

Stock structure of Icelandic cod (*Gadus morhua*) estimated with otolith shape and elemental composition

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Recent research indicate that the Icelandic cod (*Gadus morhua*) stock may consist of many populations or management units whose relative contribution to the fishable stock as well as to recruitment is unknown. The main spawning area is located southwest of Iceland, but cod have been shown to spawn as well at numerous other locations all around the country. Results from tagging studies, 0-group surveys and genetic studies all indicate that more than one cod stock exists in the Icelandic waters. Results from tagging studies do furthermore indicate that cod from different spawning grounds do maintain spatial segregation while on the feeding grounds. Further knowledge regarding the population structure of cod in Icelandic waters is needed in order to improve the stock assessment work as well as to facilitate our understanding of the recruitment variability.

In this study otolith shape and otolith chemistry were used to study the stock structure of the Icelandic cod. Otoliths were collected from mature cod at 12 different spawning locations around Iceland during spawning season in spring 2002. Discriminant function analysis was used to discriminate among the spawning groups. Based on the variation of both otolith shape and elemental composition of the otoliths there was evidence of two separate major groups, north and south of Iceland. Otolith shape had more discriminating power than elemental composition at the individual spawning location. However, the methods combined accurately classified up to 97% of individuals south of Iceland to other southern spawning locations.