

New Record of Two Marine Green Algal Species from Korea

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한국산 해양 녹조의 2 미기록 종

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Abstract

한국산 자생생물 발굴조사의 일환으로, 해양 녹조류 2종, *Caulerpa peltata* J.V. Lamouroux 및 *Codium geppiorum* O.C. Schmidt이 채집되었고, 본 종에 대한 형태학적 및 분류학적 관찰이 수행되었다. *Caulerpa peltata*는 직립지에서 선형의 소지를 방사상으로 낸다는 점에서 속내의 다른 한국산 종과 구분된다. *Codium geppiorum*은 독특한 정단부의 포낭, 부풀지 않은 가지 정단부 및 인접 가지 사이의 2차적인 유합 흔적인 돌출된 혹에 의해 특징지어진다. 이 2종은 미기록 종으로 여기서 한국 해조상에 처음 보고된다.

Key words : New record, *Caulerpa peltata*, *Codium geppiorum*, Morphology, Taxonomy, Korea

I. Introduction

Codium Stackhouse is coenocytic, siphonous green alga, and commonly distributed worldwide (Chang et al., 2002; Oliveira-Carvalho et al., 2012). This genus is characterized by siphonous thalli consisting of medullary filaments which is intertwined densely and many vesicle called utricles (Chang et al., 2002). Of 134 species accepted in this genus (Guiry and Guiry, 2014), 16 species are currently recorded in flora of Korea (Lee and Kang, 2002; Bae et al., 2010).

Another coenocytic and siphonous green alga,

Caulerpa J.V. Lamouroux is characterized by thalli composed of creeping stolon and erect branch system bearing branchlets. Of 86 species recognized in this genus (Guiry and Guiry, 2014), two species have been recorded from Korea (Lee and Kang, 2002; Bae et al., 2010).

In the course of the survey of indigenous species, two species of those genera, *Caulerpa peltata* J.V. Lamouroux and *Codium geppiorum* O.C. Schmidt, were first collected from Korea. Morphological and taxonomic notes on these species are included in the present study.

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II. Materials and Methods

Specimens for the present study were collected along the east coast of Korea. Taxonomic data were obtained from fresh, liquid-preserved and herbarium specimens. Liquid-preserved material was stored in a 10% solution of Formalin/seawater. For anatomical observations the material was cleared in 5-10% NaOH in distilled water for 2-7 days, and then rinsed in distilled water. Blades dissected from the cleared materials were hand sectioned, transferred to a slide with a drop of distilled water, and mounted in pure glycerin. In some instances, a smearing method for microscopic examination was employed. Measurements are given as width and length. For photographs the sections were stained with 0.5-1.0% aqueous methylene blue, aniline blue or hematoxylin. For permanent slides, the glycerin was exchanged with 10-20% corn syrup.

III. Results and Discussion

Caulerpa peltata J.V. Lamouroux 1809: 332.

Korean name: Ga-neun-ok-deong-gul nom. nov. (가
는옥덩굴: 신칭).

Specimens examined: PKNV 0000130200, PKNV
0000130201 (Mijo: 20.iiv.2013).

Habitat: Epilithic near subtidal.

Morphology: Thalli 15-30 cm high [Fig. 1A], consisted creeping stolon and erect branches with branchlets [Fig. 1B], light to dark green in color, attached by rhizoidal pillars on substrates; stolon terete, with many branched rhizoidal pillars, 2-3 mm in diam. [Fig. 1F]; erect branch system bearing many branchlets in all side, usually without branches; branchlets long, narrow, linear, cylindrical to clavate, constricted at the base, with rounded

apex, 0.5-1.0 mm in diam., 3-10 mm long [Fig. 1C~E]. Sexual plants were not collected during the present study.

Remarks: This species was originally described from West Indies (Lamouroux, 1809). It appears that *Caulerpa peltata* is distinct in having branchlets of peltate shape based on the specific epithet. However, according to Ohba et al. (1992), branchlets of this species vary in shape depending on some physical factors like temperature and irradiance. Considering this feature and other previous reports from Japan (Okamura, 1936; Yoshida, 1998), our specimens are identified as *Caulerpa peltata*, even though those are more or less similar to *Caulerpa racemosa* var. *laetevirens* with long, narrow and linear branchlets (Ohba et al., 1992, as *Caulerpa racemosa* var. *peltata*; Yoshida, 1998; Kraft, 2007; Dawes and Mathieson, 2008, as *Caulerpa racemosa* var. *peltata*).

In Korea, two *Caulerpa* species, *C. geminata* and *C. okamurai* are currently recorded. *Caulerpa peltata* differs from those two species in having long, narrow and linear branchlets produced from all sides of erect branches. *Caulerpa geminata* and *C. okamurai* have sub-spherical or ovoid to elongate-ovoid to clavate, and ovoid to elongate-ovoid branchlets, respectively (Bae et al., 2010). This is the first record of *C. peltata* from Korea.

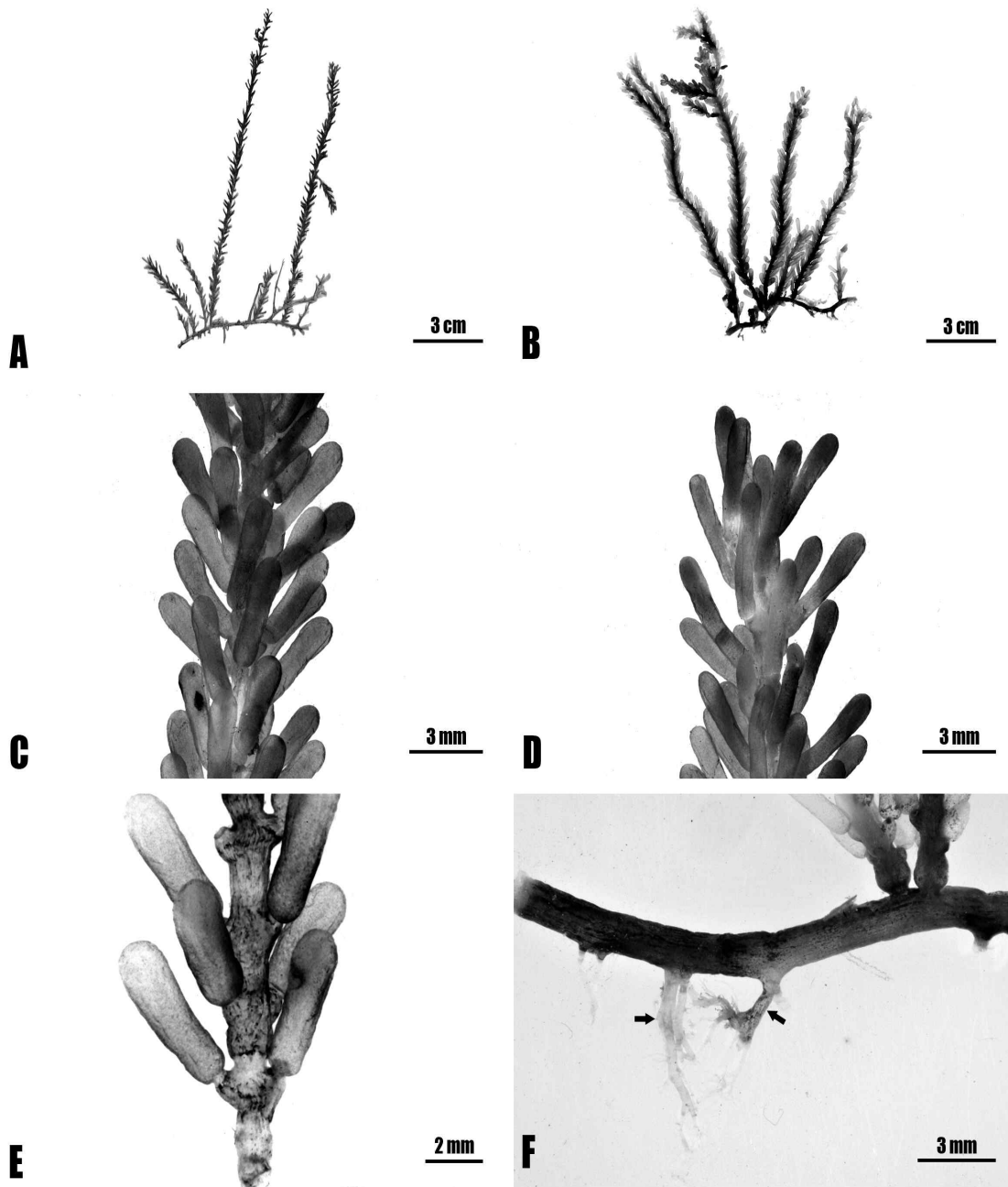
Codium geppiorum O.C. Schmidt 1923: 50, f. 33.

Korean name: Hok-cheong-gak nom. nov. (혹청각:
신칭).

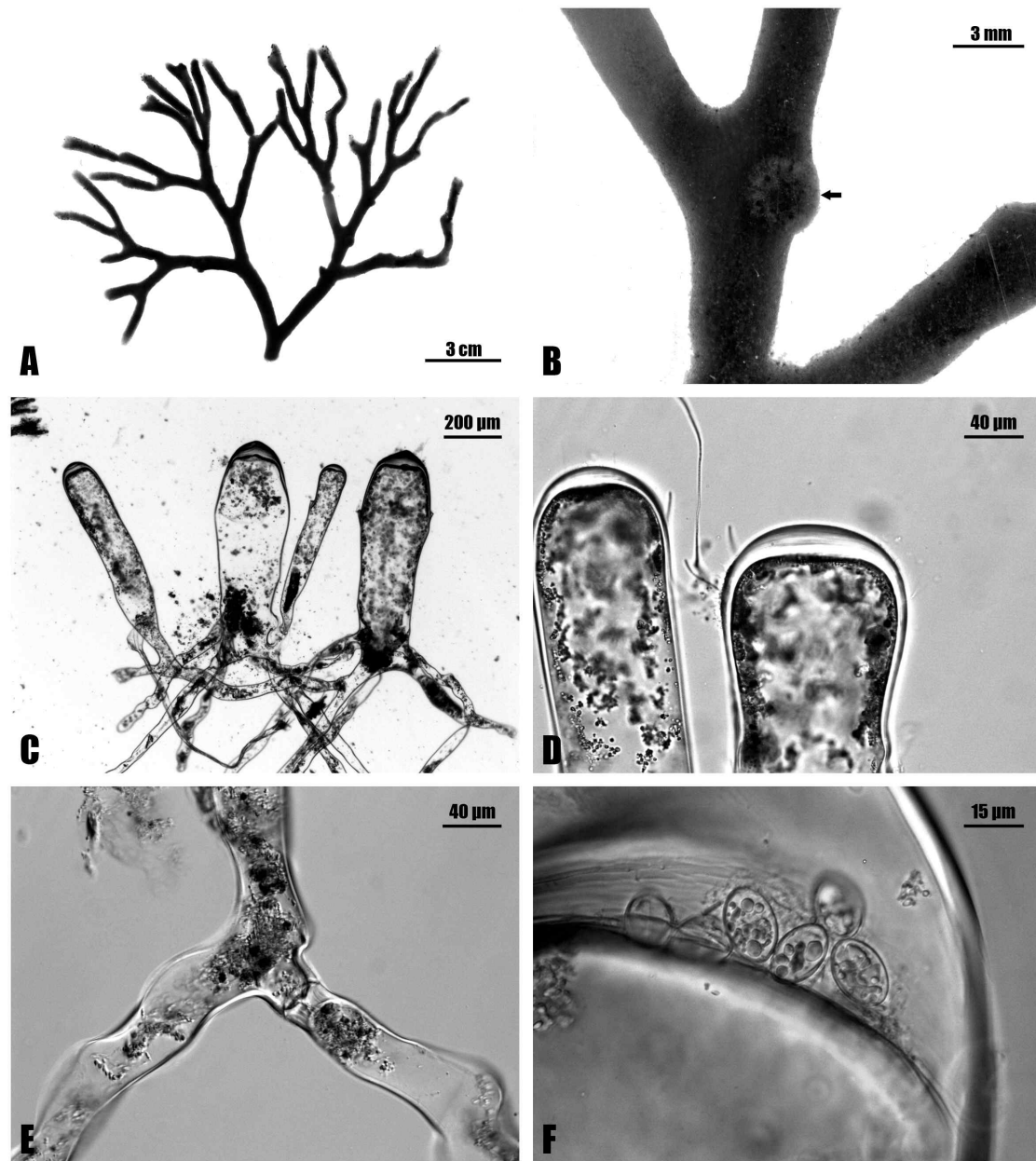
Specimens examined: PKNV 0000130300, PKNV
0000130301 (Mulchi: 26.v.2013).

Habitat: Growing on rock near subtidal.

Morphology: Thalli 10-30 cm high [Fig. 2A], repent, terete, light to dark green in color, attached



[Fig. 1] *Caulerpa peltata* J.V. Lamouroux. A, Herbarium specimen of vegetative plant; B, Habit of vegetative plant; C-D, Details of branchlets on middle (C) and upper portion (D) of erect branches; E, Branchlets with basal constriction; F, Stolon with several rhizoidal pillars (arrows).



[Fig. 2] *Codium geppiorum* O.C. Schmidt. A, Habit of vegetative plant; B, Wart-like protuberance (arrow) derived from secondary connection between adjacent branches; C, Terete to clavate utricles; D, Thickened cell wall of apical portion; E, Septum near basal portion of utricle; F, Several chloroplasts near apex.

on substrate by small hemispheric holdfast and secondary rhizoids; main axes dichotomously divided regularly or irregularly, 3-8 mm wide, issuing wart-like protuberances derived from secondary connection between branches [Fig. 2B]; utricles clavate to cylindrical [Fig. 2C], with rounded or truncate apices sometimes thickened [Fig. 2D], with many chloroplasts [Fig. 2F], 500-700 μm long, 80-250 μm wide; hairs or hair scars usually 0-3 present near upper portion of utricle; septum distinct, produced on only one side between utricle and medullary filaments [Fig. 2E]. Sexual plants were not collected during the present study.

Remarks: *Codium geppiorum* was originally described from Indonesia (Schmidt, 1923). This species is superficially similar to *Codium fragile*, *C. contractum* and *C. tomentosum*. However, *Codium fragile* differs from *C. geppiorum* in having utricles with distinct mucronate apex rather than rounded or truncate one (Kang, 1968; Bae et al., 2010). *Codium contractum* has swollen part near apical portion of thallus, whereas *C. geppiorum* has no swollen part. *C. tomentosum* differs from *Codium geppiorum* in having relatively large utricles (700-1000 μm long) rather than relatively short utricles (500-700 μm long). It appears that *C. geppiorum* is distinct from other *Codium* species in having secondary connection between branches based on the previous reports (Chang et al., 2002; Kraft, 2007). Considering the feature leaving wart-like protuberances, our specimens that were collected from eastern coast of Korea are referred to *C. geppiorum*. This is the first record of *C. geppiorum* from Korea.

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