B549 낙동강 하류수계의 수질현황

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낙동강은 남한의 1/4에 해당하는 넓은 유역면적을 지닌 강으로, 주위에 산재한 농경지와 공단, 도시 등 각종 용수의 공급원으로서 매우 큰 의미를 갖는 하천이다. 본 연구는 낙동강 하구의 수질현황을 파악하기 위하여 낙동강 하구지역의 15개 지점을 대상으로 2000년 6월부터 2001년 5월까지 월 1회에 걸쳐 조사하였다. 수온은 4.2~28.1℃범위로 계절별 특성은 나타내었지만 지역적으로 큰 차이는 없었다. pH는 6.62~9.94의 범위로서 지류인 장락지점이 평균 8.37로 높았고, DO는 1.32~14.48mg/L의 범위로 본류수계인 일웅도지점에서 가장 높았고 지류인 시만지점이 낮았다. 탁도는 평균 10.5~142NTU범위로 나타났는데 본류인 대동에서 가장 낮았다. 염도와 전기전도도는 기수역인 을숙도 지점이 평균 14.1‰, 17827 μMHOS로 가장 높았는데 강수량으로 인해 계절별로 변화의 폭이 넓었다. 클로로필 a는 평균 6.33~285.31mg/㎥의 범위로서 둔치도에서 급격한 수화현상으로 인해 6월에 가장 높은 수치인 1972.35mg/㎥의 값을 보였다. 지류수계인 조만강지역에서 아질산성 질소, 질산성 질소, 인산염 인이 각각 0.106ppm, 3.520ppm. 0.254ppm으로 높았고, 또 총인, 총질소, 암모니아성 질소는 시만지역에서 각각 0.740ppm, 6.551ppm, 0.531ppm으로 높게 나타났다.

B550 The Cadmium Tolerance in Several Herbaceous Plants and Isolation of Cd-binding Peptide

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For remediation on cadmium-contaminated sites using plants, we conducted to test cadmium tolerance of plants and to isolate Cd-binding peptide. Using five species, we examined germination rate, seedling growth rate of root, shoot and fresh biomass by exposing to cadmium. The germination rates of *Abutilion avicennae* and *Amaranthus retrofiexus* were over 90% in all tested concentration, but germinations of *Aeschynomene indica*, *Echinochloa crusgalli* var. *oryzicola* and *Echinochla crusgalli* var. *frumentacea* decreased from 15 mg $CdSO_4$/L. As increasing Cd concentration, root and shoot growth rates of all species decreased but in the case of fresh biomass, *Abutilion avicennae* and *Aeschynomene indica* decresed from 60 mg $CdSO_4$/L. Also, EC50s of these plants were 44.6-77.5 mg/L for root growth, 38.6-114 mg/L for shoot growth and 60-107.5 mg/L of $CdSO_4$ for fresh biomass. The sensitivity of plant species to cadmium ranked as root length>fresh biomass>shoot length. We conducted gel chromatography of the root supernatant of each two plant species, *Abutilion avicennae* and *Aeschynomene indica*, exposed to cadmium medium containing 5 mg $CdSO_4$/L for 7 days and detected each fraction at 254 nm. The molecular mass of Cd-binding peptide isolated from *Abutilion avicennae* was estimated to be about 6 kDa and the peptide mass from *Aeschynomene indica* was to be about 3.5 kDa.

B551 폐금속광산의 토양오염

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경북북부지역의 토현, 옥방 및 금장등 3개 폐금속광산 주변지역의 토양오염 현황조사를 통해 오염토양 복원을 위한 기초자료를 확보하고 향후관리대책을 도출하고자 하였다. 토현 폐금속광산은 주광종이 구리와 금이며, 광재적치장에서 Cd, Cu, As, Pb등이 각각 최고 40.46, 5,060, 221.10, 1,697 mg/kg이 검출되어 대책기준을 초과하였으며, 갱구에서 가까운 농경지에서도 Cd, Cu, As가 검출되었으나, 벼, 콩, 고추등의 농작물은 자연함유량 수준이었다. 옥방 및 금장 폐금속광산도 광재적치장의 중금속 함유량이 대책기준을 초과하였으나, 농작물은 자연함유량 수준이었다. 3개 광

산 모두 주오염원이 되는 폐광재 더미가 그대로 노출되어 있으므로 향후 지속적인 오염이 우려된다. 이의 처리 방법으로는 차수막 시공 후 복토와 식재가 바람직하며, 복토재로는 제강슬래그의 성질이 우수한데, 산성토양의 중화와 유해 중금속 이온의 고형화 기능이 있다.

B552 Effects of li ght availability on attached Rhinanthus minor, an angiospermatic root hemiparasite.

Jun-Kwon Hwangbo and Young-Se Kwak
Research Institute of Industrial Science & Technology (RIST)

Attached *R.minor* showed increased height in response to shading, demonstrating that *R.minor* is able to detect alterations in light quality and/or quantity due to the shading. However, neither its biomass nor number of haustoria were affected by the reduction in light availability. It seems that unlike most non-parasitic plants, photo-autotrophy of attached *R.minor* may not play an essential role in determining its growth, at least in this experimental system. The absence of a negative growth response of *R.minor* to the shading could be partly attributed to its parasitism, relying on host-derived resources for its growth. Indeed, *R.minor* is unlikely to have difficulty in abstracting host resources under shading, which was reflected in the absence of differences in both number of haustoria and amount of 15N transferred from the hosts between shading treatment. This might be mediated by less responsiveness of *R.minor* transpiration rate to fluctuations in external conditions including shading and water stress than non-parasitic plants. Therefore, it is likely that as long as the extent of resources diverted from hosts to parasite is not significantly altered by the shading, growth of attached *R.minor* may be unaffected by reduced light availability *per se*.

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B554 중금속 환경에서 소리쟁이와 고마리 및 돌피의 생장반응과 분포특성

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하천유역에 분포하는 소리쟁이, 고마리 및 돌피를 이용하여 중금속 내성실험을 실시하였다. 채종한 종자를 선별한 후 Cu와 Zn 및 Cd