

Project information

Keywords

Red king crab, aging

Project title

Direct age determination in crustaceans: validation of periodicity of age bands in Barents Sea red king crabs

Year

2015

Project leader

Bodil Bluhm

Participants

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Letter of support from: Jan Sundet, Ann Merete Hjelset (IMR)

Flagship

Fjord and Coast

Funding Source

FRAM Fjord and Coast Flagship, UiT (BFE, Arctic and Marine Biology), APN

Summary of Results

Three year summary

In year 1 of this Fram Center project we were able to confirm that age bands are present in snow and king crabs from Norwegian waters. In the second project year (ongoing) we tested if growth lines in live red king crab from Porsangerfjord are laid down annually (and are not related to molting events). We also began to build a growth curve. For the third and final year of this project we proposed: (1) to build a solid growth curve for red king crab from the Porsangerfjord by increasing our sample size, and (2) to prepare a publication of our results for a peer-reviewed journal.

Ongoing project year (year 2 of project):

To confirm that the bands we found in gastric mill ossicles of snow and red king crab in project year 1 are annual we stained approximately 70 male red king crabs between January and March 2015, and sacrificed them between January and September. Body size was measured and whole crab stomachs were dissected and preserved in a mixture of glycerol, ethanol and water. At the University of New Brunswick zygo-cardiac ossicles were sectioned, embedded in epoxy resin, and serial sections prepared with a diamond-bladed Isomet saw. These were mounted on a microscope slide, polished by hand and viewed with transmitted light at 10x–40x magnification. Age bands were counted from digital images. Molts were checked and indeed appeared to be missing some of the gastric mill ossicles, namely those where age bands were found, suggesting these ossicles get retained in the crab stomach during molt. We have processed about 35 crab so far, ranging in size from just under 40 mm to just over 160 mm carapace length. Ages based on band reads of these crabs range from 2 to 8 years. An example is given in Figure 1 where the left image shows age bands in a section of a zygo-cardiac ossicle in the gastric mill of a red king crab with four age bands (combination of light and dark band makes one likely annual band), marked by green circles and the right images shows the same section under fluorescent light where the calcein-mark in the outer (growing) edge of the endocuticle is stained.



For the Management

Accurate age information is important for stock management of red king crab and other commercial crustaceans in terms of determining quotas. Our study will help confirm or correct age information currently derived from crab sizes.

Published Results/Planned Publications

A publication is planned for year 3 (last year) of the project, pending FRAM funding. A proposal was submitted earlier this month.

Communicated Results

The results were presented at the researcher meeting of the Fjord and Coast Flagship, 9 November 2015 in Tromsø.

Interdisciplinary Cooperation

Project partners include biologists, oceanographers and fisheries researchers. We collaborate with IMR, and the results can be used by their stock assessment team.

Budget in accordance to results

Yes

Could results from the project be subject for any commercial utilization

No

Conclusions

Our preliminary data suggest that age lines are not related to molting and that crabs deposit one line a year. The ages of the analysed crabs from Porsangerfjorden appear to confirm previously established growth curves, but we need to compile more information to confirm or correct this conclusion.