

POPULATION DYNAMICS AND REPRODUCTION BIOLOGY OF DONAX MARINCOVICHII (COAN 1983) FROM “PLAYA JAHUAY” (PERU)

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ABSTRACT

Bivalves of the genus *Donax* are commonly dominating the macrofauna of exposed sandy beaches (Ansell 1983). The family is worldwide distributed and comprises 64 species. At “Playa Jahuay” (S13°24'33, W76°11'49) located 180km south of Lima a dense population of *D. marincovichii* is present since decades. During a one year study monthly samples are taken to analyse the population dynamic. First results indicate distinct cohorts. Histology carried out will be carried out to analyse the reproduction cycle of this species showed separate sexes and no hermaphrodites.

INTRODUCTION

The wide sandy beaches of Peru are inhabited by three *Donax* species. *D. obesulus* and *D. asper* occur in the North of Peru, whereas the numerically dominating *D. marincovichii* (Fig. 1) is distributed along the entire coast of Peru. The latter presents a valuable and important resource for the artisanal fishery. At beach “Jahuay” (180km south of Lima) one of the most abundant populations occurs. The aim of this one year study is to estimate abundance, biomass, reproduction and recruitment of the natural stock to provide basic knowledge for the local fisheries and management.

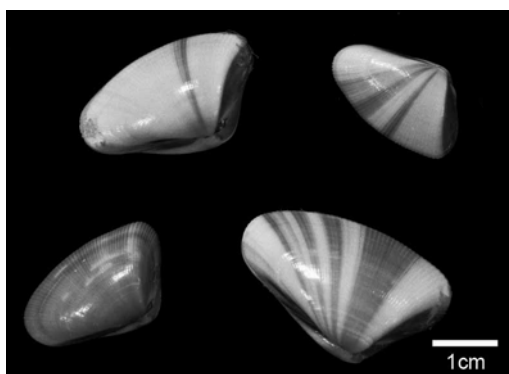


Fig. 1: *D. marincovichii* (Coan 1983) dominating exposed Peruvian sandy beaches.

MATERIAL AND METHODS

Samples are taken monthly with a hand operated corer (192cm², 20cm sediment depth) at the lower intertidal and upper subtidal of “Playa Jahuay” during spring low tide. The beach profile is documented following McLachlan (2005) as well as temperature recorded. Abundances are calculated and wet mass, dry mass and ash free dry mass estimated. Clams are measured to the nearest 0.1mm (anterior-posterior shell length). Monthly a number of 35 animals are fixated in formalin (4%) for histological examinations and further classification into four development stages (cytolyzed, inactive, active and spawning) after de Villiers (1975).

RESULTS

Jahuay is classified as exposed and reflective beach. Length-frequency plots of the first months showed clear cohorts (Fig. 2). In December 2006 the cohort maxima were at 13 and 19mm (and at 28mm). These were followed during the successive months. The maximum density was 1900

individuals/m² declining in 2007. Length ranges between 1 to 34.2mm. First results of the histological examination reveal separated sexes and no hermaphrodites.

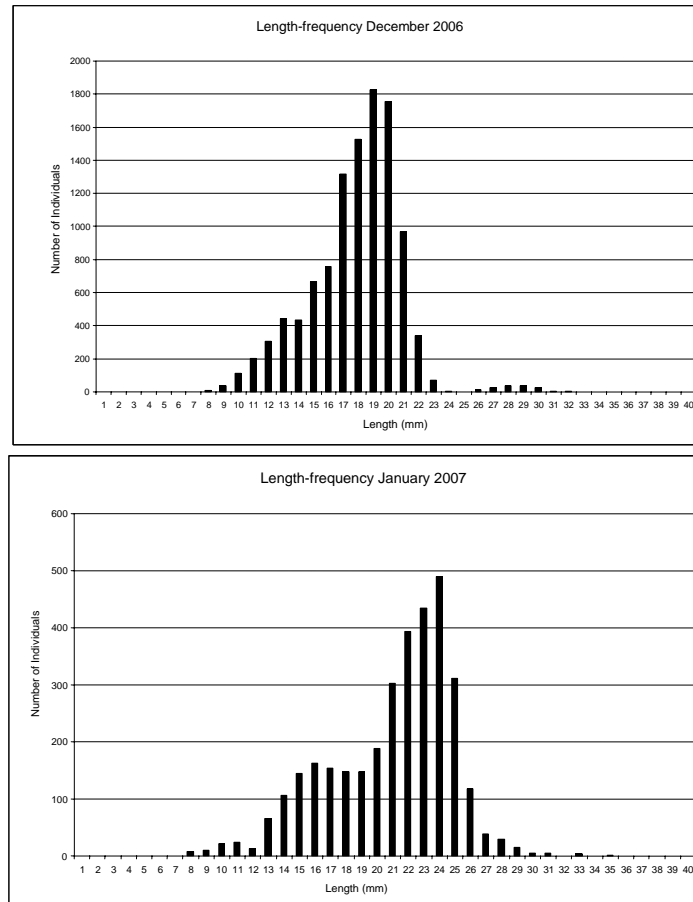


Fig. 2: Length-frequency of *D. marincovichi* from "Palya Jahuay", (Peru), December 2006(n=10,937) and January 2007 (n=3341).

CONCLUSIONS

The beach can be identified as a typical exposed dynamic habitat commonly inhabited by the genus *Donax*. *D. marincovichi* occurs in a dense population with two clear cohorts traceable over the sampling year. Estimations of the biomass and histological classification by light microscopy will be carried out to correlate this information with the recorded temperature data. The maximum shell length of 34.2mm is exceeding the maximum size reported by Coan (1983).

REFERENCES

- Ansell, A.D. (1983). The biology of the genus *Donax*. In: McLachlan, A., Erasmus, T. & Junk, W. E. (Eds.) *Developments in Hydrobiology. Sandy Beaches as Ecosystems*. Junk, 19: 607–635.
- Coan, E. (1983). The Eastern Pacific Donacidae. *Veliger* 25 (4): 273-298.
- De Villiers, G. (1975). Growth, population dynamics, a mass mortality and arrangement of white sand mussels, *Donax serra* Röding, on beaches in the south-western Cape Province. *S. Afr. Sea Fish. Branch. Invest. Rep.* 109: 1–31.
- McLachlan, A. and Dorvlo, A. (2005), Global patterns in sandy macrobenthic communities. *J Coast Res* 21: 674–687.