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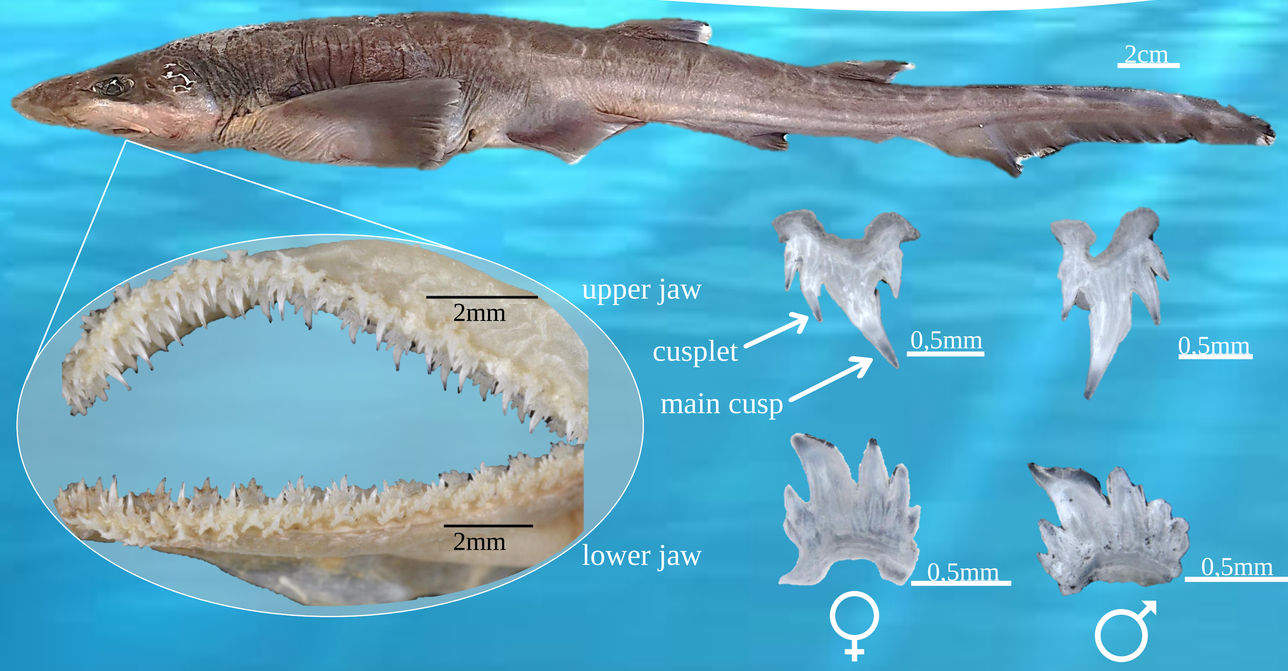
Is it all about sex?

Dental variations in the Blackmouth catshark (*Galeus melastomus*)



The goal of this study is identifying potential intraspecific morphological traits and variations in the Blackmouth catshark's teeth, which will add valuable information for the correct identification of fossil forms.

An important part of shark identification is the tooth morphology, their dentition is very specialised and reflects their feeding- and behavioural habits [1]. There is little known about the intraspecific variations in the tooth morphology for most species, and it is unknown today, whether there are intraspecific differences in tooth morphology in the Blackmouth catshark.

The *G. melastomus* is an oviparous shark quite common in Norwegian deep waters. The females are generally larger than males and can grow up to be 90cm in total length [2]. It is an opportunistic predator but feeds mostly on cephalopods, shrimps, fish and crustaceans [3].

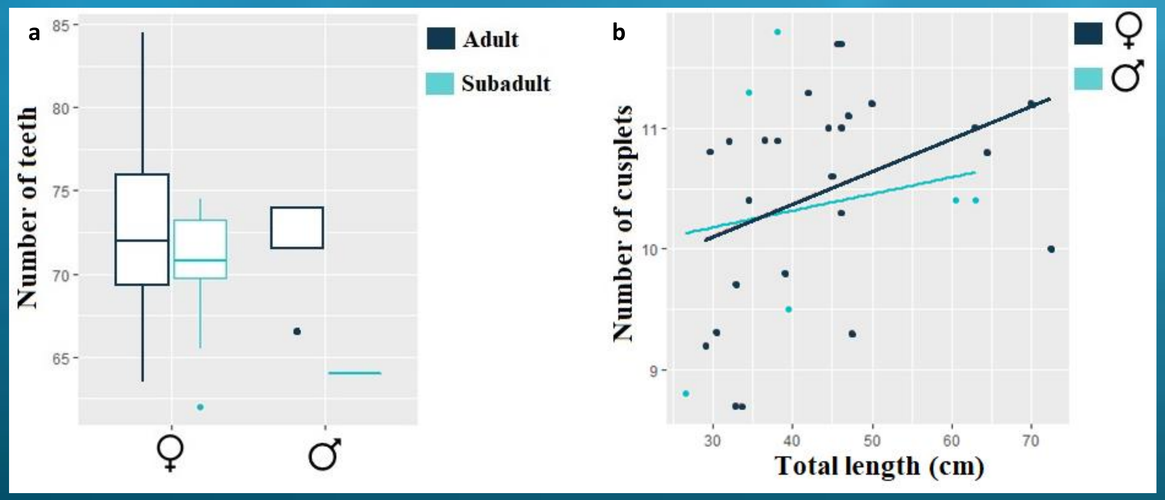


Fig. 1 Sexual and ontogenetic differences in tooth morphology and meristics in the Blackmouth catshark (*Galeus melastomus*). **a** Boxplot showing the difference in the number of teeth between sexes and ontogenetic stages. **b** Scatterplot showing the development of number of cusplets between sexes and increase in length.

Method

- Material: 6 male sharks; 1 subadult and 5 adults
  26 female sharks; 10 subadults and 16 adults.
- Data collection per specimen: Measure, photograph and identify sex
- Dissect and dry jaws
- Data collection per jaw: Count number of teeth, functional and replacement rows, series of teeth.
- Imaging: Photograph jaws
- Dissect, clean and photograph single teeth
- Data collection per tooth: count number of cusplets and measure length
- Data visualization using R [4]

Results and Discussion

- Females have more teeth than males independent of ontogenetic stage (fig.1**a**).
- Females also show a larger increase in number of cusplets (fig.1**b**).
- One explanation may be sexually different pray items, where different dentition may develop.
  Females have a larger energy demand for reproduction.
- Intraspecific dental variation may also be related to mating behaviour as it is known in some ray species and also assumed for other deep sea sharks [1].
- For checking our hypothesis, stomach content analysis will be conducted, which may reveal different pray items for each sex.

Sources:
[1] Straube, N. and Pollerspöck, J. (2020) 'Intraspecific dental variations in the deep-sea shark Etmopterus spinax and their significance in the fossil record', *Zoomorphology*. , 139(4), pp. 483–491. doi: 10.1007/s00435-020-00503-3.
[2] *Galeus melastomus* | *Shark-References* (no date). Available at: https://www.shark-references.com/species/view/Galeus-melastomus (Accessed: 30 April 2021).
[3] Anastasopoulou, A. *et al.* (2013) 'Diet and feeding strategy of blackmouth catshark Galeus melastomus', *Journal of Fish Biology*. Blackwell Publishing Ltd, pp. 1637–1655. doi: 10.1111/jfb.12269.
[4] R Core Team (2021). R: A language and environment for statistical computing. R Foundation for Statistical. Computing, Vienna, Austria. URL https://www.R-project.org/.

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