

Sampling Methods Used in the Tunisian Experimental Trawl Survey for Demersal Species

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Abstract

Experimental trawl surveys, or direct methods, are one of the fundamental tools of stock assessment. In Tunisian waters, many surveys have been carried out, particularly those concerning the demersal resources. These experimental trawl surveys started in 1925 (Le Danois, 1925) and extended from the 1960s to the 1990s. Since the acquisition of the new research vessel “Hannibal”, in 1998, the experimental surveys have been improving as a source of data for stock assessment. Indeed, the National Institute of Marine Sciences and Technologies (INSTM) considers the surveys as one of the main tools to acquire information on abundance and geographical distribution of national demersal resources.

To better evaluate and follow the spatio-temporal trends of abundances and distribution, INSTM programmes and carries out, annually, an experimental demersal trawl survey of all Tunisian waters.

In this paper we present the methodological approaches adopted by the Tunisian team and give some suggestions to improve data collection throughout trawl surveys in the light of our experience.

This could contribute to finalizing a common methodology and harmonizing its regional application, and which could be adopted by the different research teams participating in the MedSudMed Project in order to get comparable research results.

First of all, it is important to note that stations carried out by the RV “Hannibal” have been chosen generally adopting a stratified sampling design according to the depth. Depending on the prospected zones, different spatial strata can be identified: for example in the southern area we can delimit five strata (0–30 m; 30–50 m; 50–100 m; 100–200 m and below 200 m). The number of stations by stratum varies according to the fishing zones, but also according to the stratum surface.

During the trawl surveys, the main characteristics have been recorded on suitable report sheets. These characteristics concern particularly:

- Net: type, length of wings, lengths of warps, type of net
- Date: day, month, year
- Haul: ordinal number, direction, speed, geographical positions (longitude and latitude at the beginning and at the end of the haul, time at the beginning and at the end of the haul)
- Meteorological data: weather, sea state, sea-surface temperature
- Bottom: depth (at beginning and end of haul), nature of the bottom (if it is possible)

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The starting time of the haul coincides with the definitive stop of the arm and the end coincides with the beginning of the recovery of the fishing gear on board.

Generally, the haul lasts between 60 and 90 min. Differences in duration are due to the depth and the nature of the bottom. Bottom features are continuously monitored by the sounder and, in case of a dangerous bottom, the gear is immediately hauled out of the water.

For each haul, the commercial species in the catch are sorted, weighed and then analysed separately. The individual lengths are measured with an ichthyometer (0.5-cm precision), whereas weights (non eviscerated individuals) are determined with an electronic balance (50-g precision). All gathered information is recorded on ad hoc sheets. Representative samples of fishes, crustaceans, cephalopods and benthic invertebrates from the discarded fraction of each haul are collected and taken to the laboratory to evaluate number and weight.