

# Notes on the biology of *Lima hians* in the Northern Adriatic Sea

by

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Biocenological studies of the most northern part of the Adriatic Sea [VATOVA 1935, 1949; GAMULIN-BRIDA, 1967] and recent studies of the Center for Marine Research at Rovinj indicated that the bivalve *Lima hians* (Gmelin), which is distributed in patches in the Bay of Venice at depths of 30-37 m, is normally found in detritic, mud-sand bottom communities. Due to the abundance of this species, a special zooecosis *L. hians* was established near Rovinj by VATOVA [1935]. *Lima inflata* (Chemnitz), a closely related species, was also found at the same localities, but always in small numbers.

Our recent observations along the west Istrian coast have shown that the relative abundance of *L. hians* diminishes northwards; no specimens were encountered in our samples taken at Piran. On the other hand, *L. inflata* was observed frequently in this region, while its abundance diminished southward. It is obvious, therefore, that the areas of distribution of both species overlap (Fig. 1). The ecology of both species has not been established well enough to evaluate properly the influence of environmental factors affecting their distribution.

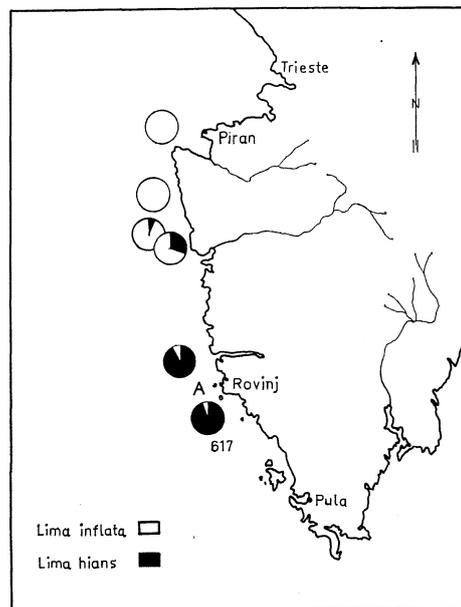


FIG. 1. — Distribution of the sample stations in the northern Adriatic Sea.

Because of the abundance and ecological importance of *L. hians* near Rovinj, we initiated a four year study of their life history. Gonadal development was observed and plankton and bottom samples were taken in order to establish the time and intensity of recruitment of *L. hians* into the population.

Histological examination of gonad tissues from a few specimens was made at infrequent intervals and the stages of gonadal development were classified into the categories described by CHIPPERFIELD [1953] & LUBET [1959] for mussels. Sex is easily distinguished macroscopically by the color of the gonads, which are white in males and red in females. No observations were made on gonadal development in *L. inflata*. Partially spawned and ripe animals were observed in mid-January, mid-March, late June and early August. Completely spawned females with a few retained eggs were noted in mid-March, late June and early August. The gonad of one male was observed to be in an early developmental stage in early November. Consequently, it appears that *L. hians* is sexually active throughout almost the entire year. Our observations of gonadal development were few in number and the results, therefore, cannot be considered conclusive.

Plankton samples were taken to determine time of appearance of larvae of *Lima* into the water column (fig. 2). Samples were taken approximately every 10 days from 1967 to 1970 at Station A<sub>1</sub> near Banjole Island (1 mile from shore) by vertically hauling a plankton net from the bottom (30 m) to the surface. *Lima* larvae, with lengths ranging from 143  $\mu$  to 357  $\mu$ , were present in the samples throughout the year. An abundance of larvae smaller than 214  $\mu$  was recorded in March, June, July, August, October and December 1968 and 1969. The appearance of a large number of small larvae in the plankton apparently followed a recent spawning of *Lima*. In early July 1967 90 larvae of various sizes were noted in one sample. It appears that the main spawning season of *Lima* in the region of Rovinj occurs in late spring and summer, but occasionally spawning does occur in other seasons. Because of their close resemblance in shape and size in the planktonic stages, the larvae of *L. hians* and *L. inflata* could not be positively identified as to species.

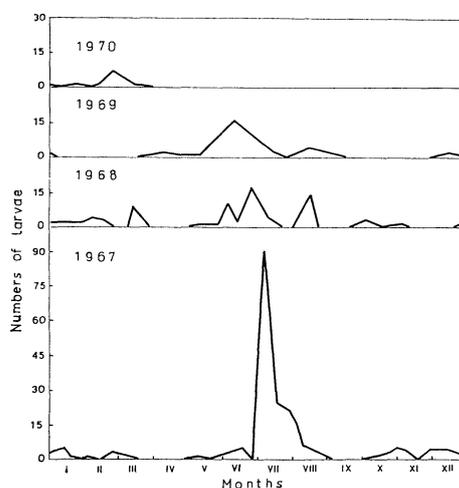


FIG. 2. — Frequency of *Lima* larvae in the plankton at the Station Banjole Island from 1967 to 1970.

There is evidence of diurnal migration of *Lima* larvae in the region studied. In plankton samples taken during the day at 11 a.m. in July and August 1968 and June 1970 *Lima* appeared in the water column from the bottom (about 30-34 m) to 15 m depth, while on moonless nights at 11 p.m. they were present in the whole water mass from the bottom to the surface.

To establish the time of most intensive recruitment of *Lima* into bottom communities samples were taken monthly from 1967 to 1969 with a Van Veen grab and Riedl dredge at Station 617 (4 nautical miles SW from Rovinj). Large numbers of recently set *Lima* were never found in the community studied, but young specimens of *Lima* (5-10 mm) were found in the spaces of a large ball-like conglomerate of *Murex* eggs and under the stones near the shore about 5-10 m depth.

The largest specimen of *L. hians* found was 36 mm in length and 21 mm in width, while the majority of *L. hians* were about 27 mm long and were noted almost every month of the year. A general mortality of animals greater than 27-30 mm appears to occur. The age of animals 30 mm long could not be determined with the data available. It would be desirable to follow the growth of *Lima* trapped in small net boxes exposed in the field.

Investigations of the biology and recruitment of *L. hians* and *L. inflata* in benthic communities in the northern Adriatic are being continued.

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