

during December 2004 - 2005. During years 2003 and 2005, the GI was higher in Coquimbo than in Caldera. The anchovy CF showed the highest values during the last two years and in both regions, with 159.2 g/cm in Caldera and 151.2 g/cm, in Coquimbo (Fig. 1d).

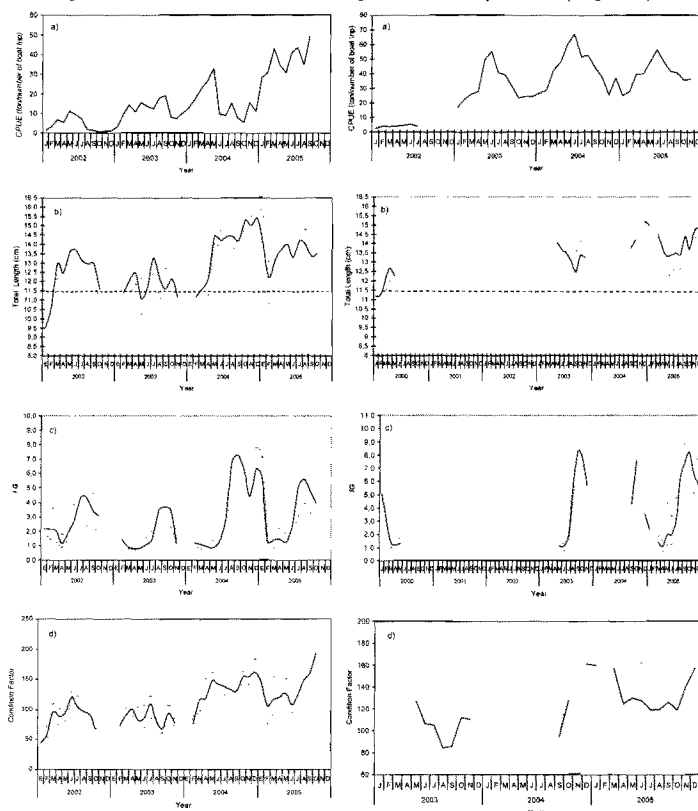


Figure 1. Time series of CPUE (a), median total length (b), Gonadosomatic Index (GI) and Condition Factor (CF) of Anchovy in Caldera (left) and Coquimbo (right), 2000 - 2005.

HCS139 - Morphological aspects of fish schooling: which traits are general across ecosystems, and which are local adaptations?

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Small pelagic fish, such as Engraulids, Clupeids and Carangids generally form schools throughout most of their life cycle. Structural patterns are common to all schooling fish species with e.g. coherent, synchronized movements and inter-individual attraction. Nevertheless, the overall morphology and structure of schools are extremely variable in shape and dimensions. What factors that determine the morphology of schools is an important issue in marine ecology, as school morphology could be used as an indicator of the population response to changing environmental conditions.

To explore the schooling phenomena we compare schooling patterns in two very different Clupeids: the Peruvian anchovy (*Engraulis ringens*) in the Humboldt Current ecosystem and the North Atlantic herring (*Clupea harengus*) in the Norwegian Sea ecosystem. These two species have distinct biology and behaviour, while living in exceedingly different environmental conditions in terms of temperature and oxygen range as well as interacting predator and prey species. However, they share an identical position in the middle of the food web being very effective planktivores and by far the most abundant and successful fish species within their respective ecosystems.

This study compares the morphology and structure of geographically distant and unrelated anchovy and herring schools in order to distinguish between common and differently evolved and specialised school characteristics. Quantitative data on important school features like dimension, shape and density has been collected from several acoustic surveys from Peru and Norway using similar methods with vertical echo sounders and multi-beam sonars linked to the physical and biological environment. The morphological differences between schools within and between species allow us to define those schooling patterns that typically vary from one species to the other and those which may be more basic and considered universal. We discuss the schooling concept by comparing two different ecosystems and we evaluate the use of school types as environmental indicators.

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