

A Taxonomic Review of the Marine Littoral Genus *Caconemobius* (Orthoptera: Gryllidae: Nemobiinae) in Korea

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ABSTRACT

The genus *Caconemobius* comprises marine apterous crickets. In recent years, two species have been confirmed in Korea: *Caconemobius sazanami* (Furukawa, 1970) and *Caconemobius takarai* (Ôshiro, 1990). A key to species, descriptions, distribution data, photographs, and figures are presented to compare the two crickets.

Keywords: taxonomy, Orthoptera, Gryllidae, Nemobiinae, *Caconemobius*, coastal, Korea

INTRODUCTION

The genus *Caconemobius* was established by Kirby (1906) based on the Hawaiian monotypic species *Paranemobius schauinslandi* Alfken, 1901. After a review of Hawaiian crickets by Otte (1994), *Caconemobius* was regarded as an endemic Hawaiian genus. When Ichikawa (1999) synonymized the Japanese genus *Parapteronemobius* with *Caconemobius*, its distribution broadened toward the Eastern Pacific. All of 13 described species are found along the shore of the Pacific Ocean (Eades and Otte, Orthoptera Species File Online).

In Korea, only one *Caconemobius* species had been reported, as *Parapteronemobius sazanami* Furukawa by Kwon and Huh (1994), although the record has not been confirmed and no taxonomic study has been conducted. In the course of studying the taxonomy of the Korean Orthoptera, we conducted the collecting trips along the seacoast and islands in summer and fall, and consequently obtained specimens of *Caconemobius*, including a species new to the Korean fauna: *Caconemobius takarai* (Ôshiro, 1990). Here, we review the Korean *Caconemobius* and compare both species in detail. All materials were deposited at the National Institute of Biological Resources (NIBR, Incheon), Korea. The Korean geographic names have been taken from the Ministry of Culture and Tourism (2000).

SYSTEMATIC ACCOUNTS

¹*Genus *Caconemobius* Kirby, 1906

Synonymic Catalogue of Orthoptera, 2(1): 13. Type species: *Paranemobius schauinslandi* Alfken=*Parapteronemobius* Furukawa, 1970. Kontyû, 38(1): 62. Type species: *Parapteronemobius sazanami* Furukawa [Ichikawa, 1999]

Diagnosis. Entirely wingless, non-singing crickets. Head short, maxillary palpi very long and slender. Pronotum with rounded margins. Fore tibiae without tympana, with two apical spurs. Mid tibiae with two apical spurs. Hind tibiae 0.8-1.0 times as long as hind femora, with 1-3 inner and 2-3 outer subapical spurs. Abdomen noticeably bulbous. Male genitalia with two apparently hinged epiphallic lobes that slope downwards to meet the ectoparameres. Ovipositor arched downwards.

Ecology. This completely marine littoral genus shows a preference for saline habitats. These so-called crab-eating shore crickets live mostly around sea-walls made of rocks (Figs. 9-10). They are excellent swimmers and can dive for more than 5 minutes. The courtship and oviposition behavior is totally unknown (Furukawa, 1970).

Key to Korean Species of the genus *Caconemobius*

1. Head with short mandibles, as high as wide in anterior view (Fig. 1A); abdominal tergites nearly dark brown with no spots (Fig. 2A); hind tibia with two inner dorsal spines (Fig. 3A); ovipositor as long as hind femur *C. sazanami*
- Head with long mandibles, 1.2 times higher than wide in

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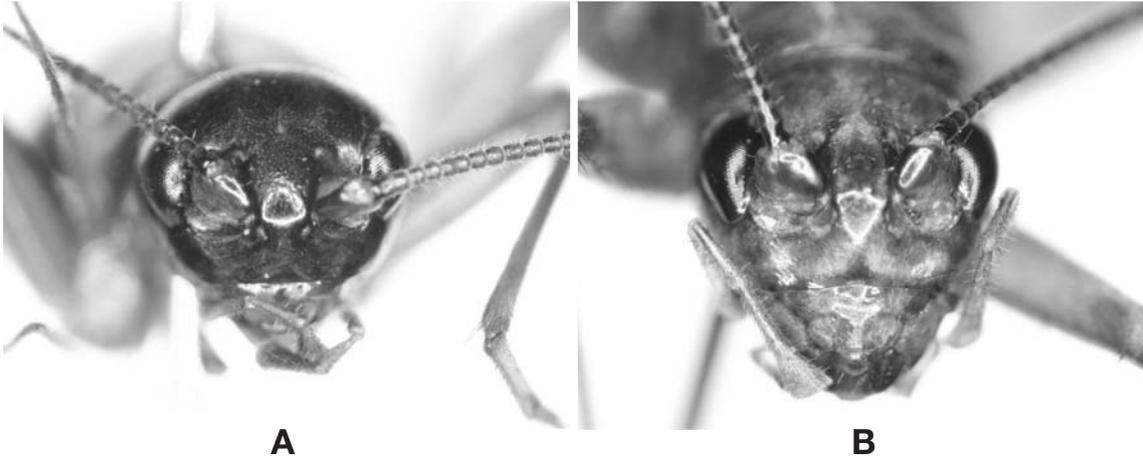


Fig. 1. Head. A. *Caconemobius sazanami*, B. *C. takarai*.

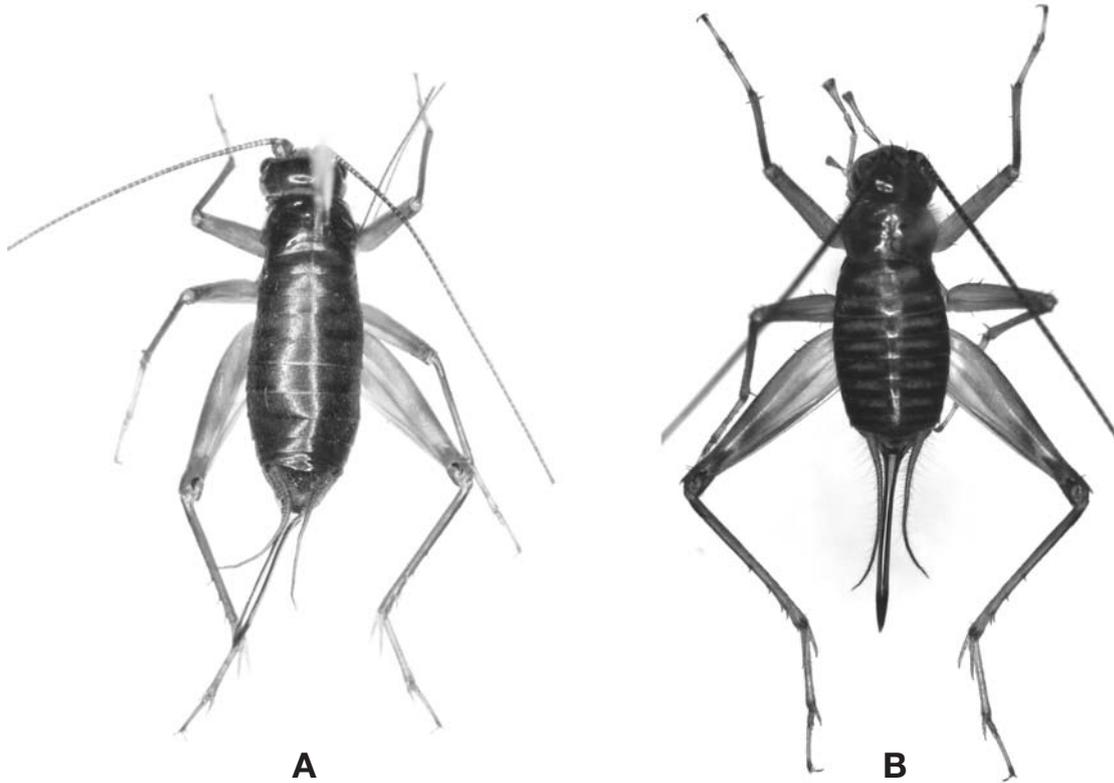


Fig. 2. Female. A. *Caconemobius sazanami*, B. *C. takarai*.

anterior view (Fig. 1B); abdominal tergites brown with bright elliptical spots (Fig. 2B); hind tibia with one inner dorsal spine (Fig. 3B); ovipositor slightly shorter than hind femur *C. takarai*

¹*1. *Caconemobius sazanami* (Furukawa)
(Figs. 1A, 2A, 3A, 4A, 5A)

Parapteronemobius sazanami Furukawa, 1970. Kontyû, 38 (1): 62, Figs. 16-32. "Japan: Manazuru Beach." Syntype ♂ ♀ deposited in the collection of the National Institute

¹*바다망울벌레

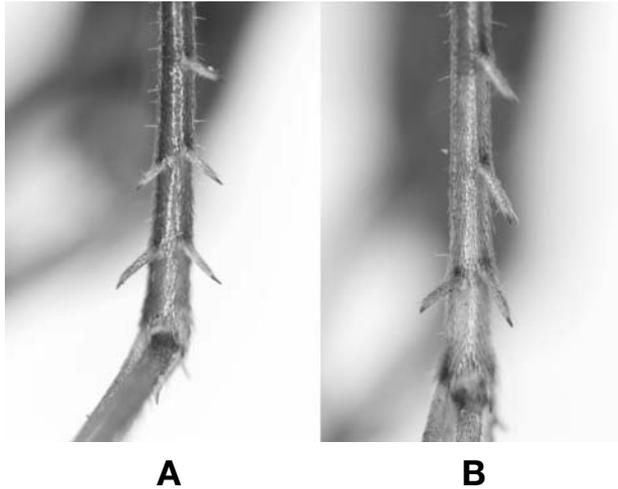


Fig. 3. Right hind tibia. A. *Caconemobius sazanami*, B. *C. takara*.

of Agro-Environmental Sciences, Tsukuba.

Parapteronemobius sazanami: Kwon and Huh, 1994: 50; Kwon et al., 1996: 104.

Caconemobius sazanami: Storozhenko, 2004: 226, Figs. 515, 587; Storozhenko and Paik, 2007: 110, Fig. 346.

Material examined. <Gyeonggi-do> 8♂, Oi-do, Jeongwang-dong, Siheung, 3-19 Oct. 2004 (T.W. Kim); 3♂3♀, Pungdo Island, Ansan, 11-12 Aug. 2006 (T.W. Kim); 1♂, Daecheong-do Island, Ongjin, Incheon, 22 Sep. 2007 (T.W. Kim); 1♀, Yeonpyeong-do Island, Ongjin, Incheon, 29 Sep 2007 (T.W. Kim); 1♂, Baekryeong-do Island, Ongjin, Incheon, 24 Sep. 2007 (T.W. Kim); <Gyeongsangbuk-do> 2♂, Tonggumi, Ulleung-do Island, 17 Jul. 2008 (T.W. Kim); <Jeollanam-do> 2♂4♀, Gatbawi, Yonghae-dong, Mokpo, 16 Oct. 2004 (T.W. Kim); 6♂8♀, Gageo-do Island, Heuksan-myeon, Sinan-gun, 12 Sep. 2004 (T.H. Kang); <Jeju-do> 1♂1♀, Yongdam-dong, Jeju-si, 16 Oct. 2008, (T.W. Kim); 4♂, Oedo-dong, Jeju-si, 11 Sep. 2006 (S.H. Jeong).

Description. <♂> Body dark brown with luster, brighter anteriorly, legs pale bright without maculation. Head as wide as pronotum, as high as wide in anterior view; vertex roundly merging with frons; interocular distance four times wider than horizontal diameter of eye; ocelli not bright, vestigial, hardly perceptible; scape wider than long; antennal socket slightly smaller than eye, touching inner lower margin of eye, 1.2 times wider than narrowest distance between antennal sockets. Pronotum shorter than fore femur, two times wider than long in dorsal view, with weakly concave anterior margin and gently concave posterior margin; dorsal surface with

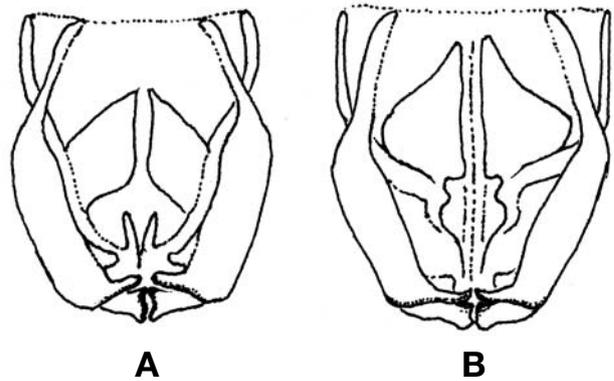


Fig. 4. Male genitalia. A. *Caconemobius sazanami*, B. *C. takara* (dorsal view).

two transverse sulci anteriorly and median shallow longitudinal depression; lateral lobe of pronotum shorter than pronotal length, lower roundly truncated. Fore and middle coxae each with anterior projections protruding acutely. Fore and middle tibiae each with a pair of small ventro-apical spurs. All basitarsi with numerous ventral bristles. Hind femur two times longer than middle femur, black crescent present on knee. Hind tibia with three external and two internal large spines, the largest inner apical spur as long as half the basitarsus. Hind basitarsus 1.2 times longer than the remaining two tarsomeres combined length; the inner apical spur as long as half the last tarsomere. Middle tarsomeres minute, compressed. Abdominal tergum dark brown, distinct maculations absent. Cercus shorter than hind femur, as long as hind tibia. Subgenital plate convex, roundly triangular. Genitalia with small trapezoidal mesal lobes; apical portions of epiphallus rounded, ectoparamere narrow and pointed. (Fig. 4A) <♀> Subgenital plate shorter than basal width, its hind margin deeply incised as V-shaped forming a pair of lateral triangular lobes. Ovipositor straight, needle-shaped, as long as hind femur, longer than cercus; ventral valve straight, a little shorter than dorsal one; dorsal valves rather swollen subapically, not serrated. All measurements are compared in Table 1.

Distribution. Korea, Japan, Russian FarEast.

¹*2. *Caconemobius takarai* (Ôshiro)

(Figs. 1B, 2B, 3B, 4B, 5B)

Parapteronemobius takarai Ôshiro, 1990. Akitu, 117: 1, Figs. 1-8. "Japan: Is. Takara." Holotype ♂ deposited at the Osaka Museum of Natural History.

Material examined. <Gyeonggi-do> 3♂4♀, Oi-do, Jeong-

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Fig. 5. Habitat. A. *Caconemobius sazanami* (Mokpo), B. *C. takarai* (Mongsanpo).

Table 1. Measurements (length in mm) of *C. sazanami* and *C. takarai*.

Species	Body	Pronotum	Hind femur	Ovipositor
<i>C. sazanami</i>	7.3-9.3	1.5-1.9	5.0-6.6	5.2-5.7
<i>C. takarai</i>	9.2-10.7	2.2-2.8	7.2-7.9	6.5-7.2

wang-dong, Siheung, 3-19 Oct. 2004 (T.W. Kim); 2♂3♀, Wolmi-do, Bukseong-dong, Incheon, 23 Sep. 2004 (T.W. Kim); 1♂, Yeonpyeong-do Island, Ongjin, Incheon, 29 Sep. 2007 (T.W. Kim); 2♀, Baekryeong-do Island, Ongjin, Incheon, 24 Sep. 2007 (T.W. Kim); <Chungcheongnam-do> 4♂5♀, Mongsanhang, Mongsanpo, Taean, 26 Aug. 2005 (T.W. Kim); 1♂2♀, Baeksajang Beach, Anmyeon-do Island, Taean, 10 Sep. 2005 (T.W. Kim); <Jeju-do> 1♂2♀, Yongdam-dong, Jeju-si, 16 Oct. 2008 (T.W. Kim).

Description. <♂> Body dark gray with luster, legs pale bright with faint maculation. Head as wide as pronotum, 1.2 times higher than wide in anterior view, mandibles longer than *sazanami*; vertex roundly merged with frons; interocular distance three times wider than horizontal diameter of one eye; median ocellus vestigial, not easily discernable; scape wider than long; antennal socket smaller than eye, touching the inner lower margin of the eye, as wide as the narrowest distance between the antennal sockets. Pronotum half the length of fore femur, two times wider than long in dorsal view, with truncated anterior margin and gently concave posterior margin, pilose; dorsal surface with two shallow transverse sulci anteriorly and a median shallow longitudinal depression; lateral lobe of pronotum shorter than pronotal length, lower margin roundly truncated. Fore and middle

coxae each with anterior projections protruding acutely. Fore and middle tibiae each with a pair of small ventro-apical spurs. All basitarsi with numerous ventral bristles. Hind femur two times longer than middle femur, black crescent present on knee. Hind tibia with three outer and one inner dorsal spines, the largest inner apical spur a little shorter than half the basitarsus. Hind basitarsus 1.2 times longer than combined length of remaining two tarsomeres, its inner apical spur a little shorter than half the last tarsomere. Middle tarsomeres minute, compressed. Abdominal tergites brown, bright elliptical spots longitudinally present. Cercus shorter than hind tibia. Subgenital plate convex, roundly triangular. Genitalia with large triangular mesal lobes; apical portions of epiphallus pointed, ectoparamere thick and rounded. (Fig. 4B) <♀> Subgenital plate shorter than basal width, its hind margin deeply incised as V-shaped forming a pair of lateral lobes, its apex roundly obtuse. Ovipositor straight, needle-shaped, slightly shorter than hind femur, longer than cercus; ventral valve straight, a little shorter than dorsal one; dorsal valves rather swollen subapically, without serration.

Distribution. Korea (new record), Japan.

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