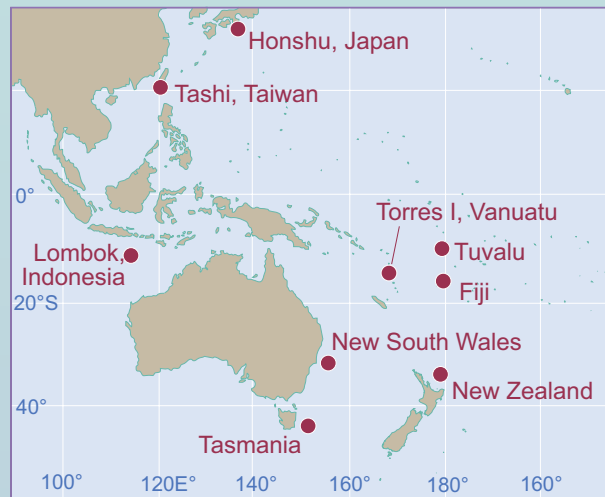
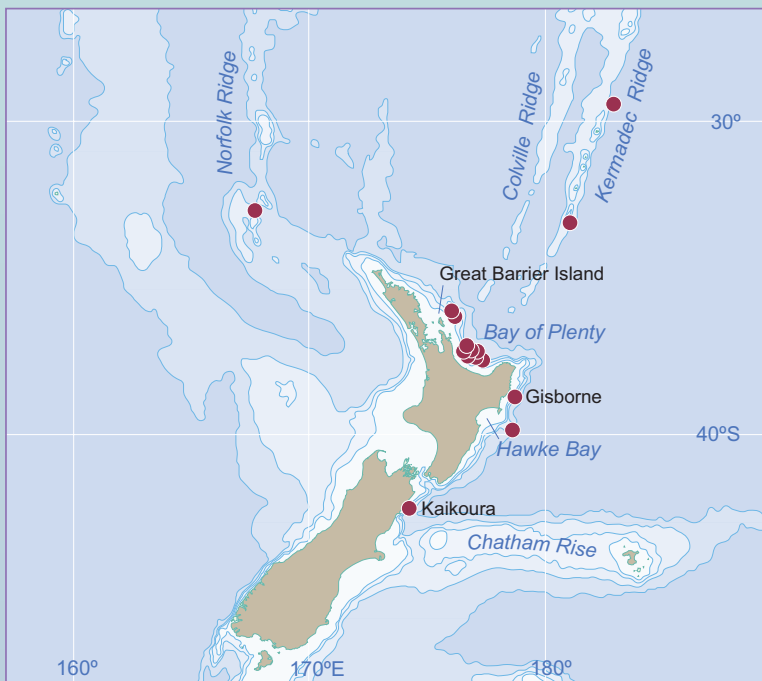
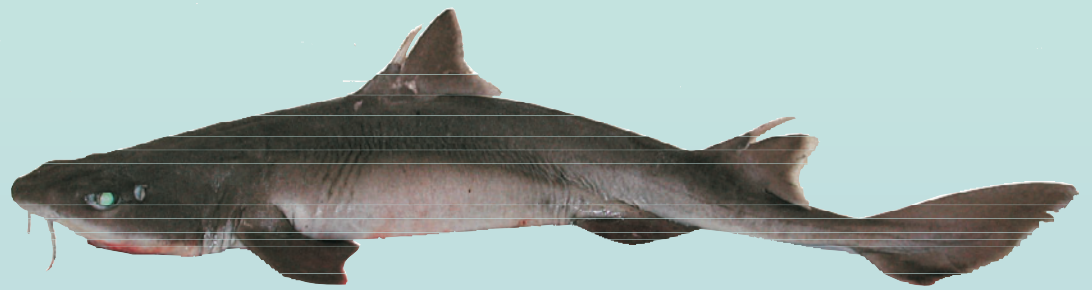


Distribution and biology of the Mandarin dogfish in New Zealand waters

The Mandarin dogfish (*Cirrbigaleus barbifer*) is little-known but widely distributed in the Indo-West Pacific Ocean. Its IUCN Red List Assessment is: near threatened. The species occurs on the outer continental shelf and uppermost continental and insular slopes between about 100 and 600 m depth. It appears to be naturally rare throughout its range. Literature accounts refer to about 18 specimens, of which about 7 have been reported from Japan.



Distribution in the Indo-Pacific region

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Here we provide 18 New Zealand records.

- The Museum of New Zealand *Te Papa Tongarewa*, Wellington, holds 14 specimens (excluding embryos): 11 were previously unreported.
- The Edward Percival Field Station, University of Canterbury, Kaikoura has one specimen in its reference collection.
- One specimen of unknown size and sex was reported off Gisborne, east coast North Island, in a recreational fishing magazine. Identification was confirmed by a photograph accompanying the report.
- We examined a pregnant female of 120 cm total length (TL) and a 115 cm TL female, both caught off Great Barrier Island, northeast North Island in 2003.

Habitat

Most captures were reportedly from steeply shelving, possibly rocky parts of the upper slope and oceanic ridges. This apparent habitat preference is reflected in the method of capture:

- 1 in a midwater research trawl (5%)
- 1 by a recreational angler (5%)
- 3 in bottom-set gill nets (17%)
- 9 taken on droplines or bottom-set longlines (50%) set for hapuka, bass and bluenose (these three fish species are large semi-pelagic teleosts, normally associated with rocky ground on the outer shelf and upper continental slope)
- No capture method information was available for the remaining 4 specimens (22%)

Capture depths ranged from 91 to 508 m (mean \pm SE = 300 ± 45.5 m, $n=10$). The trawled specimen was taken between 490 and 508 m (43 - 357 m above the bottom). The only other fish taken in that trawl were five large bluenose.

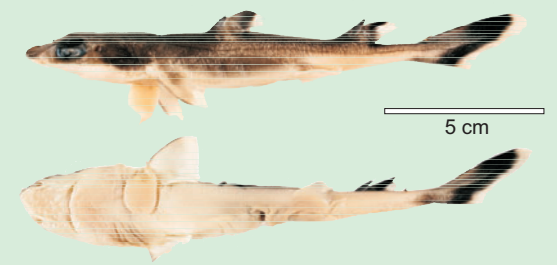
Biology

Size

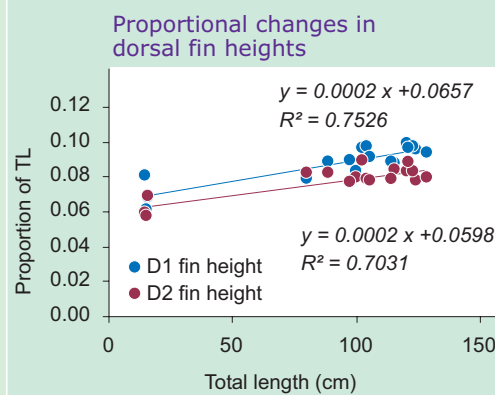
Females ranged from 87.5 to 127.7 cm TL, and males from 78.8 to 103.5 cm TL. Size at maturity for females was between 108 cm and 115 cm TL; for males it was estimated to be about 95 cm TL.

Litter size

A single litter of 10 embryos was reported from the Bay of Plenty in November 1970. 'Our' female caught off Great Barrier Island (GBI) contained 6 female embryos (3 in each uterus) ranging from 13.7 to 14.8 cm TL. All had large external yolk sacs and were not close to birth.

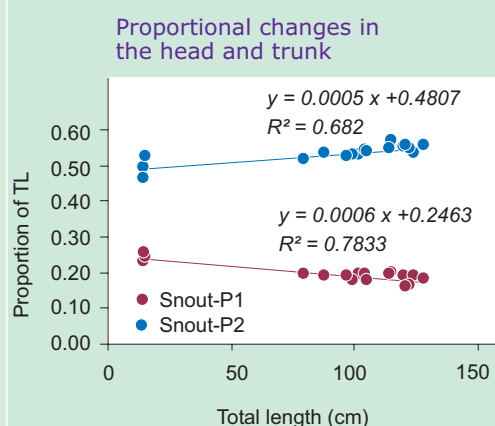


Embryo from 120 cm TL female caught off Great Barrier Island, June 2003



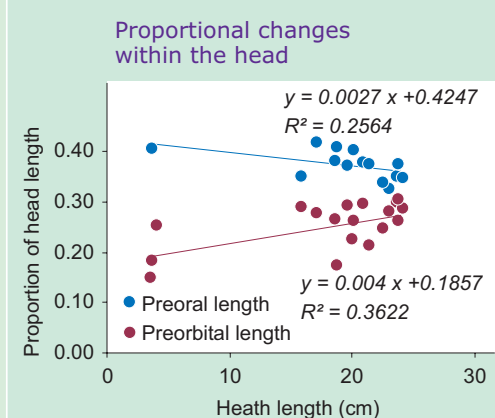
Proportions

Proportional changes with growth were generally similar to those of other squaloid dogfishes. The trunk was proportionally longer in large specimens. Within the head, the pre-oral length and orbital length tended to decrease, and pre-orbital length to increase with growth. Unlike other squaloids, the dorsal fins increased in height. In conformity with earlier reports, the distinctive nasal barbel was proportionally smaller in larger specimens.



Aging

The first dorsal spine and a section of vertebrae from beneath the first dorsal fin were collected from the 120 cm GBI female. Sectioning the vertebrae revealed no structures that could be interpreted as annuli. Our preliminary age estimate based upon counts of the bands visible on the first dorsal spine is 15-17 years.



Stomach contents

The 120 cm GBI female contained the arm of a large octopus, the 115 cm GBI female the partial remains of a large unidentified teleost. Both prey organisms were large relative to the size of the predator, and only partially consumed. These first observations of Mandarin dogfish diet confirm speculation of dietary similarity to other deepwater squaloid dogfishes.