거머리말의 생육지는 내만 지역으로 수심 2.5 ~ 4.0m의 사니질과 자갈이 혼재하는 퇴적 환경에서 작은 군락을 형성하여 밀집하게 생육하였으며, 극히 제한된 지역에서만 분포하였다. 수거머리말의 생육지는 외해의 영향이 적은 내만 지역으로 수심 4.5 ~ 12.0m의 사니질의 퇴적환경에서 초지를 형성하였으며, 제한된 분포를 나타내었다. 애기거머리말은 조석의 영향을 강하게 받는 섬의 조간대 지역에서 밀집한 초지를 형성하였으나 극히 제한된 지역에서만 출현하였다.

B511 Life table of Gastrophysa atrocyanea feeding on Rumex obtusifolius

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유럽과 일본 등지에서 Biological control agent로 사용하는 *Gastrophysa*屬의 좀남색잎벌레(*Gastrophysa atrocyanea*) 생활사를 실내사육을 통해 고찰하고 야외 조사를 통해 난괴의 크기 및 부화율을 조사하였다. 각 성장단계별 경과일수는 알 3.19 0.39일, 1령 유충 2.28 0.77일, 2령 유충 2.10 0.48일, 3령 유충 4.90 0.72일, 번데기 3.80 0.49일로 총 16.27 1.11일 만에 성충으로 우화하였다. 야외에서 돌소리쟁이(*Rumex obtusifolius*)의 잎 뒷면에 산란된 좀남색잎벌레의 난괴를 채집하여 조사한 결과, 난괴 당 알수는 32.04 12.02개로 조사되었다. 부화는 처음 산란한 날(D)로부터 평균 3일이 소요되며 첫날(D+3) 부화율은 80.6%, 둘째날(D+2) 부화율은 9.3%, 셋째날(D+3) 부화율은 0.68% 등 총 부화율은 91.02%로 매우 높게 나타났다.

B512 Geographic Spatial Autocorrelation of Morphological Characters in Wild Radish, Raphanus sativus var. hortensis f. raphannstroides

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Spatial autocorrelation of geographic variation of 30 quantitative characters was investigated in Japanese natural populations of wild radish, *Raphanus sativus* var. *hortensis* Baker f. *raphannstroides*. Moran's *I* was significantly different from the expected value in 38 of 210 cases (18.1%). Twenty-seven of these values (71.1%) were negative, indicating morphological dissimilarity among pairs of individuals in the seven distance classes. There were three types of relationships between the means of characters and spatial autocorrelations. First, there was significant heterogeneity of means with significant autocorrelation in most floral characters. Second, there was significant heterogeneity of means with nonsignificant autocorrelation in most vegetative characters. Finally, there was significant heterogeneity of means with 25% significant autocorrelation in fruit characters. The disparity between vegetative and floral measures could indicate that selection has acted differently on their characters. In particular, anther length and pistil width showed a typical monotonic decline from significant positive autocorrelation at 0 to 400 km to significant negative autocorrelation from 630 to 910 km

B513 분자마크(allozyme, cpDNA, AFLP)를 이용한 무릇(Scilla scilloides)공간적 상관의 생태학적 연구

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자생하고 있는 무릇(*Scilla scilloides* Druce)의 집단내 유전구조를 파악하기 위해 1 x 1 m 격자로 35 x 50 m 공간에서 등급내 분포하는 무릇의 유전자형의 조사하였다. Allozyme과 chloroplast DNA (cpDNA) 및 Amplified fragment length polymorphism (AFLP)의 세 분자마크로 상관관계를 분석하였다. Maran의 *I*값과 join-counts에 유전자형의 공간분포에서 cpDNA 및 AFLP는 유의성을 나타낸 반면 알로자임에 의한 결과는 약간 임의성을 나타내었다. 등급간의 분화(Gst) 역시 cpDNA 및 AFLP는 높은 등급간 유의성을 나타낸 반면 알로자임에 의한 결과는 낮은 값을 나타내었다. 이는 cpDNA 및 AFLP는 화

분에 의한 유전자 유동(gene flow)이 이루어진 반면 알로자임에 의한 결과는 종자에 의한 모계 및 부계의 양방향성 유전의 소치이다. 따라서 무릇 집단의 공간구조를 파악하기 위해 우성 및 공우성 마크에 의한 유전자 유동을 분리하여야 진정한 집단구조를 파악할 수 있으며한 근거리에서는 공간적 상관이 양의 값을 보인 반면 원거리에서는 음의 상관을 보여 무릇이 임의 분포하는 것이 아니라 창시자 효과에 의한 집단팽창효과를 지지하는 결과로 보여진다.

B514 Fish Species Diversity of the Estuaries in the Mankyong and Dongjin River, Chollabuk-do, Korea

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The fish diversity of the estuaries of the Mankyong-Dongjin River, Korea was reviewed with the relative references and the recent collections. It was conformed that there were 153 species of 60 families belonging 13 orders in the estuaries of the Mankyong-Dongjin River. The largest family is Gobiidae of 24 species which is followed by Tetraodontidae(7 spp.) and Sciaenidae(6 spp.). In this area, the dominant species were *Engraulis japonicus* and *Thryssa kammalensis* of the family Engraulidae. Both *Ophichthus rotundus* and *Sebastis koreanus* were firstly described as new species in this estuaries and also restricted only this area as the endemic species to Korea. Many fishes spawn and reside at this estuary in varying seasons and the youngs of the some marine fishes spend, in general, the first two years of their lives in this estuaries or shallow bays as an important foraging area. The reclamation of estuaries in the Mankyong-Dongjin River would be caused a serious loss of the marine fish diversity by the habitat destruction of fishes lived in this area.

B515 Carbon Dioxide Budget in Phragmites communis Stands

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The dynamic model was developed to simulate the photosynthetic rate of *Phragmites communis* stands in coastal ecosystem. The model was composed of the compartments of both climatic and biological variables. The former were photosynthetic photon flux density (PPFD), daily maximum- and minimum-temperature. The latter were combinations of the specific physiological responses of tree organs with the biomass of the respective organs. The PPFD and air temperature were calculated and using their values, gas exchange rate of each plant organ was calculated at every hour. The carbon budget was constructed using the modelled predictions. Analysis of annual productivity and fluxes showed that yearly gross population productivity, yearly population respiration and yearly net population productivity were 33.4, 21.3 and 12.1 ton CO2 $ha^{-1}yr^{-1}$, respectively. The final result was tested over two stands, produced promising predictions with regards to the levels of production attained. The model can be used to determine production potential under given climatic conditions and could even be applied to plant canopies with analogous biological characteristics.

B516 A Study on the Purification Capacity of Zizania Latifolia Community for Improvement of the Water Quality of Effluent from Agricultural Land of Yongsan River in Korea

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