Circle hooks in swordfish targetting fisheries

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Justification

- Mediterranean swordfish fisheries are using J-hooks
- Circle hooks are used in some Atlantic fisheries, (e.g. US) to mitigate sea-turtle bycatch

Past studies have shown:

- The efficiency of circle hooks in reducing sea-turtle bycatch depends on the turtle species and fishing practices (e.g bait type, depth setting of the gear)
- The impact of circle hooks on swordfish catch rates depends on the particular characteristics of the fishery (target age-class, fishing ground, etc)

Thus, regional studies are necessary to verify the usefullnes of circle hooks

Evaluate the effects of employing circle hooks on:

☞ Catch rates of target species (both commercial and undersized fractions)

☞ Catch rates of other commercial by-catch species

☞ Incidental catches of sensitive species such as sea-turtles and pelagic sharks

☞ A total of 36 experimental longline sets were accomplished from April 2016 - April 2017 in the South Aegean and Cretan seas
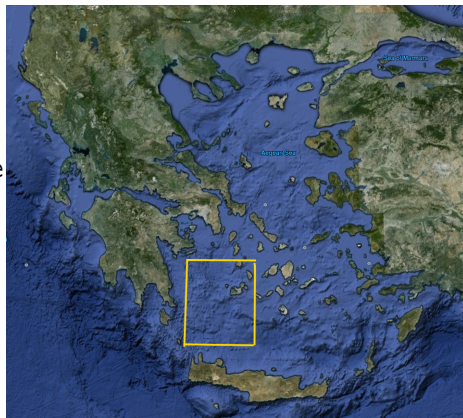
Fishing gear

☞ Circle (size 16/0, offset 10o) and J (size 9/0) hooks used in the fishing trials

☞ The fishing gear (drifting surface longline) was equiped with both Circle and J-type hooks alternating each other (400 hooks in total)

☞ Gear setting was done after sunset and hauling at dawn, using mackerel as bait (the common fishing practice).

Results
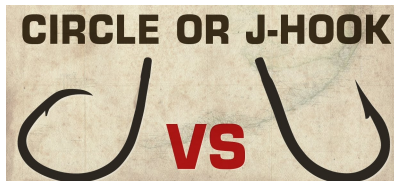
☞ A total of 138 individuals were caught belonging to 11 different species

Hook type	Species	Total Number
C	BLUEFIN (*Thunnus thynnus*)	8
C	BLUE STINGRAY (*Pteroplatytrygon violacea*)	6
C	DOLPHINFISH (*Coryphaena hippurus*)	2
C	OILFISH (*Ruvettus pretiosus*)	4
C	BLUE SHARK (*Prionace glauca*)	2
C	SHORT FIN MAKO (*Isurus oxyrinchus*)	6
C	SPEARFISH (*Tetrapturus belone*)	2
C	SWORDFISH (*Xiphias gladius*)	38
J	ALBACORE (*Thunnus alalunga*)	2
J	BLUEFIN (*Thunnus thynnus*)	10
J	BIGEYE THRESHER (*Alopias superciliosus*)	2
J	BLUE STINGRAY (*Pteroplatytrygon violacea*)	4
J	BLUNTNOSE SIXGILL SHARK (*Hexanchus griseus*)	2
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- The majority of the specimens (≈60%) were swordfish.

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☞ Comparable shark catches among hook types ($\approx$10% in terms of N)

☞ No sea turtles were captured, in either hook type

☞ Proportionally less undersized swordfish ($<$100cm) on the circle hooks (24 vs 40%)

☞

Conclusions
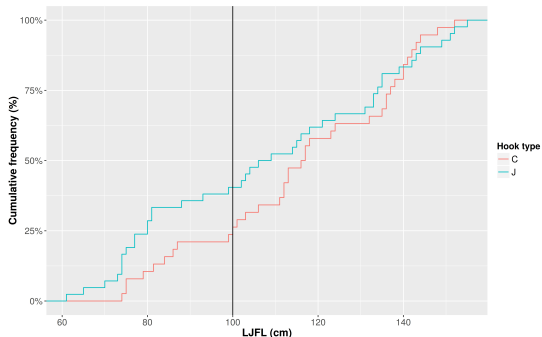
Current findings should be considered as preliminary, given the low number of experimental fishing trials. It seems however that:

- ✎ Circle hooks favor the reduction of undersized swordfish catches without affecting the volume of landings
- ✎ There are no catch rate differences regarding sharks

Further field experiments would help to verify the overall performance of circle hooks

Thank you!