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Sexual system of *Lycopus lucidus* Turcz., a perennial herb, has never been questioned seriously before. The present study is focusing on the careful investigation of *L. lucidus* flowers collected from several populations in Korea to clarify their precise sexual system. The results are confirmed that *L. lucidus* is clearly gynodioecious plant, which its population comprise plants with hermaphrodite flowers and plant whose flowers are functionally female, the male organs being reduced in size and sterile. In *L. lucidus*, all investigated floral characters (e.g., petal, sepal, stamen, style, stigma length) are significantly different between two morphs. Hermaphroditic plants are larger than those of female ones in petal length ( $P < 0.0001$ ), sepal length ( $P < 0.002$ ) and stamen length ( $P < 0.0001$ ). On the contrary, female plants larger in style length ( $P < 0.45$ ) and stigma length ( $P < 0.0001$ ) than those of hermaphrodite. Additionally, some of micromorphological characters (e.g., petal and sepal cell structure, leaf surface and seed structure, etc.) of two morphs were examined and described by means of the scanning electron microscopy (SEM). However, there are no significantly differences between female and hermaphrodite from these micromorphological characters. - (Supported by a grant KRF 2000-041-D00254)

**A212**

**Gender Dimorphism in the Korean  
Endemic Taxon, *Silene takesimensis*  
Uyeki et Sakata (Caryophyllaceae)**

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*Silene takesimensis* Uyeki et Sakata is the Korean endemic taxon, which is occurred

quite restricted area, Ullung Island. A gender dimorphism ('gynodioecy') is clearly confirmed on the basis of floral structures of *S. takesimensis* in the present study. Gynodioecious populations of this taxon in Ullung Island consist of two basic floral types: hermaphroditic and female fertile flowers. Several floral characters of these two morphs were investigated in terms of sepal, petal, style and stamen length, etc. It is shown that there is some differences of floral stages between two morphs. All investigated floral characters of the hermaphroditic flowers are significantly larger than those of female flowers of the same species ( $P < 0.0001$ ). Female flowers with rudimentary anthers do not make pollen grains. Pollen grains of the hermaphrodites are monad, medium in size; aperture is pantopolyporate; exine is tectate-punctate with scattered microechini. Additionally, the presumed reproductive biology of *S. takesimensis* is also briefly discussed. - (Supported by a grant KOSEF 981-0513-068-2)

**A213**

**Interfamilial Relationships of Korean  
Chordariales (Phaeophyceae)  
Inferred from Nuclear SSU rDNA  
Sequences**

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Chordariales was established by Setchell et Gardner (1925) with the type family Chordariaceae, which includes *Chordaria* as the type genus, typified by *Chordaria flagelliformis* (O.F. Mueller) C. Agardh. In Korea, 7 families, Acrotrichaceae, Chordariaceae, Elachistaceae, Ishigeaceae, Leathesiaceae, Spermatochnaceae, and Myrionemataceae occur in Chordariales (Lee and Kang 1986). We carried out

morphological and molecular studies for clarifying the interfamilial relationships with Korean representatives of Chordariales; *Acrothrix pacifica*, *Chordaria flagelliformis*, *Tinocladia crassa*, *Halothrix ambigua* and *Ishige sinicola*, belonging to the families mentioned above. The chordarialean algae are generally characterized morphologically by having structure with central cells, intermediate layer, long indeterminate and short determinate assimilatory filaments in macrothallus, or filamentous tufts, microscopic gametangia in life history, and subapical growth by meristematic cell situated below the terminal cell. In comparison of nuclear small-subunit rDNA Sequences together with retrieved sequences from GenBank, the Korean representatives of the families of Chordariales did not form a monophyletic group. This result agrees with the reports on the phylogenetic relationships of brown algae dealing with only a few Chordariales species (Tan 1993, Siemer *et al.* 1998).

#### A214

### A Phylogenetic Relationship of *Porphyra suborbiculata* Kjellman and *P. okamuræ* Ueda Based on Nuclear SSU rDNA and ITS 1 Sequences

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*Porphyra* (Bangiales, Rhodophyta) species, edible marine algae, currently include approximately 130 species in the world. Fourteen species and two forms have been reported in Korea. Among these taxa, *P. okamuræ* that grows on the eastern coast is characterized by having round, ovate or obovate shaped blade, while *P. suborbiculata* has a funnel-shaped one. Therefore, they were described as independent species each

other (Ueda, 1932). However, *P. okamuræ* resembles *P. suborbiculata* in reproduction; division formulas of spermatangia and carposporangia, and a microscopic spinulate process, except for differences of the range of distribution and appearance. Allozyme analysis also shows no difference between the two species. For these reasons, Hwang (1994) treated these taxa as two subspecies of one identical species, *P. suborbiculata*. In this research, their taxonomic status was reexamined by studying the morphology, reproduction, biogeography, nuclear small subunit rDNA (SSU rDNA) and internal transcribed spacer 1 (ITS 1) sequences. Although they were apparently distinguished by the biogeographic distribution, nuclear SSU rDNA data indicated an identical sequence, except for the difference of number of introns, which varied in other *Porphyras* as well (Kunimoto, 1999). The ITS 1 sequences from 10 populations ranged 271-276 bp in length. The final data matrix alignment consisted of 277 characters and the pairwise sequence divergence ranged 0-1.12%. Our molecular data indicated that *P. okamuræ* and *P. suborbiculata* were conspecific, and could not be separated as independent subspecies.

#### A215

### Interrelationship among the Genera of Dictyotaceae (Dictyotales, Phaeophyta) Based on SSU and RuBisCo Spacer Region Sequence

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A phylogeny of marine Dictyotaceae was inferred by several methods from nucleotide sequences of nuclear gene encoding small subunit rRNA and plastid gene RuBisCo from 15 species in 8 genera. Sequence