SPATIAL AND TEMPORAL VARIABILITY OF THE TWO MAIN CATCHED SPECIES OF AN ARTISANAL TRAP FISHERY IN AN OCEANIC ISLAND

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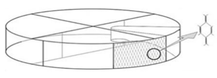
Introduction

The spatial and temporal variations of the catches have considerable effects on catch composition and the relative impact on targeted species (Halvorsen et al. 2020). We analyse the spatial and temporal variability of the two main caught species of this fish artisanal trap fishery, i.e. ***Dentex gibbosus*** and ***Stephanolepis hispidus***, from the island of Gran Canaria. Moreover, the size distributions for both species in the two mesh types, large (50.8 mm) and small (31.6 mm), respectively. This study provides comprehensive information on the exploitation status of two of the main species caught in this fishery. It represents an improvement in knowledge towards implementing effective management measures to preserve and sustain commercially important species in the medium and long term.

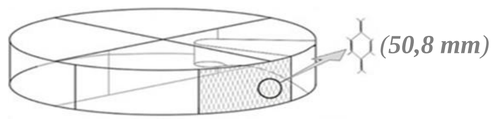
Material & methods

- **2,587 *P*-traps (100-200 cm)**. Depth: From shallow to 30 m.



→ **12,895** specimens of ***S. hispidus***

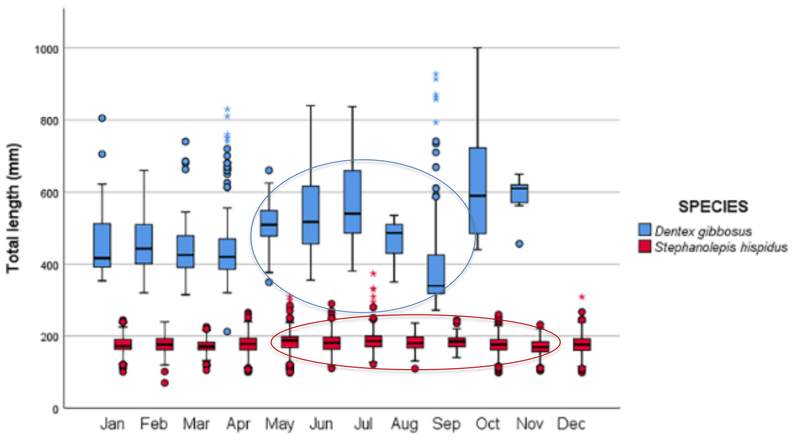
- **141 *G*-traps (200-400 cm).** Depth: From 30 to 120 m.



→ **865** specimens of ***D. gibbosus***

Results

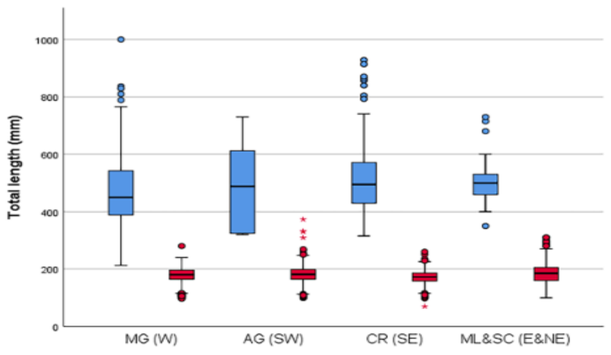
Catch composition



Total length of the specimens catches throughout the year

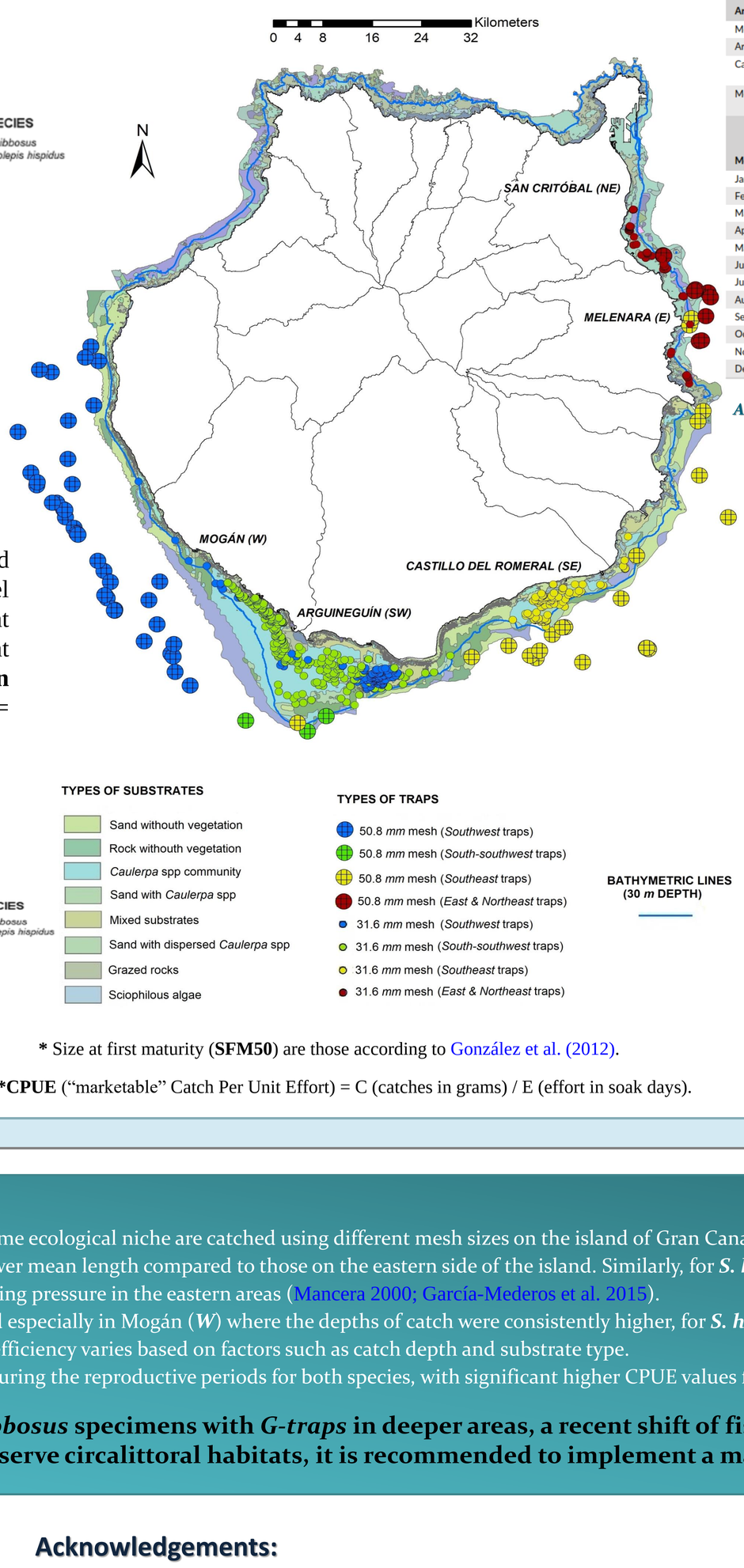
- For both species, significant differences were found in the size of specimens caught during the **reproductive** and non-reproductive months. ***D. gibbosus*** (Z = -2.437, p = 0.015) and ***S. hispidus*** (Z = -12.479, *p* = 0.000).

- For ***D. gibbosus***, significant differences were found between the catch sizes from **Mogán** and Castillo del Romeral (Z = -2.691, *p* = 0.007). Similarly, significant differences were observed between the different localities for ***S. hispidus***, except between **Arguineguín** and **Melenara & San Cristóbal** (Z = -1.577, *p* = 0.115).



Total length of the specimens catches for the fishing areas

Trap distribution for studied areas



***** Size at first maturity (**SFM50**) are those according to González et al. (2012).

***CPUE** ("marketable" Catch Per Unit Effort) = C (catches in grams) / E (effort in soak days).

Fishing efficiency

Area	*Dentex gibbosus* (large mesh size) Depth average (m)	*n* (traps)	CPUE average (grammes/traps/days)	Standard deviation	*Stephanolepis hispidus* (small mesh size) Depth average (m)	*n* (traps)	CPUE average (grammes/traps/days)	Standard deviation
Mogán	91.8	45	857.7	1502	19.2	596	64.3	85
Arguineguín	88	7	190.1	429	21.6	1318	102.9	134
Castillo del Romeral	62.3	51	124	365	22.8	382	124.9	154
Melenara & San Cristóbal	51.2	38	59.9	158	20.3	291	12.1	31

Months	*D. gibbosus* (large mesh size) Depth average (m)	*n* (traps)	CPUE average (grammes/traps/days)	Standard deviation	*S. hispidus* (small mesh size) Depth average (m)	*n* (traps)	CPUE average (grammes/traps/days)	Standard deviation
January	73.3	9	242.1	412	23.2	196	77.1	121
February	67.1	11	267.3	301	21.6	94	19.4	33
March	59.3	7	377	743	19.6	188	56.8	71
April	90.9	7	962.8	825	20.8	464	98.8	164
May	77	8	316.4	366	20.6	418	94.7	111
June	85.6	17	865.5	2154	22.1	231	165.9	148
July	90.6	22	464.6	1042	20.2	201	82.2	115
August	66.8	19	50.5	104	20.6	172	84.5	98
September	75.7	19	180	537	21.4	138	3.1	11
October	57.1	18	65.4	158	21.3	188	85.9	117
November	91.5	4	252.9	480	25.5	99	105.6	133
December	-	-	-	-	20.4	198	79.5	91

Average capture depth, CPUE, and number of traps by fishing areas and months

- For ***D. gibbosus***, significant differences were observed in CPUE values between **Mogán** (deeper areas) and Castillo del Romeral (Z = -4.482, *p* = 0.000), as well as between **Mogán** and Melenara & San Cristóbal (Z = -4.727, *p* = 0.000).

- Regarding the annual variations in CPUE, both species peaked at the end of spring and the beginning of summer. For ***S. hispidus***, significant differences were found between the **reproductive** and non-reproductive months (Z = -3.005, *p* = 0.003).

Habitats

- For ***S. hispidus*** within the echo-mapped area, the highest CPUE was recorded on substrates with ***Caulerpa* spp.**, compared to those without Caulerpa spp. Significant differences were observed (Z = -3.977, *p* = 0.000).

Discussion

- Two commercially important species, sharing part of the same ecological niche are catched using different mesh sizes on the island of Gran Canaria.
- Catches of ***D. gibbosus*** in western locations exhibited a lower mean length compared to those on the eastern side of the island. Similarly, for ***S. hispidus***, catches in the east areas also showed a higher mean length.
- The size distribution pattern suggests potentially lower fishing pressure in the eastern areas (Mancera 2000; García-Mederos et al. 2015).
- CPUE for ***D. gibbosus*** was higher in Arguineguín (***SW***) and especially in Mogán (***W***) where the depths of catch were consistently higher, for ***S. hispidus*** on substrates with ***Caulerpa*** spp presence.
- The results for these demersal species suggest that fishing efficiency varies based on factors such as catch depth and substrate type.
- The results revealed a clustering of large-sized specimens during the reproductive periods for both species, with significant higher CPUE values for ***S. hispidus*** observed during the spawning season.

***Due to the high catchability of spawning *D. gibbosus* specimens with *G-traps* in deeper areas, a recent shift of fishing effort to these depths could potentially displace adult specimens. To mitigate this effect and preserve circalittoral habitats, it is recommended to implement a maximum depth limit for the use of large mesh traps.**

Acknowledgements:

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References: García-Mederos et al. (2015)., González et al. (2012)., Halvorsen et al. (2020) and Mancera (2000).