

# Identification of Genus *Triadinium* for Plankton Monitoring Network

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## 플랑크톤 모니터링 네트워크를 위한 *Triadinium*속의 동정

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### Abstract

The major group which contains all the organisms that are commonly termed Dinoflagellates is called the division Pyrrophyta or Dinophyta in botanical systems and the order Dinoflagellida or Dinoflagellata in zoological systems. Most dinoflagellates are biflagellated solitary planktonic cells. A taxonomic survey of the dinoflagellate family, Triadiniaceae Dodge was conducted for plankton monitoring network in the coastal waters of Korea. Identification of species in water samples was usually done by using differential interference contrast (DIC), which revealed especially well lighted thecal structures. For the apparent three-dimensional image, scanning electron microscope (SEM) was used. Two species were identified and described, which were *Triadinium orientale*(Lindemann)Dodge and *Triadinium sphaericum*(Murray and Whitting)Dodge.

### 1. Introduction

For more than seventy years, investigations have been conducted on the distribution and abundance of marine phytoplankton along the Korean coast. Besides the regular series of collections, numerous short series have been taken since the Korean War in 1950. However, the taxonomic study of marine phytoplankton has been neglected somewhat in this country and its need has grown up for the scientist among oceanography, marine biology and fisheries(Shim, 1994). Taxonomical studies on the dinoflagellates were carried out by Shim *et al.*(1981) and Han(1981) for the first time in Korea.

As a rule, morphological criteria are sufficient to classify the dinoflagellate species. From examinations of thousands of specimens,

conservative versus variable morphological characters are known for dinoflagellates. In armoured dinoflagellates, the plate patterns provide useful characters for species determination(Taylor 1993).

Triadiniaceae, a family of order Gonyaulacales is characterized as three thecal plates around apex and three antapical plates in antapex and girdle equatorial(Stein, 1883). This family consists of only one genus, *Triadinium* Dodge(1981).

### 2. Materials and method

Phytoplankton samples were collected from near coastal areas of Korea. Samples were vertically and horizontally obtained using plankton net, and fixed with 4% formalin or Lugol's solution.

Identification of *Triadinium* 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 Nikon E600 microscope with a 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 1micro meter) 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

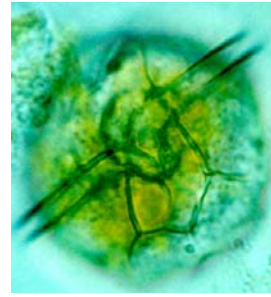
#### Genus *Triadinium* Dodge 1981

Cell polygonal or rounded with equatorial girdle which is slightly displaced. Girdle enclosed by conspicuous lists and ridges may be present along the junctions between the plates. Theca composed regularly punctuate plates. There is a distinctive apical pore with a sigmoid aperture. The characteristic feature of this genus is the arrangement of three plates around the apical pore and at the antapex(Dodge 1982). These armored cells are similar to *Alexandrium*. But there are different in size, thickness of theca, surface markings, size and shape of plates, position of plates and the presence of strong cingular lists.

#### *Triadinium orientale* (Lindemann) Dodge 1981

Cell spherical with rounded profile, theca smooth but covered with rows of pores. Girdle slightly displaced about 0.5mm girdle widths in left-handed, with broad girdle lists. This species is easily confused with *Goniodoma sphaericum*, beacuse of the cell shape, cell size, and similar girdle displacement. But the shape and the plate pattern of sulcus are different.

Distribution in Korea : Chinhae Bay

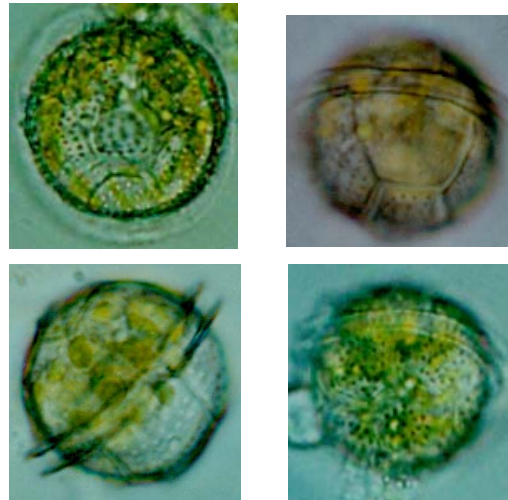


[Fig. 1] Photograph of *Triadinium orientale*.

#### *Triadinium sphaericum* (Murray &Whiting) Dodge 1982

Cell spherical with rounded profile, theca smooth but covered with rows of pores. Girdle slightly displaced about 0.5mm girdle widths in left-handed, with broad girdle lists. This species is easily confused with *Goniodoma orientale*, due to the cell shape and size, and poroid of similar theca and different sulcal plate and sulcal shape.

Distribution in Korea: Samchunpo



[Fig. 2] Photographs of *Goniodoma sphaericum*

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