Northwest Atlantic Fisheries Organization

Serial No. N4543 **NAFO SCR Doc. 01/149**

SCIENTIFIC COUNCIL MEETING – SEPTEMBER 2001
(Deep-sea Fisheries Symposium – Poster)

Demersal Fauna on Deep Seamounts of Sierra Leone Rise (Gulf of Guinea, Africa)

A. Ramos[1], F. Moya[1], F. Salmerón[1], P. García[1], A. Carroceda[1], L. Fernández[1], and J.F. González[1], O. Tello[2], J. L. Sánz (Cartography)[2] , and M. Ballesteros (ROV)*

[(1) (2)] Instituto Español de Oceanografía
Centros Oceanográfico de Málaga, Canarias y Madrid
* Universitat de Barcelona

Abstract

From January to March 2001 an experimental fishing survey was carried out on the Sierra Leone Rise by four Spanish commercial boats, with the aim of prospecting the fishing potential for longliners of the demersal resources inhabiting the seamounts located between 9ºN-5ºN and 19ºW-27ºW, at depths between 200 m and 1 000 m.

A preliminary analysis of the data recorded shows that the demersal fish fauna composition was similar in three of the ten seamounts, with an absolute dominance of the alfonsino, *Beryx splendens* Lowe, 1838, which accounted for more than 90% of the total catch between 200 and 800 m depth. Other commercial species in catches were *Beryx decadacthylus* and some Scorpenidae. The size structure and the distribution of alfonsino oscillated between 27 and 52 cm showing an increase of the mean size with depth which is similar to the pattern found in other seamounts worldwide

Major abundances were located at the northern surveyed seamount where the highest yields, up to 750 kg per 1 000 hooks, were obtained. The southernmost surveyed seamount exhibited the lowest abundances and was characterized by the absence of the alfonsino in the catches.

The species richness of these deep communities was very low, the accompanying fauna comprising less than 30 species. Discarded fishes were, in order of abundance: *Promethicthys prometeus*, *Coloconger cadenati*, *Polymixia nobilis*, *Ruvettus pretiosus*, *Etmopterus princeps*, *Serranus accraensis* and *Gephyroberyx darwini*.

Material and Methodology

From January to August 2001 an experimental fishing survey was been carried out on the Sierra Leone Rise by four Spanish commercial boats, belonging to ORPAL Ship owners (Riviera), with the aim of prospecting the fishing potential for long liners of the demersal resources inhabiting the seamounts located between 9ºN-5ºN and 19ºW-27ºW, at depths between 200 m and 1 200 m.

During the two first leg of survey 72 tons of both, commercial and discarding species, corresponding to an effort of 358,000 hooks, were sampled on board.

Multivariate analysis (Bray-Curtis similarity index and complete linkage) and ordination by MDS were applicated to standardized weights of main species recorded during the two first survey leg

Sounding data of all fishing operations have been integrated with international bathimetric database for to prepare a detailed cartography of the seamounts zone (preliminary tri-dimensional map in this poster, Tello and Sánz, in prep.).

A ROV's have been descended to 300 m at Machucambo seamount for filming the bottom sea and benthic fauna.

Temperature profiles were obtained in each fishing operations by mean a mini log sensor.

Results

The multivariate analysis clearly separate the seamounts in three groups characterized by different yields and faunistic composition, in relation to geographical area, depth range and, probably, to primary production of water column (SAT photographs). Other two seamounts, Perdido 1 and Perdido 2, remain independent of the rest.

Cluster 1

Seamounts: Machucambo and Falsos (NW and SE)
Depth range: 200-778 m
Latitude: Northwestern area
Average yields: 203 kg by 1,000 hooks.
Maximum yields up to 750 kg by 1,000 hooks

Faunistic composition: Absolute dominance of 'alfonsino', *Beryx splendens* (>90%) with other commercial species, *Beryx decadacthylus* (5%) and Scorpenidae
Discarding: Scarce <5%

Size structure of 'alfonsino': Clear differences among mounts with biggest individuals in Falsos than in Machucambo seamounts.

Cluster 2

Sea-mounts: Rompetodo, El Sablazo and Escolares
Depth range: 283-778 m
Latitude: Southern area
Average yields: 180 kg by 1,000 hooks

Faunistic composition: Dominance of *B. splendens* and highest percentages of *B. decadacthylus* (11%) and discarding species (18%)

Size structure of 'alfonsino' similar to Machucambo

Cluster 3

Sea-mounts: Chirimbolo and La Meseta
Depth range: 707-1174 m (deepest seamounts)
Latitude: Central area
Lowest yields: 55 kg by 1,000 hooks

Faunistic composition: Absence of 'alfonsino' and dominance of non-commercial species: *Promethicthys prometeus, Coloconger cadenati, Polymixia nobilis, Ruvettus pretiosus, Etmopterus princeps* and *Gephyroberyx darwini*.

Conclusions

'Alfonsino' (*Beryx splendens*), whose big agglomerates were by first time founds by Soviet researchers in the open north Atlantic (1997), is a fish species widely distributed through the world's oceans, supporting deep fisheries in many sea-mounts of the Pacific and Atlantic (Lehodey *et al*., 1994; Vinnichenko, 1998).

The great concentrations of 'alfonsino' discovered in at some seamounts of Sierra Leone Rise, to now an inexplorating area, could constitute a resource exploitable by a bottom long line fishery.

The exploitation outline should be carefully designed, taking account the very low level of sustainable yield of these fish populations (Rogers, 1994) and the isolation of sea-mount benthic ecosystems, and, in any case, it should be based on the biological results obtained in this research survey.

References

Lehodey, P., Marchal, P. and Grandperrin, R. 1994. Modelling the distribution of alfonsino, *Beryx splendens*, over the seamounts of New Caledonia. *Fish. Bull*., 92: 748-759.

Rogers, A.D. 1994. The Biology of Seamounts. *Adv. Mar. Biol*., 30: 305-350.

Vinnichenko, V.I. 1997. Russian investigations and deep-water fishery on the corner rising seamount in Subarea 6. *NAFO Sci. Coun. Studies*, 30: 41-49.

Vinnichenko, V.I. 1998. Alfonsino (*Beryx splendens*) biology and fishery on the seamounts in the open north Atlantic. *ICES. CM 1998/O:*13, 8 pp.

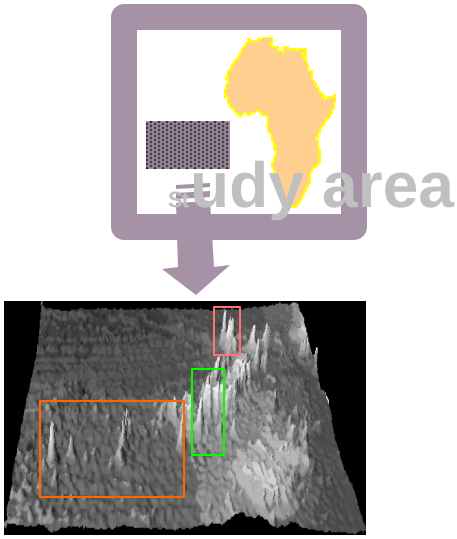

Fig. 1. Localization of seamounts and groups of cluster analysis (Tridimensional map: Tello and Sánz, in prep.)

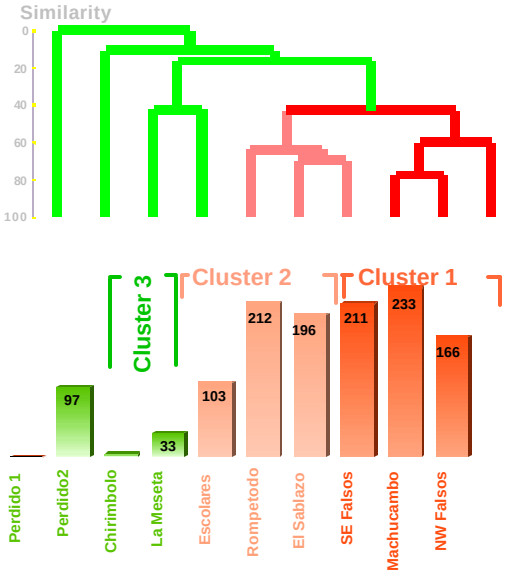

Fig. 2. Dendrogram and yields graphic (kg by 1,000 hooks in the corresponding seamounts

Perdido 2 seamount
Depth range: 819-935 m
Low yields: 91 kg by 1,000 hooks
Only discarding species

Perdido 1 seamount
Depth range: 915-1020 m
Without demersal fishes

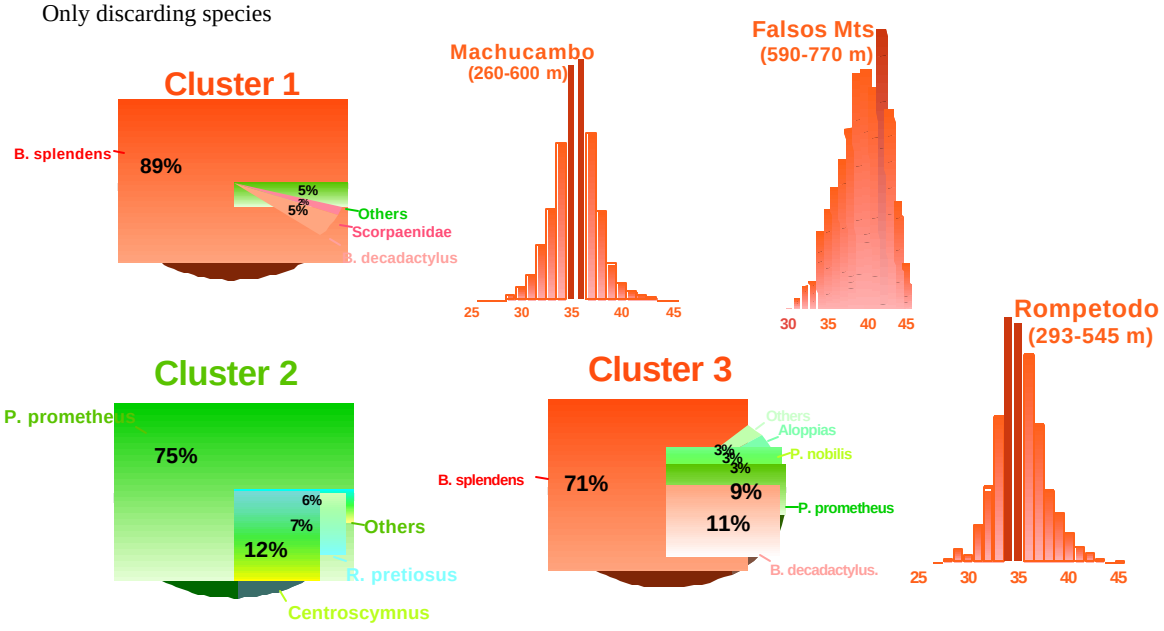

Fig. 3. Faunistic composition of in seamounts belonging to Cluster 1, 2 and 3 and size structure of *B. splendens* in the seamounts of zones 1 and 3.