1981

Preliminary studies on predicting the setting season of oysters for the benefit of shellfish farmers

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Preliminary studies on predicting the setting season of oysters for the benefit of shellfish farmers

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A spatfall forecasting program was started on April 1981 at Himamaylan River, Negros Occidental. The forecasting program consists of two main activities: monitoring of daily counts of oyster larvae in the plankton; and monitoring of actual setting of oysters on standardized collectors put in the vicinity of oyster-farm sites. For monitoring the counts of oyster larvae in the plankton, horizontal plankton-tows were conducted daily at three sampling stations. Actual setting of oyster larvae was monitored with the use of test-collectors consisting of oyster shells of the same species. In one series, the collector-string is left in the water from Monday to the next Monday, while in the other series the string was left from Friday to Friday. Upon retrieval the number of oyster spat that settled on the inner surface of each of the thirteen oyster shells was counted. Settlement of barnacles was also noted.

Peaks in the abundance of planktonic mature larvae (eye-spotted larvae + ready-to-settle larvae) and the corresponding spatfall periods are presented in Figures 1 and 2. Major periods of spatfall are usually preceded by a count of at least five mature larvae. The highest recorded count of mature larvae was 247 per 100-liter sample on September 2, 1981. This resulted in a set of 1,307 spat on 13 oyster-shell collectors (or 101 spat/shell) between September 1-7. A week earlier, larval counts ranging from 19-45/100-liter sample which persisted for four days yielded a spat set of 2,423 spat on 13 oyster-shell collectors between August 24-31 (or 186 spat/shell). Approximate surface area of each shell is 40 square centimeters. Spatfall of oysters was generally good throughout the months of July, August and September.

These initial results from 1981 may not be definitely conclusive for formulating a spatfall forecasting formula but a few general observations can be made. When the count of mature larvae exceeds five/100-liter sample and persists for at least three days, spatfall may be expected to occur very soon. This spatfall period of oyster larvae may last up to one month, so that the best strategy to be used in collecting oyster spat would be to spread out spat-collection efforts over the spatfall period instead of putting out collector materials all at the same time. In Japan, counts of mature larvae of at least 15/100 liter sample would indicate poor spatfall of oysters (Wisely, 1978).

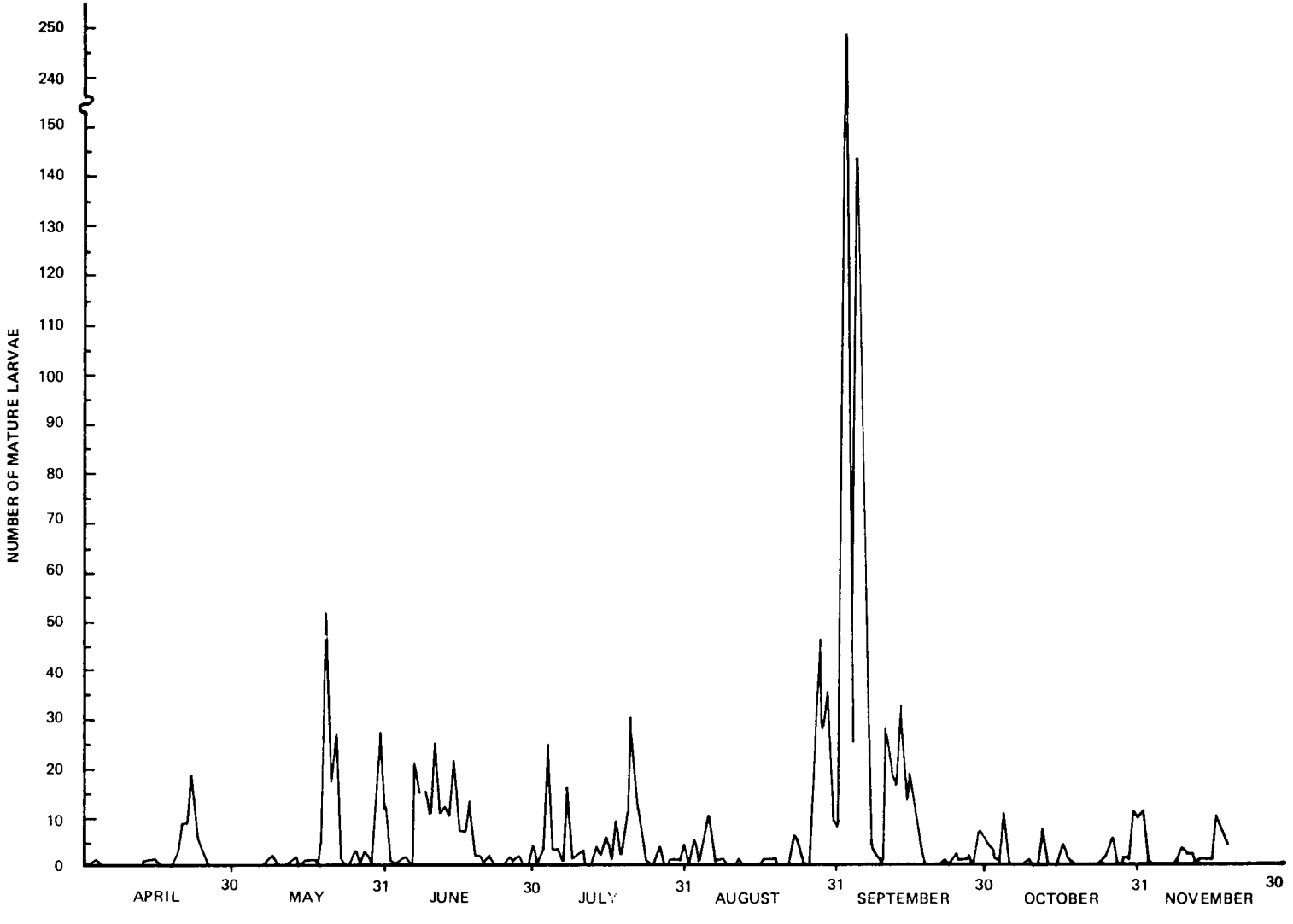

Fig. 1. Abundance of oyster larvae in the plankton from April – November 1981. (Himamaylan, Negros Occidental).

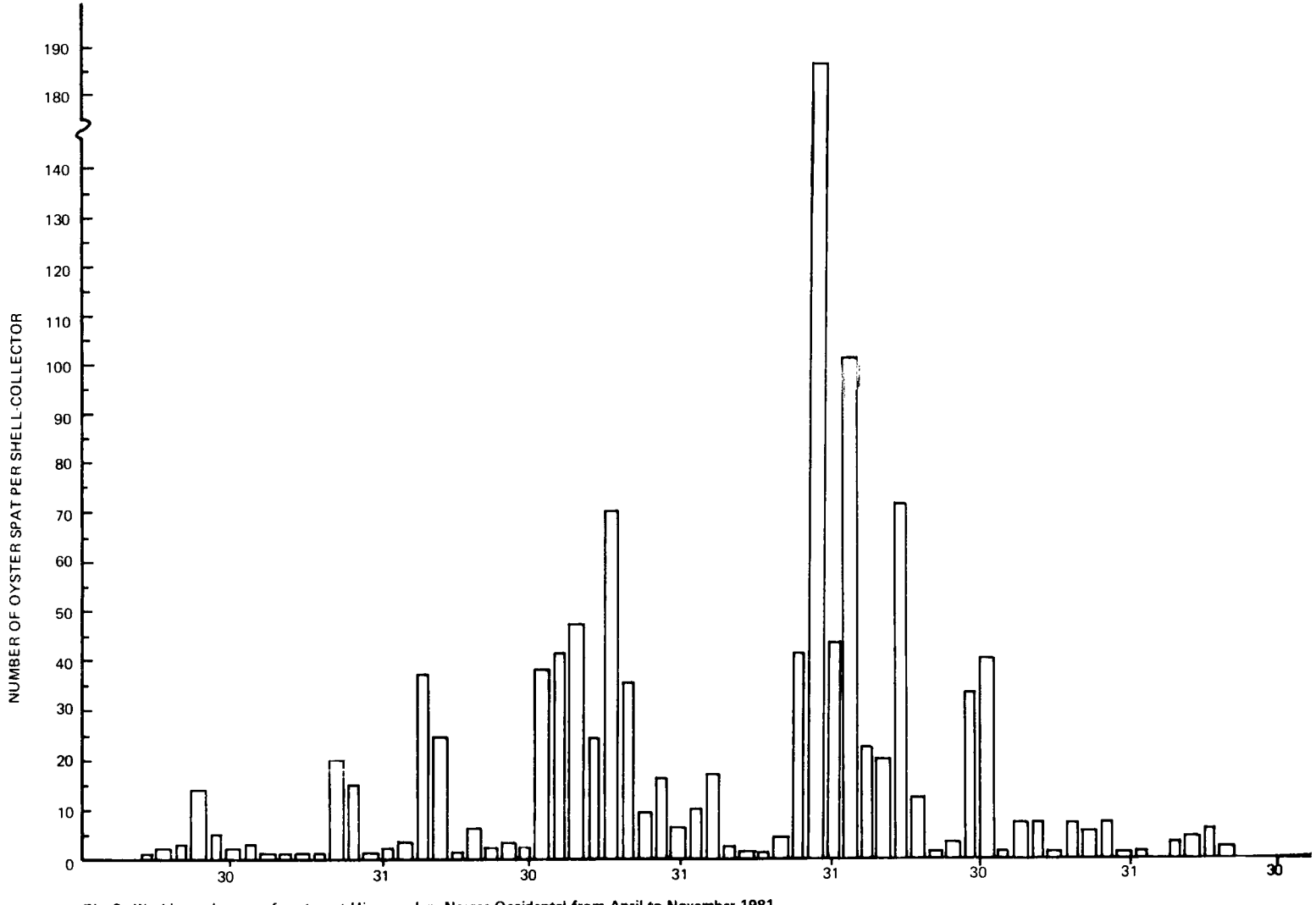

Fig. 2. Weekly settlement of oysters at Himamaylan, Negros Occidental from April to November 1981.

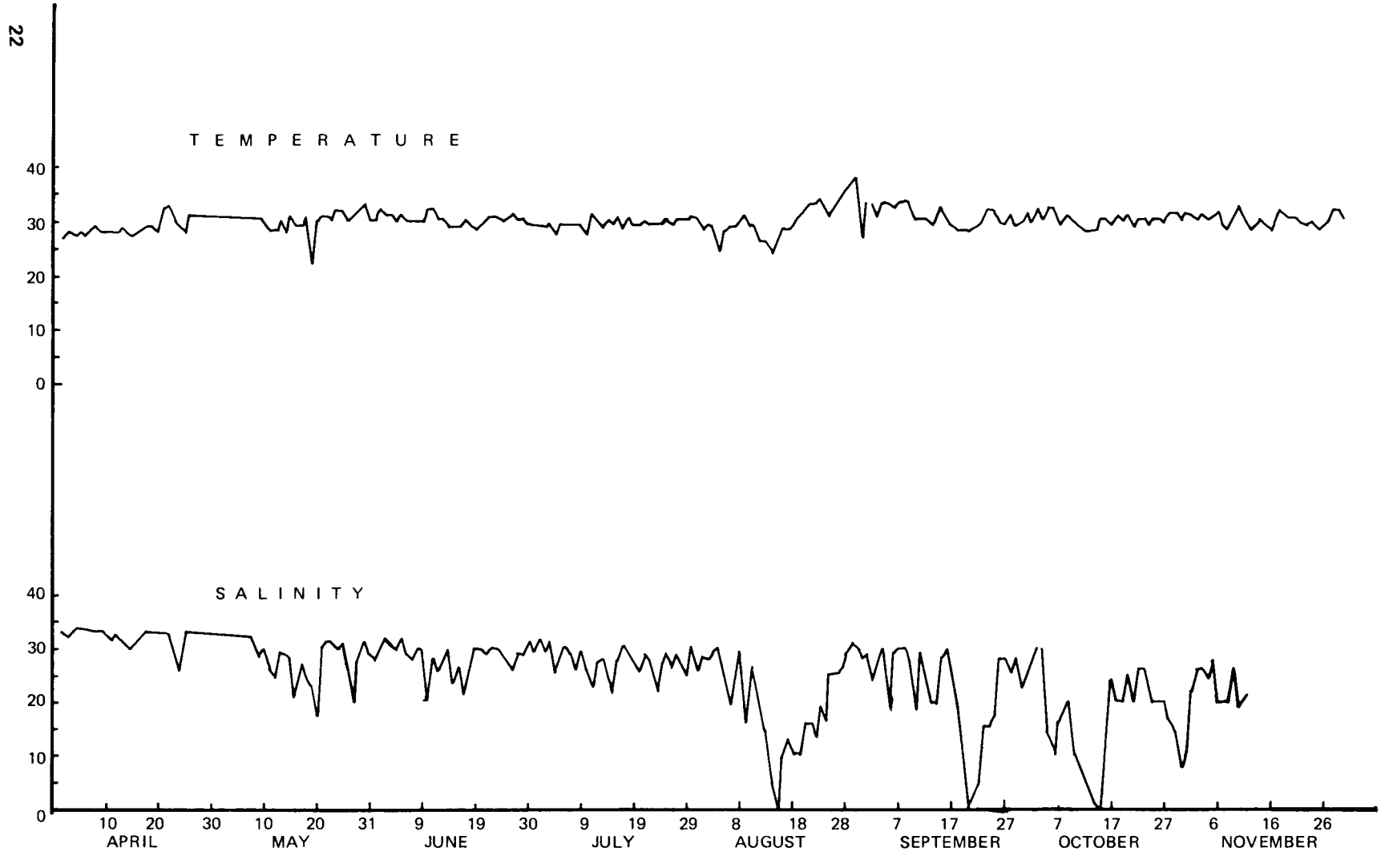

Fig. 3. Temperature and salinity conditions at Himamaylan River, April--November, 1981.

Initial forecasts of oyster spatfall may also be made from counts of non-eyed larvae in the plankton. Since the duration of each of the larval stages of the Philippine oyster *Crassostrea iredalei* have been determined from laboratory-rearing of larvae (Ver 1981), an initial prediction may be made the moment a large population of non-eyed larvae is encountered. This initial prediction may be confirmed, and a more accurate forecast made, once the mature larvae start increasing in number. Large populations of young larvae do not always result in a good spat set, however, as sudden drops in temperature or salinity could easily cause eventual mortality of the larvae. Water temperature and salinity data at Himamaylan River for 1981 are presented in Figure 3.

For a commercial farming operation in the Philippines, a good or substantial set of oyster larvae should yield at least ten spat/shell (surface area 40 sq cm). In Japan, a set of 200 spat/shell (scallop) is considered a good catch. Of these, about 50-60 oysters should survive to grow to a size of 1.0-1.5 cm within a month; in turn, if 15-20 of these survive to harvest-size, then the crop is considered satisfactory.

Literature cited:

Ver, L.M., 1981. Early development of *Crassostrea iredalei* with notes on the structure of the larval hinge. Masteral thesis, University of the Philippines, March 1981. 60 p.

Wisely, B., R. Okamoto and B.L. Reid, 1978. Pacific oyster (*Crassostrea gigas*) spatfall prediction at Hiroshima, Japan 1977. Aquaculture 15(3): 227-242.