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EDITORIAL

The present collection of papers arises from a theme session on "*Cephalopod Stocks: Review, Analyses, Assessment, and Sustainable Management*" at the 2004 ICES Annual Science Conference, Vigo, Spain.

The original proposal for the theme session was justified by the availability of much unpublished information on cephalopod biology and fisheries arising from various CEC-funded R&D projects during the last 15 years. The theme session also related directly to the EC-funded Concerted Action: CEPHSTOCK (Q5CA-2002-00962), and provided a route for dissemination of the review and synthesis work carried out under this project. The theme session was intended to facilitate the wider dissemination and publication of these results, with the long-term aim of informing future management decisions for the major fished stocks of cephalopods in European waters.

Any future European research programme, related to cephalopod biology and fisheries, will need to take into account of knowledge acquired on cephalopod populations. The theme session aimed to attract scientists working on cephalopod stocks outside the NE Atlantic as well as those from ICES countries. The scope of the theme session was:

- The current state of knowledge on exploited cephalopods (biology, fisheries, environmental relationships, stock identity) in European waters;
- Current fishery data collection, stock assessment and management practices for cephalopod capture fisheries world-wide;
- The current status of cephalopod culture and the prospects for commercial aquaculture;
- Socio-economic issues related to cephalopod fisheries;
- Current knowledge of aspects of cephalopod biology and ecology related to their suitability as resource species for capture and culture fisheries, and assessment of environmental factors which affect the immuno-competence and physiology of cephalopods;
- Assessment and management options for currently unregulated cephalopod fisheries.

The theme session attracted 28 oral presentations and 12 posters that could be broadly divided into those more concerned with biology and ecology, and those focusing on fisheries. Some of these presentations appear elsewhere, e.g. Guerra et al. (2005) on giant squid strandings. The selection of papers presented in *Aquatic Living Resources* vol. 18, No. 4, 2005, "*Environmental effects on cephalopod life history and fisheries*", illustrates how cephalopod studies could contribute to a development of an ecosystem approach to fisheries management (FAO 2003), by analysing a series of environmental effects operating at different scales.

Environmental effects on life histories

The life-cycle characteristics of cephalopods contribute the main reasons for the large inter-annual fluctuations of population densities (Boyle and Boletzky 1996). In teleost fishes differences in biological parameters have been analysed in relation to fishing, considered sometimes as the main environmental impact (Rochet et al. 2000). As a first step to transposing this approach to cephalopods, substantial biological data sets and new statistical approaches are applied to answer questions about squid life history.

Vidal et al. evaluated the influence of food supply on yolk utilization, metabolism and growth of paralarvae of *Loligo vulgaris reynaudii* while Smith et al. re-examined historical life history data to infer the relationships between nutritional state, growth and maturation in *Loligo forbesi.* Moreno et al. examined differences in age, size-at-maturity and reproductive investment in different cohorts of *Loligo vulgaris* in relation to environmental influences.

Consequences of such influences on cohort success have to be analysed taking into account the spatial organization of fished populations. Walters et al. (2004) encouraged this approach presenting "spatial life history trajectories" which involve nested designs or time-stepping structures.

Environmental effects on fisheries

Delayed effects of fishing on adults and of environmental factors on subsequent recruitment were investigated in the English Channel squid *Loligo forbesi*. Challier et al. show that the environmental component dominates interannual variability in recruitment. Pierce et al. analyse interannual variation in growth and maturation in *Loligo forbesi* in Scottish (UK) waters and confirm that some of the observed variation are related to environmental conditions. This variation may have consequences in terms of availability of squid to fisheries both in the current and following years.

In the southwest Atlantic ommastrephid squid *Illex argentinus*, Sacau et al. show significant effects of depth and temperature on local abundance, superimposed on the previously well-documented seasonal cycle. In comparison, relatively little is known about the northeast Atlantic ommastrephid *Todaropsis eblanae.* Zumholz and Piatkowski present new life history and distribution data on this species derived from research surveys.

Interactions in the ecosystem web involving cephalopods

In common with all marine organisms, cephalopods may bioaccumulate pollutants which are then passed up the food chain to consumers. Whereas some fish species are known to accumulate high levels of mercury, it is the accumulation of cadmium that is more frequently noted in cephalopods. While metal concentrations in cephalopods are relatively well-documented (e.g. Seixas et al. 2005), there is much less information available on other types of contaminants and marine toxins. Costa et al. show that the octopus *Eledone moschata* (although not the congeneric *E. cirrhosa*) can accumulate high levels of domoic acid, which is responsible for amnesic shellfish poisoning.

The decline of many finfish stocks has resulted in increased interest in the fishery potential of cephalopods and the need to evolve sustainable management practices for European cephalopod fisheries. In short-lived marine species, such as cephalopods, it is important to take into account environmental effects on population dynamics (Caddy 1983; De Oliveira 2005). Thus, the application of an "ecosystem approach" – interactions of the fished populations (and fisheries) with other biotic and abiotic ecosystem components – is particularly relevant to the future management of cephalopod fisheries. Progress in this direction will be presented at the next symposium organised by the Cephalopod International Advisory Council CIAC'06, to be held in February 2-3, 2006, Hobart, Australia: "*Cephalopod life-cycles: biology, management and conservation*".

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