Notes

An examination for the protozoan parasite, *Perkinsus* sp. in the pearl oyster, *Pinctada fucata martensii* (Dunker) from the southern coast of Korea

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*Perkinsus* spp. are protozoan pathogens which can cause mass mortality in commercially important bivalves including the American oysters, *Crassostrea virginica*, the Manila clams, *Ruditapes philippinarum*, scallops, *P. decussatus*, pearl oysters, *Pinctada maxima* and scallops, *Patinopecten yessoensis* (Mackin et al., 1950; Andrews and Hewatt, 1957; Choi et al., 1989; Norton et al., 1993; da Ros and Canzonier, 1985; Blackbourn et al., 1998). The pathogen is now suspected to be the cause of current heavy mortality in the Manila clam *Ruditapes philippinarum* on the south and west coasts of Korea. Hamaguchi et al. (1998) also reported the occurrence of *Perkinsus* sp. in Manila clams, *R. philippinarum* inhabiting Kumamoto and Hiroshima, Japan.

Since 1994, the cultivation of pearl oysters in Korea has been increasing, and about 60 million individual pearl oysters were produced from 80 ha of pearl oyster farms in 1997. This mortality resulted in a 50% decrease in the pearl oyster population during 1996 and 1997 in Japan (Miyazaki et al., 1998). The pathogen responsible for the mortalities is reported as a virus (Miyazaki et al., 1998; Miyazaki et al., 1999) although some unconfirmed reports claim that *Perkinsus*-like organisms may be associated with these current mortalities. Norton et al. (1993) also reported the occurrence of *Perkinsus*-like organisms in pearl oysters, *P. maxima* from the Torres Strait, Australia. These researchers observed *Perkinsus*-like organisms in the connective tissue of 3/14 oysters examined with the histologically, although they were unable to detect the parasite with the FTM technique. However, Goggin and Later (1987) found *Perkinsus* sp. in the pearl oysters, *P. margaritifera* and *P. sugillata* cultured in FTM.

Korean pearl oyster farmers import 1 to 4 million spats and brood stocks from Japan for industrial purpose, and are very concerned about current mass mortality in Japanese
pearl oysters although there are no mass mortalities of the pearl oysters reported yet in Korea. The present study examines the existence of *Perkinsus*-like organisms in pearl oysters, *P. fucata martensii* that are commercially raised in the coastal area of Tongyong, one of the major pearl oyster production centers in Korea (Fig. 1).

Pearl oysters used in this study were one to two years old and were cultivated using the hanging method. A total of 206 pearl oysters were collected during September and November 1998. Ray’s fluid thioglycollate medium (FTM) technique and routine histological methods were applied. A piece of mantle tissue from each pearl oyster was placed in 10 ml FTM (a mixture of 20 g of NaCl, 29.3 g dehydrated fluid thioglycollate medium, and 1 L distilled water), fortified with nystatin and chloramphenicol as antibiotics, and incubated for two weeks at room temperature. After incubation, mantle tissues were stained with Lugol’s iodine and examined under a microscope for the presence of *Perkinsus*-like organisms. For histological examinations, a cross-section of the body was made from the pearl oyster and fixed in Bouin’s solution. After dehydration, tissues were embedded in paraffin, sliced to 5 µm thickness and stained with Harris’ hematoxylin and Eosin Y. Sections were examined microscopically for the presence of *Perkinsus*-like organisms.

A total of 206 pearl oysters were examined and none of the pearl oysters cultivated in FTM showed hypnospore-like particles in their tissues. Examination of histological preparations of pearl oyster mantles, gills and visceral mass also did not detect *Perkinsus*-like organisms. In conclusion, *Perkinsus* does not appear to be associated with pearl oysters currently cultivated in Tongyoung where the pearl oysters are intensively cultivated although *Perkinsus* sp. has been reported from the Manila clam in Korea (Choi et al., 1997; Park et al., 1999). It is believed that *Perkinsus* sp reported in Korea has a host selectivity and possibly they are limited to the Manila clams (Choi and Park, 1997). Miyazaki et al. (1998, 1999) have reported that the current mortality in the pearl oysters reported in Japan is associated with an emergent virus, not *Perkinsus*-like organisms.

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References


