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**Structure and Dynamics of
Phytoplankton Communities in the
Natural Wetland, Yunchon-gun,
Kyunggi-do**

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The present studies were investigated the water quality and the structure and dynamics of phytoplankton communities at 2 stations during the period from August 1999 to July 2000 in the natural wetland, Yunchon-gun, Kyunggi-do. In order to evaluate the water quality, water temperature, pH, dissolved oxygen, conductivity, chlorophyll-a, NO₂-N, NO₃-N, NH₄-N and PO₄-P were measured. Water temperatures ranged from 7.9°C to 29.1°C, and was entirely under the influence of the air temperatures. pH is slightly acid, varied from 5.39 to 6.51. Concentrations of dissolved oxygen showed 1.69-10.55mg/ℓ, and conductivity were 40.3-193.3ms/. Chlorophyll-a concentrations ranged from 5.82mg/m³ (st. 1, November 1999) to 238.06mg/m³ (st. 2, July 2000) and it could be pointed out hypereutrophication from the viewpoint of the standard value of eutrophication. Concentrations of nitrogen and phosphorus were reached up to eutrophication level. Total 177 taxa of phytoplankton belong to 81 green algae, 38 euglenoids, 24 diatoms, 4 xanthophytes, 5 chrysophytes, 3 dinoflagellates and 1 chryptophyte were tentatively identified. Number of phytoplankton species varied from minimum 9 taxa (st. 3, May 2000) to maximum 35 taxa (st. 1, September 1999). Phytoplankton standing crops showed always blooming level more than ×10⁶ cells/ℓ every month and station except station 2 in May 2000 showing minimum 544,730 cells/ℓ. Phytoplankton dominant species were very

various by month and station. Planktosphaeria gelatinosa occupied 79.42% at st. 1 in August 1999 and 44.08% at st. 1 in July 2000. The others species at the same station were Dictyosphaerium ehrenbergianum in September 1999, Synura petersenii in November, Westella botryoides in April 2000, Euglena gracillis in May, and Pediastrum tetras in June. The dominant species at station 2 were also very different every month: Trachelomonas komarovii var. punctata in August 1999, Merismopedia elegans in September, Euglena acutissima in November, Mougeotia viridis in April 2000, Ankistrodesmus falcatus in May, Meriosmopedia punctata in June and Volvox sp. in July. Phytoplankton blooms seemed to be caused by high water temperature, and the concentrated nutrients for phytoplankton supplied with wastewaters from the agricultural area.

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**팔당호에서 수리수문 특성과
조류발생과의 상관성**

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팔당호에서 강수량, 일조율 및 상류지역 댐 방류량이 조류증식에 미치는 영향을 조사하였다. 분류, 동정된 식물플랑크톤은 총 68속으로 이중 녹조류가 31속(46%)으로 가장 많이 출현하였으며 규조류, 남조류, 편모조류 순으로 출현하였다. 팔당댐 앞의 BOD는 평균 1.4ppm으로 수질기준 II등급을 유지하고 있고 TN/TP 비율은 135로 총인에 대한 총질소의 농도가 높았다. 1월-2월에는 극심한 갈수로 엽록소 a 농도가 높았고 규조류인 *Cyclotella*가 대증식하였으며 당시 일조율은 평균 55%이었다. 3월-6월에는 강수량은 평균이하임에도 불구하고 엽록소 a 농도는 낮았는데 이는 계절적으로 동물플랑크톤 포식에 의한 생물학적 제어작용의 결과로 사료되며 특히 6월에는 팔당 상류지역의 충주호에서 방류량을 증가시킨 것도 조류성장을 제어하는데 다소간의 영향을 주었을 것

로 사료된다. 7월에는 남조류인 *Microcystis*와 *Anabaena*가 대발생하였는데 당시 일조율은 약 40% 내외로 년 중 최저치를 나타내었고 8월 장마 이후 상류지역 댐에서 지속적으로 방류량을 증가시켜 조류가 감소하였다. 또한 96년-97년 10월에 남조류인 *Aphanizomenon*이 팔당호 호수에서 연속하여 우점하였으나 98년 부터는 상류 댐 방류량이 1개월 이상 지속됨에 따라 감소하지 시작하여 99년에는 거의 출현조차 하지 않는 양상을 보이고 있어 방류량 증가에 의한 우점종의 양상이 바뀌기 시작하였다.

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**Fore and Hind Gut Contents of
1-y-old Silver Carp,
Hypophthalmichthys molitrix, and
Natural Cell Volume of Major
Nineteen Phytoplankton Dominated
the Shallow-eutrophic Lake**

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The feeding behaviour of one-year-old silver carp, *Hypophthalmichthys molitrix* (Val.) on phytoplankton species in a shallow-hypertrophic lake was studied in summer. Over the experimental period, filter-pore sizes of fish, total biomass of the phytoplankton and water temperature in each enclosure changed little with time. The fish in each enclosure became heavier with time, while their percentage weight gain depended negatively upon the stocking density, due perhaps to the competition for prey. An analysis of gut contents of silver carp showed a strong similarity between the

algal communities in the foregut and the water. This finding was significant for the enclosure with a low fish density or large fish ($p < 0.05$). The presence of silver carp did little to suppress the abundance of phytoplankton with high IU values ($r > 0.58$ for all enclosures, $p < 0.05$), such as *Oscillatoria*, *Anabaena* and *Melosira*. There were weak relationships between IU values of each phytoplankton and selectivity of fish on them ($p > 0.5$). There was no doubt that the silver carp fed unselectively when cyanobacteria occurred abundantly, even though the selectivity index for diatoms was slightly higher than those for cyanobacteria, green algae and cryptomonads. This could happen because diatoms have a tougher cell wall and are easier to observe in the fish gut compared to other algae. Improvements in methodologies are needed to clearly understand and generalize the feeding behavior of stomachless fish such as silver carp.

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**Effects of Planktivorous Fish and
Zooplankton on the Morphology of
the Small Cryptomonad *Plagioselmis
prolonga* var. *nordica*
(Cryptophyceae)**

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Two morphs of the small cryptomonad *Plagioselmis prolonga* var. *nordica* with a posterior tail, were observed during summer and fall in Lake Kasumigaura, Japan. The tail shortened in mesocosms stocked with planktivorous silver carp (*Hypophthalmichthys molitrix* Val.) and elongated by more than 50% in mesocosms from which silver carp were removed. The density of *Plagioselmis*