Abstract

The southern blue whiting, Micromesistius australis (Norman, 1937), is an important demersal resource associated with the slope and continental shelf of southern Chile, Argentina and the Malvinas/Falkland Islands. Recent studies have reported schools of adult fish from Atlantic waters migrating along the southern Chilean coast in mid-winter, moving northwards to spawn in August (47º-51ºS), and then returning to Atlantic waters, presumably to feed. The migratory pattern suggests the presence of one or more stock units associated with the South American coast. In the present study, “otolith morphometry” is used to determine the stock structure of M. australis based on applications of basic size descriptors (SDs) (area, perimeter and otolith size), shape indices (SIs) (circularity, squareness, shape factor, roundness, ellipticity), and normalised elliptical Fourier descriptors (NEFDs). Samples were collected during the winter and spring of 2010, during the reproductive period, in the economic zone of southern Chile (36º-57ºS), in the Pacific Ocean and around the Falkland Islands economic zone (50º-52ºS) in the Atlantic Ocean. Analyses were conducted to include the effects of size, sex and age. A stepwise canonical discriminant analysis showed that fish were successfully discriminated with SDs, SIs and NEFDs. In this analysis, 86.4% and 70.1% of the fish were correctly classified as belonging to the Atlantic and Pacific stocks, respectively. A multivariate analysis of variance showed that the mean values of the NEFDs, SDs, and SIs did not vary significantly between sexes within areas (P > 0.05), but varied significantly between the Pacific and Atlantic oceans (P < 0.05). These results highlighted that otolith shape analysis can be a useful tool to evaluate the potential level of mixing in feeding areas where both stocks, the Pacific and Atlantic units, are expected to co-occur.

Keywords

Otolith morphometry, demersal fish, southern blue whiting, Micromesistius australis, stock identification.