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Fin to carcass weight ratios for the silky shark *Carcharhinus falciformis* in the western Indian Ocean

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Mitigating adverse ecological impacts of open ocean fisheries

Context

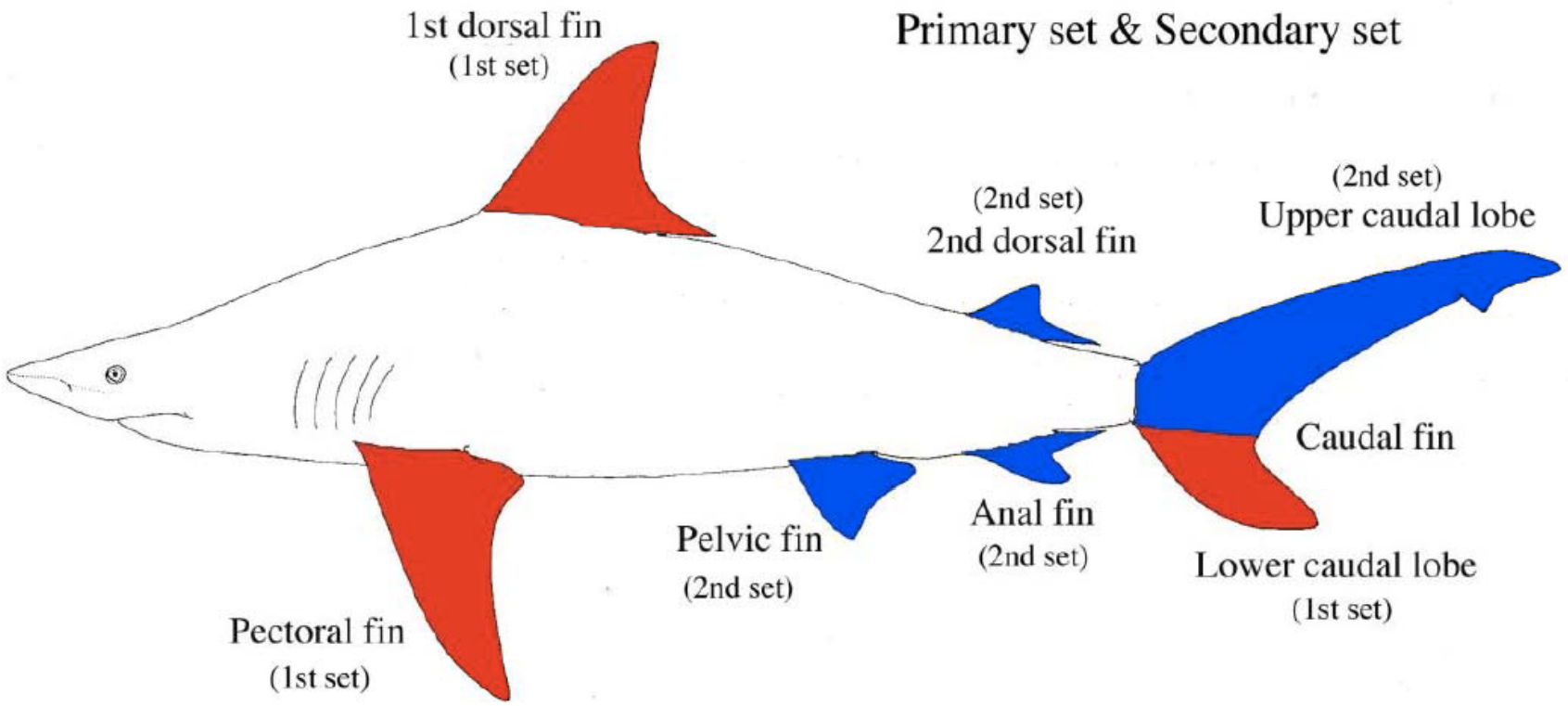
The silky shark, *Carcharhinus falciformis* is one of the main by-catch species of the open-sea pelagic fisheries, mainly in the purse-seine fisheries.
Its meat is little marketed, but its fins are valuable on the international shark fins market.

In the frame of MADE, numerous specimens of silky shark were collected and studied; it was interesting to valorise these catches by an analysis of the fin to carcass weight ratios.

The interest to determine the fin to carcass weight ratios is that these ratios are used in the regulations on finning.

The average ratio of 5% often used is controversial (cf Hareide *et al.*, 2007; Hindmarsh, 2007; IOTC, 2007; Petersen *et al.*, 2007; Fowler & Séret, 2010; Biery & Pauli, 2012).

Commercial shark fin categories



Various methods of cutting

Straight cut

Moon & half-moon cuts

Crude cut

Material & Methods

- All the fins treated in this study were taken from dead individuals of silky shark collected during several cruises performed in the frame of the MADE program in the western Indian Ocean, in 2009-2010.
- Fins were taken according to the method of straight cut
- 53 sets of fins from 26 females and 27 males
- TL : 65 cm to 182 cm
- Weight : 1.3 kg to 35 kg
- Total weight of the 53 sets : 47 kg

Material & Methods

Parameters recorded on sharks / fins

- Total length
- Fork length
- Pre-caudal length
- Total wet/raw weight
- Eviscerated weight with fins
- Eviscerated weight without fins
- First dorsal weight
- Second dorsal weight
- Weight of the two pectoral fins
- Weight of the two pelvic fins
- Anal fin weight
- Total weight of caudal fin
- Weight of the lower love of caudal fin

Fins were weighted with precision scales

Material & Methods

- Fins were dried with an Excalibur Food Dehydrator (Parallex) until constant weight.

- Drying process lasted from 24 to about 48 hours for the most fleshy fins.

Material & Methods

The following ratios were calculated:

- 1st set wet W / total body W
- 1st set dry W / total body W
- 2nd set wet W / total body W
- 2nd set dry W / total body W
- Wet W all fins / total body W
- Dry W all fins / total body W
- Wet W all fins / eviscerated W with fins
- Dry W all fins / eviscerated W with fins
- Wet W all fins / eviscerated W without fins
- Dry W all fins / eviscerated W without fins

RESULTS

	Ratio (mean)	SD	Min	Max	n
1st fin set wet weight / total body weight	2.02	0.19	1.60	2.46	42
1st fin set dried weight / total body weight	0.79	0.12	0.55	1.14	42
2nd fin set wet weight / total body weight	2.35	0.18	2.06	2.83	42
2nd fin set dried weight / total body weight	1.09	0.17	0.82	1.43	42
Total wet weight of fin / total body weight	4.67	0.34	3.90	5.57	42
Total dried weight of fin / total body weight	1.99	0.31	1.47	2.74	42
Total wet weight of fins / eviscerated body weight with fins	5.26	0.52	3.08	6.13	42
Total dried weight of fins / eviscerated body weight with fins	2.26	0.35	1.60	2.98	42
Total wet weight of fins / eviscerated body weight without fins	5.59	0.43	4.66	6.51	42
Total dried weight of fins / eviscerated body weight without fins	2.38	0.38	1.69	3.14	42
% eviscerated body weight with fins /total body weight	87.29	3.96	80.03	95.69	39
% eviscerated body weight without fins /total body weight	83.65	4.92	75.92	95.50	42

Comparisons with other studies

FW = wet fins weight
RW = raw weight
DW = dressed weight

Reference	FW / RW	n	FW / DW	n	Method	
Present study	2.02	42	-	-	straight cut	primary set
Present study	4.67	42	5.59	42	straight cut	1st + 2nd sets
Baremore et al. in Cortes & Neer 2006	1.45	19	2.53	18	?	pimary set ?
NMFS 1993 in Cortes & Neer 2006	1.62	1	_	_	?	primary set ?
Anderson & Ahmed 1993	4.6	?	7.6	?	?	?
Mejuto & Garcia 2004	6.5	2	11.09	11	variable	caudal fin included
Molina & Santana 2006	_	_	11.16	8	straight cut	caudal fin included
Santos & Garcia 2008	4.64	175	8.9	175	straight cut	caudal fin included
Biery & Pauly 2012 (compilation)	4.46	324				

Differences are mainly due to the variations in methods used : cutting methods, 1st set or all fins, with or without the upper caudal lobe.

Conclusions

- It is demonstrated that the 5% ratio commonly used in regulations does not apply for the silky shark in the western Indian Ocean.

- Methods used in this study (drying with a food dehydrator to constant weight) and use of precision scales to measure the various weights, allow to provide accurate ratios.

- When providing such ratios, it is important to mention the methods used, the size and the geographical origin of the sample.

Thank you for
your attention
&
Bon appétit !

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