

Population structure of *Donax hanleyanus* (Bivalvia: Donacidae) on two sandy beaches on the Argentinean coast

Marko Herrmann^{1,2,*}, Jürgen Laudien¹, Wolf E. Arntz¹, Pablo E. Penchaszadeh²

Introduction:

Exposed intertidal sandy beaches are often dominated by bivalves of the family Donacidae (super family Tellinacea), constituted by the genera *Donax*, *Egeria* and *Iphigeni*. On a worldwide basis, Donacidae form by far the largest group inhabiting such highly dynamic environments. The surf clam *Donax hanleyanus* (Philippi, 1845), also known as “berberecho”, can be found along the Atlantic coast of South America, from Rio de Janeiro (Brazil) to northern Argentina, representing the southernmost distribution of the *D. hanleyanus*.

Material & Methods:

The population structure of *D. hanleyanus* was studied monthly at the dissipative, anthropogenically affected sandy beach “Santa Teresita” (36°32’S, 56°41’W) from December 2004 to December 2006 and at an exposed, nature protected sandy beach “Faro Querandi” (37°29’S, 57°07’W) from March 2005 until December 2006. Quantitative samples to determine abundances and growth parameters were taken from a series of stations (4m intervals) along a transect perpendicular to the shoreline from the spring tide high water mark to the low tide water mark. At each station, three replicates were taken to 35cm depth with a 0.16m² corer. The sand was sieved on a 1mm mesh. Maximum anterior-posterior length shell of each individual was measured to the lower 0.1mm with vernier callipers to obtain monthly length-frequency distributions.



Fig. 1: Map of the study sites “Santa Teresita” and “Faro Querandi”. Punta Mogotes is the southernmost distribution for *D. hanleyanus*.



Fig. 2: Alive sampled *D. hanleyanus*.

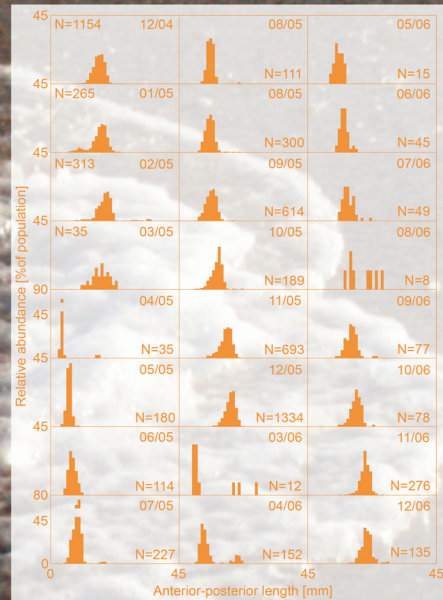


Fig. 3: Monthly length-frequency distribution of *D. hanleyanus* collected at “Santa Teresita” from December 2005 to December 2006.



Fig. 4: Monthly length-frequency distribution of *D. hanleyanus* collected at “Faro Querandi” from March 2005 to December 2006.

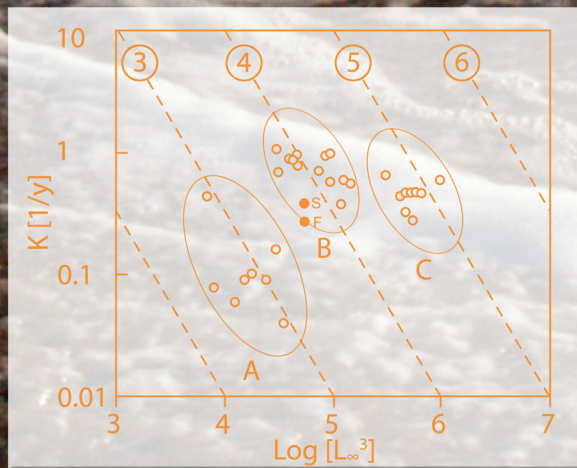


Fig. 5: Auximetric grid (according to [2]) comparing overall growth performance index $P = \log(K [L_{\infty}]^3)$ of several Donacidae (○) with Argentinean *D. hanleyanus* (●) from “Santa Teresita” (S) and “Faro Querandi” (F). Plot indicates three groups: A tropical/subtropical, B temperate and C upwelling species. Diagonal lines indicate equal values of P (numbers in circles).

Results:

A distribution subdivided in two belts was observed: recruits were found mainly during autumn in the middle swash zone, while juveniles and adults occurred across the tidal gradient up to the retention zone. Population density increased to 2475 individuals m⁻² in December 2004 at “Santa Teresita” and to 606 individuals m⁻² in June 2006 at “Faro Querandi”. Length frequency distributions indicated constant growth of the at least three co-occurring size classes.

Conclusions:

A von Bertalanffy growth function with a growth constant (K) of 0.75 yr⁻¹ at “Santa Teresita” (Fig. 5, S) and 0.59 yr⁻¹ at “Faro Querandi” (Fig. 5, F) and an asymptotic length (L_{∞}) of 42mm (observed) corresponding to an age of four years was established. The overall growth performance (OGP) index P was calculated by $P = \log(K [L_{\infty}]^3)$. OGP of Argentinean *D. hanleyanus* ($P = 4.7$ for “Santa Teresita” and $P = 4.6$ for “Faro Querandi”) corresponds well with values calculated from data set of [1] for the Uruguayan populations ($P = 4.5$). As was to be expected, our values fits with the pattern of the temperate species group in the auximetric grid (according to [2]).

References:

- [1] Defeo, O. (1996). Experimental management of an exploited sandy beach bivalve population. Rev. Chil. Hist. Nat. 69: 605-614
- [2] Laudien, J., Brey, T. & Arntz, W.E. (2003). Population structure, growth and production of the surf clam *Donax serra* (Bivalvia, Donacidae) on two Namibian sandy beaches. Estuar. Coast. Shelf Sci. 58S: 105-115
- [3] Penchaszadeh, P.E. & Olivier, S.R. (1975). Ecología de una población de ‘berberecho’ (*Donax hanleyanus*) en Villa Gesell, Argentina. Malacología 15: 133-146



* contact: Marko.Herrmann@awi.de

¹ AWI for Polar and Marine research Bremerhaven, Germany

² Lab. Inverte., Facultad de Ciencias Exactas y Nat., UBA, Argentina

