

A new species of *Agauopsis* (Acari, Halacaridae) from South Korea belonging to *A. brevipalpus* group

Jong Hak Shin ^a, Jimin Lee ^b, Cheon Young Chang ^a

^a Department of Biomedical Science, Daegu University, Gyeongsan 38453, Korea.

^b Ocean Climate Response · Ecosystem Research Department, Korea Institute of Ocean Science and Technology, Busan 49111, Korea.

Original research

ABSTRACT

A new marine halacarid mite of the genus *Agauopsis* Viets, 1927 is recorded from mussels in the intertidal bedrock of the southern coast of South Korea. *Agauopsis bisetosa* n. sp. belonging to the *A. brevipalpus* group, is characterized by an 'H'-shaped areola on the anterior dorsal plate, two pairs of costae on the posterior dorsal plate, a tectum with a truncate anterior margin, posterior epimeral plate with two ventral setae, telofemur I with one ventral and two ventromedial dentate spines, and tibia II with one ventral and one ventromedial dentate spines. Notably, the presence of two ventral setae on the posterior epimeral plate is a unique characteristic of the new species. This study deals with a description of *A. bisetosa* n. sp., accompanied by detailed illustrations drawn under a differential interference contrast microscope and scanning electron microscope photomicrographs. Additionally, it includes a character comparison table of the *A. brevipalpus* group and a key for known *Agauopsis* species in the northwest Pacific, both including the new species.

Keywords *Agauopsis bisetosa* new species; marine; meiofauna; Pacific; taxonomy

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Introduction


The genus *Agauopsis* Viets, 1927 currently comprises 90 valid species, accounting for 7.6% of all species in the family Halacaridae. It is the third most diverse genus after *Copidognathus* Trouessart, 1888 with 380 species (32.2%) and *Rhombognathus* Trouessart, 1888 with 110 species (9.3%) (Bartsch 2015a; WoRMS 2023). In this genus, 79 species are allocated to seven different species groups: the *brevipalpus*, *conjuncta*, *furcata*, *microrhyncha*, *okinavensis*, *ornata*, and *pugio* (Bartsch 1986a, 1996a, 2005, 2015a; Bartsch and Iliffe 1985; Chatterjee *et al.* 2009; Macquitty 1983), and the remaining 11 species have not yet been clearly identified as part of any specific group. Among these groups, the *brevipalpus* group is the most species-rich group, comprising 25 species (Bartsch 2015a).

In the northwest Pacific region, 14 *Agauopsis* species have been documented to date: *A. robusta* Sokolov, 1952 from the Russian coast of Sea of Japan (Sokolov 1952); *A. pseudoornata* Bartsch, 1985 from Philippines (Bartsch 1985); *A. okinavensis* Bartsch, 1986 from Japan (Bartsch 1986a); *A. ammodytes* Bartsch, 1992, *A. arenaria* Bartsch, 1992, *A. humilis* Bartsch, 1992, and *A. sordida* Bartsch, 1992 from Hong Kong (Bartsch 1992a, 1992b); *A. arborea* Bartsch, 2003, *A. dissimilis* Bartsch 2015, *A. longirostris* Bartsch, 2015, *A. moorea* Bartsch, 1992, and *A. sordida* from Singapore (Bartsch 2015a, 2015b); *A. ivanomorsellii* Chatterjee & Chang, 2007, *A. tetrasetosa* Shin & Chang, 2019 and *A. youngilensis* Chatterjee & Chang, 2007 from South Korea (Chatterjee and Chang 2007; Shin and Chang 2019). Among them, only

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Corresponding author
Cheon Young Chang 
cychang@daegu.ac.kr

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seven species belong to the *brevipalpus* group: *A. arborea*, *A. dissimilis*, *A. ivanomorsellii*, *A. longirostris*, *A. moorea*, *A. sordida*, and *A. youngilensis*.

This study deals with a new species of *Agauopsis* belonging to the *brevipalpus* group collected from mussels in the intertidal rocky shores on the southern coast of Korea, based on detailed illustrations and scanning electron microscope photographs of both females and males. Additionally, we provide a character comparison table of the *A. brevipalpus* group in the genus *Agauopsis* as well as a key to the 15 *Agauopsis* species known in the northwest Pacific.

Material and methods

Halacarid mites were collected from clumped mussels (*Mytilus* sp.) on rocks in the intertidal zone. Specimens were obtained by immersing the mussels in a bucket of tap water for approximately 10 minutes to induce osmotic shock, and rinsing through a nylon net (64 µm in pore diameter). Filtered specimens were immediately fixed with 80% ethanol or 5% formalin. Detailed methods for preparing slide specimens and creating illustrations are referenced from Lee *et al.* (2023), and scanning electron microscopy follows Lee and Chang (2017). Scale bars in the figures are in µm.

Type specimens are deposited at the Honam National Institute of Biological Resources (HNIBR), Mokpo, 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-1 to ds-6, first to sixth dorsal setae on idiosoma); GA, genitoanal plate; glp, gland pore(s), numbered glp-1 to glp-2 from anterior to posterior; GO, genital opening; OC, ocular plate(s); P, palp (P-1 to P-4, first to fourth palpal segments); pas, parambulacral setae; PD, posterior dorsal plate; PE, posterior epimeral plate; pgs, perigenital setae; sgs, subgenital setae.

Systematics

Subclass Acari Leach, 1817

Order Trombidiformes Reuter, 1909

Suborder Prostigmata Kramer, 1877

Superfamily Halacaroidea Cunliffe, 1954

Family Halacaridae Murray, 1877

Genus *Agauopsis* Viets, 1927

Agauopsis bisetosa n. sp.

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(Figures 1–4)

Type locality — Korea: Jeollanam-do, Yeosu-si, Sindeok-dong, Sindeok beach (34°49'05"N, 127°46'01"E), mussels (*Mytilus* sp.) attached to rocks, 0–0.5 m depth, 19 Aug. 2018, Shin J.H.

Type material — Holotype: ♀ (HNIBRIV11667), mounted in glycerin on H-S slide, from the type locality. Paratypes: ♂ (allotype, HNIBRIV11668) and 5♀♀, 4♂♂ (HNIBRIV11669–11677) mounted in glycerin on H-S slide from the type locality.

Additional material examined — 5♀♀, 5♂♂ on a stub for SEM, same data as for holotype.

Etymology — The specific name, *bisetosa*, refers to ‘two’ ventral ‘setae’ on the posterior epimeral plate, the unique feature of the new species.

Description of female (holotype) — Idiosoma (Figures 1A and 3A) 453 µm long (449–521 µm, mean = 471 µm, n = 6), 320 µm wide (317–401 µm, mean = 346 µm, n = 6), length to

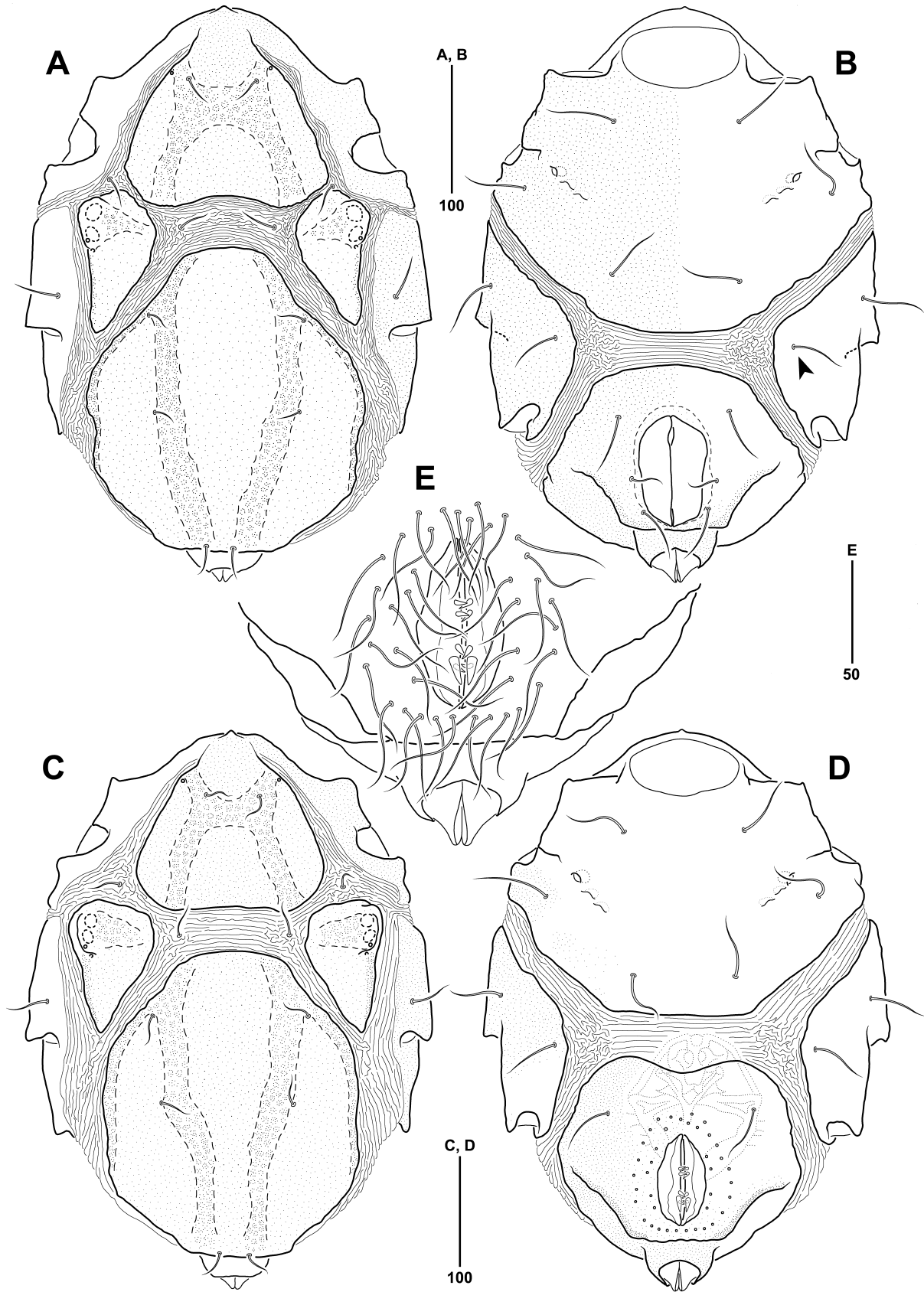


Figure 1 *Agauopsis bisetosa* n. sp. A, B, female (HNIBRIV11667): A – Idiosoma, dorsal; B – Idiosoma, ventral. C–E, male (HNIBRIV11668): C – Idiosoma, dorsal; D – Idiosoma, ventral; E – pgs and sgs on GA.

width ratio about 1.42; with a small frontal process; all dorsal plates well-developed, separated from each other by membranous cuticle, and covered with small pores (canaliculi) on surfaces excluding areolae and costae.

AD (Figure 1A) 149 μm long (144–164 μm , mean = 155 μm , $n = 6$), about 0.33 times as long as idiosoma, 160 μm wide (152–175 μm , mean = 165 μm , $n = 6$), length to width ratio 0.93; triangular-shaped, rounded posterolaterally, and concave medially at posterior margin; 'H'-shaped areola protuberant (Figure 3C), decorated with 2–3 polygonal porose panels wide; each porose panels with 6–12 canaliculi (Figure 3D); anterior part of transverse ridge of 'H'-shaped areola much shorter than rear part; pair of glp-1 located at anteromedial end of anterior arms of 'H'-shaped areola.

OC (Figure 1A) 61 μm long (59–68 μm , mean = 64 μm , $n = 6$), about 0.13 times as long as idiosoma, 116 μm wide (112–125 μm , mean = 120 μm , $n = 6$), length to width ratio 0.53; narrowing posteriorly and pointed distally; posterior end extending near insertion of leg III; each with 2 corneae on raised transverse areola laterally; areola covered with 9–11 polygonal porose panels; glp-2 and pore canaliculi located at posterolateral to posterior cornea.

PD (Figures 1A and 3E) 238 μm long (236–257 μm , mean = 247 μm , $n = 6$), about 0.53 times as long as idiosoma, 218 μm wide (211–227 μm , mean = 221 μm , $n = 6$), length to width ratio 1.09; anterior margin almost truncate; narrowest at anterior 18% of PD, approximately 0.52 times as wide as PD; with 2 pairs of longitudinal costae, medial costae more distinct than lateral ones; medial costae gradually close to each other towards posterior margin, and each costa with 2–3 polygonal porose panels wide; each lateral costa narrow, with 1–2 polygonal porose panels wide; porose panels on costae consisting of 7–14 canaliculi; remaining area of PD covered with canaliculi (Figure 3F).

Dorsal setae (Figure 1A): ds-1 situated at anterior 38% of AD; ds-2 on membranous cuticle anterior to OC; ds-3 on membranous cuticle among AD, OC, and PD; 3 pairs of dorsal setae (ds-4, ds-5, and ds-6) at anterior 22%, 55%, and 100% of PD, respectively, of which anterior two (ds-4 and ds-5) situated at lateral edge of raised medial costae, ds-6 at posterior margin of PD.

All ventral plates (Figures 1B and 3B) well-developed and separated by membranous cuticle, and just as dorsal plates covered with small pores.

AE (Figure 1B) 191 μm long (188–216 μm , mean = 204 μm , $n = 6$), 298 μm wide (291–341 μm , mean = 322 μm , $n = 6$), length to width ratio 0.64; posterior margin straight or weakly convex; with 3 pairs of ventral setae; a pair of epimeral pores present near trochanter II; 2 pairs of lyrifissures (= pore canaliculi) located consecutively posterior to epimeral pores.

PE (Figure 1A, B) with 3 pairs of setae, consisting of 1 dorsal and 2 ventral setae; both ventral setae located at the level of insertion of leg III, each ventrolaterally and ventromedially (the latter indicated by an arrowhead); ventral seta lacking in coxal field at the level of insertion of leg IV.

GA (Figure 1B) 171 μm long (164–185 μm , mean = 177 μm , $n = 6$), 0.86 times as long as AE, 207 μm wide (201–218 μm , mean = 212 μm , $n = 6$), length to width ratio 0.83; anterior margin almost straight or slightly convex; distance from anterior margin of GO to that of GA, 40 μm , about 0.45 times length of GO; with 3 pairs of pgs located at anterior 23%, 53% and 67% of GA, respectively, foremost seta at the level similar to anterior end of GO, second pgs at the level of half of GO, and last seta at posterolateral margin of GO, both second and last setae close to GO; sgs absent. GO 89 μm long, about 0.52 times as long as GA.

Gnathosoma (Figure 2A) 131 μm long (128–138 μm , mean = 135 μm , $n = 6$), about 0.29 times as long as idiosoma, 76 μm wide (74–80 μm , mean = 78 μm , $n = 6$), length to width ratio 1.72; dorsal and ventral surface covered with punctate pores; with 4 pairs of setae, consisting of 3 pairs of setae on rostrum and 1 pair of setae on gnathosomal base; protorostral and deutorostral setae situated at tip of rostrum, tritorostral setae at anterior 20% of rostrum ventrally, and basirostral setae at anterior 15% of gnathosomal base; gnathosomal base about 2.05 times length of rostrum. Rostrum 43 μm long, 0.33 times as long as gnathosoma, its tip slightly reaching beyond end of P-3. Palp (Figures 2A, B and 4C) consisting of 4 segments,

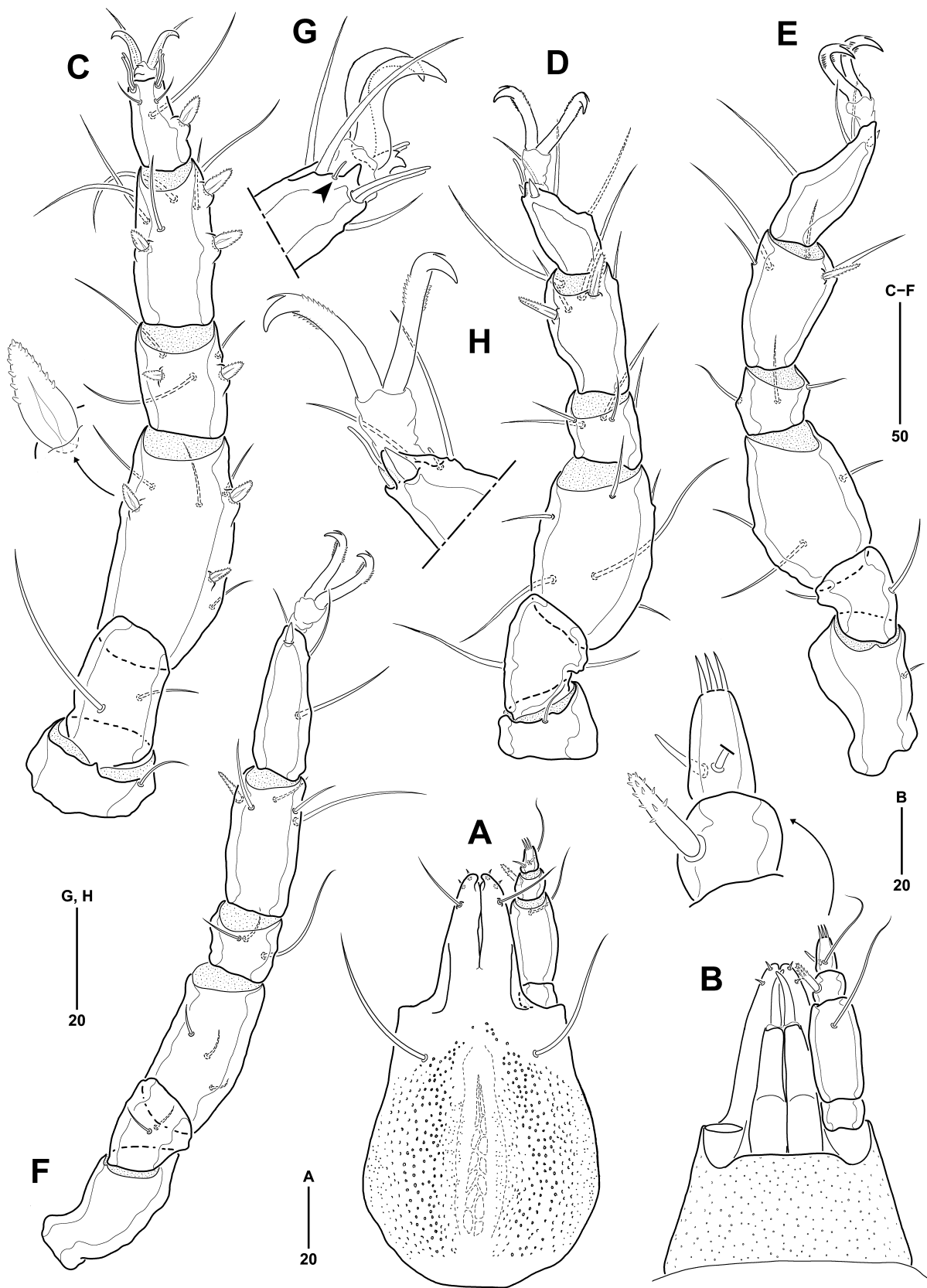


Figure 2 *Agauopsis bisetosa* n. sp., female (HNIBRIV11667). A – Gnathosoma, ventral; B – Gnathosoma, dorsal; C – Leg I, ventromedial; D – Leg II, ventromedial; E – Leg III, ventromedial; F – Leg IV, ventrolateral; G – Tarsus I, lateral (arrowhead indicating the solenidion); H – Tarsus II, ventromedial.

their lengths 7, 28, 9, and 9 μm , respectively; P-1 without setae; P-2 longest, with 1 dorsodistal seta; P-3 with 1 dentate spine (9 μm long, equal to length of P-3) medially; P-4 with 1 long dorsal and 1 short ventral setae proximally, and 3 spinelets at its distal end. Tectum truncated at its anterior margin (Figure 2B). Chelicera (Figure 2B) 56 μm long, 11 μm wide, reaching to anterior margin of rostrum.

All legs (Figure 2C–F) shorter than idiosoma, legs I–IV 367, 307, 340, and 345 μm long, respectively, and basifemora to tarsi I–IV with pores on surfaces. Chaetotaxy of all legs as follows: trochanters 1-1-1-0; basifemora 2-2-2-2; telofemora 7-6-3-3; genua 5-5-3-3; tibiae 9-6-5-5; tarsi (excluding pas and solenidion) 6-3-3-3. Trochanters III and IV about 2.23 times longer than trochanters I and II. Telofemur I armed with 1 ventral and 2 ventromedial bidentate spines. Genu I with 1 ventral and 1 ventromedial bidentate spines. Tibia I with 1 ventral and 2 ventromedial bidentate spines; tibia II with 1 ventral and 1 ventromedial bidentate spines; tibiae III–IV, each with 1 ventromedial bidentate spine. Tarsi I–IV 48, 55, 69, and 71 μm long, respectively; tarsus I (Figure 2C, G) with 3 dorsal, 2 ventral setae, 1 ventromedial bidentate spine, 1 tiny solenidion (indicated by arrowhead in Figure 2G), and a pair of doublet eupathid pas; tarsus II (Figures 2D, H and 4D) armed with 3 dorsal setae, 1 tiny solenidion, 1 lateral doublet (consisting of 1 eupathid and 1 short spinelet) and 1 medial spinelet pas; tarsi III–IV (Figure 2E, F) with 3 dorsal setae and 1 lateral spinelet pas, respectively; tarsi II–IV, each with a dorsal accessory process and 6–7 teeth on either side of curved area on lateral claw (Figures 2H and 4D), and without median claw.

Male (allotype) — Idiosoma (Figure 1C) 508 μm long (492–521 μm , mean = 508 μm , $n = 5$), 370 μm wide (362–401 μm , mean = 382 μm , $n = 5$). Similar to female, except for genital region. GA (Figures 1D and 4A, B) 197 μm long (188–206 μm , mean = 198 μm , $n = 5$), 0.98 times as long as AE, 221 μm wide (217–230 μm , mean = 224 μm , $n = 5$), length to width ratio 0.89; anterior margin concave; armed with 41 pgs, a pair of outlying pgs located at anterior 17% of GA, and 39 pgs arranged in two rows around GO (with a range of 36–42 pgs); with 5 pairs of sgs on genital sclerite, 2 pairs at anterior part and 3 pairs at posterior part, of which fourth sgs (14 μm long) larger than others (8 μm long) (Figures 1E and 4B). GO 84 μm long, about 0.43 times as long as GA; distance from anterior margin of GO to that of GA, 55 μm long, about 0.65 times length of GO. Spermatopositor large, its anterior end reaching to the level of insertion of leg III.

Remarks — Considering the classification by Bartsch (2015a), *A. bisetosa* **n. sp.** evidently belongs to the *A. brevivalpus* group with 25 congeners, and is characterized by the following combination of characters: AD with an ‘H’-shaped areola; PE with two ventral setae; P-4 with two basal setae and three apical spinelets; telofemur I with one ventral and two ventromedial dentate spines; and tibia II with one ventral and one ventromedial dentate spines.

In the *brevivalpus* group, the number of dentate spines serves as a highly valuable feature for easy identification (Bartsch 2015a). Notably, eight species including the new species, exhibit three dentate spines on telofemur I: *A. newelli* Krantz, 1973 and *A. filirostris* Macquitty, 1983 from U.S.A.; *A. reticulatus* Newell, 1984 from Chile; *A. luxtoni* Bartsch, 1986 and *A. novaezelandiae* Bartsch, 1986 from New Zealand; *A. ivanomorsellii* from Korea; and *A. glabra* Bartsch, 2009 from Australia (Bartsch 1986b, 2009; Chatterjee and Chang 2007; Krantz 1973; Macquitty 1983; Newell 1984). Among them, *A. bisetosa* **n. sp.** is closely allied with *A. ivanomorsellii* and *A. luxtoni* in sharing a short frontal process, the presence of an ‘H’-shaped areola on the AD, and two pairs of costae on the PD. However, the new species is distinguishable from them by the following characteristics (Table 1): (1) ds-4 is located on the PD in the new species and *A. ivanomorsellii*, whereas it is positioned on the membranous cuticle at the front of the PD in *A. luxtoni*; (2) PE has two ventral setae in the new species, while three ventral setae are present in *A. ivanomorsellii* and *A. luxtoni*; (3) the length ratio of rostrum/gnathosoma is 33% in the new species, whereas it is 45% and 40% in *A. ivanomorsellii* and *A. luxtoni*, respectively; (4) P-4 possesses three apical spinelets in the new species, while two spinelets

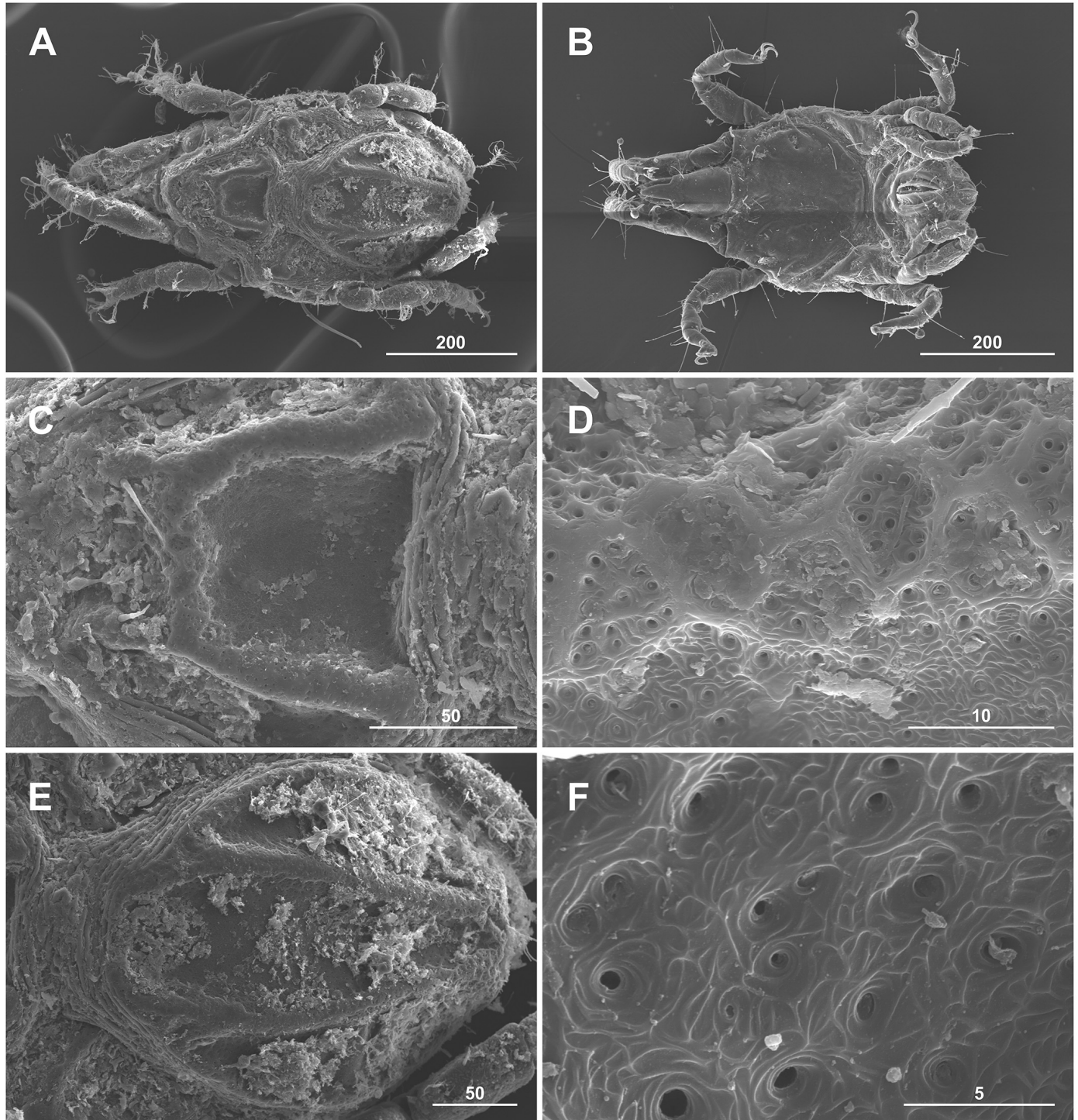


Figure 3 *Agauopsis bisetosa* n. sp., female, SEM photographs. A – Habitus, dorsal; B – Habitus, ventral; C – Areola of AD and a pair of ds-1; D – Porose panels on the areola of AD; E – PD; F – Canaliculi on PD.

are present in *A. ivanomorsellii* and *A. luxtoni*; and (5) the number of spines on tibiae II–IV is 2-1-1 spines in the new species and *A. luxtoni*, whereas *A. ivanomorsellii* has 3-2-2 spines.

In general, halacarid mites have one dorsal (or lateral) and three ventral setae on the PE (Abé 1998; Green and Macquitty 1987; Newell 1984). Despite the same is true within the genus

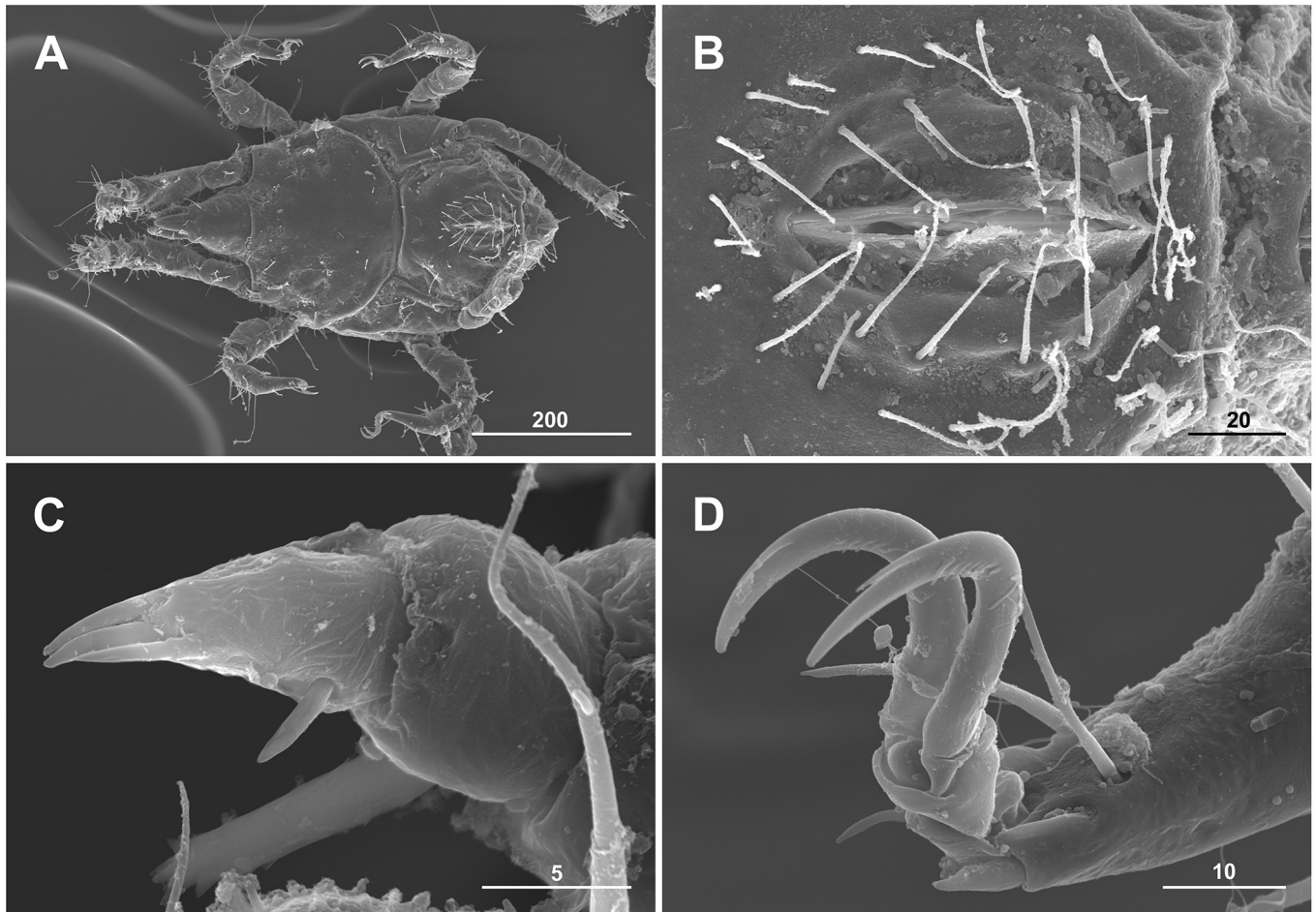


Figure 4 *Agauopsis bisetosa* n. sp., SEM photographs. A, B, male: A – Habitus, ventral; B – GO with pgs. C, D, female: C – P-3 and P-4, ventral; D – Tip of tarsus II, medial.

Agauopsis, it is reduced to one or two setae in rare cases. In the genus *Agauopsis*, two species, *A. bacescui* Konnerth-Ionescu, 1977 and *A. crassipes* (Gimbel, 1920), belonging to the *ornata* and *microrhyncha* groups, respectively, have been recorded as bearing two ventral setae on the PE (Gimbel 1920; Konnerth-Ionescu 1977). In the *brevipalpus* group, *A. bisetosa* n. sp. is the sole species with two ventral setae on the PE. As for another member of the *brevipalpus* group, *A. glabra*, Bartsch (2009) described two ventral setae on PE for the female holotype, whereas three for one female and one male paratypes. Furthermore, in the holotype of *A. glabra*, the position of the two ventral setae on PE are different from that of *A. bisetosa* n. sp.: the rear seta locates near the coxal insertion of leg IV in *A. glabra*, while ventromedial corner of PE at the level of insertion of leg III in the new species (indicated by an arrowhead in Figure 1B).

Agauopsis ivanomorsellii and *A. youngilensis*, both of which are recorded in Korea and belong to the *brevipalpus* group as *A. bisetosa* n. sp. is, exhibit distinct morphological differences from the new species. The morphological differences between *A. ivanomorsellii* and *A. bisetosa* n. sp. have been already stated above. Besides the unique characteristic of two ventral setae on the PE, *A. bisetosa* n. sp. is discernible from *A. youngilensis* as follows: (1) presence of an ‘H’-shaped areola on the AD (versus an ‘M’-shaped areola in *A. youngilensis*); (2) telofemur I with three spines (versus four spines in *A. youngilensis*); (3) tibiae II–III with two and one spines, respectively (versus three and two spines, respectively, in *A. youngilensis*); and (4) male with 5 pairs of sgs (versus seven sgs in *A. youngilensis*).

Table 1 Comparison of morphological characters in the *Agauopsis brevipalpus* group.

Species	Characters																Distributions
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV	XV	XVI	
<i>arabia</i>	H	0.52–0.55	4	S	mc	3	3	36–39	5	2, 1	2 sp	1, 1, 1, 0	2, 2, 2, 2	9, 6, 3, 3	5, 5, 3, 3	9, 7, 5, 5	India (Bartsch and Chatterjee 2001; Bartsch 2015a)
<i>arborea</i>	H	0.43	4	S	mc	3	3	34–51	5	1, 1	2 st	1, 1, 1, 0	2, 2, 2, 2	9, 5, 3, 3	5, 5, 3, 3	9, 5(6), 5, 5	Australia (Bartsch 2003), Singapore (Bartsch 2015b)
<i>atacamae</i>	H [†]	0.41	4	S	mc	3	3	42	5	2, 1	2 st	1, 1, 1, 0	2, 2, 2, 2	8(9), 6, 3, 3	5, 5, 3, 3	9, 7, 4, 4	Chile (Newell 1984)
<i>borealis</i>	H	0.51	4	S	mc	3	3	-	-	2, 1	2 sp	1, -, -, -	2, -, -, -	8, -, -, -	5, -, -, -	9, -, -, -	U.S.A. (Bartsch 1979; Newell 1947)
<i>brevipalpus</i>	H	0.54	4	S	mc	3	3	42–67	5	2, 1	2 sp	1, 1, 1, 0	2, 2, 2, 1	9, 6, 3, 3	5, 5, 3, 3	9, 7, 5, 5	Bulgaria (Chichkoff 1907), Croatia (Viets 1940), France (Trouessart 1889; André 1946), Italy (Krantz 1970; Morselli and Mari 1982), Portugal & Spain (André 1946), Romania & Russia (Bartsch 2004), Türkiye (Bartsch 2004; Durucan 2021; Durucan and Boyacı 2018; Durucan et al. 2023), Ukraine (Bartsch 1996b; Sokolov 1952; Viets 1928)
<i>collaris</i>	-	0.37	1	N	mc	3	3	20	3	1, 1	2 sp	1, 1, 1, 0	2, 2, 1, 1	4, 5, 2, 2	3, 5, 3, 3	7, 5, 4, 5	Australia (Otto 1994)
<i>dissimilis</i>	H	0.5	4	S	mc	3	3	61	4(5)	1, 1	2 st	1, 1, 1, 0	2, 2, 2, 2	8, 6, 3, 3	5, 5, 3, 3	9, 5(6), 5, 5	Singapore (Bartsch 2015a)
<i>filirostris</i>	M	0.55	3	T	mc	3	4	39	5	2, 1	2 sp	1, 0, 1, 0	2, 2, 2, 2	8, 5, 3, 3	5, 4, 3, 3	9, 7, 5, 5	California, U.S.A. (Macquitty 1983)
<i>glabra</i>	N	0.29	3	N	PD	3	3	20–24	5	1, 1	1 st, 1 sp	1, 1, 1, 1	2, 2, 2, 2	7, 6, 2, 2	5, 5, 3, 3	9, 6, 5, 5(6)	Australia (Bartsch 2009)
<i>ibssi</i>	H	0.46	4	S	mc	3	3	25–34	5	2, 1	2 sp	1, 1, 1, 0	2, 2, 2, 1	8, 6, 3, 3	5, 5, 3, 3	9, 7, 5, 5	Türkiye (Durucan and Boyacı 2018), Ukraine (Bartsch 1996b)
<i>ivanomorsellii</i>	H	0.43	3	S	PD	3	4	54	5	2, 1	2 sp	1, 1, 1, 0	2, 2, 2, 2	8, 6, 3, 3	5, 5, 3, 3	9(10), 8, 5, 5	South Korea (Chatterjee and Chang 2007)
<i>legionium</i>	H	0.56–0.63	4	-	mc	3	3	34–41	5	2, 1	2 sp	1, 1, 1, 0	2, 2, 2, 1	9, 6, 3, 3	5, 5, 3, 3	9, 7, 5, 5	Brazil (Pepato and Tiago 2005)
<i>littoralis</i>	H	0.5	4	S	mc	3	-	36	4(5)	2, 1	3 sp	1, 1, 1, -	2, 2, 2, -	9, 6, 3, -	5, 5, 3, -	9, 7, 6, -	Bermuda (Bartsch and Iliffe 1985)
<i>longirostris</i>	H	0.58	4	S	mc	3	3	36–38	4(5)	2, 1	2(3) sp	1, 1, 1, 0	2, 2, 2, 1	9, 6, 3, 3	5, 5, 3, 3	9, 7, 5(6), 5	Singapore (Bartsch 2015b)
<i>luxtoni</i>	H	0.39	3	S	mc	3	3	-	-	1, 1	1 st, 1 sp	1, -, 1, -	2, 2, 2, -	7, 6, 3, -	5, 5, 3, -	8, 6, 5, -	New Zealand (Bartsch 1985)
<i>moorea</i>	H	0.43	4	S	mc	3	3	30	5	2, 1	2 sp	1, 1, 1, 0	2, 2, 2, 2	9, 5, 3, 3	5, 5, 3, 3	9, 7, 5, 5	Australia (Bartsch 2005), Polynesia (Bartsch 1992c), Singapore (Bartsch 2015a)
<i>newelli</i>	M	0.36	3	S	mc	3	3	15–17	5	2, 1	-	-, -, -, -	2, -, -, -	8, 5, -, -	5, 4, -, -	8, 7, -, -	U.S.A. (Krantz 1973)
<i>novaezelandiae</i>	N	0.27	3	S	PD	3	3	37	5	2, 1	1 st, 1 sp	1, 1, 1, 0	2, 2, 2, 2	7, 6, 3, 3	5, 6, 3, 3	9, 7, 5, 5	New Zealand (Bartsch 1985)
<i>obtusata</i>	H	0.4	4	S	mc	3	3	53–63	5	2, 1	2 sp	1, 1, 1, 0	2, 2, 2, 2	9, 6, 3, 3	5, 5, 3, 3	9, 6, 5, 5	Australia (Bartsch 2005)
<i>reticulata</i>	H [†]	-	3	S	mc	3	3	31	5	1, 1	-	1, 1, 1, 0	2, 2, 2, 2	7, 6, 3, 3	5, 5, 3, 3	9, 6, 5, 5	Chile (Newell 1984)
<i>ripa</i>	H	0.47	4	S	mc	3	3	28–59	5	2, 1	2 sp	1, 1, 1, 0	2, 2, 2, 2	9, 6, 3, 3	5, 5, 3, 3	9, 7(8), 5, 5	Australia (Otto 1999)
<i>rosea</i>	H [†]	0.31	2	N	mc	3	3	34	5	1, 1	2 sp	1, 1, 1, 1	2, -, -, -	4, -, -, -	5, -, -, -	7, -, -, -	Chile (Newell 1984)
<i>sordida</i>	H	0.41	4	S	mc	3	3	35–47	5	2, 1	2 sp	1, 1, 1, 1	2, 2, 2, 2	9, 6(7), 3, 3	5, 5, 3, 3	9, 6(7), 5, 5	Hong Kong (Bartsch 1992a), Singapore (Bartsch 2015a)
<i>tricuspis</i>	-	0.48	5	N	mc	3	3	40	5	2, 1	2 sp	1, 0, 1, 0	2, 2, 2, 2	10, 5, 3, 3	6, 4, 3, 3	9, 7, 5, 5	France (Benard 1962)
<i>youngilensis</i>	M	0.34	4	S	PD	3	3	42	7	2, 1	2 sp	1, 1, 1, 0	2, 2, 2, 2	9, 6, 3, 3	5, 5, 3, 3	9, 7, 5, 5	South Korea (Chatterjee and Chang 2007)
<i>bisetosa</i> n.sp.	H	0.33	3	S	PD	2	3	36–42	5	1, 1	1 st, 1 sp	1, 1, 1, 0	2, 2, 2, 2	7, 6, 3, 3	5, 5, 3, 3	9, 6, 5, 5	South Korea (this study)

I, Arrangement of areola on AD: H, 'H'-shaped; H[†], 'H'-shaped without transverse line; M, 'M'-shaped; N, areola absent; II, Ratio of rostrum/gnathosoma length; III, Number of spine on telofemur I; IV, Frontal spine on AD: N, none; S, short spine; T, trifold spine; V, Position of ds-4: mc, located on membranous cuticle of between OC and PD; PD, on PD; VI, Number of ventral seta on PE; VII, Number of females pgs (each other); VIII, Number of males pgs (include outlying setae); IX, Number of males sgs (each other); X, Number of ventral and ventromedial pectinate spine on tibia II; XI, Number of ventral seta/spine on tibia III: st, seta; sp, spine; XII, Chaetotaxy of trochanters I–IV; XIII, Chaetotaxy of basifemora I–IV; XIV, Chaetotaxy of telofemora I–IV; XV, Chaetotaxy of genua I–IV; XVI, Chaetotaxy of tibiae I–IV.

Key to the species of *Agauopsis* recorded from the northwest Pacific

Below is a dichotomous key for known *Agauopsis* species from the northeast Pacific, including the new species from this study.

1. Palp with longest fourth segment (P-4); P-3 with a long medial seta *A. okinavensis* (*okinavensis* group)
 — Palp with longest second segment (P-2); P-3 with a medial spine 2
2. Idiosoma with five pairs of dorsal setae 3
 — Idiosoma with six pairs of dorsal setae 5
3. OC with two corneae; AE with garland-like areolae *A. pseudoornata* (*ornata* group)
 — OC without cornea; AE without areola 4 (*furcata* group)
4. AD as long as OC length; telofemur I with one spine *A. ammodytes*
 — AD longer than OC; telofemur I with three spines *A. arenaria*
5. P-3 with a pointed spine; tibia I with one ventral and three ventromedial spines, of which two ventromedial spines adjacent to each other 6 (*microrhyncha* group)
 — P-3 with a blunted spine; tibia I with one ventral and two ventromedial spines 8 (*brevipalpus* group)
6. Ds-4 located on membranous cuticle between OC and PD; palp shorter than rostrum *A. humilis*

- Ds-4 located on PD; palp longer than rostrum 7
- 7. Tibia IV with two setae; females with three pairs of pgs *A. robusta*
— Tibia IV with two spines; females with four pairs of pgs *A. tetrasetosa*
- 8. Telofemur I with three spines 9
— Telofemur I with four spines 10
- 9. Tibia II with three spines; tibiae III–IV each with one ventral spine *A. bisetosa* **n. sp.**
— Tibia II with four spines; tibiae III–IV with two ventral spines *A. ivanomorsellii*
- 10. AD with ‘M’-shaped areola; ds-4 located on PD *A. youngilensis*
— AD with ‘H’-shaped areola; ds-4 located on membranous cuticle between OC and PD ... 11
- 11. Tibia II with two ventral spines; tibia III without spines 12
— Tibia II with three ventral spines; tibia III with two ventral spines 13
- 12. Rostrum as long as gnathosomal base; P-4 with one basal seta *A. dissimilis*
— Rostrum shorter than gnathosomal base long; P-4 with two basal setae *A. arborea*
- 13. Gnathosoma 2.1–2.3 times longer than wide; basifemur IV with one seta ... *A. longirostris*
— Gnathosoma 1.8–1.9 times longer than wide; basifemur IV with two setae 14
- 14. Tectum with scaliform lamella; male with 30 pgs; AE with polygonal porose panels consisting of 6–8 canaliculi *A. moorea*
— Tectum with slightly arched lamella; male with 35–47 pgs; AE with polygonal porose panels consisting of 10–15 canaliculi *A. sordida*

Conflict of interest

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

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ORCID

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

Jimin Lee  <https://orcid.org/0000-0001-9004-8275>

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

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