

Akoya Oyster Disease- Disease Card¹

by

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Pathogen information

1. causative agent

- 1.1. pathogen type: unknown
- 1.2. disease name and synonyms: akoya oyster disease
- 1.3. pathogen common name and synonyms: none
- 1.4. taxonomic affiliation
 - 1.4.1. pathogen scientific name: unknown
 - 1.4.2. phylum, class, family etc...: unknown
- 1.5. description of the pathogen: -
- 1.6. authority: Miyazaki T., Goto K., Kobayashi T., Kageyama T., & Miyata M. (1999). Mass mortalities associated with a virus disease in Japanese pearl oysters *Pinctada fucata martensii*. *Dis. Aquat. Org.*, 37, 1-12. This is the only published literature that describes the causative agent (a virus isolated from diseased pearl oyster using fish cells) specifically. However, no one, other than the authors, successfully isolated the virus, and no genetic data nor antibody have been provided by the authors so far, and hence, the true nature of the causative agent is still uncertain.
- 1.7. pathogen environment: marine waters

2. modes of transmission

- 2.1. routes of transmission: horizontal
- 2.2. life cycle: unknown
- 2.3. associated factors: the disease occurs at high water temperatures(above 20 °C)
- 2.4. additional comments: -

3. host range

- 3.1. host type: Japanese pearl oyster (akoya oyster)
- 3.2. host scientific names: *Pinctada fucata martensii*
- 3.3. other known or suspected hosts: unknown
- 3.4. affected life stage: at least one year old oyster or older

¹ K. T. Wada (2003). Okoya oyster disease-disease card. Developed to support the NACA/FAO/OIE regional quarterly aquatic animal disease (QAAD) reporting system in the Asia-Pacific. NACA, Bangkok, Thailand. 3 pp.

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3.5. additional comments: Susceptibility may vary with strains or subspecies.

4. **geographic distribution**

4.1. region: The southwestern part of Japan.

4.2. country: Japan

4.3. additional comments: -

Disease information

1. clinical signs and case description

1.1. host tissues and infected organs: Since the aetiological agent is still uncertain, the primary target tissues or organs for the causative agent are also unknown.

1.2. gross observations and macroscopic lesions: The affected oysters are stunted, and the whole soft tissues are atrophied. The color of the adductor muscle exhibits yellowish-red, whereas that of healthy oysters is cream-white.

1.3 microscopic lesions and tissue abnormality: In the mantle, the loose connective tissue is degenerated and the number of host cells, many of which are presumably migrating cells, is markedly increased. The adductor muscle is also invaded by many cells, and the connective tissue stroma increases, dividing muscle fibers into many smaller bundles, which are clearly visible with a low magnification.

1.4 OIE status: Not listed

2. social and economic significance: Since the emergence of this disease is noticed in 1994, it has given marked economic losses to the pearl culture industry in the southwestern Japan.

3. zoonotic importance: No such case has been reported.

4. diagnostic methods

4.1. screening methods

4.1.1. level I: none

4.1.2. level II: none

4.1.3. level III: none

4.2. presumptive methods

4.2.1. level I: High mortality, particularly in summer to autumn. Atrophy of the soft tissues. Yellow or red coloration of the adductor muscle.

4.2.2. level II: Observation of histopathological changes in the mantle and adductor muscle, as described in "Disease information 1.3.". For histological observation, the adductor muscle should be detached from the shell with a thin metal scraper without widely opening the shell, so that the adductor muscle would not artificially broken. Fix pieces of the mantle and adductor muscle in Davidson's solution overnight and process for routine paraffin histology.

4.2.3. level III: none

4.3. confirmatory methods

4.3.1. level I: none

4.3.2. level II: none

4.3.3. level III: none

5. control methods: Since the causative agent is still unknown, and since the pearl oysters are cultured in open sea, there is no efficient control method available. However, moving the pearl oysters into areas where the water temperature is lower during summer to autumn months may reduce the mortality by this disease. Transplantation of the pearl oysters from areas where the existence of the disease is suspected, should be prohibited.

Selected references

Kurokawa T., Suzuki T., Okauchi M., Miwa S., Nagai K., Nakamura K., Honjo T., Nakajima K., Ashida K. & Funakoshi S. (1999). Experimental infection of a disease causing mass mortalities of Japanese pearl oyster *Pinctada fucata martensii* by tissue transplantation and cohabitation. *Nippon Suisan Gakkaishi*, 65, 241-251.

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