

## Note

# Report on *Protoperidinium* sp. fed on *Cochlodinium polykrikoides* (Gymnodiniales, Dinophyceae)

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In 2005, harmful dinoflagellate *Cochlodinium polykrikoides* was first occurred on July 18 and disappeared on September 12 in the Yeosu waters of the South Sea of Korea. During *C. polykrikoides* blooms, the species of *Protoperidinium* was isolated from Jabong Island in Yeosu in the middle of August, 2005. The surface water temperature at the sampling site was 25°C, and salinity was 33.1 psu. The specimen was somewhat large in size and was longer than its width. The shape was close to being ovoid, with an apical horn. This study discovered cells with colorless and transparent ingested chain-forming *C. polykrikoides*. However, this species was not abundant, implying low grazing impact on *C. polykrikoides*.

Key Words : *Cochlodinium polykrikoides*, Feeding, *Protoperidinium*, Red tide, Yeosu

It is understood that the genus *Protoperidinium* should provide insights into a wide range of distribution and food species in waters<sup>1-4)</sup>; in particular, the rapid occurrence of dominant species during dense blooms of dinoflagellates and diatoms<sup>1,5)</sup>. As indicated by their eco-biological magnitudes, they may be important members of planktonic food webs. Several researchers have reported interaction between *Protoperidinium* and a number of species of red tide dinoflagellates in cultures<sup>4,6,7)</sup>.

In 2005, potentially harmful dinoflagellate *Cochlodinium polykrikoides* was first occurred on July 18 and disappeared on September 12 in the Yeosu waters of South Sea of Korea ([www.nfrdi.re.kr](http://www.nfrdi.re.kr)). Jeong et al.<sup>8,9)</sup> reported that ciliate, *Strombidinopsis jeokjo*, and heterotrophic dinoflagellate, *Polykrikos kofoidii*, acted as prey for *C. polykrikoides*. However, the observation of the feeding behavior of *Protoperidinium* on *C. polykrikoides* has not been described.

The specimen was found using a light microscope in the coastal water of the Jabong Island in Yeosu, in the middle of August, which was in the phase of a blooming period by *C. polykrikoides*. The surface wa-

ter temperature at the sampling site was 25°C, and salinity was 33.1 psu.

Fig. 1 showed the feeding of *Protoperidinium* on multi-chain forming *C. polykrikoides* in nature. On the basis of morphological features under a light microscope, the cell was found to be somewhat large in size and was longer than its width. The shape was close to being ovoid. The apical portion included an apical horn. Since the cell is almost colorless and

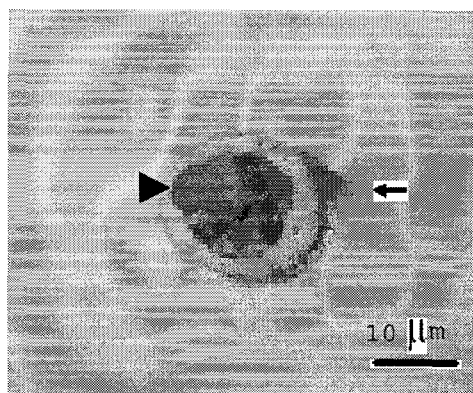


Fig. 1. Feeding of *Protoperidinium* sp. isolated from Jabong Island, Yeosu, on August, 2005, on chain-forming *Cochlodinium polykrikoides*. The arrowhead refers to ingested *C. polykrikoides* by *Protoperidinium*. The arrow represents the portion of the apical horn.

transparent, partly ingested food (chain-forming *C. polykrikoides*) can be seen within it.

According to feeding mechanisms observed in previous papers, most *Protooperidinium* used the pallium and feeding veil fed on food organisms<sup>4,6,10,11,12</sup> In this role, *Protooperidinium* began feed on prey larger than itself, resulting in a higher growth rate than dinoflagellates<sup>4</sup>. Possibly, *Protooperidinium* sp. isolated in Yeosu waters, had higher ingestion and clearance rates on chain-forming *C. polykrikoides* than those of single cells. However, during the period of the blooms caused by *C. polykrikoides*, this species was not abundant ( $\leq 1$  cell ml<sup>-1</sup>). It is assumed that this species has a significantly lower grazing impact on *C. polykrikoides* than that of *S. jeokjo* described by Jeong et al.<sup>8</sup>).

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