Notes on Three Marine Algal Species from Korea

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한국산 해조 3종에 대한 주해

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Abstract

한국산 해조 3종, *Umbraulva olivascens* (P.J.L. Dangeard) G. Furnari, *Bryopsis minor* Womersley, *Sargassum polycystum* C. Agardh에 대한 형태학적 및 분류학적 주해가 제시된다. *Umbraulva olivascens*는 뚜렷한 올리브 채색, 파상형 연변, 엽체의 구멍 및 조하대 서식처에 의해 특징지어진다. *Bryopsis minor*는 작은 조체, 모든 방향에서 많은 분지, 기부에 잘록함이 없는 선형의 소지, 두드러진 가지 흔적을 결여하는 축, 뚜렷한 중심 피레노이드를 갖는 엽록체, 주축과 비슷한 길이의 가지 및 뚜렷하지 않은 주축을 갖는 것이 특징적이다. *Sargassum polycystum*은 조체 모든 부분에서 나는 원통형 내지 난형의 돌기, 가시가 있는 뚜렷한 중륜을 갖는 전연 내지 다소 거치연의 잎과 드물게 나는 기낭을 갖는 것으로 특징지어진다. 이 3종은 여기서 한국 해조상에 처음 기록된다.

Key words : First record, *Umbraulva olivascens*, *Bryopsis minor*, *Sargassum polycystum*, Korea

Since Kang (1966), occurrence of many marine algal species has been reported from Korea (Lee and Kang, 1986; 2002; Kang and Nam, 2011). Up to now, about 900 species have been recorded in the Korean marine algal flora (Boo and Ko, 2012). In the course of a survey of indigenous biological resources, three marine algal species, *Umbraulva olivascens* (P.J.L. Dangeard) G. Furnari (Ulvaceae), *Bryopsis minor* Womersley (Bryopsidaceae), *Sargassum polycystum* C. Agardh (Sargassaceae), were collected from Korea, and morphological and taxonomic notes on these species are given here. This is the

first record of those three species from Korea.

***Umbraulva olivascens* (P.J.L. Dangeard) G. Furnari in Catra, Alongi, Serio, Cormaci & G. Furnari 2006 (Fig. 1)**

Korean name: Gu-meong-cho-rok-gal-pa-rae nom. nov. (구멍초록갈파래: 신칭).

Specimens examined: KOSPAL 0000126293, PKNU 0000126294, PKNU 0000126295 (Gujwa: 25.xi.2011).

Habitat: Epilithic in subtidal.

Morphology: Thalli up to 5-10 cm high, epilithic,

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solitary, erect from discoid holdfast, olive-green in color; blades rigid, elliptical to linear, with undulate margin having protuberances, sometimes with perforation, 80-120 μm thick in upper part, 300-400 μm in basal part; cells elliptical to polygonal, 10-15 $\times$ 12-20 μm in surface view; rhizoidal cells dark olive green, numerous near basal portion; chloroplast parietal, with 1-3 pyrenoids.

Remarks: *Umbraulva* was recently established based on distinct olive-green colored blade, containing siphonaxanthin pigment, subtidal habitat and molecular evidence (Bae and Lee, 2001). Three species are currently recognized in this genus. Of these, *U. japonica* (type) and *U. amamiensis* have been reported from Korea (Bae and Lee, 2001). *Umbraulva olivascens* described from Roscoff differs from the two species in presence or absence of perforations on blade, undulate margin and fluorescence. Our plants have rigid thalli in distinct olive-green color in subtidal as *Umbraulva*. They are identified as *U. olivascens* based on the undulate margin and perforations on blade, although those specimens show more or less small size (5-10 cm) and elliptical to linear shape rather than big size (10-20 cm) and orbicular to irregularly round shape found in *U. olivascens*. This is the first record of *U. olivascens* from Korea.

***Bryopsis minor* Womersley 1955 (Fig. 2)**

Korean name: Jag-eun-git-teol-mal nom. nov. (작은깃털말: 신칭).

Specimens examined: KOSPAL 0000126296, PKNU 0000126297 (Guryongpo: 9.ix.2011).

Habitat: Epiphytic on other algae.

Morphology: Thalli up to 2-3 cm high, tuft, epiphytic, bright green in color, attached by rhizoid; main axis indistinct, issuing numerous branches on all sides, sometimes naked near basal portion,

without prominent branch scars, 200-500 μm in diam.; branches cylindrical, linear, with numerous branchlets on all sides, 100-200 μm in diam.; branchlets constricted at base, without septum, 20-50 μm in diam.; chloroplasts round, 8-12 μm long, with a central pyrenoid.

Remarks: *Bryopsis minor* was described from southern Australia (Womersley, 1955). According to the original description, this species is characterized by small thalli (up to 2 cm high), much branched thalli on all sides, slender and linear branchlets with basal constriction, axes without prominent branch scars, chloroplasts with a prominent central pyrenoid. Similar branches to main axes in length and indistinct axes appear to be also distinct for *B. minor* (Huisman, 2000). Our specimens fit well with the original and Huisman's description. This is the first record of *B. minor* from Korea.

***Sargassum polycystum* C. Agardh 1824 (Fig. 3)**

Korean name: Dol-gi-mo-ja-ban nom. nov. (돌기모자반: 신칭).

Specimens examined: KOSPAL 0000126298, PKNU 0000126299, PKNU 0000126300 (Gujwa: 25.xi.2011).

Habitat: Growing on rock near lower intertidal to subtidal.

Morphology: Thalli up 15-30 cm high, attached by discoid holdfast, up to 0.5-1.0 cm in diam.; stem erect, terete, 1-2 cm long, 2-4 mm broad; axes terete to triquetrous, with numerous cylindrical to oval elevated cryptostomata 200-300 μm long, 2-5 mm in diam.; lateral branches well developed; leaves arranged spirally, long, elliptical to lanceolate, entire to slightly serrulate in margin, with usually distinct midrib bearing spines near basal portion, 5-50 mm long, 2-20 mm broad; cryptostomata scattered on all parts of thallus; vesicle absent to rare, ovoid.

[Fig. 1] *Umbraulva olivascens* (P.J.L. Dangeard) G. Furnari. A, Habit of vegetative plant; B, Basal discoid holdfast (arrow); C, Non-rhizoidal cells in transverse section of upper thallus; D, Rhizoidal cells in transverse section of basal thallus; E, Epidermal cells in surface view; F, Protuberances along undulate margin.

[Fig. 2] *Bryopsis minor* Womersley. A, Habit of vegetative plant without distinct main axis; B, Naked basal portion of thallus; C, Details of lateral branches; D, Branches with basal constriction (arrows) lacking septum; E, Rhizoidal holdfast; F, Round chloroplasts with central pyrenoid.

[Fig. 3] *Sargassum polycystum* C. Agardh. A, Habit of vegetative plant; B, Details of vegetative branches; C, Axis with many projections; D, Elliptical to lanceolate leaves with distinct midrib; E, Details of leaves with spines (arrows) along midrib; F, Triquetrous main axis in transverse section.

Remarks: Since Agardh (1824), *Sargassum polycystum* has been reported from many East Asian countries including China and Japan. However, occurrence of this species has not been reported from Korea. *Sargassum polycystum* appears to be distinct from other Korean *Sargassum* species in having cylindrical to oval elevated projections (= cryptostomata) on all parts of thallus, entire to slightly serrulate margin with distinct midrib bearing spines and in lacking or having rarely vesicle (the present study). These features are found in our specimens. So our Korean specimens are identified as this species based on the present and previous observations (Agardh, 1824; Chiang et al., 1992; Yoshida, 1998; Kraft, 2009). This is the first record of *S. polycystum* from Korea.

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