

**GENERAL FISHERIES COMMISSION FOR THE MEDITERRANEAN
SCIENTIFIC ADVISORY COMMITTEE
Sub-Committee for Stock Assessment
Working Group on small pelagic species
FAO, Rome, 20-22 March 2002**

OPENING OF THE MEETING

1. The third meeting of the SAC Working Group on Small Pelagic Species of GFCM was held in FAO, Rome from 20 to 22 March 2002.
2. Twenty-six scientists from six countries attended this meeting. Moreover delegates from European Union, AdriaMed and MedSudMed, participated to the discussions during the sessions. The list of the participants is attached as Appendix A.
3. The Agenda of the Working Group was adopted (Appendix B) and the list of documents was updated. The final list of documents presented during the meeting is attached as Appendix C.
4. Mr. A. Kallianiotis (NAGREF-FRI) chaired the Session. Mr. P. Vidoris (NAGREF-FRI) was the Reporter.

PRESENTATIONS TO AND DISCUSSIONS BY THE WORKING GROUP

5. Nineteen technical papers were presented and discussed by the Working Group.
6. These documents covered totally or partially 13 Management Units (MUs) and five species.
7. Two types of documents were presented: (i) assessment documents and (ii) assessment related documents. The conclusions and recommendations adopted by the Working Group and referring to assessment presented in each document are as follows:

ASSESSMENT FORMS AND DOCUMENTS

8. Ten documents of this type were reviewed. The documents are referred to by numbers (See Appendix C) by the FAO code of the species, by the number of the management unit and the year of presentation (the date indicated after the scientific name of the species refers to the period of the study). Such references should be used when completing the standard forms adopted by the last session of the Working Group.

9. Forms D, Z, concerning the synthesis of the assessments and the working papers were discussed.

10. Document n° 01. ANC+SAR_ 01 _02 *Engraulis encrasicolus* + *Sardina pilchardus*. 1990-2001

Sardine. A peak of landings of around 6000 tons was found in 1991-1992, but then decreased to an overall mean value of 1000-2000 metric tonnes during 1994-1998. From 1998 onwards, both landings and CPUE showed an increasing trend, reaching in 2000 and 2001 CPUE values higher than those observed in previous years. Taking into account these results it does not seem necessary to recommend any reduction of fishing effort on this stock

Anchovy. Only Malaga bay area, which represent 85% of total landings, has been considered.

After 1993 minimum a slight recovery of landings was observed in 1996, but a new diminution occurred in the following years, reaching a minimum in 2000. Finally, a strong increment of landings was recorded in 2001, besides to an increase of CPUE values, which reached this year the highest level since 1995, despite the autolimitations in the volume of landing decided by the fishermen in order to maintain the market prices.

The last acoustic assessment available, from 2001 ECOMED survey, indicated that anchovy biomass in Málaga Bay was 13 210 metric tonnes, showing an important increment respect to the previous situation. Since most of the stock is concentrated in Malaga Bay this estimation can be considered as representative of the whole northern Alboran area.

Since that fishing effort was already significantly reduced in number of vessels (from 185 in 1985 to 120 in 2001), and taking into account the good 2001 recruitment, it would be recommendable to maintain the actual level of fishing effort. However, taking into account the important fluctuations of this stock and the few age classes composing it (practically only 0 and 1), it would be necessary to continue the monitoring of this stock.

11. Document n° 02. ANC+SAR_ 06 _02 *Engraulis encrasicolus* + *Sardina pilchardus*. 1990-2001

ECOMED surveys were carried out from 1990 to 1993, and from 1995 to 2001, between La Nao Cape and Creus Cape.

Sardine. From 1990 to 2001, the estimated biomass fluctuated from 200 000 t in 1992 to 50 000 t in 2000. The estimation for 2001 was 97 000 t, which was double than in the previous year. The most important recruitment corresponded to the years 1991 and 1992, whereas the lower values were found in 2000 and 2001.

Taking into account the actual level of biomass and catches, as well as the low level of recruitment detected in the two last years, it would be recommended not to increase the actual level of fishing effort.

Anchovy. The period in which the surveys were carried out corresponds to the recruitment season of the species. The most important recruitment area is located

between Barcelona and the south of the Ebro River Delta. For this area, the surveys suggested that the recruitment was very low from 1996 to 2000, but the population appeared to have recovered in 2001 at amounts close to the half of those found in 1992, when the highest value was estimated. The estimated biomass for the whole area in 2001 (27000 t) was two times higher than that computed for 2000. However, taking into account the important fluctuations observed in the recruitments, which have a direct effect on the total biomass of the stock, it is recommended that actual levels of fishing effort should be maintained.

12. Document n° 03. ANC_6+7_02. *Engraulis encrasicolus* 1993-2001.

The situation of Gulf of Lions and North Catalonia anchovy shared stock was presented. Even if the GFCM management units are different, many arguments support the concept of a shared stock between France and Spain. This regards mainly the continuous distribution of the adults, eggs, larvae and juveniles and the exploitation of this resource by both fleets of each country in the Gulf of Lions, without any conflict at present. Biomass and abundance data obtained by direct methods from French and Spanish surveys are analysed and combined, as well as catches and fishing effort. Taking into account the high level of biomass available at this time and the relatively low catches on this shared stock, the W.G. recommends to maintain the fishing effort but to continue to evaluate yearly the state of the stock, due to the close relationship between environment factors and recruitment of the anchovy that can result in important natural fluctuations in the abundance of the stock.

13. Document n° 04. SAR_03_02. *Sardina pilchardus* 1990-2000.

La sardine (*Sardina pilchardus*) est l'une des espèces les plus exploitées en Méditerranée marocaine, elle constitue 80% des débarquements de la flottille sardinière. L'évaluation de la biomasse de la sardine ainsi que son état d'exploitation a été basée sur l'analyse de cohortes par longueur (LCA) d'une série de données sur la composition en tailles collectée au cours de la période 1990-2000. La biomasse a connu une phase de diminution à partir de 1992 suivie d'une augmentation à partir de 1998. Il est constaté que l'intensité de pêche est plus élevée sur les adultes avec une mortalité par pêche qui dépasse l'optimum de 40%. Face à cette situation de surexploitation de la ressource, il est recommandé de diminuer l'effort de pêche de 40% par rapport au niveau actuel.

14. Document n° 05. ANC+SAR_16_02 *Engraulis encrasicolus* + *Sardina pilchardus* 1997-2001.

Results from two echo-surveys carried out during July and September 2000 were presented and discussed. Biomass estimates show anchovy population amounts to about 1/3 of sardine biomass, as already observed in July 1998. A comparison with a DEPM estimate of anchovy spawning biomass obtained for the same area revealed a good agreement between the two methodologies in 1998. In contrast, results diverged in

summer 2000, when acoustic estimates were about 4 times higher (2,800 tons vs. 11,000 tons). Acoustic biomass estimate for anchovy was reconfirmed by landings recorded in Sciacca, the most important base port in the study area for the small pelagics landings. It is worth noting in this context that anchovy and sardine populations represent approximately 90% of landings. However, during the period 1997-2001 landings (and CPUEs) of the anchovy population experienced very high (most probably, mainly environmentally induced) inter-annual fluctuations, while sardine fluctuations were much less pronounced. Consequently, anchovy landings, which amounted to about 1/10 of sardine landings in 1999, became predominant in year 2001. So, as concerns the management issues, present results suggest the situation of anchovy population in M.U. 16 to be more critical compared to sardine population, as the combination of adverse environmental conditions with high fishing effort patterns might have very negative consequences for the resource.

No formal assessment forms were filled out because of the lack of sufficient information for the delivering of specific recommendations for the management of small pelagic species in the study area (M.U. 16, South of Sicily). In particular, there is a need for reliable estimates of total catches from the whole M.U., which combined with the acoustic biomass estimates would permit to evaluate the exploitation rates of local purse seine and mid-water pair trawling fisheries.

15. Document n° 07. SAR_17_02. *Sardina pilchardus* 1975-2001

The estimated stock biomass of sardine by VPA showed a peak between 1983 and 1985, then a gradual decrease appeared and the stock reached its lowest value in 1999. In 2000, and in a stronger way in 2001, the sardine estimated biomass increased.

Given this situation and considering also that the present level of catches (18,800 tonnes, average catch on the period 1999-2001) is about the 18% of the estimated biomass, the current level of fishing effort could be moderately increased.

Due to the low market demand for the species, discards of sardine at sea may occur. Monitoring of sardine discards at sea is recommended. Moreover, market campaigns that would increase the demand of sardine and diminish discards at sea are also recommended.

16. Document n° 08. ANC+SAR_17_02. *Engraulis encrasicolus* + *Sardina pilchardus* 2001.

In the Central and Northern Adriatic Sea hydroacoustic surveys have been carried out by the Marine Fishery Research Institute of Ancona since the 1970s. However, only the Western sector of the Adriatic could be surveyed. For the first time a hydroacoustic-pelagic trawl survey combined with environmental parameters monitoring, covering the whole Northern Adriatic Sea, was jointly carried out by Croatia (Institute of Oceanography and Fisheries, Split), Italy (IRPEM-CNR, Ancona) and Slovenia (National Fishery Research Institute, Ljubljana). This cooperative survey exercise was promoted by and carried out within the framework of the FAO-AdriaMed Regional Project. The fact that the previous years surveys had been carried out only within the western sector has led to an underestimation of 33% of the total pelagic biomass. The experimental

application of the Voronoi diagram geometric algorithm for the survey area subdivision was presented to the WG and discussed. The WG recommended echosurveys to be conducted also in the eastern part of Adriatic Sea for more reliable estimation of pelagic biomass. The WG recommended also that the methodology used in this assessment would be improved, by increasing the number of hauls.

17. Document n° 10. ANC-17-02 *Engraulis encrasicolus* 1975-2001.

The estimated stock biomass of Adriatic anchovy by VPA showed a strong fluctuation during the observed period (1975-2001). Collapse occurred in 1987 and the recovery of the stock biomass shows a positive trend. Nevertheless, the biomass level has not reached the previous higher values.

Given this situation and considering also that the present amount of catches (20,542 tonnes, average catch on the period 1999-2001) is about the 17% of estimated biomass, the current level of fishing effort should be maintained or slightly increased.

18. Document n° 12. SAR_20+22_02. *Sardina pilchardus* 2000-2001.

The first DEPM parameters are presented for Mediterranean sardine (*Sardina pilchardus*) stocks of the central Aegean and Ionian Seas. This application of DEPM presented particular interest and difficulties due to the peculiar topography of the survey area (consisting of many small-sized, semi-enclosed gulfs) and the small size and increased patchiness of sardine populations. Fish in the Ionian Sea showed a delayed spawning peak (end of January-March) compared to the Aegean Sea (November-January) and consequently the DEPM surveys were carried out in December 2000 (Aegean Sea) and January-February 2001 (Ionian Sea). To increase the number of age categories for constructing mortality curves and increase the precision of daily egg production estimates, we included both eggs and yolk-sac larvae in single embryonic mortality curves. Composite spawning frequency estimates (based on both Day-1 and Day-2 female spawners, defined by the postovulatory follicle method) were calculated and batch fecundity was measured in hydrated, tertiary-yolk globule and migratory nucleus females. In contrast to other sardine and anchovy species and subspecies, the Mediterranean sardine exhibits a group-synchronous oocyte development with a well-defined hiatus in oocyte size frequency distributions established before the onset of final maturation. The estimate of total spawning biomass for the surveyed area (central Aegean and Ionian Seas) was 19826 metric tons with a coefficient of variation $CV = 0.429$. Compared to existing values for Atlantic sardine stocks, the estimates of spawning frequency and batch fecundity were only slightly lower in the Mediterranean, despite considerable differences in mean female weight between the Mediterranean and the Atlantic populations.

19. Document n° 13. ANC_22_02. *Engraulis encrasicolus* 1999.

The application of the DEPM for estimating the anchovy spawning biomass at an area indicated between the Thraki mainland in the north and the isles of Samothraki and Thasos in the south yielded 13180 t in 1999. The extension of the study area to include the whole Thracian Sea, would increase the precision of estimations providing a more

representative picture of the spawning stock in the overall area. Moreover, standardization of the methodologies used would provide more comparable results and would eventually lead to a more accurate evaluation of spatial and temporal effects on the spawning biomass of small pelagics.

RELATED DOCUMENTS

20. Document n° 06. ANC_16_02 *Engraulis encrasicolus* 1998-2000.

Based on the results of two combined oceanographic surveys carried out during the end of June and the beginning of July 2000, the anchovy (*Engraulis encrasicolus*) spawning biomass in M.U. 16 was evaluated through the Daily Egg Production Method (DEPM). Spawning biomass amounted to about 2,850 metric tons. This DEPM application, jointly with those carried out in 1998 and 1999, are considered especially relevant in relation to the hydrographic phenomena characterising the environmental regime of the Strait of Sicily. The main results of DEPM application during the period 1998-2000 were presented to the W.G. However this working paper was not considered for discussion between participants of the W.G. due to the non-attendance of both the authors

21. Document n° 09. SAR_17+18+19_02. *Sardina pilchardus* 1997-1998.

The Adriatic shared stock of European sardine (*Sardina pilchardus*) was examined for population structuring and to identify self-recruiting units using genetic marker variation analyses. The genetic stock structure analysis of 11 sardine samples (307 individuals) collected from Adriatic Sea and Ionian neighbouring area from December 1997 to July 1998, carried out through sequence variation analysis of a 307bp cytochrome *b* gene, showed an overall lack of genetic subdivision among samples. This finding is in agreement with previous data obtained with other types of genetic markers (i.e., allozymic and mtDNA restriction fragment length polymorphism). These data indicated Adriatic sardine shared stock as a part of a larger self-recruiting population whose boundaries are larger than the investigated area and contradicted the previously hypothesised existence of two sub-populations of sardines in the Adriatic Sea argued on morphological differences, which could be rather attributed to different hydrographical and/or ecological conditions occurring in different areas of Adriatic Sea.

22. Document n° 11. ANC+SAR-17-02 . *Engraulis encrasicolus* + *Sardina pilchardus* 2001.

The small pelagic species (*Engraulis encrasicolus*, L., *Sardina pilchardus*, Walb.) are the most important shared stocks of Adriatic fishery. They represent about the 85% of the Italian small pelagic catches, the 85% of the Croatian total catches and a considerable percentage of the catches of Slovenia and Albania. Thus they are of key importance for Adriatic fisheries. In the past, data on small pelagics of Adriatic were collected in each country applying different methodologies, because data collection was focused to

different goals. As consequence, data could be not comparable and they risk to be not useful for joint data processing and data analysis.

Since June 2001 a new research programme titled “Data Collection and Biological Sampling System on Small Pelagics in the Adriatic Sea (AdriaMed-SP)” has been implemented in the context of the FAO-ADRIAMED project. Albania, Croatia, Italy and Slovenia participate in the AdriaMed-SP programme. The primary objective of AdriaMed-SP is to build a network in Adriatic for data collection (statistical and biological data) using the same methodology. Consequently, it will be then possible to carry out joint elaboration and analysis of data.

Adriamed-SP could be decisive for an efficacious joint management of small pelagics in Adriatic.

It is strongly recommended to maintain and to improve in the near future the Adriatic joint network on small pelagics built in the ambit of the research programme Adriamed-SP.

23. Document n° 14. ANC_01+07+09+17+18+20+22+29_02. *Engraulis encrasicolus* 1988-2001.

Analysis of genetic variation in the mitochondrial DNA of European anchovy (*Engraulis encrasicolus*) revealed strong population structure in the Black and Mediterranean Seas and the East Atlantic. Two distinct groups of haplotypes (phylads A and B) were revealed, the relative proportions of which varied widely in different basins. Black sea contained only phylad A, whereas its frequency declined to app. 0.85 to the northern Aegean, to 0.40 in the Ionian Sea, Ligurian Sea, the Gulf of Lions and the Bay of Biscay, and to 0.14 in northern Adriatic. Unexpectedly, an area defined by Cape Verde to the South, north coasts of Portugal to the North, and Alboran Sea to the East, was characterized by phylad proportions more similar to the North Aegean or the Black Sea rather, than to the neighboring areas of Mediterranean and the Bay of Biscay. Given the complex and information rich population structure of this species in the Mediterranean, monitoring of genetic variability in this species, both in space and time, should constitute an integral part of studies for stock structure.

24. Document n° 15. BOO+TRA_22_02. *Boops boops* + *Trachurus trachurus* + *Trachurus mediterraneus*. 1998-2000.

Samplings were carried out with chartered trawler and beach seiner monthly in the Saronikos Gulf (Sep '98 to Aug '99) and bimonthly in the Cyclades islands (Sep '99 to Aug '00) in order to identify sites of juvenile concentrations. Juveniles of picarel (*Spicara smaris*) and bogue (*Boops boops*) caught by beach seiner were not observed in the Saronikos Gulf during the open fishing season (Oct-May) except for bogue caught during October. On the contrary juveniles of these species, caught by beach seiner as well, were observed in the Cyclades islands during late spring and spring respectively. The time difference for the occurrence of juveniles in the two areas appears to be related to different time of spawning connected with seawater temperature. In the Saronikos Gulf juveniles of Mediterranean horse mackerel (*Trachurus mediterraneus*) caught by beach seiner and of horse mackerel (*Trachurus trachurus*) caught by trawler were observed during October and May (open fishing season) respectively. Trawler in the Cyclades

islands did not catch juveniles of small pelagics. Due to the occurrence of juveniles in the catch of beach seiners mainly during spring, the fishing season for this gear has been recently decreased.

25. Document n° 16. ANC+SAR+TRA_20+22_02. *Engraulis encrasicolus*, *Sardina pilchardus*, *Trachurus* sp. 2000-2001.

The purse seine fishery in the west coast of Greece (Patraikos gulf) and in the central Aegean Sea (Pagassitikos gulf) was investigated on a monthly basis, from June to December 2000 and from March to December 2001. Sardine and anchovy composed about 80% of the catch in both areas, but the proportion of each species varied. Other important species were *Boops boops*, *Trachurus* sp., *Scomber japonicus* and *Sardinella aurita*

26. Document n° 17. ANC+SAR_20_02. *Engraulis encrasicolus*, *Sardina pilchardus* 2000-2001.

The reproduction of sardine and anchovy was studied in Patraikos gulf (West Greece). Samples were collected with commercial purse seiners, on monthly basis, from June to December 2000 and from March to December 2001. The spawning season for anchovies is quite elongated but is more intensive during the summer months. The reproduction of sardine is taking place during winter. The results showed that the L_{50} for both males and females anchovies was 12.8 cm. For female sardines maturity was attained at 14.1 cm and for male sardines at 13 cm. These results are considered preliminary and further studies are needed.

27. Document n° 18. ANC+SAR_20+22+23_02. *Engraulis encrasicolus*, *Sardina pilchardus* 1996-2001.

Data on fishing effort (fishing days at sea) and corresponding total catch/day for the purse seine fleet have been collected by the Institute of Marine Biology of Crete (IMBC) since the second half of 1995. Data were collected over a net of 21 stations throughout the Greek Seas. In the present study we analyzed the monthly data of fishing effort as well as catch per day during 1996-2000, using time series analysis. The following vessel size groups were considered: purse-seiners smaller than 15 m and larger than 15 m. Collected data were also aggregated for five fishing subareas: North Aegean, Central Aegean, South Aegean, Cretan waters and Ionian Sea. The analysis of the time series of catch/day indicated that pelagic resources, have been declining in the main fishing grounds. This declining trend was mainly reflected in the anchovy catch per day series, than in the sardine series. Declining catch/day trends are regarded as strong indicators of overfishing especially in the light of the fact that fishers maintain high catch rates by fishing in “hot spots”. The results of the present analysis provide important information on the state of the Greek pelagic fisheries resources, which are characterized by a complete lack of accurate long-term data on catch per unit of effort.

28. Document n° 19. ANC_22_02. *Engraulis encrasicolus*, 1984-2000.

In the present study the Autoregressive Integrated Moving Average (ARIMA) and the Exponential Smoothing models were used to analyze the anchovy monthly landings as they recorded by the auctions statistics. The data are monthly totals of landings in weight for 16 consecutive years, January 1984 to December 1999, from the six main auctions located in the Aegean Sea; Alexandroupoli, Kavala and Mixaniona in the North Aegean Sea and Volos, Chalkida and Piraeus in the central Aegean Sea. Time series analysis concern the anchovy landing sizes as they recorded by the auctions statistics. The best fits were obtained by a multiplicative seasonal ARIMA model (0,1,2) (0,1,1) 12 and a multiplicative seasonal exponential smoothing model with damped trend, both indicating the multiplicative seasonality of the series. However, both methods did not provide annual forecasts with 95 % confidence intervals for the year 2000.

Recommendations

1. In small pelagic fishes, abundance is heavily dependent on recruitment and natural mortality shows high inter-annual variability. The study group recommends the conduction of direct biomass estimates for small pelagics in the Mediterranean by means of acoustics and the daily egg production method (DEPM) and the integrated analysis of catch-at-age data with direct biomass estimates to efficiently assess the state of the stocks. It should be noted that for only 4 management units (Alboran Sea, Northern Spain, Gulf of Lions and Northern Adriatic) there are available time series data for stock assessment. In some other areas there are fragmental series of assessments in the framework of various EC projects. Biomass estimations have to be made on a yearly basis in all management units. Time series of assessment for small pelagic species in Mediterranean is of high priority and it is necessary for management recommendations. An effort should be made for such projects to be initiated. The application of acoustics and DEPM methods should be standardized among different Mediterranean research groups.
2. As a preliminary work to standardize methods, it will be useful to compare methodologies in age reading and the results of age-length keys for different years. At this purpose an *ad hoc* Working Group should meet to establish common criteria for age-reading in the GFCM area, in collaboration with other research groups working on the subject.
3. Lengths at first maturity estimates of the Mediterranean sardine and anchovy show deviations resulting by the adoption of different methodologies. Specifically, (a) the manner of assigning maturity stages (macroscopic vs. microscopic methods) (b) the timing of sample collection for estimating L_{50} in relation to the seasonal variation of spawning intensity and the timing of peak spawning. It is recommended that a standard procedure be adopted for the estimation of L_{50} . Standardized, unbiased estimates of L_{50} for anchovy and sardine

stocks in the Mediterranean are urgently needed for the implementation of management measures.

4. The list of main target species should be reexamined during next year. Each participating country, will provide in the next meeting, a table with species to be included in the reference list. The WG intends to address a request to the SAC committee in order to produce priority criteria for the completion of the species list. Such criteria like the commercial value, the percentage in catch and the shared exploitation of the species may be considered.
5. Population structure and dynamics of small pelagic fish can best be understood by incorporating studies of genetic stock identification. Analysis of intra-specific genetic variability can provide important insights for the effective management of the stocks, as the case of anchovy has demonstrated. Therefore, it is recommended that analysis of genetic stock structure should constitute an integral part of stock assessment studies.
6. It was pointed out that, as in previous years, the presented studies covered only partially the GFCM area. More important small pelagic stocks in Alborán sea, Northern Spain, Gulf of Lions, Northern Adriatic, Strait of Sicily, Ionian and Aegean Sea have been regularly analyzed by the group. On the other hand, the absence of attendants from most of the Eastern and Southern Mediterranean and Black sea countries, as well as of experts working in some northern regions, as Ligurian and Tyrrhenian seas and south Adriatic, have resulted in a lack of information from those areas. So, this WG strongly recommends to GFCM to make a special effort and encourage all countries to attend these meetings.
7. The Working Group took note on the recent progress, concerning the standardization of methodologies and the joint assessment of stocks, made in the Western Mediterranean and the Adriatic Sea through the international cooperation promoted by the FAO-CopeMed and FAO-AdriaMed Projects. With reference to the relevance of international cooperation within the Mediterranean, particularly to address the resources assessment and fishery management of shared small pelagic stocks, the WG appreciated and considered desirable the further development of scientific cooperation projects such as the FAO Regional Projects as CopeMed (Western Mediterranean), AdriaMed (Adriatic Sea) and the recent MedSudMed (Strait of Sicily). Also, the importance of this kind of international initiatives was underlined, as they foster the scientific cooperation among EU-member and non-member States of the Mediterranean.

DATE AND PLACE OF THE NEXT MEETING

The next meeting will be held in March 2003 at the Istituto di Ricerche Sulla Pesca Maritima in Ancona, Italy.

ADOPTION OF THE REPORT

The report of the 3rd W.G on small pelagic species of the Sub Committee on Stock Assessment was adopted on 22 March 2002.

SCIENTIFIC ADVISORY COMMITTEE - GFCM

**Sub-Committee of Stock Assessment -Working Group on small pelagic species
Rome, Italy, 20-22 March, 2002**

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**GENERAL FISHERIES COMMISSION FOR THE MEDITERRANEAN
SCIENTIFIC ADVISORY COMMITTEE
Sub-Committee for Stock Assessment
Working Group on small pelagic species
20-22 March 2002
FAO, Rome, Pakistan room (A-372)**

The Working Group on Small pelagic species aims to review and discuss the assessment forms of the main small pelagic species as *E. encrasicolus*, *S. pilchardus*, *S. aurita*, *S. sprattus*, *T. trachurus*, *B. boops* and to provide recommendations to the Scientific Advisory Committee

Agenda and time schedule

20-03 Morning : beginning of the session at 9.30 am

Opening of the meeting, Adoption of the agenda and arrangements of the session

Revision of the 26 GFCM Mandate for the Scientific Committee (Annex G, 26th Rapport of the GFCM)

Presentation and discussion of new stock assessments and related documents

20-03 Afternoon

Presentation and discussion of new stock assessments and related documents

21-03 Morning beginning of the session at 9.00 am

Presentation and discussion of new stock assessments and related documents

21-03 Afternoon

Discussion on the recommendations to include in the report

Brief presentation of on going projects related to the small pelagic species

Other matters

22-03 Morning beginning of the session at 10.00 am

10:00 : Adoption of the report, work program and time schedule for the next year, date and venue of the next meeting.

APPENDIX C

LIST OF DOCUMENTS

1	Giráldez, A. & Alemany F.	Spain	The small pelagic fisheries in the South-Mediterranean Region (Western Mediterranean Sea): Past and present state
2	Giraldez A. & Allemany F.	Spain	Echo-Survey estimations of anchovy, sardine, gilt sardine, bogue and horse mackerel populations in the NW Mediterranean Sea (from Creus Cape to La Nao Cape)
3	Allemany F. <i>et al.</i>	Spain+ France	Preliminary results on anchovy shared stocks in the Gulf of Lions and North Catalanian Sea
4	Elouamari N.	Morocco	Evaluation du stock de la sardine en Mediterranee marocaine
5	Patti B <i>et al.</i>	Italy	Biomass and distribution of Anchovy and Sardine populations in the Strait of Sicily: Compared results from two acoustic surveys carried out in July and September 2000
6	Quintanilla, L.F. & Garcia A.	Italy	The Sicilian Anchovy daily egg production spawning biomass during July 2000
7	Cingolani, N., <i>et al</i>	Italy	Stock assessments of sardine (<i>Sardina pilchardus</i> , Walb.) in the northern and central Adriatic Sea, in the period 1975-2001
8	Azzali M <i>et al.</i>	Italy+ Slovenia+ Croatia	Pilot joint echo-survey in the northern part of the Adriatic Sea on small pelagic fish and its implications on the historical surveys
9	Guarniero, I. <i>et al.</i>	Italy	Multi-approach data analyses suggest Adriatic Sardine shared stock is a part of a larger self-recruiting population of the Central Mediterranean Sea.
10	Cingolani N <i>et al.</i>	Italy	Stock assessments of anchovy (<i>Engraulis encrasicolus</i> , L.) in the northern and central Adriatic Sea, in the period 1975-2001
11	Cincolani N. <i>et al.</i>	Italy + Slovenia +Croatia + Albania	FAO-AdriaMed research program : Data collection and biological sampling in the Adriatic Sea. Advancement of the program
12	Somarakis S. <i>et al.</i>	Greece	Application of the daily egg production method (DEPM) for the estimation of the spawning biomass of Sardine stocks in coastal waters of the Central Aegean and Ionian Seas
13	Vassilopoulou V. <i>et al.</i>	Greece	Estimation of the anchovy biomass in the Thracian Sea (Greece)
14	Magoulas A.	Greece	Genetic population structure of anchovy (<i>Engraulis encrasicolus</i>) in the Mediterranean and adjacent seas
15	Karlou-Riga K.	Greece	Juvenile concentrations in the Saronikos Gulf and the Cyclades islands (Central Aegean Sea)
16	Petrakis G <i>et al.</i>	Greece	Catch composition in purse seine fishery in Greece
17	Petrakis G. & Chilari A.	Greece	Preliminary results on the reproduction of sardine and anchovy in Greek waters
18	Machias A. <i>et al.</i>	Greece	Trend in Greek purse seine catches/day and fishing effort
19	Vidoris P. <i>et al.</i>	Greece	Time series analysis of monthly anchovy landings in the Aegean Sea. ARIMA and Exponential models