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°51'S) [1] to Mar del Plata, Argentina (38°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.

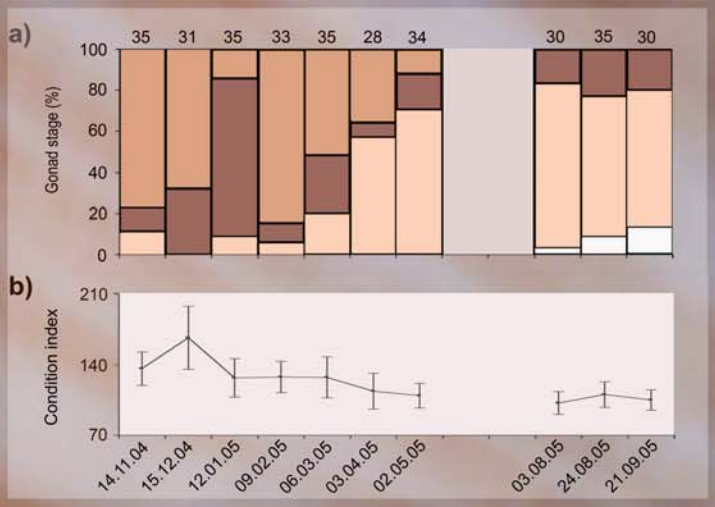

Fig 2: *D. hanleyanus* of Mar de las Pampas. a) Distribution of gonad stages: cytolysed, nactive, ctive, spawning, N above bars. b) Mean condition index of monthly samples.

Reproductive cycle

- *D. hanleyanus* attains first maturity at 11.18 mm anterior-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).

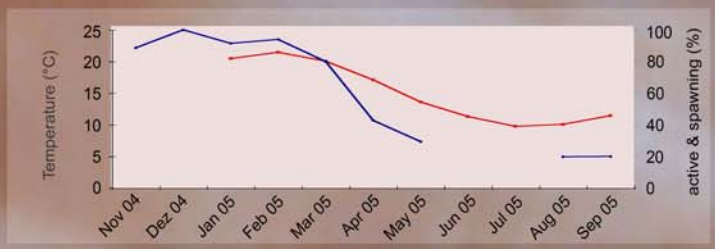

Fig. 3: Mean SST of Mar de Ajó and Mar del Plata (red) and the percentage of gonad stages of proliferation (active and spawning) at Mar de las Pampas (blue).

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 discontinous 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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