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Systematic Study on Some Interstitial Collembola (Insecta) from Sand Dunes of Korean Western Coast

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ABSTRACT

The present study deals with four species of interstitial Collembola from South Korea. They are new to science and as follows: *Pseudanurida longisetosa* n. sp., *Onychiurus donjiensis* n. sp., *O. jindoensis* n. sp., and *Folsomia minuta* n. sp.. Two species of them, *Pseudanurida longisetosa* and *Folsomia minuta* n. sp. were collected from shell heap. So far eleven halophilous species of Collembola, including species to be recorded in this paper, were reported from the Korean peninsula.

Key words: Systematics, halophilous Collembola, Insecta, Korea

INTRODUCTION

We carried out a field work of several littoral sand areas of western coast of Korea. We have an early report of similar study (Thibaud and Lee, 1994). Mesofaunal specimens were taken from surface of water with sand in the bucket and Collembola were sorted out under the dissecting microscope.

They cover only several localities, however, and many more forms showing a great diversity are anticipated to be found from the Korean peninsula.

Type specimens examined will be deposited in the Department of Biology Education, Jeonbug National Univerisity.

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DESCRIPTION

Neanuridae

***Pseudanurida longisetosa* n. sp. (Fig. 1)**

Type data. Holotype ♀, collected from shell heap of Is. Norae, Jeonlabug-do Province, Okgu-gun County, 21 June 1994, leg. Hong Yong. Paratypes (♂ ♀), same data as holotype.

Description. Body up to 0.8 mm long, dark gray in alive and in alcohol.

Body surface covered with many fine granulation, with fovea on dorsal side.

Body setae simple and smooth but with 2 kinds of long and small setae (Fig. 1A). Ant. III and IV segment ankylosed (Fig. 1B). Ant. IV segment tip bilobed (Fig. 1B). Third antennal ogran (IIIAO) consists of elongated, simple 2 rods, both in same direction in a groove (Fig. 1C). Ratio of Ant.: Hd. as 15:13. Eye 8+8. Eye patch with dark pigmentation. Postantennal organ (PAO) absent.

Unguis long, carinated, and with 1 inner tooth (Fig. 1D). Unguiculus absent (Fig. 1D). Ventral tube with 4+4 setae.

Furca present, ratio of manubrium:dens:mucron as 8:6:3. Manubrium with 5+5 setae. Dens with 6 setae on posterior side. Mucron boat-shaped (Fig. 1E). Genital plate with 14 small setae (Fig. 1F).

Abd. VI segment unilobed and protruded.

Remarks. This species resembles *Pseudanurida billitonensis* Schött, 1901 in eye number, tenaculum, IIIAO, but they are different in body size, mucron, shape of last abdominal segment, and the number of setae on genital plate.

Onychiuridae

***Onychiurus donjiensis* n. sp. (Fig. 2)**

Type data. Holotype ♀, collected from sand dunes of Donji, Jeonlabug-do Province, Buan-gun County, 1 April 1994, leg. Kim, J.-T. Paratypes (♂ ♀), same data as holotype

Body length up to 1.0 mm. Body color white in alive and in alcohol. Body covered with small and simple setae (Fig. 2A, B, C). Antennal length almost equal to diagonal of head. Ratio of Ant.:Hd. as 17:20. Antennal segment ratio as 5:10:26. Ant. I seg. with 6 setae. Ant. II seg. with 10 setae. Ant. III seg. with 58 setae, IIIAO consists of 5 guard setae, 4 protected papillae, 2 smooth sensory setae in shape of large racket and 2 rod-shaped sensory setae (Fig. 2D). Ant. IV seg. with poorly differentiated 6 sensory setae and unilobed. Postantennal organ (PAO) consists of 12-14 small elements.

Unguis carinated, without inner tooth (Fig. 2E). Unguiculus with a very narrow lamella (Fig. 2E), reach about a quarter to exterior length of unguis. Tenent hair absent. Ventral tube with 6+6 setae. No furcal rest. Two anal spines short, separated from each other (Fig. 2F).

Genital plate with 10 setae (Fig. 2G). Orifice with some setae in ventral side of abdomen (Fig. 2H).

Formula of dorsal pseudocellae: 22/222/222220

Formula of pseudocellae of ventral side: 11/200/001100, with one psedudocellus on subcoxa of legs.

Remarks. This species is close to *Onychiurus mariangeae* Thibaud and Lee, 1994 from Korea. It is

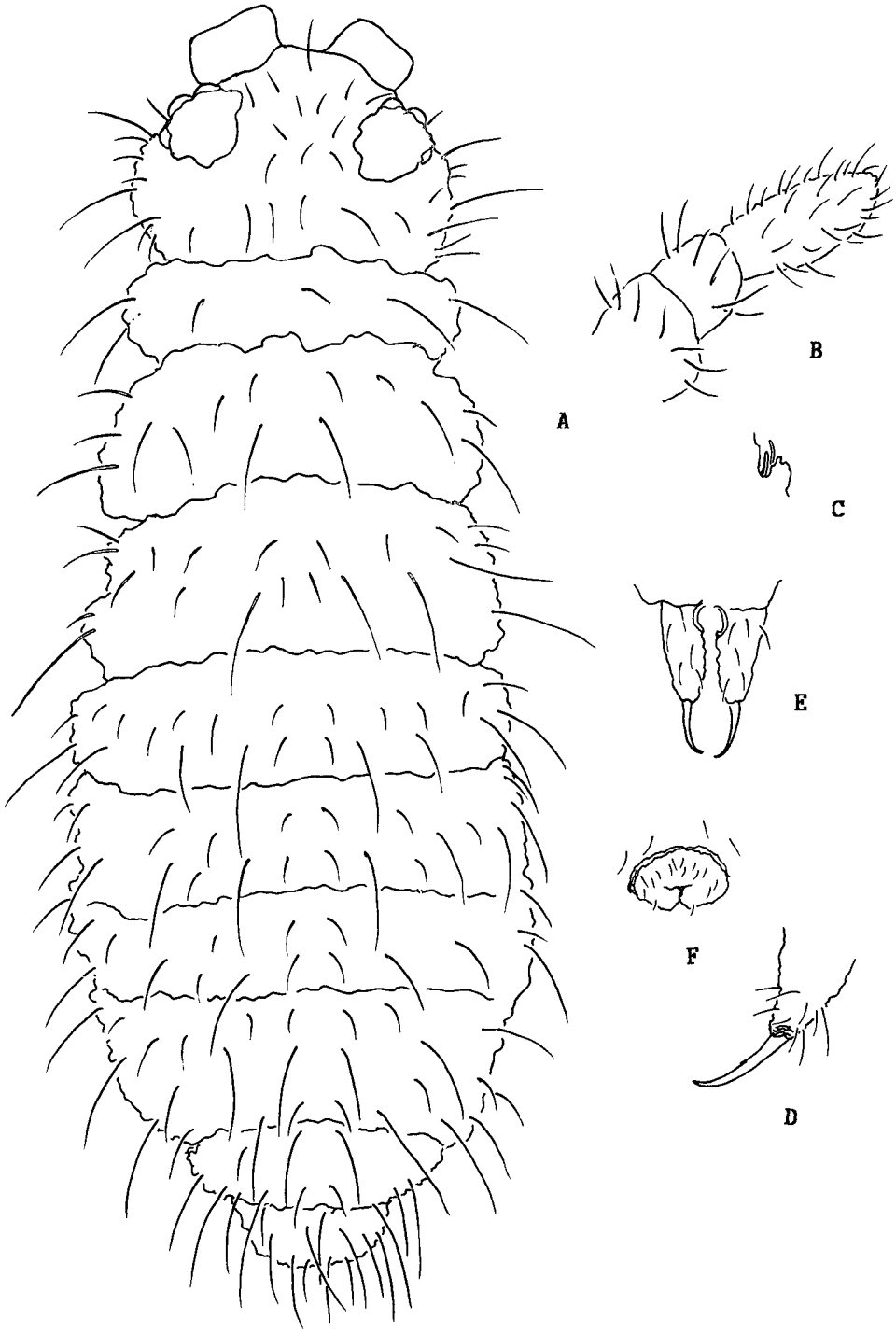

Fig. 1. *Pseudanurida longisetosa* n. sp. A, Chaetotaxy of body; B, antenna segment; C, third antennal organ (IIIAO); D, hind claw; E, furca; F, Genital plate.

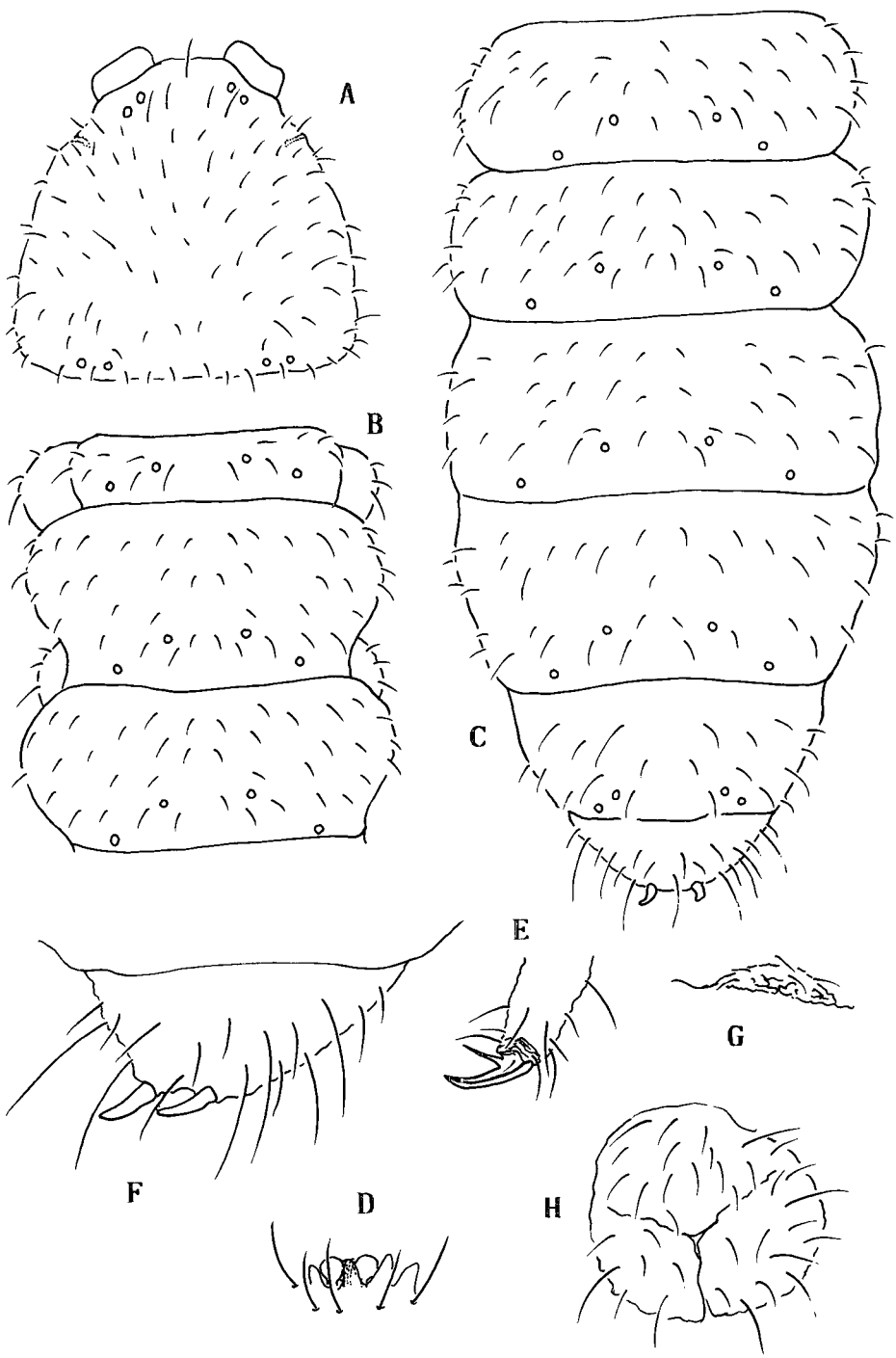

Fig. 2. *Onychiurus donjiensis* n. sp. A, chaetotaxy of head; B, C, chaetotaxy of thorax and abdomen; D, third antennal organ (IIIAO); E, hind claw; F, abdomen VI segment; G, genital plate; H, orifice in ventral side of abdomen.

different, however, in body chaetotaxy and pseudocellae number in both dorsal and ventral side.

***Onychiurus jindoensis* n. sp. (Fig. 3)**

Type data. Holotype ♀, collected from sand beach of Geumgap, Jeonlanam-do Province, Jindo-gun County, 24 Jul. 1994, leg. Kim, J.-T. Paratype (♂ ♀), same data as holotype.

Description. Body length up to 0.8 mm. Body color white in alive and in alcohol. Body covered with small and simple setae (Fig. 3A). Postantennal organ (PAO) consists of 12 small elements like granules (Fig. 3B). Ratio of Ant.: Hd. as 11:13. Antennal segment ratio as 10:12:35. Ant. I seg. with 6 setae. Ant. II seg. with 10 setae. Ant. III + IV seg. with 58 setae. IIIAO consists of 5 guard setae, 4 protected papillae, 2 smooth sensory setae in shape of large racket and 2 rod-shaped sensory setae (Fig. 3C). Ant. IV seg. with 6 poorly differentiated sensory setae and apical lobe unilobed. Ratio Ant.:Hd. as 11:13.

Unguis carinated, without inner tooth (Fig. 3D). Unguiculus with a very narrow lamella (Fig. 3D). Tenent hair absent. Genital plate with 10 setae (Fig. 3E). Ventral tube with 6+6 setae. No furcal rest. Two anal spines short, separated from each other (Fig. 3F).

Orifice with some setae in abdominal ventral side (Fig. 3G).

Formula of dorsal pseudocellae: 32/233/333330

Formula of pseudocellae of ventral side: 10/000/010200 with one pseudocellus on subcoxa of legs.

Asymmetry of pseudocellae, as 3+2 in ventral side of abdominal IV.

Remarks. This species is close to *Onychiurus mariangeae* Thibaud and Lee, 1994 from Korea. But there is difference in body chaetotaxy, and pseudocellae number in dorsal and ventral side. Also it is similar to *O. volinensis* Szeptycki, 1964 from Poland in pseudocellae number of dorsal side, with one pseudocellus on subcoxa and with two anal spines. But it is different from pseudocellae number in ventral side of abdominal segments.

Isotomidae

***Folsomia minuta* n. sp. (Fig. 4)**

Type data. Holotype ♀, collected from near the interstitial zone of Is. Gado, Jeonlabug-do Province, Okgu-gun County, 21 June 1994, leg. Hong Yong. Paratypes (♂ ♀) same data as holotype.

Description. Body length up to 0.6 mm. Body color white in alive and in alcohol. Body covered with small and simple setae (Fig. 4A,B). Abdominal IV, V and VI segments completely ankylosed (Fig. 4C). Antenna almost equal in length to diagonal of head, 4 antennal segments related as 5:7:7:14. Antenna IV with terminal bulb, numerous simple setae, with 4 weakly differentiated sensory setae. Ocelli absent. Postantennal organ (PAO) in unicircular form (Fig. 4A). Unguis carinated, without inner tooth (Fig. 4D). Unguiculus with narrow broad lamella, reach a half of outer unguis (Fig. 4D). Tenent hair absent. Rami of tenaculum quadridentate: corpus with a single long seta. Furcular reaching posterior margin of 2nd abdominal segment (Fig. 4E). Manubrium:dens:mucron as about 18:12:3. Manubrium with many small and simple seta, but without any long seta (Fig. 4F). Dens some crenulated, with 12 setae in posterior side and with 10 setae each side on anterior face. Mucron bidentated: subapical tooth usually larger than the other tooth (Fig. 4E).

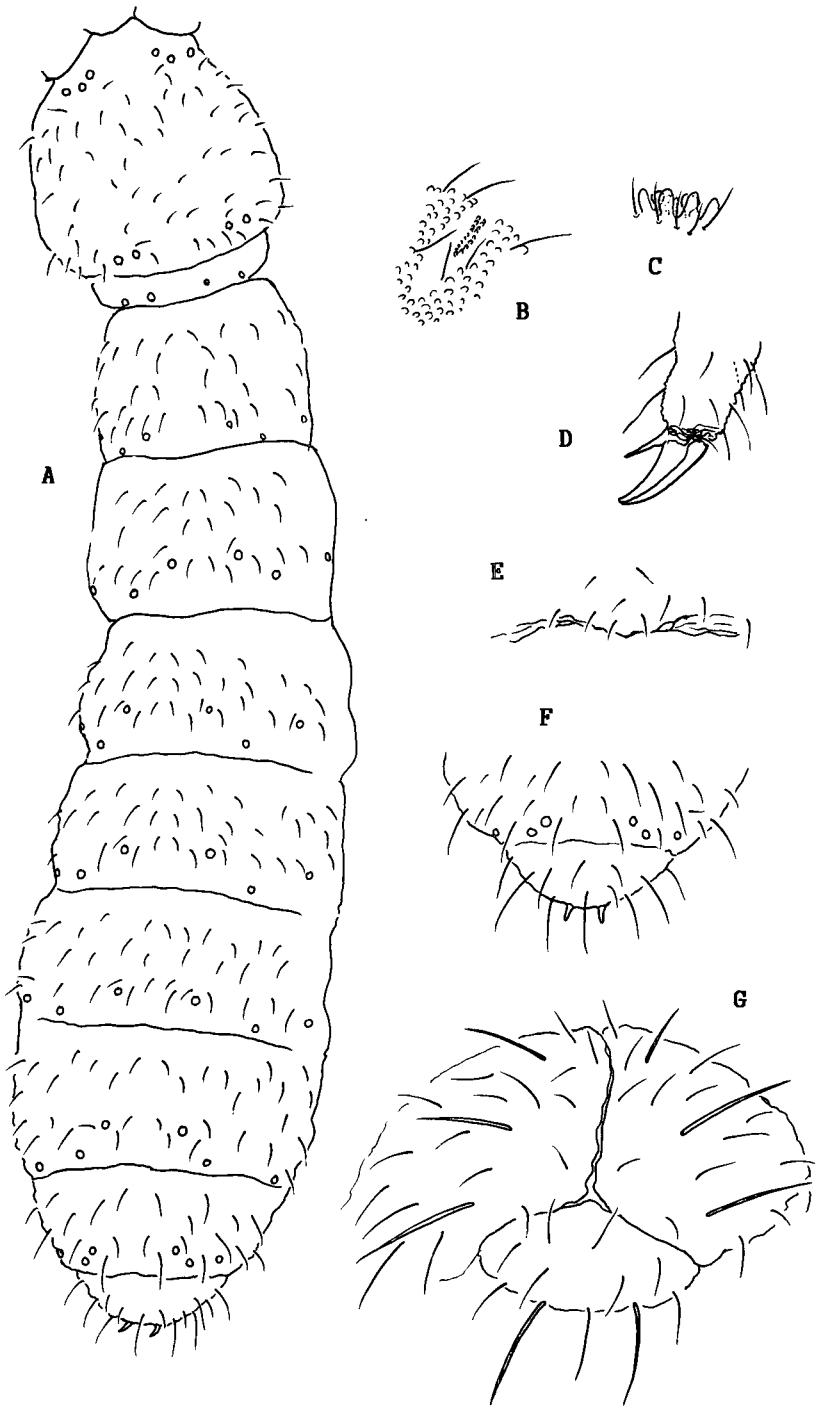

Fig. 3. *Onychiurus jindoensis* n. sp. A, chaetotaxy of head, thorax and abdomen; B, postantennal organ (PAO); C, third antennal organ (IIIAO); D, hind claw; E, genital plate; F, chaetotaxy of abdomen V and VI segment; G, orifice in ventral side of abdomen.

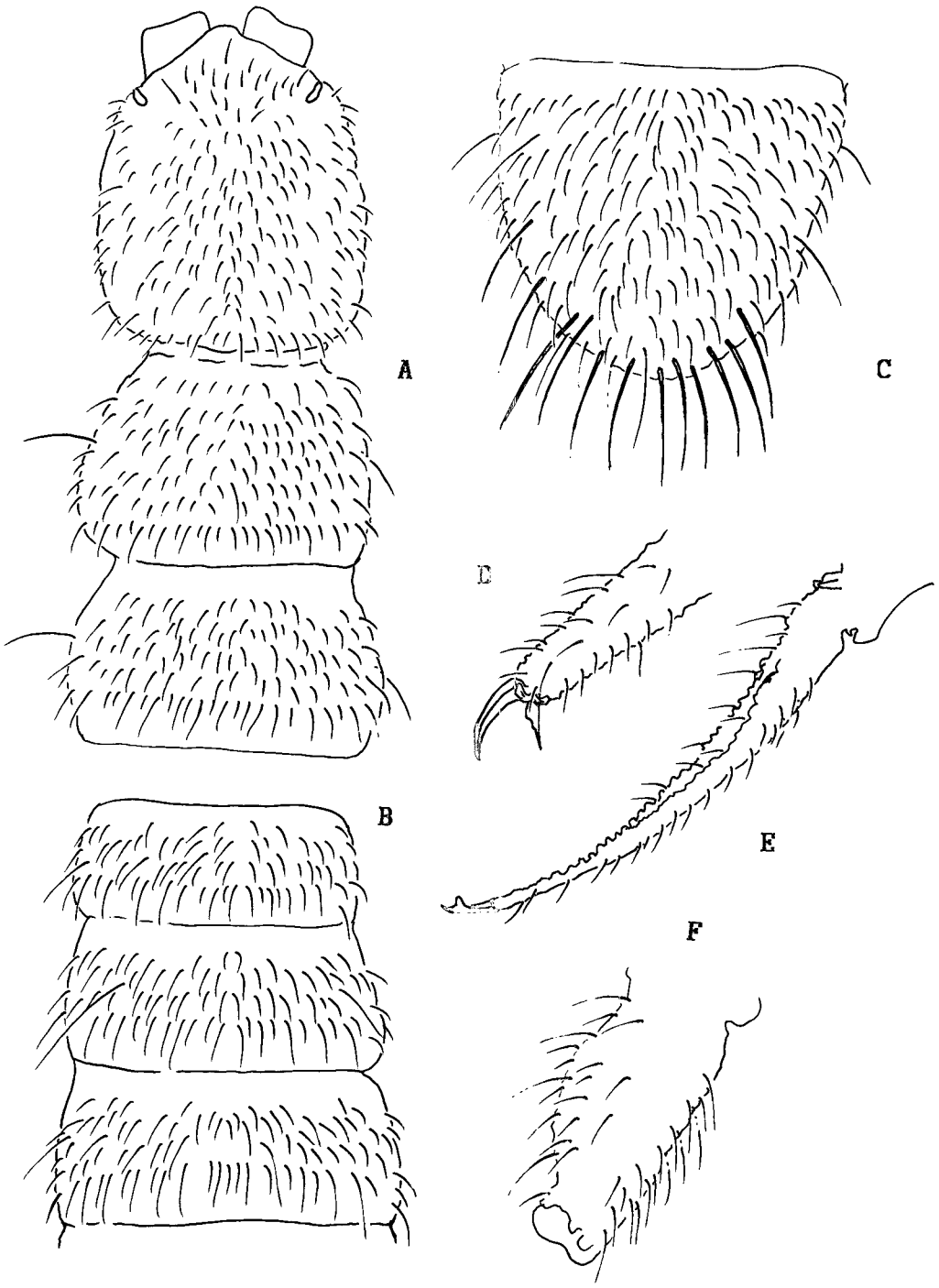

Fig. 4. *Folsomia minuta* n. sp. A, chaetotaxy of head and thorax; B, abdomen I-III segment; C, abdomen IV-VI segment; D, hind claw; E, dens and mucron; F, manubrium.

Body with simple setae, becoming longer toward posterior part of abdomen. Abdominal segments with long, simple dorsal setae.

Remarks. These specimens resemble *Folsomia hexasetosa* Lee, 1977 from Korea in body seta, dens and mucronal setae number. It is differentiated, however, by chaetotaxy of body and eye presence. They are also similar to *F. oézana* Yosii, 1954 and *F. nakajimai* Yosii, 1959 from Japan with number of setae and teeth of mucron, but chaetotaxy, manubrium setae number separate them.

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한국 서해안의 사구성 톡토기(곤충강)에 대한 분류학적 연구

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요 약

한국의 서해안 수 개 지역의 砂丘와 바닷가에서 채집한 결과 4新種 *Pseudanurida longisetosa* n. sp., *Onychiurus donjiensis* n. sp., *O. jindoensis* n. sp. 그리고 *Folsomia minuta* n. sp.가 밝혀져 이를 보고한다. 이 가운데 *Pseudanuria longisetosa*와 *Folsomia minuta* 2종은 貝塚에서 채집되었다. 본 연구 결과 지금까지 보고된 한국산 호염성 톡토기는 모두 11종이 된다.