

## Implications of the use of otolith weight in the estimation of fish age

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To investigate the potential use of otolith weight and its associated problems, populations of three inshore benthic teleosts species of the genus *Serranus* were sampled from the Canary Islands between 1992 and 1996. The otolith weight increased with the age and the highest variability was observed in the oldest fish. The fish age was better discriminated by the otolith weight than by the fish size. In *S. cabrilla* and *S. scriba*, the relationship between otolith weight and fish age indicated a continuous growth of otolith weight with the age. The estimate of the fish age were similar when using otolith weight or otolith reading, being the maximum bias  $\pm 1$  year. In *S. atricauda*, however, it could not be possible to calculate one relationship between otolith weight and fish age due to a non-normal distribution of residuals. Nevertheless, for this case one solution was found by dividing the population into slower- and faster-growing individuals. Then, the estimate of the fish age by using otolith weight was also similar when using otolith reading, being the maximum bias  $\pm 1$  year. This methodology seems to be used for the first time and the results indicate that it might be applied to other species with similar ecological characteristics. Consequently, the otolith weight represent a valuable criteria as an age determination technique at least in these teleosts.

## Osteological development of *Bovichtus angustifrons* (Bovichtidae, Notothenioidei)

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*Bovichtus angustifrons* Regan belongs to one of the less advanced families of the notothenioids Bovichtidae, systematic position of which in the suborder Notothenioidei are discussed recently (Balushkin, 1992, 2000; Lecointre et al., 1998). We have held the study of the osteological development of *B.angustifrons* and comparative analyze of it with the morphogenesis and rate of osteological development of other species of more advanced families of the notothenioids (Voskoboinikova & Tereshchuk, 1991; Voskoboinikova, Tereshchuk, Kellermann, 1994; Voskoboinikova, 1997a, b, 1998; Voskoboinikova & Kellermann, 1997; Voskoboinikova, 1998). *B.angustifrons* is characterized by the following of ossification in general similar to the following of ossification of other notothenioids, that notes at the relationship between *Bovichtus* and other notothenioids and supports monophyly of suborder Notothenioidei. At the same time, *Bovichtus* has the highest rate of the osteological development among the notothenioids. Taking into consideration general tendency of notothenioids to decreasing of the rate of osteological development as increasing of their morphological advance, we consider high rate of the osteological development of *Bovichtus* as ancestral for the notothenioids, which promotes conservation of many plesiomorphies of that species (the structure of ecto-, meso- and metapterygoideum, quadratum, symplecticum, hyomandibulare, presense of teeth on the epibranchiale 3, relatively large size of cleithrum and small size of scapula, coracoideum and radialia, position of the scapular foramen, presence of two postcleitra and structure of the caudal skeleton).