

A New Species of the *Peltidium quinquesetosum* (Copepoda: Harpacticoida: Peltidiidae) on the Marine Macroalgae in Korea

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ABSTRACT

Peltidium quinquesetosum n. sp. belonging to the family Peltidiidae is described from algal bed on subtidal rocky bottoms of Korea. The most characteristic features of this species are found in the setal number of distal segment of leg 1 endopod and the shape of leg 5 in female, and the caudal rami fully concealed by urosome in a dorsal view.

Key words: Copepoda, Harpacticoida, Peltidiidae, *Peltidium*, new species, Korea

INTRODUCTION

The harpacticoids of *Peltidium*, having dorsoventrally flattened body with strongly developed chitin struts (Huys *et al.*, 1996), have been found mainly on macroalgae, corals, sand, etc.

After the genus *Peltidium* was established in 1839 by Philippi, Nicholls (1941) listed 22 species belonging to the genus. Lang (1948) reduced the species number to 15 excluding *incertae sedis* among the species described till then. Thereafter 12 species are currently recognized in this genus (Bodin, 1997).

In East Asia, only two species in the genus have been reported in Japan. *Peltidium laudatum* was described from Kyushu by Tanaka and Hue (1968), and *P. ovale* T. & A. Scott, 1903 was reported from Tanabe Bay of Honshu by Gamo (1969).

In this paper, the authors will describe a new species *P. quinquesetosum*.

The materials examined in the present study were obtained by washing out the macroalgae (*Ulva pertusa*, *Caulerpa okamurae*, *Sargasum siliquastrum*, etc.) on the shallow sublittoral rocks of less

than 1 m depth, or collected with a light trap by senior author (S. J. Song). Specimens were dissected, figured and measured in lactophenol on the Cobb's hole slide. Figures were made with the aid of a drawing tube. Type specimens are deposited in the Natural History Museum of Ewha Womans University.

DESCRIPTION

Family Peltidiidae Sars, 1904

Genus *Peltidium* Philippi, 1839

***Peltidium quinquesetosum* new species (Figs. 1-3)**

Material examined. 6 ♀ ♀, 5 ♂ ♂, Masan-ri, Pohang City (36° 00' 95"N, 129° 29' 55"E), 24 Oct. 1996. Holotype female (EWNHM60210), allotype (EWNHM60211) and undissected paratypes (1 female and 1 male) (EWNHM60212) are deposited in the Natural History Museum of Ewha Womans University, and the remaining paratypes in the collection of the authors.

Additional material examined. 1 ♀, Kuryongpo, 25 July 1990; 1 ♂, Songjiho, Kosung-gun, 25 July 1995; 8 ♀ ♀, 5 ♂ ♂, Sangju-ri, Namhae-gun (with light trap), 1 July 1998.

Female. Body (Fig. 1A) dorsoventrally depressed, dark red in color, total length 1.86 mm measured from tip of rostrum to posterior margin of urosome. Cephalothorax about 1.31 times wider than long with scattered small hairs. Rostrum large, broad and directed downward. Abdomen (Fig. 1B) represented by two broad lobes, covering dorsally whole caudal rami. Caudal ramus (Fig. 1C) slightly directed outward, about 2.05 times longer than wide, with a large terminal seta and 6 smaller setae in total.

Antennule (Fig. 1D) 7-segmented; aesthetascs each on tip of fourth and distal segment; first segment longest and the next three segments becoming shorter. Antenna (Fig. 1E) with allobasis about 3.0 times as long as maximum width, with a hairy seta near distal quarter. Exopod distinctly 2-segmented; first segment much shorter than second one, bearing 1 pinnate seta near distal edge; second one with 1 subdistal seta and 2 distal setae, innermost of which longest. Endopod armed with 3 strong claws along inner distal corner, 4 long geniculate spines, 1 slender seta, 1 small plumose seta on a tiny protuberance and 1 sharp spine proximally on inner margin.

Coxa of mandible (Fig. 1F) elongate, with strong bidentate gnathobase bearing 1 pilose seta and 2 processes each side. Coxa-basis somewhat widened distally ornamented with fine hairs along inner margin and several clusters of tiny hairs on surface. Endopod elongate, nearly 3 times as long as wide, with 1 medial and 8 distal setae. Exopod absent. Praecoxal arthrite of maxillula (Fig. 1G) narrowing distally, ending with 6 setae and 5 teeth including a setulose one; several clusters of fine spinular row on surface. Basis and endopod fused together, with a seta on small projection ornamented with fine hairs, and 3 bare setae on distal end. Exopod elongate with 2 apical setae. Syncoxa of maxilla (Fig. 1H) with 2 endites: proximal one with a well-developed seta; distal one with 1 bulbous seta and 2 normal setae. Basis bearing a strong terminal claw, with a seta on distal end and 3 bare setae on anterior margin. Maxilliped (Fig. 1I) prehensile. Basis slightly tapering distally, with 1 seta on distal end. Endopod convex on both inner and outer margins, with a spinular row along inner margin and many spinules on outer margin; a stout claw a little shorter

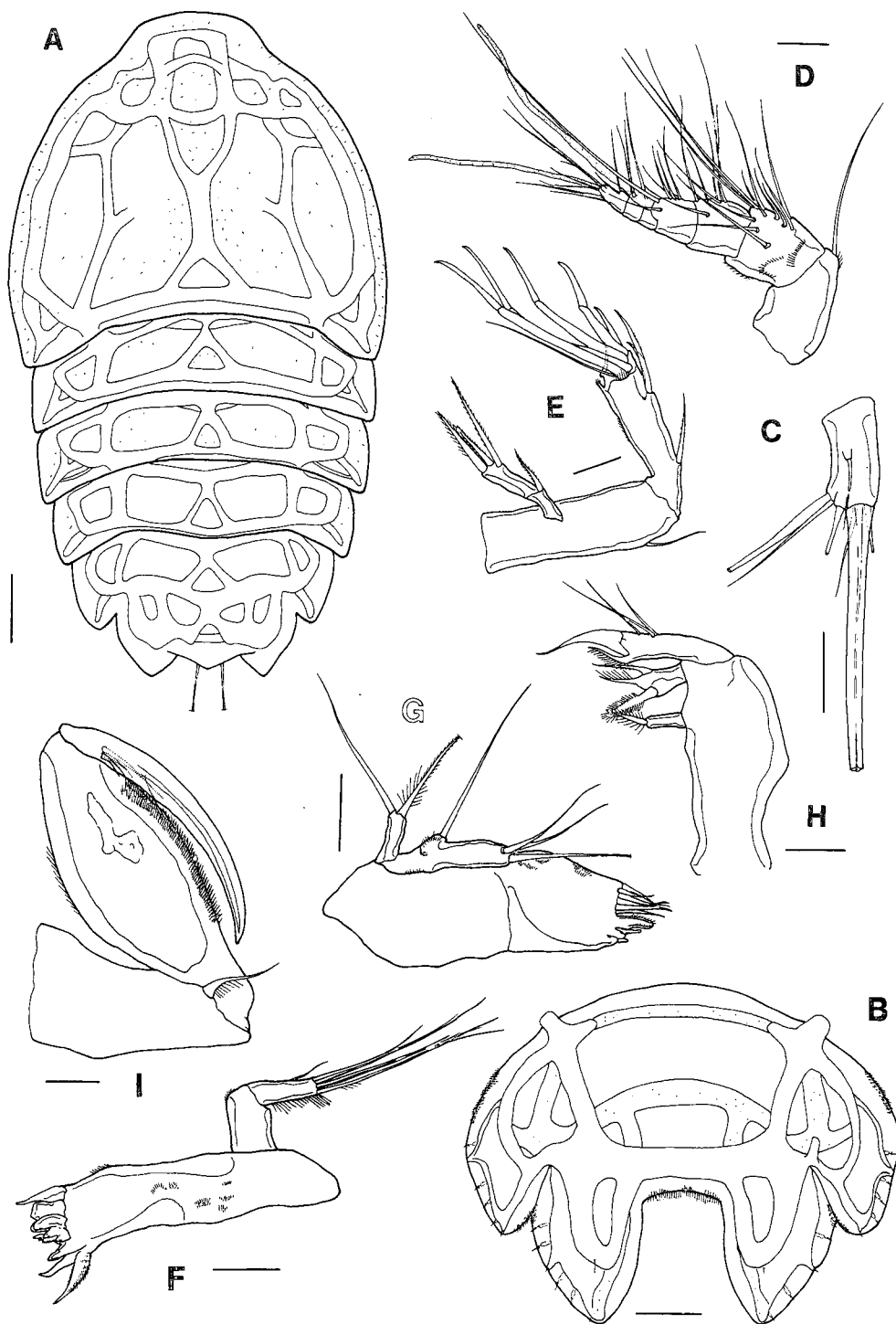


Fig. 1. *Peltidium quinquesetosum* n. sp., female. A, Habitus, dorsal; B, Urosome, ventral; C, Caudal ramus; D, Antennule; E, Antenna; F, Mandible; G, Maxillula; H, Maxilla; I, Maxilliped. Scales: A = 0.2 mm; B = 0.1 mm; C-I = 0.05 mm.

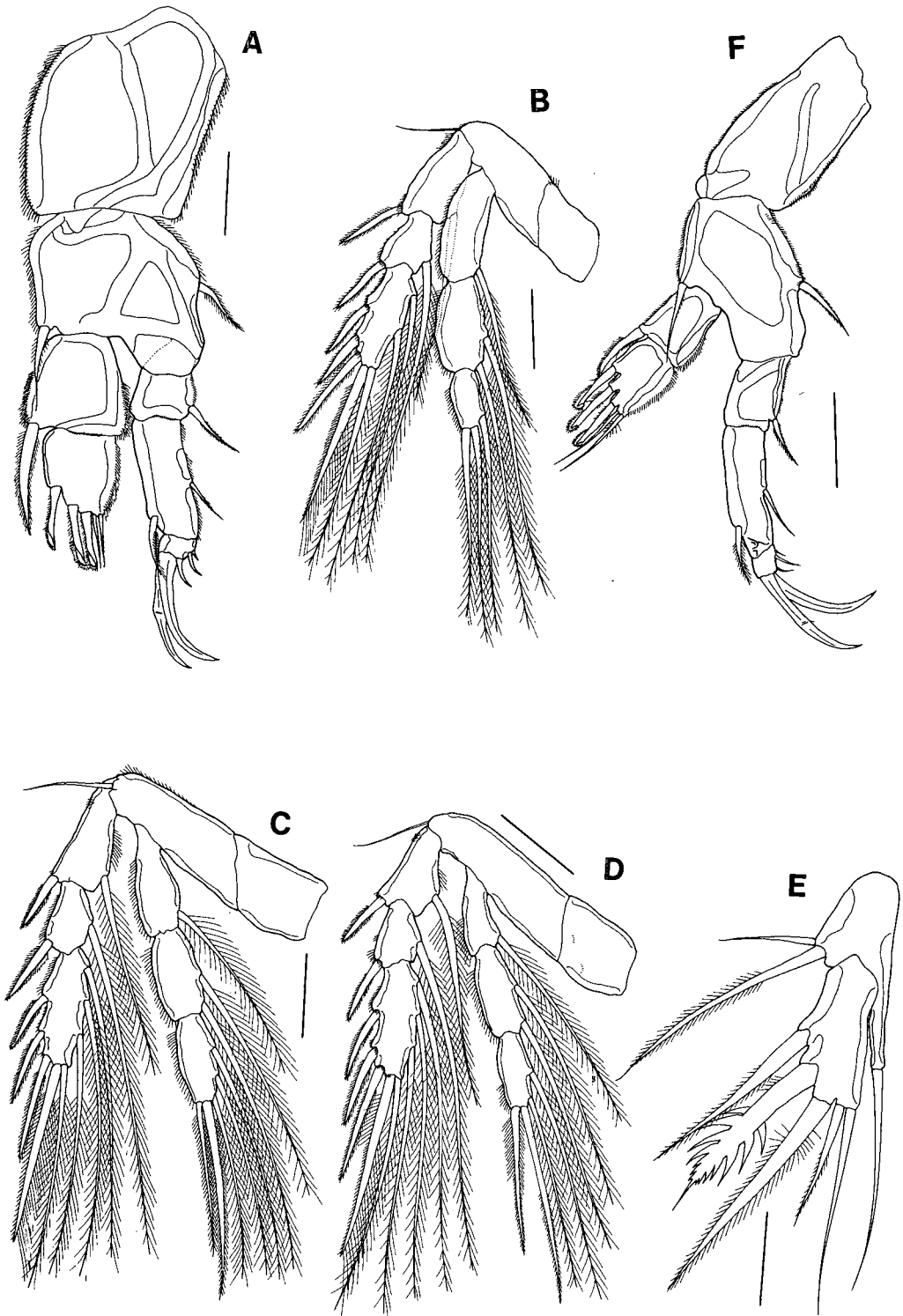


Fig. 2. *Peltidium quinquasetosum* n. sp., female. A-E, legs 1-5. male. F, leg 1. Scales: A-F = 0.1 mm.

than endopod, bearing 4 tiny setae proximally.

Coxa of leg 1 (Fig. 2A) slightly longer than wide, with many spinules along outer and inner margins. Basis about 1.28 times wider than long, with 1 disteromedial spine and 1 inner spine. Exopod distinctly 3-segmented; first segment with a seta on outerodistal edge and many spinules along outer margin; second one longest, with a spine in the middle of outer margin, with a seta on inner distal edge and many spinules along outer margin; distal one wider than long with 2 strong and 3 small claws. Endopod somewhat shorter than exopod, consisting of 2 segments, much swollen; first segment as long as wide, with a thickly plumose seta exceeding tip of distal segment, and armed with minute spinules along distal half of both margins; distal one with 3 scroll-like setae and 2 bare setae on distal end. Rami of legs 2-4 (Figs. 2B-D) 3-segmented. Ornamentation of legs 2-4 as follows (Roman numerals indicating spines and Arabic numerals representing setae):

| | | | | | | |
|-------|-------|-----|--------|-------------------|---------|-----------------|
| Leg 2 | basis | 0-1 | exopod | 1-I, 1-I, 2-2-III | endopod | 1-0, 2-0, 1-2-0 |
| Leg 3 | basis | 0-1 | exopod | 1-I, 1-I, 3-2-III | endopod | 1-0, 2-0, 3-2-0 |
| Leg 4 | basis | 0-1 | exopod | 1-I, 1-I, 3-2-III | endopod | 1-0, 2-0, 2-2-0 |

Leg 5 (Fig. 2E) robust and elongate; baseoendopod furnished with a bare seta on a cylindrical process and 2 disteromedial setae, of which plumose one about 2.5 times longer than innermost one; exopod heavily chitinized, about 2.4 times longer than wide, bearing 1 plumose seta and 1

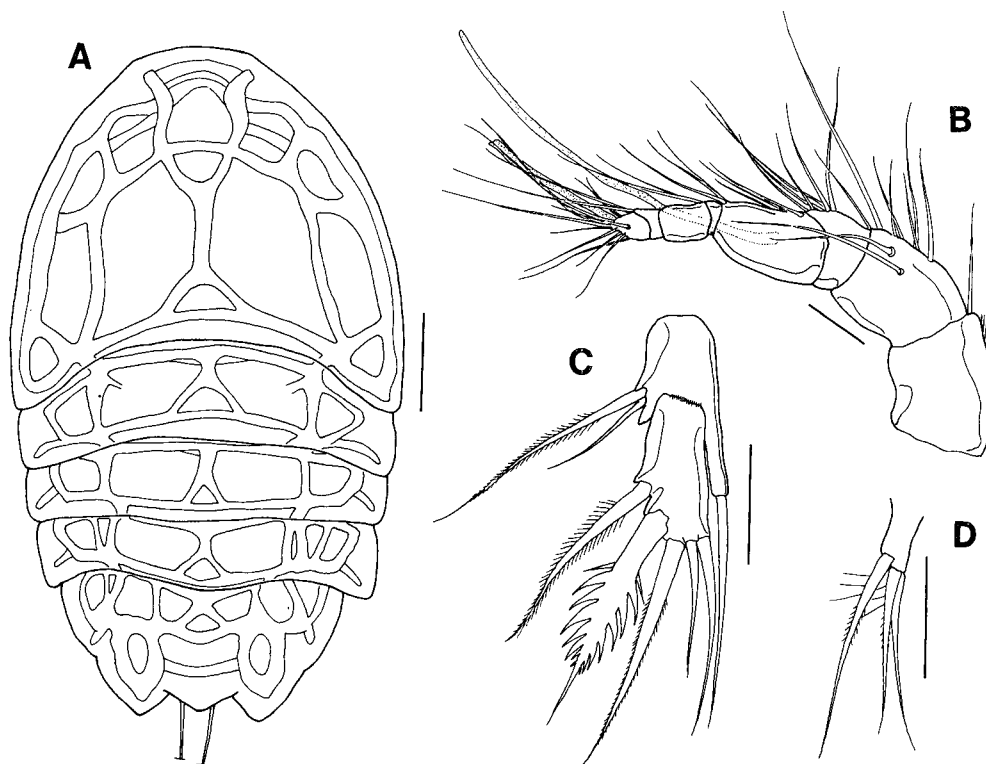


Fig. 3. *Peltidium quinquesetosum* n. sp., male. A, Habitus, dorsal; B, Antennule; C, leg 5; D, leg 6. Scales: A = 0.2 mm; B-D = 0.05 mm.

thorned seta on inner margin, with 3 setae on distal edge.

Male. Body (Fig. 3A) length 1.29 mm, excluding rostrum and caudal setae. General body shape similar to that of female, but its color more pale. Antennule (Fig. 3B) 8-segmented, of which fifth and seventh short; fourth one bent; aesthetascs each on fourth and distal one. Leg 1 (Fig. 2F) slenderer than that of female; inner setae of first endopodal segment slightly not reaching tip of second endopodal segment. Leg 5 (Fig. 3C) similar to that of female. Baseoendopod with 2 inner setae, innermost of which 2.0 times longer than bare seta. Exopod 2.1 times longer than wide, with 5 setae in total as female. Leg 6 (Fig. 3D) represented by a oblong process with, 3 long apical setae.

Etymology. The specific name *quinquesetosum* is taken from the ornamentation of distal endopodal segment of leg 1 (*quinque* - five; *setos* - of seta, bearing a seta)

Measurements and variability. Measurements from four adult females and six adult males from four localities are shown in Table 1. Some variations are found in all dissected materials: 2 of 6 males have 7-segmented antennule abnormally; remaining one has two inner setae on distal endopodal segment of leg 2. However, the following characteristics are consistent: caudal ramus with 7 setae in total; each exopod of antenna of female bearing 1 and 3 setae; distal endite of maxilla having 1 seta; the setal number on distal segment of leg 1 endopod; leg 5 exopod both in females and males bearing 1 thorn-shaped seta respectively.

Remarks. The classification of genus *Peltidium* has been so confused for a long time mostly by reasons that many species were inadequately described and lots of type specimens were not available. Currently, twelve species are recognized excluding several *incertae sedis* (see Bodin, 1997).

Geddes (1968) categorized four groups by the criteria of the form of leg 5 with the setal arrangement on the exopod of it, admitting Pesta's (1935) grouping on the basis of the setal number on the exopod of leg 5. According to his categorizing, *P. quinquesetosum* n. sp. apparently belongs to the second major group which bears five setae either apically or on the inner edge of leg 5 exopod. Within this group, considering the character combination of the antennular segmentation, the setation of antennal exopod, the setal number of proximal endite of maxilla, the

Table 1. Measurements of *Peltidium quinquesetosum* new species.

| Parameters | Females (N = 4) Range (Mean ± SD) | Males (N = 6) Range (Mean ± SD) |
|---|--------------------------------------|------------------------------------|
| Body length (mm) | 1.82-1.90 (1.86 ± 0.04) | 1.23-1.41 (1.35 ± 0.01) |
| Length to width ratio of caudal ramus | 2.05-2.53 (2.39 ± 0.17) | 2.00-2.40 (2.18 ± 0.15) |
| Length ratio of 1st seg. to 2nd seg. of antennule | 1.00-1.32 (1.13 ± 0.14) | |
| Length ratio of 2nd seg. to 1st of antenna exopod | 1.15-1.50 (1.35 ± 0.15) | 1.23-1.81 (1.53 ± 0.26) |
| Length ratio of 1st seg. to 2nd seg. of leg 1 endopod | 0.95-1.18 (1.05 ± 0.09) | 0.85-1.00 (0.96 ± 0.06) |
| Length to width ratio of leg 5 exopod | 2.18-2.55 (2.39 ± 0.2) | 2.30-3.14 (2.69 ± 0.36) |

setal formula of legs 2-4, and the figure or setation of caudal ramus, *P. quinquesetosum* is evidently much related to *P. nicholli* Geddes, 1968, *P. lernerii* Geddes, 1968 and *P. laudatum* Tanaka and Hue, 1968 rather than *P. angulatum* T. and A. Scott, 1903, *P. proximum* Nicholls, 1941 and *P. maldivianum* Sewell, 1940. *Peltidium nicholli* and *P. lernerii*, both of which were described on the basis of only females from Exuma Cays of Bahama by Geddes (1968), show the clear differences from the new species in having three setae on second endopodal segment of leg 1 against five setae in our specimens. *Peltidium laudatum* described from Shingu of Japan is discernible from *P. quinquesetosum* in having 6-segmented antennule and the different shape of the female leg 5.

Besides the above congeners, *P. perturbatum* and *P. fenestratum* are also somewhat similar to *P. quinquesetosum*, but there are major discrepancies between the two species and this new species as follows: *P. perturbatum* possesses 7-segmented antennule in male, two setae on proximal endite of maxilla, three setae on distal segment of leg 1 endopod and the different setal formula of legs 2-4; on the other hand, *P. fenestratum* has 6-segmented antennule in female with the same characteristics in leg 1 and the setal formula of legs 2-4 as *P. perturbatum*.

Additionally, *P. quinquesetosum* is easily distinguished from *P. ovale* T. & A. Scott, which was reported also from Tanabe Bay of Japan by Gamo (1969), by the different setal formula of legs 2-4, 6-segmented antennule, two setae on proximal endite of maxilla and three setae on distal segment of leg 1 endopod.

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한국산 해조류에 서식하는 갈고리노벌레류 1신종 *Peltidium quinquesetosum*
(요각 아강: 갈고리노벌레 목: Peltidiidae 과)의 기재

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요 약

동해안과 남해안의 해조류에서 채집된 갈고리노벌레류 1신종 *Peltidium quinquesetosum*을 기재하였다. 본 종의 가장 뚜렷한 형태적 특징은 암컷의 제 1다리 내지 끝마디에 난 강모의 수와 제 5다리의 모양, 그리고 꼬리마디가 후체부에 완전히 덮힌다는 점이다.