

***Soldanellonyx monardi* (Acari, Halacaridae), a Freshwater Halacarid Species Newly Recorded from Korea**

Jong Hak Shin, Cheon Young Chang*

Department of Biological Science, Daegu University, Gyeongsan 38453, Korea

ABSTRACT

Soldanellonyx monardi Walter, 1919, a halacarid species is newly recorded from South Korea, as the second member for the freshwater halacarid mites in Korea after *S. chappuisi* Walter, 1917 reported from Gossi-gul Cave, a limestone cave at Yeongwol in 1968. It was collected from three wells in the southeastern part of Korean peninsula this year. Korean specimens are well accorded with *S. monardi* s. str. in having telofemur I less than 1.5 times longer than wide, two spiniform setae on the ventral side of tibia I, relatively longer anterior dorsal plate (slightly longer than its width and about half the length of posterior dorsal plate), and the posterior epimeral plates lacking a dorsal seta. Based on the Korean specimens, a brief table for the morphological differences between adult females and deutonymphs are provided, which shows a tendency of rather consistent increment according to growth in the number of spiniform dorsal setae on telofemora and genua of legs I and II, the number of perigenital setae, and the number of genital acetabula. In this paper, detailed redescription and a brief table for the morphological differences between adult females and deutonymphs of *S. monardi* are provided.

Keywords: description, deutonymph, halacarid mite, subterranean, taxonomy, wells

INTRODUCTION

Halacarida is a basically marine taxon, as its name implies. Among 1,153 nominal species of 62 genera currently recorded in the family Halacaridae (WoRMS, 2020), only 67 species or subspecies of 17 genera are known from freshwaters or brackish waters (Bartsch, 2018), accounting for about 6% of total number of species in the Halacaridae. Recently we have found several halacarid mites at three wells in the southeastern region of South Korea, which were all identified as *Soldanellonyx monardi* Walter, 1919 and are redescribed herein as a new record from Korea.

In the genus *Soldanellonyx* Walter, 1917, 11 species or subspecies are recognized (Bartsch, 2014, 2018). In Asia, since *S. monardi* was first recorded from Java, Indonesia (as *S. monardi saranganensis* Viets, 1929), nine species and two subspecies are recorded as yet: six species and two subspecies from Japan (Imamura, 1957, 1959, 1970, 1971, 1981; Tuzovskij, 2011), one species from South Korea (Imamura, 1968), three from the Lake Baikal and Kamchatka, Russia (Sokolov and Yan-

kovskaya, 1970; Bartsch, 2012, 2018), one from Kyrgyzstan (Bartsch, 2009), and two from Vietnam (Bartsch, 2014). The sole record from Korea is *S. chappuisi* Walter, 1917 from cavern pools in Gossi-gul limestone cave, Yeongwol county, Kangwon province by Imamura (1968).

Collection was carried out at three wells each in Gyeongsan, Pohang and Gyeongju in Gyeongbuk province in 2020. Halacarid mites were collected by swirling and whipping a dipnet, which was fixed at the end of a 2.7-meters-long, telescopic fishing stick, for filtering bottom sediments in the wells through a nylon net (63 µm mesh). All the samples were fixed with 95% ethanol in the field. Laboratory works, such as preparation for microscope examination, drawings, and measurements, are same as in our previous studies (Lee and Chang, 2017; Shin and Chang, 2019).

Voucher specimens are kept in the specimen room of the Department of Biological Science, Daegu University (DB), Gyeongsan, Korea.

Terminology and abbreviations in the text and figure captions follow Bartsch (2006): AD, anterior dorsal plate; AE,

anterior epimeral plate; ds, dorsal setae on idiosoma (ds-2, second dorsal setae on idiosoma); GA, genitoanal plate; gac, genital acetabula; glp, gland pore(s), numbered glp-1 to glp-5 from anterior to posterior; GO, genital opening; OC, ocular plate(s); P, palp (P-2, second palpal segment); pas, parambulacral setae; PD, posterior dorsal plate; PE, posterior epimeral plate; pgs, perigenital setae; sgs, subgenital setae.

SYSTEMATIC ACCOUNTS

Subclass Acari Leach, 1817
Order Trombidiformes Reuter, 1909
Suborder Prostigmata Kramer, 1877
Superfamily Halacaroidea Murray, 1877
Family Halacaridae Murray, 1877
Genus *Soldanellonyx* Walter, 1917

¹**Soldanellonyx monardi* Walter, 1919 (Figs. 1, 2)

Soldanellonyx monardi Walter, 1919: 238, figs. 4–7; Bartsch, 1975: 28, figs. 1–10; 2006: 142, figs. 5–19a–f; 2007: 82, fig. 3; 2008: 21; 2011: 502, fig. 11A–C; 2014: 167, fig. 2A–K; 2018: 94, fig. 10A–G; Green and MacQuitty, 1987: 156, fig. 65A–C; Durucan, 2020: 7, fig. 6A–F.
Soldanellonyx monardi saranganensis Viets, 1929: 32, figs. 5–7a, b.

Material examined. Korea: 1 ♀ (DB50035), 2 deutonymphs, Korea: Gyeongsangbuk-do: Gyeongsan, Sajeong-dong (near Gyeongsan railway station), 33°43'16"N, 128°43'39"E, 7 Mar 2020, Chang CY; 1 ♀ (DB50036), same locality, 4 Aug 2020, Shin JH; 1 protonymph, Pohang, Hwajin-1-ri (in a seaside village), 36°14'17"N, 129°23'05"E, 20 Jul 2020, Chang CY, Shin JH; 2 ♀♀ (DB50037, 50039), Gyeongju, Bonggil-ri (near Daebon beach), 35°44'24"N, 129°28'58"E, 12 Aug 2020, Shin JH. All the specimens mounted on H-S slides.

Description. Female (DB50035): Idiosoma (Fig. 1A) 273 µm long, 191 µm wide. All dorsal plates with somewhat uniform and delicate porosity, surface of plates compactly reticulated. AD nearly rectangular, 77 µm long, 75 µm wide (length to width ratio 1.02), slightly narrowing posteriorly; anterior margin straight, posterior margin slightly concave anteriorly. OC 47 µm long, 34 µm wide (length to width ratio 1.38); corneae absent. PD 160 µm long, 98 µm wide (length to width ratio 1.63); anterior margin arched, strongly convex anteriorly; posterior margin nearly straight, or slightly convex posteriorly. Dorsal setae: ds-1 located at 0.42 level of AD; ds-2 locating at membranous cuticle just ahead of anteromedial edge of OC; ds-3 on membranous cuticle between OC and PD; ds-4

placed at 0.31 level of PD, near anterolateral margin; ds-5 on anal plate. Dorsum with 5 pairs of glp; glp-1 situated at same level of ds-1, near anterolateral margin of AD; glp-2 on membranous cuticle near anterolateral margin of OC; glp-3 on membranous cuticle, posterior to OC; glp-4 on membranous cuticle, near middle of lateral margin of PD; glp-5 on membranous cuticle near posterolateral corner of PD.

All ventral plates (Fig. 1B) separate; uniformly porose, with surface of plates reticulated. AE 98 µm long, 180 µm wide (length to width ratio 0.54); bearing 3 pairs of ventral setae; 1 pair of ep situated each near fundus of leg II, on level of ds-2; posterior margin of AE nearly straight or slightly convex posteriorly. PE with 2 ventral setae; dorsal setae absent; lateral surface engraved with numerous polygons. GA 139 µm long, 108 µm wide (length to width ratio 1.29); about 50.9% of whole idiosomal length. GO 59 µm long. Genital acetabula located near posterolateral margin of GO, comprising 9 in total, consisting of 5 on left side of ventral surface and 4 on right. Pgs numbered 7, consisting of 3 on left and 4 on right. Paired sgs short, situated at anterior 1/3 of GO.

Gnathosoma (Fig. 1C) 91 µm long, 86 µm wide (length to width ratio 1.05). Palp (Fig. 1D) 4-segmented; lengths of dorsal surface of P-1 to P-4 11, 58, 24, 33 µm, respectively (relative proportion 1:5.3:2.2:3.0); widths of P-1 to P-4 31, 35, 19, 4 µm, respectively; P-1 lacking accessories; P-2 armed with 1 short, curved, spiniform dorsal seta proximally, and 1 long, slender dorsal seta subapically; P-3 with 1 ventromedial spine; P-4 a little narrowing distally, with 4 lateral and 1 medial naked setae. Rostrum 32 µm long, 0.35 times as long as gnathosoma. Gnathosoma with 3 pairs rostral setae; proto-rostral setae situated near tip of rostrum, deutero-rostral setae positioned near posterior quarter of rostrum; basirostral setae long, smooth, located at anterior 1/5 of gnathosomal base. Ventral surface of gnathosomal base uniformly porose, with surface of plates reticulated. Chelicera (Fig. 1E) slender; slightly curved dorsally.

All legs (Fig. 2A–D) shorter than idiosoma; leg IV longer than front legs. Trochanters I–IV length ratio about 1:1:1.5:1.5. Telofemora I–IV length to width ratio 1.45, 1.35, 1.68, 1.80, respectively. Chaetotaxy of legs as follows: trochanters 1-1-1-0; basifemora 3-3-2-1; telofemora 5-4-2-2; genua 6 (or 5)-6-4-3; tibiae 7-7-5-5; tarsi (pas excluded) 5-4-4-3. Basifemora I–IV with 2, 2, 1, 0 simple, slender setae and 1, 1, 1, 1 spiniform dorsal setae; telofemur I–IV with 3, 2, 1, 1 slender setae and 2, 2, 1, 1 spiniform dorsal setae. Genu I with 2 simple, 2 (or 1) spiniform dorsal setae and 2 bipectinate ventral setae. Genu II with 2 simple, 2 spiniform dorsal setae and 2 simple ventral setae. Genu III with 1 simple, 1 spiniform dorsal setae and 2 simple ventral setae. Genu IV

Korean name: ¹*꽃발톱판물응애(신칭)

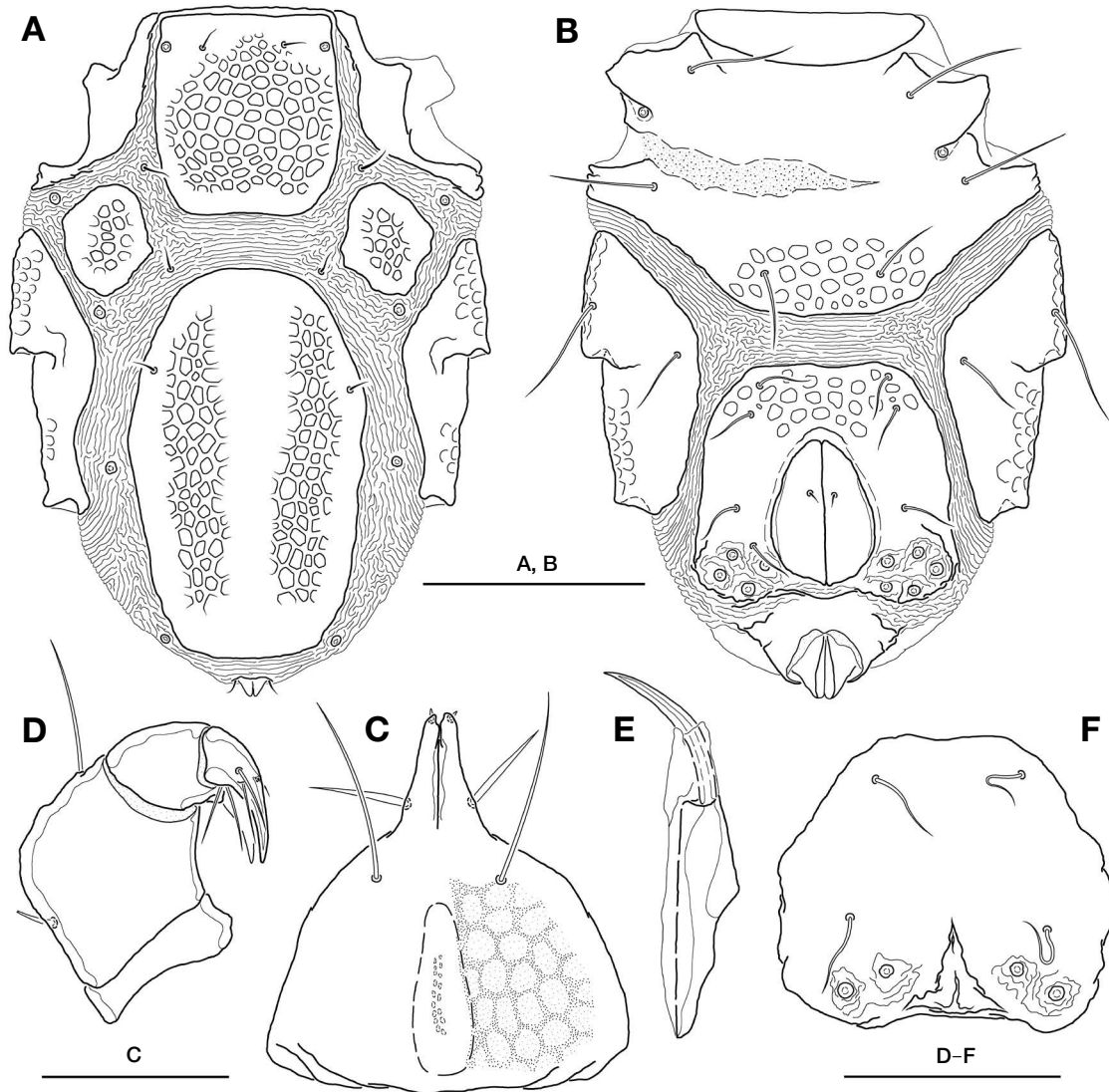


Fig. 1. *Soldanellonyx monardi*. A–E, Female: A, Idiosoma, dorsal; B, Idiosoma, ventral; C, Gnathosoma (palp extending), ventral; D, Palp, lateral; E, Chelicera, lateral; F, Deutonymph: genitoanal plate (adanal plate extending). Scale bars: A, B=100 μ m, C–F=50 μ m.

with 1 simple, 1 spiniform dorsal setae and 1 simple ventral seta. Tibia I with 4 simple, 1 spiniform dorsal setae and 2 bipectinate ventral setae. Tibia II with 3 simple, 2 spiniform dorsal setae and 1 bipectinate, 1 simple ventral setae. Tibia III with 3 simple dorsal setae and 1 bipectinate, 1 simple ventral setae. Tibia IV with 2 simple dorsal setae and 1 bipectinate, 1 simple ventral setae. Tarsi I and II with 3 dorsal setae, 1 solenidion, pair of bacilliform pas, respectively (Fig. 2E, F); tarsus I with 1 ventral simple seta. Tarsi III and IV with 4, 3 dorsal setae. Tarsi III and IV with 1 bacilliform and 1 scali-form pas (Fig. 2G); scali-form pas with teeth. Lateral claws of tarsus I armed with 10–12 solid tines, showing umbrella-ribs arrangement along medial surface (Fig. 2E). All tarsi of legs

without median claws.

Male: Not confirmed as yet in this species (see Bartsch, 2018 for details).

Deutonymph: Idiosoma 237 μ m long, 162 μ m wide (length to width ratio 1.46). Almost similar to female, except for genital region and chaetotaxy of legs. All dorsal plates with relatively uniform and delicate porosity, surface of plates compactly reticulated. GA (Fig. 1F) 102 μ m long, 72 μ m wide (length to width ratio 1.42); about 43% of whole idiosomal length. GO absent. GA with 2 pairs of pgs and 2 pairs of gac. Chaetotaxy of legs as follows: trochanters 1-1-1-0; basifemora 3-3-2-1; telofemora 4-3-2-2; genua 5-5-4-3; tibiae 7-7-5-5; tarsi (pas excluded) 5-4-4-3.

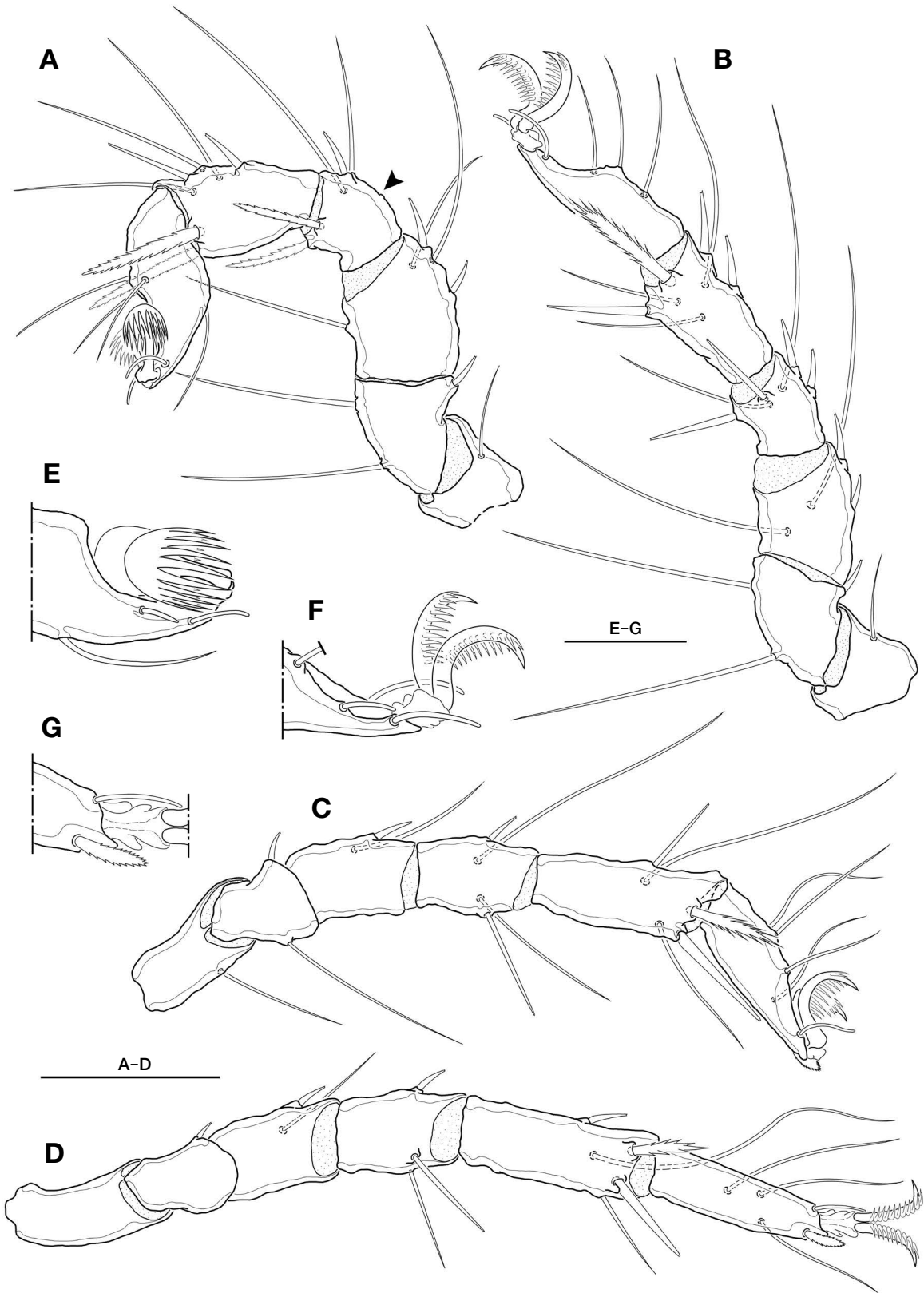


Fig. 2. *Soldanellonyx monardi*, female. A-D, Legs I-IV (arrowhead indicating the trace of disappearance of a dorsal spiniform seta); E, Tip of tarsus I, lateral; F, Tip of tarsus II, lateral; G, Tip of tarsus IV, ventral. Scale bars: A-D=50 μ m, E-G=20 μ m.

Measurements and variability. Four adult female specimens were examined and measured: idiosomal lengths ranged from 248 to 273 μm (mean 261 μm , standard deviation 10.12), maximum widths from 166 to 191 μm (mean 180 μm , standard deviation 9.35), mean ratio of length to width 1.45. The pgs numbered 7 in all the specimens examined, with an asymmetrical arrangement of 3 or 4 in each side. Three females possessed a pair of sgs, while absent in one female; number of gac ranged from 7 to 9 (3 to 5 in each side) on the posterior part of GA. Genu I with 1 or 2 short, spiniform setae. Number of dorsal spiniform setae on genu I were variable with asymmetrical arrangements: 1 on right leg and 2 on left leg in two specimens, while 1 on both legs in two specimens, showing the trace of disappearance (cf. arrowhead in Fig. 2A). One female specimen showed an abnormality of an additional spiniform seta on telofemur of the left leg IV.

Remarks. In the genus *Soldanellonyx* Walter, eleven species or subspecies are currently recognized as valid, including two subspecies of *S. monardi* (Bartsch, 2014, 2018). According to a table for distinguishing *Soldanellonyx* species (Bartsch, 2014, table 1) and a key to species of the genus (Bartsch, 2019), the nine species are to be manifestly separated into two groups by character combination of the relative length of telofemur I and the number of ventral spiniform setae of tibia I. *Soldanellonyx monardi* shares the two characters above (telofemur I less than 1.5 times longer than wide and bearing 2 spiniform setae on the ventral side of tibia I) with only *S. miyakoensis* Imamura, 1957 from Miyako Island, Okinawa, Japan. However, *S. monardi* is clearly distinguished from *S. miyakoensis* by the relative length of AD (equal to or slightly longer than its width, and about half the length of PD, while shorter than the width and about 2/5 times as long as PD in *S. miyakoensis*), and the PE lacking a dorsal seta (versus a dorsal seta on PE in *S. miyakoensis*). The other seven congeneric species, which share four spiniform ventral setae on tibia I and slender telofemur I, are *S. chappuisi* Walter, 1917 from Eurasia (including South Korea) and North America, *S. papillosus* Imamura, 1957 and *S. akiyoshiensis* Imamura, 1959 from Japan, *S. visurgis* Viets, 1959 from Vietnam, Europe and United States, *S. lohmannelloides* Sokolov & Yankovskaya,

1970 from the Lake Baikal, Russia, *S. morimotoi* Imamura, 1970 from Tsushima Island, Japan, and *S. biwaensis* Tuzovskij, 2011 from the Lake Biwa, Japan (see Bartsch, 2009 for the outline of their zoogeographical distribution). Besides the two characters above, Korean specimens are well accorded with *S. monardi s. str.* in having 2 dorsal setae (of a simple, naked and a spiniform setae) on the short second palpal segment (P-2), a pair of epimeral pores on AE, a pair of gland pores located on AD and other 4 pairs on dorsal membranous cuticle of idiosoma, 2 bipectinate ventral setae on tibia II, and 3 setae (2 simple and 1 spiniform) on basifemur I.

Three subspecies have been recorded in *S. monardi* so far: *S. monardi saranganensis* Viets, 1929 from Java, Indonesia (Viets, 1929), *S. monardi japonicus* Imamura, 1971 from a lava cave in Mt. Fuji (Imamura, 1971) and *S. monardi hyogoensis* Imamura, 1981 from a well in Hyogo Prefecture (Imamura, 1981). Recently, Bartsch (2014) confirmed that *S. monardi saranganensis*, 'the only record of *Soldanellonyx* from the Oriental Region', is not a distinct subspecies, not showing "marked difference" from the "European *S. monardi*". Therefore, only two Japanese subspecies are now recognized. *Soldanellonyx monardi monardi* is discernible from the two Japanese subspecies by bearing 4 pairs of ds including 1 pair of ds on PD (while both the two have 4 pairs and 6 pairs of ds, respectively, without ds on PD). Moreover, *S. monardi monardi* is distinguished from *S. monardi japonicus* by 4 setae on P-4 (versus 2 in *S. monardi japonicus*), 9–11 pairs of gac on GA (versus 4–5 pairs in *S. monardi japonicus*); also from *S. monardi hyogoensis* by 9–11 pairs of gac on GA (versus 4–5 pairs in *S. monardi hyogoensis*), 2 dorsal spiniform setae on telofemur I (versus 1 in *S. monardi hyogoensis*), and lacking ds on PE (versus 1 pair on PE in *S. monardi hyogoensis*). Considering the characters above, Korean specimens definitely differ from the Japanese subspecies, and coincides with the nominate subspecies, *S. monardi monardi*.

The *Soldanellonyx* halacarids are known to occur rarely with scarce number of individuals, and often are collected juveniles only. As shown in the Table 1, the four adult females and three deutonymphs examined in this study showed rather consistency in the number of dorsal setae on idiosoma (as

Table 1. Developmental changes of some characters from deutonymphs to adult females in *Soldanellonyx monardi* from Korea

	Adult females (n=4)	Deutonymphs (n=3)
No. of ds (number of ds on PD) and glp	5 (1), 5	5 (1), 5
No. of dorsal spiniform setae of telofemora I–IV	2, 2, 1, 1	1, 1, 1, 1
No. of dorsal spiniform setae of genua I–IV	2, 2, 1, 1	1, 1, 1, 1
No. of dorsal spiniform setae of tibiae I–IV	1, 2, 0, 1	1, 2, 1, 1
No. of pgs (right, left)	4, 3	2, 1–2
No. of gac on GA (right, left)	4–5, 4–5	2, 2–3

ds, dorsal setae on idiosoma; PD, posterior dorsal plate; pgs, perigenital setae; gac, genital acetabula; GA, genitoanal plate.

5 pairs, including 1 pair on PD) and in the increment of the number of dorsal spiniform setae on telofemora and genua of legs I and II (from 1 to 2 at all the segments), the number of perigenital setae (from 4–5 to 7), and the number of genital acetabula on GA (from 4–5 to 8–10) according to growth. As in the adult females, the deutonymphs of *S. monardi monardi* appear to have 5 pairs of dorsal setae including 1 pair on PD consistently. Therefore, they can be distinguished from the deutonymphs and adults of the two Japanese subspecies, as well as from *S. chappuisi*, the sympatric species in both countries, which has 6 pairs of ds, including 2 pairs on PD. Moreover, deutonymphs of *S. monardi monardi* and *S. monardi hyogoensis* are differentiated by the number of gac and pgs on GA, that is, 2 pairs of gac and 2 pairs of pgs in *S. monardi monardi*, while 2 pairs of gac and 3 pairs of pgs in *S. monardi hyogoensis*.

Distribution. Europe, Korea, Vietnam, Indonesia, Tunisia, Kenya, Madagascar, Hawaiian Islands, Canada, U.S.A., Brazil, Chile, Falkland Islands, Australia, New Zealand.

ORCID

Jong Hak Shin: <https://orcid.org/0000-0002-1889-4212>

Cheon Young Chang: <http://orcid.org/0000-0001-5557-7120>

CONFLICTS OF INTEREST

No potential conflict of interest relevant to this article was reported.

ACKNOWLEDGMENTS

We appreciate the kind comments of Dr. Ilse Bartsch for dealing with inquiries about the information of *Soldanellonyx* species. We are grateful to two anonymous reviewers for their critical comments that greatly improved the manuscript. This work was supported in part by the research grant of Daegu University, Korea in 2017 to Cheon Young Chang.

REFERENCES

- Bartsch I, 1975. Zur Kenntnis der Halacaridenfauna (Acari) der Quellenregion, I. Ein Beitrag zur Morphologie und biologie dreier arten aus dem Sphagnetum. *Gewässer und Abwässer*, 57/58:27-42.
- Bartsch I, 2006. 5. Acari: Halacaroida. In: Süßwasserfauna von Mitteleuropa 7/2-1, Chelicerata: Araneae, Acari I (Ed., Ger-ecke R). Elsevier, Spektrum, Heidelberg, pp. 113-157.
- Bartsch I, 2007. Freshwater Halacaridae (Acari) from New Zealand rivers and lakes, with notes on character variability. *Mitteilungen aus dem Hamburgischen Zoologischen Museum und Institut*, 104:73-87.
- Bartsch I, 2008. Freshwater halacarid mites (Halacaridae: Prostigmata: Acari) from Tunisia, three new records and notes on geographical distribution of these species. *Entomologische Mitteilungen aus dem Zoologischen Museum Hamburg*, 15:15-27.
- Bartsch I, 2009. Checklist of marine and freshwater halacarid mite genera and species (Halacaridae: Acari) with notes on synonyms, habitats, distribution and descriptions of the taxa. *Zootaxa*, 1998:1-170. <https://doi.org/10.11646/zootaxa.1998.1.1>
- Bartsch I, 2011. North American freshwater Halacaridae (Acari): literature survey and new records. *International Journal of Acarology*, 37:490-510. <https://doi.org/10.1080/01647954.2010.525528>
- Bartsch I, 2012. *Soldanellonyx lohmannelloides* (Sokolov & Yankovskaya, 1970) (Acari: Halacaridae), a re-description. *Entomologische Mitteilungen aus dem Zoologischen Museum Hamburg*, 16:19-27.
- Bartsch I, 2014. New records of freshwater Halacaridae (Acari) from the oriental region and a supplementary description of *Soldanellonyx visurgis*. *International Journal of Acarology*, 40:165-173. <https://doi.org/10.1080/01647954.2014.897369>
- Bartsch I, 2018. Freshwater halacarid mites (Acari: Halacaridae) from Madagascar: new records, keys and notes on distribution and biology. *Bonn Zoological Bulletin*, 67:79-99. <https://doi.org/10.20363/BZB-2018.67.2.079>
- Bartsch I, 2019. Arachnida: Acari: Trombidiformes: Halacaridae. In: Thorp and Covich's freshwater invertebrates, 4th edition. Vol. 4. Keys to Palaearctic Fauna (Eds., Rogers DC, Thorp JH). Kansas Biological Survey, Department of Ecology and Evolutionary Biology, University of Kansas, Lawrence, KS, pp. 554-563.
- Durucan F, 2020. Two new genera, *Limnohalacarus* and *Soldanellonyx* (Acari: Halacaridae) in freshwater halacarid mites with additional new records from Turkey. *Persian Journal of Acarology*, 9:1-11.
- Green J, MacQuitty M, 1987. Halacarid mites. *Synopses of the British Fauna, New Series*, 36:1-178.
- Imamura T, 1957. Erste Mitteilung über Porohalacaridae aus unterirdischen Gewässern in Japan. *Abhandlungen Naturwissenschaftlichen Verein zu Bremen*, 35:53-62.
- Imamura T, 1959. Water-mites (Hydrachnellae and Porohalacaridae) from the subterranean waters Akiyoshidae Karst, Japan. *Japanese Journal of Zoology*, 12:251-255.
- Imamura T, 1968. Results of the speleological survey in South Korea 1966. IX. Halacaridae (Acari) found in a limestone cave of South Korea. *Bulletin of the National Science Museum, Tokyo*, 11:281-284.
- Imamura T, 1970. Subterranean water mites (Limnohalacaridae and Hydrachnellae) of the Tsushima Islands. *Bulletin of the*

- National Science Museum, Tokyo, 13:249-262.
- Imamura T, 1971. The fauna of the lava lakes around Mt. Fuji-san. V. Limnohalacarinae (Acari). Bulletin of the National Science Museum, Tokyo, 14:333-336.
- Imamura T, 1981. Fresh-water halacarid mites from Oahu Island, Hawaii. Annotationes Zoologicae Japonenses, 54:287-292.
- Lee J, Chang CY, 2017. *Scaptognathus teuriensis*, a new record of halacarid mite (Acari, Halacaridae) from Dokdo Island of Korea. Animal Systematics, Evolution and Diversity, 33:45-50. <https://doi.org/10.5635/ASED.2017.33.1.055>
- Shin JH, Chang CY, 2019. A new species of the genus *Agauopsis* (Acari: Halacaridae) from Jeju Island, Korea. Animal Systematics, Evolution and Diversity, 35:49-56. <https://doi.org/10.5635/ASED.2019.35.2.008>
- Sokolov II, Yankovskaya AI, 1970. Novie dannie po gidrakarino-faune Baikala. Izvestija biologo-geografičeshogo nauchno-issledovatel'skogo Instituta, Irkutsk, 23:95-103.
- Tuzovskij PV, 2011. Description of a new water mite species of the genus *Soldanellonyx* Walter, 1917 (Acari: Halacaridae) from Japan. Amurian Zoological Journal, Blagoveshchensk, 3:205-209.
- Viets K, 1929. Über Süßwasser-Halacaridae. (Vierte Mitteilung über Hydracarina von den Sunda-Inseln). Zoologischer Anzeiger, 86:27-34.
- Walter C, 1917. Schweizerische Süßwasserformen der Halacariden. Revue Suisse de Zoologie, 25:411-423.
- Walter C, 1919. Schweizerische Süßwasserformen der Halacariden. Revue Suisse de Zoologie, 27:235-242.
- WoRMS, 2020. *Soldanellonyx* Walter, 1917 [Internet]. Accessed 14 Aug 2020, <<https://www.marinespecies.org/aphia.php?p=taxdetails&id=406437>>.

Received August 29, 2020
Revised October 27, 2020
Accepted October 27, 2020