

BIPOLAR SEX RATIO STUDY REVEALS A DECADE OF REPRODUCTIVE ABNORMALITIES IN ARCTIC OSTRACODS



Emily Y. Chen, Katarzyna Błachowiak Samołyk, Emilia Trudnowska
Institute of Oceanology, Polish Academy of Sciences



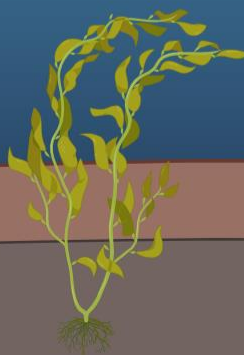
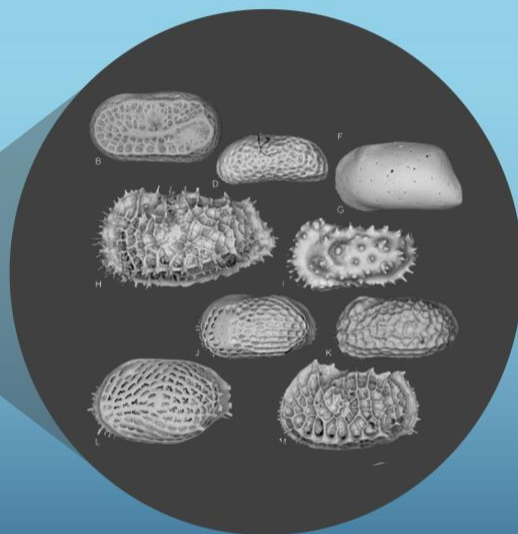
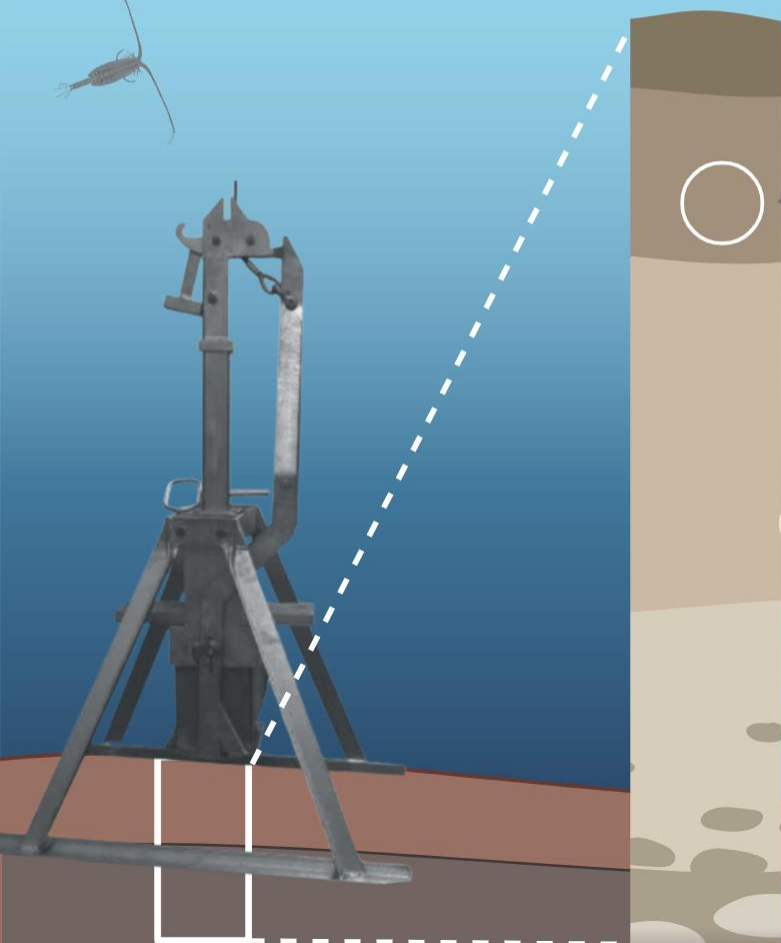
Centre
for Polar
Studies

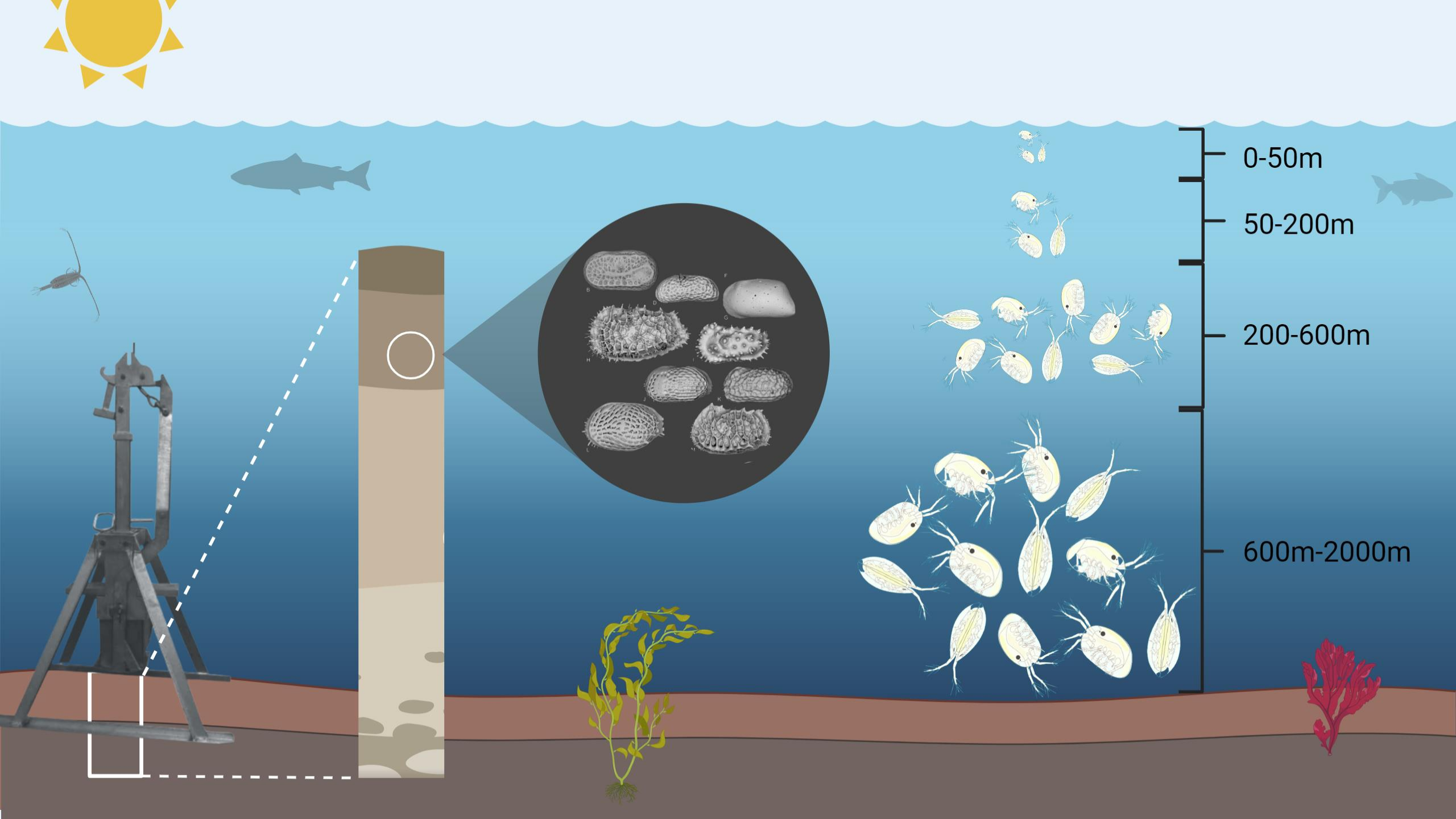


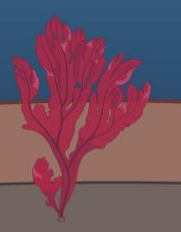
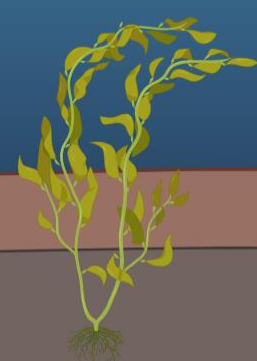
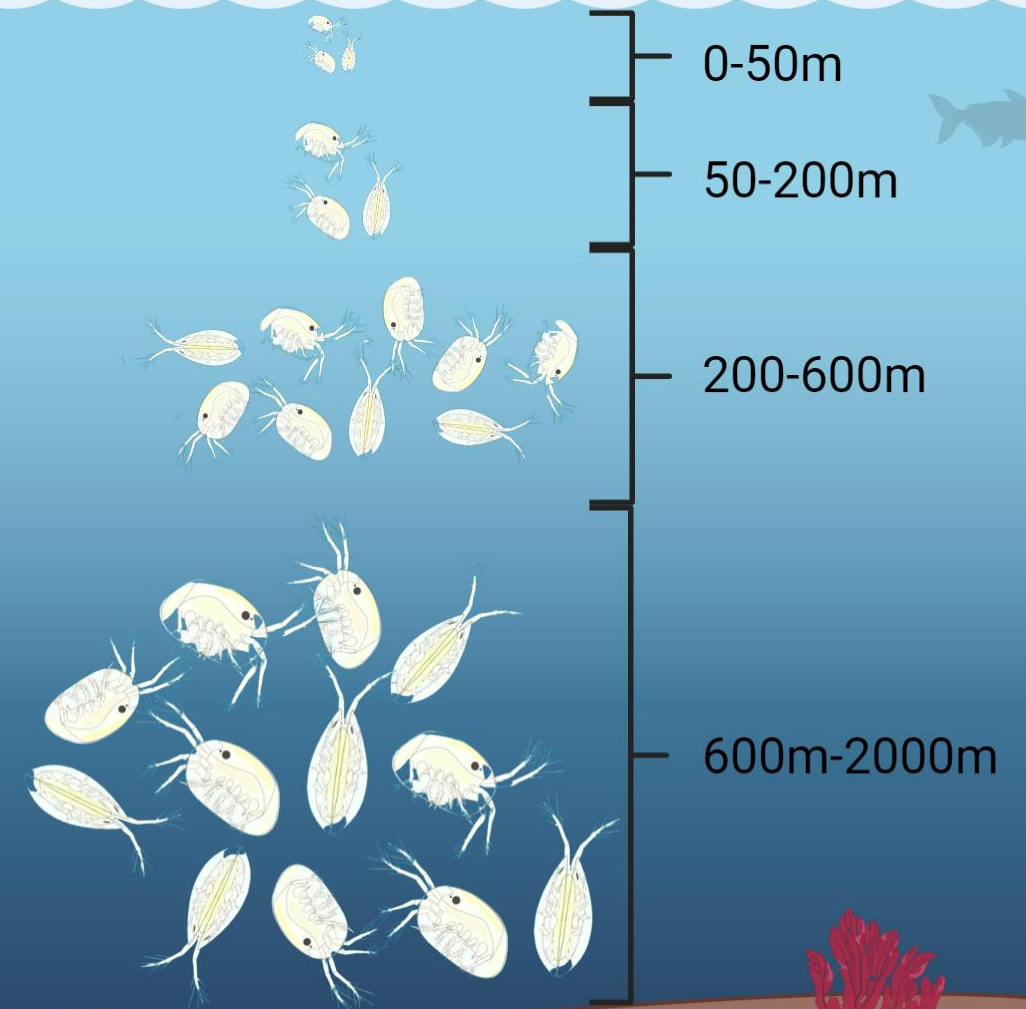
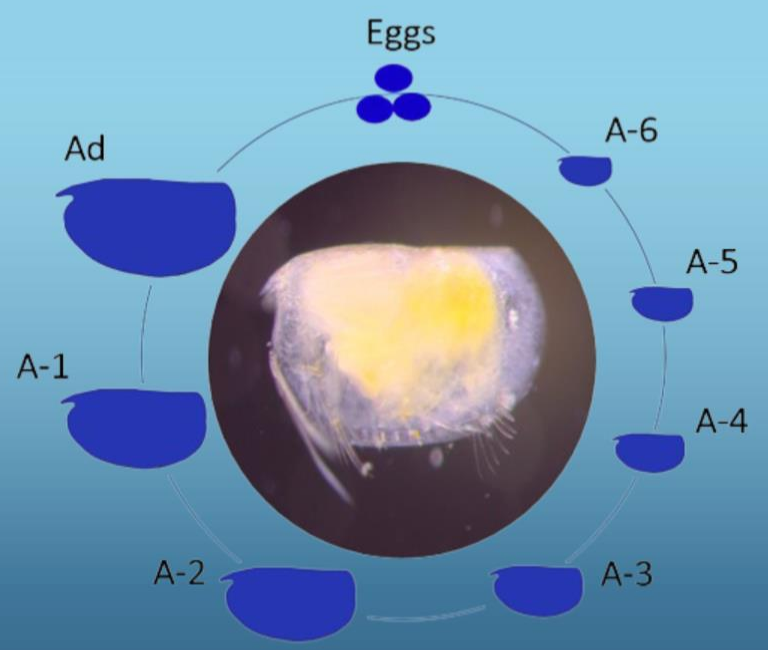
Centrum
Studiów
Polarnych



UNIVERSITY OF SILESIA
IN KATOWICE







Sexually Dimorphic

FEMALE

Boroecia maxima



Discoconchoecia elegans



Obtusoecia obtusata



Boroecia borealis



MALE

Boroecia maxima



Discoconchoecia elegans



Obtusoecia obtusata



Boroecia borealis



Sexually Dimorphic

FEMALE

Boroecia maxima



Discoconchoecia elegans



Obtusoecia obtusata



Boroecia borealis



MALE

Boroecia maxima



Discoconchoecia elegans



Obtusoecia obtusata



Boroecia borealis





Search NCBI

Orthoconchoecia striola AND COI



Search

No results (1 error)

Arctic





Search NCBI

Orthoconchoecia striola AND COI



Search

No results



Search NCBI

Proceroecia vityazi AND COI



Search

No results (1 error)

Arctic





National Library of Medicine
National Center for Biotechnology Information

Search NCBI

Orthoconchoecia striola AND COI



Search

No results



National Library of Medicine
National Center for Biotechnology Information

Search NCBI

Proceroecia vityazi AND COI



Search

No results



National Library of Medicine
National Center for Biotechnology Information

Search NCBI

Obtusoecia obtusata AND COI



Search

No results

Arctic





National Library of Medicine

National Center for Biotechnology Information

Search NCBI

Orthoconchoecia striola AND COI



Search

No results



National Library of Medicine

National Center for Biotechnology Information

Search NCBI

Proceroecia vityazi AND COI



Search

No results



National Library of Medicine

National Center for Biotechnology Information

Search NCBI

Obtusoecia obtusata AND COI



Search

No results



National Library of Medicine

National Center for Biotechnology Information

Search NCBI

Bathyconchoecia arctica AND COI



Search

No results

Arctic





Search NCBI

Gaussicia gaussi AND COI



Search

No results (1 error)

Antarctic





Search NCBI

Gaussicia gaussi AND COI



Search

No results



Search NCBI

Bathyconchoecia lacunosa AND COI



Search

No results (2 errors)

Antarctic





National Library of Medicine
National Center for Biotechnology Information

Search NCBI

Gaussicia gaussi AND COI



Search

No results



National Library of Medicine
National Center for Biotechnology Information

Search NCBI

Bathyconchoecia lacunosa AND COI



Search

No results



National Library of Medicine
National Center for Biotechnology Information

Search NCBI

Conchoecia parvidentata AND COI



Search

No results (1 error)

Antarctic





National Library of Medicine
National Center for Biotechnology Information

Search NCBI

Gaussicia gaussi AND COI



Search

No results



National Library of Medicine
National Center for Biotechnology Information

Search NCBI

Bathyconchoecia lacunosa AND COI



Search

No results



National Library of Medicine
National Center for Biotechnology Information

Search NCBI

Conchoecia parvidentata AND COI



Search

No results



National Library of Medicine
National Center for Biotechnology Information

Search NCBI

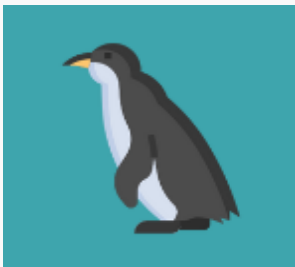
Loricoecia ctenophora AND COI



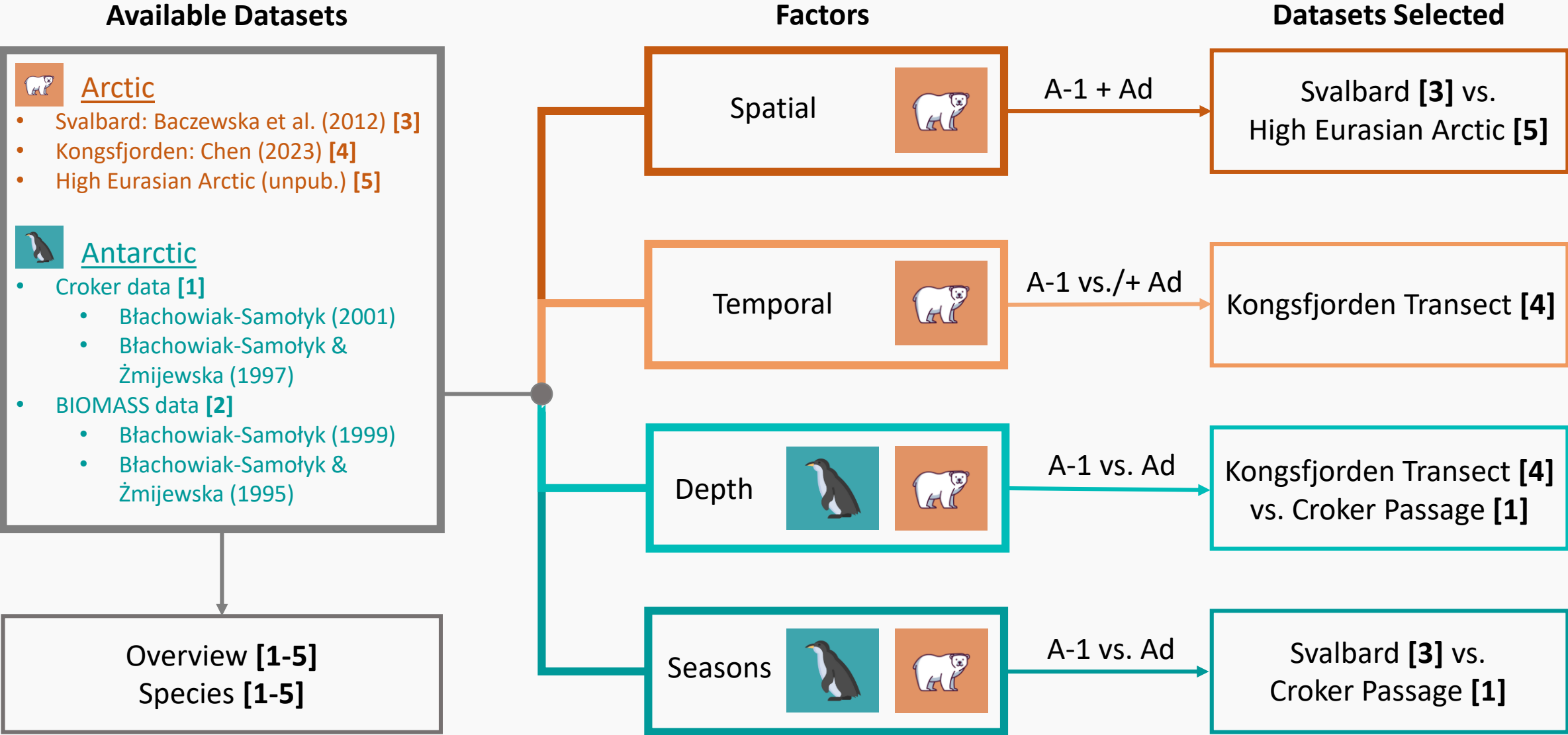
Search

No results

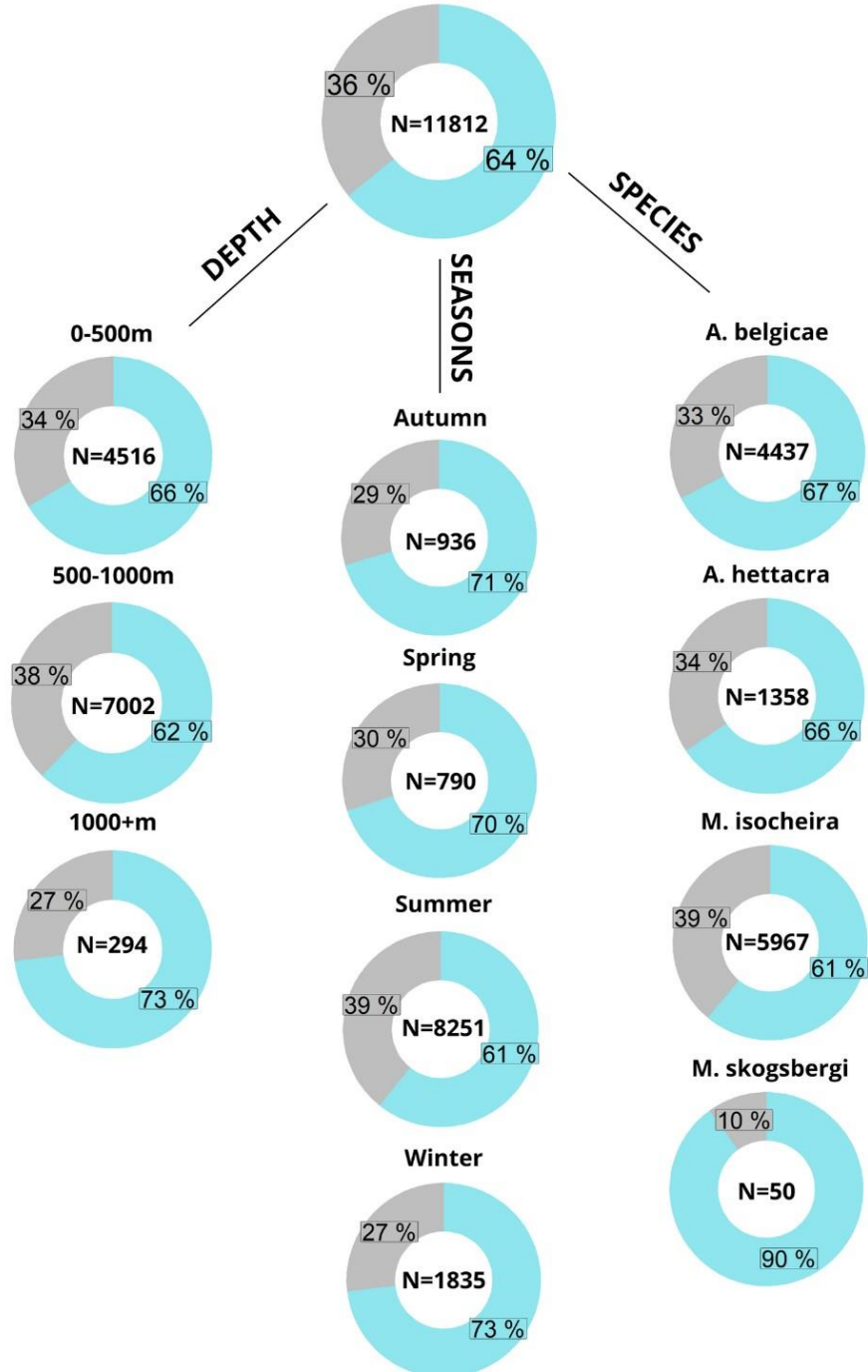
Antarctic



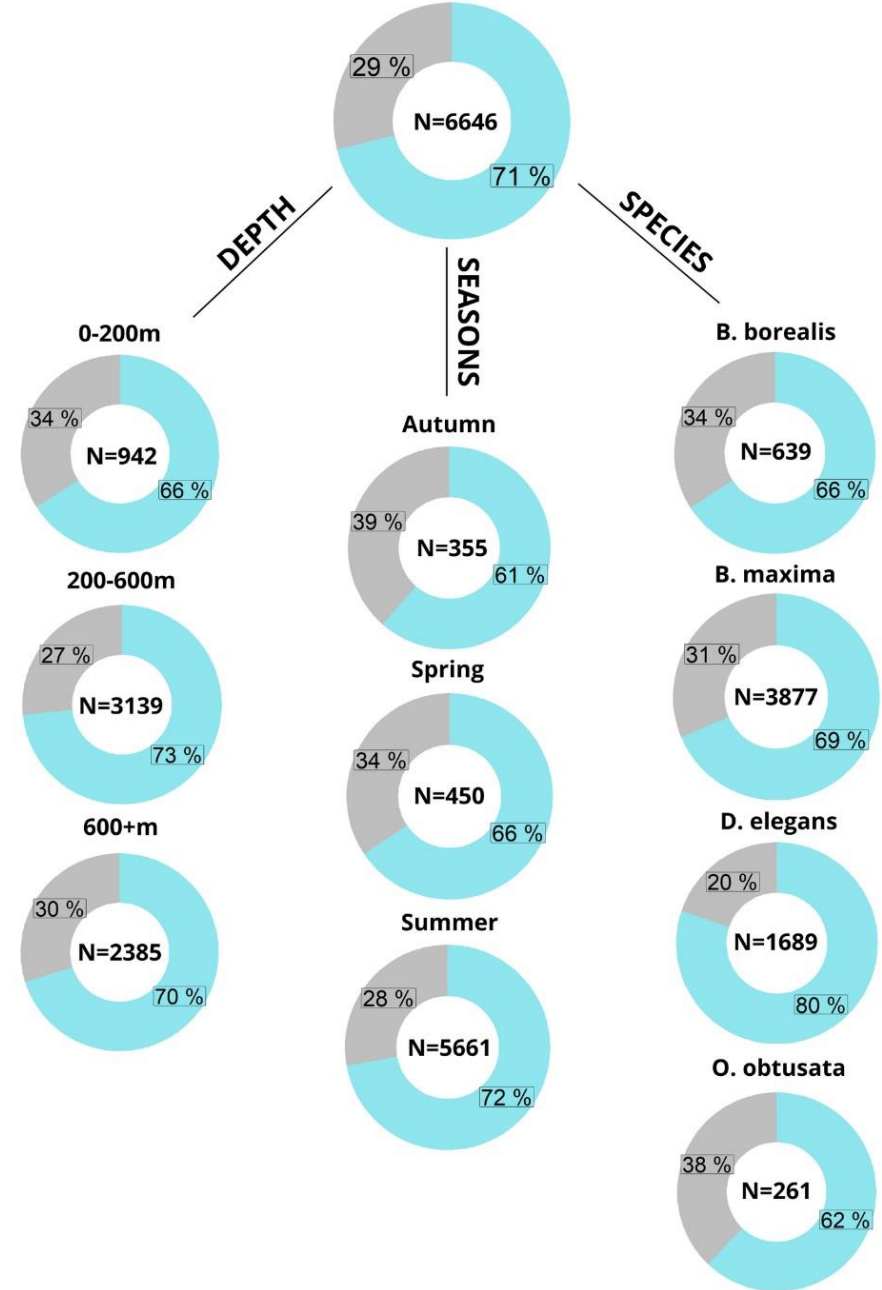
Sex Ratio of Polar Ostracods



ANTARCTIC



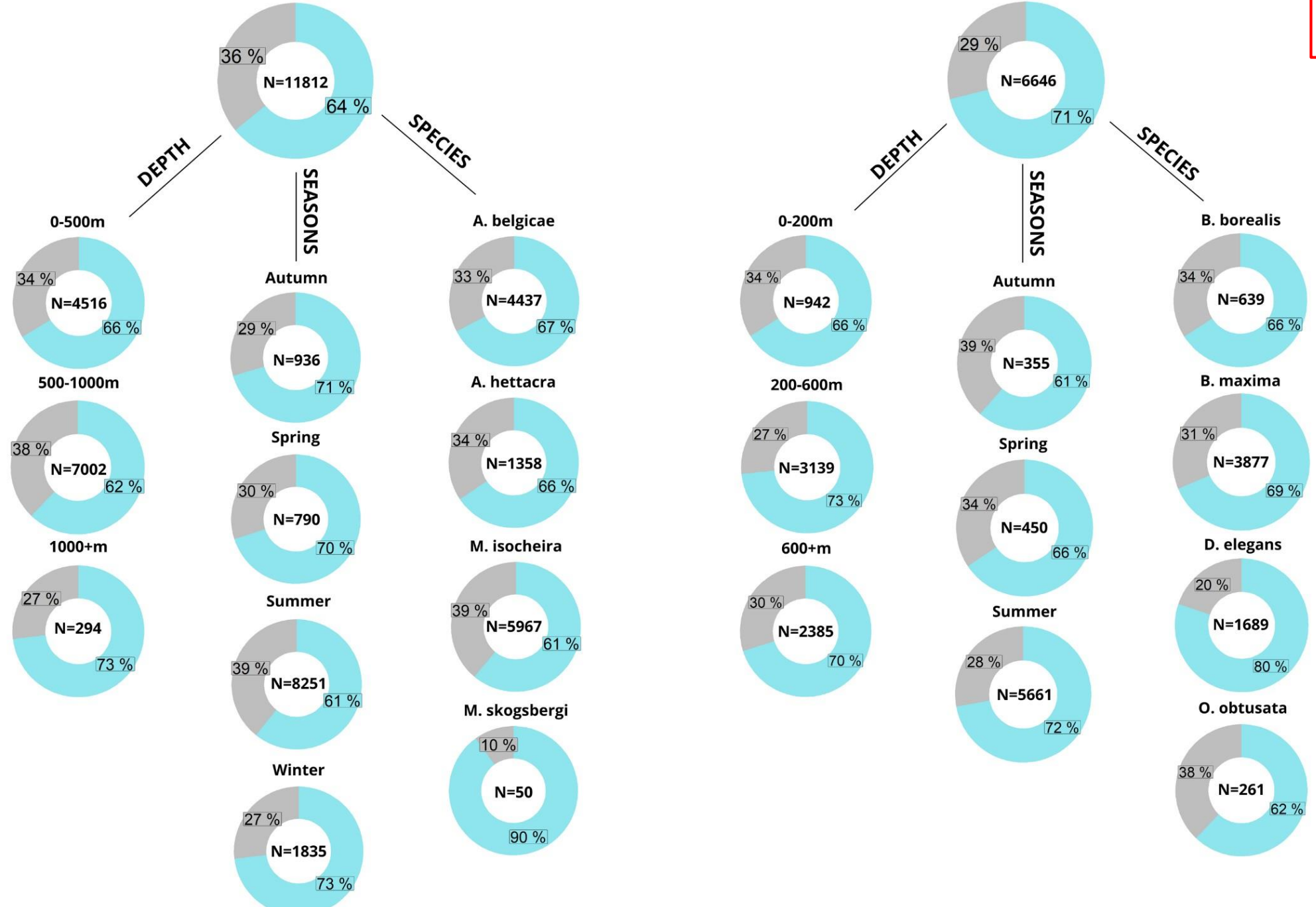
ARCTIC



ANTARCTIC

ARCTIC

60-80%

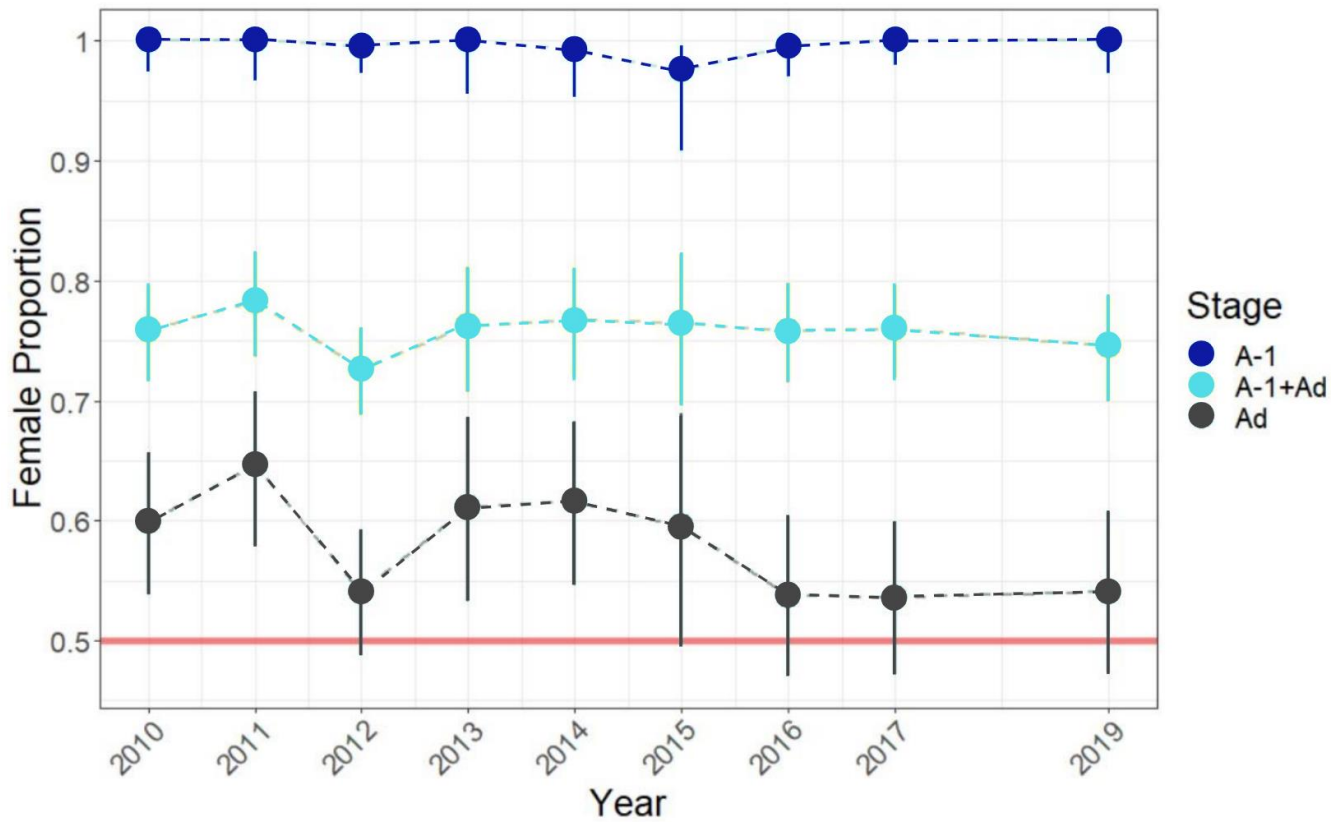
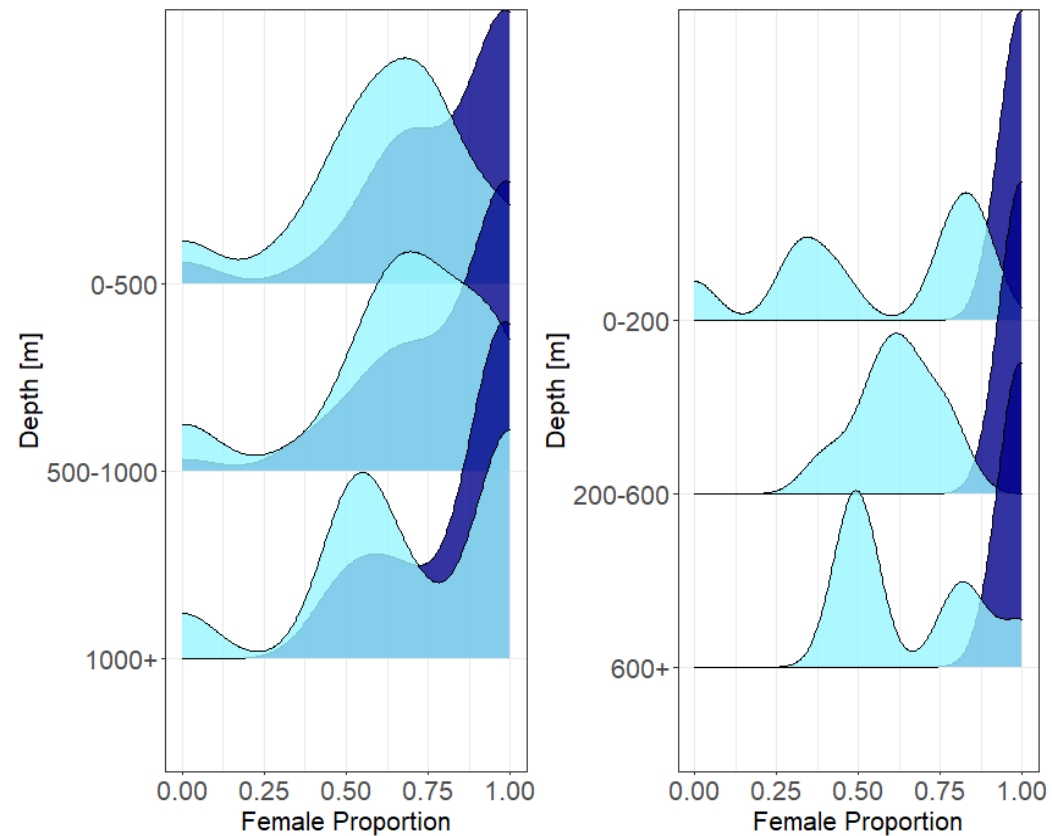


Depth

Temporal

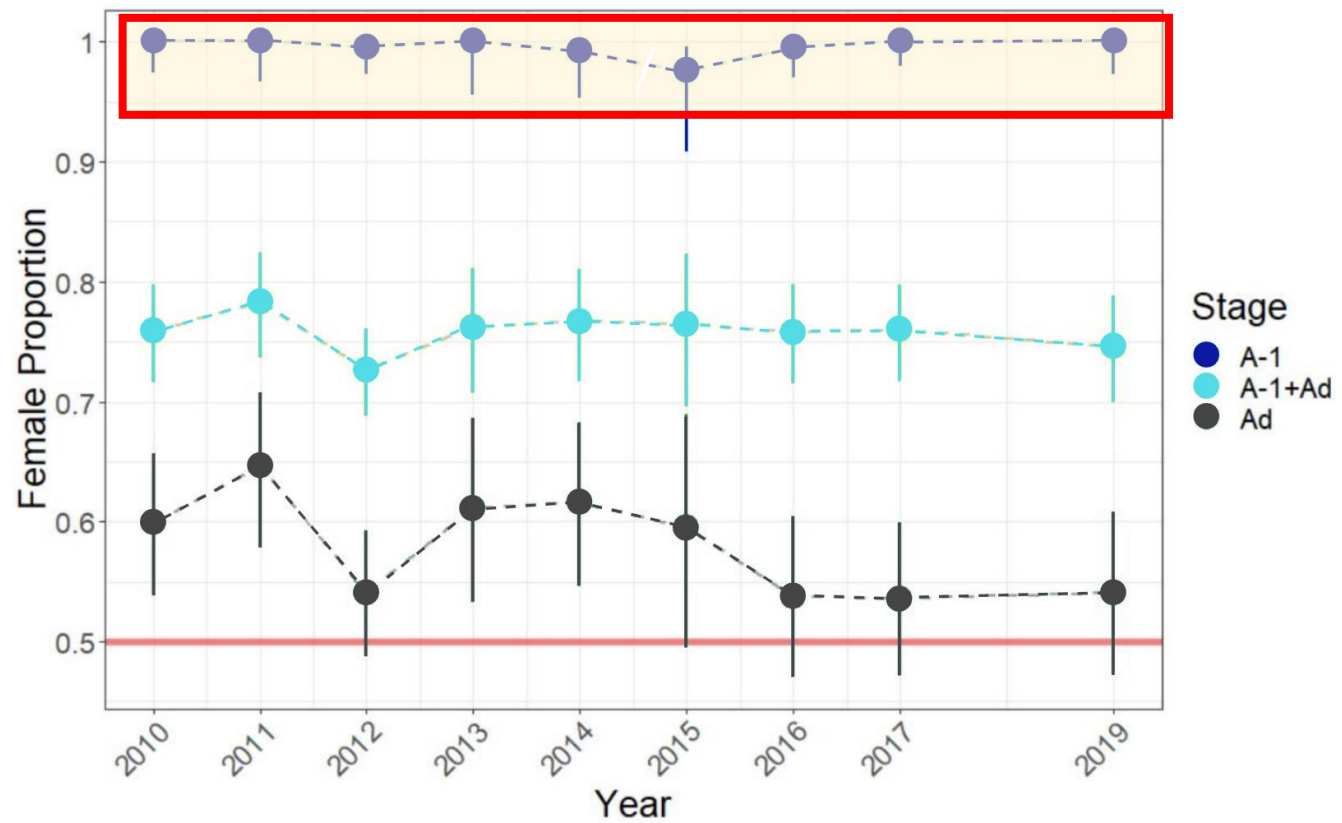
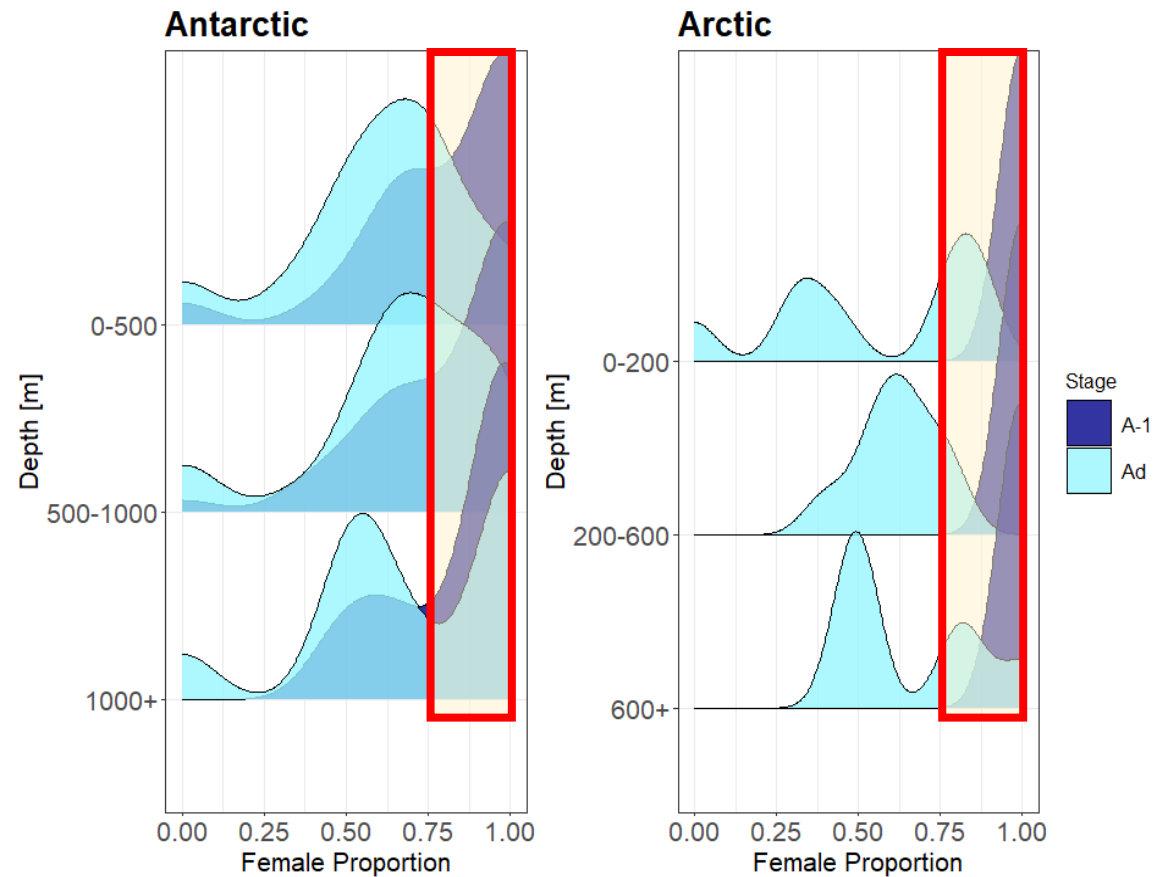
Antarctic

Arctic



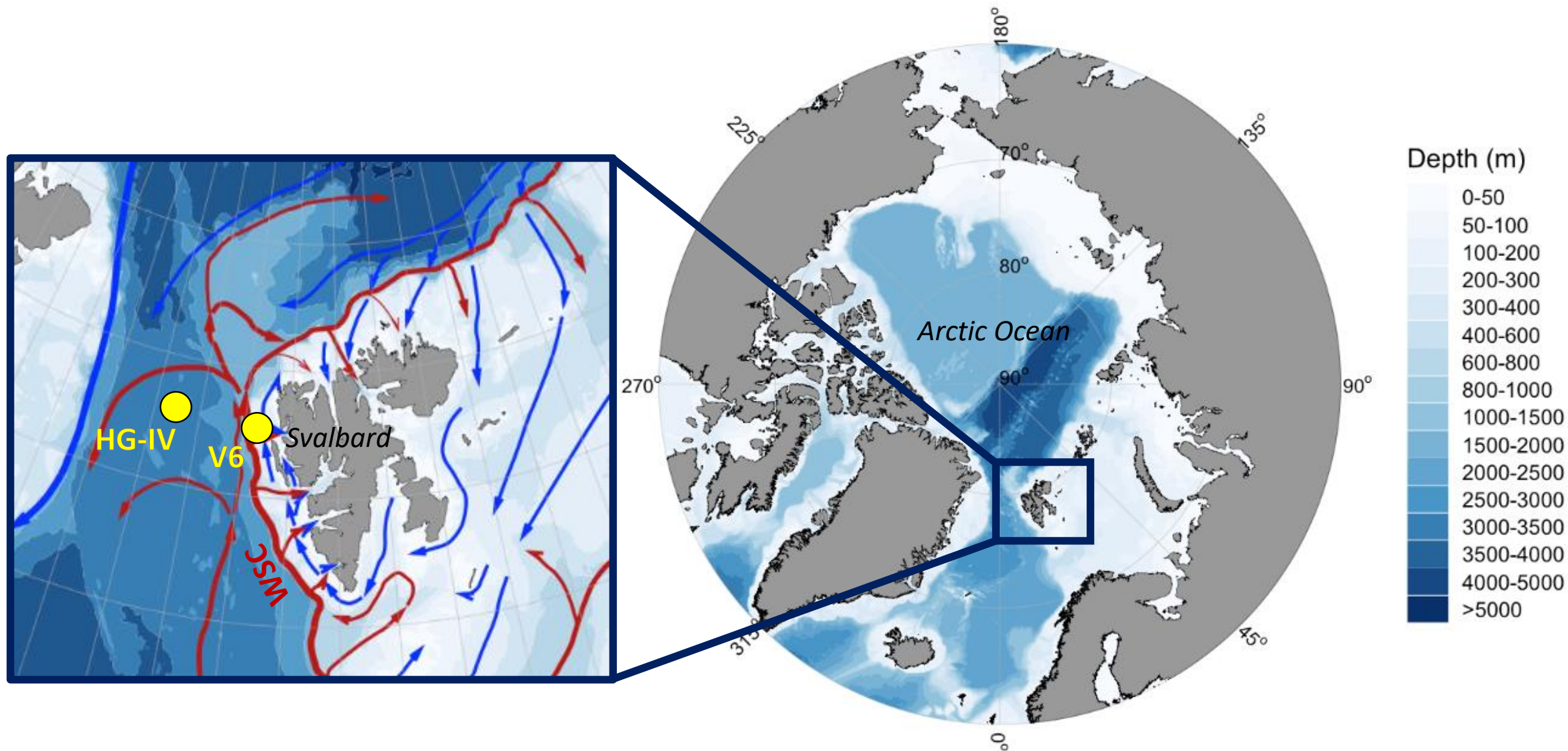
Depth

Temporal

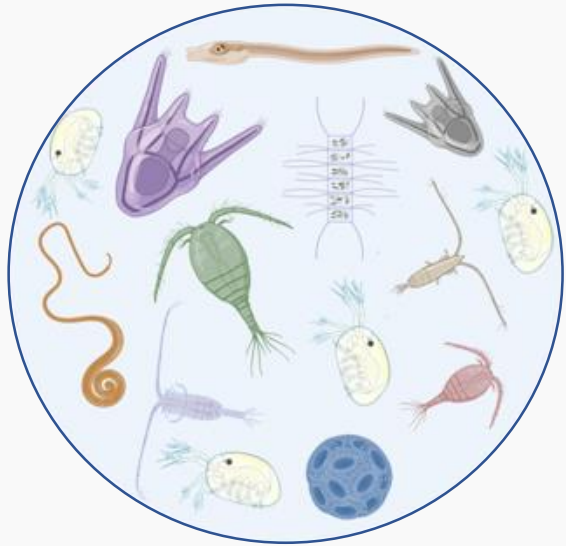


Presence of Reproductive Abnormalities

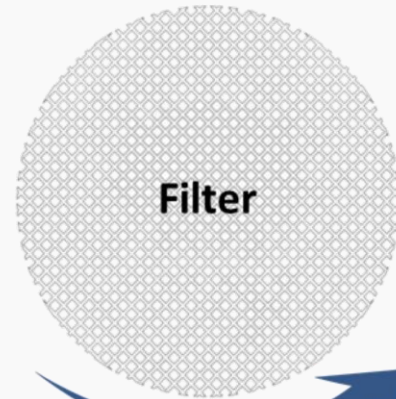
2010-2019: 0-20m, 20-50m, 50-200m, 200-600m, 600-bottom



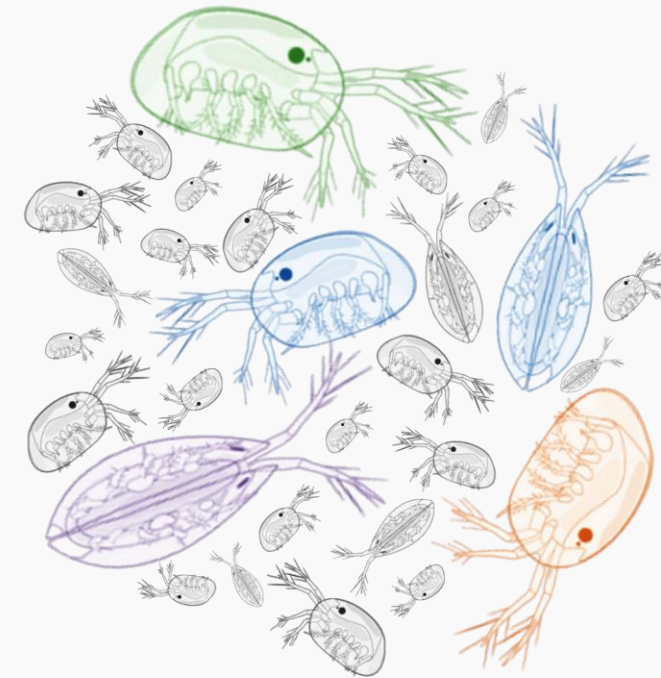
Zooplankton Sample



Ostracod Population

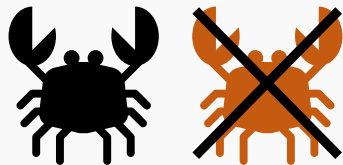


A-1 and Adults N= 4,371

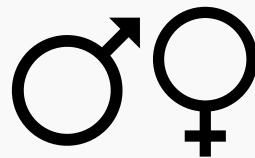


Recorded Data

Species



Sex



Life Stage



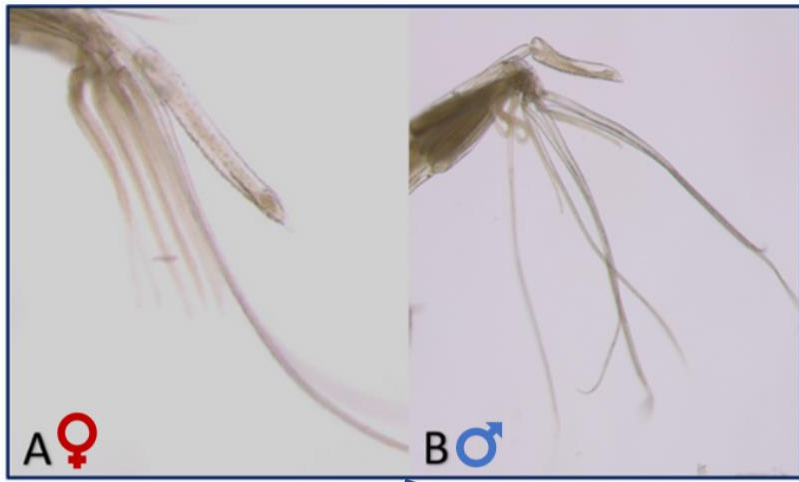
Measurements



Abnormalities

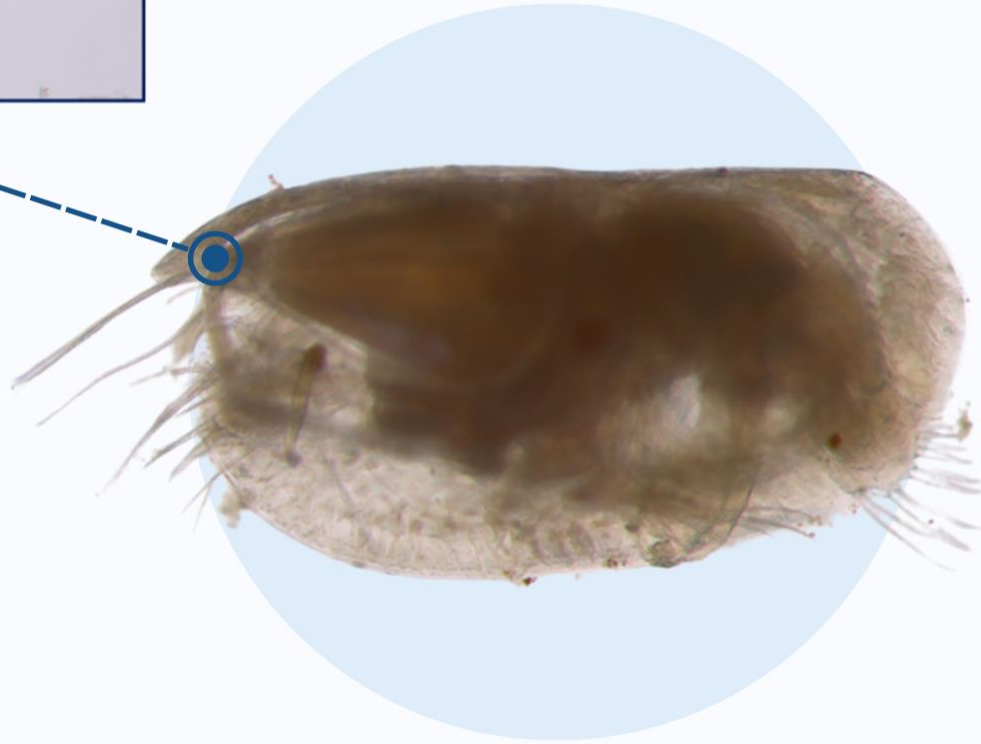






First Antenna

Sexually dimorphic frontal organ & antennules

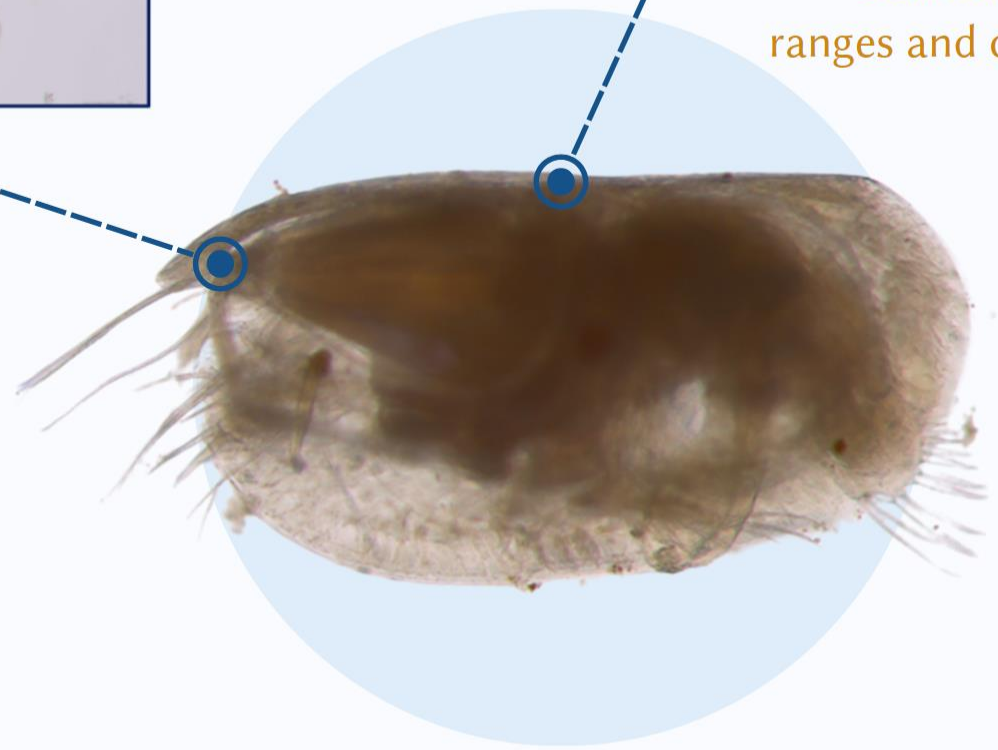




First Antenna
Sexually dimorphic frontal organ & antennules

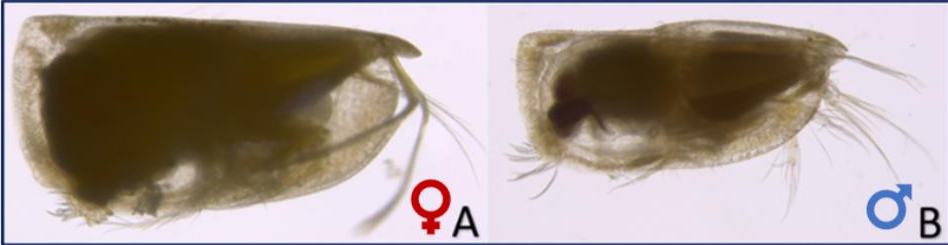


Carapace
Conservative size ranges and consistent shapes

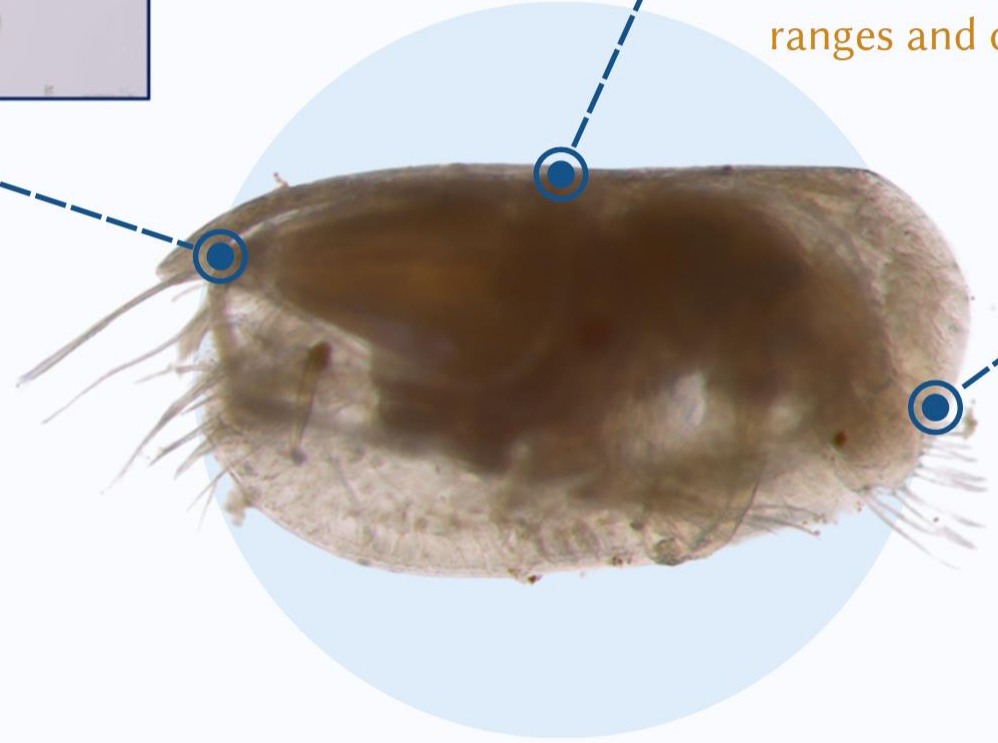




First Antenna
Sexually dimorphic frontal organ & antennules

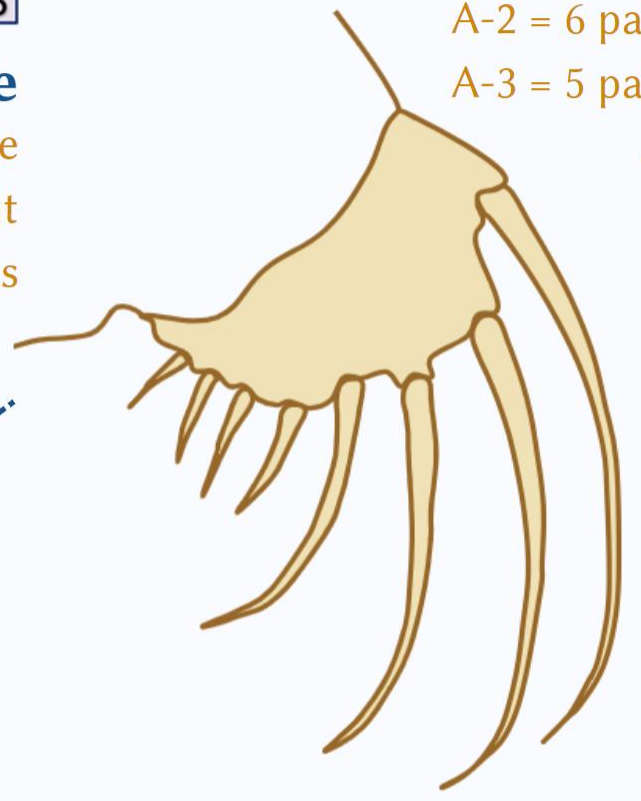


Carapace
Conservative size ranges and consistent shapes



Caudal Furca

- Adult = 8 pairs
- A-1 = 7 pairs
- A-2 = 6 pairs
- A-3 = 5 pairs
-





First Antenna

Sexually dimorphic frontal organ & antennules

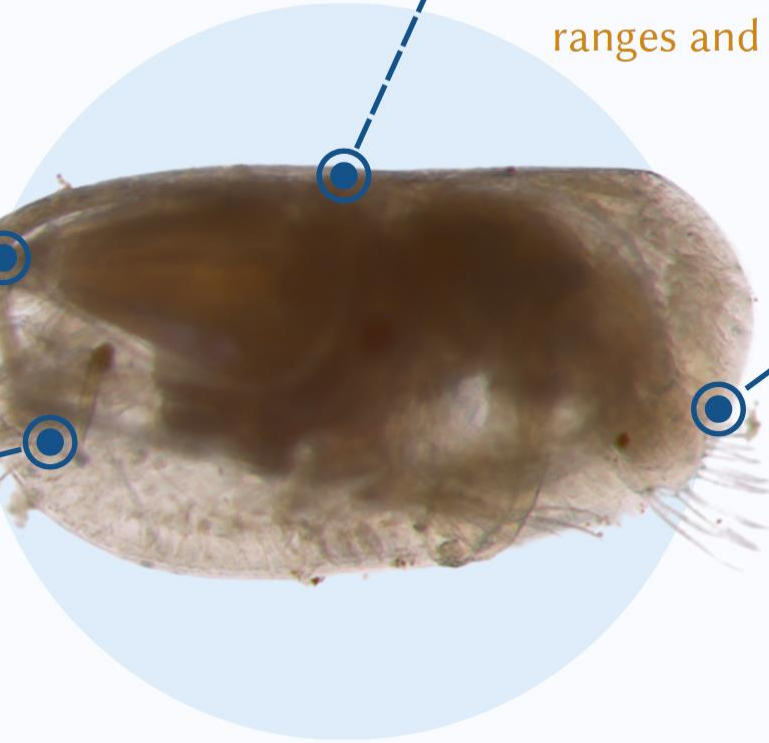
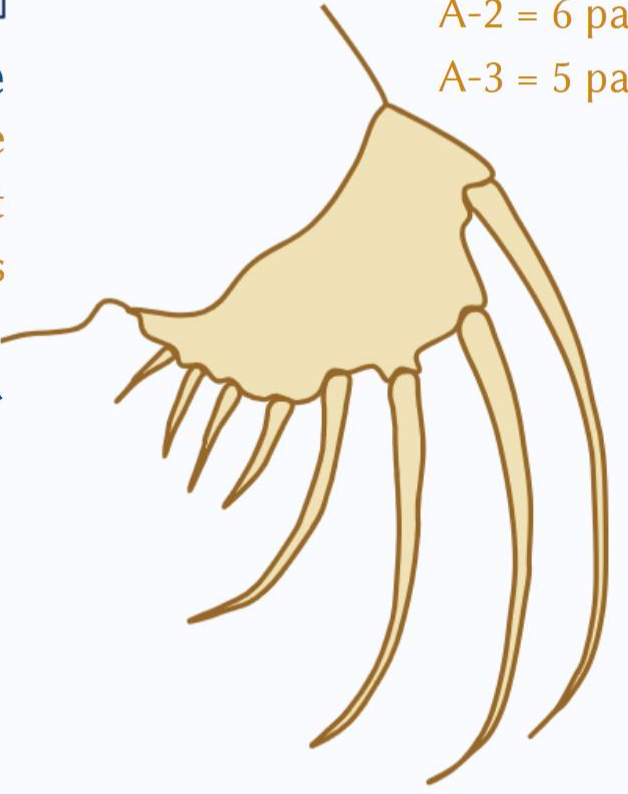


Carapace

Conservative size ranges and consistent shapes

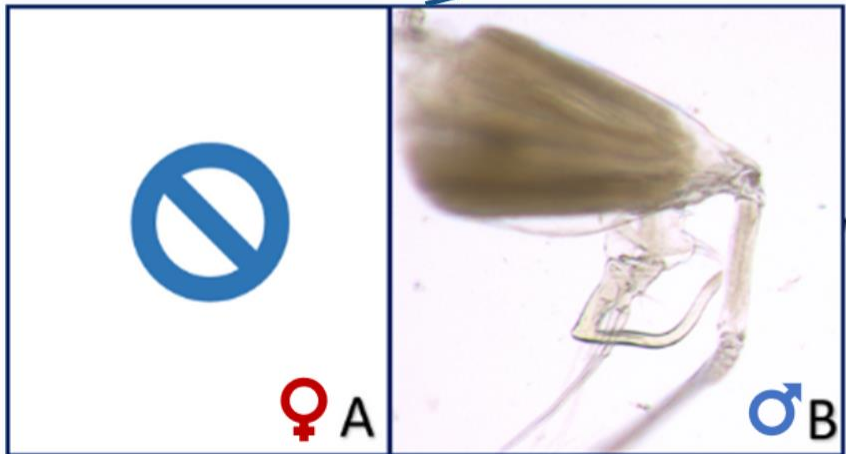
Caudal Furca

- Adult = 8 pairs
- A-1 = 7 pairs
- A-2 = 6 pairs
- A-3 = 5 pairs
-



Clasper Hook

Male-exclusive



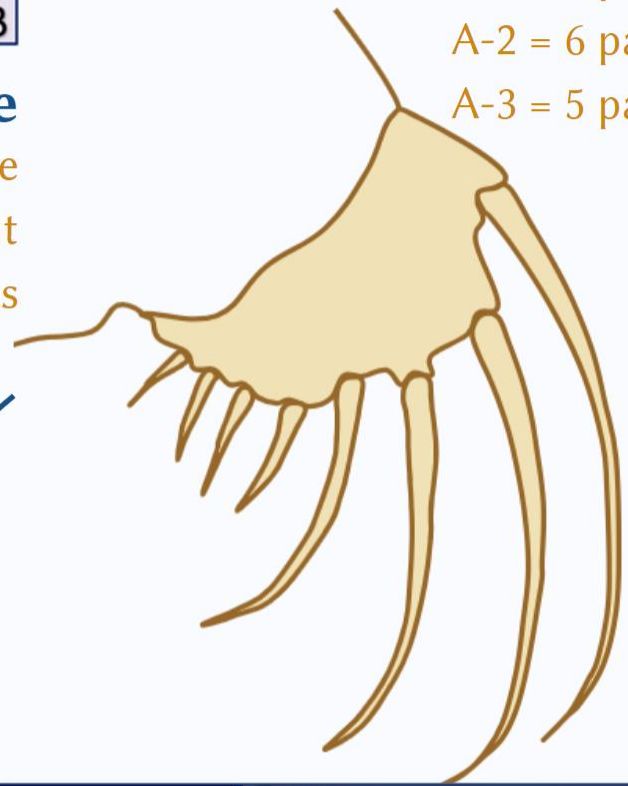


First Antenna
Sexually dimorphic frontal organ & antennules

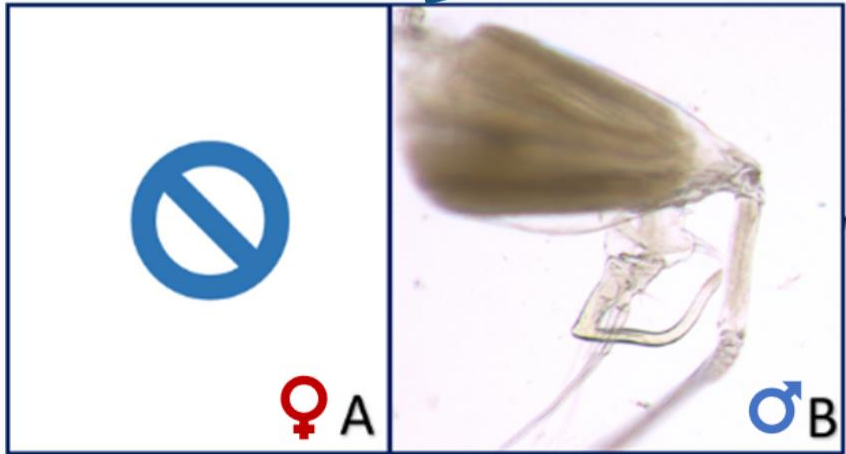


Carapace
Conservative size ranges and consistent shapes

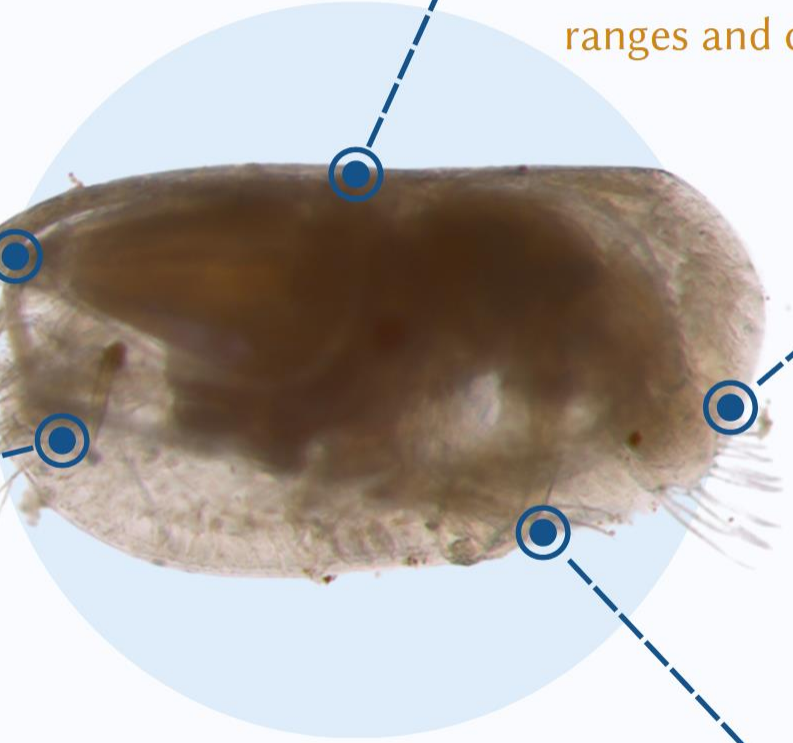
Caudal Furca
Adult = 8 pairs
A-1 = 7 pairs
A-2 = 6 pairs
A-3 = 5 pairs
.....



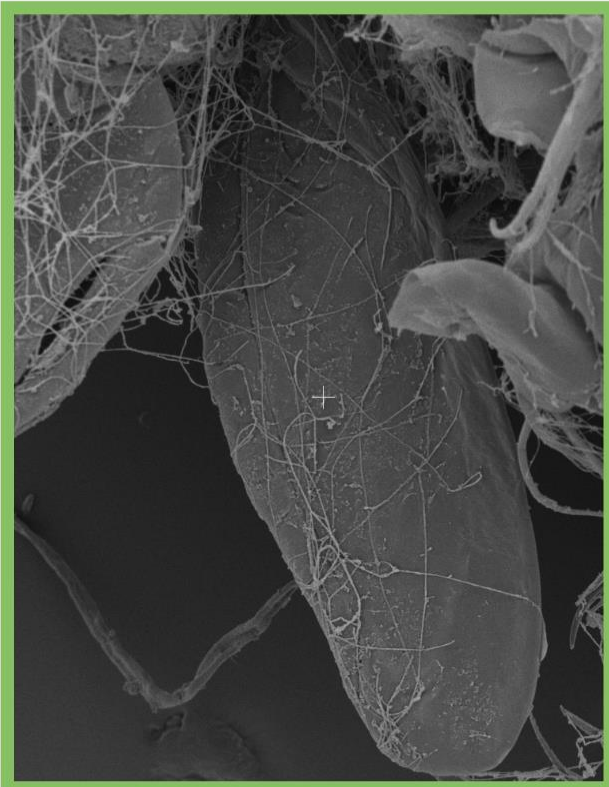
Clasper Hook
Male-exclusive



Reproductive Organ
Male-exclusive



Normal Adult Male



All Arctic Species



2010-2019



Both Locations



15%

Abnormal A-1 Females
(646 / 4,371)



Monographs



Studies/Experts



Abnormal A-1 Female



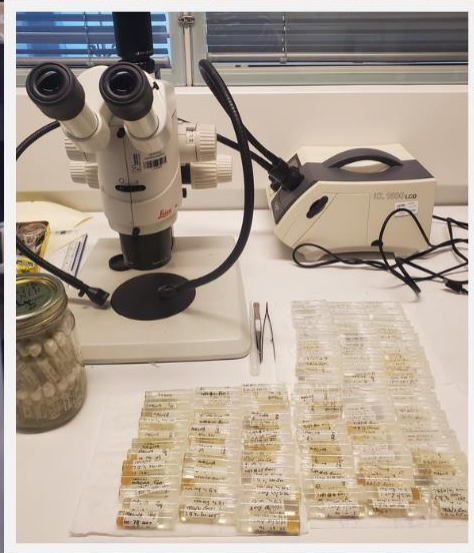


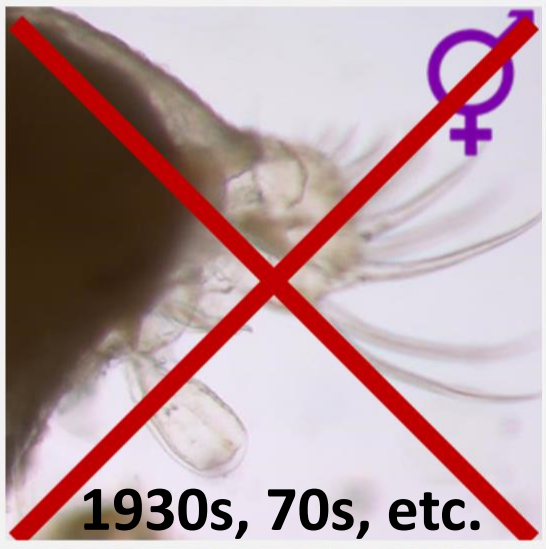
What about Antarctic ostracods...?



**NATURAL
HISTORY
MUSEUM**

What about Antarctic ostracods...?





Natural History Museum
Explore and download the Museum's research and collections data.

Data Portal
Home Datasets Search Contact About

Search **5,793,325** of the Museum's 80 million specimens. **33.9M** records **246** datasets **1.1k** authors

e.g. Homo sapiens

Specimens Collections Everything

2,331,648 Entomology **1,393,826** Zoology **1,089,718** Botany **604,984** Palaeontology **373,183** Mineralogy

Initial Database

341
(fossils)



Natural History Museum
Data Portal
Explore and download the Museum's research and collections data.

Home Datasets Search Contact About

Search **5,793,325** of the Museum's 80 million specimens.

33.9M records 246 datasets 1.1k authors

e.g. Homo sapiens

Specimens Collections Everything

2,331,648 Entomology 1,393,826 Zoology 1,089,718 Botany 604,984 Palaeontology 373,183 Mineralogy

Initial Database

341 (fossils)

Updating Database

1.6 million (wet)

Intersexuality in Aquatic Crustaceans

1



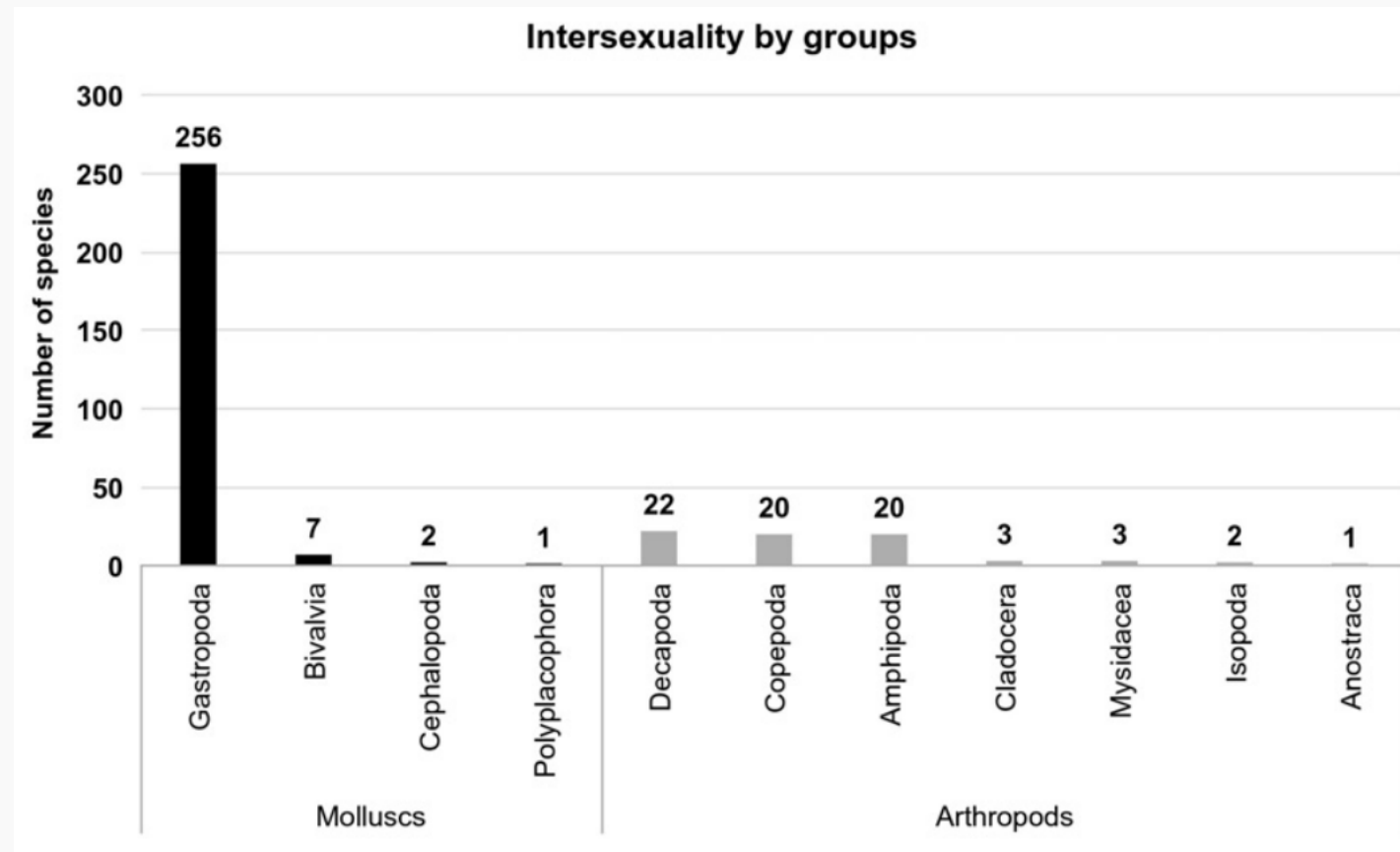
Prevalence

Mollusca: Gastropoda

(256/266 spp.)

Arthropoda: Decapoda, Copepoda,

Arthropoda (62/71 spp.)

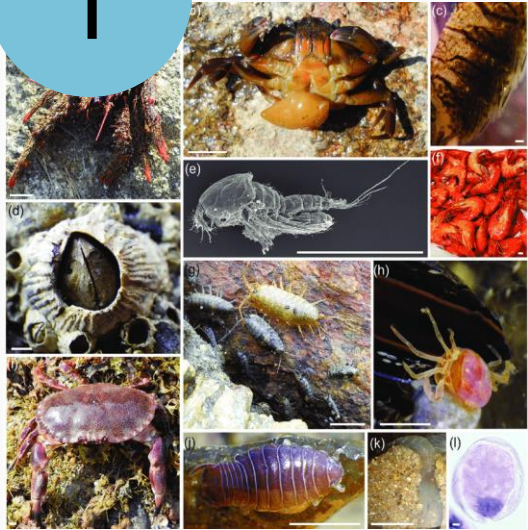


(Grilo & Rosa, 2017)

Sci of Tot Env

Intersexuality in Aquatic Crustaceans

1



Prevalence

Mollusca: Gastropoda
(256/266 spp.)

Arthropoda: Decapoda, Copepoda,
Arthropoda (62/71 spp.)

2



Causes

Environmental Contamination

Genetic Mutations

Parasitism

Intersexuality in Aquatic Crustaceans

1

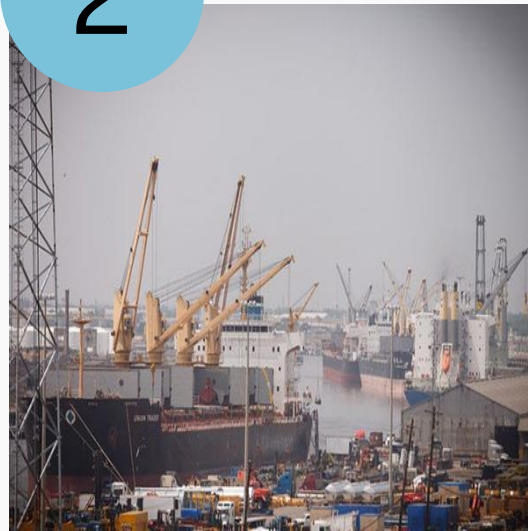


Prevalence

Mollusca: Gastropoda
(256/266 spp.)

Arthropoda: Decapoda, Copepoda,
Arthropoda (62/71 spp.)

2



Causes

Environmental Contamination
Genetic Mutations
Parasitism

3

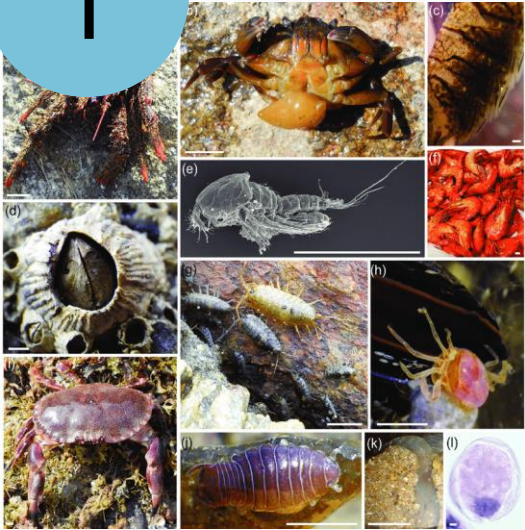


Knowledge Gaps

Experiments
Baseline Life History
Molecular Mechanism

Intersexuality in Aquatic Crustaceans

1



Prevalence

Mollusca: Gastropoda
(256/266 spp.)

Arthropoda: Decapoda, Copepoda,
Arthropoda (62/71 spp.)

2



Causes

Environmental Contamination
Genetic Mutations
Parasitism

3



Knowledge Gaps

Experiments
Baseline Life History
Molecular Mechanism

4



Consequences

Reproduction
Fitness
Population Decline



Centre for Polar Studies



Centrum Studiów Polarnych

THANK YOU



UNIVERSITY OF SILESIA
IN KATOWICE

NARODOWE
CENTRUM
NAUKI

Preludium BIS:

Bipolarity [2020/39/O/NZ8/01793]



emily@iopan.pl

