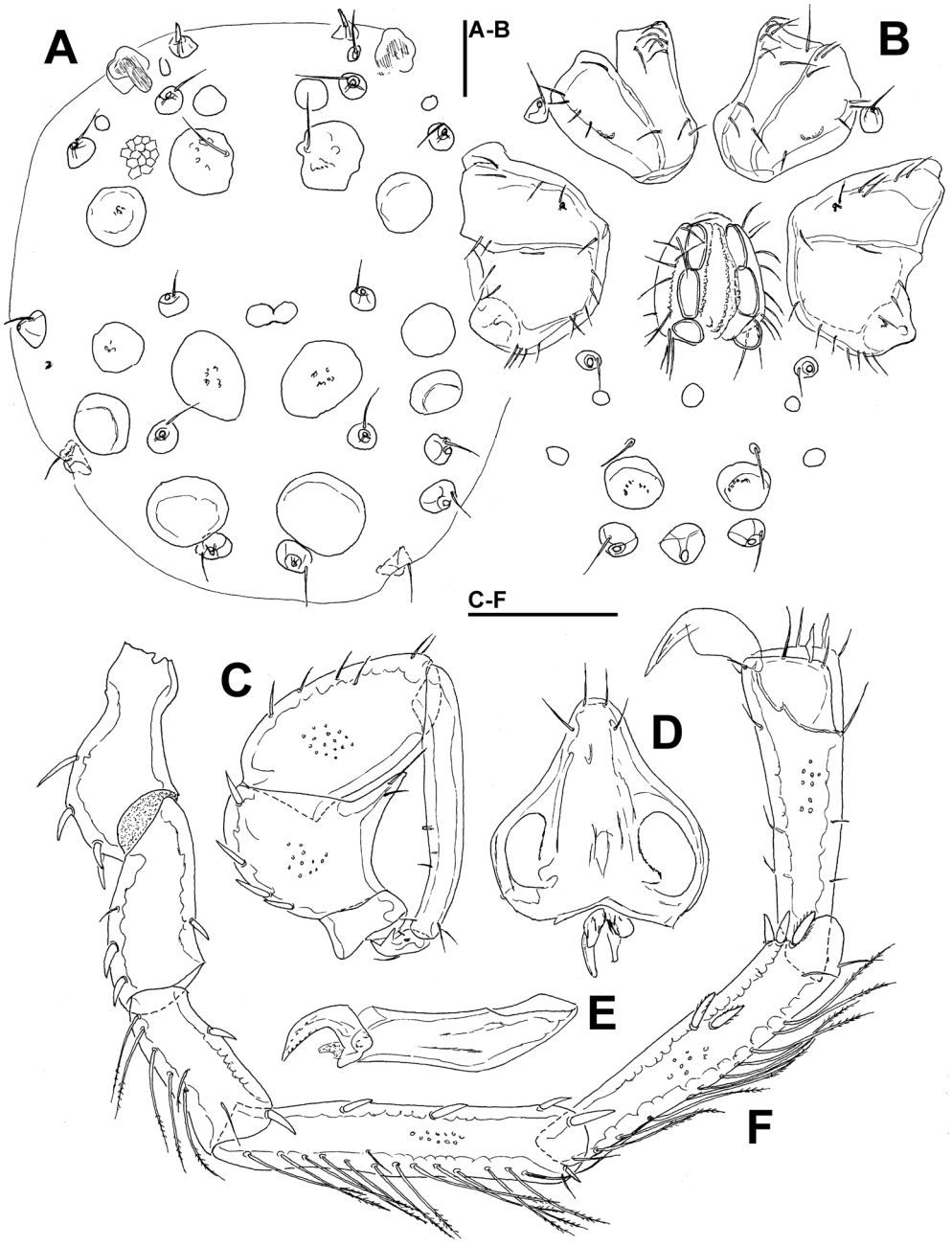


FIGURE 5. *Sperchon indicus* Kumar, Kumar & Pesic, 2007, male, Uttarakhand, Kyunja Gad Stream: A = idiosoma, dorsal view; B = idiosoma, ventral view; C = palp; D = gnathosoma; E = chelicera; F = IV-Leg. Scale bars = 100 μm.

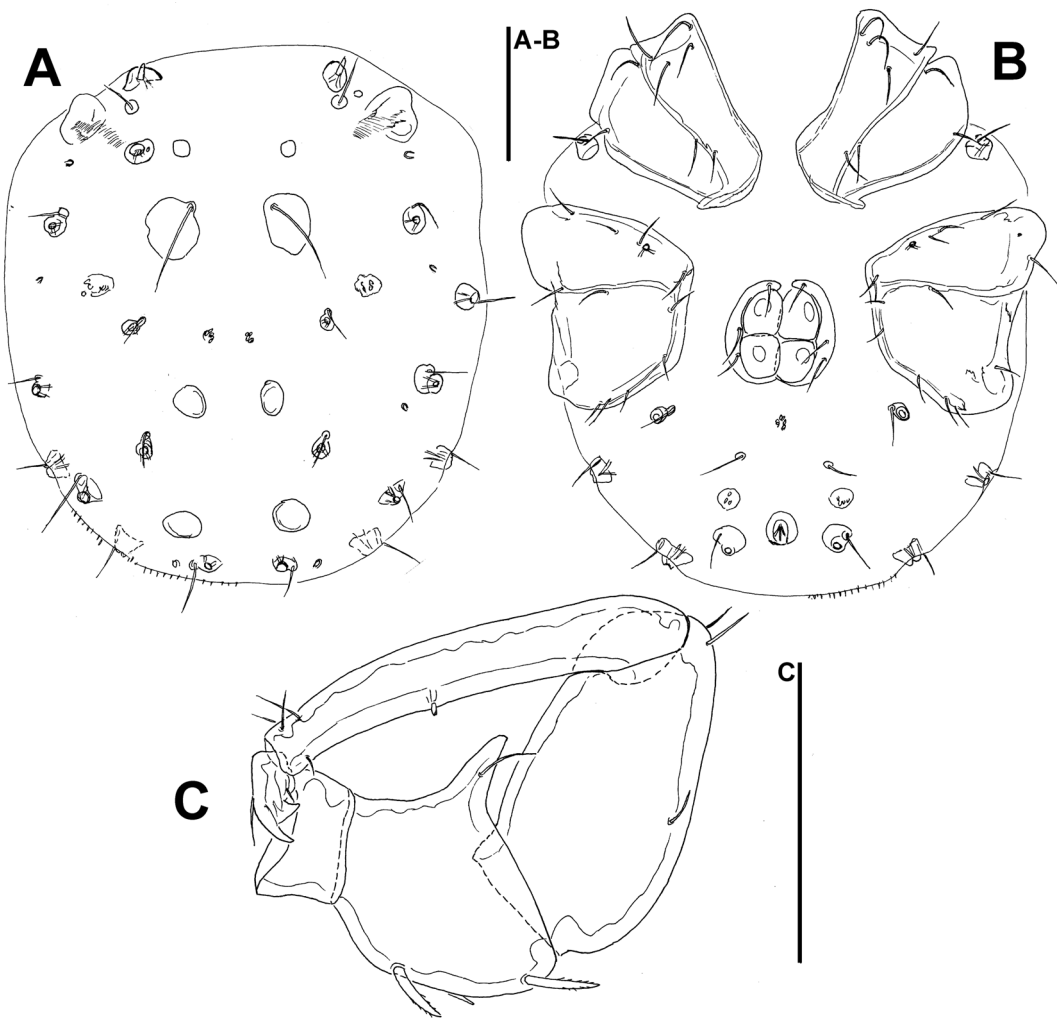


FIGURE 6. *Sperchon indicus* Kumar, Kumar & Pesic, 2007, deutonymph, Uttarakhand, Kyunja Gad Stream: A = idiosoma, dorsal view; B = idiosoma, ventral view; C = palp, lateral view. Scale bars = 100 µm.

Measurements. *Male* (n = 1)—Idiosoma (ventral view: Fig. 5B) L 800; coxal field L 463, W 663; genital field L/W 148/147, L Ac-1-3: 59, 69, 41. Gnathosoma vL 156, chelicera L 206; palp total 522, dL/H, dL/H ratio: P-1, 31/56, 0.56; P-2, 108/103, 1.05; P-3, 153/81, 1.88; P-4, 189/34, 5.6; P-5, 41/17, 2.4; P-2/P-4 ratio 0.57. dL of I-L-2-6: 81, 94, 158, 156, 178; dL of IV-L: 150, 109, 122, 250, 234, 231.

Female (n = 1)—Idiosoma L 1144; coxal field L 544, W 834; genital field L/W 209/125, pregenital sclerite W 81, L Ac-1-3: 69-72, 59-63, 48-52. Gnathosoma vL 253, chelicera L 269; palp total 750, dL/H, dL/H ratio: P-1, 39/75, 0.52; P-2, 163/119, 1.37; P-3, 222/113, 1.97; P-4, 272/basal 55, 5.0; P-5, 54/28, 1.9; P-2/P-4 ratio 0.6. dL of I-L-2-6: 89, 116, 197, 197, 177; dL of IV-L: 163, 147, 150, 300, 294, 278.

Deutonymph (n = 1)—Idiosoma (ventral view: Fig. 6B) L 440, W 360; coxal field L 300, Cx-III W 397; provisional genital field L/W 80/84. Gnathosoma vL 131; palp total 405, dL/H, dL/H ratio: P-1, 27/42, 0.63; P-2, 78/69, 1.14; P-3, 122/62, 2.0; P-4, 147/31, 4.7; P-5, 31/14, 2.2; P-2/P-4 ratio 0.53. dL of I-L-2-6: 61, 64, 110, 109, 131; dL of IV-L: 81, 81, 91, 184, 175, 170.

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, Pešić & Smit (2007) reported a single female specimen from Bhutan and assigned it with a question mark to *Sperchon indicus*. This is the first description of the male and deutonymph.

Distribution. India: Uttarakhand State (Kumar *et al*. 2007; this study); Bhutan ("*Sperchon cf. indicus*". Pešić & Smit 2007).

Family Hygrobatidae Koch, 1842

Genus *Atractides* Koch, 1837

Atractides (*Atractides*) *indicus* Pešić & Smit sp. nov.

(Figs. 7A–C, 8A–D, 9C–E)

Type material. Holotype male (RMNH), dissected and slide mounted, India, Uttarakhand State, Randi Gad stream, 30°6'28,26"N, 78°37'30,68"E, 1-xii-2017 leg. P. Bahuguna. Paratypes: 0/1/0, same data as holotype, dissected and slide mounted; 1/0/0, Kyunja Gad stream, 30°25'37,56"N, 79°4'20,55"E, 26-xii-2017 leg. P. Bahugana.

Diagnosis. Characters of the *nodipalpis* species group (integument finely striated, muscle insertions unsclerotized; males with anteriorly indented genital field, P-2 with distoventral projection and ventral margin of P-4 projecting); Vgl-1 fused to Vgl-2; P-4 sword seta not curved, shorter than maximum height of the segment; separation S-1-2 < 20 μm in ♂, < 25 μm in ♀; I-L-6 relatively longer, L I-L-5/6 1.4.

Description. Integument striated; dorsal and ventrocaudal idiosoma without sclerotized muscle insertions. Acetabula large, in triangular arrangement. Excretory pore smooth; Vgl-1 fused to Vgl-2 (Fig. 9E). Palp with a strong sexual dimorphism in the shape of P-2 and P-4, in both sexes medial peg-like seta inserting between ventral setae. Legs: I-L-5 long and slender, with dorsal and ventral margins weakly diverging distally, S-1 and S-2 distanced and relatively slender, L ratio S-1/2 1.28-1.35; I-L-6 basally thickened and distally equally narrowed (Fig. 9D); distal margins of IV-L-3/4 equally convex, only slightly extending beyond the base of the subsequent segments. *Male*—Genital field: anterior and posterior margins indented, anterior identation V-shaped (Figs. 7A, 9E); ventral margin P-2 with a strongly developed distal extension, P-3 concave, P-4 proximally concave, distinctly inflated near proximoventral seta (Fig. 7C). *Female*—Genital field with short gonopore (Fig. 8B); P-2-4 with straight ventral margins (Fig. 8C), P-2 with a right-angled ventrodistal edge, P-3 dorsal margin convex, P-4 slender than in male.

Measurements. Male—Idiosoma L 639, W 512. Coxal shield L 378; Cx-III W 431; Cx-I+II mL 144, Cx-I+II lL 272. Genital plate L/W 135/175, ratio 0.77, L Ac-1-3: 52-55, 63-65, 58-59. Palp: palp total L 352; dL/H, dL/H ratio: P-1, 36/33, 1.2; P-2, 75/63, 1.2; P-3, 86/51, 1.69; P-4, 109/44[basal 27], 2.49 [4.1]; P-5, 46/17, 2.7; length ratio P-2/P-4 0.69.

Legs: I-L-5 dL 200, vL 136, dL/vL ratio 1.47, maximum H 49, dL/maximum H 4.07, S-1 L 84, L/W ratio 9.8, S-2 length 67, L/W ratio 6.0, distance S-1-2, 16, dL ratio S-1/2 1.48; I-L-6 dL 142, central H 25, dL/central H ratio 5.7; length ratio I-L-5/6 1.41.

Female—Idiosoma L 825, W 656. Coxal shield L 397; Cx-III W 488; Cx-I+II mL 148, Cx-I+II lL 294. Genital field L/W 166/184, genital plate L 130, gonopore L 119, pregenital sclerite W 83, L Ac-1-3: 56-58, 63-66, 55-56. Palp: palp total L 436; dL/H, dL/H ratio: P-1, 41/39, 1.04; P-2, 88/56, 1.55; P-3, 123/50, 2.47; P-4, 136/34 [27], 3.95 [5.1]; P-5, 48/27, 1.75; length ratio P-2/P-4 0.64.

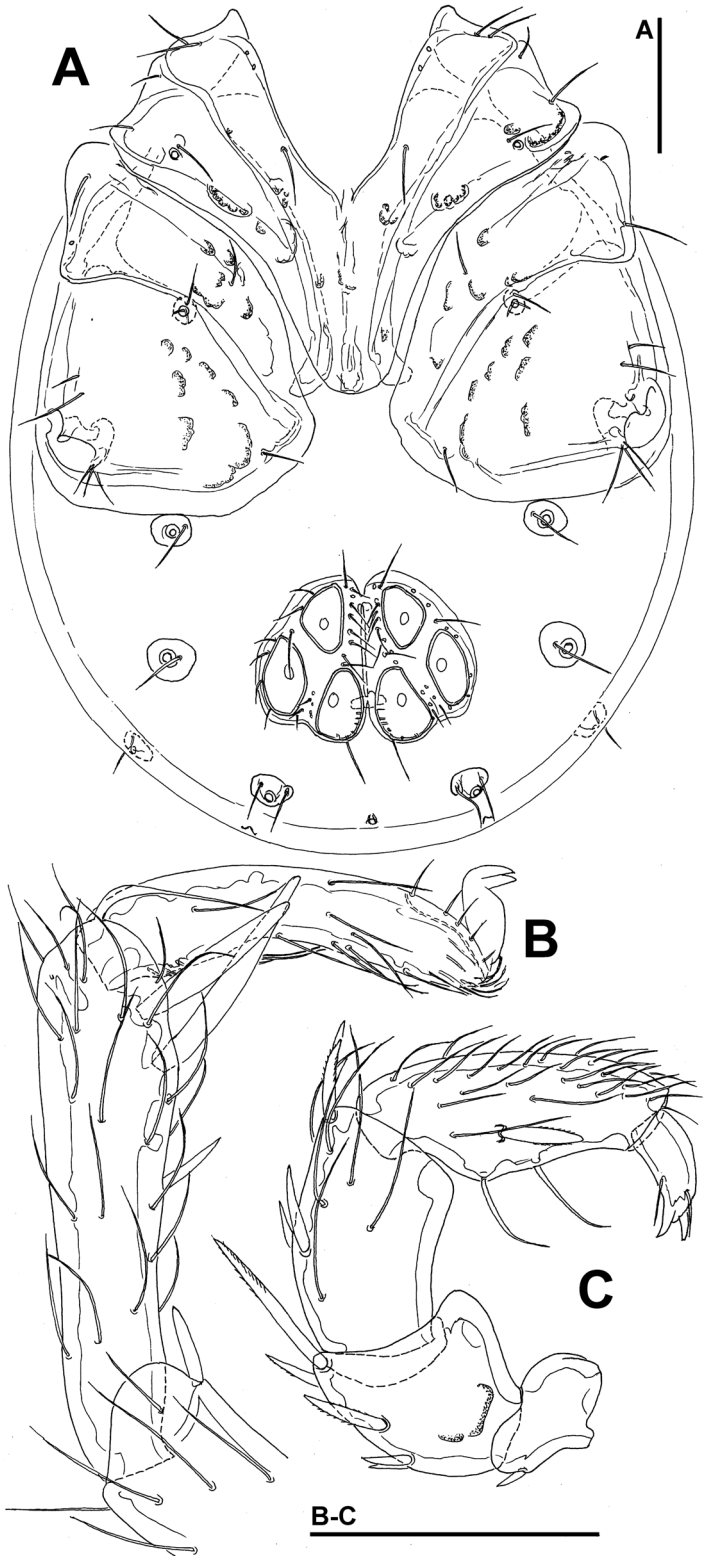


FIGURE 7. *Atractides indicus* sp. nov., male holotype, Uttarakhand, Randi Gad Stream: A = idiosoma, ventral view; B = I-L-5 and -6; C = palp, medial view. Scale bars = 100 μm.

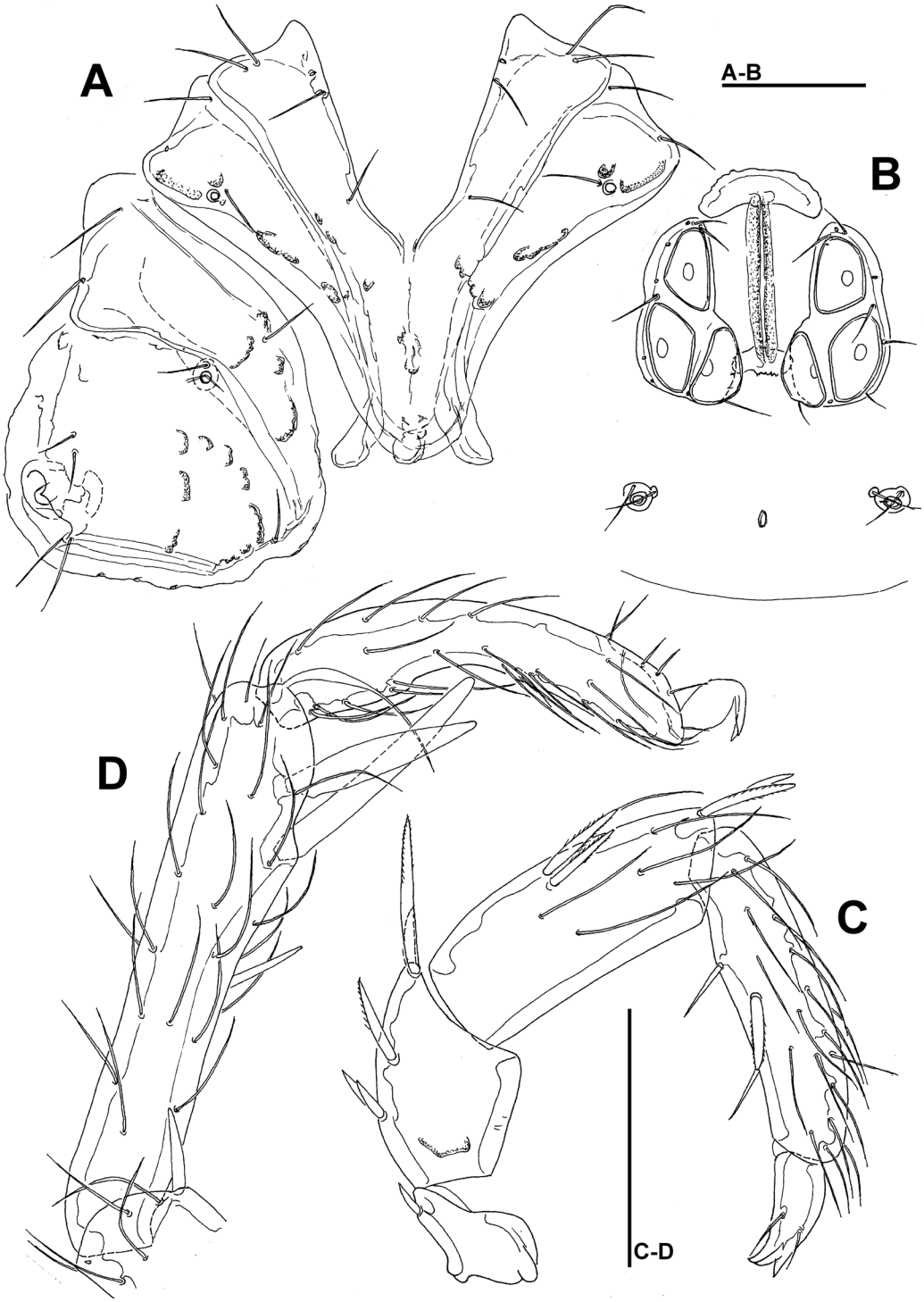
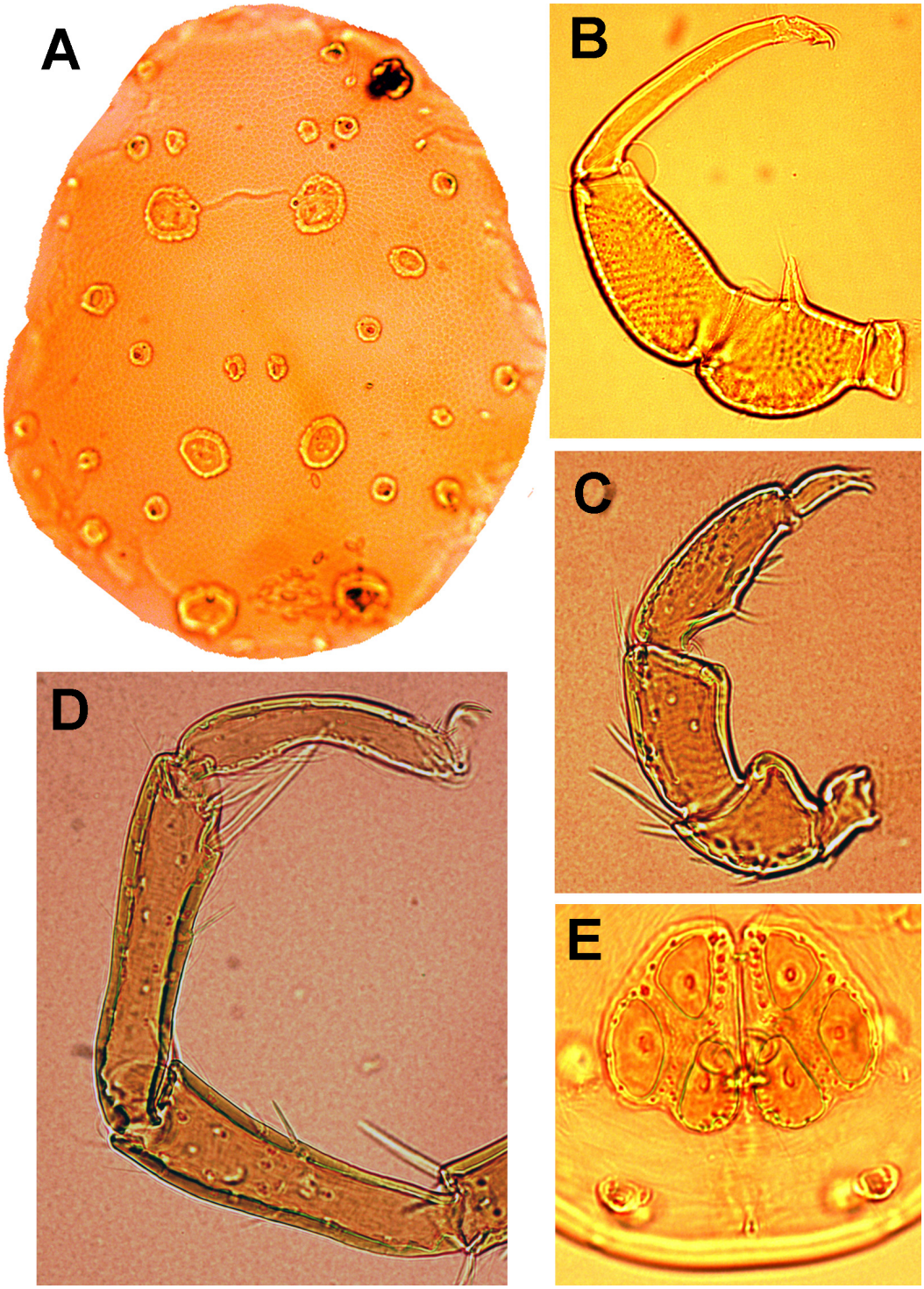


FIGURE 8. *Atractides indicus* sp. nov., female, Uttarakhand, Randi Gad Stream: A = coxal field; B = genital field; C = palp, medial view; D = I-L-5 and -6. Scale bars = 100 μm.



FIGURES 9. Photographs of selected water mites. **A-B** *Sperchon indicus* Kumar, Kumar & Pesic, 2007, female, Uttarakhand, Randi Gad Stream: A = idiosoma, dorsal view; B = palp. **C**–**E** *Atractides indicus* sp. nov., male, Uttarakhand, Randi Gad Stream: C = palp; D = I-L-4-6; E = genital field.

Legs: I-L-5 dL 231, vL 157, dL/vL ratio 1.47, maximum H 48, dL/maximum H 4.77, S-1 L 101, L/W ratio 9.3, S-2 length 77, L/W ratio 5.8, distance S-1-2, 22, dL ratio S-1/2 1.32; I-L-6 dL 167, central H 26, dL/central H ratio 6.5; length ratio I-L-5/6 1.38.

Etymology. Named after the country where the new species was collected.

Remarks. Due to the combination of characters of the *nodipalpis* group (see under diagnosis) and fused Vgl-1 and -2 the new species most closely resembles to *Atractides angulipalpis* (K. Viets, 1935) described from Sumatra (K. Viets 1935), *A. angulipalpisanus* Jin, 1997 from Yunan province, China (Jin 1997) and *A. synglandulopilosis* Jin, 1997 from Guangxi Province, China (Jin 1997).

Atractides angulipalpis and *A. synglandulopilosus* differs in the very long ventral setae of P-4 and sword seta of P-4 slender and longer than maximum height of the segment, located more proximally in the both sexes, in males inserting proximal to the proximoventral seta (see K. Viets 1935 and Jin 1997, respectively). *Atractides angulipalpisanus* resembles in the sword seta of P-4 situated halfway between the ventral setae but differs in a relatively shorter I-L-6 (I-L-5/6 1.6 calculated from figure from Jin 1997, fig. 98L) and sword seta of P-4 curved and more slender. Moreover, based on the figures of the original descriptions in comparision with our new species all three abovementioned species have a generally wider separation S-1/-2 and a thicker S-2.

Atractides vayitrensis Cook, 1967 known from a single male specimen from a mountain stream in Kerala State, India (Cook 1967) can be separated in the shape of the genital field (anterior margin concave without a central identation), relatively shorter I-L-5) and unfused Vgl-1 and -2 (see Cook 1967).

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

Atractides (*Atractides*) cf. *incertus* Lundblad, 1969

(Fig. 10A-D)

Material examined. India, Uttarakhand, Randi Gad stream, 30°6'28,26"N, 78°37'30,68"E, 1-xii-2017 leg. P. Bahuguna 0/2/0 (0/1/0 dissected and slide mounted, RMNH).

Morphology. *Female*—Integument striated; muscle insertions unsclerotized, visible only as granulated areas (Fig. 10A). Coxal field: Cx-2 with strong caudolaterally-directed apodemes (Fig. 10B). Genital field: Ac in an obtuse triangle. Excretory pore smooth, Vgl-1 separated from Vgl-2. Palp: P-2 and -3 without extensions, ventral margin P-2 straight, P-3 concave, P-4 longer than P-2, sword seta strong, between ventral hair insertions, but close to distoventral hair (Fig. 10C). Legs: I-L-5 with dorsal and ventral margins weakly diverging distally, setae S-1 and -2 closely together, S-2 thickened; I-L-6 stocky and weakly curved (Fig. 10D).

Measurements—Idiosoma L 588, W 405. Coxal shield L 320; Cx-III W 359; Cx-I+II mL 134, Cx-I+II lL 219. Genital field L/W 136/125, genital plate L 106, gonopore L 105, L Ac-1-3: 33-36, 35-39, 42-45. Palp: palp total L 274; dL/H, dL/H ratio: P-1, 30/25, 1.19; P-2, 61/42, 1.44; P-3, 77/36, 2.13; P-4, 79/30[basal 24], 2.7 [3.3]; P-5, 27/13, 2.0; length ratio P-2/P-4 0.77.

Legs: I-L-5 dL 136, vL 108, dL/vL ratio 1.26, maximum H 39, dL/maximum H 3.48, S-1 L 47, L/W ratio 6.3, S-2 length 45, L/W ratio 4.4, distance S-1-2, 4.0, dL ratio S-1/2 1.04; I-L-6 dL 108, central H 31, dL/central H ratio 3.5; length ratio I-L-5/6 1.26.

Remarks. The specimen from Randi Gad stream agrees well in general morphology and measurements with *Atractides incertus* Lundblad, 1969. This species was originally described from Burma (Lundblad 1969) based on a single male specimen. The female was described by Pešić & Smit (2009) from Thailand. However, without a male our identification is tentative and for clearing the taxonomic state of population from Uttarakhand state, finding of a male should be necessary.

Distribution. Thailand (Pešić & Smit 2009). New for India.

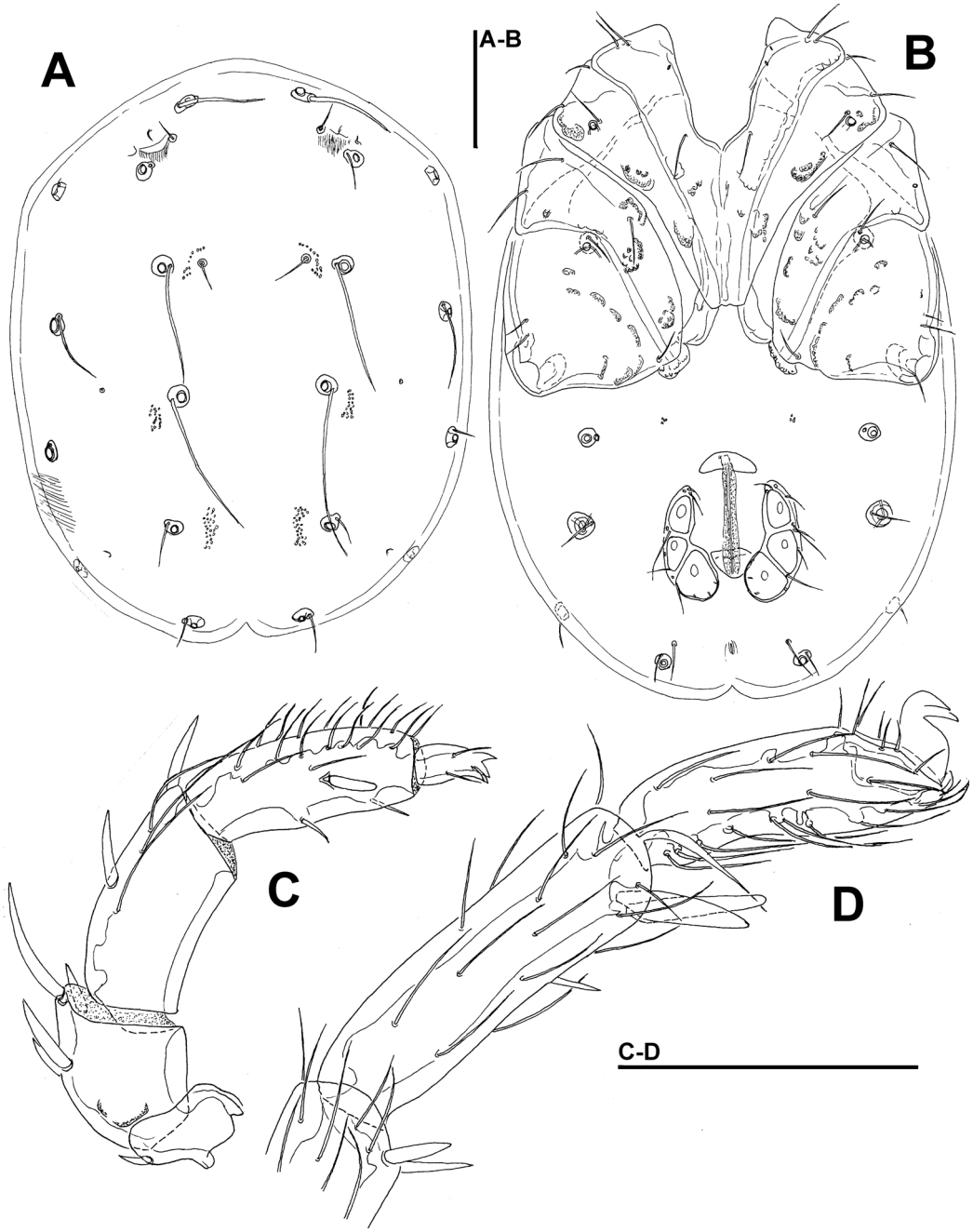


FIGURE 10. *Atractides* cf. *incertus* Lundblad, 1969, female, Uttarakhand, Randi Gad Stream: A = idiosoma, dorsal view; B = idiosoma, ventral view; C = palp, medial view; D = I-L-5 and -6. Scale bars = 100 μm.

***Atractides* (*Atractides*) *garhwali* Pešić, Kumar & Kumar, 2007**

Material examined. India, Uttarakhand State, Randi Gad stream, 30°6'28,26"N, 78°37'30,68"E, 1-xii-2017 leg. P. Bahuguna 0/1/0 (mounted, RMNH).

Compared material. *Atractides garhwali*, Holotype ♂, paratype ♀, Uttaranchal State, Dhundeshwargad stream, August 2006, leg. K. Kumar (RMNH).

Remarks. The single female specimen from Randi Gad stream fits well the description of *Atractides garhwali* Pešić *et al*. 2007, a species orginally described from two tributaries of the Alaknanda River in Uttarakhand State of India (Pešić *et al*. 2007a).

Distribution. India: Uttarakhand State (Pešić *et al*. 2007a; this study).

Atractides (*Tympanomegapus*) *yukii* Cook, 1967

(Fig. 11A–G)

Material examined. India, Uttarakhand State, Randi Gad stream, 30°6'28,26"N, 78°37'30,68"E, 1-xii-2017 leg. P. Bahuguna 0/1/0 (mounted, RMNH).

Morphology. *Female*—Integument striated; muscle insertions unsclerotized. Posterior margin of Cx-I curved. Genital field with Ac in triangular position (Fig. 11B). Excretory pore sclerotized, Vgl-1 separate from Vgl-2 (Fig. 11B). Palp (Figs. 11D-E): ventral margin of P-2 straight, P-3 ventral margin weakly concave, P-4 sword seta distal to distoventral seta, very fine, hair-like; P-5 with lateral 'cheeks'. Legs: I-L-5 with S-1/-2 with rounded tips; I-L-6 with a regular row of ventral setae, claws strong, without dorsal clavlets (Fig. 11F).

Measurements—Idiosoma L 869, W 656. Coxal shield L 469; Cx-III W 531; Cx-I+II mL 125, Cx-I+II lL 306. Genital field L/W 180/223, genital plate L 150-152, gonopore L 134, pregenital sclerite W 98, L Ac-1-3: 61-65, 63-64, 66-69. Palp: palp total L 431; dL/H, dL/H ratio: P-1, 52/20, 2.5; P-2, 83/41, 2.0; P-3, 116/38, 3.0; P-4, 139/36[basal 25], 3.87[5.6]; P-5, 41/17, 2.36; length ratio P-2/P-4 0.6. Gnathosoma vL 266, chelicera total L 359.

Legs: I-L-5 dL 233, vL 177, dL/vL ratio 1.32, maximum H 47, dL/maximum H 5.0, S-1 L 75, L/W ratio 8.5, S-2 length 75, L/W ratio 8.0, distance S-1-2, 16, dL ratio S-1/2 1.0; I-L-6 dL 158, central H 28, dL/central H ratio 5.6; length ratio I-L-5/6 1.48. dL of IV-L-4-6: 281, 306, 247.

Remarks. Due to the less elongated gnathosoma, claws without dorsal clawlets, and the presence of a hair-like sword seta on P-4, the specimen from Uttarakhand fits description of *Atractides yukii* Cook, 1967. In the original description no information is given on the presence of 'cheeks' on P-5 and the shape of the excretory pore and Vgl-1 and -2. However Cook (1967) mentioned that females of *Atractides yukii* are almost identical to females of *A. clypeatus* K. Viets, 1935 a species known from Sumatra and diagnosed by sclerotized excretory pore, unfused Vgl-1 and -2 and 'cheeks'on P-5 (see K. Viets 1935, figs. 54c,-f).

Distribution. India: Maharashtra State (Cook, 1967; Prasad 1974; Pešić *et al*. 2010); Uttarakhand State (Kumar & Dobriyal 1992; this study).

Genus *Hygrobates* Koch, 1837

Hygrobates dobriyali Pešić & Smit sp. nov.

(Fig. 12A–E)

Type material. Holotype female (RMNH), dissected and slide mounted, India, Uttarakhand State, Kyunja Gad stream, 30°25'37,56"N, 79°4'20,55"E, 26-xii-2017 leg. P. Bahuguna.

Diagnosis. Female (male unknown). Posterior idiosoma margin undulating, medially convex; genital plates located far posterior, on the level of postgenital sclerite; P-2 without ventral projection, ventral surface of P-2 and -3 without denticle, P-4 L/H 2.4.

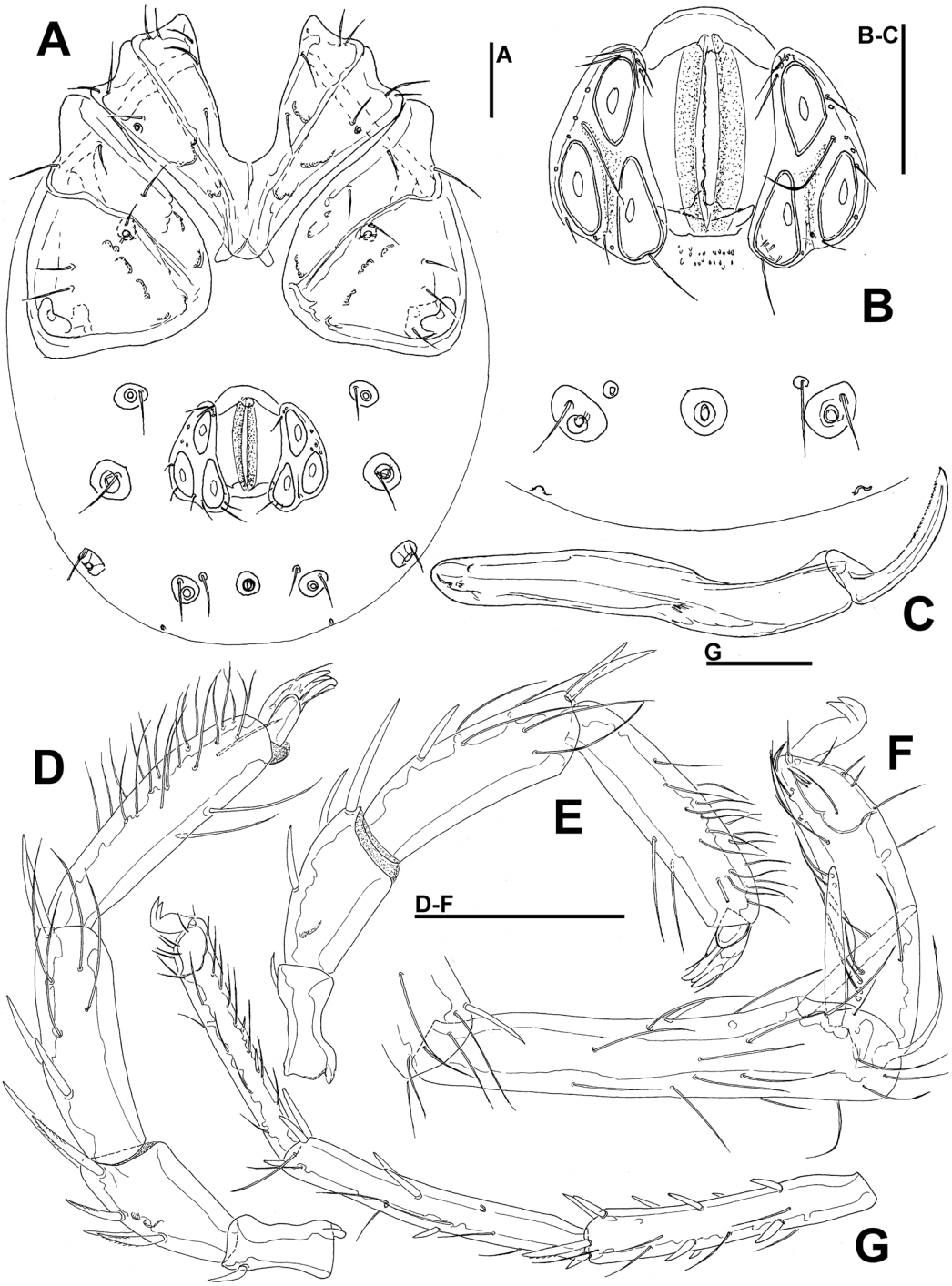


FIGURE 11. *Atractides yukii* Cook, 1967, female, Uttarakhand, Randi Gad Stream: A = idiosoma, ventral view; B = genital field; C = chelicera; D = palp, lateral view; E = palp, medial view; F = I-L-5 and -6; G = IV-L-4-6. Scale bars = 100 μm.

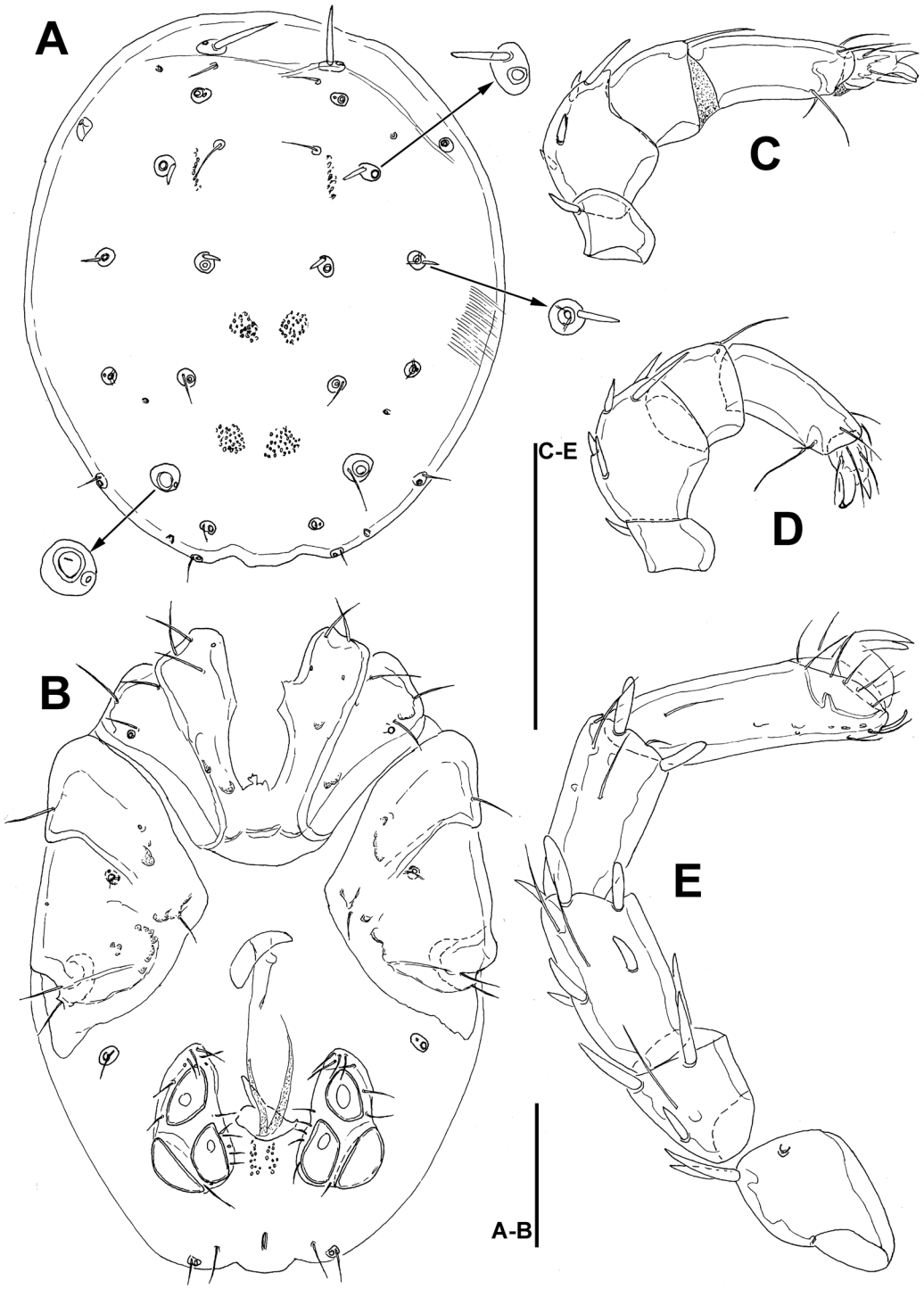


FIGURE 12. *Hygrobates dobriyali* sp. nov., female, Uttarakhand, Kyunja Gad Stream: A = idiosoma, dorsal view; B = idiosoma, ventral view; C-D = palp; E = I-L-2-6. Scale bars = 100 µm.

Description. *Female*—Integument striated; antenniform setae strong and stiff, Dgl-4 distinctly larger than other Dgl; dorsal muscle insertions visible as three pairs of granulated areas (Fig. 12A); posterior idiosoma margin undulating, medially convex. Posteromedial margin of anterior coxal plate rounded; Cx-IV medially forming an obtuse angle, Cx-III+IV with an extended border of secondary sclerotization, Cx-IV subtriangular in shape, suture lines of Cx-III/Cx-IV incomplete. Genital plates far posterior, on the level of postgenital sclerite, gonopore long, only in its posterior part flanked by the genital plates, acetabula elongated, in a triangular position (Fig. 12B). Excretory pore smooth; Vgl-1 separate from Vgl-2. P-2 ventral margin slightly concave, distally forming a right angle, without ventral projection; P-3-4 ventral margin weakly concave, P-4 ventral setae lying close to each other, in the distal third of segment (Figs. 12C-D). Legs: I-L-5 short; I-L-6 ventral margin almost straight.

Measurements—Idiosoma L 419, W 334; coxal shield L 295; Cx-III W 306; genital field L/W 182/167, gonopore L 145, genital plates L 102–109, L Ac-1-3: 38–48, 50–51, 42–44; egg maximum diameter (n =2) 106–109.

Palp: palp total L 187; dL/H, dL/H ratio: P-1, 19/25, 0.75; P-2, 52/41, 1.27; P-3, 33/34, 0.95; P-4, 56/23, 2.4; P-5, 27/13, 2.0; L ratio P-2/P-4 0.92. Chelicera total L 139, L basal segment 91, claw 46, L basal segment/claw ratio 2.0. Legs: dL of I-L-2-6 (Fig. 12E): 39, 47, 70, 67, 100; dL of IV-L: 94, 53, 98, 131, 127, 120.

Male—Unknown.

Etymology. The species is named after Prof. A.K. Dobriyal in appreciation of his pioneer work on the water mite fauna of Garhwal Himalaya, India.

Remarks. The combination of a undulated posterior margin with a medial extension, triangular genital plates located far posterior on the level of postgenital sclerite, and the morphology of the palp (P-2 without ventral projection, ventral surface of P-2 and -3 without denticles, P-4 stout) are unique and separate the new species from all previously known species of the genus.

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

Family Feltriidae K. Viets, 1926

Genus *Feltria* Koenike, 1892

Feltria (*Feltria*) *gereckei* Pesic & Panesar, 2008

Material examined. India, Uttarakhand State, Randi Gad stream, 30°6'28,26"N, 78°37'30,68"E, 1-xii-2017 leg. P. Bahuguna 1/0/0.

Distribution. India: Himachal Pradesh State (Pešić & Panesar 2008), Uttarakhand State (this study).

Family Aturidae Thor, 1900

Genus *Kongsbergia* Thor, 1899

Kongsbergia (*Kongsbergia*) *rucira* Cook, 1967

Material examined. India, Uttarakhand State, Randi Gad stream, 30°6'28,26"N, 78°37'30,68"E, 1-xii-2017 leg. P. Bahuguna 0/1/0 (mounted, RMNH).

Distribution. India: Maharashtra State (Cook, 1967; Prasad 1974; Pešić *et al*. 2010), Uttarakhand State (this study).

Acknowledgements

The third author (PB) is indebted to Prof. A.K. Dobriyal, Head of Zoology and Biotechnology Department, Campus Pauri, H.N.B.Garhwal University (Central University) Srinagar Garhwal for constant encouragement. The third author (PB) gratefully acknowledges the financial assistance rendered by Science and Engineering Research Board (SERB) as a major Project F. No. –ECR/2016/001291.

References

Bader, C. & Sepasgozarian, H. (1980) Wassermilben (Acari, Prostigmata, Hydrachnellae) aus dem Iran. 11. Mitteilung. *Sperchon* (*Mixosperchon*) *afzalipouri* nov. spec. *Journal of Entomological Society of Iran*, 5 (1–2), 35–55.

Cook, D. R. (1967) Water mites from India. *Memoirs of the American Entomological Institute*, 9, 1–411.

Cook, D.R. (1974) Water mite genera and subgenera. *Memoirs of the American Entomological Institute*, 21, 1–860.

Gerecke, R., Gledhill, T., Pešić, V. & Smit, H. (2016) Chelicerata: Acari III. *In*: Gerecke, R. (Ed.), *Süßwasserfauna von Mitteleuropa, Bd. 7/2-3*, Springer-Verlag Berlin, Heidelberg, pp. 1–429. http://dx.doi.org/10.1007/978-3-8274-2689-5

Jin, D. (1997) Hydrachnellae—*Morphology, Systematics. A primary study of chinese fauna*. Guizhou Science and Technology Publishing House, 356 pp.

Kumar, N. & Dobriyal, A. K. (1992) Some observations on the water mites of a Hillstream Khandagad in Gharwal Himalaya. *Journal of Freshwater Biology*, 4, 193–197.

Kumar, N., Kumar, K., Kumar, S. & Pesic, V. (2006) *Monatractides tuzovskyi* sp. nov. (Acari: Torrenticolidae), a new water mite species from the Garhwal Himalayas (India). *Acarina*, 14(2), 81–83.

Kumar, N., Kumar, K, & Pesic, V. (2007) Two new species of *Sperchon* Kramer (Acari: Hydrachnidia: Sperchontidae) from the Garhwal Himalayas (India). *Systematic & Applied Acarology*, 12, 31–36. https://doi.org/10.11158/saa.12.1.5

Lundblad, O. (1934) Report on Hydracarina (Yale North India Exped. 7). *Memoirs of the Connecticut Academy of Arts and Science, New Haven*, 10, 85–118.

Lundblad, O. (1967) Wassermilben von Hinterindien. *Arkiv för Zoologie*, Serie 2, 19(21), 391–419.

Lundblad, O. (1969) Indische Wassermilben, hauptsächlich aus Hinterindien. *Arkiv för Zoologi*, 22, 1–126.

Lundblad, O. (1971) Weitere Beiträge zur Kenntnis der Fließwassermilben Javas. *Arkiv för Zoologi*, Serie 2, 23(5), 293–359.

Panesar, A. (2004) Evolution in water mites (Hydrachnellae, Actinedida, Acari). A revision of the Anisitsiellidae Koenike, 1910. *Bonner zoologische Monographien*, 52, 1–144.

Panesar, A. & Gerecke, R. (1994) A new *Partnunia* Species (Acari, Actinedida, Hydryphantidae) from Keylong (Himalaya, India). *Aquatic Insects*, 16(4), 241–248. https://doi.org/10.1080/01650429409361560

Pešić, V. & Smit, H. (2007) First records of water mites (Acari: Hydrachnidia) from Bhutan, with description of two new species. *Zootaxa*, 1613, 45–56.

Pesic, V., Kumar, N & Kumar, K. (2007a) Two new species of water mites of the family Hygrobatidae (Acari: Hydrachnidia) from the Garhwal Himalayas (India). *Systematic & Applied Acarology*, 12, 161–166. https://doi.org/10.11158/saa.12.2.11

Pesic, V., Kumar, N & Kumar, K. (2007b) A new species of *Monatractides* (Acari: Hydrachnidia: Torrenticolidae) and new records of other torrenticolid water mites from the Garhwal Himalayas (India). *Systematic & Applied Acarology*, 12(3–4), 205–212. https://doi.org/10.11158/saa.12.3.5

Pešić, V. & Gerecke, R. (2008) A new water mite (Acari, Hydrachnidia, Sperchontidae) from the Himalaya

Mountains (Northern India). *Vestnik Zologii*, 42 (1), 77–80.
Pesic, V. & Panesar, A. (2008) Studies on water mites (Acari, Hydrachnidia) from the Himalayas, I. The water mite genus *Feltria* Koenike, with descriptions of eight new species. *Zootaxa*, 1758, 1–28.
Pešić, V. & Smit, H. (2009a) Water mites of the family Torrenticolidae Piersig, 1902 (Acari: Hydrachnidia) from Thailand, Part I. The genera *Torrenticola* Piersig, 1896, *Neoatractides* Lundblad, 1941 and *Pseudotorrenticola* Walter, 1906. *Zootaxa*, 1982, 38–62.
Pešić, V. & Smit, H. (2009b) Water mites of the family Torrenticolidae Piersig, 1902 (Acari: Hydrachnidia) from Thailand, Part II. The genus *Monatractides* K.Viets. *Zootaxa*, 2012, 1–27.
Pešić, V. & Panesar, A. (2009) Studies on water mites (Acari, Hydrachnidia) from the Himalayas, II. New records and descriptions of seven new species from India. *Zootaxa*, 2119, 1–22.
Pešić, V. & Ranga Reddy, Y. (2009) New records of water mites (Acari: Hydrachnidia) from interstitial freshwaters of India, with descriptions of three new species. *Zootaxa*, 2158, 20–32.
Pešić, V., Chatterjee, T. & Bordoloi, S. (2010) A checklist of the water mites (Acari: Hydrachnidia) of India, with new records and description of one new species. *Zootaxa,* 2617, 1–54.
https://doi.org/10.11646/zootaxa.2355.1.1
Pešić, V., Semenchenko, K., Chatterjee, T., Yam, R.S.W. & Chan, B.K.K. (2011) New records of water mites of the family Torrenticolidae (Acari, Hydrachnidia) with descriptions of two new species from Nanshih River system in Taiwan and redescription of *Torrenticola ussuriensis* (Sokolow, 1940) from the Russian Far East. *ZooKeys*, 116, 1–14.
http://dx.doi.org/10.3897/zookeys.116.1253
Pešić, V., Chatterjee, T., Das, M. K. & Bordoloi, S. (2012) Two rare water mite species (Acari, Hydrachnidia) from the streams of the Indian eastern Himalayan region. *Systematic and Applied Acarology*, 17(4), 458–464.
http://dx.doi.org/10.11158/saa.17.4.15
Pešić, V., Chatterjee, T., Das, M.K. & Bordoloi, S. (2013) A new species of water mite (Acari, Hydrachnidia) from Assam, India, found in the gut contents of the fish *Botia dario* (Botiidae). *Zootaxa*, 3746(3), 454–462. ·
https://doi.org/10.11646/zootaxa.3746.3.4
Pešić, V., Semenchenko, K. & Lee, W. (2013) Torrenticolid water mites from Korea and the Russian Far East. *ZooKeys*, 299, 21–48.
http://dx.doi.org/10.3897/zookeys.299.5272
Pešić, V. & Smit, H. (2014) Torrenticolid water mites (Acari: Hydrachnidia: Torrenticolidae) from Malaysian Borneo. *Zootaxa*, 3840(1), 1–72.
http://dx.doi.org/10.11646/zootaxa.3820.1.1
Prasad, V. (1974) *A catalogue of mites of India*. Ludhiana, Indira Acarology Publishing House, 320 pp.
Rodgers, W.A., Panwar, H.S. & Mathur, V.B. (2002) *Wildlife Protected Area Network in India: A Review, Executive Summary*. Dehradun, Wildlife Institute of India, 51 pp.
Smit, H. & Pesic, V (2008) New records of the water mite genus *Arrenurus* from India, with the description of one new species (Acari: Hydrachnidia: Arrenuridae). *Zootaxa*, 1894, 53–58.
Viets, K. (1935) Die Wassermilben von Sumatra, Java und Bali nach den Ergebnissen der Deutschen Limnologischen Sunda- Expedition. *Archiv für Hydrobiologie, Supplement* 14 (Tropische Binnengewässer), 1–113.
Vitzthum, Graf H. (1942) Acarina. *In*: Bron, H.G. (ed.), *Klassen und Ordnungen des Tierreichs. Arachnoidea und kleinere, ihnen nahegestellte Gruppen* 5, Abteilung 4, Buch 5, Lieferung 6, 801–912.
Walter, C. (1928) Zur Kenntnis der Mikrofauna von Britisch Indien. II. Hydracarina. *Records of the Indian Museum, Calcutta*, 30(1), 57–108.
Wiles, P.R. (1997) Asian and Oriental Torrenticolidae Piersig, 1902 (Acari: Hydrachnidia: Lebertioidea): a revision of the family and description of new species of *Torrenticola* Piersig and *Pseudotorrenticola* Walter, from Southeast Asia. *Journal of Natural History*, 31, 191–236.
http://dx.doi.org/10.1080/00222939700770121

Submitted: 20 Nov. 2018; accepted by Zhi-Qiang Zhang: 17 Dec. 2018; published: 16 Jan. 2019