International bottom trawl survey in the Mediterranean

Instruction manual

Version 6

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The MEDITS programme is conducted within the Data Collection Framework (DCF) in compliance with the Regulations of the European Council n. 199/2008, the European Commission Regulation n. 665/2008 the Commission Decisions n. 949/2008 and n. 93/2010. The financial support is from the European Commission (DG MARE) and Member States.

Preamble

The MEDITS project started in 1994 within the cooperation between several research Institutes from the four Mediterranean member States of the European Union. The target was to conduct a common bottom trawl survey in the Mediterranean in which all the participants use the same gear, the same sampling protocol and the same methodology.

A first manual with the major specifications was prepared at the start of the project. The manual was revised in 1995, following the 1994 survey, taking into account the methodological improvements acquired during the first survey. During the course of years, several improvements were made. A new version of the manual was issued each time it was felt necessary to make improvements to the previous protocol. In any case, each time the MEDITS co-ordination committee ensured that amendments did not disrupt the consistency of the series. The third version of this manual was edited in 1999, while the fourth one served as a manual for the surveys carried out between 2000 and 2006. The fifth version, although issued in 2007, included improvements adopted by the MEDITS group since 2005, and was the protocol followed from the 2005 surveys until 2011 due to the issue of the present version.

This sixth version is an update of the 2007 MEDITS handbook, taking into consideration the evolution of the MEDITS survey within the Data Collection Framework. This version presents changes related to the reference list of species, the biological parameters to be collected, and consequently the storage data formats that have been adjusted to account for these changes.

Co-ordination of the MEDITS program (2012)

Co-ordination

The MEDITS program is currently co-ordinated at international level by Maria Teresa Spedicato (COISPA Tecnologia&Ricerca, Italy).

The MEDITS group is currently composed as in table 1. The members of the Steering Committee are indicated by the letter N in the same table.

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R= Regional Coordinator; N=National Coordinator; I=International Coordinator

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Introduction

This document is the sixth version of a manual elaborated in the frame of an international project to harmonise sampling of demersal resources in the Mediterranean Sea, through the MEDITS trawl survey. It is the reference document for research institutes contributing to the MEDITS surveys on the continental shelves and slopes in the Mediterranean (Fig. 1), for the 2012 surveys and onwards.

The manual describes the sampling gear characteristics, the sampling methodology and the processing of samples. Finally, it gives the specifications of the data files for data storage and exchange.

This manual includes amendments and improvements to the MEDITS protocol as agreed by the MEDITS Co-ordination Committee up to the 2012 annual meeting. Considering the need for progress towards new objectives (e.g common data-base) and amendments to be considered after the trial stage of this new protocol, updates to this manual will be carried out as necessary.

At the MEDITS coordination meeting in Ljubljana (Slovenia, 6-8 March 2012), it was also decided to further progress in the harmonization of the the MEDITS samplings in the Mediterranean Sea, establishing a multidisciplinary Working Group with the presence of technologists and other researchers with different expertise (more detailed Terms of References are reported in the report of the MEDITS coordination meeting held in Ljubljana, Slovenia, 6-8 March 2012) to tackle some relevant aspects dealed in the chapter 1 and 2 of this manual.
This WG should report regularly to the MEDITS coordination group the findings of the investigations. In this manual a preliminary focus on this subject was introduced adding some details to the technical specifications of the gear characteristics and checks. This contribute should be considered preliminary as it will be further implemented by the established WG.

[1] Specifications of the sampling gear

The standardised protocols of the MEDITS survey include the sampling gear (feature and handling), the design of the survey, the information collected, the management of the data as far as the common standard analysis of the data". The adopted gear constitutes a compromise between different constraints. To increase the catch of demersal species, it has a vertical opening slightly superior to the most common professional gears used in the Mediterranean. The design of the gear has been drawn up by fishery technologists from specifications defined by the biologists" (Bertrand et al., 1997).

1.1 The trawl

The sampling gear is a bottom trawl made of four panels. Figure 2 shows a schematic diagram of this trawl (IFREMER reference GOC 73). This gear should be operated by a vessel with a towing power of at least 368 kW (500 ch) and 4.5 tons of bollard pull.

The most important gear specifications were: to be able to work in all the areas and at all the depths specified by the programme (10-800 m), to have a selectivity as low as possible so as to have good images of the populations sampled. In practice the last requirement was the opposite of what is normally asked to the fishermen, which is to use good selective gears so as to allow the small size individuals to escape. This goal is generally obtained by imposing to all the commercial gears a minimum size for the meshes used. For the Mediterranean the present minimum legal mesh opening for the demersal trawl gears is currently a square-mesh of 40 mm or a diamond-mesh of 50 mm, but for the sampling gear to be used during the MEDITS surveys it was decided to limit the mesh size of the codend to 10 mm of mesh side, which corresponds to about 20 mm of mesh opening.

Even if other sampling gears for survey purposes exist in the world (e.g. the GOV – *Grande*

OuvertureVerticale trawl used in the North Sea surveys), it was decided to design a new trawl to better follow the required specifications and for a better adaptation to the particular characteristics of the Mediterranean Sea mentioned above.

For all the report and figures, the mesh side value, or half mesh, will be used to indicate the mesh dimensions. The mesh side is defined by the International Organization for Standardization (ISO 1107-1974 - Mesh Measurements, definitions) as: the distance between two sequential knots, measured from centre to centre when the yarn between those points is fully extended. In some cases, the values of mesh opening, or inside measurement, will also be used, but only after an explicit declaration. For knotted netting, the opening of the mesh is defined by the same ISO standard, as the distance between two opposite knots in the same mesh when fully extended in the N-direction, which is the fore-aft direction along the net. For knotless netting it is defined as the distance between two opposite joints in the same meshes when fully extended along its longest possible axis.

On the plan in Figure 2 the mesh sizes are indicated in bar length. The mesh numbers in height correspond to well finished and joined netting sections; the joining mesh should then be subtracted when cutting. The numbers of mesh in width do not include the side seams and these should then be added when cutting.

The nets should be made from good quality polyamide netting (nylon). It will however not be possible for the net manufacturer always to obtain sheet netting of exactly the same length as specified in this manual. Thorough care must be taken to obtain materials with properties as close as possible to the ones specified in Figure 2.

The headline should have 40 floats resisting to an immersion of 1,300 m. Their diameter should be around 20 cm, their individual buoyancy of 2.7 kgf (± 5%), the total buoyancy of the 40 floats being around 108 kgf (± 5%). The 40 floats should be distributed along the headline as follows (Fig. 3 and 7): from the end of each wing, one float every 1.50 m, 5 times; then one pair of floats every 1.50 m on the whole remaining length; in the headline bosom a small adjustment of the spacing is necessary. With this number of floats the vertical opening of the trawl should reach 2.4 to 2.6 m depending on the horizontal opening.

A weighting chain of 120 kg (3 × 40) should be secure to the foot rope at 17 cm intervals (with a hanging height of a maximum of 8 cm). A supplementary chain of 15 kg (around 6.50 m and a diameter of 10 mm) should in addition be secured symmetrically on both parts of the belly bosom in the same way as the first one (garland of 17 cm in length).

1.2 The rigging

The general drawing of the rigging is given in figure 3. Various details of mounting and connecting are shown in figure 4. The upper bridle length is 30 m; the lower bridle length is 29 m, plus the adjustment chain of 1m (the adjustement chain is only found on the lower legs).

To maintain the geometry of the trawl as constant as possible, two bridle lengths are defined according to the depth. They are given in the following table:

Depth (in meters)	10 - 200	201 - 800
Bridles length (in meters)	100	150

Following the results of an experiment carried out on board the RV/L'Europe in June 2000, it is recommended to increase the bridle length to 200 m in depths deeper than -500 m. This modification, even though not compulsory, may favour a better and faster contact of the trawl with the seabed.

1.3 The doors (Otter Boards)

The doors are also normalised. They are of type MorgereWH S (Figure 5 and Figure 6). The adopted doors correspond to the size number 8. The warp is shackled in the fore hole of the bracket sheet (see arrow 1 in

Figure **2**). The short parts of the external crowfoot are shackled in the most back part of the backside sheets, upper and lower (see arrow 2 in

Figure **2**). The length of the backstrops (shackles not included) are as follow:

long external back-strops: 1.60 m
short upper and lower back-strops: 0.65 m (± 10%).

1.4 Warp diameter and length

Taking the characteristics of the trawl and the rigging into account, the warps should have a diameter of 16 mm, with a minimum thickness of 14 mm and a maximum of 22 mm. The length of warps to be shot is determined by the operating depth. The recommended relationship between depth and warp length is given in figure 7. Although in certain particular circumstances some adaptations can be made to this relationship, it is recommended to respect the depth/warp length ratio as far as possible.

For the vessels which are not equipped with a device to measure the length of warp shot, it is recommended to standardise the position of the last mark on the warp, for example at the warp block furthest back.

1.5 Complementary equipment

The systematic use of a device to control the trawl geometry (vertical and horizontal openings, contact with the bottom) is highly recommended. The sensors should be positioned as shown in figure 8. If this is not possible, measurements of the trawl geometry should be taken at various depths on board each vessel at the beginning of the survey to establish a graph. Data about if the value of the net horizontal opening for each haul was measured *in situ* or estimated, will be included in the TA data file, as specified further on in this manual.

A net safety recovery system (the pennant) allowing the retrieval of the trawl by the codend can be installed. As far as possible, it is recommended to secure the lazy line as shown in figure 7 and to take care of its fixations. Rules for the use of the pennant must be adopted in order to avoid deformations of the gear geometry and drag. Ropes attached to the codend and terminating with a float must be avoided (Figure 8). Ropes starting from the codend and terminating to the wing tip are allowed only if connected to the strengthening lacing at regular intervals (every 1-1.5 m; Figure 8).

[2] Sampling methodology

2.1 Vessel characteristics

The vessels used for the MEDITS surveys should have an engine of at least 370 kW to be able to tow the standard sampling gear (traction at ground run: 4.5 tons). It is strongly recommended that as far as possible the same vessel and crew be used every year in each area so as to reduce variations between years due to vessel effect. The list of the vessels used since the beginning of the survey series is given in **annex I**.

2.2 Period of the survey

The period of the MEDITS survey is centred around June (from May to July).

2.3 Hauls localisation

The hauls are positioned following a depth stratified sampling scheme with random drawing of the positions within each stratum. The number of positions in each stratum is proportional to the area of these strata. Except in the case of peculiar problems (damages noted in previous years, etc.), the hauls are made in the same position from year to year. The decision to make a haul in a given place should not be influenced by the presence of fish shoals detected with the sounder or the sonar.

The following depths are fixed in all areas as strata limits:

10 - 50 m,
50 - 100 m,
100 - 200 m,
200 - 500 m,
500 - 800 m.

Furthermore the strata are limited by lines more or less perpendicular to the coast, depending on the geographical characteristics of each area. The adopted stratification schemes are shown in figure 1. It is strongly recommended to maintain the same scheme between years. The strata are described in **annex II**. The target number of hauls by area is given in **annex III**.

The *Posidonia sp.* meadows are excluded from the sampling scheme and should never be trawled.

2.4 Operating the gear

2.4.1 Sampling period in the day

The hauls must be performed only during daylight. The daylight period is defined as the time between 30 minutes after sunrise and 30 minutes before sunset.

2.4.2 Haul speed and duration

The standard fishing speed is 3 knots on the ground. This recommended speed is very important in order to ensure the best trawl geometry. The actual speed as well as the covered distance should be monitored and recorded.

It is highlighted that a speed lower than 2.8 knots can have a negative effect on the verticality and the stability of the doors which can lie down and get stuck in the mud. A speed greater than 3.2 knots can take the trawl off the seabed at great depths.

The haul duration is fixed at 30 minutes on depths less than -200 m and at 60 minutes at depths more than -200 m. In case during the fishing operations the haul should be stopped before the completion of the standard duration, the haul can be considered valid if at least 2/3 of the time or of the distance have been successfully attained.

2.4.3 Haul start and end definition

The start of the haul is defined as the moment at which the trawl geometry (vertical and horizontal) is stabilised (cf. § 3.4.5.). The end of the haul is defined as the moment at which warp hauling begins. The haul start and end times should be recorded in UT time (GMT) and not in the local time.

2.4.4 Haul orientation

In general, hauls should be performed at constant depth. The depth variations during the haul should not exceed ± 5% relative to the initial depth. The discrepancies to this target should be recorded. In case of a significant difference between the depth under the vessel as recorded by the eco-sounder onboard and the depth at which the trawl is, the recorded depth should be taken as the latter.

As far as possible and in respect of the previous constraints, the hauls should be rectilinear. If for some reasons that is not possible, the turning circle must be as wide as possible so as not to disrupt the trawl geometry. In all cases the fields "COURSE" and "DISTANCE" of the "TA" data file (see § 5.2 and **Annex X**.) should be precisely documented.

2.4.5 Managing the end of shooting operations and the start of the haul

After the complete shooting of the warps and the braking of the winches, a relatively high speed (5-6 knots) should be maintained for around 1 minute to allow the trawl to open well both in length and in width. The speed should then be strongly reduced (even to 0) allowing the doors to reach the seabed. The time required varies depending on the vessel and the depth; for example 2-3 minutes at 500 m. .Once the doors are on the seabed, a speed lower than the normal one (2.5-2.7 knots) should be maintained in order to allow the trawl to reach the bottom. Once the net is well stabilised the speed will be increased towards the standard speed (3 knots); this moment is defined as the real start of the haul. The above procedure should be respected as precisely as possible, except in some particular situations where minor adaptations may be absolutely necessary.

For those vessels using a device such as a SCANMAR Trawl Sensor or SIMRAD, the trawl can be considered as well stabilised as soon as its vertical opening is between 2 and 3 m. For the vessels without such a device, preliminary trials shall be made before the survey. The aim of these trials is to determine ship by ship the time needed for the trawl to operate correctly from one vessel to another, taking into consideration the approach of each individual skipper.

2.4.6 Setting of the trawl on the ground

It is important that the gear stays in good contact with the seabed during the whole haul. This should be regularly checked either by an acoustic device during the haul, by the observation ofthe chains wear or by the observation of benthic organisms in the catches after the haul.

2.4.7 Trawl geometry while fishing

The trawl is designed to have a vertical opening between 2 and 3 meters at the various depths if the above mentioned adjustments are respected. When a device like the SCANMAR Trawl Sensor is used, the vertical and horizontal (between the wings) opening should be checked as often as possible, once the trawl is stabilised. The average values of these two parameters (disregarding the obviously aberrant values) will be reported in the data file for each haul.
When appropriate instruments to control the gear behaviour are not regularly used, reliable models of horizontal- and vertical-net opening related to some other available parameters (i.e. warp length, depth, etc.) should be used. So that estimated values of net openings can be derived and applied when necessary. Nevertheless the use of these instruments is highly recommended because they give exact information on the gear behaviour. From one side they give the measure of the horizontal and vertical net openings in all the conditions, even when some external and unpredictable effect (i.e. part of the net entangled or damaged, particular types of the bottom) can influence the above parameters and make the possible estimates inaccurate. From the other side, the knowledge of the gear behaviour could improve the setting operations and the determination of the exact tow duration also at high depths.

For each Operative Unit, some specific models of MEDITS gear behavior were produced from the data collected during the project *"Intercalibration des campagnes internationales de chautage démersal en Méditerranée central"* (IRPEM-CE project MED/93/015). During trawl survey, if it will be not possible to use the gear monitoring system due to risky hauls (e.g. rocks, relicts, etc.), such models should be used to interpolate any missing values. Also, some new general models have been derived from the pooled data collected during the above mentioned project. General quantitative predictions of MEDITS gear geometry (e.g. horizontal and vertical openings) from the other known parameters (e.g. cable length, bottom depth, bridles length, etc.) will be provided to each Operative Unit after the evaluation of the established Working Group. We recommend the new MEDITS Units or Units without any gear monitoring system to adopt these new general models consistently throughout the years in order to keeping eventual errors constant in the time series.

2.4.8 Wear of the trawl

Since no system has been developed to prevent the bosom of the trawl from rubbing against the seabed it is recommended that affected sections of the trawl be replaced as needed, particularly when they have lost their initial resistance characteristics.

2.4.9 Checks of the sampling equipment

During use, the trawls must be checked at regular intervals by taking a number of check measurements on the geometry of the trawl.

The net should be regularly checked for wear and tear and all damages shall be repaired upon discovery. The net will eventually stretch under normal fishing conditions. The overall status for the net should be checked at the beginning of every cruise. Every year a detailed check should be made of all net and rope dimensions. Special attention should be given to ensure that the relationship (difference) between the length of the netting sections in the top and bottom panels are maintained. Lower sections are of the same length than the top sections. These similar lengths have to be maintained by monitoring the net at regular intervals. In the case that the difference is larger than 1 mesh size the longer section must be shortened to the proper size. Also the relationship between the length of the framing ropes and the nets in the wings and arms must be retained. The percentage the net is stretched on the headline and footrope is given in the specification (Figure 2). When the netting after a period of use loses its stretch, the headline and footrope must be cut off, the net in the wings and arms shortened and remounted on the ropes again.

The trawl consists of four panels: top, bottom and side panels. Each panel has several sections. It is necessary to check the relative length of each netting section. They are all compared with the corresponding sections in the other panels in the way that the top and bottom panel sections are checked against the side panel sections. The best method to compare two sections is to let two persons – one in each end of the section – take around 10 meshes from the centre line of one section in one hand and hold it against 10 meshes from the centre line of the other section in the other hand. The sections must then be stretched and the difference in length observed. Length of side, top and lower panel sections must be equal. The procedure is repeated for each section. In case any difference is detected, a skilled net maker should be consulted to evaluate a possible adjustment.

The length of the groundrope and headline must be compared by holding the two together. The length is adjusted by means of the adjustment chain on the groundrope. The groundrope (40 m) must be 4.30 m longer than the headline (35.70 m).

[3] Treatment of the catches

3.1 Samplings

On board the vessel, the catches are split into the categories and sub-categories as reported in **Annex V** and **XV** of this manual.
For each species the total weight and number of individuals should be collected, excluding the faunistic category V, G, H for which only the total weight should be collected. For faunistic categories D and E, the number of individuals is not mandatory (NM).

When the catch of a given species or a fraction of a given species (e.g. juveniles) is too abundant to be measured *in extenso* it is reasonable to take a representative sub-sample of the catch. This sub-sample should be not less than 100 individuals.
The common coding system adopted for the complete set of species (**Annex XV**) is a RUBIN like coding system as defined in the NCC standard[1], even if this international coding system has been no longer maintained for some years. This coding system appears to be a very practical one and it would be very easy in the future to build a correspondence table with any new coding system. In respect to the NCC recommendations and as the MEDITS coding is not strictly identical to the RUBIN one (different use, species not referenced to in the RUBIN code), the "name" of this code has been changed and is for the purpose of the MEDITS called "FM list".
The species identifications are made following Fisher and al, 1987[2]. For the fish species not included in this work, the descriptions from Whitehead *et al*, 1984[3] have been used. Furthermore, a correspondence with the most updated revisions by international bodies (e.g. Fishbase[4] for fish) is given. The 2012 review of the species list is based on the checklist of Fauna and Flora of Italian seas. Nevertheless, the species coding is to be strictly kept identical in the data base, even if the scientific species name has been changed, in order to keep the time series consistant.
It is important to precise the extent of species recorded from the catch. Coding for this information is given in **Annex IV**.

Since 2012, the MEDITS reference list of target species (**Annex VI)** includes 82 species, of which 32 are Elasmobranches. The list also includes all species of the *Epinepheus* and *Scomber* genera, for which length measurements should be obtained.

For all the 82 species and the two genera mentioned above (*Epinepheus* and *Scomber*) and reported in **Annex VI,** the total number of individuals, the total weight and the individual length should be collected.

This list has been further split in two groups:

- MEDITS G1 includes 41 species with 9 demersal (3 fish, 4 crustaceans and 2 cephalopods) and 32 Selachians. For these species the total number of individuals, the total weight, the individual length, and also biological parameters including sex, maturity, individual weight and age (age has been proposed only for the teleosteans of the Group 1) should be collected;
- MEDITS G2 includes 43 species for which only total number of individuals, total weight and individual length should be collected.

If a live specimen of a rare species or a species subject to conservation measures is caught, efforts should be made to obtain length, weight and sex data and return the specimen back to the sea unharmed, giving it a chance for survival. The specimens should be returned at sea preferably within 4-5 minutes.

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[1] NCC: Nordic code centre (Stockholm).
[2] Fisher W., M.L., Bauchaud et M. Shneider (rédact.), 1987. Fiches FAO d'identification des espèces pour les besoins de la pêche (révision 1). Méditerranée et mer Noire (volumes I et II). Projet GCP/INT/422/EEC. *FAO*, Rome: 1530 p.
[3]Whitehead P.J.P., M.L. Bauchot, J.C. Hureau, J. Nielsen, E. Tortonese, 1984. Poissons de l'Atlantique du nord-est et de la Méditerranée (3 volumes). *UNESCO*, Paris.
[4] Froese R. & D. Pauly eds, 2002. FishBase. World Wide Web electronic publication. www.fishbase.org.

3.2 Biological parameters

3.2.1 Measurement units

For fish (bony fish and Elasmobranches) the total length.with the tail fully extended should be recorded). The measurement unit is the lower half centimetre. For crustaceans the cephalo-thoracic length at the lower millimetre should be measured, while for cephalopods, the dorsal mantle length at the lower half centimetre should be obtained. For octopods the measure is taken along the line passing through the eyes. Sketches of the standard measurements to be obtained are reported in the **Annex VII**.

If a given team wishes to make complementary observations on other species or of another nature, for its own works, it is kindly invited to inform the MEDITS Group (Co-ordination and Steering Committees) to eventually allow to normalise the methodology with other research teams.

3.2.2 Sex and maturity

The sex is defined following four categories: male, female, undetermined (impossible to determine it by eye) and not determined (the individual has not been examined).

Sex data is presented at the individual level in the newly introduced TE file (**Annex XIII**) and at the aggregated level in the TC file (**Annex XII**). The latter is necessary for estimating the sex ratio of the target species.

The sexual maturity is defined using the maturity scales given in **Annex VIIIa-VIIIe** for the fish, crustaceans and cephalopods. The staging reported in the blue column must be adopted.

The individuals of hermaphrodistic species undergoing a change in sex when observed, are qualified into the sex showing the more developed gonads.

The former MEDITS scale for the description of elasmobranch maturity stages referred only to oviparous species (Rayadae and Scyliorhinidae). However the majority of elasmobranchs are viviparous or ovoviparous which have a great diversity in ovarian cycles and gestation periods. The examination of male maturity does not present particular problems, considering that they are classified according to the relative sizes and development of claspers and internal spermiducts. For females it is necessary to apply the dissection of the individual to observe the presence of oocytes and the formation of egg-cases in mature oviparous individuals. For this reason it is opportune to use a specific scale for the viviparous and ovoviviparous species usually fished in the Mediterranean sea as well as *Squalus acanthias*, *Squalus brainvillei*, *Etmopterus spinax*, *Torpedo* spp., *Dasyatis* spp. for which the reproductive biology is less investigated in several of the Mediterranean areas. For these reasons the maturity scale for viviparous elasmobranches adopted at WKMSEL 2010 (Ices, 2010) is reported in the **Annex VIIIc**.

While all maturity stages during the MEDITS survey, should be reported using the MEDITS maturity scales**,** a conversion of these maturity scales to the scales proposed at the Workshops on Maturity stages is provided in **Annex IX** in case needed.

Reference

ICES. 2010. Report of the Workshop on Sexual Maturity Staging of Elasmobranches (WKMSEL), 11-15 October 2010, Valletta, Malta. ICES CM 2010/ACOM:48. 132 pp.

3.2.3 Otolith, weight and maturity stage at individual level

The MEDITS meeting held in Nantes on 15-17 March 2011 agreed to increase the information recorded during the MEDITS survey, including the monitoring of new biological variables such as the age of bony fish species coded G1 in the new list of target species (**Annex XIV**), and the individual weight of all the species coded G1 in the same list. Data on the Maturity Stages for the same species should also be collected.

Otoliths of routinely assessed species should also be collected for age determination, useful to estimate, *inter alia*, the probability reaction norm of maturation (PRNM) i.e. the indicator n. 4 of Data Collection Framework (Commission Decisions n. 949/2008 and SEC(2008) 449).

The above decisions were also approved by the 8th Regional Coordination Meeting of the Mediterranean and Black Sea held in Ljubljana (Slovenia) on May 10-13, 2011.

The decisions taken during the MEDITS coordination meeting in Ljubljana (March, 6-8, 2012) based on the above mentioned document are reported in **Annex XIV** that represents the sampling protocol to collect the biological information related to otoliths, individual weight and maturity stage by sex from MEDITS survey 2012.

Due to these changes, a new file type; the TE file (**Annex XIII**), was introduced in order to store individual data. Consequently, new specifications were introduced in the TC file (**Annex XII**).

3.3 Other parameters

The bottom water temperature should be recorded at the start and the end of each haul. This information should be stored in the TA exchange file with the format defined in the **Annex X**. Thus also the TA file format has been changed and information before included in TD file has been here incorporated.

The former recommended sensor was the Vemco minilog TDR –5 to 35°C, however this sensor is currently out of production. It can be replaced by other devices such as the one produced by Star-Oddi. It should be fixed on the bosom head line. It is important that the clock of the computer which receives the data from the sensor is exactly set accordingly with the UT time (GMT) to have the same times as in the TA file. The temperatures from all the hauls (beginning and end) should be kept and reported in the TA file. These temperature should correspond to the official time of beginning and end of the haul, assuming that the trawl begins and stops to work properly at these official times.

[4] Inter-calibration of the work at sea

Two possibilities are recommended for the inter-calibration of the working methods between the various vessels:

- an exchange of scientists on board the vessels.
- a co-ordinated trawling operation by the two vessels at the border of the areas covered by these two vessels.

To favour the exchange of scientists one place will be reserved on board of each vessel for the eventual boarding of a scientist from another team. In addition, each co-ordination group will do their best to send a scientist from their own team on board of other vessels participating in the project. It is expected that the reports of these boardings help to identify eventual differences in the working methodology.

Where and when different teams are in charge of adjacent working areas, even though rather difficult and time consuming, they are invited to try and organise some common hauls in parallel to reach an inter-calibration between the two vessels.

[5] Data exchange formats

5.1 General information

Standard formats are defined for the storage and to facilitate the exchange of the data produced by the MEDITS surveys. The exchange files are in .csv format, using semicolon as field separator.

5.2 Files type

Four file types are defined in order to store and exchange the data: Type A: Characteristics of haul (**Annex X**) - this file now includes the data on bottom temperature and stratification, formely included in TD and TT type files; Type B: Catches by haul (**Annex XI**); Type C: Length, sex, and maturity at aggregated level (**Annex XII**); Type E: Age weight and maturity by length at individual level (**Annex XIII**).

The file names are defined as follow:

Position	Variable	Possible values
Character 1	Files type	**A** (haul characteristics) **B** (catch by haul) **C** (biological parameters at aggregated level) **E** (biological parameters at individual level)
Character 3	Country	**MLT**, **ESP**, **FRA**, **ITA**, **SLO**, **HRV**, **ALB**, **MON**, **MOR**, **ML**, **GRC, CYP**
Character 4-5	Area	**See Annex III**
Character 6-9	Year	**2000**, **2001**, etc.
Character 10	Separator	**.** (point)
Character 11-13	Extension	**csv**

5.3 Files structure and information's coding

The exchange files format are described in **Annexes X to XIII**. Complementary coding tables used to fill in the data files are given in the annexes referred above.

[6] Gear standardization and monitoring

At the MEDITS coordination meeting in Ljubljana (Slovenia, March 6-8, 2012), it was decided to include in this manual further technical specifications regarding the sampling gear (e.g. gear parameters, quality checks related to the gear), as well as to establish a multidisciplinary working group to progress in the harmonization of the the MEDITS samplings in the Mediterranean Sea.
The tasks of this WG can be synthesised as follows:

1) preparing a clear, commented and documented (e.g. using photos, sketches, etc..) checklist for the quality control of the technical characteristics of the MEDITS gear, in order to avoid the use of a gear that has not exactly the same characteristics from year to year;
2) preparing a clear and standard procedure, easy to apply in the field even by non technologists, for the monitoring and collection of the data on the gear performance;
3) evaluate and make available tools that enable, using the same methodological approach, the estimate of the parameters of the gear performance.

More detailed Terms of References are reported in the report of the MEDITS coordination meeting held in Ljubljana (Slovenia, 6-8 March 2012).
The present revision of the technical specifications of the MEDITS manual regarding the gear characteristics and the relevant quality checks should be considered preliminary as they will be further implemented by the established WG. The new multidisciplinary group should report regularly to the MEDITS coordination group the findings of the investigations.

[7] Other aspects (MEDITS Rules)

MEDITS internal rules were adopted during the MEDITS meeting, Split (Croatia), 15-16/06/2010 and are reported in the **Annex XVI**.

FIGURES

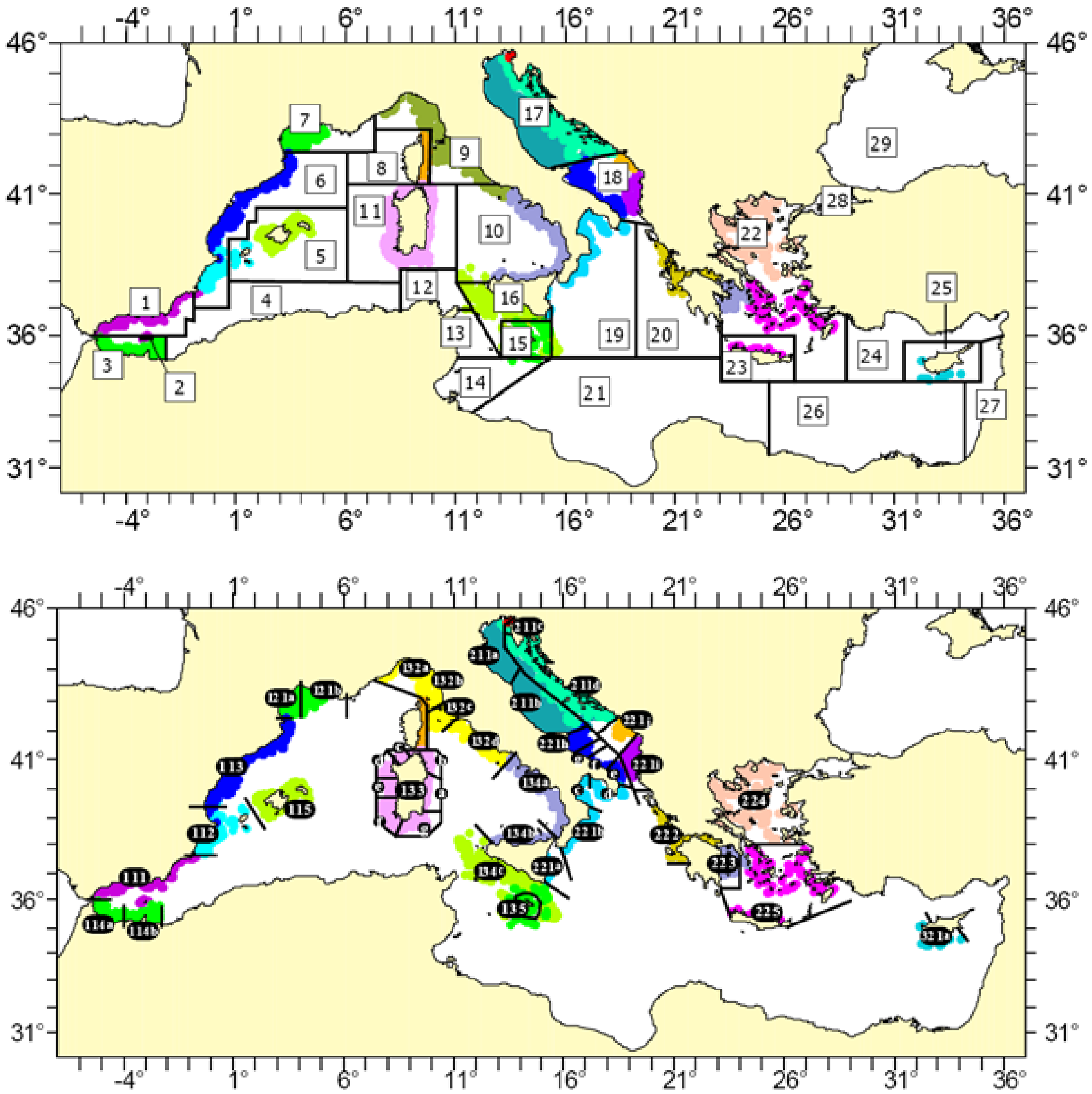


Fig. 1. General map of the area covered by the programme. Top: the GFCM GSAs, Down: the MEDITS strata.
Coloured: areas covered by the MEDITS surveys.

The designations used and the presentation of cartographic data imply no line as for the juridicial status of the various areas neither as for the border lines between countries.

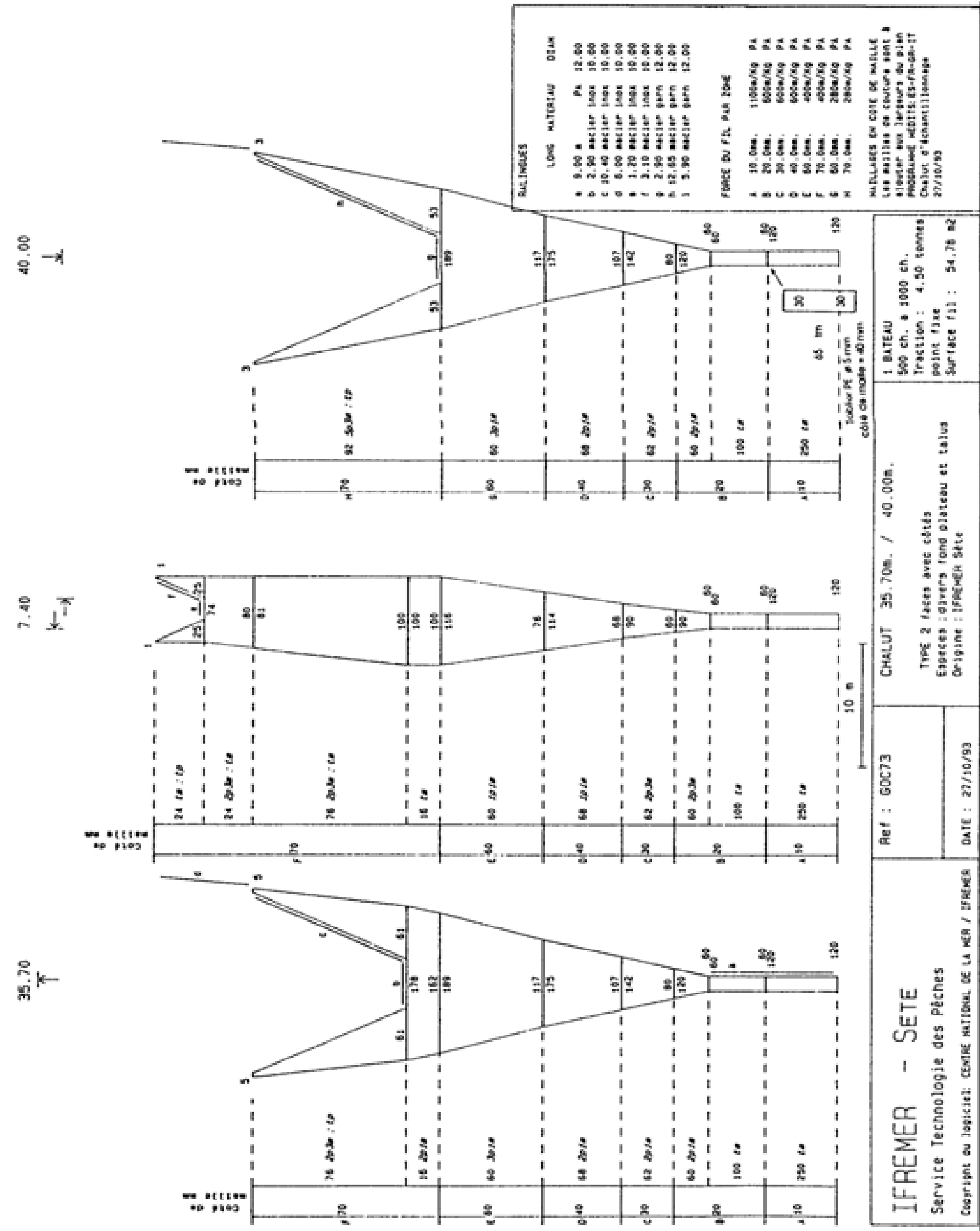


Fig. 2. Design of the GOC 73 trawl used for the MEDITS survey. It is very important to maintain the original relationship (hanging ratio, difference in length) between the netting lengths and the framing ropes along the headline and footrope.

<u>Note to netmakers</u>: The numbers of meshes shown for netting panel widths do not include selvedge meshes. Five meshes (six knots) per selvedge must be added where indicated . Conversely to obtain panel depths one row (1/2 mesh) must be subtracted from each panel as the joining row is included inm the number of meshes deep.

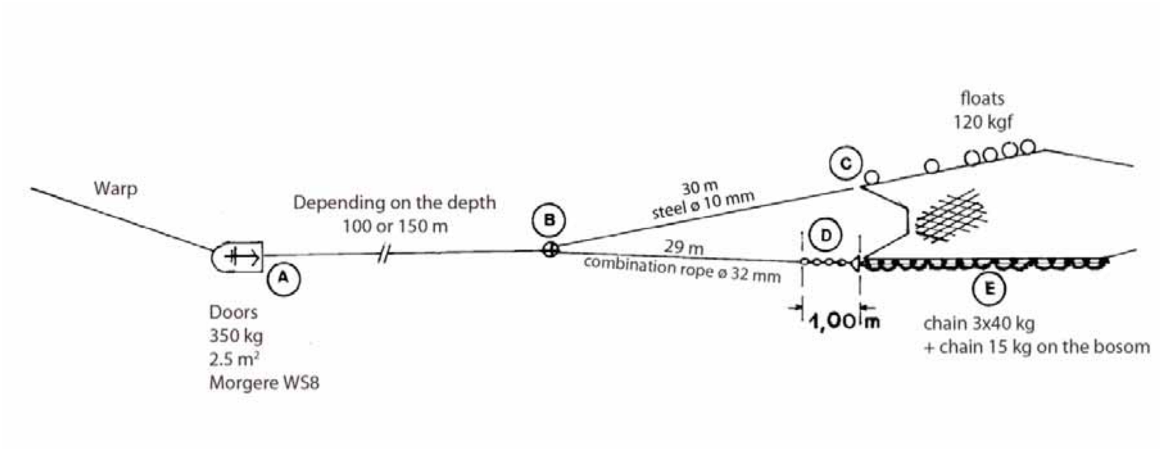


Fig. 3. Gear rigging details adopted for the MEDITS trawl. For the letter A, B, C, D and E refer to Figure 4.The length of the 1 m chain (D) must be adjusted in order to obtain the upper- (steel) and the lower-bridle (combination rope + chain) of the same length (30 m). See Figure 4 for further details.

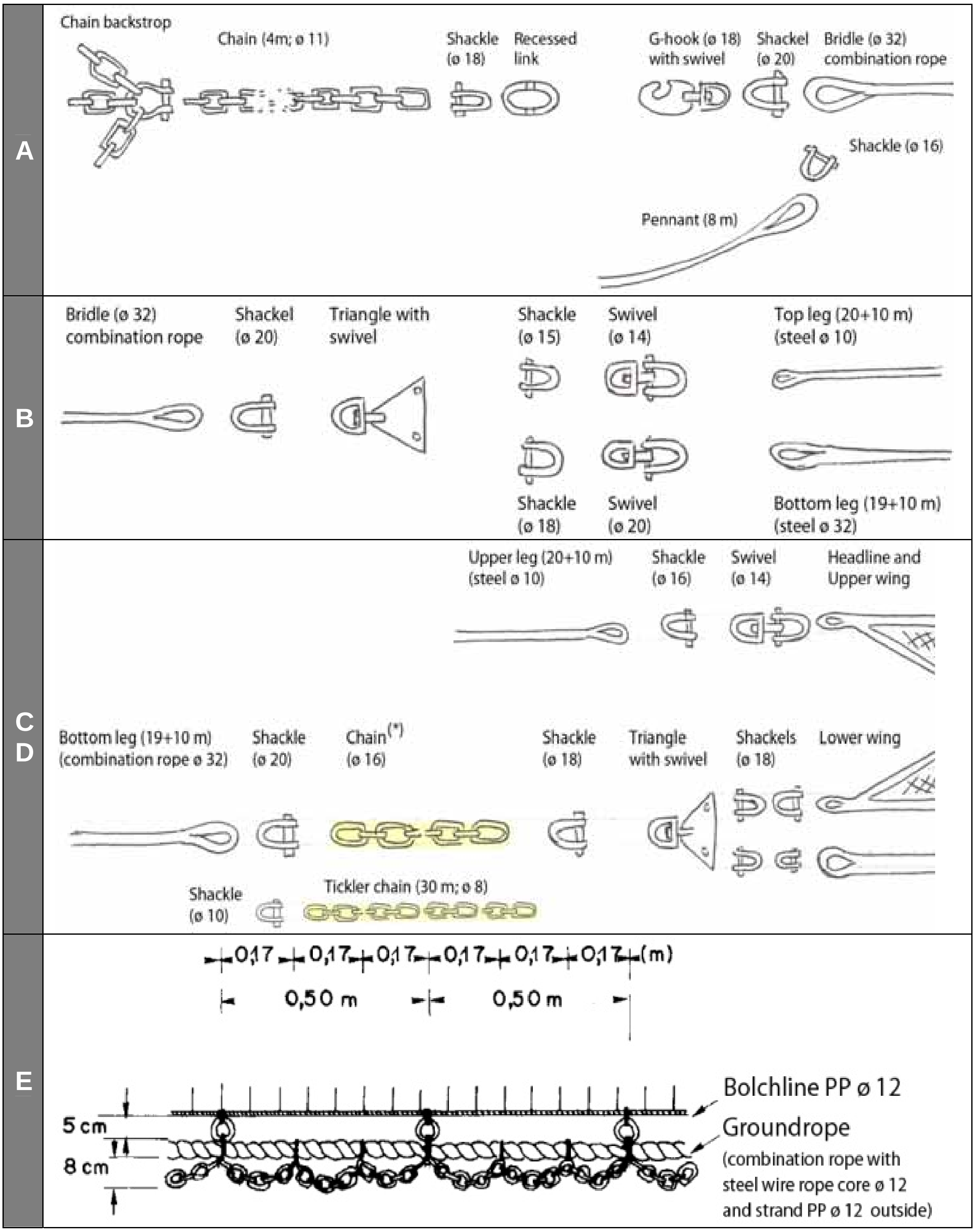
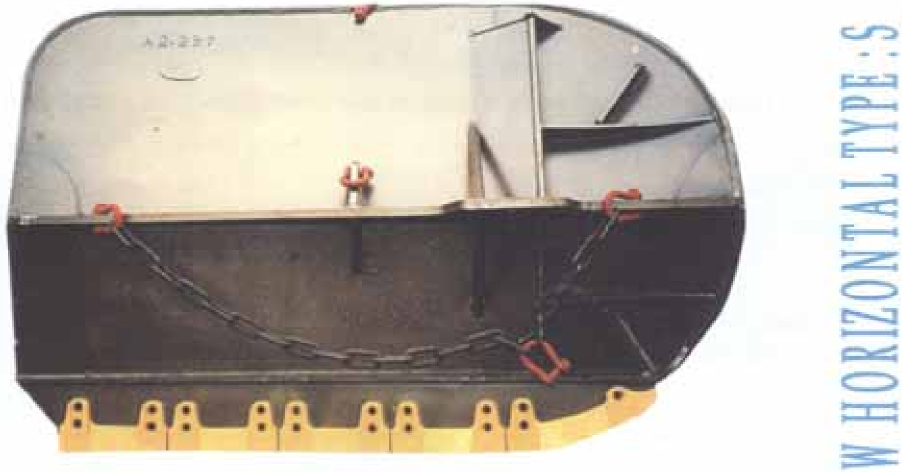


Fig. 4. Various details of the MEDITS trawl gear rigging. The length of the chain (*) must be adjusted in order to obtain the upper- (steel) and the lower-bridle (combination rope + chain) of the same length (30 m). The tickler chain must be rigged at the tip of the lower-bridle.



The otterboard WH can be equipped with chain or with fixed bracket.
In the back side, the otterboard can be equipped with 2 or 3 chains backstrop.

TYPE	DIMENSIONS	SURFACE M2	WEIGHT KG	TYPE	DIMENSIONS	SURFACE M2	POIDS KG
WS 0	1 050 X 750	0.70	60 – 100	WS 14	2 650 X 1 700	4.34	1 000 – 1 200
WS 1	1 300 X 850	1.00	100 – 130	WS 15	1 750 X 1 750	4.62	1 150 – 1 300
WS 2	1 500 X 900	1.12	110 – 150	WS 16	2 800 X 1 800	4.90	1 250 – 1 350
WS 3	1 600 X 1 000	1.36	150 – 180	WS 17	2 900 X 1 900	5.20	1 300 – 1 400
WS 4	1 700 X 1 050	1.62	200 – 240	WS 18	3 050 X 2 000	5.70	1 400 – 1 600
WS 5	1 750 X 1 100	1.74	230 – 280	WS19	3 200 X 2 100	6.10	1 500 – 1 700
WS 6	1 900 X 1 150	1.96	250 – 300	WS 20	3 400 X 2 200	6.60	1 700 – 1 900
WS 7	2 000 X 1 200	2.23	320 – 350	WS 21	3 500 X 2 300	7.30	1 900 – 2 100
WS 8	2 050 X 1 250	2.46	350 – 400	WS 22	3 600 X 2 400	7.58	2 000 – 2 300
WS 9	2 150 X 1 300	2.62	380 – 500	WS 23	3 750 X 2 500	8.82	2 300 – 2 700
WS 10	2 300 X 1 350	2.82	500 – 700	WS 24	4 000 X 2 700	9.31	2 300 – 3 000
WS 11	2 400 X 1 400	2.93	600 – 700	WS 25	4 300 X 2 900	11.10	2 500 – 4 000
WS 12	2 500 X 1 500	3.30	750 – 900	WS 26	4 600 X 3 200	13.00	3 000 – 5 000
WS 13	2 600 X 1 600	3.70	900 – 1 000	WS 27	5 000 X 3 500	15.80	4 000 – 6 000

Figure 1. Main characteristics of the Morgere W Horizontal (WH) otterboards. For the MEDITS program it was selected the WS8 type. The otterboard weight refers to without- and with-plates in the shoe.

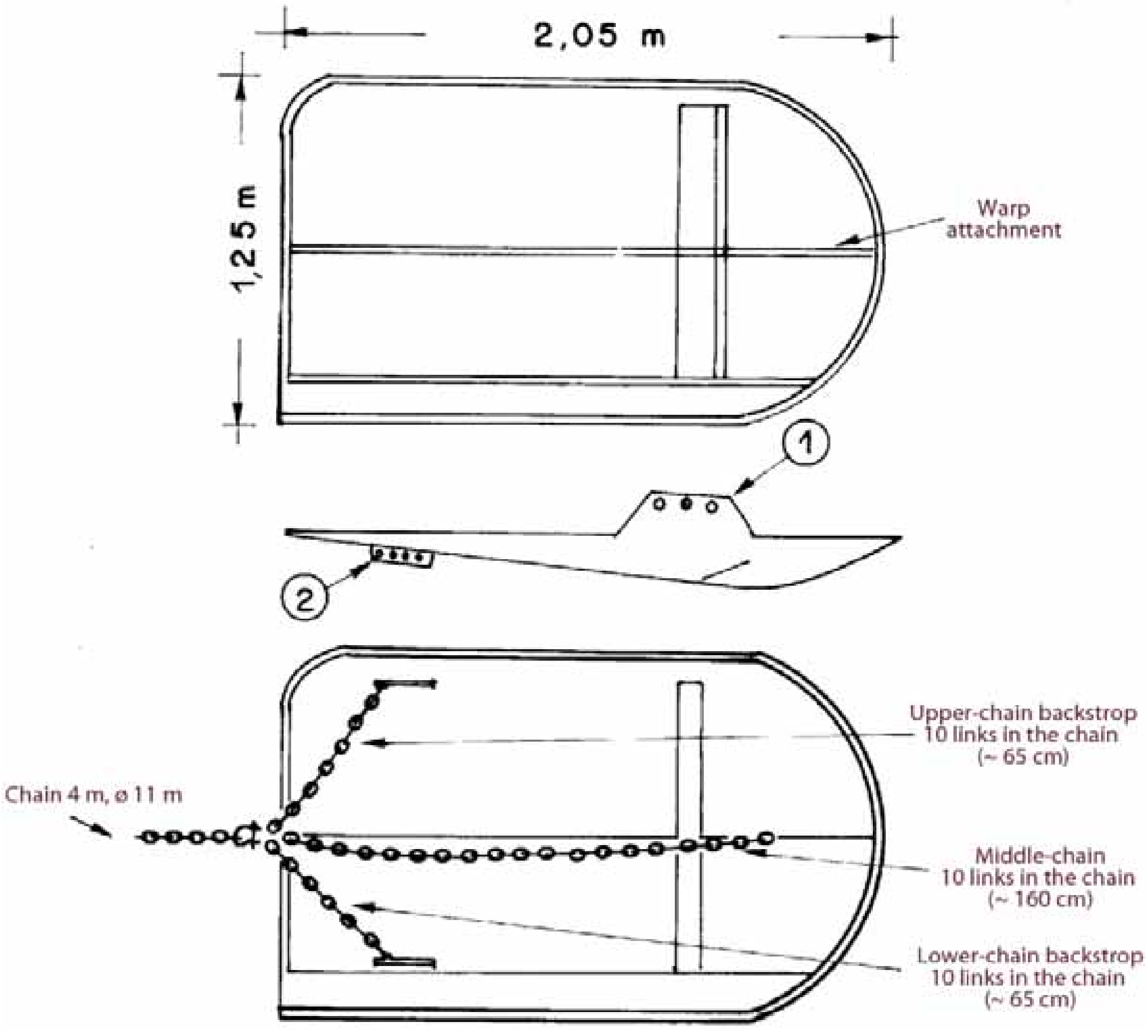
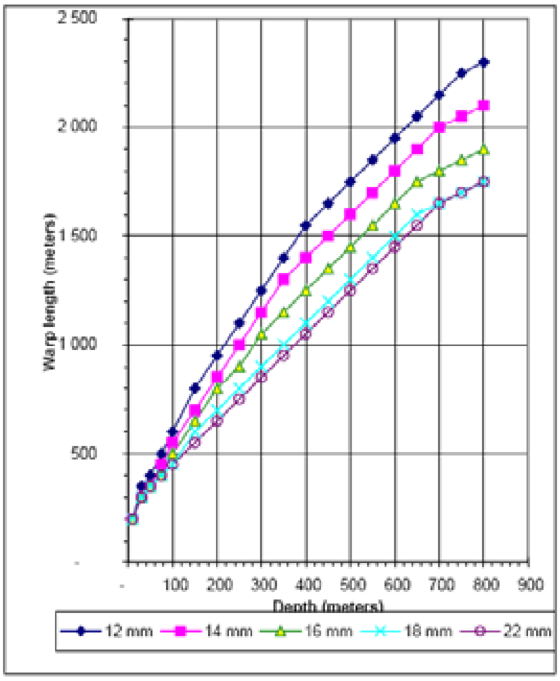


Figure 2. Morgere WS8 (350 kg; 2.5 m^2). The lengths of the backstrop chains are indicated without the shackles. The warp is shackled in the fore hole of the bracket sheet (see arrow 1). The short parts of the external crowfoot are shackled in the most back part of the backside sheets, upper and lower (see arrow 2).



Relation ship between depth and warp length
Warp lentgh in meters

Depth (m)	12 mm	14 mm	16 mm	18 mm	22 mm
10	200	200	200	200	200
30	350	300	300	300	300
50	400	350	350	350	350
75	500	450	400	400	400
100	600	550	500	450	450
150	800	700	650	600	550
200	950	850	800	700	650
250	1 100	1 000	900	800	750
300	1 250	1 150	1 050	900	850
350	1 400	1 300	1 150	1 000	950
400	1 550	1 400	1 250	1 100	1 050
450	1 650	1 500	1 350	1 200	1 150
500	1 750	1 600	1 450	1 300	1 250
550	1 850	1 700	1 550	1 400	1 350
600	1 950	1 800	1 650	1 500	1 450
650	2 050	1 900	1 750	1 600	1 550
700	2 150	2 000	1 800	1 650	1 650
750	2 250	2 050	1 850	1 700	1 700
800	2 300	2 100	1 900	1 750	1 750

Fig. 7. Relationship between depth and warp length for the trawl GOC 73.

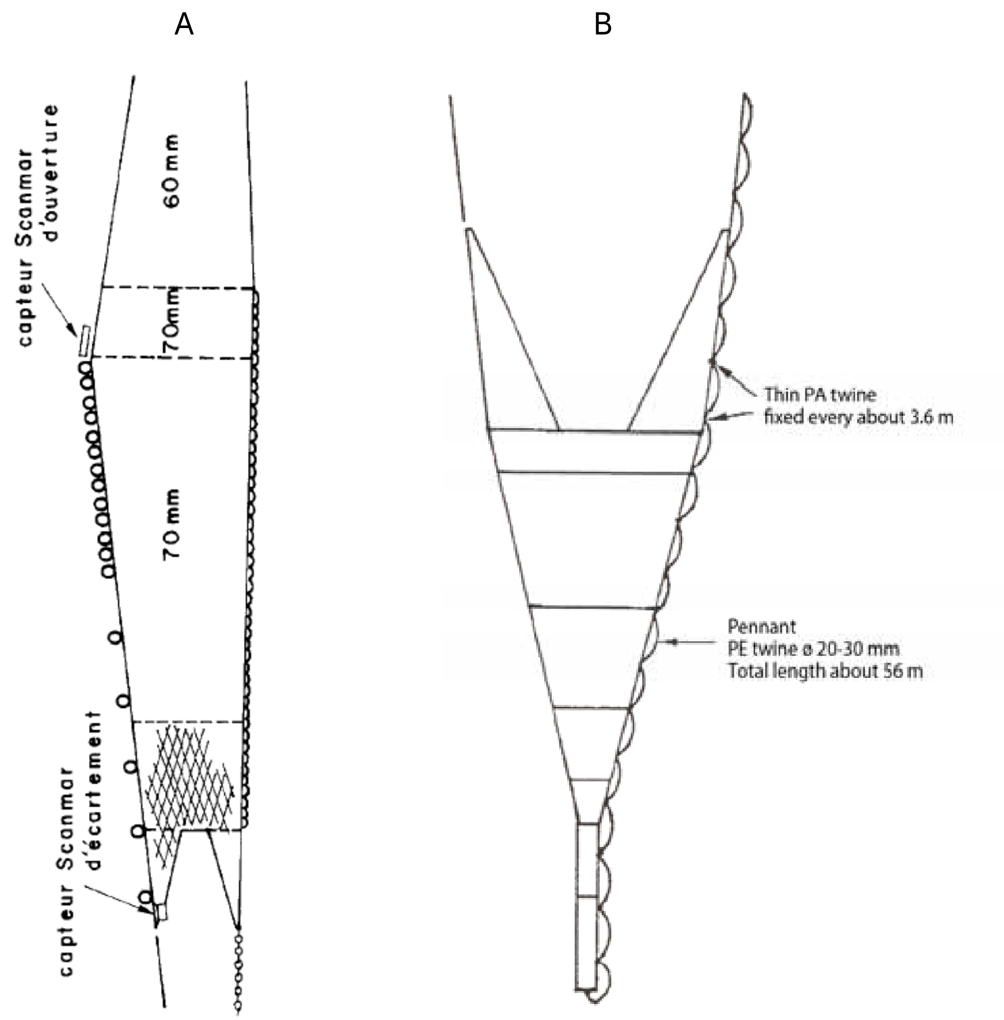


Fig. 8. A. Position of the geometry sensors and drawing of the lazy line.
B. Details of the pennant adopted for the MEDITS trawl. The pennant must be fixed both at the wing tip and at the codend closure. The pennant must be sewed every 3.6 m at the starboard strengthening lacing

[6] Annexes

I. Code of countries, vessels and gear

II. Stratification scheme

III. Target number of hauls by area

IV. Code of recorded species, of general observations on hauls and of quadrants

V. Code of faunistic categories. Form to introduce new species

VI. List of reference species

VII. Standard length measurement for Crustaceans, Cephalopods bony fish and Elasmobranches

VIII. Codes of sexual maturity for Fish, Crustaceans and Cephalopods

IX. Protocol for Conversion of maturity scales from the scales proposed at the Workshops on Maturity stages and the MEDITS scales

X. Format of the type A files (Data on hauls)

XI. Format of the type B files (Catches by haul)

XII. Format of the type C files (Length, sex and maturity at aggregated level)

XIII. Format of the type E files (Age, weight and maturity by length at individual level)

XIV. Protocol for sampling otoliths, individual weight and maturity stage of MEDITS target species

XV. Preliminary considerations for quality checks of the gear (by Antonello Sala)

XVI. FM list of species codes

XVII. Internal rules of the MEDITS group

I. CODES FOR COUNTRIES, VESSELS AND GEAR

Codes for countries (Position 3-5 in the file A)

Code	*Country*
ALB	*Albania*
CYP	*Cyprus*
ESP	*Spain*
FRA	*France*
GRC	*Greece*
HRV	*Croatia*
ITA	*Italy*
MLT	*Malta*
MOR	*Morocco*
MON	*Montenegro*
SLO	*Slovenia*

Vessel codes and characteristics (Vessel code: Position 8-10 in the file A)

Vessel code	Vessel Name	Type	Length (m)	Tonnage (TJB)	Year	Material	Power (kW)	Warp diam (mm)	Warp length (m)
AND	Andrea	R	29.5	211	1998	aluminium	1300	14	2250
BIM	Bianca Maria	P	26.81	116	1988	wood	485	12	3000
CHA	Charif Alidrissi	R	41	397	1986	steel	808	22	3000
COR	Cornide de Saavedra	R	66.7	1524	1970	steel	1651	29	2700
DAP	Dalla Porta	R	35.3	285	2000	steel	809	14	2500
DEM	Demetrios	P	27.77	78.24	1991	steel	537	12	3000
EGU	Elisa Guidotti	P	29	69	1991	bois	330	14	2500
EVA	Evagelistria	P	29.1	59.45	2000	steel	497	12	1800
FRP	Francesco Padre	P	25	88	1984	steel	660	14	3000
FUL	Fulmine	P	29	147.2	0	wood	736	14	2500
GAB	Gabriella	P	23	64	1970	wood	441	12	3500
GIS	Gisella	P	29.3	168	1999	iron	432	15	3000
IGO	Igor	P	22.5	102	1979	iron	345	14	2500
IRO	Ioannis Rossos	P	26.3	115.75	1986	iron	368	12	3000
LEU	L'Europe	R	29.6	259.69	1993	aluminium	690	16	2700
LIB	Libera	P	22.3	69	1987	wood	441	14	2500
MEG	Megalochari	P	33	150	2005	steel	367	12	2000
NAU	Nautilos	P	28.4	138	1991	iron	600	14	2500
NAV	Francisco Paula Navarro	R	30.5	178	1987	wood	750	18	2200
NUS	Nuovo Splendore	P	29.45	134.51	1967	wood	685	16	2450
PAR	Kapetan Paraschos	P	26.1	85.71	1989	wood	386	12	2000
PEC	Pasquale e Cristina	P	33.06	158.77	1996	wood	923	16	2500
PRI	Principessa I	P	32	165	1995	steel	403	14	2500
ROS	Roselys	R	0	0	0	wood	0	0	0
SAN	Sant'Anna	P	32.2	97.06	1981	steel	1357	14	3100

Codes for the gear (MEDITS code: Position 11-23 in the file A)

Nature	Gear	MEDITS code	Comments
Trawl	Large opening and 4 faces	GOC73	Standard for all vessels
Rigging	With legs	GC73	Standard for all vessels
Doors	Morgère WH S8	WHS8	Standard for all vessels

II. Stratification scheme (by stratum number) (Stratum: Position 125-129 in the file A)

GSA	Country	Stratum		Depth (m)	Surface (km²)	Area
1	Spain	11101	a	10-50	510	Alboran Sea
1	Spain	11102	a	50-100	1951	
1	Spain	11103	a	100-200	1086	
1	Spain	11104	a	200-500	3461	
1	Spain	11105	a	500-800	4912	
2	Spain	11106	b	10-50	0	Alboran Island
2	Spain	11107	b	50-100	130	Alboran Island
2	Spain	11108	b	100-200	132	
2	Spain	11109	b	200-500	221	
2	Spain	11110	a	500-800	350	
3	Morocco	11401	a	10-50	355	West Morocco
3	Morocco	11402	a	50-100	444	
3	Morocco	11403	a	100-200	487	
3	Morocco	11404	a	200-500	3580	
3	Morocco	11405	a	500-800	1108	
3	Morocco	11406	b	10-50	878	East Morocco
3	Morocco	11407	b	50-100	1098	
3	Morocco	11408	b	100-200	938	
3	Morocco	11409	b	200-500	3507	
3	Morocco	11410	b	500-800	1446	
5	Spain	11501	a	10-50	0	West Baleares
5	Spain	11502	a	50-100	1170	West Baleares
5	Spain	11503	a	100-200	1773	
5	Spain	11504	a	200-500	1123	
5	Spain	11505	a	500-800	2030	
5	Spain	11507	b	50-100	2255	East Baleares
5	Spain	11508	b	100-200	1472	
5	Spain	11509	b	200-500	1518	
5	Spain	11510	b	500-800	1315	
6	Spain	11201	a	10-50	1130	Valenciana
6	Spain	11202	a	50-100	4095	
6	Spain	11203	a	100-200	3302	
6	Spain	11204	a	200-500	4242	
6	Spain	11205	a	500-800	3159	
6	Spain	11301	a	10-50	1896	Tramontana
6	Spain	11302	a	50-100	7219	
6	Spain	11303	a	100-200	3587	
6	Spain	11304	a	200-500	2477	
6	Spain	11305	a	500-800	1399	
7	France	12101	a	10-50	1482	West Gulf of Lions
7	France	12102	a	50-100	3911	
7	France	12103	a	100-200	819	
7	France	12104	a	200-500	709	
7	France	12105	a	500-800	660	
7	France	12106	b	10-50	696	East Gulf of Lions
7	France	12107	b	50-100	2610	
7	France	12108	b	100-200	1734	
7	France	12109	b	200-500	653	
7	France	12110	b	500-800	586	
8	France	13101	a	10-50	0	North East Corsica
8	France	13102	a	50-100	521	North East Corsica
8	France	13103	a	100-200	234	
8	France	13104	a	200-500	920	
8	France	13105	a	500-800	867	

GSA	Country	Stratum		Depth (m)	Surface (km²)	Area
8	France	13106	b	10-50	0	South East Corsica
8	France	13107	b	50-100	524	South East Corsica
8	France	13108	b	100-200	153	
8	France	13109	b	200-500	383	
8	France	13110	b	500-800	960	
9	Italy	13201	a	10-50	657	North Ligurian Sea
9	Italy	13202	a	50-100	729	
9	Italy	13203	a	100-200	658	
9	Italy	13204	a	200-500	1737	
9	Italy	13205	a	500-800	2093	
9	Italy	13206	b	10-50	2053	East Ligurian Sea
9	Italy	13207	b	50-100	1598	
9	Italy	13208	b	100-200	3186	
9	Italy	13209	b	200-500	2449	
9	Italy	13210	b	500-800	879	
9	Italy	13211	c	10-50	945	North Tyrrhenian Sea
9	Italy	13212	c	50-100	1506	
9	Italy	13213	c	100-200	2732	
9	Italy	13214	c	200-500	2828	
9	Italy	13215	c	500-800	3071	
9	Italy	13216	d	10-50	2107	Central Tyrrhenian Sea
9	Italy	13217	d	50-100	2159	
9	Italy	13218	d	100-200	4302	
9	Italy	13219	d	200-500	3573	
9	Italy	13220	d	500-800	3148	
10	Italy	13401	a	10-50	1194	South East Tyrrhenian Sea
10	Italy	13402	a	50-100	1224	
10	Italy	13403	a	100-200	2095	
10	Italy	13404	a	200-500	3238	
10	Italy	13405	a	500-800	5248	
10	Italy	13406	b	10-50	622	South West Tyrrhenian Sea
10	Italy	13407	b	50-100	1003	
10	Italy	13408	b	100-200	1224	
10	Italy	13409	b	200-500	1966	
10	Italy	13410	b	500-800	2441	
11	Italy	13301	a	10-50	822	South East Sardinia
11	Italy	13302	a	50-100	382	
11	Italy	13303	a	100-200	351	
11	Italy	13304	a	200-500	589	
11	Italy	13305	a	500-800	502	
11	Italy	13306	b	10-50	910	North East Sardinia
11	Italy	13307	b	50-100	1592	
11	Italy	13308	b	100-200	839	
11	Italy	13309	b	200-500	765	
11	Italy	13310	b	500-800	855	
11	Italy	13311	c	10-50	627	North Sardinia
11	Italy	13312	c	50-100	796	
11	Italy	13313	c	100-200	512	
11	Italy	13314	c	200-500	500	
11	Italy	13315	c	500-800	242	
11	Italy	13316	d	10-50	431	North West Sardinia
11	Italy	13317	d	50-100	541	
11	Italy	13318	d	100-200	896	
11	Italy	13319	d	200-500	471	
11	Italy	13320	d	500-800	335	
11	Italy	13321	e	10-50	1096	West Sardinia
11	Italy	13322	e	50-100	446	

GSA	Country	Stratum		Depth (m)	Surface (km²)	Area
11	Italy	13323	e	100-200	927	
11	Italy	13324	e	200-500	412	
11	Italy	13325	e	500-800	260	
11	Italy	13326	f	10-50	783	South West Sardinia
11	Italy	13327	f	50-100	987	
11	Italy	13328	f	100-200	2335	
11	Italy	13329	f	200-500	1620	
11	Italy	13330	f	500-800	1041	
11	Italy	13331	g	10-50	705	South Sardinia
11	Italy	13332	g	50-100	350	
11	Italy	13333	g	100-200	768	
11	Italy	13334	g	200-500	1060	
11	Italy	13335	g	500-800	1227	
15	Malta	13501	a	10-50	152	Malta
15	Malta	13502	a	50-100	1473	
15	Malta	13503	a	100-200	3076	
15	Malta	13504	a	200-500	3353	
15	Malta	13505	a	500-800	2526	
16	Italy	13411	c	10-50	3145	Strait of Sicily
16	Italy	13412	c	50-100	6610	
16	Italy	13413	c	100-200	9866	
16	Italy	13414	c	200-500	13424	
16	Italy	13415	c	500-800	15653	
17	Italy	21101	a	10-50	17300	North Adriatic Sea
17	Italy	21102	a	50-100	8200	
17	Italy	21103	a	100-200	0	
17	Italy	21104	a	200-500	0	
17	Italy	21105	a	500-800	0	
17	Italy	21106	b	10-50	4700	Central Adriatic Sea
17	Italy	21107	b	50-100	10350	
17	Italy	21108	b	100-200	14950	
17	Italy	21109	b	200-500	3900	
17	Italy	21110	b	500-800	950	
17	Slovenia	21111	c	10-50	184	North Adriatic-Slovenia
17	Slovenia	21112	c	50-100	0	
17	Slovenia	21113	c	100-200	0	
17	Slovenia	21114	c	200-500	0	
17	Slovenia	21115	c	500-800	0	
17	Croatia	21116	d	10-50	7308	North East Adriatic-Croatia
17	Croatia	21117	d	50-100	14785	
17	Croatia	21118	d	100-200	7225	
17	Croatia	21119	d	200-500	2409	
17	Croatia	21120	d	500-800	0	
18	Italy	22121	e	10-50	261	South West Adriatic Sea
18	Italy	22122	e	50-100	509	
18	Italy	22123	e	100-200	1348	
18	Italy	22124	e	200-500	332	
18	Italy	22125	e	500-800	860	
18	Italy	22126	f	10-50	329	South West Adriatic Sea
18	Italy	22127	f	50-100	599	
18	Italy	22128	f	100-200	1809	
18	Italy	22129	f	200-500	472	
18	Italy	22130	f	500-800	350	
18	Italy	22131	g	10-50	290	South West Adriatic Sea
18	Italy	22132	g	50-100	689	
18	Italy	22133	g	100-200	1214	
18	Italy	22134	g	200-500	260	

GSA	Country	Stratum		Depth (m)	Surface (km²)	Area
18	Italy	22135	g	500-800	336	
18	Italy	22136	h	10-50	1702	South West Adriatic Sea
18	Italy	22137	h	50-100	1307	
18	Italy	22138	h	100-200	1407	
18	Italy	22139	h	200-500	707	
18	Italy	22140	h	500-800	492	
18	Albania	22141	i	10-50	568	South East Adriatic-Albania
18	Albania	22142	i	50-100	2231	
18	Albania	22143	i	100-200	2186	
18	Albania	22144	i	200-500	1840	
18	Albania	22145	i	500-800	1910	
18	Montenegro	22146	j	10-50	280	South Adriatic-Montenegro
18	Montenegro	22147	j	50-100	1100	
18	Montenegro	22148	j	100-200	1700	
18	Montenegro	22149	j	200-500	1150	
18	Montenegro	22150	j	500-800	770	
19	Italy	22101	a	10-50	412	North-Western Ionian Sea (East Sicily)
19	Italy	22102	a	50-100	377	
19	Italy	22103	a	100-200	334	
19	Italy	22104	a	200-500	650	
19	Italy	22105	a	500-800	641	
19	Italy	22106	b	10-50	326	North-Western Ionian Sea (South Calabria)
19	Italy	22107	b	50-100	225	
19	Italy	22108	b	100-200	257	
19	Italy	22109	b	200-500	939	
19	Italy	22110	b	500-800	1370	
19	Italy	22111	c	10-50	599	North-Western Ionian Sea (North Calabria)
19	Italy	22112	c	50-100	321	
19	Italy	22113	c	100-200	393	
19	Italy	22114	c	200-500	1327	
19	Italy	22115	c	500-800	1190	
19	Italy	22116	d	10-50	787	North-Western Ionian Sea (Apulia)
19	Italy	22117	d	50-100	778	
19	Italy	22118	d	100-200	1680	
19	Italy	22119	d	200-500	1439	
19	Italy	22120	d	500-800	2302	
20	Greece	22201	a	10-50	2916	East Ionian Sea
20	Greece	22202	a	50-100	4365	
20	Greece	22203	a	100-200	2536	
20	Greece	22204	a	200-500	3158	
20	Greece	22205	a	500-800	3848	
22	Greece	22301	a	10-50	2467	Argosaronikos
22	Greece	22302	a	50-100	587	
22	Greece	22303	a	100-200	7143	
22	Greece	22304	a	200-500	6074	
22	Greece	22305	a	500-800	8645	
22	Greece	22401	a	10-50	8645	North Aegean Sea
22	Greece	22402	a	50-100	8489	
22	Greece	22403	a	100-200	15823	
22	Greece	22404	a	200-500	19774	
22	Greece	22405	a	500-800	15426	
22	Greece	22501	a	10-50	4918	South Aegean Sea (encl. GSA 23: Crete)
22	Greece	22502	a	50-100	4090	
22	Greece	22503	a	100-200	13269	
22	Greece	22504	a	200-500	18100	
22	Greece	22505	a	500-800	22224	
25	Cyprus	32101	a	10-50	796	Cyprus
25	Cyprus	32102	a	50-100	717	
25	Cyprus	32103	a	100-200	918	
25	Cyprus	32104	a	200-500	2245	
25	Cyprus	32105	a	500-800	6430	

III. Target number of hauls by area (based on 2002 onwards records)

Country	GSA	Strata	Surface (km²)	No Hauls	Area
Spain	1, 2	111	12753	35	Northern Alboran Sea
Morocco	3	114	13841		Southern Alboran Sea
Spain	5	115	12656	53	Balearic Islands
Spain	6	112-113	32506	82	Northern Spain
France	7, 8	121, 131	18422	90	Gulf of Lions & Corsica
Italy	9	132	42410	120	Ligurian, North and Central Tyrrhenian Sea
Italy	10	134a-b	20255	70	Central and Southern Tyrrhenian Sea
Italy	11	133	26975	101	Sardinia
Malta	15	135	10580	44	Malta
Italy	16	134c	48698	120	Strait of Sicily
Italy	17	211a-b	60350	120	Northern Adriatic Sea
Slovenia	17	211c	184	2	Northern Adriatic Sea
Croatia	17	211d	31727	60	Northern Adriatic Sea
Italy	18	221e-h	15273	53	Southern Adriatic Sea
Albania	18	221i	8735	27	Southern Adriatic Sea
Montenegro	18	221j	5000	10	Southern Adriatic Sea
Italy	19	221a-d	16347	70	North-Western Ionian Sea
Greece	20	222	16823	32	Eastern Ionian Sea
Greece	22	223	24916	21	Aegean Sea (Argosaronikos)
Greece	22	224	68157	65	Aegean Sea (North)
Greece	22	225	62601	61	Aegean Sea (South)
Cyprus	25	321	11106	26	Cyprus

IV. CODES FOR RECORDED SPECIES, OF THE OBSERVATIONS ON HAULS AND OF QUADRANTS

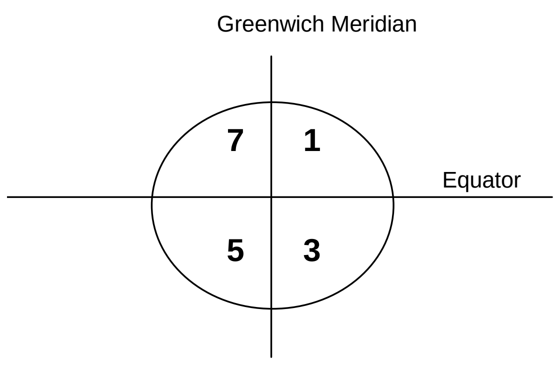
Codes of recorded species (Position 85 in the file A)

MEDITS code	Nature	Comments
0	No standard species recorded	
1	Only the species of the reference list are recorded	See Annex VI
2	The species of the reference list plus some others are recorded	
3	All the caught species are recorded	See Annex XV
4	Species from a national list	

Coding of the observations (Position 112 in the file A)

MEDITS code	Nature	Comments
0	No problem	
1	Slight plugging of the net	
2	Heavy plugging of the net	
3	High abundance of jellyfish	
4	High abundance of plants in the net	
5	Tears of the net	
6	High abundance of benthos	
7		
8		
9	Other	

Coding of the quadrants (Positions 41 and 63 in the file A)



V. Codes of faunistic categories. Form to introduce new species codes

Codes of faunistic categories (Position 24 in the file B)

MEDITS code	Nature	Years of use
A	**Fish**	**1994-2011**
Ao	**Fish Osteichthyes**	**2012÷**
Ae	**Fish Elasmobranch**	**2012÷**
B	**Crustaceans (Decapoda, Stomatopoda, Eufausiacea)**	**1994-2012÷**
C	**Cephalopods**	**1994-2012÷**
D	**Other commercial (edible) species**	**1994-2011**
Dmb	**Mollusca Bivalvia**	**2012÷**
Dmg	**Mollusca Gastropoda**	**2012÷**
Dec	**Echinoderms**	**2012÷**
Dtu	**Tunicata (Ascidiacea)**	**2012÷**
E	**Other animal species but not commercial (edible)**	**1994-2011**
Emb	**Mollusca Bivalvia**	**2012÷**
Emg	**Mollusca Gastropoda**	**2012÷**
Eec	**Echinoderms**	**2012÷**
Etu	**Tunicata (Ascidiacea)**	**2012÷**
Emo	**Opistobranchia**	**2012÷**
Esc	**Scaphopoda**	**2012÷**
Epo	**Polychaeta**	**2012÷**
Ebr	**Bryozoa**	**2012÷**
Esp	**Sponges (Porifera)**	**2012÷**
Ecn	**Cnidaria**	**2012÷**
V	**Vegetalia**	**2012÷**
G	**portions or products of animal species (shell debris, eggs of gastropods, selachians, etc.)**	**2012÷**
H	**portions or products of vegetal species (e.g. leaves of sea grasses, of terrestrial plants, etc.)**	**2012÷**

Form to introduce new species codes

Name of scientist: Date:
GSA:

Proposed Code		Scientific name	Reference for scientific name description	Geographical position	Stratum
Genus	Species				

Sheet to be send to:

prof. Giulio Relini
Centro di Biologia Marina del Mar Ligure
Dip.Te.Ris. biolmar@unige.it

VI. List of the reference species

The MEDITS reference list (since 2012) includes 82 species, of which 32 are Elasmobranches. The list also includes all species of the *Epinepheus* and *Scomber* genera.

For all the 82 species and all species of the *Epinepheus* and *Scomber* genera, the total number of individuals, the total weight and the individual length should be collected.

This list is further split in two groups:

- MEDITS G1 includes 41 species with 9 demersal (3 fish, 4 crustaceans and 2 cephalopods) and 32 Selachians. For these species the total number of individuals, the total weight, the individual length, and also biological parameters including sex, maturity, individual weight and age (age has been proposed only for the teleosteans of the Group 1) should be collected;
- MEDITS G2 includes 42 species for which only total number of individuals, total weight and individual length and should be collected.

The new list of reference species (Tot. No=total number of individuals in the haul; Tot. W= total weight of the individuals in the haul; the number 1 in the column* MEDITS G1 *and* MEDITS G2 *indicates that the species has been selected for some measurements; the column date indicates when the species has been introduced in the list of target species, the symbol > followed by the year indicates that the species was excluded by the list in that year)

No	Medit LIST proposal 2011	Species group DCF	MEDITS G1	MEDITS G2	Group	Old MEDITS list	Tot. No	Tot. W	Ind. Length	Sex	Mat. stage	Age	Ind. weight	Date	CODE	English common name
	Teleosteans															
1	*Aspitrigla cuculus*	G3		1	Fish	1	x	x	x					1998	ASPI CUC	Red gurnard
2	*Boops boops*	G2		1	Fish	1	x	x	x					2006	BOOPBOO	Bogue
3	*Citharus linguatula*	G3		1	Fish	1	x	x	x					1994	CITH MAC	Spotted flounder
4	*Diplodus annularis*	G3		1	Fish		x	x	x					2012	DIPLANN	Annular seabream
5	*Diplodus puntazzo*	G3		1	Fish		x	x	x					2012	DIPLPUN	Sharpsnout seabream
6	*Diplodus sargus*	G3		1	Fish		x	x	x					2012	DIPLSAR	White sea bream
7	*Diplodus vulgaris*	G3		1	Fish		x	x	x					2012	DIPLVUL	Common two-banded seabream

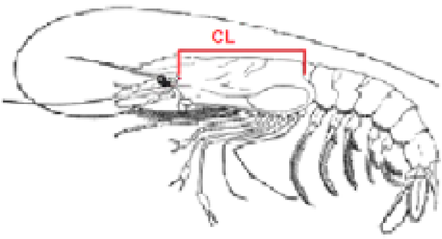
8	*Engraulis encrasicolus*	G1		1	Fish		x	x	x					2012	ENGRENC	Anchovy
9	*Epinephelus spp.**	G3		1	Fish		x	x	x					2012	EPINSPP	Grouper
10	*Eutrigla gurnardus*	G2		1	Fish	1	x	x	x					1994	EUTR GUR	Grey gurnard
11	*Helicolenus dactylopterus*	G3		1	Fish	1	x	x	x					1994	HELI DAC	Rockfish
12	*Lepidorhombus boscii*	G3		1	Fish	1	x	x	x					1994	LEPM BOS	Four-spotted megrim
13	*Lithognathus mormyrus*	G3		1	Fish		x	x	x					2012	LITH MOR	Striped seabream
14	*Lophius budegassa*	G2		1	Fish	1	x	x	x					1994	LOPH BUD	Black-bellied angler
15	*Lophius piscatorius*	G2		1	Fish	1	x	x	x					1994	LOPH PIS	Angler
16	***Merluccius merluccius***	**G1**	**1**		**Fish**	**1**	**x**	**x**	**x**	**x**	**x**	**x**	**x**	**1994**	**MERL MER**	**European hake**
17	*Micromesistius poutassou*	G2		1	Fish	1	x	x	x					1994	MICM POU	Blue whiting
18	***Mullus barbatus***	**G1**	**1**		**Fish**	**1**	**x**	**x**	**x**	**x**	**x**	**x**	**x**	**1994**	**MULL BAR**	**Red mullet**
19	***Mullus surmuletus***	**G1**	**1**		**Fish**	**1**	**x**	**x**	**x**	**x**	**x**	**x**	**x**	**1994**	**MULL SUR**	**Striped red mullet**
20	*Pagellus acarne*	G3		1	Fish	1	x	x	x					1994	PAGE ACA	Axillary seabream
21	*Pagellus bogaraveo*	G3		1	Fish	1	x	x	x					1994	PAGE BOG	Blackspot seabream
22	*Pagellus erythrinus*	G2		1	Fish	1	x	x	x					1994	PAGE ERY	Common pandora
23	*Pagrus pagrus*	G3		1	Fish		x	x	x					> 1996	SPAR PAG	Common seabream
24	*Phycis blennoides*	G3		1	Fish	1	x	x	x					1994	PHYI BLE	Greater forkbeard
25	*Polyprion americanus*	G3		1	Fish		x	x	x					2012	POLY AME	Wreckfish
26	*Psetta maxima*	G2		1	Fish		x	x	x					2012	PSET MAX	Turbot
27	*Sardina pilchardus*	G1		1	Fish		x	x	x					2012	SARD PIL	Sardine
28	*Scomber spp.**	G2		1	Fish		x	x	x					2012	SCOM SPP	mackerel
29	*Solea vulgaris*	G1		1	Fish	1	x	x	x					1994	SOLE VUL	Common sole
30	*Spicara flexuosa*	G3		1	Fish	1	x	x	x					1994	SPIC FLE	Picarel
31	*Spicara maena*	G3		1	Fish		x	x	x					2012	SPIC MAE	Blotched picarel
32	*Spicara smaris*	G2		1	Fish	1	x	x	x					1998	SPIC SMA	Picarel
33	*Trachurus mediterraneus*	G2		1	Fish	1	x	x	x					1994	TRAC MED	Mediterranean horse mackerel
34	*Trachurus trachurus*	G2		1	Fish	1	x	x	x					1994	TRAC TRA	Atlantic horse mackerel
35	*Trigla lucerna*	G2		1	Fish	1	x	x	x					2006	TRIGLUC	Tub gurnard

36	*Trigloporus lastoviza*	G3		1	Fish	1	x	x	x					1998	TRIP LAS	Streaked gurnard
37	*Trisopterus minutus capelanus*	G3		1	Fish	1	x	x	x					1994	TRIS CAP	Poor-cod
38	*Zeus faber*	G3		1	Fish	1	x	x	x					1994	ZEUS FAB	John dory
	Elasmobranches															
39	*Centrophorus granulosus*	G1	1		Elasmob		x	x	x	x	x		x	2012	CENT GRA	Gulper shark
40	*Dalatias licha*	G1	1		Elasmob		x	x	x	x	x		x	2012	SCYM LIC	Kitefin shark
41	*Dipturus batis*	G1	1		Elasmob		x	x	x	x	x		x	2012	RAJA BAT	Skate
42	*Dipturus oxyrinchus*	G1	1		Elasmob		x	x	x	x	x		x	2012	RAJA OXY	Longnosed skate
43	*Etmopterus spinax*	G1	1		Elasmob		x	x	x	x	x		x	2012	ETMO SPI	Velvet belly
44	*Galeorhinus galeus*	G1	1		Elasmob		x	x	x	x	x		x	2012	GALE GAL	Tope shark
45	*Galeus melastomus*	G1	1		Elasmob	1	x	x	x	x	x		x	1999	GALU MEL	Blackmouth catshark
46	*Heptranchias perlo*	G1	1		Elasmob		x	x	x	x	x		x	2012	HEPT PER	Sharpnose sevengill shark
47	*Hexanchus griseus*	G1	1		Elasmob		x	x	x	x	x		x	2012	HEXA GRI	Bluntnose sixgill shark
48	*Leucoraja circularis*	G1	1		Elasmob		x	x	x	x	x		x	2012	RAJA CIRC	Sandy ray
49	*Leucoraja melitensis*	G1	1		Elasmob		x	x	x	x	x		x	2012	RAJA MEL	Maltese ray
50	*Mustelus asterias*	G1	1		Elasmob		x	x	x	x	x		x	2012	MUST AST	Starry smoothhound
51	*Mustelus mustelus*	G1	1		Elasmob		x	x	x	x	x		x	2012	MUST MUS	Smoothhound
52	*Mustelus punctulatus*	G1	1		Elasmob		x	x	x	x	x		x	2012	MUST PUN	Blackspotted smoothhound
53	*Myliobatis aquila*	G1	1		Elasmob		x	x	x	x	x		x	2012	MYLIA AQU	Common eagle ray
54	*Oxynotus centrina*	G1	1		Elasmob		x	x	x	x	x		x	2012	OXYN CEN	Angular rough shark
55	*Raja asterias*	G1	1		Elasmob		x	x	x	x	x		x	2012	RAJA AST	Starry ray
56	*Raja clavata*	G1	1		Elasmob	1	x	x	x	x	x		x	1999	RAJA CLA	Thornback ray
57	*Raja miraletus*	G1	1		Elasmob		x	x	x	x	x		x	2012	RAJA MIR	Brown ray
58	*Raja polistigma*	G1	1		Elasmob		x	x	x	x	x		x	2012	RAJA POL	Speckled ray
59	*Raja undulata*	G1	1		Elasmob		x	x	x	x	x		x	2012	RAJA UND	Undulate ray
60	*Rhinobatos cemiculus*	G1	1		Elasmob		x	x	x	x	x		x	2012	RHIN CEM	Blackchin guitarfish
61	*Rhinobatos rhinobatos*	G1	1		Elasmob		x	x	x	x	x		x	2012	RHIN RHI	Common guitarfish
62	*Rostroraja alba*	G1	1		Elasmob		x	x	x	x	x		x	2012	RAJA ALB	White skate
63	*Scyliorhinus canicula*	G1	1		Elasmob	1	x	x	x	x	x		x	1999	SCYO CAN	Smallspotted

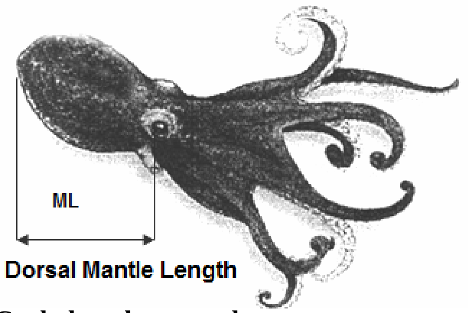
																catshark
64	*Scyliorhinus stellaris*	G1	1		Elasmob		x	x	x	x	x		x	2012	SCYO STE	Nursehound
65	*Squalus acanthias*	G1	1		Elasmob		x	x	x	x	x		x	2012	SQUA ACA	Piked dogfish
66	*Squalus blainvillei*	G1	1		Elasmob		x	x	x	x	x		x	2012	SQUA BLA	Longnose spurdog
67	*Squatina aculeata*	G1	1		Elasmob		x	x	x	x	x		x	2012	SQUT ACU	Sawback angelshark
68	*Squatina oculata*	G1	1		Elasmob		x	x	x	x	x		x	2012	SQUT OCL	Smoothback angelshark
69	*Squatina squatina*	G1	1		Elasmob		x	x	x	x	x		x	2012	SQUT SQU	Angelshark
70	*Torpedo marmorata*	G1	1		Elasmob		x	x	x	x	x		x	2012	TORP MAR	Marbled electric ray
	Crustaceans															
71	***Aristeomorpha foliacea***	**G1**	**1**		**Cru**	**1**	**x**	**x**	**x**	**x**	**x**		**x**	**1994**	**ARIS FOL**	**Giant red shrimp**
72	***Aristeus antennatus***	**G1**	**1**		**Cru**	**1**	**x**	**x**	**x**	**x**	**x**		**x**	**1994**	**ARIT ANT**	**Blue and red shrimp**
73	***Nephrops norvegicus***	**G1**	**1**		**Cru**	**1**	**x**	**x**	**x**	**x**	**x**		**x**	**1994**	**NEPR NOR**	**Norway lobster**
74	***Parapenaeus longirostris***	**G1**	**1**		**Cru**	**1**	**x**	**x**	**x**	**x**	**x**		**x**	**1994**	**PAPE LON**	**Deep-water pink shrimp**
75	*Palinurus elephas*	G3		1	Cru		x	x	x					2012	PALI ELE	Spiny lobster
76	*Penaeus kerathurus*	G2		1	Cru		x	x	x					2012	PENA KER	Caramote prawn
77	*Squilla mantis*	G2		1	Cru		x	x	x					2012	SQUI MAN	Spottail mantis squillids
	Cephalopods															
78	*Eledone cirrosa*	G2		1	Cef	1	x	x	x					1994	ELED CIR	Horned octopus
79	*Eledone moschata*	G2		1	Cef	1	x	x	x					1997	ELED MOS	Musky octopus
80	***Illex coindettii***	**G2**	**1**		**Cef**	**1**	**x**	**x**	**x**	**x**	**x**		**x**	**1994**	**ILLE COI**	**Broadtail squid**
81	***Loligo vulgaris***	**G2**	**1**		**Cef**	**1**	**x**	**x**	**x**	**x**	**x**		**x**	**1994**	**LOLI VUL**	**European squid**
82	*Octopus vulgaris*	G2		1	Cef	1	x	x	x					1994	OCTO VUL	Common octopus
83	*Sepia officinalis*	G2		1	Cef	1	x	x	x					1994	SEPI OFF	Common cuttlefish
84	*Todarodes sagittatus*	G2		1	Cef		x	x	x					2012	TODA SAG	Arrow squid

*not all *Epinephelus* and *Scomber* species are listed but the single species should be considered as target

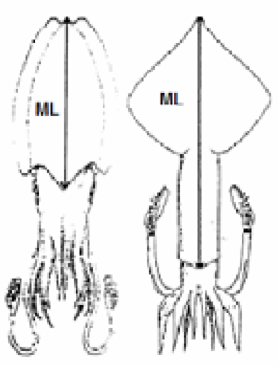
VII. Standard length measurement for Crustaceans, Cephalopods and Fish



Crustaceans
CL: cephalo-thoracic length

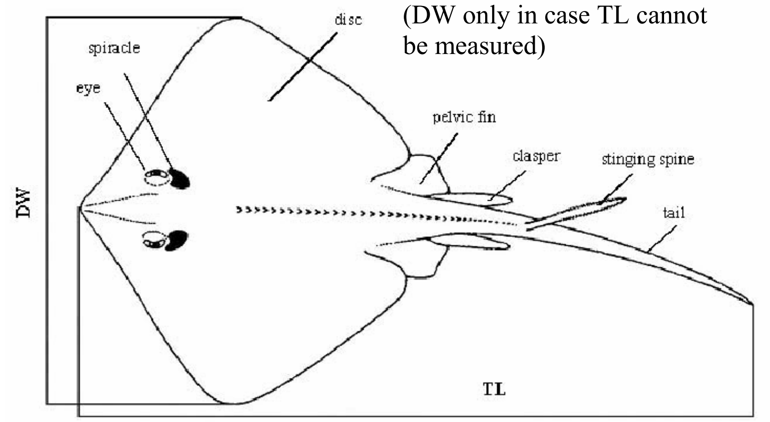


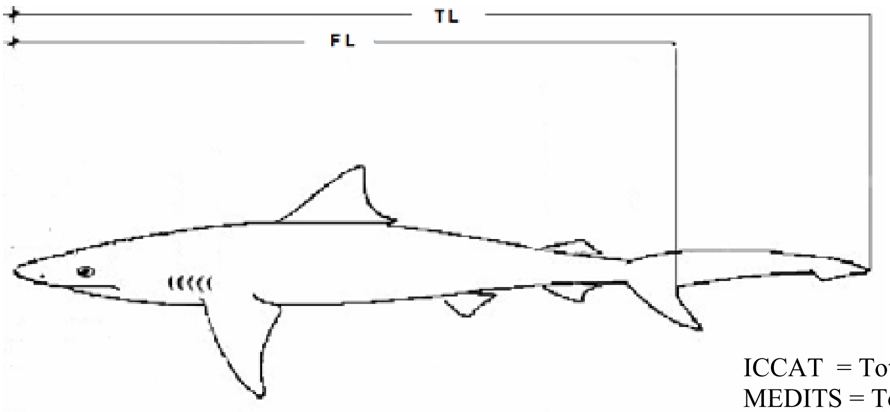
Cephalopods octopoda
Dorsal Mantle Length



Cephalopods decapoda
ML=Dorsal Mantle Length

ICCAT = Disk Width DW
MEDITS = Total LengthTL
(DW only in case TL cannot be measured)





ICCAT = Total Length TL
MEDITS = Total Length TL
(Fork length FL in case TL cannot be taken; e.g. damaged fins)

Note: rule to take TL of Elasmobranches holds also for bony fish

VIII. CODES OF SEXUAL MATURITY FOR FISH, CRUSTACEANS AND CEPHALOPODS

VIII.A

Bony Fish

SEX	GONAD ASPECT	MATURATION STATE	STAGE	MEDITS
I	Sex not distinguished by naked eye. Gonads very small and translucid, almost transparent. Sex undetermined.	UNDETERMINED	0	0
F	Small pinkish and translucent ovary shorter than 1/3 of the body cavity. Eggs not visible by naked eye.	IMMATURE=VIRGIN	1	1
M	Thin and withish testis shorter than 1/3 of the body cavity.			
F	Small pinkish/reddish ovary shorter than ½ of e body cavity. Eggs not visible by naked eye.	VIRGIN-DEVELOPING*	2a	2
M	Thin withish testis shorter than 1/2 of the body cavity.			
F	Pinkish-reddish/ reddish-orange and translucent ovary long about ½ of the body cavity. Blood vessels visible. Eggs not visible by naked eye.	RECOVERING*	2b	
M	Withish/pinkish testis, more or less symmetrical, long about ½ of the body cavity			
F	Ovary pinkish-yellow in colour with granular appearance, long about 2/3 of the body cavity. Eggs are visible by naked eye trough the ovaric tunica, which is not yet translucent. Under light pressure eggs are not expelled.	MATURING	2c	
M	Withish to creamy testis long about 2/3 of the body cavity. Under light pressure sperm is not expelled.			
F	Ovary orange-pink in colour, with conspicious superficial blood vessels, long from 2/3 to full length of the body cavity. Large transparent, ripe eggs are cleary visible and could be expelled under light pressure. In more advanced conditions, eggs escape freely.	MATURE/SPAWNER	3	3
M	Whitish-creamy soft testis long from 2/3 to full length of the body cavity. Under light pressure, sperm could be expelled. In more advanced conditions, sperm escapes freely.			
F	Reddish ovary shrunked to about 1/2 length of the body cavity. Flaccid ovaric walls; ovary may contain remanants of disintegrating opaque and/or translucent eggs.	SPENT	4a	4
M	Bloodshot and flabby testis shrunken to about 1/2 length of the body cavity			
F	Pinkish and translucent ovary long about 1/3 of the body cavity. Eggs not visible by naked eye.	RESTING*	4b	
M	Whitish/pinkish testis, more or less simmetrical, long about 1/3 of the body cavity.			

be careful, these stages can be easily confused

Adult specimens

VIII.B

Elasmobranchs oviparous

SEX	GONAD ASPECT	MATURATION STATE	STAGE	MEDITS
F	**Ovary is barely discernible with small isodiametric eggs. Distal part of oviducts is thick-walled and whitish. The nidamental glands are less evident.**	**IMMATURE/VIRGIN**	**1**	**1**
M	**Claspers are small and flaccid and do not reach the posterior edge of the pelvic fins. Spermducts not differentiated. Testis small and narrow .**			
F	**Whitish and/or few yellow maturing eggs are visible in the ovary. The distal part of oviducts (uterus) is well developed but empty. The nidamental glands are small.**	**MATURIN*G**	**2**	**2**
M	**Claspers are larger, but skeleton still flexible. They extend to the posterior edge of the pelvic fins. Spermducts well developed eventually beginning to meander.**			
F	**Ovaries contain yellow eggs (large yolk eggs). The nidamental glands are enlarged and oviducts are distended.**	**MATURE**	**3a**	**3**
M	**Claspers extends well beyond the posterior edge of the pelvic fin and their internal structure is generally hard and ossified. Testis greatly enlarged. Spermducts meandering over almost their entire length.**			
F	**Ovary walls transparent. Oocytes of different sizes, white or yellow. Nidamental glands large. Egg-cases more or less formed in the oviducts (Extruding Stage).**	**MATURE/EXTRUDING-ACTIVE**	**3b**	
M	**Clasper longer than tips of posterior pelvic fin lobes, skeleton hardened with axial cartilages hardened and pointed. Spermducts largely. Sperm flowing on pressure from cloaca (Active Stage).**			
F	**Ovary walls transparent. Oocytes of different sizes, white or yellow. Oviducts appear much enlarged, collapsed and empty. The nidamental glands diameter are reducing.**	**RESTING**	**4a**	**4**
M	**Clasper longer than tips of posterior pelvic fin lobes, skeleton hardened with axial cartilages still hardened. Spermducts empty and flaccid.**			
F	**Ovaries full of small follicles similar to stage 2, enlarged oviducal glands and uterus**	**REGENERATING***	**4b**	

be careful, these stages can be easily confused

Adult specimens

VIII.C

Elasmobranchs viviparous

VIVIPAROUS ELASMOBRANCHES (RAYS AND SHARKS)				
Sex	**GONAD ASPECT**	**MATURATION STATE**	**MATURITY**	**STAGE**
M	**Claspers flexible and shorter than pelvic fins. Testes small (in rays, sometimes with visible lobules). Sperm ducts straight and thread-like.**	**IMMATURE**	**IMMATURE**	**1**
F	**Ovaries barely visible or small, whitish; undistinguishable ovarian follicles. Oviducal (nidamental) gland may be slightly visible. Uterus is thread-like and narrow.**			
M	**Claspers slightly more robust but still flexible. Clasp-ers as long as or longer than pelvic fins. Testes enlarged; in sharks testes start to segment; in rays lobules clearly visible but do not occupy the whole surface. Sperm ducts developing and beginning to coil (meander).**	**DEVELOPING**	**IMMATURE ***	**2**
F	**Ovaries enlarged with small follicles (oocytes) of dif-ferent size. Some relatively larger yellow follicles may be present. Ovaries lack atretic follicles. Developing oviducal gland and uterus.**			
M	**Claspers fully formed, skeleton hardened, rigid and generally longer than pelvic fins. Testes greatly enlarged; in sharks testes are fully segmented; in rays filled with developed lobules. Sperm ducts tightly coiled and filled with sperm.**	**SPAWNING CAPABLE**	**MATURE**	**3a**
F	**Large ovaries with enlarged yolk follicles all of about the same size so that they can be easily distinguished. Oviducal gland and uterus developed without yolky matter, embryos and not dilated.**	**CAPABLE to RE-PRODUCE**		
M	**Description similar to stage 3a, however with clasper glands dilated, often swollen and reddish (occasion-ally open). Sperm often present in clasper groove or glans. On pressure sperm is observed flowing out of the cloaca or in the sperm ducts.**	**ACTIVELY SPAWNING**	**MATURE**	**3b**
F	**Uteri well filled and rounded with yolk content (usually candle shape). In general segments cannot be distinguished and embryos cannot be observed.**	**EARLY PREGNANCY**	**MATERNAL**	
F	**Uteri well filled and rounded, often with visible segments. Embryos are always visible, small and with a relatively large yolk sac.**	**MID PREGNANCY**	**MATERNAL**	**3c**
F	**Embryos fully formed, yolk sacs reduced or absent. Embryos can be easily measured and sexed.**	**LATE PREGNANCY**	**MATERNAL**	**3d**
M	**Claspers fully formed, similar to stage 3. Testes and spermducts shrunken and flaccid.**	**REGRESSING**	**MATURE**	**4**
F	**Ovaries shrunken without follicle development and with atretic (degenerating) follicles. The oviducal glands diameter may be reducing. Uterus appears much enlarged, collapsed, empty and reddish.**	**REGRESSING**	**MATURE**	**4a**
F	**Ovary with small follicles in different stages of de-velopment with the presence of atretic ones. Uterus enlarged with flaccid walls. Oviducal gland distinguishable.**	**REGENERATING (mature)**	**MATURE ***	**4b**

be careful, these stages can be easily confused

Adult specimens

VIII.D

Crustaceans

SEX	REPRODUCTIVE APPARATUS ASPECT	COLOURING OF FRESH OVARY	MATURATION STATE	STAGE	MEDITS
I	Sex not distinguished by naked eye. Sex undetermined	translucid	UNDETERMINED	0	0
F	Ovary hardy visible in transparence. After dissection of the tegument ovary is small and lobes are flaccid, stringy and poorly developed. *A. foliacea* and *A. antennatus* no sphermatophores on thelycum.	Whitish or traslucid	IMMATURE = VIRGIN *	1	1 FEMALE
M	Petasma is not much visible, and there are not spermatic masses (emi-spermatophores) on the seminal ammpullae, located on side of the V pair of pereiopods. *A. foliacea* and *A. antennatus* : long rostrum.				
F	Ovary status to develop. Cephalic and lateral lobes are small but distinguishable by naked eye. Abdominal extension are thin and just visible.	*A. foliacea* : flesh coloured; *A. antennatus:* Ivory coloured with orange pink-violet dotting. *N. norvegicus* : cream. *P. longirostris* : cream orange.	VIRGIN DEVELOPING **	2a	2 FEMALE
M	Petasma appears visible and nearly or completely joined, but there are no spermatic masses in the seminar ammpullae. *A. foliacea* & *A. antennatus* : long or intermediate rostrum.				
F	Ovary status to re-develop. Cephalic and lateral lobes are small but distinguishable by naked eye. Abdominal extension are thin and just visible. Occasionally presence of spermatophores in *A. foliacea* and *A. antennatus* .	*A. foliacea* : flesh coloured; *A. antennatus* : Ivory coloured with orange pink-violet dotting. *N. norvegicus* : cream. *P. longirostris* : cream orange.	RECOVERING**	2b	
M	Petasma appears completely joined, but there are no spermatic masses in the seminar ampullae. *A. foliacea* & *A. antennatus* : short rostrum.				
F	Ovary developed and occupies almost entirely the dorsal portion. The cephalic and lateral lobes are much developed and have a turgid consistence.	*A. foliacea* : light and dark grey; *A. antennatus* : lilla; *N. norvegicus* : light green; *P. longirostris* : light green or grey green.	MATURING OR ALMOST MATURE	2c	
M					
F	Turgid ovary extends to the whole dorsal portion, covery the organs below. Lobes and extensions well developed, in particular the abdominal extention are much evident. Oocytes well visible.	*A. foliacea* : black; *A. antennatus* : violet; *N. norvegicus* : dark grey; *P. longirostris* : brigth green or olive green.	MATURE	2d	
M	Petasma is perfectly visible and completely joined. Spermatic masses in seminar ampullae. *A. foliacea* & *A. antennatus* : small rostum.				
F	Resting ovary. Presence of spermatophores in *A. foliacea* and *A. antennatus* .	Uncoloured.	RESTING ADULT*	2e	
F (*N. norvegicus*)	Eggs on pleiopods		BERRIED	3	3 *N. norvegicus* , FEMALE

Adult specimens

*, ** : WARNING ! Be careful.These stages could be confused each other.

VIII.E

Cephalopods

SEX	REPRODUCTIVE APPARATUS ASPECT	EGGS SIZE (mm)	SPERMATOPHORES DEVELOPMENT	MATURATION STATE	STAGE	MEDITS
I	Sex not distinguished by naked eye. Sex undetermined.	Total absence of eggs.	Total absence of spermatophores.	UNDETERMINED	0	0
F	Small and translucid Nidamental Glands (NG) / Oviducal Glands (OG). Ovary is semi-transparent, stringy and lacking granular structure Small semi-transparent NG / OG. Oviduct meander not visible.	*L. vulgaris* & *I. coindetii*: no eggs *S.officinalis*: ø <2mm *E. moschata*: ø <4mm *E. cirrhosa* ø <2mm *O. vulgaris* ø <1mm	Total absence of spermatophores	IMMATURE = VIRGIN	1	1
M	Testis small. Spermatophoric complex (SC) semi-transparent with not visible Vas deferens. Penis appears as a small prominence of SC.					
F	NG / OVG enlarged. NG covering some internal organs. Whitish ovary with granular structure clearly visible, not reaching the posterior half of the mantle cavity. Oviduct meander clearly visible.	Very small eggs	Absence of spermatophores	DEVELOPING	2a	2
M	Enlarged testis with structure not clearly visible. The Vas deferens whitish or white and the spermatophoric organ with white streak.					
F	Large NG covering the viscera below. Ovary occupies the whole posterior half of mantle cavity, containing reticulated oocytes of all sizes tightly packed and probably a few ripe ova at its proximal part. Oviducts fully developed but empty.	*L. vulgaris* & *I. coindetii* : maturing eggs visible by naked eye. *S.officinalis:* 2,1mm< ø<4mm *E. moschata:* 4mm<ø<11mm *E. cirrhosa:* 2mm<ø<5mm *O. vulgaris:* 1mm<ø<2mm	*L. vulgaris, I. coindetii* and *S.officinalis* : few immature spermatophores in Needham's sac. *E. moschata, E. cirrhosa, O. vulgaris* : few spermatophores, barelly developed and not functional	MATURING	2b	
M	The Vas deferens white, meandering, enlarged. The Needham's sac (SS) with structureless whitish particles inside. Normally the Needham's sac is without funtional spermatophores but sometimes some immature/abortive ones could occur. The testis tight, crispy, with visible structure.					
F	Large NG as previously. Ovary containing higher percentage of large reticulated eggs and some large ripe ova with smooth surface. In Teuthoidea ripe ova in oviducts.	*L. vulgaris* & *I. coindetii* : amber- colored and isodiametric eggs in oviducts and in part of the ovary (ø =2mm in *Loligo* and ø =1mm in *Illex*). *S.officinalis* : medium eggs (4,1mm< ø<6,0mm) and big eggs (6,1mm<ø<8mm) *E. moschata* : ø >11mm (striped eggs). *E. cirrhosa* : ø >5mm *O. vulgaris* : ø >2mm	Well developed spermatophores	MATURE	3a	3
M	Testis as before. Spermatophores packed in the Needham's sac.					
F	NG/OG large but soft and running. Ovary shrinked and flaccid, with only immature oocytes attached to the central tissue and a few loose large ova in the coelom. In Teuthoidea oviduct may contain some mature ova but is no longer packed.	Few large ova	Disintegrating spermatophores	SPENT	3b	
M	Disintegrating spermatophores in the Needham's sac and the penis.					

Grey shading (MATURATION STATE column, stages 2a–3b): **Adult specimens**

IX. PROTOCOL FOR CONVERSION OF MATURITY SCALES FROM THE SCALES PROPOSED AT THE WORKSHOPS ON MATURITY STAGES AND THE MEDITS SCALES

Adopted during the MEDITS meeting, Nantes (France), 15-17/03/2011

The protocol for conversion of maturity scales adopted during the MEDITS Coordination meeting, Nantes (France), 15-17/03/2011 is here reported with some editorial changes .

Conversion of maturity scale for *Merluccius merluccius*

MEDITS SCALE		WKMAT SCALE	
0	INDETERMINED		
1	IMMATURE /VIRGIN	1	IM - VIRGIN
2A	VIRGIN DEVELOPING	1	IM - VIRGIN
2B	RECOVERING	4	SP/RE - SPENT RECOVERY
2C	MATURING	2	MI - MATURING
3	MATURE/SPAWNER	3	MA - SPAWNING
4A	SPENT	4	SP/RE - SPENT RECOVERY
4B	RESTING	4	SP/RE - SPENT RECOVERY
5		5	OS - OMITTED SPAWNING *(shrunken and greyer gonads sexually mature, not contributing to the SSB)*

Notes:

- The WKMAT scale has a unique stage for "Spent/recovery" while in the MEDITS scale these stages are divided in 2B (Recovering), 4A (Spent) and 4B (Resting).
- During the MEDITS meeting in Nantes, it was suggested to include stage 5 (omitted spawning) in the MEDITS scale. However, a better understanding and a feedback from experts using the WKMAT scale to better apply the classification of this stage and to recognize how it can be macroscopically recognized, is necessary.

Conversion of maturity scale for *Lophius spp.*

MEDITS SCALE		WKMAT SCALE	
0	INDETERMINED		
1	IMMATURE /VIRGIN	1	IMMATURE
2A	VIRGIN DEVELOPING	2	DEVELOPING RESTING
2B	RECOVERING	2	DEVELOPING RESTING
2C	MATURING	3	MATURING/PRE SPAWNING
3	MATURE/SPAWNER	4	SPAWNING
4A	SPENT	5	POST-SPAWNING
4B	RESTING	2	DEVELOPING RESTING

Notes:

- The WKMAT scale has a unique stage for "Developing Resting" while in the MEDITS scale these stages are divided in 2A (Virgin developing), 2B (Recovering) and 4B (Resting).

Crustacean maturity scale key

MEDITS SCALE		WKMSC SCALE	
0	INDETERMINED	0	UNDETERMINED
1	IMMATURE VIRGIN	1	IMMATURE
2a	VIRGIN DEVELOPING	2	DEVELOPING/RECOVERING
2b	RECOVERING		
2c	MATURING OR ALMOST	3	MATURING
2d	MATURE	4	MATURE
2e	RESTING ADULT	5	SPENT
3	BERRIED (only for *Nephrops*		

Notes:

- A lot of similarities have been found between the WKMSC and MEDITS scales. Only the stages 2a (Virgin developing) and 2b (Recovering) of the MEDITS scale have been joined into a unique stage 2 (developing/recovering) in the WKMSC one, since differences cannot be found by a macro and micro point of view.
- In the MEDITS scale, for *Nephrops norvegicus* females, there is also a stage 3 (Berried). However, in the WS only ovary stages were analyzed and it wasn suggested to always consider the stage of the ovaries even for females with the eggs in the pleiopods. However the problem remains for the old data: the stage 3 could in fact be either 2B and 2E stages. During the meeting in Nantes it was decided that in case of comparing MEDITS data of *N. norvegicus* with maturity data from the WKMSC scale, the 3 (Berried) stage (MEDITS scale) will be considered as the 5 (Spent) of the WKMSC scale.

Elasmobranches maturity scale key

MEDITS SCALE		**WKMSEL SCALE**	
0	INDETERMINED	0	UNDETERMINED
1	IMMATURE VIRGIN	1	IMMATURE
2	MATURING	2	DEVELOPING
3a	MATURE	3a	SPAWNING CAPABLE
3b	MATURE/EXTRUDING-ACTIVE	3b	ACTIVELY SPAWNING
4	SPENT	4a	REGRESSING
		4b	REGENERATING*

Notes: *Only for females

- For the Elasmobranches, the first 5 stages present many common points between the two scales (WKMSEL and MEDITS). In the WKMSEL, another stage, 4b (regenerating) for females, has been added. It is similar to stage 2 but with enlarged oviductal glands and uterus. It should be added also in the MEDITS scale.
- The WKMSEL scale regards only the oviparous species. During the WS, a new scale for the viviparous species has been created and is being adopted as part of this manual.

Cephalopods maturity scale key

MEDITS SCALE		**WKMCEPH SCALE**	
0	INDETERMINED	0	UNDETERMINED
1	IMMATURE VIRGIN	1	IMMATURE VIRGIN
2a	DEVELOPING	2a	DEVELOPING
2b	MATURING	2b	MATURING
3a	MATURE	3a	MATURE/SPAWNING
3b	SPENT	3b	SPENT

Notes:

No particular differences have been identified between the WKMCEPH scale and the MEDITS one for the cephalopods.

X. FORMAT OF THE TYPE A FILES (Data on the haul)

Name	Type	Position	Range	Comments
TYPE_OF_FILE	2A	1 - 2	TA	Fixed value
COUNTRY	3A	3 - 5	See Annex I	ISO Code
AREA	**2N**	6 - 7	**See Annex III**	**GFCM Code**
VESSEL	3A	8 - 10	See Annex I	MEDITS Code
GEAR	5A	11 - 15	See Annex I	MEDITS Code
RIGGING	4A	16 - 19	See Annex I	MEDITS Code
DOORS	4A	20 - 23	See Annex I	MEDITS Code
YEAR	4N	24 - 27		E.g. 2000
MONTH	2N	28 - 29	1 to 12	
DAY	2N	30 - 31	1 to 28/29/30/31	
HAUL_NUMBER	3N	32 - 34	1 to 999	One series by vessel/year
CODEND_CLOSING	1A	35 - 35	S, C	S: without; C: controlled
PART_OF_THE_CODEND	**1A**	36 - 36	**A, M, P, S**	**Mandatory if codend closing = C; A: anterior, M: middle; P: posterior; S sum of the 3 parts**
SHOOTING_TIME	4N	37 - 40	0 to 2400	In UT Ex: 7 h 25 min > 725
SHOOTING_QUADRANT	1N	41 - 41	1, 3, 5, 7	See Annex X
SHOOTING_LATITUDE	7N	42 - 48	3400 to 4600	Ex: 36° 40,22' > 3640,22.
SHOOTING_LONGITUDE	7N	49 - 55	0 to 2900	Ex: 4° 19,84' > 419,84
SHOOTING_DEPTH	3N	56 - 58	0, 10 to 800	At the trawl position, in meters; unknown: 0
HAULING_TIME	4N	59 - 62	0 to 2400	In UT Ex: 7 h 25 min > 725
HAULING_QUADRANT	1N	63 - 63	1, 3, 5, 7	See Annex X
HAULING_LATITUDE	7N	64 - 70	3400 to 4600	Ex: 36° 40,22' > 3640,22.
HAULING_LONGITUDE	7N	71 - 77	0 to 2900	Ex: 4° 19,84' > 419,84
HAULING_DEPTH	3N	78 - 80	0, 10 to 800	At the trawl position, in meters; unknown: 0
HAUL_DURATION	2N	81 - 82	5 to 90	In minutes
VALIDITY	1A	83 - 83	V, I	V: valid; I: invalid.
COURSE	1A	84 - 84	R, N	R: rectilinear; N: not rectilinear
RECORDED_SPECIES	2N	85 - 86	See Annex IV	MEDITS code
DISTANCE	4N	87 - 90	1000 to 9999	Distance over ground in meters
VERTICAL_OPENING	3N	91 - 93	10 to 99	In decimeters
WING_OPENING	3N	94 - 96	50 to 250	In decimeters
GEOMETRICAL_PRECISION	1A	97 - 97	M, E	M: measured; E: estimated.
BRIDLES_LENGTH	3N	98 - 100	100 to 200	In meters
WARP_LENGTH	4N	101 - 104	100 to 2200	In meters
WARP_DIAMETER	2N	105 - 106	10 to 30	In millimeters
HYDROLOGICAL_STATION	5A	107 - 111		National coding
OBSERVATIONS	1N	112 - 112	1 to 999	MEDITS code (Annex IV)
BOTTOM_TEMPERATURE_BEGINNING	**5N**	113 - 117	**0 to 30**	**in °C with two decimals**
BOTTOM_TEMPERATURE_END	**5N**	118 - 122	**0 to 30**	**in °C with two decimals**
MEASURING_SYSTEM	**2A**	123 - 124	**see Annex X.a**	**see Annex X.a**
NUMBER_OF_THE_STRATUM	**5N**	125 - 129	**see Annex II**	

Legend
A: alphabetic field; N: numerical field
Before the type of the field there is the number of digit allowed for the field (e.g. 2N: numeric field with length 2)
(1) For the invalid hauls (I), no information on species

ANNEX X.A

System	Code
Vemco- Minilog TDR -5 to +35 C°	VA
Star Oddi temperature sensor	SO
XBT	XA
SCANMAR	SA
SIMRAD	SI
CTD probe	CTD

XI. FORMAT OF THE TYPE B FILES (Catches by haul)

Name	Type	Position	Range	Comments
TYPE_OF_FILE	2A	1 - 2	TB	Fixed value
COUNTRY	3A	3 - 5	See Annex I	ISO Code
AREA	**2N**	6 - 7	**See Annex III**	**GFCM Code**
VESSEL	3A	8 - 10	See Annex I	MEDITS Code
YEAR	4N	11 - 14		E.g. 2000
MONTH	**2N**	**15 - 16**	**1 to 12**	
DAY	**2N**	**17 - 18**	**1 to 28/29/30/31**	
HAUL_NUMBER	3N	19 - 21	1 to 999	One series by vessel/year
CODEND_CLOSING	1A	22 - 22	S, C	S: without; C: controlled
PART_OF_THE_CODEND	1A	23 - 23	A, M, P, S	Mandatory if Codend closing = C; A: anterior, M: middle; P: posterior; S sum of the 3 parts
FAUNISTIC_CATEGORY	**3A**	**24 - 26**	**See Annexe V**	**MEDITS code**
GENUS	4A	27 - 30	See Annex XV	Following the Reference List
SPECIES	3A	31 - 33	See Annex XV	Following the Reference List
NAME_OF_THE_REFERENCE_LIST	2A	34 - 35	See Annex XV	NCC or MEDITS FM list
TOTAL_WEIGHT_IN_THE_HAUL	7N	36 - 42	0 to 9999999	For the given species, in grams
TOTAL_NUMBER_IN_THE_HAUL	7A	43 - 49	0 to 9999999, NM: not mandatory*	For the given species. Should be equal to the sum of the 3 following fields.
NB_OF_FEMALES	7A	50 - 56	0 to 9999999, NM: not mandatory*	
NB_OF_MALES	7A	57 - 63	0 to 9999999, NM: not mandatory*	
NB_OF_UNDETERMINED	7A	64 - 70	0 to 9999999, NM: not mandatory*	Undetermined or not determined

Legend
A: alphabetic field; N: numerical field
Before the type of the field there is the number of digit allowed for the field (e.g. 2N: numeric field with length 2)
*Not mandatory for faunistic category V,G,H, D, and E

XII. FORMAT OF TYPE C FILES (length and aggregated biological parameters)

Name	Type	Position	Range	Comments
TYPE_OF_FILE	2A	1 - 2	TC	Fixed value
COUNTRY	3A	3 - 5	See Annex I	ISO Code
AREA	**2N**	**6 - 7**	**See Annex III**	**GFCM Code**
VESSEL	3A	8 - 10	See Annex I	MEDITS Code
YEAR	4N	11 - 14		E.g. 2000
MONTH	**2N**	**15 - 16**	**1 to 12**	
DAY	**2N**	**17 - 18**	**1 to 28/29/30/31**	
HAUL_NUMBER	3N	19 - 21	1 to 999	One series by vessel/year
CODEND_CLOSING	1A	22 - 22	S, C	S: without; C: controlled
PART_OF_THE_CODEND	1A	23 - 23	A, M, P, S	Mandatory if Codend closing = C; A: anterior, M: middle; P: posterior; S sum of the 3 parts
FAUNISTIC_CATEGORY	**3A**	**24 - 26**	**See Annexe V**	**MEDITS code**
GENUS	4A	27 - 30	See Annex XV	Following the Reference List
SPECIES	3A	31 - 33	See Annex XV	Following the Reference List
LENGTH_CLASSES_CODE	1A	34 - 34	m, 0, 1	Type of classes: m: 1 mm; 0: 0.5 cm; 1: 1cm
WEIGHT_OF_THE_FRACTION	6N	35 - 40	0 to 999999	Weight of the fraction in the whole haul in grams
WEIGHT_OF_THE_SAMPLE_MEASURED	6N	41 - 46	0 to 999999	Weight of the sample really measured for length, sex and maturity stages (in grams)
SEX	1A	47 - 47	M, F, I, N	M: male; F: female; I: indetermined; N: not determined
NO_OF_INDIVIDUAL_OF_THE_ABOVE_SEX_MEASURED	6N	48 - 53	1 to 999999	Number of individuals of the above sex measured in the sample
LENGTH_CLASS	4N	54 - 57	1 to 9999	Identifier: lower limit of the class in mm; e.g. 30.5-31 cm ->305 (LENGTH_CLASS_CODE:0); 30-31 cm ->300 (LENGTH_CLASS_CODE:1)
MATURITY	**1N or 2A**	58 - 59	0 to 4; **ND***: Not Determined (allowed from 2012)**	**See Annexes VIIIa-VIIIe. Maturity codes are according to the blue column since 2007 onwards; ND: Not Determined (allowed from 2012)**
MATSUB	**2A**	60 - 61	from A to E; **ND***: Not Determined (allowed from 2012)**	**introduced in 2007; See Annexes VIIIa-VIIIe maturity codes are according to the blue column since 2007 onwards; ND: Not Determined (allowed from 2012)**
NUMBER_OF_INDIVIDUALS_IN_THE_LENGTH_CLASS_AND_MATURITY_STAGE	6N	62 - 67	1 to 999999	**No of individuals per maturity stage and length class for a given sex. The length classes without any individual are excluded from the file. The sum of No of individuals per class and sex is the No of individuals measured per sex. When maturiy stage is ND (since 2012) this field is the No per class and sex.**

Legend
A: alphabetic field; N: numerical field
Before the type of the field there is the number of digit allowed for the field (e.g. 2N: numeric field with length 2)
* All numerical fields (N) are right justified; all alphanumeric fields (A) fields are left justified
** The word "Fraction" means any sub-group of individual from the total catch of a species (males, females, large sized individuals, small individuals, juveniles, etc.) on which it could be proceed to a sub-sample. For example: total weight = 1000 g which is divided into 100g of big individuals and 900 g of small. The big individuals will be entirely measured (PFRAC = 100; PECHAN = 100). The small ones will be sub –sampled with a ratio of 1/10 (PFRAC + 900; PECHAN = 90)
*******Not Determined code (ND) was included in case length measures only were taken, as for the species coded MEDITS G2 in the Annex VI of this manual.

XIII. FORMAT OF TYPE E FILES (biological parameters at individual level)

Name	Type	Position	Range	Comments
TYPE_OF_FILE	2A	1 - 2	TE	Fixed value
COUNTRY	3A	3 - 5	See Annex I	ISO Code
AREA	**2N**	**6 - 7**	**See Annex III**	**GFCM Code**
VESSEL	3A	8 - 10	See Annex I	MEDITS Code
YEAR	4N	11 - 14		E.g. 2000
MONTH	**2N**	**15 - 16**	**1 to 12**	
DAY	**2N**	**17 - 18**	**1 to 28/29/30/31**	
HAUL_NUMBER	3N	19 - 21	1 to 999	One series by vessel/year
FAUNISTIC_CATEGORY	**3A**	**22 - 24**	**See Annexe V**	**MEDITS code**
GENUS	4A	25 - 28	See Annex XV	Following the Reference List
SPECIES	3A	29 - 31	See Annex XV	Following the Reference List
LENGTH_CLASSES_CODE	1A	32 - 32	m, 0, 1	Type of classes: m: 1 mm; 0: 0.5 cm; 1: 1 cm
SEX	1A	33 - 33	M, F, I, N	M: male; F: female; I: indetermined; N: not determined
NO_PER_SEX_MEASURED_IN_SUB_ SAMPLE_FOR_OTOLITH	6N	34 - 39	1 to 999999	Number of individuals of the above sex measured in the sub-sample for otolith
LENGTH_CLASS	4N	40 - 43	1 to 9999	Identifier: lower limit of the class in mm; e.g. 30.5-31 cm ->305 (LENGTH_CLASS_CODE:0); 30-31 cm ->300 (LENGTH_CLASS_CODE:1)
MATURITY	1N	44 - 44	0 to 4	**See Annexes VIIIa-VIIIe maturity codes are according to the blue column**
MATSUB	1A	45 - 45	from A to E	**See Annexes VIIIa-VIIIe maturity codes are according to the blue column**
INDIVIDUAL_WEIGHT	6N	46 - 51	0 to 999999; ND: not determined	Only for the species in List G1. See **Annex VI**
NO_PER_SEX_MEASURED_IN_SUB_ SAMPLE_FOR_WEIGHT	6N	52 - 57	1 to 999999	Number of individuals of the above sex measured in the sub-sample for individual weight
OTOLITH_SAMPLED	2A	58 - 59	Y for Teleosts and NR for the other species	NR: not requested; for species in G1 list see **Annex VI**
NO_PER_SEX_MEASURED_IN_SUB_ SAMPLE_FOR_AGEING	6N	60 - 65	1 to 999999	Number of individuals of the above sex measured in the sub-sample for ageing
OTOLITH_READ	2A	66 - 67	Y or N for Teleosts and NR for the other species	NR: not requested; Y: otolith read; N: otolith not read
AGE	4N	68 - 71	0 to 99 for Teleosts, UR for unreadable, NR for the other species	Also decimal number for age (e.g. 10.5); NR: not requested; for species in G1 list see **Annex VI** UR unreadable otolith
OTOLITH_CODE	35A	72 - 74	[Country][GSA][Vessel][Year][Haul][Genr_Spec][Stage][Sex][Length][individual code]	ITA10PEC2012100MULL_BAR2AM110_xxxxxx

Legend
A: alphabetic field; N: numerical field
Before the type of the field there is the number of digit allowed for the field (e.g. 2N: numeric field with length 2)
NR species for which ageing is not requested
This table will be filled in only for specimens (already entered in TC) for which individual measures have been collected

XIV. Protocol for sampling otoliths, individual weight and maturity stages of MEDITS target species

Adopted during the MEDITS meeting, Ljubljana (Slovenia), 6-8/03/2012

A document with an overview on this subject was prepared by Maria Teresa Spedicato and circulated to the group. This document was discussed during the MEDITS coordination meeting (Ljubljana, Slovenia, 6-8/03/2012) and is attached as Annex 6 to this Coordination meeting report.

The decisions taken during the MEDITS coordination meeting in Ljubljana (Slovenia, 6-8/03/2012) based on the above mentioned document are reported in this annex and represent the sampling protocol to collect the biological information related to otoliths, individual weight and maturity stage by sex from MEDITS survey in 2012.

Objectives

The MEDITS meeting held in Nantes on 15-17 March 2011 agreed to increase the information recorded during the MEDITS survey, including the monitoring of new biological variables, such as age of bony fish species coded G1 in the new list of target species, and individual weight of all the species coded G1 in the same list. Data on the Maturity Stages for the same species should also be collected.

Age monitoring of bony fish, which implies otolith sampling, requires a common protocol to harmonise sampling technique, sample size, and information recording.

It is thus important to first identify the objectives of the new implementation.

Sampling otoliths can be aimed to:

1) estimate indices of abundance at age and monitoring of stock structure along the time;
2) monitor the spatial distribution of age groups;
3) use length at age data to estimate growth curves;
4) estimate structured survey indices to be used in tuning procedures for stock assessment;
5) use age data to estimate, in particular, the probability reaction norm of maturation (PRNM) i.e. the indicator n. 4 of the DCF.

Monitoring of individual weight can be aimed to:

1) estimate length-weight relationship of target species;
2) estimate growth curve in weight, if also otoliths are sampled;
3) estimate the condition factor of the sampled species as a welfare indicator of wild population;
4) use weight at length to estimate the ecosystem indicator that requires individual weight (as plarge in the DCF).

Monitoring of maturity can be aimed to:

1) estimate the indices of abundance, trends and spatial distribution by life stage (e.g. spawner).

Sampling frame

A sampling protocol that enables the simultaneous fulfilment of all these objectives is preferable, in terms of costs and sampling effort.

The group decided to adopt the ***length-stratified random sampling in which a fixed number of individuals are randomly collected from each length class by sex to take otoliths, individual weight and maturity stages.***

This let lean towards the ALK-like sampling, that is also the one adopted in the trawl surveys carried out in Europe, like in Evohe and IBTS.

Regarding the G1 species for which otoliths should not be sampled, the sample size for individual weight and maturity stages will be set according to a similar framework as for the species sampled for otoliths, as specified in the table 2. The precision of the body weight will be 0.1 grams.

Sampling requirements and size

The following criteria were taken into account to set the sample size for each length class:

- for the smallest size groups, that presumably contain only one age group, the number of otoliths per length class may be reduced. Conversely more otoliths per length are required for the larger length classes (see Tab. 1 as a general criterion);
- for estimating indicator n. 4, a number of 100 individuals by age class is required, mainly at maturity stages 2a, 2b, 2c and 3. Thus, to identify a criterion for balancing the number of individuals by length class, avoiding an oversampling of the juveniles, the $L_{m25\%}$ (length at 25% maturity) was chosen as a reference size (lower bound among different estimates if available) for collecting a higher number of individuals in the higher length classes, as these likely account for a larger portion of the length frequency distribution. If information of $L_{m25\%}$ is not available the criterion will be to take a higher sample if the portion of the length class is more than 5% (see Tab. 1).
- sex, maturity and individual weight data should be reported for all the target species for which otoliths and age data are collected and for all the G1 species of the MEDITS list;
- for individual weight and maturity stage samplings, the number of individuals per length class may be reduced for the smallest size groups, conversely more individuals per length are required for the larger length classes; by analogy with the second dash $L_{m25\%}$ can be a reference size for collecting a higher number of individuals. If information of $L_{m25\%}$ is not available the criterion will be to take an higher sample if the portion of the length class is more than 5% (see Tab. 1).
- targets should be set to ensure that data are collected from the entire survey area;
- participants are encouraged to collect age samples also from other commercially important species and any other species deemed important to the DCF.

The optimum number of otoliths per length class cannot be given in a universal form and the number of individual weight and maturity stage as well.
A description of the optimum sample size of age readings and length measurements dependent on a universal cost function is given in Oeberst (2000). According to Mandado and Vasquez (2011) a sample of 20 otoliths in a stratified sampling by length class was considered the optimum for a species with 30-40 length classes. Experiences gathered in the DCF for samplings of commercial catches in Italian GSAs evidenced an acceptable coefficient of variations (around 5%) when sampling 5 otoliths by sex per length class (0.5 or 1 cm depending on the species).
The analyses showed that the necessary number age readings in a length class depend on (AA.VV., 2011):

- the portion of the length class within the length frequency,
- the maximum variance of the portions of the age-groups within the length class.

The table 1 below gives for BITS (AA.VV., 2011) a criterion for establishing the minimum number of otoliths by length class.

Table 1 – Minimum number of otoliths by length class in BITS survey (AA.VV., 2011).

Criterion	**Sample size**
With probably only one age-group (age-group 0, 1)	**2 to 5**
With probably more than on age-group	
Portion of the length class less than 5%	**10**
Portion of the length class more than 5%	**20**

The above criteria hold also for establishing the minimum number for collecting individual weight and maturity stages data.

Therefore, the number of individuals suggested in the IBTS survey protocols (AA.VV., 2010a, b) for the same species as in MEDITS, or for species with comparable number of size classes, can be taken into consideration as a first approximation. In addition, the requirements for the calculation of the indicator n. 4 of DCF, for which a number of 100 otoliths per age class by sex can be considered suitable for the indicator estimate, should be also taken into account.

In the following table 2, a sample size is proposed for the MEDITS species coded as G1 in the new list of target species (Annex VI of this report).

Table 2 – Sample size by length class and sex proposed for otoliths, individual weight and maturity stages for the MEDITS species coded as G1 in the new list of target species.

Species	**length class**	**sample size**	**sex**
Merluccius merluccius	**1 cm**	**5 otoliths**	**by sex (<Lm25%)**
		10 otoliths	**by sex (>=Lm25%)**
Mullus barbatus	**0.5 cm**	**6 otoliths**	**by sex (<Lm25%)**
		14 otoliths	**by sex (>=Lm25%)**
Mullus surmuletus	**0.5 cm**	**6 otoliths**	**by sex (<Lm25%)**
		14 otoliths	**by sex (>=Lm25%)**
Crustaceans	**1 mm**	**6 individuals**	**Juveniles ((<Lm25%) or portion of the length class less than 5%)**
		14 individuals	**by sex (>=Lm25%)**
Cephalopods*	**0.5 cm**	**6 individuals**	**Juveniles ((<Lm25%) or portion of the length class less than 5%)**
		30 individuals	**by sex (>=Lm25%)**
Elasmobraches	**1 cm**	**5 individuals**	**Juveniles ((<Lm25%) or portion of the length class less than 5%)**
		10 individuals	**by sex (>=Lm25%)**

*the number of individuals per length class is increased for cephalopods taking into account the higher variability of individual weight.

After analysing the characteristics of the G1 MEDITS species and the requirements of the indicator n. 4 of DCF, *P. erythrinus* has been excluded, because the sexual hermaphrodite pattern makes the attribution to a sex from year to year uncertain.

It is expected that for the species in table 2 the number of otoliths required for the estimation of indicator n.4 in the DCF should be fulfilled.

It is recommended that otoliths, individual weight and maturity stages are collected in each haul. This would avoid autocorrelation in the sample (e.g. individuals belonging to the same school).

For example 1-2 individuals should be taken per length class and haul, or 1 fish every 10 fish per length class and haul as in the Evhoe survey. However this specific approach will be adapted to the characteristics of each GSA. Otolith are then dried stored for later age determination.

Consequently, the number of fish selected for otolith extraction, should be equal to the number of fish for which individual weight, sex and maturity stage are obtained.

For those species for which otoliths are not taken, the number of fish selected for measuring individual weight, sex and maturity stage are equal to the numbers suggested for age reading.

In some vessels or in particular weather conditions during the MEDITS survey, individual weight cannot be measured accurately and the use of frozen samples is unavoidable. Thus, it is recommended to develop conversion factors between fresh and frozen samples.

Estimates of abundance indices at age

After the age distribution is allocated to the length distribution, the age based indices are calculated. The precision of the ALK can be estimated using the method of Baird (1983) or Oeberst (2000).

In the estimates of the abundance indices at age, it is necessary to compute the average numbers at length and associated variances as a first step.

The mean stratified standardization formulas by Souplet (1996) shall be used for the computation of average numbers at length and associated variances by stratum (formulas (1) and (2) below) and for the total area (formulas (3) and (4) below):

$$\bar{x}_{k,j} = \frac{\sum_{h=1}^{H} x_{h,k,j}}{\sum_{h=1}^{H} A_{h,k}} \tag{1}$$

$$V(\bar{x}_{k,j}) = \frac{1}{H-1}\sum_{h=1}^{H} A_{h,k}\left(\frac{x_{h,k,j}}{A_{h,k}} - \bar{x}_{k,j}\right)^2 \tag{2}$$

$$I_j = \sum_{k=1}^{K} W_k * \bar{x}_{k,j} \tag{3}$$

$$V(I_j) = \sum_{k=1}^{K} \frac{W_k^2 S(\bar{x}_{h,j})^2}{\sum_{h=1}^{H} A_{h,k}}(1 - f_k) \tag{4}$$

where:

$x_{h,k,j}$ is the number of individuals in the haul *h* of the stratum *k* and length class *j*;

$A_{h,k}$ is the swept area of haul *h* in stratum *k;*

$\bar{x}_{k,j}$ is the average number at length *j* in the stratum *k;*

$V(\bar{x}_{k,j})$ is the variance of the average number at length *j* in the stratum *k;*

W_k is the stratum weight calculated as the area of stratum *k* divided by the GSA area;

I_j is the abundance index of the length class *j*;

$V(I_j)$ is the variance of the abundance index of the length class;

f_k is the finite population correction factor.

In a second phase, when building the age-length key, the computation of the proportions at age *i* per length class *j* and associated variances is computed as:

$$p_{i,j} = \frac{n_{i,j}}{n_j} \tag{5}$$

$$V(p_{i,j}) = \frac{p_{i,j}(1 - p_{i,j})}{n_j} \tag{6}$$

where :

$n_{i,j}$ is the number of otoliths of age *i* in the length class *j*;

n_j is the total number of otolith in the length class *j*;

$p_{i,j}$ is the proportion of age *i* in the length class *j;*

$V(p_{i,j})$ is the variance of the proportion of age *i* in the length class *j*.

In a third phase, the computation of mean numbers at age and the associated variances are computed. The mean numbers at age are given by :

$$I_i = \sum_{j=1}^{J} I_j * p_{i,j} \tag{7}$$

and the associated variance is:

$$V(I_i) = \sum_{j=1}^{J} \left[V(I_j) p_{i,j}^2 + I_j^2 V(p_{i,j}) + V(p_{i,j}) V(I_j) \right] \quad (8)$$

where

I_i is the abundance index of the age class *i* and $V(I_i)$ its variance.

These computations are done by sex and the total age composition is given for each age *i* by:

$$Itot_i = Ima_i + Ife_i \quad (9)$$

its variance is:

$$V(Itot_i) = V(Ima_i) + V(Ife_i) \quad (10)$$

and the sampling being independent on sex the covariance is not considered.

References

AA.VV. 2010a - Manual for the International Bottom Trawl Surveys. ADDENDUM 1. IBTS Manual - REVISION VIII. The International Bottom Trawl Survey Working Group. ICES web site: http://datras.ices.dk/Documents/Manuals/Manuals.aspx

AA.VV. 2010b - ADDENDUM 2: IBTS MANUAL ON THE WESTERN AND SOUTHERN AREAS Revision III-Agreed during the meeting of the International Bottom Trawl Survey Working Group 22–26 March 2010, Lisbon. ICES web site: http://datras.ices.dk/Documents/Manuals/Manuals.aspx

AA.VV. 2011 - Manual for the Baltic International Trawl Surveys, ADDENDUM 1: WGBIFS BITS Manual 2011. ICES web site: http://datras.ices.dk/Documents/Manuals/Manuals.aspx AA.VV. **NS-IBTS indices calculation procedure** ICES web site: http://datras.ices.dk/Documents/Manuals/Manuals.aspx

Baird, J.W. 1983. A method to select optimum numbers for aging in a stratified random approach. *In* Sampling commercial catches of marine fish and invertebrates. *Edited by* W.G. Doubleday and D. Rivard. Can. Spec. Publ. Fish. Aquat. Sci. **66**: 161–164.

Mandado M., Vázquez A. 2011. On otoliths sampling. NAFO SCR Doc. 11/023: 9pp.

Oeberst R. 2000. An universal cost function for the optimization of the number of age readings and length measurements for Age-Length-Key-Tables (ALKT). Arch. Fish. Mar. Res. 48(1): 43–60.

Souplet A. (1996). Calculation of abundance indices and length frequencies in the MEDITS survey. In: J. A. Bertrand et al. (eds), Campagne internationale du chalutage démersal en Méditerraneé. Campagne 1995. EU Final Report, Vol. III.

XV. FM LIST OF SPECIES CODES

FAUNISTIC LIST OF THE MEDITERRANEAN
To be used in the trawl surveys
Name of the list: FM
WARNING

The present list is destined to code the marine species encountered in the Mediterranean. It has been built following the principle used in the Nordic Code Centre (Stockholm). For most of the species the codes are identical to those proposed by the NCC. However some species can be coded differently. In addition numerous Mediterranean species are not included in the NCC code and have been added. So the present list is specific. It has to be referred as the FM list.
The initial list was made to be used during the surveys conducted by Ifremer in the western Mediterranean (French and Algerian coasts). Its use has been spread to the International survey MEDITS since 1994.
The first fish list has been established accordingly to the following work:
Hureau J.-C. et Th. Monod (réd.), 1973. Catalogue des poissons de l'Atlantique du nord-est et de la Méditerranée. Unesco, Paris, Vol I, xxii + 683 p.; vol II, 331 p. [réimpression comprenant le *Supplément 1978*, par E. Tortonese et J. -C. Hureau (réd), en 1979]. The reference of the species following this work is reported as "C" (for Clofnam) in the column "Source" with number which is attributed to this species in the Catalogue in the column "Reference".

This list has been increased with reference to the following works:
- Fisher W., M.L., Bauchot et M. Schneider (rédact.), 1987. Fiches FAO d'identification des espèces pour les besoins de la pêche. (Révision 1). Méditerranée et mer Noire. Zone de pêche 37. Volume I. Végétaux et Invertébrés. Volume II. Vertébrés. Publication préparée par la FAO, résultat d'un accord entre la FAO et la Commission des Communautés Européennes (Projet GCP/INT/422/EEC) financée conjointement par ces deux organisations. Rome, FAO, 1530 p.

The reference of the species coming from this book are reported as "F" (for FAO) in the "Source" with the reference given to this species.
- Whitehead P.J.P., M.L. Bauchot, J.C. Hureau, J. Nielsen, E. Tortonese, 1984. Poissons de l'Atlantique du nord-est et de la Méditerranée. Vol. I. UNESCO, Paris, 510 p.
- Whitehead P.J.P., M.L. Bauchot, J.C. Hureau, J. Nielsen, E. Tortonese, 1986. Poissons de l'Atlantique du nord-est et de la Méditerranée. Vol. II et III. UNESCO, Paris, 511-1473.

For most of the Invertebrates, the species have been named accordingly to the following works:
- Zariquiey Alvarez R., 1968. Crustaceos decapodos ibéricos. Invest. Pesq. 32, 510 p.
- Riedl R., 1963. Fauna und flora der Adria. Paul Parey Ed. – 640pp.

The references to these works are mentioned as Z and R respectively in the column "Source".
The scientific names in the list are those of the last update of these various works.
Until 2011 the source file of this list was located at the "Ecologie et modèles pour l'halieutique" department of Ifremer in Nantes.

In 2012 the list has been review by Società Italiana di Biologia Marina (prof. Giulio Relini ed dr. Alessadro Mannini) following the subdivision in the following main categories:
A fishes, B Crustaceans (Decapoda, Stomatopoda, Eufausiacea), C Cephalopods, D Other commercial (edible) species, E Other animal species but not commercial (edible) for this classification the main references is Fisher et al. 1987, *Fiches FAO* d'*identification* des *espèces* pour les *besoins* de la *pêche*. *Méditerranée* et *mer* Noire. mimeo

Three more categories were added:
- V = Vegetalia;
- G = portions or products of animal species (shell debris, eggs of gastropods, selachians, etc.);
- H = portions or products of vegetal species (e.g. leaves of sea grasses, of terrestrial plants, etc.);

The categories A D E were sub-divided in the following subcategories:

- Ao = Fish Osteichthyes;	- Ae = Fish Elasmobranch;	
- Bamp = Amphipoda;	- Bcir = Cirripeda;	- Biso = Isopoda;
- Dmb/Emb = Mollusca Bivalvia;	- Dmg/Emg = Mollusca Gastropoda;	
- Dec/ Eec = Echinoderms;	- Dtu/ Etu = Tunicata (Ascidiacea);	
- Ebr = Bryozoa;	- Ebrac = Brachiopoda;	
- Ecn = Cnidaria;	- Ecte = Ctenophora;	
- Ehir = Hirudinea	- Emo Opistobranchia;	
- Epo = Polychaeta;	- Esc = Scaphopoda;	
- Esip = Sipunculida;	- Esp = Sponges (Porifera) ;	

In addition the following codes were added (column 'Remarks' in the list)
AL = alien species
Δ = species not yet recorded in Italian seas
ΔΔ = species not yet recorded in the Mediterranean seas

Codlon represents the Length classes code: m = 1 mm; 0 = 0,5 cm; 1 = 1 cm;
In the column 'Year' of the following table the year in which the species was introduced is reported, while in the column 'Note' a code of the author of the introduction s reported.

Other new codes for new species could be added.
It was decided do not consider species lower than 1 cm like Isopoda, Amphipoda, small Polychaets etc. For the moment the species listed in the previous version (Relini *et al*., 2008) are maintained.
It was decided for the moment to maintain, when applicable, two codes for one species and to avoid the presence of the same code for different genus (the first 4 letters of the species code). The species codes included in the data tables are based on the FM list. So, to maintain the consistency of the data series, they cannot be changed even if a species name is reviewed.
The codes are reported in alphabetical order in the list.

C = Clofnam (Hureau and Monod, 1973)
F = Fisher *et al*., 1987
G = Golani et al., 2002
R = Riedl 1968 (italian editions 1991)
Z = Zariquiey 1968

All the problems dealing with the list and in particular introduction of new species will be managed by the following WG: Relini Giulio (leader), Massutti Enric, Mérigot Bastien and Tursi Angelo. Proposals for new species will be sent to Giulio Relini (See **Annex V**).
To know the valid scientific name of species present in Italian seas the main reference is the checklist of Fauna and Flora of Italian seas (Relini, 2010).

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FM MEDITS LIST (2012 UPDATED)

N.	MEDITS Code	Scientific Name	Source	Reference	Remarks	CATFAU	CODLON	Valid Name	Year	Note
1	ABRAVER	Abralia veranyi	F	ENOP		C	0	Abralia verany (Rüppell, 1844)		
2	ABRIMOR	Abraliopsis morisii	F	ENOP		C	0	Abraliopsis morisii (Vérany, 1839)	2011	LM
3	ABRRALB	Abra alba	R	p. 339 Tav. 129		E mb	0	Abra alba (Wood W., 1802)		
4	ACANEXI	Acantephyra eximia	Z	84		B	m	Acanthephyra eximia S.I. Smith, 1884		
5	ACANPEL	Acanthephyra pelagica	Z	86		B	m	Acanthephyra pelagica (Risso, 1816)		
6	ACANSPP	Acanthephyra spp.	Z	83		B	m	Acanthephyra A. Milne Edwards, 1881	2011	LM e MT
7	ACATPAL	Acantholabrus palloni	C	145.2.1		A o	0	Acantholabrus palloni (Risso, 1810)		
8	ACTARIC	Actinauge richardi				E cn	0	Actinauge richardi (Marion, 1882)	2011	LM e MT
9	ACTIEQU	Actinia equina				E cn	0	Actinia equina (Linnaeus, 1758)	2011	LM
10	ACTISPP	Actinia spp.				E cn	0	Actinia Linnaeus, 1767	2011	LM
11	ADAMCAR	Adamsia carciniopados				E cn	0	Adamsia carciniopados (Otto, 1823)	2011	LM
12	AEQUOPE	Aequipecten opercularis	F	PECT Aeq 1		D mb	0	Aequipecten opercularis (Linnaeus, 1758)		**d1**
13	AGELORO	Agelas oroides				E sp	0	Agelas oroides (Schmidt, 1864)	2011	LM
14	ALCYPAL	Alcyonium palmatum				E cn	0	Alcyonium palmatum Pallas, 1766		
15	ALEPROS	Alepocephalus rostratus	C	30.1.1		A o	0	Alepocephalus rostratus Risso, 1820		
16	ALLOMED	Alloteuthis media	F	LOLIG Allot 3		C	0	Alloteuthis media (Linnaeus, 1758)		
17	ALLOSPP	Alloteuthis spp.	F	LOLIG Allot		C	0	Alloteuthis Wülker, 1920		
18	ALLOSUB	Alloteuthis subulata	F	LOLIG Allot 2		C	0	Alloteuthis subulata (Lamarck, 1798)		
19	ALOPVUL	Alopias vulpinus	C	9.1.1		A e	0	Alopias vulpinus (Bonnaterre, 1788)		
20	ALOSFAL	Alosa fallax	C	33.6.3		A o	0	Alosa fallax (Lacepède, 1803)		
21	ALPHGLA	Alpheus glaber	F	ALPH Alph 5		B	m	Alpheus glaber (Olivi, 1792)		
22	ALPHPLA	Alpheus platydactylus				B	m	Alpheus platydactylus Coutière, 1897		
23	AMATSEM	Amathia semiconvoluta				E br	0	Amathia semiconvoluta (Lamouroux, 1824)	2011	LM e MT
24	AMPHSQU	Amphipholis squamata				E ec	0	Amphipholis squamata (Delle Chiaje, 1828)	2011	MT
25	AMYGLUT	Amygdalum luteum		D'Onghia		E mb	0	Amygdalum politum (Verrill & Smith, 1880)		
26	ANADCOR	Anadara corbuloides				E mb	0	Anadara corbuloides (Monterosato, 1878)	2011	SB e MT
27	ANADDIL	Anadara diluvii	F	ARC Anad 3		D mb	0	Scapharca demiri (Piani, 1981)		

28	ANAMRIS	Anamathia rissoana	Z	465		B	m	Anamathia rissoana (Roux, 1828)		
29	ANAPBIC	Anapagurus bicorniger	Z	259		B	m	Anapagurus bicorniger A. Milne-Edwards & Bouvier, 1892		
30	ANAPLAE	Anapagurus laevis	Z	256		B	m	Anapagurus laevis (Bell, 1845)		
31	ANARGRA	Anarchias euryurus (grassii)	C	73.3.1		A o	0	Anarchias euryurus (Lea, 1913)		
32	ANCINIC	Ancistroteuthis lichtensteini	F	ONYCHO		C	0	Ancistroteuthis lichtensteinii (Férussac [in Férussac & d'Orbigny], 1835)		
33	ANCOLES	Ancistrocheirus lesueurii	F	ENOP		C	0	Ancistrocheirus lesueurii (d'Orbigny, 1842)	2011	LM
34	ANDRPAR	Andresia partenopea				E cn	0	Andresia partenopea (Andres, 1884)	2011	MT
35	ANGUANG	Anguilla anguilla	C	71.1.1		A o	0	Anguilla anguilla (Linnaeus, 1758)		
36	ANOMEPH	Anomia ephippium				E mb	0	Anomia ephippium Linnaeus, 1758	2011	MT
37	ANSEPLA	Anseropoda placenta				E ec	0	Anseropoda placenta (Pennant, 1777)	2011	SB e MT
38	ANTEMED	Antedon mediterranea				E ec	0	Antedon mediterranea Lamarck, 1816	2011	SB, LM e MT
39	ANTHANT	Anthias anthias	C	124.2.1		A o	0	Anthias anthias (Linnaeus, 1758)		
40	ANTOMEG	Antonogadus megalokynodon	C	101.19.2		A o	0	Gaidropsarus biscayensis (Collett, 1890)		
41	ANTOSPP	Antonogadus spp.	C	101.19		A o	0	Gaidropsarus Rafinesque, 1810		
42	APERADR	Aperiovula adriatica				E mg	0	Aperiovula adriatica (G.B. Sowerby I, 1828)	2011	MT
43	APHIMIN	Aphia minuta	C	162.2.1		A o	0	Aphia minuta (Risso, 1810)		
44	APHRACU	Aphrodita aculeata				E po	0	Aphrodita aculeata Linnaeus, 1761	2011	SB, LM e MT
45	APLYFAS	Aplysia fasciata				E mo	0	Aplysia fasciata Poiret, 1789	2011	MT
46	APLYSPP	Aplysia spp.				E mo	0	Aplysia Linnaeus, 1767	2011	MT
47	APOGIMB	Apogon imberbis	C	127.1.1		A o	0	Apogon imberbis (Linnaeus, 1758)		
48	APORPES	Aporrhais pespelecani	F	APOR Apor 1		D mg	0	Aporrhais pespelecani (Linnaeus, 1758)		
49	APORSER	Aporrhais serresianus	F	APOR Apor 2		D mg	0	Aporrhais serresianus (Michaud, 1828)		
50	APTECAE	Apterichthus caecus	C	86.2.1		A o	0	Apterichtus caecus (Linnaeus, 1758)		
51	ARGESPY	Argentina sphyraena	C	46.1.1		A o	0	Argentina sphyraena Linnaeus, 1758		
52	ARGOOLE	Argobuccinum olearium	F	CYM Argo 1		D mg	0	Ranella olearia (Linnaeus, 1758)		
53	ARGRACU	Argyropelecus aculeatus	C	38.2.2	ΔΔ	A o	0	Argyropelecus aculeatus Valenciennes, 1850		
54	ARGRHEM	Argyropelecus hemigymnus	C	38.2.1		A o	0	Argyropelecus hemigymnus Cocco, 1829		
55	ARGUARG	Argonauta argo	F	ARGO Argo 1		C	0	Argonauta argo Linnaeus, 1758	2011	LM

56	ARGYREG	Argyrosomus regius	C	137.2.1		A o	0	Argyrosomus regius (Asso, 1801)		
57	ARIOBAL	Ariosoma balearicum	C	82.2.1		A o	0	Ariosoma balearicum (Delaroche, 1809)		
58	ARISFOL	Aristaeomorpha foliacea	F	ARIST Aris 1		B	m	Aristaeomorpha foliacea (Risso, 1827)		
59	ARITANT	Aristeus antennatus	F	ARIST Arist 1		B	m	Aristeus antennatus (Risso, 1816)		
60	ARMIMAC	Armina maculata	F	NAT Natic 1		D mg	0	Armina maculata Rafinesque, 1814		
61	ARMITIG	Armina tigrina	R	RIEDL		D mg	0	Armina tigrina Rafinesque, 1814		
62	ARNOIMP	Arnoglossus imperialis	C	196.2.2		A o	0	Arnoglossus imperialis (Rafinesque, 1810)		
63	ARNOKES	Arnoglossus kessleri	C	196.2.3		A o	0	Arnoglossus kessleri Schmidt, 1915	2011	LM e MT
64	ARNOLAT	Arnoglossus laterna	C	196.2.1		A o	0	Arnoglossus laterna (Walbaum, 1792)		
65	ARNORUP	Arnoglossus rueppelli	C	196.2.4		A o	0	Arnoglossus rueppelii (Cocco, 1844)		
66	ARNOSPP	Arnoglossus spp.	C	196.2		A o	0	Arnoglossus Bleeker, 1872	2011	LM
67	ARNOTHO	Arnoglossus thori	C	196.2.5		A o	0	Arnoglossus thori Kyle, 1913		
68	ASCEASP	Ascidiella aspersa				E tu	0	Ascidiella aspersa (O.F. Müller, 1776)	2011	LM
69	ASCESCA	Ascidiella scabra				E tu	0	Ascidiella scabra (O.F. Müller, 1776)	2011	LM
70	ASCESPP	Ascidiella spp.				E tu	0	Ascidiella Roule, 1883	2011	MT
71	ASCIMEN	Ascidia mentula				E tu	0	Ascidia mentula O.F. Müller, 1776	2011	SB, LM e MT
72	ASCIVIR	Ascidia virginea				E tu	0	Ascidia virginea O.F. Müller, 1776	2011	MT
73	ASDOMUE	Aspidosiphon muelleri muelleri				E sip	0	Aspidosiphon muelleri muelleri Diesing, 1851	2011	MT
74	ASPICUC	Aspitrigla cuculus	C	185.2.1		A o	0	Aspitrigla cuculus (Linnaeus, 1758)		
75	ASPIOBS	Aspitrigla obscura	C	185.2.2		A o	0	Chelidonichthys obscurus (Block & Schneider, 1801)		
76	ASTRARA	Astropecten aranciacus				E ec	0	Astropecten aranciacus (Linnaeus, 1758)	2011	SB, LM e MT
77	ASTRBIS	Astropecten bispinosus				E ec	0	Astropecten bispinosus (Otto, 1823)	2011	SB, LM e MT
78	ASTRIRR	Astropecten irregularis pentacanthus				E ec	0	Astropecten irregularis pentacanthus (Delle Chiaje, 1825)	2011	SB, LM e MT
79	ASTRJON	Astropecten jonstoni				E ec	0	Astropecten jonstoni (Delle Chiaje, 1825)	2011	LM
80	ASTRSPI	Astropecten spinulosus				E ec	0	Astropecten spinulosus (Philippi, 1837)	2011	SB e LM
81	ASTRSPP	Astropecten spp.				E ec	0	Astropecten Gray, 1840		
82	ASTSMED	Astrospartus mediterraneus				E ec	0	Astrospartus mediterraneus (Risso, 1826)	2011	MT
83	ATELROT	Atelecyclus rotundatus	Z	342		B	m	Atelecyclus rotundatus (Olivi, 1792)		
84	ATRIFRA	Atrina fragilis	F	PINN Atr 4		D mb	0	Atrina pectinata (Linnaeus, 1767)		

85	AULOFIL	Aulopus filamentosus	C	50.1.1		A o	0	Aulopus filamentosus (Bloch, 1792)		
86	AXINCAN	Axinella cannabina				E sp	0	Axinella cannabina (Esper, 1794)	2011	LM
87	BALICAR	Balistes carolinensis	C	201.1.2		A o	0	Balistes capriscus Gmelin, 1789		
88	BASOPRO	Bathysolea profundicola	C	198.2.1		A o	0	Bathysolea profundicola (Vaillant, 1888)		
89	BATHDUB	Bathypterois dubius	C	53.1.1		A o	0	Bathypterois dubius Vaillant, 1888		**a1**
90	BATHMED	Bathypterois mediterraneus	C	53.1.2		A o	0	Bathypterois dubius Vaillant, 1888		**a1**
91	BATISPO	Bathypolypus sponsalis	F	OCT Bath 2		C	0	Bathypolypus sponsalis (P. Fischer & H. Fischer, 1892)		
92	BATONIG	Bathophilus nigerrimus	C	42.2.1		A o	0	Bathophilus nigerrimus Giglioli, 1882	2011	SB, LM e MT
93	BATYMAR	Bathynectes maravigna	F	PORT		B	m	Bathynectes maravigna (Prestandrea, 1839)		**c1**
94	BATYSUP	Bathynectes superbus	Z	382		B	m	Bathynectes maravigna (Prestandrea, 1839)		**c1**
95	BELLAPO	Bellotia apoda	C	172.3.1		A o	0	Bellottia apoda Giglioli, 1883		
96	BENSGLA	Benthosema glaciale	C	58.2.1		A o	0	Benthosema glaciale (Reinhardt, 1837)		
97	BENTROB	Benthocometes robustus	C	172.4.1		A o	0	Benthocometes robustus (Goode & Bean, 1886)		
98	BERTAUR	Berthella aurantiaca				E mo	0	Berthella aurantiaca (Risso, 1818)	2011	MT
99	BERYDEC	Beryx decadactylus	C	112.1.1		A o	0	Beryx decadactylus Cuvier, 1829		
100	BERYSPL	Beryx splendens	C / G	112.1.2 / 90	AL	A o	0	Beryx splendens Lowe, 1834		
101	BLENBAS	Lipophrys (Blennius) basiliscus	C	164.1.3		A o	0	Salaria basilisca (Valenciennes, 1836)		
102	BLENCRI	Scartella (Blennius) cristata (crinitus)	C	164.1.6		A o	0	Scartella cristata (Linnaeus, 1758)		
103	BLENGAT	Parablennius (Blennius) gattorugine	C	164.1.8		A o	0	Parablennius gattorugine (Linnaeus, 1758)		
104	BLENOCE	Blennius ocellaris	C	164.1.1		A o	0	Blennius ocellaris Linnaeus, 1758		
105	BLENPAV	Lipophrys (Blennius) pavo	C	164.1.12		A o	0	Salaria pavo (Risso, 1810)		
106	BLENSPP	Blenniidae	C	164		A o	0	Blenniidae		
107	BLENSPY	Aidablennius (Blennius) sphynx	C	164.1.17		A o	0	Aidablennius sphynx (Valenciennes, 1836)		
108	BLENTEN	Parablennius (Blennius) tentaculari	C	164.1.18		A o	0	Parablennius tentacularis (Brünnich, 1768)		
109	BOOPBOO	Boops boops	C	139.2.1		A o	0	Boops boops (Linnaeus, 1758)		
110	BOROANT	Borostomias antarcticus	C	39.2.1		A o	0	Borostomias antarcticus (Lönnberg, 1905)		
111	BOTHPOD	Bothus podas	C	196.1.1		A o	0	Bothus podas (Delaroche, 1809)		

112	BOTRSCH	Botryllus schlosseri				E tu	0	Botryllus schlosseri (Pallas, 1766)	2011	SB, LM e MT
113	BOTRSPP	Botryllus				E tu	0	Botryllus Gaertner, 1774	2011	SB
114	BRACRII	Brachioteuthis riisei	F	BRACHIO Bra. 2		C	0	Brachioteuthis riisei (Steenstrup, 1882)		
115	BRAMBRA	Brama brama	C	133.2.1		A o	0	Brama brama (Bonnaterre, 1788)	2011	MT
116	BRANSEX	Brachynotus sexdentatus	Z	431		B	m	Brachynotus sexdentatus (Risso, 1827)	2011	MT
117	BRINCOR	Brisingella coronata				E ec	0	Brisingella coronata (G. O. Sars, 1871)	2011	LM
118	BRIOLYR	Brissopsis lyrifera				E ec	0	Brissopsis lyrifera (Forbes, 1841)	2011	LM
119	BRISUNI	Brissus unicolor				E ec	0	Brissus unicolor (Leske, 1778)	2011	SB
120	BUCCCOR	Buccinulum corneum	F	BUCC Buc 1		D mg	0	Buccinulum corneum (Linnaeus, 1758)		
121	BUCCHUN	Buccinum humphreysianum	F	BUCC	Δ	D mg	0	Buccinum humphreysianum Bennet, 1824		
122	BUCCSPP	Buccinum spp.	F	BUCC		D mg	0	Buccinulum Deshayes, 1830		
123	BUGLLUT	Buglossidium luteum	C	198.3.1		A o	0	Buglossidium luteum (Risso, 1810)		
124	BUNOVER	Bunodactis verrucosa				E cn	0	Bunodactis verrucosa (Pennant, 1777)	2011	MT
125	BURSLEA	Bursatella leachi			AL	E mo	0	Bursatella leachi Blainville, 1817	2011	MT
126	CALAGRA	Calappa granulata	F	CAL Cal 2		B	m	Calappa granulata (Linnaeus, 1758)		
127	CALATUE	Calappa tuerkayana				B	m	Calappa tuerkayana Pastore, 1995	2011	LM
128	CALCTUB	Calcinus tubularis				B	m	Calcinus tubularis (Linnaeus, 1767)		
129	CALGVER	Callogorgia verticillata				E cn	0	Callogorgia verticillata (Pallas, 1766)	2011	MT
130	CALICHI	Calyptraea chinensis		D'Angelo		E mg	0	Calyptraea chinensis (Linnaeus, 1758)		
131	CALLRIS	Callionymus risso	C	163a.1.7.		A o	0	Callionymus risso Lesueur, 1814		**a2**
132	CALLRUB	Callanthias ruber	C	124.3.1		A o	0	Callanthias ruber (Rafinesque, 1810)		
133	CALMFAS	Callionymus fasciatus	C	163a.1.3		A o	0	Callionymus fasciatus Valenciennes, 1837	2011	LM
134	CALMLYR	Callionymus lyra	C	163a.1.1		A o	0	Callionymus lyra Linnaeus, 1758		
135	CALMMAC	Callionymus maculatus	C	163a.1.3		A o	0	Callionymus maculatus Rafinesque, 1810		
136	CALMPHA	Synchiropus (Callionymus) phaeton	C	163a.1.4		A o	0	Synchiropus phaeton (Günther, 1861)		
137	CALMRIS	Callionymus risso	C	163a.1.7		A o	0	Callionymus risso Lesueur, 1814		**a2**
138	CALMSPP	Callionymus	C	163a.1		A o	0	Callionymus Linnaeus, 1758		
139	CALOCOR	Calocarides coronatus			Δ	B	m	Calocarides coronatus (Trybom, 1904)		
140	CALOMAC	Calocaris macandreae	Z	225		B	m	Calocaris macandreae Bell, 1846		
141	CALPNOB	Calpensia nobilis				E br	0	Calpensia nobilis (Esper, 1796)	2011	MT
142	CALTPAR	Calliactis parasitica				E cn	0	Calliactis parasitica (Couch, 1838)	2011	LM e MT

143	CANCCAN	Cancellaria cancellata	F	GASTEROPODA F14		E mg	0	Cancellaria cancellata (Linnaeus, 1767)		
144	CANIGRA	Calliostoma granulatum	F	TROCH		E mg	0	Calliostoma (Ampullotrochus) granulatum (Von Born, 1778)		
145	CANILAU	Calliostoma (Calliostoma) laugeri laugeri				E mg	0	Calliostoma (Calliostoma) laugeri laugeri (Payraudeau, 1826)	2011	MT
146	CANIZIZ	Calliostoma (Calliostoma) zizyphinum				E mg	0	Calliostoma (Calliostoma) zizyphinum (Linnaeus, 1758)	2011	SB
147	CAPOAPE	Capros aper	C	123.1.1		A o	0	Capros aper (Linnaeus, 1758)		
148	CARAHIP	Caranx hippos	C	131.1.1		A o	0	Caranx hippos (Linnaeus, 1766)		
149	CARARHO	Caranx rhonchus	C	131.1.5		A o	0	Caranx rhonchus Geoffroy Saint-Hilaire, 1817		
150	CARCPLU	Carcharhinus plumbeus	C	13.1.7		A e	0	Carcharhinus plumbeus (Nardo, 1827)		
151	CARCSPP	Carcharhinus spp.	C	13.1		A e	0	Carcharhinus Blainville, 1816		
152	CARDACU	Acanthocardia aculeata	F	CARD Acan 1		D mb	0	Acanthocardia aculeata (Linnaeus, 1758)		
153	CARDECH	Acanthocardia (Cardium) echinata	F	CARD Acan 2		D mb	0	Acanthocardia echinata (Linnaeus, 1758)		
154	CARDSPI	Acanthocardia spinosa		D'Angelo		D mb	0	Acanthocardia spinosa (Solander, 1786)		
155	CARISPP	Cardiomya spp.	R	p. 348		E mb	0	Cardiomya Adams A., 1864		
156	CARISTE	Caridion steveni	F	HIPPOL	Δ Δ	B	m	Caridion steveni Lebour, 1930		
157	CARPACU	Carapus acus	C	175.1.1		A o	0	Carapus acus (Brünnich, 1768)		
158	CARYSMI	Caryophyllia smithii				E cn	0	Caryophyllia smithii Stokes & Broderip, 1828	2011	MT
159	CASSECH	Cassidaria echinophora	F	CASS Cass 1		D mg	0	Galeodea echinophora (Linnaeus, 1758)		
160	CASSSAB	Phalium (Cassis) saburon	F	CAS Phal 2		D mg	0	Phalium saburon (Bruguière, 1792)		
161	CASSTYR	Cassidaria tyrrhena	F	CASS Cass 2		D mg	0	Galeodea rugosa (Linnaeus, 1771)		
162	CATAALL	Cataetyx alleni	C	172.6.1		A o	0	Cataetyx alleni (Byrne, 1906)		
163	CAVOTRI	Cavolinia tridentata				E mo	0	Cavolinia tridentata (Niebuhr, 1775 ex Forskål ms.)	2011	SB
164	CECACIR	Centracanthus cirrus	C	141.1.1		A o	0	Centracanthus cirrus Rafinesque, 1810		
165	CELLHAS	Celleporina hassalli				E br	0	Celleporina hassalli (Johnston, 1847)	2011	MT
166	CENONIG	Centrolophus niger	C	176.1.1		A o	0	Centrolophus niger (Gmelin, 1789)		
167	CENSLON	Centrostephanus longispinus				E ec	0	Centrostephanus longispinus (Philippi, 1845)	2011	MT
168	CENTGRA	Centrophorus granulosus	C	16.1.2		A e	0	Centrophorus granulosus (Bloch & Schneider, 1801)		
169	CENTUYA	Centrophorus uyato	C	16.2.4		A e	0	Centrophorus uyato (Rafinesque, 1810)		

170	CEPHVOL	Dactylopterus (Cephalacanthus) volitans	C	193.1.1		A o	0	Dactylopterus volitans (Linnaeus, 1758)		
171	CEPOMAC	Cepola rubescens (macrophthalma)	C	128.1.1		A o	0	Cepola macrophthalma (Linnaeus, 1758)		
172	CERAMAD	Cerastocopelus maderensis	C	58.4.1		A o	0	Ceratoscopelus maderensis (Lowe, 1839)		
173	CERMGRE	Ceramaster grenadensis				E ec	0	Ceramaster grenadensis (Perrier, 1881)	2011	LM
174	CHAELON	Chaetaster longipes				E ec	0	Chaetaster longipes (Retzius, 1805)	2011	MT
175	CHAUSLO	Chauliodus sloani	C	40.1.1		A o	0	Chauliodus sloani Bloch & Schneider, 1801		
176	CHEOLAB	Chelon labrosus	C	181.2.1		A o	0	Chelon labrosus (Risso, 1827)		
177	CHIMMON	Chimaera monstrosa	C	26.1.1		A e	0	Chimaera monstrosa Linnaeus, 1758		
178	CHIRVER	Chiroteuthis veranii	F	CHIRO Chiro 1		C	0	Chiroteuthis veranii (Férussac, 1835)	2011	LM
179	CHLAOPE	Chlamys opercularis	F	PECT Aeq 1		D mb	0	Aequipecten opercularis (Linnaeus, 1758)		**d1**
180	CHLAVAR	Chlamys varia	F	PECT Chlam 1		D mb	0	Mimachlamys varia (Linnaeus, 1758)		
181	CHLOGRA	Chlorotocus crassicornis (gracilipes)	Z	98		B	m	Chlorotocus crassicornis (A. Costa, 1871)		
182	CHONREN	Chondrosia reniformis				E sp	0	Chondrosia reniformis Nardo, 1847	2011	MT
183	CHROCHR	Chromis chromis	C	144.1.1		A o	0	Chromis chromis (Linnaeus, 1758)		
184	CHTESIC	Chtenopteryx sicula	F	CTENO Cteno 1		C	0	Chtenopteryx sicula (Vérany, 1851)	2011	SB e LM
185	CIDACID	Cidaris cidaris				E ec	0	Cidaris cidaris (Linnaeus, 1758)	2011	SB, LM e MT
186	CIONINT	Ciona intestinalis				E tu	0	Ciona intestinalis (Linnaeus, 1767)	2011	MT
187	CIRCCAS	Circomphalus casinus	F	VEN		D mb	0	Venus casina Linnaeus, 1758		
188	CIROBOR	Cirolana borealis				B iso	0	Cirolana borealis Lilljeborg, 1852		
189	CITHMAC	Citharus linguatula (macrolepidotus)	C	194.1.1		A o	0	Citharus linguatula (Linnaeus, 1758)		
190	CLOPBIC	Chlopsis bicolor	C	77.1.1		A o	0	Chlopsis bicolor Rafinesque, 1810		
191	CLORAGA	Chlorophthalmus agassizi	C	55.1.1		A o	0	Chlorophthalmus agassizi Bonaparte, 1840		
192	COBLGAL	Coryphoblennius galerita	C	164.2.1		A o	0	Coryphoblennius galerita (Linnaeus, 1758)		
193	CODIBUR	Codium bursa				V		Codium bursa (Olivi) C.Agardh, 1817	2011	SB e MT
194	CODIVER	Codium vermilara				V		Codium vermilara (Olivi) Delle Chiaje, 1829	2011	MT
195	COELCOE	Coelorhynchus coelorhynchus	C	99.12.1		A o	0	Coelorinchus caelorhincus (Risso, 1810)		
196	COELOCC	Coelorhynchus occa (C. labiatus)	C	99.12.2		A o	0	Coelorinchus occa (Goode & Bean, 1885)		

197	CONGCON	Conger conger	C	82.1.1		A o	0	Conger conger (Linnaeus, 1758)		
198	CORIJUL	Coris julis	C	145.4.1		A o	0	Coris julis (Linnaeus, 1758)		
199	CORSCAS	Corystes cassivelaunus	Z	340		B	m	Corystes cassivelaunus (Pennant, 1777)	2011	SB
200	CORYGUN	Coryphaenoides guentheri	C	99.13.2		A o	0	Coryphaenoides guentheri (Vaillant, 1888)		
201	CRANSPP	Crangon sp.	F	CRANG		B	m	Crangon J.C. Fabricius, 1798		
202	CRASGIG	Crassostrea gigas	F	OSTR Crass 1	AL	D mb	0	Crassostrea gigas (Thunberg, 1793)		
203	CRASSPP	Crassostrea spp.	F	OSTR		D mb	0	Crassostrea Sacco, 1897		
204	CUBIGRA	Cubiceps gracilis	C	177.2.1		A o	0	Cubiceps gracilis (Lowe, 1843)		
205	CUSPCUS	Cuspidaria cuspidata				E mb	0	Cuspidaria cuspidata (Olivi, 1792)		
206	CYCLBRA	Cyclothone braueri	C	37.4.3		A o	m	Cyclothone braueri Jespersen & Tåning, 1926	2011	SB
207	CYCLPIG	Cyclothone pygmaea	C	37.4.8		A o	m	Cyclothone pygmaea Jespersen & Tåning, 1926		
208	CYCLSPP	Cyclothone spp.	C	37.4		A o	m	Cyclothone Goode & Bean, 1883		
209	CYLICYL	Cylichna cylindracea				E mo	0	Cylichna cylindracea (Pennant, 1777)	2011	MT
210	CYMACOR	Cymatium corrogatum	F	CYM Cym 1		E mg	0	Cymatium (Monoplex) corrugatum corrugatum (Lamarck, 1816)		
211	CYMBOLL	Cymbium olla			Δ	D mg	0	Cymbium olla (Linnaeus, 1758)		
212	CYMUPER	Cymbulia peronii				E mo	0	Cymbulia peronii Lamarck, 1819	2011	SB
213	CYNPFER	Cynoponticus ferox	C	79.1.1		A o	0	Cynoponticus ferox Costa, 1846		
214	CYSSCOM	Cystoseira compressa f. compressa				V		Cystoseira compressa f. compressa (Esper) Gerloff et Nizamuddin, 1975	2011	MT
215	CYSTDEL	Cystodytes dellechiaiae				E tu	0	Cystodytes dellechiaiae (Della Valle, 1877)	2011	MT
216	DALOIMB	Dalophis imberbis	C	86.3.1		A o	0	Dalophis imberbis (Delaroche, 1809)		
217	DARDARR	Dardanus arrosor	Z	241		B	m	Dardanus arrosor (Herbst, 1796)		
218	DARDCAL	Dardanus calidus	Z	242		B	m	Dardanus calidus (Risso, 1827)		
219	DARDSPP	Dardanus spp.	Z	240		B	m	Dardanus Paulson, 1875	2011	SB
220	DASICEN	Dasyatis centroura	C	22.1.2		A e	0	Dasyatis centroura (Mitchill, 1815)		
221	DASIPAS	Dasyatis pastinaca	C	22.1.1		A e	0	Dasyatis pastinaca (Linnaeus, 1758)		**b1**
222	DASITOR	Dasyatis tortonesi	C	22.1.4		A e	0	Dasyatis pastinaca (Linnaeus, 1758)		**b1**
223	DASIVIO	Dasyatis violacea	C	22.1.3		A e	0	Pteroplatytrygon violacea (Bonaparte, 1832)		
224	DENDSPP	Dendrodoris spp.				E mo	0	Dendrodoris Ehrenberg, 1831	2011	MT
225	DENTDEN	Dentex dentex	C	139.3.1		A o	0	Dentex dentex (Linnaeus, 1758)		

226	DENTGIB	Dentex gibbosus	C	139.3.3		A o	0	Dentex gibbosus (Rafinesque, 1810)		
227	DENTMAC	Dentex macrophthalmus	C	139.3.4		A o	0	Dentex macrophthalmus (Bloch, 1791)		
228	DENTMAR	Dentex maroccanus	C	139.3.5		A o	0	Dentex maroccanus Valenciennes, 1830		
229	DENTSPP	Dentalium spp.				E sc	0	Dentaliidae Children, 1834		
230	DEOARA	Deosergestes arachnipodus				B	m	Deosergestes arachnipodus (Cocco, 1832)	2011	LM
231	DIAPHOL	Diaphus holti	C	58.6.5		A o	0	Diaphus holti Tåning, 1918		
232	DIAPMET	Diaphus metopoclampus	C	58.6.7		A o	0	Diaphus metopoclampus (Cocco, 1829)		
233	DIAPRAF	Diaphus rafinesquei	C	58.6.9		A o	0	Diaphus rafinesquii (Cocco, 1838)		
234	DIAPSPP	Diaphus spp.	C	58.6		A o	0	Diaphus Eigenmann & Eigenmann, 1890		
235	DIAZVIO	Diazona violacea				E tu	0	Diazona violacea Savigny, 1816	2011	MT
236	DICAMAY	Dicranodromia mayheuxi	Z	297	Δ Δ	B	m	Dicranodromia mahieuxii A. Milne-Edwards, 1883		
237	DICELAB	Dicentrarchus labrax	C	124.4.1		A o	0	Dicentrarchus labrax (Linnaeus, 1758)		
238	DICEPUN	Dicentrarchus punctatus	C	124.4.2		A o	0	Dicentrarchus punctatus (Bloch, 1792)		
239	DICOCUN	Dicologoglossa cuneata	C	198.4.2	Δ	A o	0	Dicologlossa cuneata (Moreau, 1881)		
240	DIDEMAC	Didemnum maculosum				E tu	0	Didemnum maculosum (Milne-Edwards, 1841)	2011	MT
241	DIDESPP	Didemnum spp.				E tu	0	Didemnum Savigny, 1816	2011	MT
242	DIODITA	Diodora italica				E mg	0	Diodora italica (Defrance, 1820)		
243	DIPGBIM	Diplacogaster bimaculata	C	208.2.1		A o	0	Diplecogaster bimaculata bimaculata (Bonnaterre, 1788)		
244	DIPLANN	Diplodus annularis	C	139.4.1		A o	0	Diplodus annularis (Linnaeus, 1758)		
245	DIPLCER	Diplodus cervinus cervinus	C	139.4.2.		A o	0	Diplodus cervinus cervinus (Lowe, 1838)		
246	DIPLPUN	Diplodus puntazo	C	139.8.1		A o	0	Diplodus puntazzo (Cetti, 1777)		
247	DIPLSAR	Diplodus sargus	C	139.4.3		A o	0	Diplodus sargus sargus (Linnaeus, 1758)		
248	DIPLVUL	Diplodus vulgaris	C	139.4.4		A o	0	Diplodus vulgaris (Geoffroy Saint-Hilaire, 1817)		
249	DISMVAR	Distomus variolosus				E tu	0	Distomus variolosus Gaertner, 1774	2011	MT
250	DISTMAG	Distaplia magnilarva				E tu	0	Distaplia magnilarva Della Valle, 1881	2011	MT
251	DORHTHO	Dorhynchus thomsoni	Z	467		B	m	Dorhynchus thomsoni Wyville & Thomson, 1873		**c2**
252	DORILAN	Dorippe lanata	Z	312		B	m	Medorippe lanata (Linnaeus, 1767)		
253	DORITHO	Dorhynchus thomsoni	Z	467		B	m	Dorhynchus thomsoni Wyville & Thomson, 1873		**c2**

254	DORSPSE	Doris pseudoargus				E mo	0	Doris pseudoargus Rapp, 1827	2011	MT
255	DORSSTI	Doris sticta				E mo	0	Doris sticta (Iredale & O'Donoghue, 1923)	2011	MT
256	DORSVER	Doris verrucosa	R	p. 304 Tav. 116		E mo	0	Doris verrucosa Linnaeus, 1758		
257	DOSISPP	Dosinia spp.				D mb	0	Dosinia Scopoli, 1777		
258	DROMPER	Dromia personata	F	DROM Drom 1		B	m	Dromia personata (Linnaeus, 1758)		
259	DUSSELO	Dussumieria elopsoides	G	48	Δ AL	A o	0	Dussumieria elopsoides Bleeker, 1849		
260	EBALCRA	Ebalia cranchi	Z	329		B	m	Ebalia cranchii Leach, 1817		
261	EBALNUX	Ebalia nux	Z	328		B	m	Ebalia nux A. Milne-Edwards, 1883		
262	ECHASEP	Echinaster sepositus				E ec	0	Echinaster sepositus (Retzius, 1783)	2011	SB, LM e MT
263	ECHCCOR	Echinocardium cordatum				E ec	0	Echinocardium cordatum (Pennant, 1777)	2011	SB
264	ECHCMED	Echinocardium mediterraneum				E ec	0	Echinocardium mediterraneum (Forbes, 1844)	2011	MT
265	ECHEMIR	Echelus myrus	C	84.1.1		A o	0	Echelus myrus (Linnaeus, 1758)		
266	ECHIDEN	Echiodon dentatus	C	175.2.2		A o	0	Echiodon dentatus (Cuvier, 1829)		
267	ECHNACU	Echinus acutus				E ec	0	Echinus acutus Lamarck, 1816	2011	SB e MT
268	ECHNMEL	Echinus melo				E ec	0	Echinus melo Lamarck, 1816	2011	SB, LM e MT
269	ELECRIS	Electrona rissoi	C	58.8.1		A o	0	Electrona risso (Cocco, 1829)		
270	ELEDCIR	Eledone cirrhosa	F	OCT Eled 1		C	0	Eledone cirrhosa (Lamarck, 1798)		
271	ELEDMOS	Eledone moschata	F	OCT Eled 2		C	0	Eledone moschata (Lamarck, 1798)		
272	ELEDSPP	Eledone spp.	F	OCT Eled		C	0	Eledone Leach, 1817		
273	ENGRENC	Engraulis encrasicolus	C	35.1.1		A o	0	Engraulis encrasicolus (Linnaeus, 1758)		
274	EPHIGUT	Ephippion guttiferum	C	204.1.1	Δ	A o	0	Ephippion guttifer (Bennett, 1831)		
275	EPIGCON	Epigonus constanciae	C	127.2.3		A o	0	Epigonus constanciae (Giglioli, 1880)		
276	EPIGDEN	Epigonus denticulatus	C	127.2.2		A o	0	Epigonus denticulatus Dieuzeide, 1950		
277	EPIGSPP	Epigonus spp.	C	127.2		A o	0	Epigonus Rafinesque, 1810	2011	SB
278	EPIGTEL	Epigonus telescopus	C	127.2.1		A o	0	Epigonus telescopus (Risso, 1810)		
279	EPINAEN	Epinephelus aeneus	C	124.5.1		A o	0	Epinephelus aeneus (Geoffroy Saint-Hilaire, 1817)		
280	EPINALE	Epinephelus alexandrinus	C	124.5.2		A o	0	Epinephelus costae (Steindachner, 1878)		
281	EPINCAN	Epinephelus caninus	C	124.5.3		A o	0	Epinephelus caninus (Valenciennes, 1843)		

282	EPINGUA	Epinephelus guaza	C	124.5.4		A o	0	Epinephelus marginatus (Lowe, 1834)		
283	EPINSPP	Epinephelus spp.	C	124.5		A o	0	Epinephelus Bloch, 1793		
284	EPIZARE	Epizoanthus arenaceus				E cn	0	Epizoanthus arenaceus (Delle Chiaje, 1822)	2011	MT
285	EPIZSPP	Epizoanthus spp.				E cn	0	Epizoanthus Gray, 1867	2011	LM
286	ERETKLE	Eretmophorus kleinenbergi	C	103.1.1		A o	0	Eretmophorus kleinenbergi Giglioli, 1889		
287	ERGACLO	Ergasticus clouei	Z	463		B	m	Ergasticus clouei A. Milne-Edwards, 1882		
288	ETHUMAS	Ethusa mascarone	Z	309		B	m	Ethusa mascarone (Herbst, 1785)		
289	ETMOSPI	Etmopterus spinax	C	16.6.1		A e	0	Etmopterus spinax (Linnaeus, 1758)		
290	EUCHLIG	Euchirograpsus liguricus	Z	429		B	m	Euchirograpsus liguricus H. Milne-Edwards, 1853		
291	EUNIVER	Eunicella verrucosa				E cn	0	Eunicella verrucosa (Pallas, 1766)	2011	SB
292	EUPHKRO	Euphausia krohni				B eu	m	Euphausia krohni (Brandt, 1851)	2011	LM
293	EUPHSPP	Euphausiidae				B eu	m	Euphausiidae Dana, 1852		
294	EURYASP	Eurynome aspera	Z	462		B	m	Eurynome aspera (Pennant, 1777)		
295	EUTRGUR	Eutrigla gurnardus	C	185.3.1		A o	0	Eutrigla gurnardus (Linnaeus, 1758)		
296	EVERBAL	Evermannella balboi (= balbo)	C	60.1.1		A o	0	Evermannella balbo (Risso, 1820)		
297	FLEXFLE	Flexopecten flexuosus	F	PETC Flex		D mb	0	Flexopecten flexuosus (Poli, 1795)		
298	FLEXGLA	Flexopecten glaber glaber				D mb		Flexopecten glaber glaber (Linnaeus, 1758)	2011	LM
299	FRONVER	Frondipora verrucosa				E br	0	Frondipora verrucosa (Lamouroux, 1821)	2011	MT
300	FUNCWOO	Funchalia woodwardi	F	PEN		B	m	Funchalia woodwardi Johnson, 1868		
301	FUNIQUA	Funiculina quadrangularis				E cn	0	Funiculina quadrangularis (Pallas, 1766)	2011	SB e MT
302	FUSIROS	Fusinus rostratus	F	FASC Fus 1		E mg	0	Fusinus (Fusinus) sanctaeluciae (Von Salis, 1793)		
303	FUSISYR	Fusinus (Aptyxis) syracusanus				E mg	0	Fusinus (Aptyxis) syracusanus (Linnaeus, 1758)	2011	MT
304	FUSTUND	Fusituris undatiruga				E mg	0	Fusiturris undatiruga (Bivona Ant. in Bivona And., 1838)		
305	GADAMAR	Gadella maraldi	C	103.3.1		A o	0	Gadella maraldi (Risso, 1810)		
306	GADIARG	Gadiculus argenteus	C	101.5.1		A o	0	Gadiculus argenteus argenteus Guichenot, 1850		
307	GADUMER	Merlangius merlangus	C	101.7.1		A o	0	Merlangius merlangus (Linnaeus, 1758)		
308	GAIDMED	Gaidropsarus mediterraneus	C	101.20.1		A o	0	Gaidropsarus mediterraneus (Linnaeus, 1758)		
309	GAIDVUL	Gaidropsarus vulgaris	C	101.20.4		A o	0	Gaidropsarus vulgaris (Cloquet, 1824)		

310	GALADIS	Galathea dispersa	Z	278		B	m	Galathea dispersa Bate, 1859		
311	GALAINT	Galathea intermedia	Z	279		B	m	Galathea intermedia Liljeborg, 1851		
312	GALANEX	Galathea nexa	Z	277		B	m	Galathea nexa Embleton, 1834		
313	GALEGAL	Galeorhinus galeus	C	13.3.1		A e	0	Galeorhinus galeus (Linnaeus, 1758)		
314	GALIDEC	Galeoides decadactylus	C	182.1.1	Δ	A o	0	Galeoides decadactylus (Bloch, 1795)		
315	GALUATL	Galeus atlanticus	F	SCYL Gal 11	Δ	A e	0	Galeus atlanticus (Vaillant, 1888)		
316	GALUMEL	Galeus melastomus	C	11.3.1		A e	0	Galeus melastomus Rafinesque, 1810		
317	GENNELE	Gennadas elegans	F	ARIST		B	m	Gennadas elegans (S.I. Smith, 1882)		
318	GENOMAC	Genocidaris maculata				E ec	0	Genocidaris maculata A. Agassiz, 1869	2011	LM
319	GEPYDAR	Gephyroberyx darwini	C / G	115.1.1 / 88	Δ AL	A o	0	Gephyroberyx darwinii (Johnson, 1866)		
320	GERYLON	Geryon longipes	F	GER Ger 2		B	m	Geryon longipes A. Milne-Edwards, 1882		
321	GIBBSPP	Gibbula spp.		D'Angelo		D mg	0	Gibbula Risso, 1826		
322	GLOSLEI	Glossanodon leioglossus	C	46.2.1		A o	0	Glossanodon leioglossus (Valenciennes, 1848)		
323	GLOSVAL	Glossodoris valenciennesi	R	p. 304 Tav. 116		E mo	0	Hypselodoris picta (Schultz in Philippi, 1936)		
324	GLOUHUM	Glossus humanus	F	GLOSS Gloss 1		E mb	0	Glossus humanus (Linnaeus, 1758)		
325	GNATMYS	Gnathophis mystax	C	82.3.1		A o	0	Gnathophis mystax (Delaroche, 1809)		
326	GOBICOL	Deltentosteus (Gobius) colonialus	C	162.10.2		A o	0	Deltentosteus collonianus (Risso, 1820)		
327	GOBIFRI	Leusueurigobius (Gobius) friesii	C	162.16.2		A o	0	Lesueurigobius friesii (Malm, 1874)		
328	GOBIGEN	Gobius geniporus	C	162.1.8		A o	0	Gobius geniporus Valenciennes, 1837		
329	GOBILIN	Crystallogobius (Gobius) linearis	C	162.9.1		A o	0	Crystallogobius linearis (Düben, 1845)		
330	GOBINIG	Gobius niger	C	162.1.1		A o	0	Gobius niger Linnaeus, 1758		
331	GOBIQUA	Deltentosteus (Gobius) quadrimaculatus	C	162.10.1		A o	0	Deltentosteus quadrimaculatus (Valenciennes, 1837)		
332	GOBISAN	Lesueurigobius (Gobius) sanzoi	C	162.16.4	Δ	A o	0	Lesueurigobius sanzi (De Buen, 1918)		
333	GOBISPP	Gobius spp.	C	162		A o	0	Gobius Linnaeus, 1758		
334	GOBISUE	Lesueurigobius suerii	C	162.16.1		A o	0	Lesueurigobius suerii (Risso, 1810)		
335	GONERHO	Goneplax rhomboides (= angulata)	Z	414		B	m	Goneplax rhomboides (Linnaeus, 1758)		
336	GONICOC	Gonichthys coccoi	C	58.9.1		A o	0	Gonichthys cocco (Cocco, 1829)		
337	GONODEN	Gonostoma denudatum	C	37.1.1		A o	0	Gonostoma denudatum Rafinesque, 1810		
338	GONOSPP	Gonostoma spp.	C	37.1		A o	0	Gonostoma Rafinesque, 1810	2011	SB
339	GRYPVIT	Gryphus vitreus				E brac		Gryphus vitreus (Born, 1778)	2011	SB, LM e

										MT
340	GYMACIC	Gymnammodytes cicerellus	C	147.2.1		A o	0	Gymnammodytes cicerelus (Rafinesque, 1810)		
341	GYMNALT	Gymnura altavela	C	22.2.1		A e	0	Gymnura altavela (Linnaeus, 1758)		
342	HADRCRA	Hadriana craticuloides	F	MUR		D mg	0	Hadriania oretea (De Gregorio, 1885)		
343	HALOPAP	Halocynthia papillosa				E tu	0	Halocynthia papillosa (Linnaeus, 1767)	2011	SB e MT
344	HAMINAV	Haminoea navicula				E mo	0	Haminoea navicula (Da Costa, 1778)	2011	LM
345	HEDIDIV	Hediste diversicolor				E po	0	Hediste diversicolor (O.F. Müller, 1776)	2011	SB e MT
346	HELIDAC	Helicolenus dactylopterus	C	184.2.1		A o	0	Helicolenus dactylopterus dactylopterus (Delaroche, 1809)		
347	HEPTPER	Heptranchias perlo	C	3.2.1		A e	0	Heptranchias perlo (Bonnaterre, 1788)		
348	HETEDIS	Heteroteuthis dispar	F	SEPIOL		C	0	Heteroteuthis dispar (Rüppell, 1844)		
349	HEXAGRI	Hexanchus griseus	C	3.1.1		A e	0	Hexanchus griseus (Bonnaterre, 1788)		
350	HEXAVIT	Hexanchus nakamurai (vitulus)	C	3.1.2		A e	0	Hexanchus nakamurai Teng, 1962		
351	HIATARC	Hiatella arctica				E mb	0	Hiatella arctica (Linnaeus, 1767)	2011	MT
352	HIATSPP	Hiatella spp.				E mb	0	Hiatella Bosc, 1801	2011	SB
353	HINIINC	Hinia incrassata	F	NASS Hin		D mg	0	Nassarius (Hima) incrassatus (Stroem, 1768)		
354	HINIRET	Hinia reticulata	F	NASS Hin 1		D mg	0	Nassarius (Hinia) nitidus (Jeffreys, 1867)		
355	HIPPGUT	Hippocampus guttulatus	C	97.4.2		A o	0	Hippocampus guttulatus Cuvier, 1829	2011	SB
356	HIPPHIC	Hippocampus hippocampus	C	97.4.1		A o	0	Hippocampus hippocampus (Linnaeus, 1758)		
357	HISTBON	Histioteuthis bonnellii	F	HISTIO		C	0	Histioteuthis bonnellii (Férussac, 1835)		
358	HISTREV	Histioteuthis reversa	F	HISTIO		C	0	Histioteuthis reversa (Verrill, 1880)		
359	HISTSPP	Histioteuthis spp.	F	HISTIO		C	0	Histioteuthis d'Orbigny, 1841		
360	HOLOFOR	Holothuria forskali				E ec	0	Holothuria forskali Delle Chiaje, 1823	2011	MT
361	HOLOHEL	Holothuria helleri				E ec	0	Holothuria helleri Marenzeller, 1878	2011	LM
362	HOLOPOL	Holothuria polii				E ec	0	Holothuria polii Delle Chiaje, 1823	2011	SB, LM e MT
363	HOLOTUB	Holothuria tubulosa				E ec	0	Holothuria tubulosa Gmelin, 1788	2011	SB e MT
364	HOMAVUL	Homarus vulgaris	F	NEPH Hom 1		B	m	Homarus gammarus (Linnaeus, 1758)		
365	HOMOBAR	Homola barbata	Z	304		B	m	Homola barbata (J.C. Fabricius, 1793)		
366	HOPLATL	Hoplostethus atlanticus	C	115.2.2	Δ Δ	A o	0	Hoplostethus atlanticus Collett, 1889		
367	HOPLMED	Hoplostethus mediterraneus	C	115.2.1		A o	0	Hoplostethus mediterraneus mediterraneus Cuvier, 1829		

368	HYGOBEN	Hygophum benoiti	C	58.10.2		A o	0	Hygophum benoiti (Cocco, 1838)		
369	HYGOHIG	Hygophum hygomii	C	58.10.1		A o	0	Hygophum hygomii (Lütken, 1892)		
370	HYGOSPP	Hygophum spp.	C	58.10		A o	0	Hygophum Bolin, 1939	2011	MT
371	HYMEITA	Hymenocephalus italicus	C	99.5.1		A o	0	Hymenocephalus italicus Giglioli, 1884		
372	HYMPSPP	Hymenopenaeus sp.	Z	47	Δ Δ	B	m	Hymenopenaeus Smith, 1882		
373	HYPESPP	Hyperiidae				B anf	0	Hyperiidae		
374	HYPOPIC	Hyporhamphus picarti	C	93.2.1	Δ	A o	0	Hyporhamphus picarti (Valenciennes, 1847)		
375	HYPSSPP	Hypselodoris spp.				E mo	0	Hypselodoris Stimpson, 1855	2011	MT
376	ICHTOVA	Ichthyococcus ovatus	C	37.6.1		A o	0	Ichthyococcus ovatus (Cocco, 1838)		
377	ILIANUC	Ilia nucleus	Z	322		B	m	Ilia nucleus (Linnaeus, 1758)	2011	SB
378	ILLECOI	Illex coindetii	F	OMMAS Ill 1		C	0	Illex coindetii (Vérany, 1839)		
379	ILLESPP	Illex	F	OMMAS Ill		C	0	Illex Steenstrup, 1880		
380	INACCOM	Inachus communissimus	Z	470		B	m	Inachus communissimus Rizza, 1839		
381	INACDOR	Inachus dorsettensis	Z	472		B	m	Inachus dorsettensis (Pennant, 1777)		
382	INACPAR	Inachus parvirostris				B	m	Inachus parvirostris (Risso, 1816)	2011	SB
383	INACSPP	Inachus spp.	Z	467		B	m	Inachus Weber, 1795	2011	SB, LM e MT
384	INACTHO	Inachus thoracicus	Z	473		B	m	Inachus thoracicus P. Roux, 1830		
385	IRCISPP	Ircinia spp.				E sp	0	Ircinia Nardo, 1833	2011	MT
386	ISIDELO	Isidella elongata				E cn	0	Isidella elongata (Esper, 1788)	2011	LM e MT
387	JAXENOC	Jaxea nocturna	Z	226		B	m	Jaxea nocturna Nardo, 1847		
388	JORUTOM	Jorunna tomentosa				E mo	0	Jorunna tomentosa (Cuvier, 1804)	2011	MT
389	LABIDIG	Labidoplax digitata				E ec	0	Labidoplax digitata (Montagu, 1815)	2011	MT
390	LABRVIR	Labrus viridis	C	145.1.4		A o	0	Labrus viridis Linnaeus, 1758		
391	LABSBIM	Labrus bimaculatus	C	145.1.1		A o	0	Labrus mixtus Linnaeus, 1758		
392	LAETHYS	Laetmonice hystrix				E po	0	Laetmonice hystrix (Savigny, 1820)	2011	SB e LM
393	LAEVCAR	Laevicardium oblongum	F	CARD Laev 1		D mb	0	Laevicardium oblongum (Gmelin, 1791)		
394	LAGOLAG	Lagocephalus lagocephalus	C	204.2.1		A o	0	Lagocephalus lagocephalus lagocephalus (Linnaeus, 1758)		
395	LAMACRO	Lampanyctus crocodilus	C	58.12.1		A o	0	Lampanyctus crocodilus (Risso, 1810)		
396	LAMAPUS	Lampanyctus pusillus	C	58.12.10		A o	0	Lampanyctus pusillus (Johnson, 1890)		
397	LAMASPP	Lampanyctus spp.	C	58.12		A o	0	Lampanyctus Bonaparte, 1840		
398	LAMPGUT	Lampris guttatus	C	105.1.1		A o	0	Lampris guttatus (Brünnich, 1788)		

399	LAPPFAS	Lappanella fasciata	C	145.7.1		A o	0	Lappanella fasciata (Cocco, 1833)		
400	LATRELE	Latreillia elegans	Z	307		B	m	Latreillia elegans Roux, 1830	2011	SB, LM e MT
401	LATRSPP	Lattreillia	Z	307		B	m	Latreillia Roux, 1830		
402	LEPALEP	Lepadogaster lepadogaster	C	208.4.1		A o	0	Lepadogaster lepadogaster (Bonnaterre, 1788)		
403	LEPASPP	Lepadogaster spp.	C	208.4		A o	0	Lepadogaster Goüan, 1770	2011	SB
404	LEPGSAR	Leptogorgia sarmentosa				E cn	0	Leptogorgia sarmentosa (Esper, 1789)	2011	MT
405	LEPICAU	Lepidopus caudatus	C	155.4.1		A o	0	Lepidopus caudatus (Euphrasen, 1788)		
406	LEPMBOS	Lepidorhombus boscii	C	195.2.2		A o	0	Lepidorhombus boscii (Risso, 1810)		
407	LEPMWHS	Lepidorhombus whiffiagonis	C	195.2.1		A o	0	Lepidorhombus whiffiagonis (Walbaum, 1792)		
408	LEPOLEP	Lepidion lepidion	C	103.6.1		A o	0	Lepidion lepidion (Risso, 1810)		
409	LEPRPHA	Leptometra phalangium				E ec	0	Leptometra phalangium (J. Müller, 1841)	2011	SB e MT
410	LEPTCAV	Lepidotrigla cavillone	C	185.4.1		A o	0	Lepidotrigla cavillone (Lacepède, 1801)		
411	LEPTDIE	Lepidotrigla dieuzeidei	C	185.4.2		A o	0	Lepidotrigla dieuzeidei Blanc & Hureau, 1973		
412	LESTSPD	Lestidiops sphyrenoides	C	63.2.1		A o	0	Lestidiops sphyrenoides (Risso, 1820)		
413	LESTSPP	Lestidiops spp.	C	63.2		A o	0	Lestidiops Hubbs, 1916		
414	LICHAMI	Lichia amia	C	131.5.1		A o	0	Lichia amia (Linnaeus, 1758)		
415	LIGUENS	Ligur ensiferus	Z	133		B	m	Ligur ensiferus (Risso, 1816)		
416	LISSCHI	Lissa chinagra	Z	459		B	m	Lissa chiragra (J.C. Fabricius, 1775)		
417	LITHMOR	Lithognathus mormyrus	C	139.5.1		A o	0	Lithognathus mormyrus (Linnaeus, 1758)		
418	LIZAAUR	Liza aurata	C	181.3.2		A o	0	Liza aurata (Risso, 1810)		
419	LIZARAM	Liza ramada	C	181.3.1		A o	0	Liza ramado (Risso, 1810)		
420	LIZASAL	Liza saliens	C	181.3.4		A o	0	Liza saliens (Risso, 1810)		
421	LOBIDOF	Lobianchia dofleini	C	58.14.12		A o	0	Lobianchia dofleini (Zugmayer, 1911)		
422	LOBIGEM	Lobianchia gemellarii	C	58.14.1		A o	0	Lobianchia gemellarii (Cocco, 1838)		
423	LOLIFOR	Loligo forbesi	F	LOLIG Lolig 2		C	0	Loligo forbesi Steenstrup, 1856		
424	LOLISPP	Loligo	F	LOLIG Lolig		C	0	Loligo Lamarck, 1798		
425	LOLIVUL	Loligo vulgaris	F	LOLIG Lolig 1		C	0	Loligo vulgaris Lamarck, 1798		
426	LOPEPER	Lophelia pertusa				E cn	0	Lophelia pertusa (Linnaeus, 1758)	2011	SB e LM

427	LOPHBUD	Lophius budegassa	C	210.1.2		A o	0	Lophius budegassa Spinola, 1807		
428	LOPHPIS	Lophius piscatorius	C	210.1.1		A o	0	Lophius piscatorius Linnaeus, 1758		
429	LOPHSPP	Lophius	C	210.1		A o	0	Lophius Linnaeus, 1758		
430	LOPOTYP	Lophogaster typicus				B	m	Lophogaster typicus M. Sars, 1857		
431	LUIDCIL	Luidia ciliaris				E ec	0	Luidia ciliaris (Philippi, 1837)	2011	SB e MT
432	LUIDSAR	Luidia sarsi				E ec	0	Luidia sarsi (Düben Koren, 1846)	2011	MT
433	LUNACAT	Lunatia catena	F	NAT		E mg	0	Polinices catena (da Costa, 1778)		
434	LUNAFUS	Lunatia fusca		D'Onghia		E mg	0	Polinices fusca (De Blainville, 1825)		
435	LUTRSPP	Lutraria spp.	R	p. 342		E mb	0	Lutraria Lamarck, 1799		
436	LYTOMYR	Lytocarpia myriophyllum				E cn	0	Lytocarpia myriophyllum (Linnaeus, 1758)	2011	LM e MT
437	MACOSCO	Macrorhamphosus scolopax	C	96.1.1		A o	0	Macroramphosus scolopax (Linnaeus, 1758)		
438	MACRLIN	Macropodia linaresi	Z	479		B	m	Macropodia linaresi Forest & Zariquiey-Alvarez, 1964		
439	MACRLON	Macropodia longipes	Z	482		B	m	Macropodia longipes (A. Milne-Edwards & Bouvier, 1899)		
440	MACRROS	Macropodia rostrata	F	MAJI		B	m	Macropodia rostrata (Linnaeus, 1761)		
441	MACRSPP	Macropodia spp.	Z	476		B	m	Macropodia Leach, 1814	2011	SB
442	MAJACRI	Maja crispata	F	MAJI Maja		B	m	Maja crispata Risso, 1827		
443	MAJAGOL	Maja goltziana	Z	447		B	m	Maja goltziana d'Oliveira, 1888	2011	MT
444	MAJASQU	Maja squinado	F	MAJI Maja 1		B	m	Maja squinado (Herbst, 1788)		
445	MARTGLA	Marthasterias glacialis				E ec	0	Marthasterias glacialis (Linnaeus, 1758)	2011	SB, LM e MT
446	MAURMUE	Maurolicus muelleri	C	37.8.1		A o	0	Maurolicus muelleri (Gmelin, 1789)		
447	MCPIARC	Liocarcinus arcuatus	F	PORT Lioc 3		B	m	Liocarcinus navigator (Herbst, 1794)		
448	MCPICOR	Liocarcinus corrugatus	Z	372		B	m	Liocarcinus corrugatus (Pennant, 1777)		
449	MCPIDEP	Liocarcinus (Macropipus) depurator	F	PORT Lioc 4		B	m	Liocarcinus depurator (Linnaeus, 1758)		
450	MCPIMAC	Liocarcinus maculatus	F	PORT Lioc		B	m	Liocarcinus maculatus (Risso, 1827)		
451	MCPIPUB	Necora (Macropipus) puber	F	PORT Neco 1	Δ	B	m	Necora puber (Linnaeus, 1767)		
452	MCPITUB	Macropipus tuberculatus	F	PORT Macro 1		B	m	Macropipus tuberculatus (Roux, 1830)		
453	MCPIVER	Liocarcinus vernalis	Z	377		B	m	Liocarcinus vernalis (Risso, 1827)	2011	SB e MT
454	MEGANOR	Meganyctiphanes norvegica				B eu	m	Meganyctiphanes norvegica (M. Sars, 1857)		
455	MELAATL	Melanostigma atlanticum	C	170.6.1		A o	0	Melanostigma atlanticum Koefoed, 1952		

456	MERLMER	Merluccius merluccius	C	100.1.1		A o	0	Merluccius merluccius (Linnaeus, 1758)		
457	MICICOC	Microichthys coccoi	C	127.4.1		A o	0	Microichthys coccoi Rüppell, 1852	2011	SB e MT
458	MICMPOU	Micromesistius poutassou	C	101.8.1		A o	0	Micromesistius poutassou (Risso, 1826)		
459	MICOSAB	Microcosmus sabatieri	F	PYUR Micr 2		D tu	0	Microcosmus sabatieri Roule, 1885		
460	MICOSPP	Microcosmus spp.				D tu		Microcosmus Heller, 1877	2011	SB e MT
461	MICOSQU	Microcosmus squamiger			AL	D tu		Microcosmus squamiger Hartmeyer & Michaelsen, 1928	2011	MT
462	MICOVUL	Microcosmus vulgaris				D tu		Microcosmus vulgaris Heller, 1877	2011	LM e MT
463	MICRMCS	Microstoma microstoma	C	46.1.3		A o	0	Microstoma microstoma (Risso, 1810)		
464	MICUAZE	Microchirus azevia	C	198.5.2	Δ	A o	0	Microchirus theophila (Risso, 1810)		
465	MICUBOS	Microchirus boscanion	C	198.5.4	Δ Δ	A o	0	Microchirus boscanion (Chabanaud, 1926)		
466	MICUOCE	Microchirus ocellatus	C	198.5.3		A o	0	Microchirus ocellatus (Linnaeus, 1758)		
467	MICUVAR	Microchirus variegatus	C	198.5.1		A o	0	Microchirus variegatus (Donovan, 1808)		
468	MODIBAR	Modiolus barbatus				E mb	0	Modiolus barbatus (Linnaeus, 1758)	2011	MT
469	MODOSUB	Modiolarca subpicta				E mb	0	Modiolarca subpicta (Cantraine, 1835)	2011	MT
470	MOLAMOL	Mola mola	C	207.1.1		A o	0	Mola mola (Linnaeus, 1758)		
471	MOLGOCC	Molgula occulta				E tu	0	Molgula occulta Kupffer, 1875	2011	MT
472	MOLGSPP	Molgula spp.				E tu	0	Molgula Forbes, 1848	2011	LM
473	MOLVDYP	Molva dipterygia	C	101.14.2		A o	0	Molva dipterygia (Pennant, 1784)		
474	MOLVMOL	Molva molva	C	101.14.1		A o	0	Molva molva (Linnaeus, 1758)		
475	MONOHIS	Monochirus hispidus	C	198.6.1		A o	0	Monochirus hispidus Rafinesque, 1814		
476	MORAMOR	Mora moro	C	103.7.1		A o	0	Mora moro (Risso, 1810)		
477	MORIRUG	Morio rugosa				D mg	0	Galeodea rugosa (Linnaeus, 1771)		
478	MUGICEP	Mugil cephalus	C	181.1.1		A o	0	Mugil cephalus Linnaeus, 1758		
479	MUGISPP	Mugilidae	C	181		A o	0	Mugilidae		
480	MULLBAR	Mullus barbatus	C	138.1.1		A o	0	Mullus barbatus Linnaeus, 1758		
481	MULLSUR	Mullus surmuletus	C	138.1.2		A o	0	Mullus surmuletus Linnaeus, 1758		
482	MUNICUR	Munida curvimana	Z	283		B	m	Munida curvimana A. Milne-Edwards & Bouvier, 1894		
483	MUNIINT	Munida intermedia	Z	286		B	m	Munida intermedia A. Milne-Edwards & Bouvier, 1899		
484	MUNIIRI	Munida iris	Z	283		B	m	Munida rutllanti Zariquiey-Alvarez, 1952		
485	MUNIPER	Munida perarmata (= tenuimana)	Z	288		B	m	Munida tenuimana G.O. Sars, 1872		**c3**

486	MUNIRUG	Munida rugosa	Z	285		B	m	Munida rugosa (J.C. Fabricius, 1775)		
487	MUNISPP	Munida	Z	281		B	m	Munida Leach, 1820		
488	MUNITEN	Munida tenuimana	Z	288		B	m	Munida tenuimana G.O. Sars, 1872		**c3**
489	MURAHEL	Muraena helena	C	73.1.1		A o	0	Muraena helena Linnaeus, 1758		
490	MUREBRA	Bolinus (Murex) brandaris	F	MUR Bol 1		D mg	0	Bolinus brandaris (Linnaeus, 1758)		
491	MUREEGG	Capsule ovigere di Murex				G		Capsule ovigere di Murex	2011	MT
492	MURETRU	Murex trunculus	R	RIEDL		D mg	0	Hexaplex trunculus (Linnaeus, 1758)		**d2**
493	MUSTAST	Mustelus asterias	C	13c.5.2		A e	0	Mustelus asterias Cloquet, 1821		
494	MUSTMED	Mustelus mediterraneus	C	13c.5.3		A e	0	Mustelus punctulatus Risso, 1827		
495	MUSTMUS	Mustelus mustelus	C	13c.5.1		A e	0	Mustelus mustelus (Linnaeus, 1758)		
496	MYCOPUN	Myctophum punctatum	C	58.1.1		A o	0	Myctophum punctatum Rafinesque, 1810		
497	MYCOSPP	Myctophidae	C	58		A o	0	Myctophidae		
498	MYCTRUB	Mycteroperca rubra	C	124.6.1		A o	0	Mycteroperca rubra (Bloch, 1793)		
499	MYLIAQU	Myliobatis aquila	C	23.1.1		A e	0	Myliobatis aquila (Linnaeus, 1758)		
500	MYTIGAL	Mytilus galloprovincialis	F	MYTIL Mytil 1		D mb	0	Mytilus galloprovincialis Lamarck, 1819		
501	MYTISPP	Mytilidae spp.	F	MYTIL		D mb	0	Mytilidae Rafinesque, 1815		
502	NANSOBI	Nansenia oblita	C	46.4.2		A o	0	Nansenia oblita (Facciolà, 1887)		
503	NASSLIM	Nassarius lima				D mg		Nassarius (Uzita) lima (Dillwin, 1817)	2011	SB
504	NASSMUT	Nassarius (Sphaeronassa) mutabilis				D mg		Nassarius (Sphaeronassa) mutabilis (Linnaeus, 1758)	2011	SB
505	NASSSPP	Nassariidae				D mg	0	Nassariidae Iredale, 1916		
506	NATIMIL	Naticarius millepunctatus		D'Angelo		D mg	0	Natica (Naticarius) stercusmuscarum (Gmelin, 1791)		
507	NATISPP	Naticidae	F	NAT		D mg	0	Naticidae Guilding, 1834		
508	NAUCDUC	Naucrates ductor	C	131.6.1		A o	0	Naucrates ductor (Linnaeus, 1758)		
509	NEMEANT	Nemertesia antennina				E cn	0	Nemertesia antennina (Linnaeus, 1758)	2011	MT
510	NEMERAM	Nemertesia ramosa				E cn	0	Nemertesia ramosa (Lamarck, 1816)	2011	MT
511	NEMISCO	Nemichthys scolopaceus	C	76.1.1		A o	0	Nemichthys scolopaceus Richardson, 1848		
512	NEOPCOC	Neopycnodonte cochlear				E mb	0	Neopycnodonte cochlear (Poli, 1795)	2011	SB, LM e MT
513	NEORCAR	Neorossia caroli	F	SEPIOL		C	0	Neorossia caroli (Joubin, 1902)		
514	NEPRNOR	Nephrops norvegicus	F	NEPH Neph 1		B	m	Nephrops norvegicus (Linnaeus, 1758)		
515	NEROMAC	Nerophis maculatus	C	97.2.1		A o	0	Nerophis maculatus Rafinesque, 1810		

516	NEROOPH	Nerophis ophidion	C	97.2.2		A o	0	Nerophis ophidion (Linnaeus, 1758)		
517	NETOBRE	Dysomma (Nettodarus) brevirostris	C	81.1.1		A o	0	Dysomma brevirostre (Facciolà, 1887)		
518	NETTMEL	Nettastoma melanurum	C	80.1.1		A o	0	Nettastoma melanurum Rafinesque, 1810		
519	NEVEJOS	Neverita josephinia				E mg	0	Neverita josephinia Risso, 1826	2011	SB
520	NEZUAEQ	Nezumia aequalis	C	99.9.1		A o	0	Nezumia aequalis (Günther, 1878)		
521	NEZUSCL	Nezumia sclerorhynchus	C	99.9.2		A o	0	Nezumia sclerorhynchus (Valenciennes, 1838)		
522	NOTABON	Notacanthus bonapartei	C	89.1.2		A o	0	Notacanthus bonaparte Risso, 1840		
523	NOTORIS	Notolepis rissoi	C	63.4.1		A o	0	Arctozenus risso (Bonaparte, 1840)		
524	NOTRPUN	Notarchus punctatus				E mo	0	Notarchus punctatus Philippi, 1836	2011	MT
525	NOTSBOL	Notoscopelus bolini	C	58.17.5		A o	0	Notoscopelus bolini Nafpaktitis, 1975		**a3**
526	NOTSELO	Notoscopelus elongatus	C	58.17.3		A o	0	Notoscopelus elongatus (Costa, 1844)		
527	NOTSKRO	Notoscopelus kroeyerii	C	58.17.4		A o	0	Notoscopelus bolini Nafpaktitis, 1975		**a3**
528	NOTSSPP	Notoscopelus spp.	C	58.17		A o	0	Notoscopelus Günther, 1864	2011	MT
529	NUCUNUC	Nucula nucleus				E mb	0	Nucula nucleus (Linnaeus, 1758)	2011	SB e LM
530	OBLAMEL	Oblada melanura	C	139.6.1		A o	0	Oblada melanura (Linnaeus, 1758)		
531	OCENERI	Ocenebra erinacea	R	RIEDL		D mg	0	Ocenebra erinaceus (Linnaeus, 1758)		
532	OCNUPLA	Ocnus planci				E ec	0	Ocnus planci (Panning, 1962)	2011	SB e MT
533	OCTESIC	Octopoteuthis sicula	F	OCTO Oct 1		C	0	Octopoteuthis sicula Rüppell, 1844	2011	LM
534	OCTODEP	Octopus defilippi	F	OCT Oct 10		C	0	Octopus defilippi Vérany, 1851		
535	OCTOMAC	Octopus macropus	F	OCT Oct 2		C	0	Octopus macropus Risso, 1826		
536	OCTOSAL	Octopus salutii	F	OCT Oct 23		C	0	Octopus salutii Vérany, 1839		
537	OCTOSPP	Octopus spp.	F	OCT Oct		C	0	Octopus Cuvier, 1797		
538	OCTOTET	Pteroctopus tetracirrhus	F	OCT Pter 1		C	0	Pteroctopus tetracirrhus (Delle Chiaje, 1830)		
539	OCTOVUL	Octopus vulgaris	F	OCT Oct 1		C	0	Octopus vulgaris Cuvier, 1797		
540	OCYTTUB	Ocythoe tuberculata	F	OCY ocy 1		C	0	Ocythoe tuberculata Rafinesque, 1814		
541	ODOAMED	Odontaster mediterraneus				E ec	0	Odontaster mediterraneus Marenzeller, 1891	2011	LM e MT
542	ODONFER	Odontaspis ferox	C	5.1.1		A e	0	Odontaspis ferox (Risso, 1810)		
543	ODONTAU	Eugonphodus (Odontaspis) taurus	C	5.1.3		A e	0	Carcharias taurus Rafinesque, 1810		
544	OEDALAB	Oedalechilus labeo	C	181.4.1		A o	0	Oedalechilus labeo (Cuvier, 1829)		

545	OLIGATE	Oligopus ater	C	172.1.1		A o	0	Grammonus ater (Risso, 1810)		
546	ONYCBAN	Onychoteuthis banksi	F	ONYCHO		C	0	Onychoteuthis banksii (Leach, 1817)		
547	ONYCSPP	Onychoteuthis spp.	F	ONYCHO		C	0	Onychoteuthis Lichtenstein, 1818		
548	OPDELON	Ophioderma longicaudum				E ec	0	Ophioderma longicaudum (Retzius, 1805)	2011	MT
549	OPDIBAR	Ophidion barbatum	C	173.1.1		A o	0	Ophidion barbatum Linnaeus, 1758		
550	OPDIROC	Ophidion rochei	C	173.1.2+3		A o	0	Ophidion rochei Müller, 1845		
551	OPHCRUF	Ophichthus rufus	C	86.1.2		A o	0	Ophichthus rufus (Rafinesque, 1810)		
552	OPHDOPH	Ophidiaster ophidianus				E ec	0	Ophidiaster ophidianus (Lamarck, 1816)	2011	MT
553	OPHISER	Ophisurus serpens	C	86.4.1		A o	0	Ophisurus serpens (Linnaeus, 1758)		
554	OPHOFRA	Ophiothrix fragilis	R	p. 572 Tav. 226		E ec	0	Ophiothrix fragilis (Abildgaard, 1789)		
555	OPHOSPP	Ophiothrix spp.				E ec	0	Ophiothrix Müller-Troschel, 1842	2011	MT
556	OPHUOPH	Ophiura ophiura				E ec	0	Ophiura ophiura (Linnaeus, 1816)	2011	SB, LM e MT
557	OPISSPP	Opisthobranchia spp.				E mo	0	Opisthobranchia Milne-Edwards, 1848		
558	OPLOSPP	Oplophoridae	Z	83		B	m	Oplophoridae Dana, 1852		
559	OPTOAGA	Opistoteuthis agassizii		FAUNA IBER		C	m	Opisthoteuthis calypso Villanueva, Collins, Sánchez e Voss, 2002		
560	OSMUVOL	Osmundaria volubilis				V		Osmundaria volubilis (Linnaeus) R.E. Norris, 1991	2011	MT
561	OSTREDU	Ostrea edulis	F	OSTR Ostr 1		D mb	0	Ostrea edulis Linnaeus, 1758		
562	OSTRSPP	Ostrea spp.	R	RIEDL		D mb	0	Ostrea Linnaeus, 1758		
563	OXYNCEN	Oxynotus centrina	C	15.1.1		A e	0	Oxynotus centrina (Linnaeus, 1758)		
564	PAGEACA	Pagellus acarne	C	139.7.2		A o	0	Pagellus acarne (Risso, 1827)		
565	PAGEBOG	Pagellus bogaraveo	C	139.7.3		A o	0	Pagellus bogaraveo (Brünnich, 1768)		
566	PAGEERY	Pagellus erythrinus	C	139.7.1		A o	0	Pagellus erythrinus (Linnaeus, 1758)		
567	PAGIERE	Paguristes eremita				B	m	Paguristes eremita (Linnaeus, 1767)		
568	PAGUALA	Pagurus alatus	Z	247		B	m	Pagurus alatus (J.C. Fabricius, 1775)		
569	PAGUCUA	Pagurus cuanensis	Z	247		B	m	Pagurus cuanensis Bell, 1845		
570	PAGUEXC	Pagurus excavatus	Z	247		B	m	Pagurus excavatus (Herbst, 1791)		
571	PAGUFOR	Pagurus forbesii	Z	246 (sin.)		B	m	Pagurus forbesii Bell, 1845		
572	PAGUPRI	Pagurus prideauxi	Z	250		B	m	Pagurus prideaux Leach, 1815		
573	PAGUSPP	Pagurus spp.	Z	243		B	m	Pagurus Fabricius, 1775	2011	SB, LM e MT
574	PALIELE	Palinurus elephas	F	PALIN Palin 1		B	m	Palinurus elephas (J.C. Fabricius, 1787)		

575	PALIMAU	Palinurus mauritanicus	F	PALIN Palin 3		B	m	Palinurus mauritanicus Gruvel, 1911		
576	PALISPP	Palinurus	F	PALIN		B	m	Palinurus Weber, 1795		
577	PANDPRO	Pandalina profonda	F	PANDL		B	m	Pandalina profunda Holthuis, 1946		
578	PAPANAR	Parapandalus narval	F	PANDL Parapnd		B	m	Plesionika narval (J.C. Fabricius, 1787)		
579	PAPELON	Parapenaeus longirostris	F	PEN Parap 1		B	m	Parapenaeus longirostris (Lucas, 1846)		
580	PAPOHUM	Parapristipoma humile	C	136.3.1	Δ Δ	A o	0	Parapristipoma humile (Bowdich, 1825)		
581	PAPOOCT	Parapristipoma octolineatum	C	136.3.2	Δ	A o	0	Parapristipoma octolineatum (Valenciennes, 1833)		
582	PARALEP	Paraliparis leptochirus	C	192.3.3		A o	0	Eutelichthys leptochirus Tortonese, 1959		
583	PARCLIV	Paracentrotus lividus				D echi		Paracentrotus lividus (Lamarck, 1816)	2011	SB e MT
584	PARLCOR	Paralepis coregonoides	C	63.1		A o	0	Paralepis coregonoides Risso, 1820		**a4**
585	PARLSPE	Paralepis speciosa	C	63.1.5		A o	0	Paralepis coregonoides Risso, 1820		**a4**
586	PAROCUV	Paromola cuvieri	F	HOM Par 1		B	m	Paromola cuvieri (Risso, 1816)		
587	PARSFER	Parasquilla ferussaci				B st	m	Parasquilla ferussaci (Roux, 1830)	2011	MT
588	PARTANG	Partenope angulifrons	Z	439		B	m	Derilambrus angulifrons (Latreille, 1825)		
589	PARTMAC	Parthenope macrochelos	Z	439		B	m	Spinolambrus macrochelos (Herbst, 1790)		
590	PARTMAS	Parthenope massena	Z	441		B	m	Parthenopoides massena (Roux, 1830)		
591	PARTSPP	Parthenopidae	Z	437		B	m	Parthenopidae MacLeay, 1838	2011	LM e MT
592	PASIMUL	Pasiphaea multidentata	F	PASI Pasi 1		B	m	Pasiphaea multidentata Esmark, 1866		
593	PASISIV	Pasiphaea sivado	F	PASI Pasi 2		B	m	Pasiphaea sivado (Risso, 1816)		
594	PASISPP	Pasiphaea spp.	Z	70		B	m	Pasiphaea Savigny, 1816	2011	LM e MT
595	PECTJAC	Pecten jacobaeus	F	PECT Pect 1		D mb	0	Pecten jacobaeus (Linnaeus, 1758)		
596	PECTMAX	Pecten maximus	F	PECT	Δ	D mb	0	Pecten maximus (Linnaeus, 1758)		
597	PECTSPP	Pecten	F	PECT		D mb	0	Pecten Müller O.F., 1776		
598	PELANOC	Pelagia noctiluca				E cn	0	Pelagia noctiluca (Forsskål, 1775)	2011	MT
599	PELSPLA	Peltaster placenta				E ec	0	Peltaster placenta (Müller-Troschel, 1842)	2011	LM e MT
600	PELTATR	Peltodoris atromaculata	R	p. 305 Tav. 117		E mo	0	Discodoris atromaculata (Bergh, 1880)		
601	PENAKER	Penaeus kerathurus	F	PEN Pen 1		B	m	Melicertus kerathurus (Forsskål, 1775)		
602	PENNPHO	Pennatula phosphorea				E cn	0	Pennatula phosphorea Linnaeus, 1758		
603	PENNRUB	Pennatula rubra				E cn	0	Pennatula rubra (Ellis, 1764)	2011	SB, LM e MT
604	PERCGRA	Periclimenes granulatus	Z	182		B	m	Periclimenes granulatus Holthuis, 1950		
605	PERICAT	Peristedion cataphractum	C	186.1.1		A o	0	Peristedion cataphractum (Linnaeus, 1758)		
606	PETRFIC	Petrosia ficiformis				E sp	0	Petrosia (Petrosia) ficiformis (Poiret, 1789)	2011	LM

607	PHALGRA	Phallium granulatum	F	CASS Phal 1		D mg	0	Phalium granulatum (Von Born, 1778)		
608	PHASMAM	Phallusia mammillata				E tu	0	Phallusia mammillata (Cuvier, 1815)	2011	SB, LM e MT
609	PHILECH	Philoceras echinulatus	F	CRANG		B	m	Philocheras echinulatus (M. Sars, 1861)		
610	PHINAPE	Philine aperta				E mo	0	Philine aperta (Linnaeus, 1767)	2011	LM e MT
611	PHIPDEP	Philinopsis depicta				E mo	0	Philinopsis depicta (Renier, 1807)	2011	MT
612	PHROSED	Phronima sedentaria				B anf		Phronima sedentaria (Forsskal, 1775)	2011	LM
613	PHRYREG	Phrynorhombus regius	C	195.3.1		A o	0	Zeugopterus regius (Bonnaterre, 1788)		
614	PHRYSPP	Phrynorhombus	C	195.3.1		A o	0	Zeugopterus Gottsche, 1835		
615	PHYIBLE	Phycis blennoides	C	101.15.2		A o	0	Phycis blennoides (Brünnich, 1768)		
616	PHYIPHY	Phycis phycis	C	101.15.1		A o	0	Phycis phycis (Linnaeus, 1766)		
617	PHYLTRU	Phylonotus (Murex)(=Trunculariopsis)	F	MUR Phyl 1		D mg	0	Hexaplex trunculus (Linnaeus, 1758)		**d2**
618	PHYOURN	Phyllophorus urna				E ec	0	Phyllophorus urna Grube, 1840	2011	SB
619	PHYSDAL	Physiculus dalwigki	C	103.8.1		A o	0	Physiculus dalwigki Kaup, 1858		
620	PILUSPI	Pilumnus spinifer	Z	391		B	m	Pilumnus spinifer H. Milne-Edwards, 1834		
621	PILUVIL	Pilumnus villosissimus	Z	392		B	m	Pilumnus villosissimus (Rafinesque, 1814)		
622	PINNNOB	Pinna nobilis	F	PINN Pinn 1		D mb	0	Pinna nobilis Linnaeus, 1758		
623	PINNPEC	Pinna pectinata	R	p. 322 Tav. 123		E mb	0	Atrina pectinata (Linnaeus, 1767)		
624	PINOPIN	Pinnotheres pinnotheres	Z	409		B	m	Nepinnotheres pinnotheres (Linnaeus, 1758)		
625	PISAARN	Pisa armata	Z	454		B	m	Pisa armata (Latreille, 1803)		
626	PISANOD	Pisa nodipes	Z	454		B	m	Pisa nodipes (Leach, 1815)		
627	PISASPP	Pisa spp.	Z	448		B	m	Pisa Leach, 1814	2011	SB
628	PISILON	Pisidia longicornis	Z	293		B	m	Pisidia longicornis (Linnaeus, 1767)		
629	PLATFLE	Platichys flesus	C	197.8.1		A o	0	Platichthys flesus (Linnaeus, 1758)		
630	PLEOMED	Plectorhinchus mediterraneus	C	136.4.1	Δ	A o	0	Plectorhinchus mediterraneus (Guichenot, 1850)		
631	PLERMEC	Pleurobranchea meckely	R	p. 289 Tav. 111		E mo	0	Pleurobranchaea meckeli Meckel in Leue, 1813		
632	PLESACA	Plesionika acanthonotus	Z	102		B	m	Plesionika acanthonotus (S.I. Smith, 1882)		
633	PLESANT	Plesionika antigai	Z	100		B	m	Plesionika antigai Zariquiey-Alvarez, 1955		
634	PLESEDW	Plesionika edwardsii	F	PANDL Plesio 2		B	m	Plesionika edwardsii (Brandt, 1851)		
635	PLESGIG	Plesionika gigliolii	Z	106		B	m	Plesionika gigliolii (Senna, 1903)		
636	PLESHET	Plesionika heterocarpus	F	PANDL		B	m	Plesionika heterocarpus (A. Costa, 1871)		

				Plesio 8						
637	PLESMAR	Plesionika martia	F	PANDL Plesio 1		B	m	Plesionika martia (A. Milne-Edwards, 1883)		
638	PLESSPP	Plesionika spp.	Z	99		B	m	Plesionika Bate, 1888	2011	SB e LM
639	PLEUPIL	Pleurobrachia pileus				E cte	0	Pleurobrachia pileus (O. F. Müller, 1776)		
640	POLARIS	Polyacanthonotus rissoanus	C	89.2.1		A o	0	Polyacanthonotus rissoanus (De Filippi & Verany, 1857)		
641	POLBHEN	Polybius henslowi	F	PORT		B	m	Polybius henslowii Leach, 1820		
642	POLCTYP	Polycheles typhlops	Z	209		B	m	Polycheles typhlops Heller, 1862		
643	POLYAME	Polyprion americanum	C	124.7.1		A o	0	Polyprion americanus (Bloch & Schneider, 1801)		
644	POMABEN	Pomadasys incisus (bennetti)	C	136.1.1		A o	0	Pomadasys incisus (Bowdich, 1825)		
645	POMSMAR	Pomatoschistus marmoratus	C	162.21.4		A o	0	Pomatoschistus marmoratus (Risso, 1810)		
646	POMSMIC	Pomatoschistus microps	C	162.21.5		A o	0	Pomatoschistus microps (Krøyer, 1838)		
647	POMSMIN	Pomatoschistus minutus	C	162.21.1		A o	0	Pomatoschistus minutus (Pallas, 1770)		
648	POMTSAL	Pomatomus saltator	C	129.1.1		A o	0	Pomatomus saltatrix (Linnaeus, 1766)		
649	PONIKUH	Pontinus kuhlii	C	184.3.1		A o	0	Pontinus kuhlii (Bowdich, 1825)		
650	PONOMUR	Pontobdella muricata				E hir	0	Pontobdella muricata (Linnaeus, 1758)	2011	SB
651	PONPNOR	Pontophilus norvegicus				B	m	Pontophilus norvegicus (M. Sars, 1861)		
652	PONPSPI	Pontophilus spinosus	F	CRANG Pontop 1		B	m	Pontophilus spinosus (Leach, 1815)		
653	PONTCAT	Pontocaris cataphractus	Z	188		B	m	Aegaeon cataphractus (Olivi, 1792)		
654	PONTLAC	Pontocaris lacazei	F	CRANG Pont 1		B	m	Aegaeon lacazei (Gourret, 1887)		
655	POSIEGA	Egagropili di Posidonia oceanica				H		Egagropili di Posidonia oceanica	2011	MT
656	POSILEA	Fogli di Posidonia oceanica				H		Fogli di Posidonia oceanica	2011	MT
657	POSIOCE	Posidonia oceanica				V		Posidonia oceanica (Linnaeus) Delile, 1813	2011	SB
658	PRIOGLA	Prionace glauca	C	13.8.1		A e	0	Prionace glauca (Linnaeus, 1758)		
659	PROCEDU	Processa edulis	F	PROC Proc 2		B	m	Processa edulis edulis (Risso, 1816)		
660	PROCMED	Processa canaliculata (mediterranea)	F	PROC Proc 1		B	m	Processa canaliculata Leach, 1815		
661	PROCNOU	Processa nouveli	F	PROC		B	m	Processa nouveli Al-Adhub & Williamson, 1975		
662	PROCSPP	Processa spp.	Z	151		B	m	Processa Leach, 1815	2011	SB, LM e MT
663	PROSSPP	Prosobranchia spp.				E mg	0	Prosobranchia Milne Edwards, 1848		

664	PSAMMIC	Psamechinus microtuberculatus	R	p. 558 Tav. 221		E ec	0	Psammechinus microtuberculatus (Blainville, 1825)		
665	PSEDCER	Pseudosquillopsis cerisii				B st	m	Pseudosquillopsis cerisii (Roux, 1828)	2011	LM
666	PSENPEL	Psenes pellucidus	C / G	177.3.2 / 188	Δ AL	A o	0	Psenes pellucidus Lütken, 1880		
667	PSETMAX	Psetta maxima	C	195.4.1		A o	0	Psetta maxima (Linnaeus, 1758)		
668	PSEUSYR	Pseudocnus syracusanus				E ec	0	Pseudocnus syracusanus (Panning, 1962)	2011	MT
669	PSEVCAR	Pseudosimnia carnea		D'Angelo		E mg	m	Pseudosimnia carnea (Poiret, 1789)		
670	PTEAPEL	Pteragogus pelycus	G	162	Δ AL	A o	0	Pteragogus pelycus Randall, 1981		
671	PTEDSPI	Pteroeides spinosum				E cn	0	Pteroeides spinosum (Ellis, 1764)	2011	SB, LM e MT
672	PTEOBOV	Pteromylaeus bovinus	C	23.2.1		A e	0	Pteromylaeus bovinus (Geoffroy Saint-Hilaire, 1817)		
673	PTERHIR	Pteria hirundo	F	PTER		E mb	0	Pteria hirundo (Linnaeus, 1758)		
674	PUNTPUN	Diplodus (Puntazzo) puntazzo	C	137.8.1		A o	0	Diplodus puntazzo (Cetti, 1777)		
675	PYROATL	Pyrosoma atlanticum				E tu	0	Pyrosoma atlanticum Péron, 1804	2011	SB e LM
676	PYROSPP	Pyrosoma				E tu	0	Pyrosoma Péron, 1804	2011	SB
677	PYRTMAR	Pyroteuthis margaritifera	F	ENOP		C	0	Pyroteuthis margaritifera (Rüppell, 1844)	2011	LM
678	PYURDUR	Pyura dura				E tu	0	Pyura dura (Heller, 1877)	2011	MT
679	PYURMIC	Pyura microcosmus				E tu	0	Pyura microcosmus (Savigny, 1816)	2011	LM e MT
680	PYURSPP	Pyura spp.				E tu	0	Pyura Molina, 1782	2011	MT
681	RAJAALB	Raja alba	C	21.1.18		A e	0	Rostroraja alba (Lacepède, 1803)		
682	RAJAAST	Raja asterias	C	21.1.2		A e	0	Raja asterias Delaroche, 1809		
683	RAJABAT	Raja batis	C	21.1.10		A e	0	Dipturus batis (Linnaeus, 1758)		
684	RAJABRA	Raja brachyura	C	21.1.3		A e	0	Raja brachyura Lafont, 1873		
685	RAJACIR	Raja circularis	C	21.1.14		A e	0	Leucoraja circularis (Couch, 1838)		
686	RAJACLA	Raja clavata	C	21.1.4		A e	0	Raja clavata Linnaeus, 1758		
687	RAJAEGG	Capsule ovigere di Raja spp.				G		Capsule ovigere di Raja spp.	2011	MT
688	RAJAFUL	Raja fullonica	C	21.1.13		A e	0	Leucoraja fullonica (Linnaeus, 1758)		
689	RAJAMEL	Raja melitensis	C	21.1.21		A e	0	Leucoraja melitensis (Clark, 1926)		
690	RAJAMIR	Raja miraletus	C	21.1.1		A e	0	Raja miraletus Linnaeus, 1758		
691	RAJAMON	Raja montagui	C	21.1.7		A e	0	Raja montagui Fowler, 1910		
692	RAJANAE	Raja naevus	C	21.1.15		A e	0	Leucoraja naevus (Müller & Henle, 1841)		
693	RAJAOXY	Raja oxyrinchus	C	21.1.12		A e	0	Dipturus oxyrinchus (Linnaeus, 1758)		

694	RAJAPOL	Raja polystigma	C	21.1.22		A e	0	Raja polystigma Regan, 1923		
695	RAJARDA	Raja radula	C	21.1.23		A e	0	Raja radula Delaroche, 1809		
696	RAJASPP	Raja	C	21.1.12		A e	0	Raja Linnaeus, 1758		
697	RAJAUND	Raja undulata	C	21.1.25		A e	0	Raja undulata Lacepède, 1802		
698	REGAGLE	Regalecus glesne	C	106.1.1.		A o	0	Regalecus glesne Ascanius, 1772		
699	RHINCEM	Rhinobatos cemiculus	C	19.1.2		A e	0	Rhinobatos cemiculus Geoffroy Saint-Hilaire, 1817		
700	RHINRHI	Rhinobatos rhinobatos	C	19.1.1		A e	0	Rhinobatos rhinobatos (Linnaeus, 1758)		
701	RHIPMAR	Rhinoptera marginata	C	24.1.1		A e	0	Rhinoptera marginata (Geoffroy Saint-Hilaire, 1817)		
702	RHIZPYR	Rhizaxinella pyrifera				E sp	0	Rhizaxinella pyrifera (Delle Chiaje, 1828)	2011	SB e MT
703	RHYNHEP	Rhynchogadus hepaticus	C	103.9.1		A o	0	Rhynchogadus hepaticus (Facciolà, 1884)		
704	RICHFRE	Richardina fredericii	Z	68		B	m	Richardina fredericii Lo Bianco, 1903		
705	RISSDES	Rissoides desmaresti	F	SQUIL		B st	m	Rissoides desmaresti (Risso, 1816)		
706	RISSPAL	Rissoides pallidus	F	SQUIL		B st	m	Rissoides pallidus (Giesbrecht, 1910)		
707	RIZOPUL	Rhizostoma pulmo				E cn	0	Rhizostoma pulmo (Macri, 1778)	2011	SB e MT
708	ROCHCAR	Rochinia carpenteri	Z	464	Δ	B	m	Rochinia carpenteri (Thomson, 1873)		
709	RONDMIN	Rondeletiola minor	F	SEPIOL		C	0	Rondeletiola minor (Naef, 1912)		
710	ROSSMAC	Rossia macrosoma	F	SEPIOL Ross 1		C	0	Rossia macrosoma (Delle Chiaje, 1830)		
711	SADASAR	Sarda sarda	C	158.4.1		A o	0	Sarda sarda (Bloch, 1793)		
712	SAGAELE	Sagartia elegans				E cn	0	Sagartia elegans (Dalyell, 1848)	2011	MT
713	SALOTRU	Salmo trutta trutta	C	45.1.2		A o	0	Salmo trutta trutta Linnaeus, 1758		
714	SARCFOE	Sarcotragus foetidus				E sp	0	Sarcotragus foetidus Schmidt, 1862	2011	LM
715	SARDPIL	Sardina pilchardus	C	33.3.1		A o	0	Sardina pilchardus (Walbaum, 1792)		
716	SARIAUR	Sardinella aurita	C	33.4.1		A o	0	Sardinella aurita Valenciennes, 1847		
717	SARIMAD	Sardinella maderensis	C	33.4.2		A o	0	Sardinella maderensis (Lowe, 1838)		
718	SARPSAL	Sarpa salpa	C	139.9.1		A o	0	Sarpa salpa (Linnaeus, 1758)		
719	SCAEUNI	Scaeurgus unicirrhus	F	OCT Scae 1		C	0	Scaeurgus unicirrhus (Delle Chiaje, 1841)		
720	SCALSCA	Scalpelum scalpelum	R	Riedl		B cir	m	Scalpellum scalpellum (Linnaeus, 1758)		
721	SCAPNIG	Scaphander lignarius				D mg	0	Scaphander lignarius (Linnaeus, 1758)		
722	SCHEMED	Schedophilus medusophagus	C	176.3.1		A o	0	Schedophilus medusophagus Cocco, 1829	2011	SB e MT
723	SCHEOVA	Schedophilus ovalis	C	176.3.2		A o	0	Schedophilus ovalis (Cuvier, 1833)		

724	SCHICAN	Schizaster canaliferus				E ec	0	Schizaster canaliferus (Lamarck, 1816)	2011	SB e MT
725	SCIAUMB	Sciaena umbra	C	137.1.1		A o	0	Sciaena umbra Linnaeus, 1758		
726	SCOBSAU	Scomberesox saurus	C	91.1.1		A o	0	Scomberesox saurus saurus (Walbaum, 1792)		
727	SCOHRHO	Scophthalmus rhombus	C	195.1.1		A o	0	Scophthalmus rhombus (Linnaeus, 1758)		
728	SCOMPNE	Scomber (Pneumatophorus) japonicus	C	156.1.2		A o	0	Scomber colias Gmelin, 1789		
729	SCOMSCO	Scomber scombrus	C	156.1.1		A o	0	Scomber scombrus Linnaeus, 1758		
730	SCORELO	Scorpaena elongata	C	184.1.3		A o	0	Scorpaena elongata Cadenat, 1943		
731	SCORLOP	Scorpaena loppei	C	184.1.5		A o	0	Scorpaena loppei Cadenat, 1943		
732	SCORMAD	Scorpaena maderensis	C	184.1.6		A o	0	Scorpaena madurensis Valenciennes, 1833		
733	SCORNOT	Scorpaena notata	C	184.1.7		A o	0	Scorpaena notata Rafinesque, 1810		
734	SCORPOR	Scorpaena porcus	C	184.1.1		A o	0	Scorpaena porcus Linnaeus, 1758		
735	SCORSCO	Scorpaena scrofa	C	184.1.8		A o	0	Scorpaena scrofa Linnaeus, 1758		
736	SCORSPP	Scorpaena spp.	C	184.1		A o	0	Scorpaena Linnaeus, 1758	2011	MT
737	SCYLARC	Scyllarus arctus	F	SCYL Scylr 1		B	m	Scyllarus arctus (Linnaeus, 1758)		
738	SCYLLAT	Scyllarides latus	F	SCYL Scyld 1		B	m	Scyllarides latus (Latreille, 1803)		
739	SCYLPYG	Scyllarus pygmaeus	F	SCYL Scylr 2		B	m	Scyllarus pygmaeus (Bate, 1888)		
740	SCYMLIC	Dalatias (Scymnorhinus) licha	C	16.4.3		A e	0	Dalatias licha (Bonnaterre, 1788)		
741	SCYOCAN	Scyliorhinus canicula	C	11.1.1		A e	0	Scyliorhinus canicula (Linnaeus, 1758)		
742	SCYOSTE	Scyliorhinus stellaris	C	11.1.2		A e	0	Scyliorhinus stellaris (Linnaeus, 1758)		
743	SEPENEG	Sepietta neglecta	F	SEPIOL		C	0	Sepietta neglecta Naef, 1916		
744	SEPEOBS	Sepietta obscura	F	SEPIOL		C	0	Sepietta obscura Naef, 1916		
745	SEPEOWE	Sepietta oweniana	F	SEPIOL		C	0	Sepietta oweniana (d'Orbigny, 1841)		
746	SEPESPP	Sepietta spp.	F	SEPIOL		C	0	Sepietta Naef, 1912		
747	SEPIELE	Sepia elegans	F	SEP Sep 3		C	0	Sepia elegans De Blainville, 1827		
748	SEPIOFF	Sepia officinalis	F	SEP Sep 1		C	0	Sepia officinalis Linnaeus, 1758		
749	SEPIORB	Sepia orbignyana	F	SEP Sep 4		C	0	Sepia orbignyana Férussac, 1826		
750	SEPISPP	Sepia	F	SEP Sep 1		C	0	Sepia Linnaeus, 1758		
751	SEPOAFF	Sepiola affinis	F	SEPIOL		C	0	Sepiola affinis Naef, 1912		
752	SEPOINT	Sepiola intermedia	F	SEPIOL		C	0	Sepiola intermedia Naef, 1912		
753	SEPOLIG	Sepiola ligulata	F	SEPIOL		C	0	Sepiola ligulata Naef, 1912		

754	SEPOROB	Sepiola robusta	F	SEPIOL		C	0	Sepiola robusta Naef, 1912		
755	SEPORON	Sepiola rondeleti	F	SEPIOL		C	0	Sepiola rondeleti Leach, 1817		
756	SEPOSPP	Sepiola spp.	F	SEP		C	0	Sepiola Leach, 1817		
757	SERAATR	Serranus atricauda	C	124.1.2	Δ	A o	0	Serranus atricauda Günther, 1874		
758	SERACAB	Serranus cabrilla	C	124.1.1		A o	0	Serranus cabrilla (Linnaeus, 1758)		
759	SERAHEP	Serranus hepatus	C	124.1.3		A o	0	Serranus hepatus (Linnaeus, 1758)		
760	SERASCR	Serranus scriba	C	124.1.4		A o	0	Serranus scriba (Linnaeus, 1758)		
761	SERGARC	Sergestes arcticus	Z	61		B	m	Eusergestes arcticus (Krøyer, 1855)		
762	SERGROB	Sergestes robustus	Z	61		B	m	Sergia robusta (S.I. Smith, 1882)		
763	SERGSAR	Sergestes sargassi (= henseni)	Z	62		B	m	Allosergestes sargassi (Ortmann, 1893)		
764	SERIDUM	Seriola dumerili	C	131.9.1		A o	0	Seriola dumerili (Risso, 1810)		
765	SHELDEB	Shell drebis				G		Shell drebis	2011	MT
766	SICYCAR	Sicyonia carinata	Z	57		B	m	Sicyonia carinata (Brünnich, 1768)	2011	LM
767	SOLEIMP	Solea impar	C	198.1.2		A o	0	Pegusa impar (Bennett, 1831)		
768	SOLEKLE	Solea kleini	C	198.1.3		A o	0	Synapturichthys kleinii (Risso, 1827)		
769	SOLELAS	Solea lascaris	C	198.1.4		A o	0	Pegusa lascaris (Risso, 1810)		
770	SOLESEN	Solea senegalensis	C / G	198.1.6 / 194	Δ AL	A o	0	Solea senegalensis Kaup, 1858		
771	SOLESPP	Solea spp.	C	198.1		A o	0	Solea Quensel, 1906	2011	LM
772	SOLEVUL	Solea vulgaris	C	198.1.1		A o	0	Solea solea (Linnaeus, 1758)		
773	SOLOMEM	Solenocera membranacea	F	SOLENO Soleno		B	m	Solenocera membranacea (Risso, 1816)		
774	SPARAUR	Sparus aurata	C	139.1.1		A o	0	Sparus aurata Linnaeus, 1758		
775	SPARCAE	Pagrus (Sparus) coeruleostictus	C	139.11.2		A o	0	Pagrus caeruleostictus (Valenciennes, 1830)		
776	SPARPAG	Pagrus (Sparus) pagrus	C	139.11.3		A o	0	Pagrus pagrus (Linnaeus, 1758)		
777	SPATPUR	Spatangus purpureus				E ec	0	Spatangus purpureus (O.F. Müller, 1776)	2011	SB e MT
778	SPHAGRA	Sphaerechinus granularis				E ec	0	Sphaerechinus granularis (Lamarck, 1816)	2011	MT
779	SPHOCUT	Sphoeroides cutaneus	C / G	204.3.2 / 208	AL	A o	0	Sphoeroides pachygaster (Müller & Troschel, 1848)		
780	SPHYSPY	Sphyraena sphyraena	C	180.1.1		A o	0	Sphyraena sphyraena (Linnaeus, 1758)		
781	SPICFLE	Spicara flexuosa	C	141.2.2		A o	0	Spicara flexuosa Rafinesque, 1810		
782	SPICMAE	Spicara maena	C	141.2.1		A o	0	Spicara maena (Linnaeus, 1758)		
783	SPICSMA	Spicara smaris	C	141.2.3		A o	0	Spicara smaris (Linnaeus, 1758)		

784	SPICSPP	Spicara	C	141.2		A o	0	Spicara Rafinesque, 1810		
785	SPISSPP	Spisula spp.	F	MACTR		E mb	0	Spisula J.E. Gray , 1837		
786	SPISSUB	Spisula subtrucata	F	MACTR		E mb	0	Spisula subtruncata (Da Costa, 1778)		
787	SPODCAN	Spondyliosoma cantharus	C	139.10.1		A o	0	Spondyliosoma cantharus (Linnaeus, 1758)		
788	SPONOFF	Spongia officinalis officinalis				E sp	0	Spongia (Spongia) officinalis officinalis Linné, 1759	2011	LM
789	SPRASPR	Sprattus sprattus	C	33.5.1		A o	0	Sprattus sprattus sprattus (Linnaeus, 1758)		
790	SQUAACA	Squalus acanthias	C	16.1.1		A e	0	Squalus acanthias Linnaeus, 1758		
791	SQUABLA	Squalus blainvillei	C	16.1.2		A e	0	Squalus blainvillei (Risso, 1827)		
792	SQUIMAN	Squilla mantis	F	SQUIL Squil 5		B st	m	Squilla mantis (Linnaeus, 1758)		
793	SQUTACU	Squatina aculeata	C	17.1.2		A e	0	Squatina aculeata Cuvier, 1829		
794	SQUTOCL	Squatina oculata	C	17.1.3		A e	0	Squatina oculata Bonaparte, 1840		
795	SQUTSPP	Squatina spp.	C	17.1		A e	0	Squatina Duméril, 1806		
796	SQUTSQU	Squatina squatina	C	17.1.1		A e	0	Squatina squatina (Linnaeus, 1758)		
797	STENSPI	Stenopus spinosus	Z	66		B	m	Stenopus spinosus Risso, 1827	2011	SB
798	STEPDIA	Stephanolepis diaspros	C / G	202.1.2 / 200	AL	A o	0	Stephanolepis diaspros Fraser-Brunner, 1940		
799	STERSCU	Sternaspis scutata				E po	0	Sternaspis scutata (Ranzani, 1817)	2011	SB e MT
800	STICREG	Stichopus regalis	F	STICH Stich 1		E ec	0	Stichopus regalis (Cuvier, 1817)		
801	STOLLEU	Stoloteuthis leucoptera	F	SEPIOL		C	0	Stoloteuthis leucoptera (Verrill, 1878)		
802	STOMBOA	Stomias boa	C	41.1.1		A o	0	Stomias boa boa (Risso, 1810)		
803	STROFIA	Stromateus fiatola	C	179.1.1		A o	0	Stromateus fiatola Linnaeus, 1758		
804	STYESPP	Styela spp.				E tu	0	Styela Fleming, 1822	2011	MT
805	STYLAFF	Stylocidaris affinis				E ec	0	Stylocidaris affinis (Philippi, 1845)	2011	MT
806	SUBECAR	Suberites carnosus				E sp	0	Suberites carnosus (Johnston, 1842)		
807	SUBEDOM	Suberites domuncula				E sp	0	Suberites domuncula (Olivi, 1792)		
808	SUBESPP	Suberites spp.				E sp	0	Suberites Nardo, 1833		
809	SUDIHYA	Sudis hyalina	C	63.5.1		A o	0	Sudis hyalina Rafinesque, 1810	2011	LM e MT
810	SYMBVER	Symbolophorus veranyi	C	58.19.1		A o	0	Symbolophorus veranyi (Moreau, 1888)		
811	SYMDCIN	Symphodus cinereus	C	145.9.3		A o	0	Symphodus cinereus (Bonnaterre, 1788)		
812	SYMDMED	Symphodus mediterraneus	C	145.9.6		A o	0	Symphodus mediterraneus (Linnaeus, 1758)		

813	SYMDOCE	Symphodus ocellatus	C	145.9.9		A o	0	Symphodus ocellatus (Forsskål, 1775)		
814	SYMDROI	Symphodus roissali	C	145.9.11		A o	0	Symphodus roissali (Risso, 1810)	2011	SB e MT
815	SYMDROS	Symphodus rostratus	C	145.9.1		A o	0	Symphodus rostratus (Bloch, 1791)		
816	SYMDTIN	Symphodus tinca	C	145.9.12		A o	0	Symphodus tinca (Linnaeus, 1758)		
817	SYMPLIG	Symphurus ligulatus	C	199.2.2		A o	0	Symphurus ligulatus (Cocco, 1844)		
818	SYMPNIG	Symphurus nigrescens	C	199.2.1		A o	0	Symphurus nigrescens Rafinesque, 1810		
819	SYNDSAU	Synodus saurus	C	51.1.2		A o	0	Synodus saurus (Linnaeus, 1758)		
820	SYNGACU	Syngnathus acus	C	97.1.1		A o	0	Syngnathus acus Linnaeus, 1758		
821	SYNGPHL	Syngnathus phlegon	C	97.1.3		A o	0	Syngnathus phlegon Risso, 1827		
822	SYNGSPP	Syngnathus spp.	C	97.1		A o	0	Syngnathus Linnaeus, 1758	2011	MT
823	SYNGTAE	Syngnathus taenionotus	C	97.1.6		A o	0	Syngnathus taenionotus Canestrini, 1871		
824	SYNGTEN	Syngnathus tenuirostris	C	97.1.7		A o	0	Syngnathus tenuirostris Rathke, 1837	2011	LM
825	SYNGTYP	Syngnathus typhle	C	97.1.8		A o	0	Syngnathus typhle Linnaeus, 1758		
826	TAENGRA	Taeniura grabata	C	22.4.1		A e	0	Taeniura grabata (Geoffroy Saint-Hilaire, 1817)		
827	TELLSPP	Tellina spp.	F	TELL		D mb	0	Tellina Linnaeus, 1758		
828	TELMFOR	Telmatactis forskali				E cn	0	Telmatactis forskali (Ehrenberg, 1834)	2011	MT
829	TETAAUR	Tethya aurantium				E sp	0	Tethya aurantium (Pallas, 1766)	2011	SB e MT
830	TETACIT	Tethya citrina				E sp	0	Tethya citrina Sarà & Melone, 1965	2011	MT
831	TETHFIM	Tethys fimbria				E mo	0	Tethys fimbria Linnaeus, 1767		
832	TETYSUB	Tethyaster subinermis				E ec	0	Tethyaster subinermis (Philippi, 1837)	2011	SB e LM
833	THAMPOI	Thalamita poissonii	Y	Y	Δ AL	B	m	Thalamita poissonii (Audouin, 1826)		
834	THENMUR	Thenea muricata				E sp	0	Thenea muricata (Bowerbank, 1858)	2011	SB
835	THYOELO	Trachythyone elongata				E ec	0	Trachythyone elongata (Düben Koren, 1844)	2011	SB e MT
836	THYOTER	Trachythyone tergestina				E ec	0	Trachythyone tergestina (M. Sars, 1857)	2011	SB
837	TODASAG	Todarodes sagittatus	F	OMMAS Todarod		C	0	Todarodes sagittatus (Lamarck, 1798)		
838	TODIEBL	Todaropsis eblanae	F	OMMAS Todarod		C	0	Todaropsis eblanae (Ball, 1841)		
839	TONNGAL	Tonna galea				D mg		Tonna galea (Linnaeus, 1758)	2011	MT
840	TORPMAR	Torpedo marmorata	C	20.1.2		A e	0	Torpedo marmorata Risso, 1810		
841	TORPNOB	Torpedo nobiliana	C	20.1.3		A e	0	Torpedo nobiliana Bonaparte, 1835		

842	TORPSPP	Torpedo	C	20.1		A e	0	Torpedo Houttuyn, 1764		
843	TORPTOR	Torpedo torpedo	C	20.1.1		A e	0	Torpedo torpedo (Linnaeus, 1758)		
844	TRACMED	Trachurus mediterraneus	C	131.10.3		A o	0	Trachurus mediterraneus (Steindachner, 1868)		
845	TRACPIC	Trachurus picturatus	C	131.10.4		A o	0	Trachurus picturatus (Bowdich, 1825)		
846	TRACTRA	Trachurus trachurus	C	131.10.1		A o	0	Trachurus trachurus (Linnaeus, 1758)		
847	TRAHARA	Trachinus araneus	C	148.1.2		A o	0	Trachinus araneus Cuvier, 1829		
848	TRAHDRA	Trachinus draco	C	148.1.1		A o	0	Trachinus draco Linnaeus, 1758		
849	TRAHRAD	Trachinus radiatus	C	148.1.3		A o	0	Trachinus radiatus Cuvier, 1829		
850	TRARTRA	Trachyrhynchus trachyrhynchus	C	99.1.1		A o	0	Trachyrincus scabrus (Rafinesque, 1810)		
851	TRAYCRI	Trachyscorpia cristulata	C / G	184.7.1 / 98	Δ AL	A o	0	Trachyscorpia cristulata echinata (Koehler, 1896)		
852	TRIGLUC	Trigla lucerna	C	185.1.2		A o	0	Chelidonichthys lucerna (Linnaeus, 1758)		
853	TRIGLYR	Trigla lyra	C	185.1.1		A o	0	Trigla lyra Linnaeus, 1758		
854	TRIILEP	Trichiurus lepturus	C	155.1.1		A o	0	Trichiurus lepturus Linnaeus, 1758		
855	TRIPLAS	Trigloporus lastoviza	C	185.5.1		A o	0	Trigloporus lastoviza (Bonnaterre, 1788)		
856	TRISCAP	Trisopterus minutus capelanus	C	101.11.1		A o	0	Trisopterus minutus (Linnaeus, 1758)		
857	TRISLUS	Trisopterus luscus	C	101.11.3		A o	0	Trisopterus luscus (Linnaeus, 1758)		
858	TRITNOD	Charonia (Triton) rubicunda (nodifer)	F	CYM Char 1		D mg	0	Charonia lampas lampas (Linnaeus, 1758)		
859	TURRCOM	Turritella comunnis	F	D12		E mg	0	Turritella communis Risso, 1826		
860	TURRSIM	Turris similis		D'Angelo		E mg	0	Fusiturris similis (Bivona Ant., 1838)		
861	TURRSPP	Turritella spp.	F	TURR		E mg	0	Turritella Lamarck, 1799		
862	UMBAMED	Umbraculum mediterraneum				E mo	0	Umbraculum umbraculum (Lightfoot, 1786)		
863	UMBRCAN	Umbrina canariensis	C	137.4.2		A o	0	Umbrina canariensis Valenciennes, 1843		
864	UMBRCIR	Umbrina cirrosa	C	137.4.1		A o	0	Umbrina cirrosa (Linnaeus, 1758)		
865	UMBRRON	Umbrina ronchus	C	137.4.3		A o	0	Umbrina ronchus Valenciennes, 1843		
866	UPENMOL	Upeneus moluccensis	C / G	138.3.1 / 134	Δ AL	A o	0	Upeneus moluccensis (Bleeker, 1855)		
867	URANSCA	Uranoscopus scaber	C	149.1.1		A o	0	Uranoscopus scaber Linnaeus, 1758		
868	VENUSPP	Venus spp.	F	VEN		D mb	0	Venus Linnaeus, 1758		
869	VENUVER	Venus verrucosa	F	VEN Ven 1		D mb	0	Venus verrucosa Linnaeus, 1758		
870	VINCATT	Vinciguerria attenuata	C	37.12.1		A o	0	Vinciguerria attenuata (Cocco, 1838)		

871	VINCPOW	Vinciguerria poweriae	C	37.12.3		A o	0	Vinciguerria poweriae (Cocco, 1838)		
872	XANTCOU	Medaeus (Xantho) couchi	Z	400		B	m	Monodaeus couchi (Couch, 1851)		
873	XANTPIL	Xantho pilipes	Z	395		B	m	Xantho pilipes A. Milne-Edwards, 1867	2011	MT
874	XENOCRI	Xenophora crispa	F	XENOPH		E mg	m	Xenophora crispa (Koenig, 1825)		
875	XENOSPP	Xenophora spp.	F	XENOPH		E mg	m	Xenophora Fischer Von Waldheim, 1807		
876	XIPHGLA	Xiphias gladius	C	161.1.1		A o	0	Xiphias gladius Linnaeus, 1758		
877	XYRINOV	Xyrichthys novacula	C	145.11.1		A o	0	Xyrichthys novacula (Linnaeus, 1758)	2011	LM e MT
878	ZEUSFAB	Zeus faber	C	120.1.1		A o	0	Zeus faber Linnaeus, 1758		
879	ZOSTOPH	Zostoricessor ophiocephalus	C	162.26.1		A o	0	Zosterisessor ophiocephalus (Pallas, 1814)		

Notes:
a1: The species *Bathypterois dubius* has two codes **BATHDUB** and **BATHMED** (*Bathypterois mediterraneus* is considered non valid species);
a2: The species *Callionymus risso* has two codes **CALLRIS** and **CALMRIS** because of input mistake;
a3: The species *Notoscopelus bolini* has two codes **NOTSBOL** and **NOTSKRO** (*Notoscopelus kroeyerii* is considered non valid species);
a4: The species *Paralepis coregonoides* has two codes PARLCOR and PARLSPE (*Paralepis speciosa* is considered non valid species, probably juvenile of *P. coregonoides*);
G = Golani *et al.*,2002 - CIESM Atlas of Exotic Species in the Mediterranean. In: F. Briand (ed), *Fishes*. CIESM Publishers, Monaco, 1: 256 pp
b1: The species *Dasyatis pastinaca* has two codes DASIPAS and DASITOR (*Dasyatis tortonesi* is considered non valid species);
c1: The species *Bathynectes maravigna* has two codes BATYMAR and BATYSUP (*Bathynectes superbus* is considered non valid species);
c2: The species *Dorhynchus thomsoni* has two codes DORHTHO and DORITHO because of wrong input;
c3: The species *Munida tenuimana* has two codes MUNIPER and MUNITEN because *Munida perarmata* is a synonym of *Munida tenuimana;*
d1: The species *Aequipecten opercularis* has two codes AEQUOPE and CHLAOPE (*Chlamys opercularis* is considered non valid species);
d.2: The species *Hexaplex trunculus* has two codes MURETRU and PHYLTRU (*Murex trunculus* is considered non valid species);

Legend:

Δ Δ = species not yet recorded in the Mediterranean seas
Δ = species not yet recorded in Italian seas
AL = alien species

Ae = Fish Osteichthyes
Ao = Fish Elasmobranch
B = Crustaceans Decapoda, Eufasiacea, Stomatopoda
Bamp = Amphipoda
Bcir = Cirripeda
Biso = Isopoda
C = Cephalopods
Dmb/Emb = Mollusca Bivalvia
Dmg/Emg = Mollusca Gastropoda
Dec/Eec = Echinoderms
Dtu/Etu = Tunicata (Ascidiacea)
Ebr = Bryozoa
Ebrac = Brachiopoda
Ecn = Cnidaria
Ecte = Ctenophora
Ehir = Hirudinea
Emo = Opistobranchia
Epo = Polychaeta
Esc = Scaphopoda
Esip = Sipunculida
Esp = Sponges (Porifera)

V = Vegetalia
G = Portions or products of animal species (shell debris, eggs of gastropods, selachians, etc.)
H = Portions or products of vegetal species (e.g. leaves of seagrasses, of terrestrial plants, etc.)

Source:
C = Clofnam, 1973
F = Fisher *et al*., 1987
G = Golani *et al.,* 2002
R = Riedl 1968
Z = Zariquiey 1968

Codlon (Length classes code):
m = 1 mm
0 = 0,5 cm
1 = 1 cm

Species added by:
SB = Mario Sbrana
LM = Lea Maiorano
MT = Maria Teresa Spedicato

XVI. Internal rules of the MEDITS group

Adopted during the MEDITS meeting, Split (Croatia), 15-16/06/2010

Objective of the document

This document presents the way of working of the international group organised to coordinate the activity done by different countries to implement the MEDITS surveys.

The MEDITS survey initiative

Some Mediterranean countries have decided to join their efforts to carry out systematic bottom trawl surveys (acronym MEDITS) to produce basic information on benthic and demersal species in term of life history traits, population and community distribution and demographic structure.

The initiative started in 1993 and the first MEDITS survey was conducted by four countries in 1994. Since 2001, the European countries bordering the Mediterranean Sea are obliged to carry out MEDITS surveys yearly in the framework of the European Data Collection regulation. In 2010, ten Mediterranean countries collaborated in the project, and permanent links are maintained with the relevant bodies of the European Union and GFCM. All the information related to the MEDITS surveys is given in the MEDITS website.

All the countries interested to contribute to this challenge in view of extending the MEDITS survey coverage in the Mediterranean and Black Sea are warmly welcome in the MEDITS initiative.

The mandate of the MEDITS group

The MEDITS group has been created to coordinate the activity done in the MEDITS framework. Basically the aim of the group is to ensure consistency and coherence of the MEDITS surveys into space and time. With this goal, the group can review the standards defined to carry out the survey, including the sampling scheme, the gears used and the common observations to be done during the surveys. It can be entrusted with questions related to quality management of the surveys as well as about common management of the data. The group may also incite for the development of common research between the partners.

The terms of reference of the group include requests from the EU-RCM Med & BS, issues addressed by the GFCM, and questions from internal initiative.

Composition of the MEDITS group

The MEDITS group is open to all the scientists involved in the MEDITS surveys.

In each country participating in the MEDITS surveys, the contact point is the national coordinator of MEDITS. When relevant taking into account the national organisation of research activity and the characteristics of the surveyed area, regional coordinators may be identified near a national coordinator.

The activity of the group is managed by a steering committee.

The steering committee

The steering committee is the reference entity of the MEDITS group. The steering committee validates all the decisions taken in the name of the MEDITS group. It endorses the terms of reference, timings and agendas of the MEDITS sessions. It ratifies the conclusions and recommendations elaborated by the group.

The MEDITS steering committee is composed by scientists coming from the research groups involved in the MEDITS surveys, on the basis of one member by country. These scientists are the national coordinators of the MEDITS survey, or their representative.

Chairmanship

The MEDITS coordinator is in charge of animation of the MEDITS group, including the annual sessions of the group (preparation of the agenda, convening of the meeting, chair of the session, coordination and spreading of the report) and the in between activity (relationship with the other bodies, coordination of the tasks, management of the internal communication). The coordinator (or representative from the steering committee) participates in the RCM Med & BS upon request, for ensuring the link between the two Groups.

The mandate of the coordinator of the MEDITS group is for three years. The new coordinator is nominated by the steering committee at the end of an annual session, for immediate effect. One coordinator can be nominated for a maximum of two consecutive mandates. When the MEDITS coordinator is the national coordinator of one partner, a new national coordinator is nominated for this country.

Internal rules of the group

Annual session

The MEDITS group meets at least once a year. This meeting may include plenary sessions and sessions limited to the steering committee.

The plenary sessions of the MEDITS group are open to scientists from the member countries at the convenience of the relevant national coordinators. Furthermore, the MEDITS meetings are open to other scientists from invitation by the general coordinator.

In principle, date and place of the next annual meeting are defined by common agreement during the actual session. Nevertheless, they can be changed later by common agreement of the steering committee members, particularly to take into account the calendar of the reference bodies (GFCM and EU-RCM Med&BS). The place of the next meeting is decided from invitation given by the members.

The usual mode of working is elaboration of recommendations in the plenary meetings, then decision by consensus by the steering committee.

The requests submitted by external bodies (GFCM) must be transmitted to the MEDITS coordinator at least two months before the date of the next annual session.

Other activities

The MEDITS group may create ad hoc working groups in view of development of common activity on topics of interest in link with the MEDITS surveys (to progress on specific research questions, etc.). In this scope, the MEDITS group may incite and facilitate common publications at a global scale.

Website

A website presents the activity of the MEDITS group. It is managed by one of the members. The content of the website is validated by the steering committee. To facilitate exchanges between the members of the group, the group can open a private or a cooperative website.