**INTRODUCTION**

Jones and Marshall (1986) mentioned that the copepod associates of New Zealand marine invertebrates are poorly known and 17 species had been described from this country until that time, not including *Cocculinika myzorama* they described.

The siphonostomatoid copepod genus *Artotrogus* Boeck, 1859, the type genus of the family Artotrogidae, may be characterized by the possession of a circular, disk-shaped body, two inner setae on the second endopodal segment of leg 1, no leg 4, and an antennary exopod reduced to a papilla bearing one seta (Boxshall and Halsey, 2004). The genus consists of 10 described species (Kim, 1996) from the northwestern Europe, Mediterranean, Australia, and the Far East. Known hosts of *Artotrogus* include nudibranch mollusks for *A. orbucularis* and *A. sarsi* (Boeck, 1859; Sars, 1915), an ascidian for *A. incidentus* and *A. halocynthiae* (Kim, 1996), and a bryozoan for *A. acutus* and *A. rotundus* (Kim, 1996).

From the South Pacific, three species of the genus has been described: *A. latifurcatus* by Nicholls (1944) and *A. haikungae* and *A. sardae* by McKinnon (1988), all from the Australian waters. In this paper a new species of *Artotrogus* is described as the first record of the genus from the New Zealand region.

*Schizosmittina cinctipora* (Hincks) (Cheilostomata: Bitectiporidae) is a common shelf bryozoan that is widely distributed around New Zealand from the Kermadec Ridge to subantarctic Auckland and Campbell Islands. As an encrusting species of rocky and shelly substrata, it is found from 0-253 m depth.

**MATERIALS AND METHODS**

The specimen had been preserved in 10% formalin until the microscopic observation, after then it has been preserved in 80% ethanol. Before measuring and dissection, the specimen was soaked in lactic acid for more than 30 minutes. The dissection was done using the reverse slide method of Humes and Gooding (1964). Drawings were made with the aid of a camera lucida. The urosome of the specimen was drawn in situ.

**SYSTEMATIC ACCOUNTS**

Order Siphonostomatoida Burmeister, 1835  
Family Artotrogidae Brady, 1880  
Genus *Artotrogus* Boeck, 1859  
*Artotrogus gordoni* n. sp. (Figs. 1, 2)

*Material examined.* 1 ♀ holotype (NIWA 35328; appendages of left side dissected out and mounted on a slide) from washings of the bryozoan *Schizosmittina cinctipora* (Hincks, 1885) collected at intertidal shore (0-1 m) of Station Z15308 (41°20′47″S, 174°46′58″E), New Zealand, by Dr. Dennis P. Gordon, on 14 January 2008. The holotype (partly dissected, with intact urosome, mandibles, and other appendages of right side) and slide mount containing dissected appendages of holotype have been deposited in the National Insti-
Fig. 1. *Artotrogus gordoni* n. sp., female. A, habitus, dorsal; B, posterolateral part of epimera of second pedigerous somite showing dorsal ornamentation; C, urosome, ventral (*in situ*); D, egg sac; E, oral area, ventral; F, antennule; G, antenna. Scales bars=0.5 mm (A, D), 0.05 mm (B, F, G), 0.1 mm (C, E).
Artotrogus gordoni n. sp. (Copepoda: Siphonostomatoida) from New Zealand

Fig. 2. Artotrogus gordoni n. sp., female. A, maxillule; B, maxilla; C, maxilliped; D, leg 1; E, leg 2; F, leg 3. Scales bars=0.1 mm (A-F).
Mandible inserting to oral siphon. Maxillule (Fig. insertion of maxillae but not reaching insertion of maxilliped fused with segment at base. μm (143 times as long as proximal segment, with 1 inner lateral seta ed and 33 distal seta. Endopod 2-segmented; proximal segment unarm-
× Exopod small, 7.5 μm long, tapering, and extending over epimera of third pedigerous somite. Third pedigerous somite reversed U-shaped, its posterior margin extending to level of middle of caudal rami. Dorsal surface of tergite of prosomal somites ornamented with simple spines, sensillum accompanied by minute nearby pore, paired hair-like sensillae in pit accompanied by nearby minute pore(s) (Fig. 1B).

Urosome (Fig. 1C) 5-segmented. Fifth pedigerous somite short. Genital double somite 146 × 242 μm (measured along middle axis of ventral side), consisting of broader anterior part and short narrower posterior part (this part 187 μm wide and not seen in dorsal view of urosome), asymmetrical in having large, tapering (in dorsal and ventral views) posterolateral process on right side and small, lobate posterolateral process on left side (Fig. 1C); genital area located ventrally. Three free abdominal somites 35 × 171, 24 × 171, and 104 × 188 μm. Anal somite with row of minute spines along posteroventral border. Caudal ramus 63 × 78 μm (1 : 1.24), with patch of setules on inner margin and 6 plumose setae; 2 dorsal ones of caudal setae distinctly smaller than other 4. Egg sac 700 × 608 μm, disk-shaped, and containing 24 eggs; each egg 223 μm in diameter.

Rostrum broad but short, directed ventrally, with W-shaped ventral margin (Fig. 1E). Antennule (Fig. 1F) 367 μm and 8-segmented, with armature formula 1, 11, 6, 2, 2, 2, 1, and 14+ aesthetasc; setae usually weakly plumose; seta on seventh segment minute; lengths of segments 96, 87, 23, 18, 29, 17, 24, and 63 μm from proximal to distal; aesthetasc on last segment 212 μm long. Antenna with unarmed coxa of 25 × 15 μm; basis 53 × 29 μm, gradually widend distally. Exopod small, 7.5 × 6.7 μm, nipple-shaped, with 1 smooth lateral process on right side and small, lobate posterolateral tip extending over epimera of third pedigerous somite. Fifth pedigerous somite reversed U-shaped, its posterior margin extending to level of middle of caudal rami. Dorsal surface of tergite of prosomal somites ornamented with simple spines, sensillum accompanied by minute nearby pore, paired hair-like sensillae in pit accompanied by nearby minute pore(s) (Fig. 1B).

Three free abdominal somites 35 × 171, 24 × 171, and 104 × 188 μm. Anal somite with row of minute spines along posteroventral border. Caudal ramus 63 × 78 μm (1 : 1.24), with patch of setules on inner margin and 6 plumose setae; 2 dorsal ones of caudal setae distinctly smaller than other 4. Egg sac 700 × 608 μm, disk-shaped, and containing 24 eggs; each egg 223 μm in diameter.

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Legs 1-3 (Fig. 2D-F) with 3-segmented rami. Leg 4 lacking. Second endopodal segment of legs 2 and 3 with bicuspid outer distal corner. Third endopodal segment of leg 3 with bicuspid process on middle of outer margin at base of outer seta. Leg 3 with exopod ornamented with spines on outer margin but those of legs 1 and 2 with setules. Distal spine on endopod of legs 2 and 3 plumose proximally but spinulated distally. Armature formula of legs 1-3 as follows: Leg 1 : coxa 0-1; basis 1-1; exopod I-1; I-1; III,2,3; endopod 0-1; 0-2; 1,2,3 Leg 2 : coxa 0-1; basis 1-0; exopod I-1; I-1; III,1,5; endopod 0-1; 0-2; 1,1+1,3 Leg 3 : coxa 0-0; basis 1-0; exopod I-1; I-1; III,1,5; endopod 0-1; 0-2; 1,1+1,3

Leg 5 represented by 1 plumose and 2 small setae on ventrolateral side of fifth pedigerous somite (Fig. 1C). Leg 6 represented by plumose seta and setule located lateral to genital area (Fig. 1C).

Male. Unknown.

Etymology. The new species is named after Mr. Dennis Gordon who collected the type specimen.

DISCUSSION

In most species of Artotrogus the third endopodal segment of leg 2 has one spine and five setae (armature formula 1, 1+1, 3), except for A. incidentus Kim, 1996 which has six setae (formula 1, 2, 3) and A. latifurcatus Nicholls, 1944 which is not known for leg 2. The armature formula of the third endopodal segment of leg 3 is variable among species: 1, I, 3 in A. orbicularis Boeck, 1859 (see Giesbrecht, 1899); 1, 1+1, 3 in A. acutus Kim, 1996 and A. sarsi McKinnon, 1988; 1, 2, 2 in A. halocynthiae Kim, 1996 and A. sarsi Kim,
1996; and 1, 2, 3 in A. gladiator (Giesbrecht, 1899), A. hae-kungae McKinnon, 1988, A. incidentus, A. latifurcatus, and A. rotundus Kim, 1996. Therefore, only two species, A. acutus and A. sardae, are known to have the armature formula 1, 1++I, 3 on the third endopodal segment of both legs 2 and 3, as in A. gordoni n. sp.

Artotrogus gordoni differs from A. acutus in having a seta on the posterior margin of the basis of leg 1 (lacking a seta in A. acutus), three spines and five setae (formula III, 2, 3, in contrast to II, 2, 3 in A. acutus), and no seta on the coxa of leg 3 (a seta present in A. acutus).

Artotrogus gordoni seems most close to A. sardae in having the same armature formula of legs 1-3. Both species were found in the same zoogeographical region, as well. However, they can be differentiated by the following ways: although the antennule of the female is eight-segmented in both species, its longest segment is the first one in A. gordoni but the second one in A. sardae; the anal somite is narrower than the genital double somite in A. gordoni; in A. gordoni the genital double somite bears the short and narrow posterolateral process that is not reported in A. sardae; the process on each side of the genital double somite is much more developed in A. gordoni than in A. sardae.

The process on the genital double-somite is frequent in Artotrogus and tapered as in A. gordoni or rounded as in A. sardae. Interestingly, in both A. gordoni and A. sardae one of two processes is atrophied in relation to the other. This asymmetry is considered to be the result of an accidental lost of one of the processes.

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