

High biomass and production rate of mesozooplankton in Honjo District, an enclosed brackish-water body in Lake Nakaumi, Japan, with special reference to the potential use of them as food for fish seed production

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#### Summary

Coastal lagoons, Lake Shinji and Lake Nakaumi, are the largest brackish-water ecosystem remaining in Japan at present, although this area has been exploited for decades to produce new agricultural land. Honjo District, a northwestern corner of Lake Nakaumi, was enclosed with banks for future reclamation, but the actual reclamation was temporality suspended, because of strong civil movements against this project. In order to maintain Honjo District as a water body, the economic value that this area possesses should be added. One of the options for this purpose is proposed here, i.e. a plan to use of mesozooplankton in Honjo District as food for fish seed production.

The feasibility of this plan was assessed based on results from 2-year, monthly investigations to measure environmental conditions and zooplankton. Although zooplankton showed remarkable seasonal fluctuations, their overall mean abundance ( $37.2 \times 10^4$  indiv.  $m^{-3}$ ), biomass (71.0 mg C  $m^{-3}$ ) and production rate (17.6 mg C  $m^{-3} d^{-1}$ ) were the world highest, to our knowledge, in Honjo District. In particular, copepods, suitable diet for fish larvae, were dominant constituents (mean: 83.4% of total biomass). Our conservative assumption, i.e. exploiting 10% of daily zooplankton production (or ca. 2.5% of biomass), show that Honjo District enables to produce seeds of 5.6 million red sea bream (*Pagrus major*) or Japanese flounder (*Paralichthys olvaceus*), and 15.4 million ayu (*Plecoglossus altivelis*) annually. Hence, we conclude that Honjo District provides a suitable site for our proposed plan to use zooplankton therein as food for fish seed production.