

## HCS010 - Genetic distances between *Donax marincovich* and *Donax obesulus* confirmed by morphological features

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Keywords: Donacidae, genetic taxonomy, sperm morphology, surf clams.

Surf clams of the genus *Donax* exist worldwide. They dominate sandy beaches in dense populations, occupy an important ecological role and are subject to artisanal and recreational fisheries in many countries. The taxonomy of Donacidae is controversially discussed resulting in 45 to 64 described species. High variations might be due to the large variability in shape, size and colour of the respective species. The taxonomic status of the two Pacific American Donacidae *Donax marincovich* and *Donax obesulus* is also not clear. Furthermore, little is known about the larval dispersal allowing gene flow among populations of these two "species". To clarify the taxonomic status and to obtain information on the genetic drift clams were collected at nine different Chilean and Peruvian exposed sandy beaches along their distributional range (18°27'53.8"S 70°18'24.3"W to 3°33'57"S 80°27'5"W). As a reference additionally *Donax asper* was collected from northern Peru and *Donax hanleyanus* from northern Argentina. 35 clams per beach were conserved with opened valves in 80% ethanol. A part of the muscle of the food was taken for DNA extraction using a commercial "Qiagen Dneasy" kit. Amplification was realized by partial cytochrome oxidase I (COI) sequences in order to estimate genetic distances between both putative species and to estimate the intraspecific gene flow along the coastline. Gained sequences were verified by BLAST-search in the gene bank (<http://www.ncbi.nlm.nih.gov/blast/>). Sequence data from the COI proved to be useful for species discrimination within the genus *Donax*: The taxonomic status of *D. asper* and *D. hanleyanus* is well supported (> 15% sequence divergence among each other and the two putative Humboldt Current species). However, there is no indication of reproductive isolation between *D. marincovich* and *D. obesulus* from the COI data. With only up to 1.2% sequence divergence, the divergence between the latter is in the order of known intraspecific variability in the COI gene (Held 2000). Therefore, the taxonomic status of two species must be questioned. No genetic differentiation between the geographically separated "*D. marincovich*" populations could be observed from the sequence data indicating gene flow in-between populations. In the future, molecular markers with higher resolving power (e.g. AFLP, Microsatellites) should be analysed.

Morphological features like shell length (anterior-posterior), height (ventral-dorsal) and width (left-right) (Laudien 2003) or sperm morphology deliver good possibilities for taxonomic investigations (Introini 2004). The comparison of these features can confirm the genetic results of this study.

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## HCS019 - The relationship between Peruvian anchovy reproduction and feeding; considerations of time and space in the feeding condition of reproducing anchovies

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Keywords: anchovy, feeding condition, reproduction, spawning

In this study we consider the relationship between the reproductive condition of the Peruvian anchoveta and stomach fullness, under the hypothesis that periods of higher reproduction reflect better feeding conditions for anchoveta. We explored data at two levels of spatial and temporal resolution; data on stomach contents and reproductive condition of anchoveta sampled during scientific surveys in summer 2000-2002 throughout the entire Peruvian coast and stomach contents and percentage of spawning females over three separate coastal regions (Paita, Chimbote and Callao), continuously collected between 1999 and 2004. Analysis of the first data set suggested an inverse relationship between stomach fullness and reproductive condition of females, which did not support the initial hypothesis. However, comparison of percentage spawning females and stomach fullness in each of the regions sampled suggested a possible time lag between periods of high stomach fullness and high reproductive intensity; although a

statistically significant time lagged correlation could not be found. Also, when the seasons were divided into reproductive (above a threshold level of spawning females) and non-reproductive periods, stomachs were significantly fuller during the reproductive periods suggesting that they reflect better feeding conditions. Establishing significant relationships between feeding and reproduction in continuous breeders such as anchoveta is a challenge and may require new methods of sampling, some of which are suggested here.

### **HCS024 - Predicting weight composition of fish diets for trophic foodwebs: converting frequency of occurrence of prey to relative weight composition**

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Keywords: fish diets, weight composition, frequency of occurrence

The growing importance of ecosystem-based assessment as a complementary approach to traditional single-species assessment has emphasized the importance of the availability of diet composition data. Diet compositions expressed in weight are essential to determine the trophic relationships between the compartments within a system. However, many fish diet composition studies provide the frequency of occurrence of prey in diets (often the case in historical studies), which is the percentage of fish stomachs analysed containing a particular prey item irrespective of the amount (in weight or numbers). In order to make use of such studies for modelling purposes, the objective of this study was to explore empirical relationships between the frequency of occurrence and the preferred index, relative weight composition. Diet composition data from stomachs were compiled from a number of sources (62102 stomachs), covering four broad areas such as the Northwest Atlantic, South Africa, West Africa and the Azores Islands in order to evaluate the general applicability of the results. The relationship between frequency of occurrence and relative weight was modelled using Linear Models (LM), which was highly significant and explained 74% of the variance in the data. Data were grouped according to categories (factors) such as the area, predator habitat, feeding type, predator size group, and prey type to study the effect of these factors in the empirical relationship. All factors were found to be highly significant except for predator habitat. Nonetheless, the value of including these factors was questionable, as they contributed to only small increases in explanatory power (less than 2% of variance explained). The clear exception to this is prey type, which should clearly be included in the empirical relationship. Various conversion equations are presented by prey type, which can be used as rough estimates of weight composition in fish diets, if the only available information is frequency of occurrence.

### **HCS036 - Predation by oystercatcher *Haematopus ater* in a rocky intertidal of central Peru**

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Keywords: oystercatcher; Peru; predation effects; rocky intertidal

**INTRODUCTION:** Predation is nearly a universal pressure affecting the structure of many intertidal communities. Most of the works have focused on the predatory effects of the more abundant and easily manipulating marine invertebrate species; however, terrestrial predators, particularly birds, may also exploit intertidal species. Because they often occur in small numbers, bird interaction strength has received comparative less attention. These vertebrates have fast metabolic rates, and their ability to exploit prey over large areas may be greater than that of slower-moving invertebrate predators; therefore, birds can play a significant role in structuring rocky intertidal communities, even when present in low abundance.

In this work we investigated predation of the oystercatcher *Haematopus ater* in a rocky intertidal of central Peru. The aims of this work are to identify the feeding preferences of oystercatchers, to estimate their predation rates, and to evaluate their potential effects on their prey populations.

**METHODS:** The study was conducted from May 2005 to March 2006 in a rocky intertidal of the Ancón Bay (11°46'S, 77°11'W), in central Peru. To determine foraging rate by oystercatchers, focal observations were performed using a 16 X 50 binocular. Data were collected from the early morning to the afternoon (before sunset) and saved in a portable tape recorder. Each bird was observed during 5-15 minutes identifying

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