

Foreword

It is a great honour to be invited to write the foreword to this special issue devoted to the black scabbardfish, *Aphanopus carbo*. I well remember my first encounter with the species. In 1973 the new laboratory of the Scottish Marine Biological Association (now Scottish Association for Marine Science) on the west coast of Scotland acquired an ocean going research vessel, the RRS Challenger. A priority was to begin a new multidisciplinary programme of deep-sea research in the Rockall Trough, a deep water channel lying between the Scottish continental slope and the Rockall plateau. At the time I was working on inshore fishes but was invited to join the first deep-water fishing trials of the new vessel in 1974. We only achieved one deep-water haul at 800 m and the catch that fell from the codend was totally unfamiliar and at the same time fascinating. Prominent amongst the catch was an elongate fish of about a metre in length with a white body, black lateral line and black skin around the head. Back in the laboratory we confirmed that this was the black scabbardfish which had lost its delicate skin due to abrasion by the trawl net and the other fish, especially sharks, in the cod end. It was not until 1979 during a mid-cruise break in Funchal, Madeira that that I saw the black scabbardfish in its natural state with a beautiful iridescent black skin.

In 1975 my career changed when I was asked to lead a new project on the deep-water fish of the Rockall Trough. At that time fisheries laboratories, notably the UK and Germany were investigating the potential for new deep-water fish resources in the northern Northeast Atlantic and black scabbardfish was identified as a species of commercial importance. Reports on its marketability described it as having flesh that is firm and chewy, with short fibres like a flatfish and has a good flavour. At SAMS we had the opportunity to carry out seasonal sampling and study the biology.

At the same time as studying the biology I began reviewing the literature and discovered that the fishery for this species off Madeira is one of the oldest deep-water fisheries dating back to the mid 17th century (see Merrett and Haedrich, 1997 for a succinct review of the Madeiran fishery). The fish caught off Madeira and subsequently from the fishery that developed off mainland Portugal in 1983 attained a larger size than those caught off Scotland and Ireland. These northern fish were all immature. As far as I am aware there is only one report, from Icelandic waters, of a mature black scabbardfish in northern waters. This has led to much speculation over the years as to whether there is a single stock spawning around Madeira. Part of this hypothesis is that there is a migration, possibly for feeding, of sub-adults to northern waters. The life stage at which this migration might occur is unknown because virtually nothing is known of the egg, larval or juvenile stages of this species.

The rapid development of deep-water trawl fisheries in northern European waters in the early 1990s and concerns over their sustainability led the International Council for the Exploration of the Sea (ICES) to form a Study Group on the Biology and Assessment of Deep-Sea Fisheries Resources (SGDEEP). Technically Madeira is outside the ICES area but was frequently included along with the mainland Portugal fishery when describing black scabbardfish fisheries. During my chairmanship throughout the 90s, when I chaired SGDEEP, there were frequently vigorous debates on the one stock hypothesis but the scientific evidence was mostly lacking. It was unfortunate that the work done using DNA and otolith microchemistry during the EU funded BASBLACK project (1998-2000) was inconclusive. Because of the uncertainties ICES, to this date, consider that there is a single Northeast Atlantic stock but for management purposes they

recognise two components based on the fishing method, longline in the south and bottom trawl in the north. I understand that that the debates within the ICES Group continue to be as vigorous!

The black scabbardfish never ceases to provide surprises. One of the first papers that I read on the species was the detailed study of the morphology by Quentin Bone (Bone, 1971) in which he concluded that slow swimming was by a skulling motion of the caudal fin and this allowed the long lateral line to remain straight and hence achieve maximum sensitivity for the detection of prey. Once prey was detected rapid swimming to effect a capture would be of an anguilliform nature. This image of the fish skulling around in a horizontal position was shattered when Pascal Lorange of IFREMER showed me images taken from a submersible of a black scabbardfish hanging vertically, head uppermost in the water column. Monty Priede of Ocean Lab, University of Aberdeen has recently reported similar findings of large numbers of what were thought to be the closely related silver scabbardfish in a similar posture around the Casablanca Seamount. So it seems that the skulling by the caudal fin might be to maintain vertical position rather than or as well as for slow cruising

Although it has been known for some time that there are two very similar species, *Aphanopus carbo* and *A. intermedius*, it is only recently that microsatellite markers have made it relatively easy to separate the two species. As reported in this volume it is now known that both species can be present in the Madeiran landings. This leads me to speculate whether the black scabbardfish holds yet another surprise. A component of the BASBLACK project was a study of age and growth led by Beatriz Morales-Nin of IMEDEA (Morales-Nin *et al.*, 2002). Otoliths were exchanged between project partners for age determination and considerable variation was found in the age interpretation which was ascribed to the complex spatial distribution and to differing length structures. I recall at the time that there seemed to be some variation in the shape of the otoliths, some being quite smooth in profile and others have a more complex structure. This might be a simple factor of age but it is interesting to speculate whether the differences in shape are in fact because the samples contained a mixture of the two species. It should be fairly simple to test this hypothesis.

Scientifically, the black scabbardfish is an interesting species which is also of high economic importance especially in southern European waters. There is still much to be discovered and no doubt there will be some further surprises. The papers in this special issue, culminating from the APHACARBO project add much to our knowledge of the southern European component. Whether or not the single stock hypothesis adopted by ICES turns out to be correct the results of this study of the southern component are also highly relevant to the whole Northeast Atlantic.

REFERENCES

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