

Notes on Two Marine Algal Halymeniacean Species from Korea

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한국산 해조 보들지누아리과 2종의 주해

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Abstract

Two marine algal halymeniacean species were collected from eastern coast of Korea during the survey of indigenous species of algae. One is distinct from other similar species by foliose thalli with irregular shape and several branches and linear proliferations without division. The other is characterized by indistinct midrib, foliose unbranched thalli and refractive ganglioid cells in medulla. These two species are identified as *Grateloupia latissima* and *Cryptonemia yendoi* based on the morphological features, respectively. Morphological and taxonomic notes on these species are included in the present study. This is the first record of *G. latissima* and *C. yendoi* from Korea.

Key words : First record, *Cryptonemia yendoi*, *Grateloupia latissima*, Morphology, Taxonomy, Korea

I. Introduction

Since Kang (1966), many species have been recorded in Korean marine algal flora (Lee and Kang, 1986; 2002; Kim et al., 2013). Recently, this kind of study has been extensively carried out in Korea (Kang and Nam, 2013; 2014). It appears that about 900 species of marine algae are currently recorded in Korea based on some recent publications (Boo and Ko, 2012; Kim et al., 2013).

In the course of the survey of indigenous algal species, many marine algae were observed in Korea. Of these, two halymeniacean species which were collected from eastern coast of Korea were examined morphologically in details. These algae

are identified as *Grateloupia latissima* Okamura and *Cryptonemia yendoi* Weber-van Bosse (Halymeniaceae, Rhodophyta) based on the morphological features, respectively. Morphological and taxonomic notes on these species are included in the present study. This is the first record of *G. latissima* and *C. yendoi* from Korea.

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

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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

***Grateloupia latissima* Okamura 1936: 541.**

Korean name: Gin-ga-ji-ji-nu-a-ri nom. nov. (신칭: 긴가지지누아리)

Specimens examined: PKNU 0000187637, PKNU 0000187638 (Byeonggok: 10.vii.2012).

Habitat: Growing on rock near upper to lower intertidal.

Morphology: Thalli 15–30 cm high [Fig. 1A & 2A], foliose, flat, non-parasitic, without midrib, dark red to brown in color, cartilaginous to leathery in texture, attached on substrate by small discoid holdfast; main axes issuing numerous branches and proliferations on margin; branches simple or branched; proliferations linear to lanceolate [Fig. 1B & 2B], simple, not divided, tapering upward, with basal constriction [Fig. 1C], 10–15 cm long, 1–2 cm wide; cortex five to ten cell layers, with two to three cell layers in outer cortex; inner cortex ellipsoidal to polygonal in cell shape, with stellate cells [Fig. 3D]; secondary pit-connections present in cortex; medullary filaments loosely entwined, without refractive cells [Fig. 3A–3C]; spermatangia

clavate, produced from outer cortical cell [Fig. 3E & 3F], 2–4 μm \times 7–10 μm . Female and tetrasporangial plants were not collected during the present study.

Remarks: *Grateloupia latissima* was first described from Japan (Okamura, 1936). This species is distinct from other Korean *Grateloupia* species in having foliose thalli with irregular shape and several branches and linear proliferations without division. *Grateloupia latissima* is similar to *Grateloupia sparsa* and *G. elliptica* in gross morphology. However, *G. latissima* differs from the latter two species in having proliferations without division. This is the first record of *G. latissima* from Korea.

***Cryptonemia yendoii* Weber-van Bosse 1921: 249, f. 77.**

Korean name: Ip-ba-da-sun-in-jang nom. nov. (신칭: 잎바다선인장).

Specimens examined: PKNU 0000126211–0000126215 (Pohang: 23.iv.2012).

Habitat: Epilithic in intertidal to subtidal.

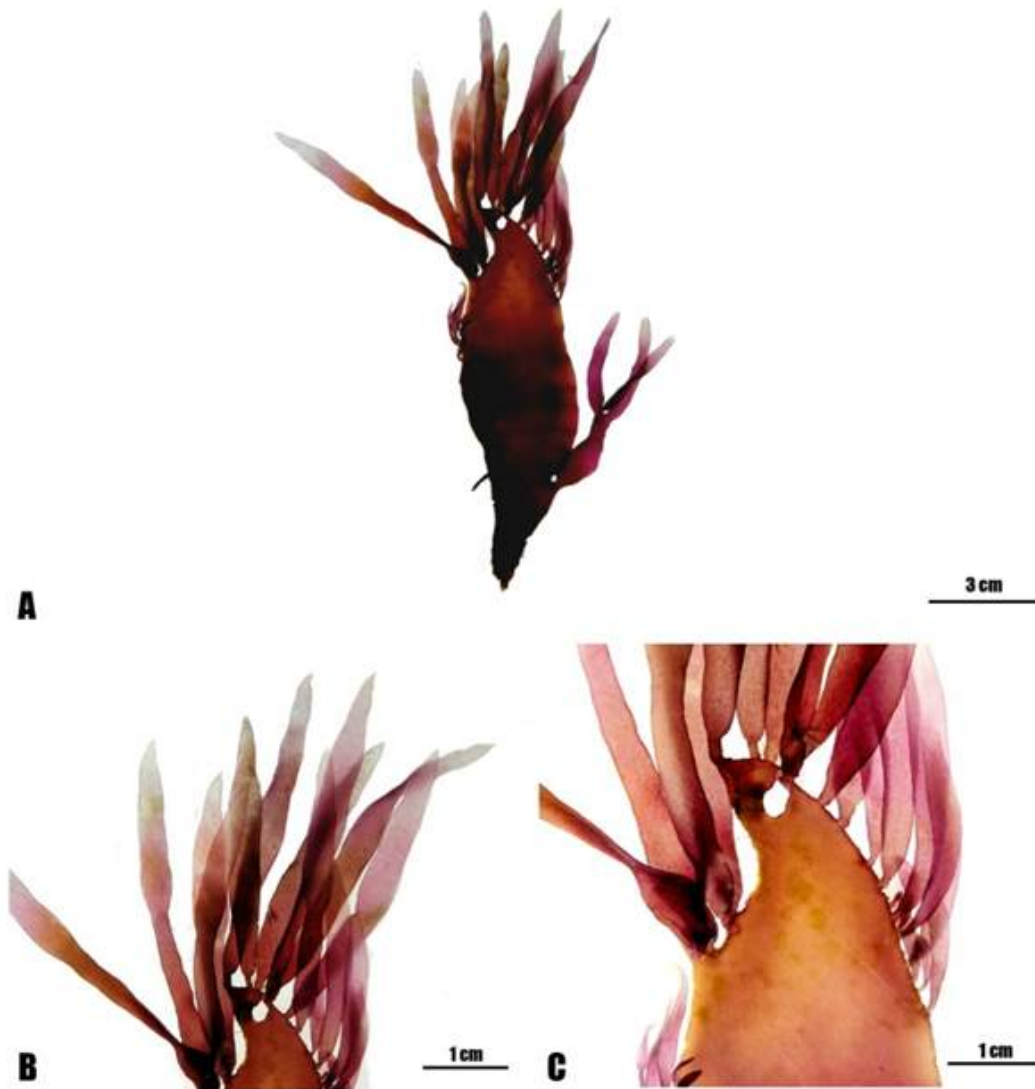
Morphology: Thalli 20–40 cm high [Fig. 4A & 4B], solitary, foliose, red to purplish red in color, mucilaginous in texture, attached on substrate by small hemispherical holdfast [Fig. 5C]; stipe short, scarcely detectible, expanding into a flat lamina; lamina with indistinct midrib, elliptical, unbranched, with undulate margin [Fig. 5A & 5B], 300–400 μm thick; cortex five to seven cell layers [Fig. 5D], with three to four cell layers in outer cortex; inner cortex circular in cell shape, rarely with stellate cells; secondary pit-connections present in cortex; medulla without transversely oriented filaments, with refractive ganglioid cells [Fig. 5F]; medullary filaments densely arranged [Fig. 5E]; carpogonial branches 2-celled; auxiliary cell ampulla converging

above [Fig. 6A & 6B]; cystocarps ellipsoid, scattered throughout thallus [Fig. 6C–6F], 80–120 μm \times 60–90 μm . Male and tetrasporangial plants were not collected during the present study.

Remarks: This species was described from Tual, Iles Kei, Indonesia (Guiry and Guiry, 2015). Two *Cryptonemia* species, *C. lomation* and *C. tuniformis*,

have been recorded in Korean algal flora (Lee and Kang, 1986; Kim et al., 2013).

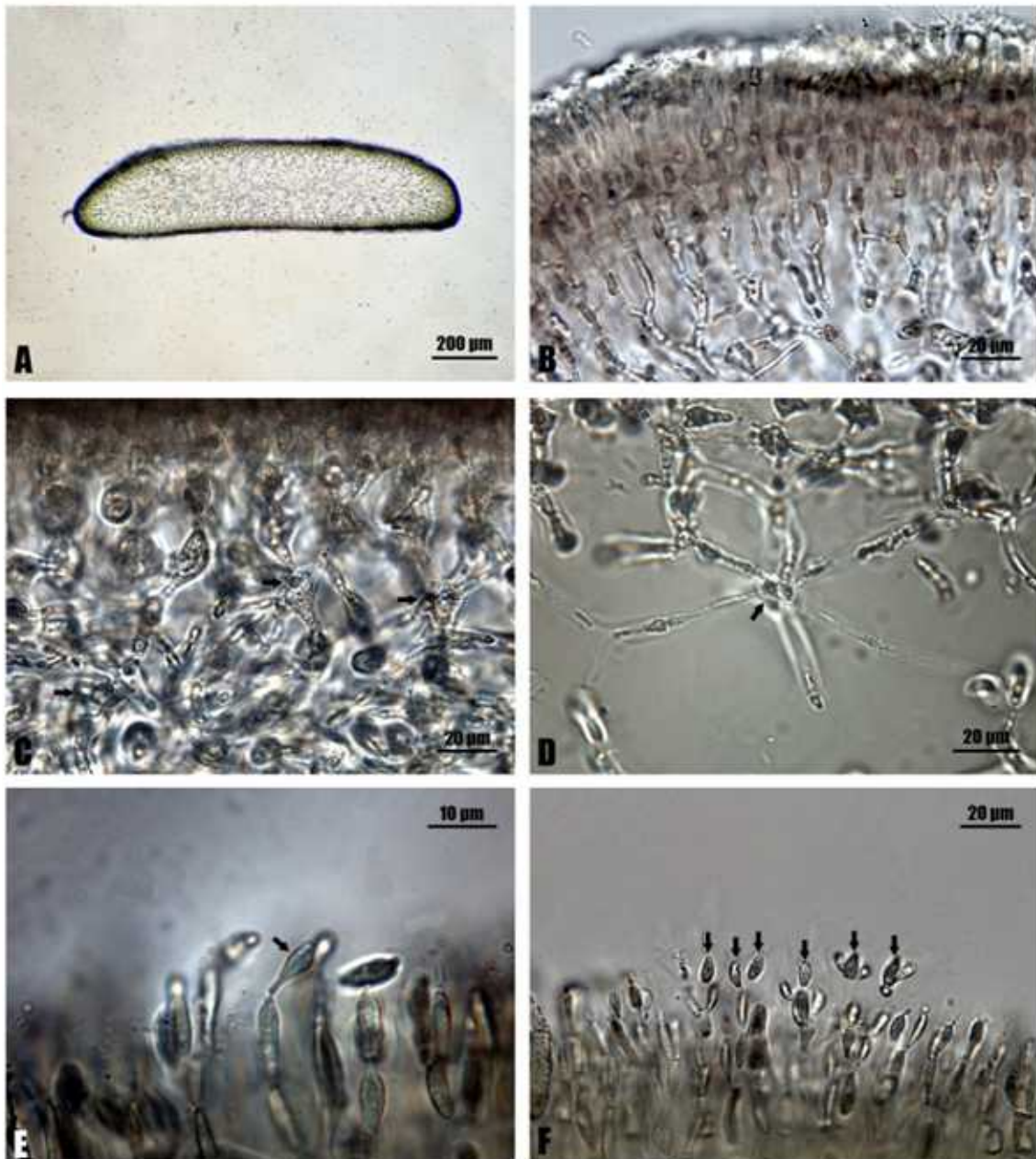
Cryptonemia yendoi is distinct from these two species by having indistinct midrib, foliose unbranched thalli and refractive ganglioid cells in medulla, and is newly recorded in Korea, here.



[Fig. 1] *Grateloupia latissima*. A. Habit of vegetative plant; B. Details of unbranched proliferations; C. Details of proliferation with constriction near base.



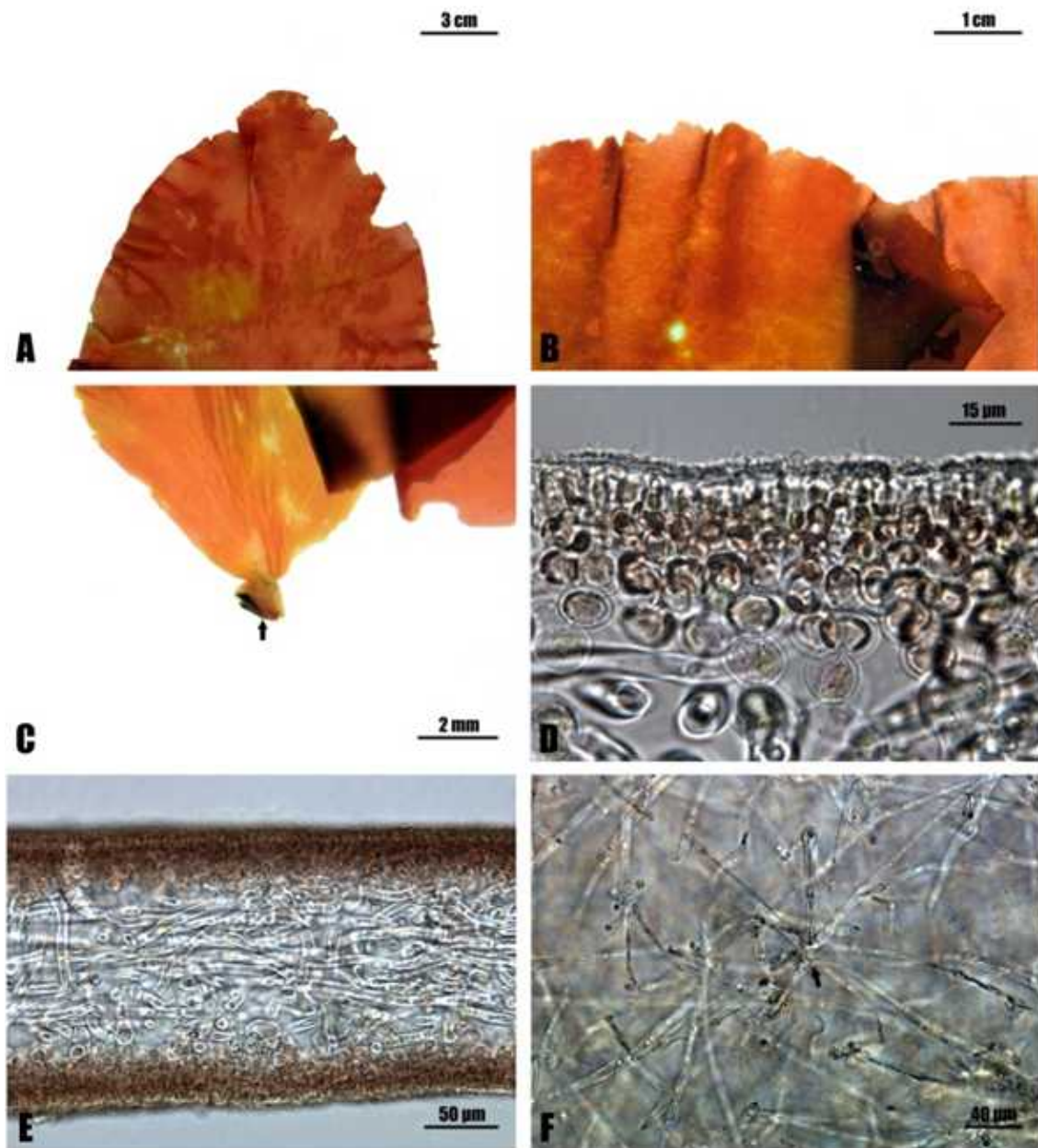
[Fig. 2] *Grateloupia latissima*. A. Habit of male plant; B. Details of unbranched proliferations of male plant.



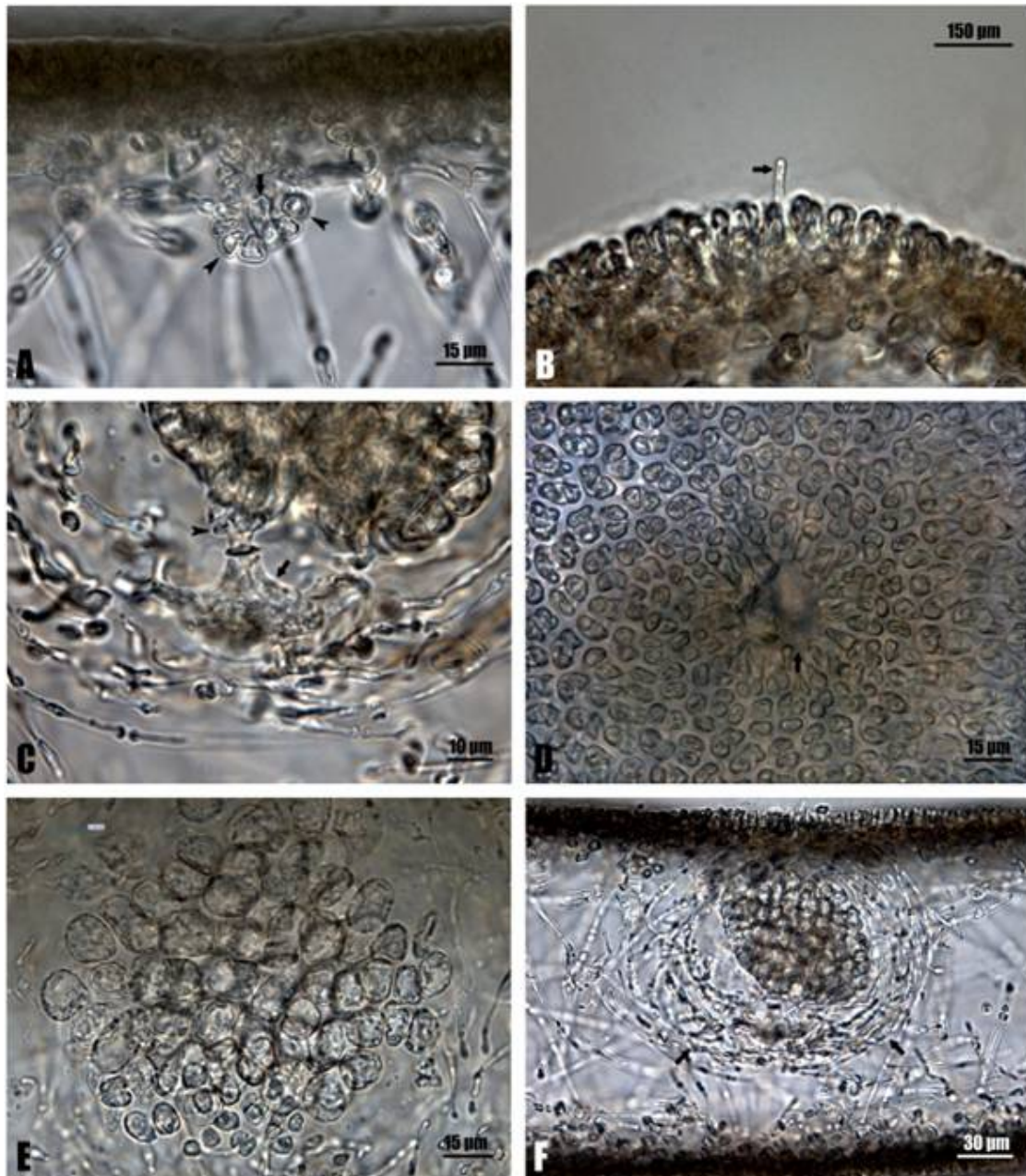
[Fig. 3] *Grateloupia latissima*. A. Loosely entwined medullary filaments in transverse section of vegetative branch; B. Cortical cell layers; C. Inner cortical cells with pit connection (arrows) between adjacent cells; D. Stellate cell (arrow) in inner cortex; E. Spermatangium initial (arrow) produced from outer cortical cell; F. Released spermatangia (arrows).



[Fig. 4] *Cryptonemia yendoii*. A, B. Habit of vegetative (A) and female (B) plants with indistinct midrib.



[Fig. 5] *Cryptonemia yendoii*. A, B. Details of apical portion (A) and margin (B) of blade. C. Hemispherical holdfast (arrow); D. Cortical cell layers; E. Densely arranged medullary cells; F. Refractive ganglioid cell (arrow) in medulla.



[Fig. 6] *Cryptonemia yendoii*. A. Auxiliary cell (arrow) from ampulla filaments (arrowheads) converging above; B. Trichogyne; C. Fusion cell (arrow) with basal cell of gonimoblasts (arrowhead); D. Details of ostiole (arrow); E. Round carospores; F. Fully developed cystocarp with well developed involucre (arrows).

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