

IMPROVING KING SCALLOP SPAT COLLECTION BY THE BAG COLLECTOR



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Introduction

We previously found a natural population of the Mediterranean scallop *Pecten jacobaeus* L. in an area between 50 and 100 m depth in Castellón waters (Western Mediterranean). This is a fishing bed for some economically important fish species that are living on the sand and mud bottom around some rocky formations. In previous studies raschel bags were used as standard collectors with good results in stations A and B (Fig. 1) at 70-75 m depth. The main problem we have had in the last years is regarding the cutting of some of the collector's surface buoys by fishermen or curious people. In the last years we are deploying some filamentous collectors in a fish farm (C) located at a depth of 28-33 m on sand bottom (40° 03'N, 0° 12'E). The aim of this study was to improve scallop spat collection testing some bags made in Chile.

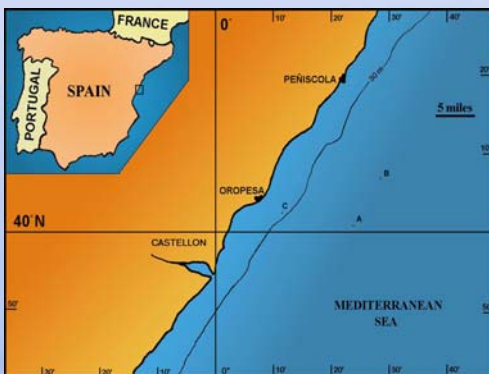


Figure 1: Map of Castellón coast showing the site where collectors were deployed.

Material & Methods

Scallop spat are usually caught by means of filamentous collectors, positioned along the water column near the bottom. We have tested two kinds of bags: the raschel bag (42x46 cm), which was used in the last years that have a pore size of 16 mm and contains two polyethylene net fragments of 41x42 cm, and the Chilean onion bag (66x41 cm) with 2 mm pore mesh which contains four net fragments, used in Chile for massive settlement of scallops. The collector lines were attached to the fish farm structure with an eight kg weight two meters above the sea floor. Seven bags, separated 60 cm between them, were attached in each collector line from 3 to 6.6 m above the bottom. The surface water temperature in Castellón reaches 26-27°C during summer, and usually collectors are removed in June or after October, when the water temperature decreases to 18-20°C. Collectors were positioned in March 14th and retrieved in June 13th 2005.

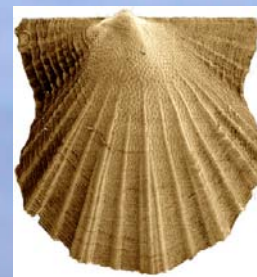
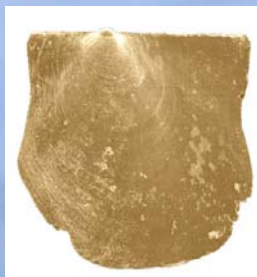


Figure 2: Left valve of *P. jacobaeus*

Figure 3: Left valve of *A. opercularis*

Figure 4: Left valve of *M. varia*

Figure 5: Left valve of *C. multistriata*

Figure 6: Left valve of *F. flexuosus*

Results and Discussion

In raschel bags three commercial pectinid species were attached: *Pecten jacobaeus* (Fig. 2) *Aequipecten opercularis* (Fig. 3) and *Mimachlamys varia* (Fig. 4), meanwhile in Chilean bags some other species were found, as *Crassadoma multistriata* (Fig. 5) and *Flexopecten flexuosus* (Fig. 6) that have no commercial value and are competing for space and food.

The number of king scallop spat per bag was 17-fold higher in Chilean bags instead of two-fold, as expected. The mean number of *Pecten jacobaeus* per bag was 0.95 in raschel bags, while was 16.33 in Chilean bags. The percentage of *Pecten jacobaeus* among other pectinid species was 4.6% in raschel bags and 15.5% in Chilean bags (Table I). The highest spat percentage in raschel bags was found in *Aequipecten opercularis* (75.6%) with a total of 653 juveniles (a mean of 15.5 spat per bag) and in Chilean bags, *Mimachlamys varia* had the highest spat percentage (35.7%), with a total of 1584 juveniles (a mean of 37.7 spat per bag). In general, since Chilean bags have a smaller pore size, higher amounts of pectinid spat are retained.

The mean size of *A. opercularis* spat on Chilean bags (Fig. 7) was 6.03 ± 0.19 mm (range 0.5 to 12.88 mm) and on the raschel bags was 6.79 ± 0.07 mm (range 2.8 to 11.6 mm). The mean shell height of *Pecten jacobaeus* spat (Fig. 8) was 5.97 ± 0.34 mm (range 0.6 to 16.5 mm) in Chilean bags and 8.07 ± 0.43 mm (range 3.6 to 14.8 mm) in raschel bags. The mean shell height of *M. varia* spat (Fig. 9) was 2.62 ± 0.05 mm (range 0.5 to 10.5 mm) in Chilean bags and 4.29 ± 0.08 mm (range 2.4 to 7.8 mm) in raschel bags. In general, scallop juveniles in Chilean bags are more numerous but with smaller size than on raschel bags.

However, some crab species, mostly *Eriphia verrucosa*, are also more retained, because they cannot escape. In fact, the average amount of crabs per bag in Chilean collectors was 5.7, whereas there were only 0.2 crabs in raschel bags.

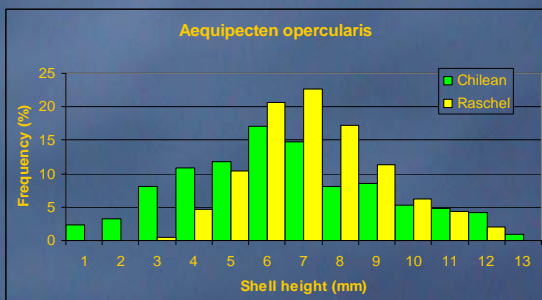


Figure 7: Size frequency distribution of *A. opercularis* spat on raschel and Chilean bags off Orpesa coast.

Conclusions

The new collectors used, consisting of double size and 2 mm pore mesh are more effective than raschel bags for settlement of scallop spats. Therefore, the Chilean bag is a good collector for catching pectinid spats in shallow waters.

In raschel bags very few crabs were present, but in Chilean bags many were alive and some scallop and other bivalve species shells were broken by crabs.

As found in last experiments, collectors holding a big amount of spat had juveniles of smaller size than bags with few scallop spat.

SPECIES	CHILEAN BAGS			RASCHEL BAGS		
	TOTAL	%	N/BAG	TOTAL	%	N/BAG
<i>Aequipecten opercularis</i>	211	4.76	5.02	653	75.58	15.55
<i>Mimachlamys varia</i>	1584	35.73	37.71	171	19.79	4.07
<i>Pecten jacobaeus</i>	686	15.47	16.33	40	4.63	0.95
<i>Crassadoma multistriata</i>	1023	23.08	24.36	-	-	-
<i>Flexopecten flexuosus</i>	929	20.96	22.12	-	-	-
TOTAL	4433	100	105.55	864	100	20.57

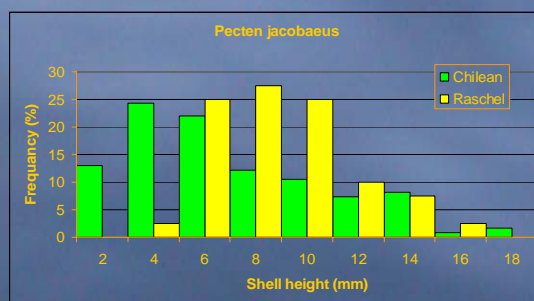


Figure 8: Size frequency distribution of *P. jacobaeus* spat on Chilean and raschel collectors in a fish farm.

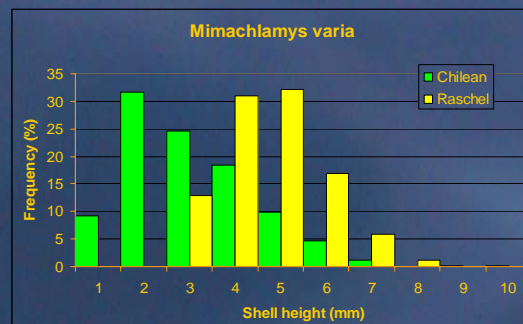


Figure 9: Size frequency distribution of *M. varia* spat on Chilean and raschel collectors in a fish farm.

Acknowledgements

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