

Reproductive cycle of the Argentinean surf clam *Donax hanleyanus*

(Philippi, 1847) (Bivalvia:Donacidae)

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Fig. 1: *Donax hanleyanus*

Introduction

Donax hanleyanus (Phillipi, 1847) is a free-spawning surf clam inhabiting exposed intertidal sandy beaches from Rio de Janeiro, Brazil ($22^{\circ}51'S$)^[1] to Mar del Plata, Argentina ($38^{\circ}20'S$)^[2].

Its reproductive cycle was investigated at Santa Teresita, Mar de las Pampas and Faro Querandí from November 2004 to September 2005. Gonadal development was monitored monthly analyzing histological sections ($N = 978$), condition indices, number and sizes of oocytes.

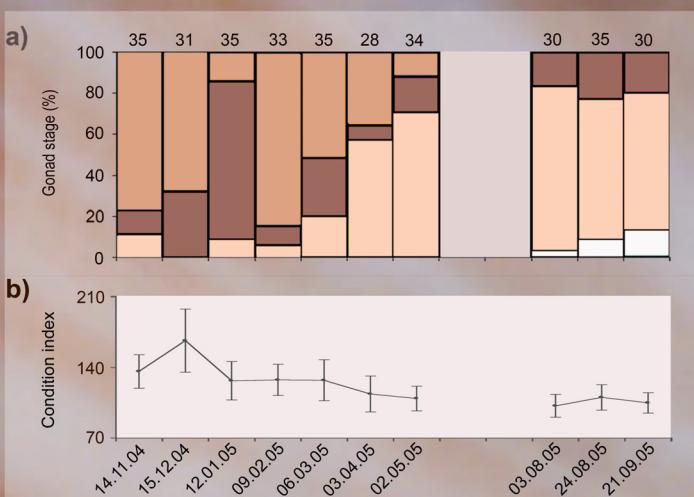


Fig 2: *D. hanleyanus* of Mar de las Pampas. a) Distribution of gonad stages: ■ cytolytic, □ inactive, ■ active, ■ spawning, N above bars. b) Mean condition index of monthly samples.



Fig. 3: Mean SST of Mar de Ajó and Mar del Plata (red) and the percentage of gonad stages of proliferation (active and spawning) at Mar de las Pampas (blue).

Reproductive cycle

- *D. hanleyanus* attains first maturity at 11.18 mm antero-posterior length.
- Sex ratio is 1:1, hermaphroditism was not recorded.
- Clams are sexually active from November to March and inactive from April to September at all three sites.
- Absolute gonadal inactivity was not observed.
- Females at Mar de las Pampas showed an extended period of gonadal activity (November to May).
- The condition indices and the number of oocytes support the histological results.
- Oocytes are ripe when they achieve a diameter exceeding 38 µm (up to 83.5 µm).

Sea surface temperature (SST)

- SST is oscillating between 9.75 °C and 21.45 °C throughout the year.
- Reproductive activity is positively correlated with SST ($R^2 = 0.96$).

Discussion and Conclusion

- Earlier studies of the reproductive cycle of *D. hanleyanus* from Mar del Plata described shorter spawning seasons. This suggests that environmental factors affect the reproductive season^[2].
- Spawning season is during summer as described for *D. serra* of the Benguela upwelling system^[3]. It remains unclear why female gonadal activity is prolonged.
- Condition index indicates spawning. However unfavourable environmental conditions like starvation and hydrodynamic processes impact clam conditions in the same way. Therefore histological validation is needed.
- Histology proved discontinuous annual reproductive cycle related to SST. This suggests that there are further environmental factors, e.g. the abundance of food, which additionally influence the reproductive activity.

References

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