Identification of Genus *Prorocentrum* for Plankton Monitoring Network

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플랑크톤 모니터링 네트워크를 위한 *Prorocentrum*속의 동정

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Abstract

Dinoflagellates are known to cause red tide outbreaks and even to produce toxin. Recently, red tide events have frequently occurred in several embayments of the Korean coast and have brought serious damage to inshore fisheries. Thus, the red tide research activities including the taxonomy as well as distribution of toxic dinoflagellates have received ever increasing attention in Korean waters. Therefore, it is necessary to conduct an extensive taxonomical study on red tide organisms in coastal zone of Korea. The present study is to clarify the fine structures of *Prorocentrum* spp. and to describe each species with taxonomical notes for plankton monitoring network.

1. Introduction

Since 1976, the inventories of phytoplankton, especially of dinoflagellate species, have carried out to clarify causative organisms of red tides in Korean waters by many scientists(Cho 1978; Cho 1979; Park 1979; Park 1980; Shim *et al.* 1981; Yoo 1982; Han and Yoo 1983a; Han and Yoo 1983b). Among the dinoflagellates of Masan Bay, where known as the representative zone of recurring red tides in Korea, the genus *Prorocentrum* is the most predominant group throughout the year, and it includes some toxic species such as *Prorocentrum balticum* and *P. minimum*. In previous record, there were eight species of genus *Prorocentrum* in Masan Bay and the following three species have been already described, i.e., *Promcentrum micans, P. minimum* and *P. triestinum* (Yoo 1982). In spite of their importance in coastal waters, there are still many gaps in our knowledge on systematics of dinonagellate in Korean waters as well as in Masan Bay.

The purpose of the present study is to clarify the fine structures of *Prorocentrum* for plankton monitoring.

2. Materials and method

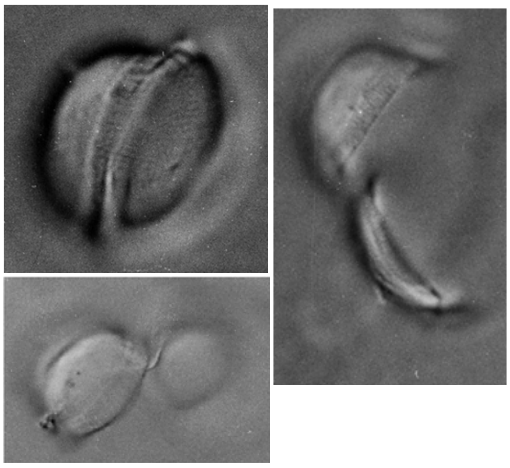
Identification of *Prorocentrum* spp. in water samples was usually done by using differential interference contrast (DIC), which revealed especially well lighted thecal structures. The microscope was equipped out on a Zeiss Axioskop microscope with a Mc 80 microphotosystem. For the apparent three-dimensional image, scanning electron microscope (SEM) was used. For SEM analysis, an aliquot of sample material was pipetted onto a Nucleopore filter (pore diameter

1m) and filtered gently. The filter paper was rinsed with 100 ml of distilled water to remove salt crystals, air-dried, and then affixed to an aluminum stub. The stubs were sputter coated with gold and examined with a JEOL JSM-840A.

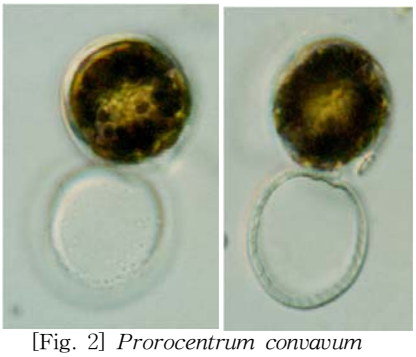
3. Results

Genus *Prorocentrum* Ehrenberg 1833

Armored, but composed of 2 opposing thecas, with or without apical teeth or protrusions, but with apical platelet. Thecas typically with poroids, pores, reticualtions, spines or other surface markings. Cell usually compressed laterally and with chloroplasts. Variously shaped from oval to almost circular. Earlier this genus was maintained as distinct from *Exuviaella* by the presence of a more or less apical spine adjacent to the flagellar opening as a principle distinguishing feature of *Prorocentrum*, lacking in *Exuviaella*.

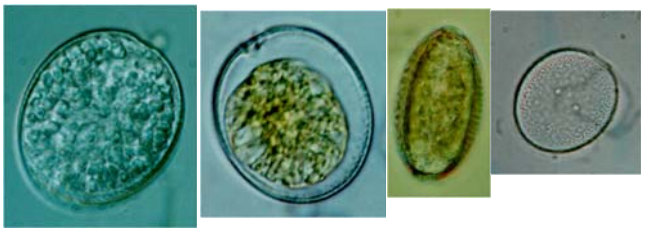


[Fig. 1] *Prorocentrum balticum*



[Fig. 2] *Prorocentrum convavum*

Lebour(1925) and Schiller(1937) observed *Exuviaella* having small apical spinelets. Secondarily *Prorocentrum* was considered to be more compressed than *Exuviaella,* and also more acute in antapical contour. Abe(1967) also incorporated the genera *Exuviaella* and *Prorocentrum* under the latter name, a consolidation needed for many years. Armored, laterally compressed cells with conspicuous cingular list. Anterior cingular list broadly funnel shaped extending beyond the epitheca which is relatively short, at times barely detectable. Hypotheca usually exceeds epitheca by at least x6. Cingulum distinctly premedian and unusually of even width. Sulcal lists prominent, often resembling wings, supported by ribs, with or without simple posterior "sails". Plate formula: 5 epithecal plates, 4 cingular plates, 4 sulcal plates and 4 hypothecal plates. Chloroplasts usually present.



[Fig. 3] *prorocentrum compressum*

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