

[PA-012]

우리나라에 생육하는 녹조 갈파래속의 다양성과 계통지리

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녹조 갈파래목에 속하는 갈파래속은 전 세계적으로 분포하는 분류군으로 100 여종이 알려져 있다. 갈파래속에 속하는 종들은 형태가 단순하여 비교 형질이 다양하지 않으며, 형질 변이의 폭이 넓어 동정이 매우 어려운 분류군이다. 또한 인위적인 전파에 의해 과거 우리나라의 해조류의 목록에는 기록되어 있지 않았던 종들이 우리나라의 해안에서 자주 관찰되기도 하며, 이들 중에는 간혹 대발생을 일으켜 연안생태계에 심각한 악영향을 미치는 종들도 보고되고 있다. 따라서 본 연구에서는 우리나라의 동, 서, 남해안과 제주도의 대표적인 지역에서 생육하는 갈파래속 종들을 대상으로 형태 형질과 분자 형질을 분석하여 종의 다양성과 계통지리를 파악하고자 하였다. 본 발표에서는 연구의 예비실험 단계에서 동해안(구룡포, 포항), 서해안(강화도 여차리, 태안 학암포, 대천 해수욕장, 대천항), 남해안(남해 하목도, 무안 송석리), 제주도(산방산 용머리해안) 그리고 중국 청도에서 채집한 갈파래속 식물을 대상으로 형태 자료와 핵의 5S spacer 그리고 엽록체의 *rbcL* 염기서열 자료를 비교 검토하였다. 지금까지의 분석 결과, 본 조사지역에서 갈파래속 6종(*Ulva armoricana*, *U. californica*, *U. compressa*, *U. flexuosa*, *U. pertusa* 그리고 *U. prolifera*)의 생육을 확인하였으며, 이들 중 동일한 지점에서 채집한 *U. armoricana*와 *U. pertusa* 그리고 *U. compressa*와 *U. prolifera*는 각각 형태적으로 매우 유사하여 동일 개체군으로 구분하였으나, 분자 형질을 분석한 결과 다른 종들이 동일 지점에서 함께 혼생하는 것으로 확인되었다. *Ulva pertusa* (Hakodate, Japan)를 제외한 나머지 종들이 유럽 대서양 연안(*U. armoricana*, *U. compressa*, *U. prolifera*)과 지중해 연안(*U. flexuosa*) 그리고 북미 태평양 연안(*U. californica*)에서 최초로 기재되었으므로, 우리나라에 생육하는 갈파래속의 종들에 대한 전파 경로의 파악을 위하여 계통지리 연구가 절실히 요구되고 있다.

[PD-031]

Characterization and chemical modification of a
GlcNAc/GalNAc specific lectin, Bryohealin, from
the marine green alga *Bryopsis plumosa*

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Bryohealin is lectin isolated from the marine green alga *Bryopsis plumosa*. It was reported to be involved in the wound-healing process of *B. plumosa*. The lectin molecule is composed of two identical subunits of 27 kDa each, cross-linked by disulfide bond and showed binding specificity to *N*-acetyl-D-glucosamine and *N*-acetyl-D-galactosamine. We demonstrated characterization of a carbohydrate binding site of Bryohealin by chromatography and chemical modification methods. Bryohealin had identical two or more binding sites and shared same binding site for two different carbohydrates (GalNAc and GlcNAc). During chemical modification studies, hemagglutinating activities of Bryohealin were not affected by modification of histidine, tryptophan, aspartic acid, and glutamic acid. When 50% of arginine residues were modified with 1, 2-cyclohexanedione, activity of Bryohealin rapidly decreased. Protection was observed when the arginine modification was performed in the presence of inhibitory sugar (0.15 M GalNAc). The results suggest that the modified arginine is included in the carbohydrate binding site of Bryohealin. Tryptic digested peptides containing modified arginine residues were separated by HPLC.

being grown for biofuels and are economically important products (e.g., poly-unsaturated fats, beta carotene, antioxidants). While global oxygen production, oceanic primary production and fossil petroleum deposits result from natural algal growth, biofuels, biomedical products, etc. depend upon algal cultures. Culture collections maintain algal diversity that is used in basic and applied research. Strains whose genomes have been sequenced are available in collections so that others can expand and extend knowledge. Cultures allow for repeated experimentation so that critical or controversial research can be corroborated or refuted. Culture collections also can be repositories for preserving endangered algal species. There are several hundred public and private collections of microalgae, but very few that specialize in seaweeds. The CCMP has carried out 3000 cryopreservation events, with approximately 71% success (1590 strains and 260 genera), including 100% success with *Navicula*, *Phaeodactylum* and *Cylindrotheca* (35 strains), nearly 100% for Trebouxiophyceae (107 of 108 strains) and Eustigmatophyceae (33 of 34 strains), and high success rates for Prasinophyceae 214 strains of 224, 95%) and Prymnesiophyceae (133 of 146 strains, 91%). DMSO was the most successful cryoprotectant, and we used concentrations from 2-25%. Methanol was successful for many green algae, but it gave very poor results for chromalveolates.

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PROPOSAL OF JANIA PENNATA SP. NOV. WITH REASSESSMENT OF J. ROSEA (CORALLINAEALS, RHODOPHYTA)

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Johansen & Womersley (1986) examined hundreds of collections including 13 type specimens of haliptiloid species collected in southern Australia in the 1800s and they recognized only one species, *J. rosea* (as *Haliptilon roseum*). Because of the wide range of morphology of the Australian species many representatives recognized later from other localities of northern and southern hemisphere have been identified as *J. rosea*. However, we recognized evidence of at least five cryptic species within *J. rosea* from four localities based on SSU rDNA data. The aims of this study were to assign Korean representatives to the genus *Jania* by their morphological characteristics and molecular data as a new species, and to restore taxonomic position of some species merged into *J. rosea*. This study was carried out by means of comparison of morphology with materials from the herbaria and fresh materials from Korea, South Africa, Australia, and California, USA. Because of the morphological variability on the representative haliptiloid *Jania* species, *J. rosea*, molecular data were employed to ascertain phylogenetic relationships among the Korean representatives and other species in the *Jania*. To establish their phylogenetic relationships among members of the genus, SSU rDNA and *cox1* sequence data were determined and analyzed. Four species, *J. gracilis*, *J. subulata*, *J. trichocarpa*, and *J. verticillata* were restored their taxonomic positions from *J. rosea* based on the results. Korean representatives were also assigned to the *Jania*, as a new species, *J. pennata* sp. nov.