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with the compliments
of the author

**A New Subspecies of *Caridina denticulata*
(Crustacea, Decapoda, Atyidae) from Jeju Island, Korea**

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적 요

1973년 7월 15일 제주도 서귀포 천지연 폭포 상류에서 채집된 *Caridina denticulata*가 신아종을 확인하고 이를 학명으로 *Caridina denticulata keunbaei*, 한국말로 제주새뱅이라 명명하여 기재한다. 이 신아종은 다른 유연자들에 비해 이마뿔이 매우 짧다.

Kim (the present author) and Park found that about 400 specimens of fresh-water shrimp, *Caridina denticulata* De Haan, 1849, which were collected by the late K. B. Park in Jeju Island, were quite different in some respects from known subspecies of this species. They described it in Korean under the name of *Neocaridina denticulata* subsp. (Kim and Park, 1973). Thereafter this was proved to be a new subspecies. This is described herewith as *Caridina denticulata keunbaei* subsp. nov. the subspecific name of which is derived from the late Mr. Park's personal name Keun Bae.

***Caridina denticulata keunbaei* subsp. nov.**

Korean name: Jeju-saebaengi

(Figs. 1, 2, 3)

Materials examined: 1 ovigerous ♀ (holotype, ZNSNU no. 1,000), 149♀♀ and 242♀♀ including 179 ovigerous ones (paratypes, ZNSNU no. 1,001), upper stream of Cheonji fall, Jeju I., collected by K. B. Park, July 15, 1973. The type specimens are deposited in the specimen room of the Department of Zoology, College of Natural Sciences, Seoul National University.

Description of holotype: The carapace is 3 times as long as the rostrum, provided with an antennal spine and a small acute tooth at the anteroinferior angle.

Rostrum is very short, slightly inflected downwards, reaching almost middle of penultimate segment of antennular peduncle. Its upper border bears 14 small forwardly directed teeth of which two of posterior ones are situated on the carapace behind the level of the orbit. The upper border is slightly convex, its distal portion is inflected a little downwards and the distal third of its length is unarmed. Its lower border bears four teeth.

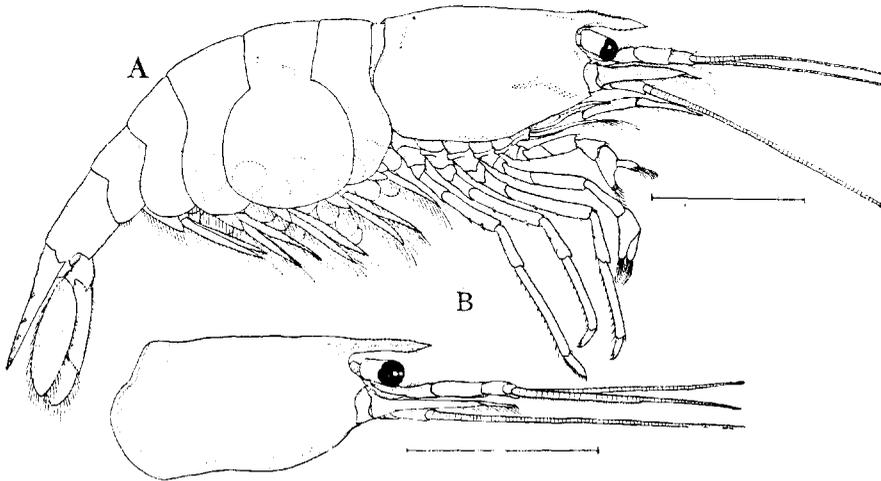


Fig. 1. *Caridina denticulata keunbaei* subsp. nov.

A. whole body in lateral view, holotype female. B. anterior part of body in lateral view, paratype male, scale lines; 5 mm.

Eyes are well-developed and cylindrical, cornea rounded, shorter than stalk and not wider than it. Stylocerite of antennular peduncle reaches a little beyond the middle of the proximal segment which bears a large acute tooth at the outer distal end. The penultimate segment is 1.7 times as long as ultimate segment and a little shorter than the proximal segment. The antennal scale reaches a little beyond the apex of the antennular peduncle, its outer margin is very slightly concave with terminal sharp tooth, its inner border is slightly convex. These two borders are almost parallel except the proximal and distal parts. The distal part of lamella is very much extruded and rounded, and the length from the base of terminal tooth to the apex of lamella is about 2.3 times the length of the tooth.

The telson is longer than the sixth abdominal somite and shorter than uropods, provided with five pairs of spines on the dorsal surface which are arranged equidistantly and six pairs of spines on the rounded posterior border with an acute apex; the outermost spines on the border are the shortest; the length of telson is about six times as long as its width.

The third maxilliped reaches nearly the apex of the antennal scale, its exopodite extending a little beyond the middle of penultimate segment of antennular

peduncle. The first pereopod reaches the middle of penultimate segment of antennular peduncle; its carpus is short and wide, the outline is almost regular triangle; anteriorly it is very deeply hollowed to receive the rounded proximal end of the chela. The second pereopod is slender and much longer than the first one, extending to a little beyond the distal end of penultimate segment of antennular peduncle. The third pereopod is the longest of all pereopods, extending to a little beyond the apex of the antennal scale; its dactylus with a sharp claw bears eight spines on its lower border, their size gradually decreasing proximally; its propodus is slightly curved and bears 13 small spines; carpus and merus are provided with three spines on the lower border. Fourth pereopod is shorter than the third one, its dactylus with sharp claw bears nine spines, carpus and merus bear three spines much as in the case of the third leg. Fifth pereopod is longer than the fourth leg but shorter than the third one, its dactylus with sharp claw is provided with about 70 setae on lower border.

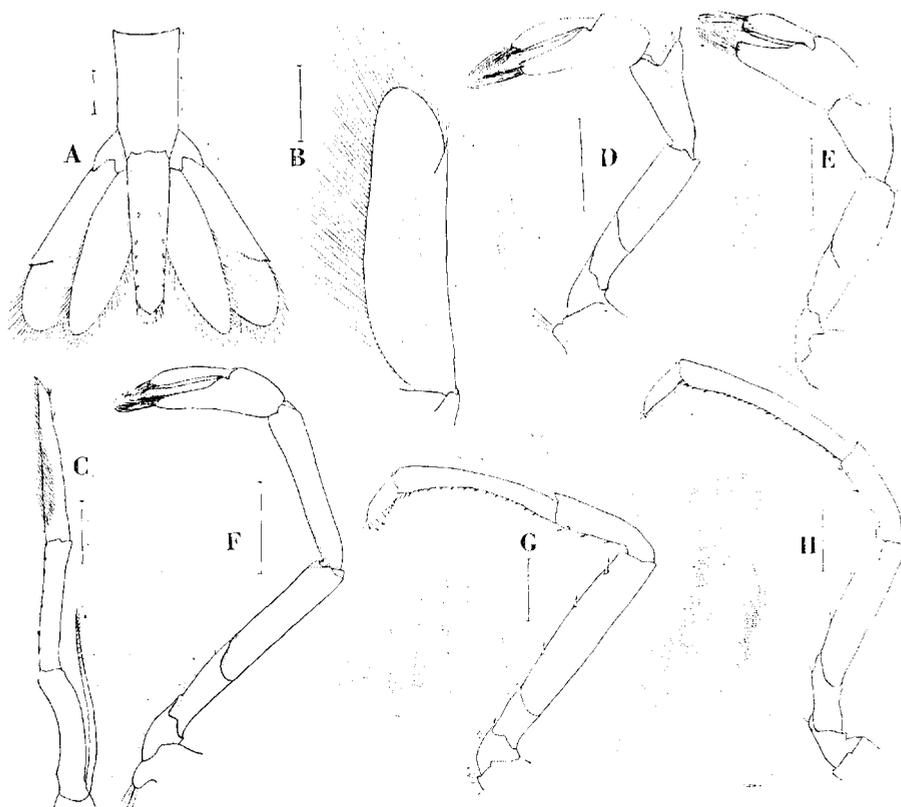


Fig. 2. *Caridina denticulata keunbaei* subsp. nov., paratypes.

A. 6th abdominal somite and telson (♂). B. right antennal scale (♂). C. left 3rd maxilliped (♂). D. left 1st pereopod (♂). E. left 1st pereopod (♀). F. left 2nd pereopod (♂). G. left 3rd pereopod (♂). H. left 5th pereopod (♂). scale lines; 1 mm.

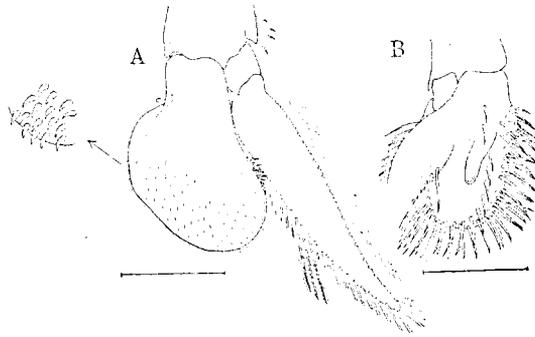


Fig. 3. *Caridina denticulata keunbaei* subsp. nov., paratype.
A. endopodite of left 1st pleopod (♂). B. endopodite
of left 2nd pleopod (♂). scale lines; 1 mm.

Measurements—length of rostrum: 2.2 mm, length of carapace: 6.6 mm, body length: 24.4 mm, length of telson: 3.7 mm, average of five eggs: 1.21 mm by 0.74 mm in longer and shorter diameter.

Paratypes: The length of rostrums is much variable. The rostrums of females are a little longer than the ones of males in general. Rostrums of about half of male individuals reach the end of proximal one third of the penultimate segment of antennular peduncle and they do not reach this point in the other half individuals. In about 55% of female individuals rostrums reach the end of proximal two third of the penultimate segment and they reach the distal end of this segment in a few individuals.

The number of teeth on the upper and lower borders of rostrums is much variable. The tooth numbers on the rostrums observed in the random samples consist of 50 individuals in each sex are shown in Tables 1 and 2. There may be no correlation between the number of teeth on the upper border and on the lower border.

The carpus of first pereiopod of male is a little longer and narrower than in the case of female. The endopodite of the pleopod of males is much expanded in both lateral sides; this expanded part is ovoid form, provided densely with microscopic claw like spines on the surface. Appendix masculina of the second pleopod of males is broad and long and extremely larger than the appendix interna.

Remarks: The typical form of *Caridina denticulata* De Haan, 1849 (De Haan, 1849; Doflein, 1902; Rathbun, 1902; Kubo, 1938; Kamita, 1951, 1961; Kim and Park, 1973) and two subspecies of this species have been described: *Caridina denticulata sinensis* Kemp, 1918 (Kemp, 1918; Ueno, 1935; Kubo, 1938, 1940; Kim and Park, 1973) and *Caridina denticulata koreana* (Kubo, 1938) (Kubo, 1938; Lee, 1958a, 1958b).

The present new subspecies is different from the typical form and two known subspecies as follows:

Table 1. Tooth numbers on upper and lower rostral borders of *Caridina denticulata keunbaei* subsp. nov. (♂) from Seogwipo, Jeju Is. Bivariate frequency distribution.

	No. of teeth on lower border					Total
	1	2	3	4	5	
				1		1
					1	1
				1		1
No. of teeth on			2	2		4
upper border			1	4	2	7
		1	2	2	2	7
	1			9	2	12
	1	2	7	4		14
		1		1		2
		1				1
Total	2	5	12	24	7	50

Table 2. Tooth numbers on upper and lower rostral borders of *Caridina denticulata keunbaei* subsp. nov. (♀) from Seogwipo, Jeju Is. Bivariate frequency distribution.

	No. of teeth on lower border						Total
	1	2	3	4	5	6	
			2				2
				2	1	1	4
			1	2		1	4
No. of teeth on		5	8	2	1		16
upper border	1	2	3	3			9
	1	2	1	1	1		6
	1	2	1	2			6
		2	1				3
Total	3	13	17	12	3	2	50

1. It is found in Jeju Island of Korea which is isolated from other localities where the typical form and another subspecies are found.

2. In the new subspecies the rostrums are very short and do not reach distal end of penultimate segment of antennular peduncle, while the rostrums of the other ones much exceeding this segment.

3. Distal part of the antennal scale lamella in the new subspecies is much extruded and the terminal spine is shorter than in the case of the typical form and

Caridina denticulata sinensis.

4. Expanded part of the endopodite of the first pleopod in the new subspecies is more elongated than in the case of typical form and *Caridina denticulata sinensis* but much larger than in the case of *Caridina denticulata koreana*.

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