The least known may tell the best story: diversity, distribution, ecology and connectivity of deep-sea crustacean Peracarida

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4 employees
3 post-docs
1 PhD student
3 students



Small crustaceans – good model

- Peracarida: **25 000+** species
  - small (2-20 mm)
  - marine (5 orders)
  - benthic
  - cosmopolitan
  - underestimated (known < 5%)

  - coral reefs, estuaries, mat of algae, canyons,seamount, **hydrotermal vents, cold seeps**, **polymetalic nodules**...

tanaid on polymetalic nodules
Central Pacific, depth 4900 m

Small crustaceans – good model

peracarids

- Amphipoda
- Tanaidacea
- Isopoda
- Cumacea
- Mysida

- taxonomy

- ecology
- biogeography
- phylogenetic

methods

- morphology
- morphometry
- barcoding
- Sanger seq.
- NGS

CONSERVATION: Marine Protected Areas (MPA)
Vulnerable Marine Ecosystem (VME)

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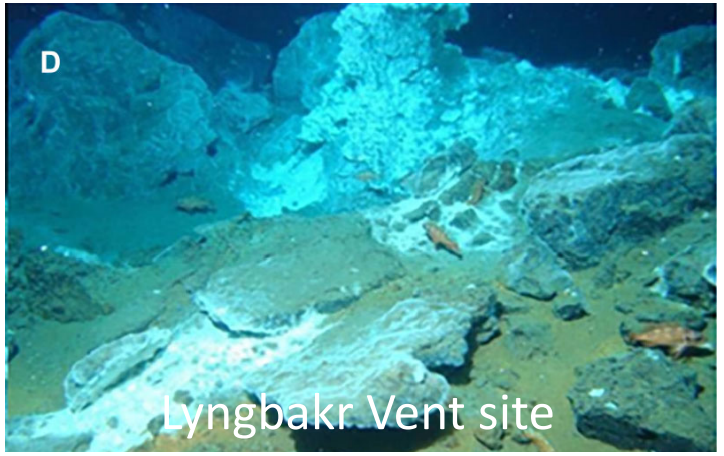
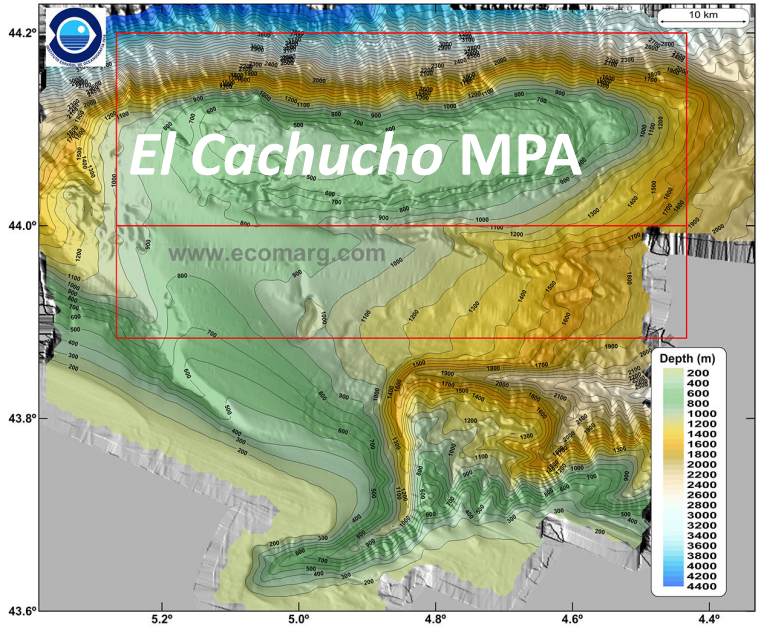
Vulnerable Marine Ecosystem (VME)

Deep-sea canyons, seamounts, and vent fields are exceptional sites hosting high abundance and diversity of Peracarida





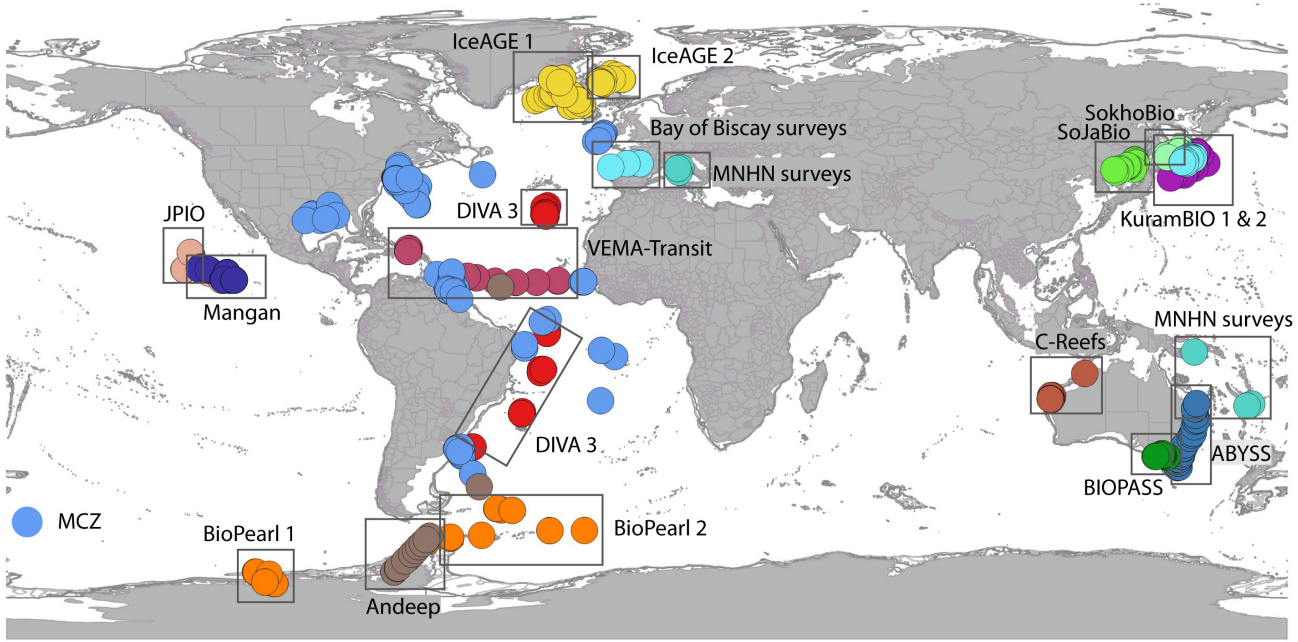
Sánchez et al. (2014), Taylor et al. (2021), www.ecomarg.com

Materials

cooperation:

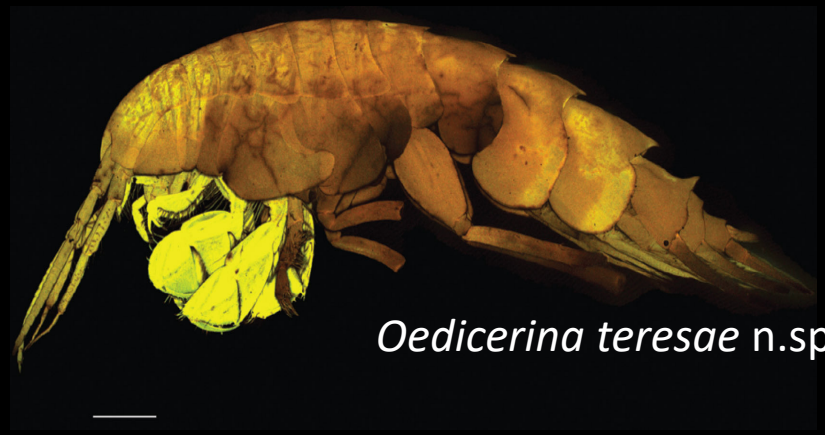
Senckenberg (Germany); Melbourne Museum (Australia); Museum of Natural History (France); Ifremer (France); Museum of Comparative Zoology (Boston, US); National Institute of Water and Atmospheric Research (New Zealand); University of Ghent (Belgium); Spanish Institute of Oceanography (Spain)

Samples collected with EBS and GKG



New taxa "factory"

Paranarthrurellidae fam. nov.



Oedicerina teresae n.sp.

3 new families
36 genera
>220 species

Typhlotanais grahami n. sp

Acanthocope galaica n. sp.

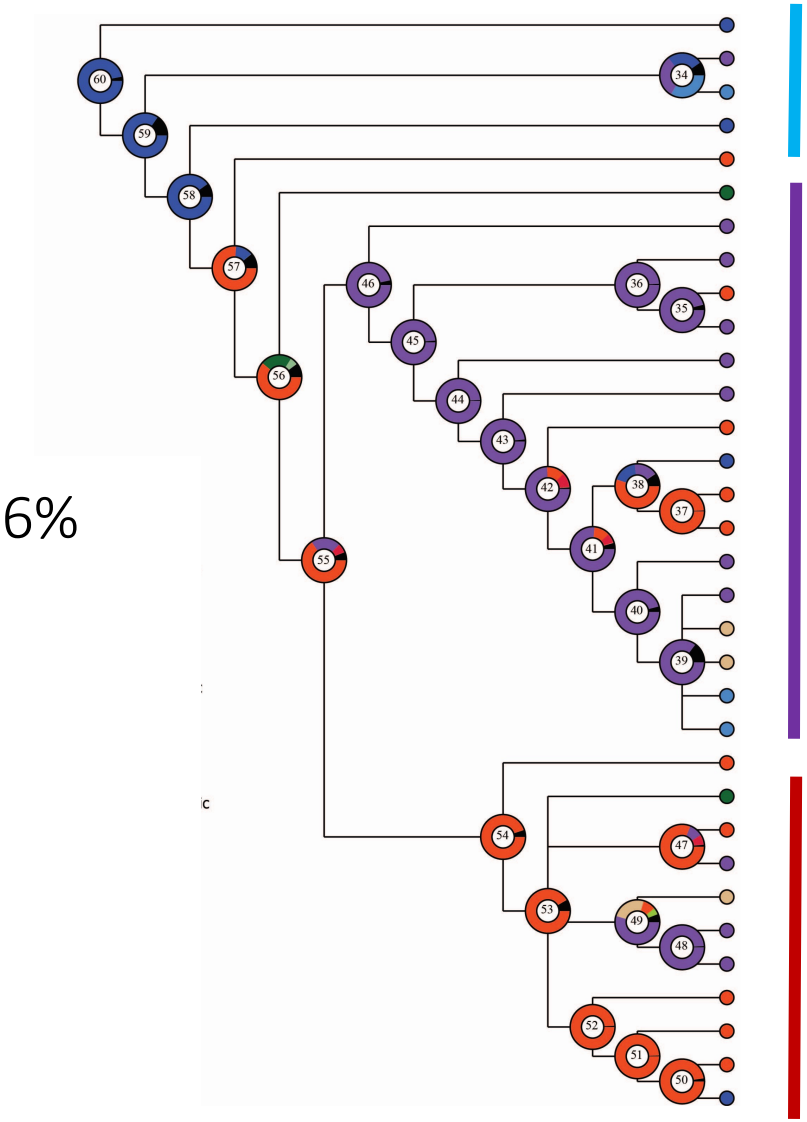
Dorotea gen. nov.

Stellamblyops gen. nov.

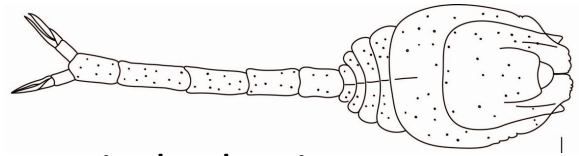
Petryashov & Frutos (2017), Malyutina et al. (2017), Corbari et al. (2019), Blazewicz et al. (2019), Jażdżewska et al. (2021)

Ancestral state reconstrucion

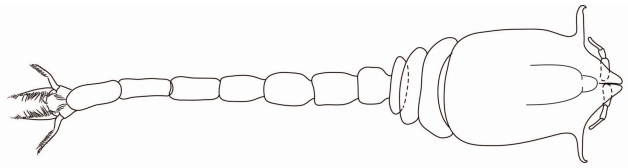
Cumacea: *Eocuma*



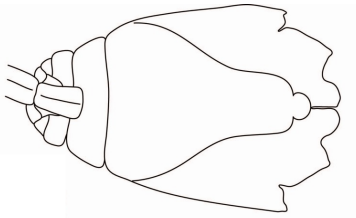
South Africa



Tropical Atlantic



Eastern Indo-Pacific



The South Africa indicated as ancestral state, with probability 86%

Two main places of radiation: the Tropical Atlantic and the Western Indian Ocean

Stepień *et al*. (submitted). *Zool. Eur. J*

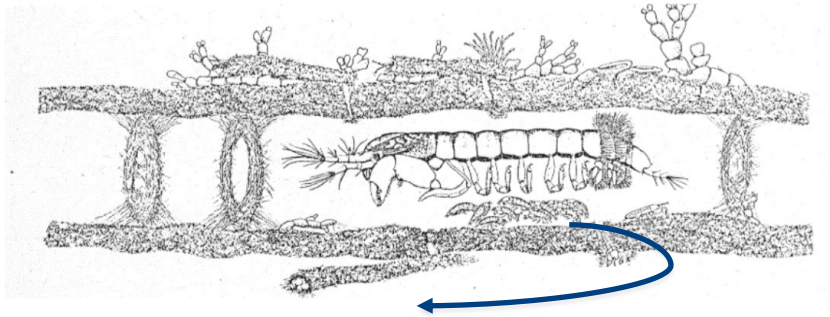
Small crustaceans – good model (brooders!)

Amphipoda & Isopoda

- scavengers
- wide dispersial potential

Tanaidacea

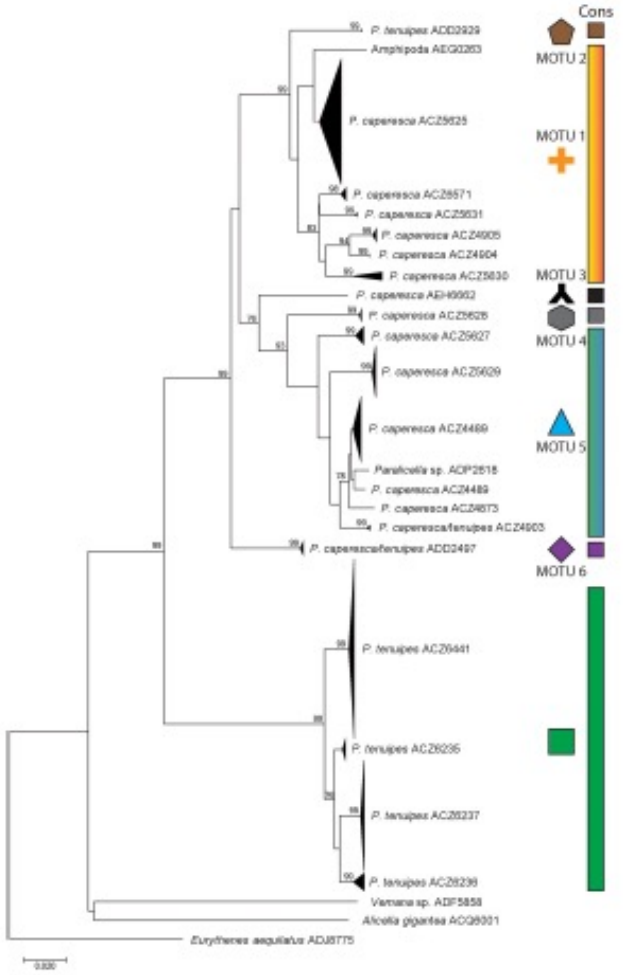
- tube building life style
- immobile juvenile stage (manca)
- restricted dispersal potential



ideal indicators of the environmental conditions!!!

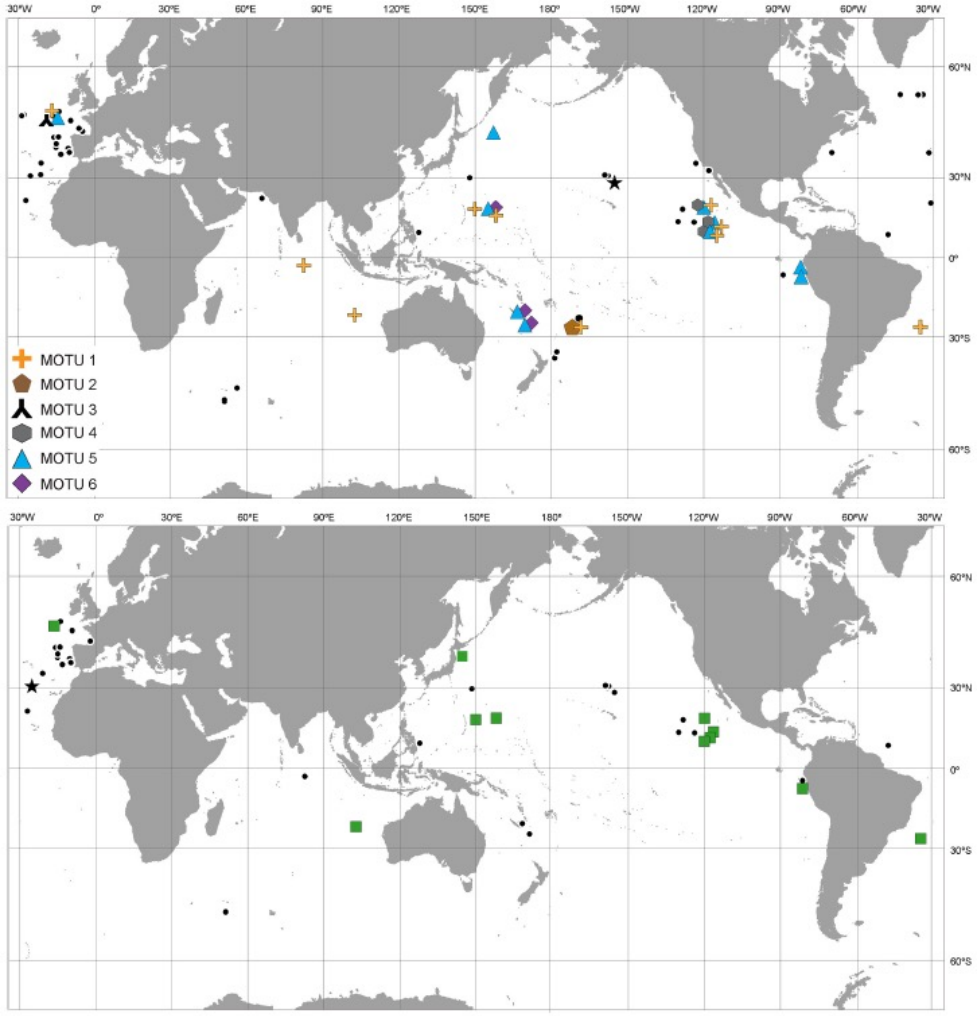
Hidden diversity within widespread species

Amphipoda – *Paralicella caperesca* and *P. tenuipes*



Paralicella caperesca
six potential cryptic spp.,
some MOTUs widespread

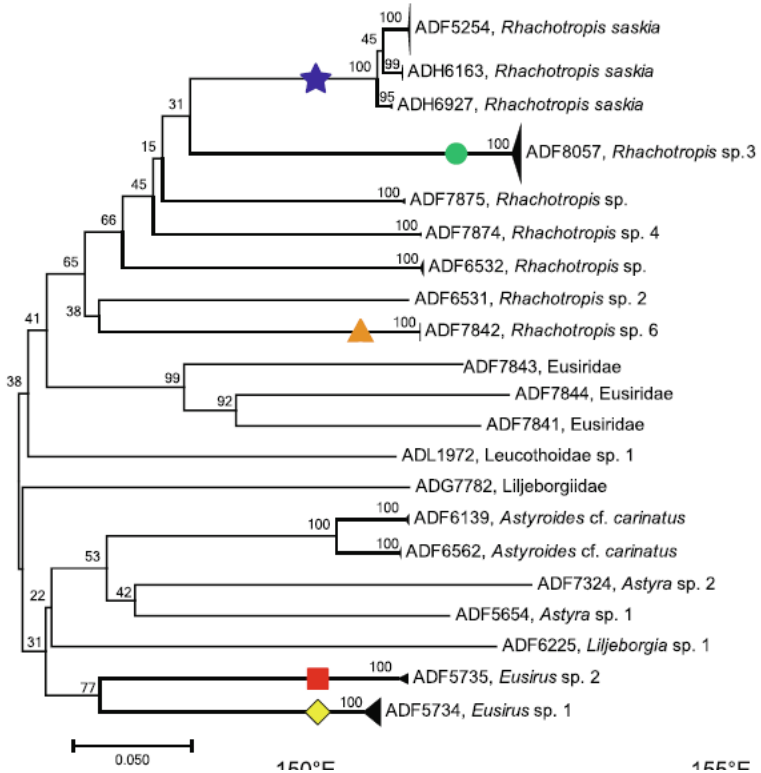
Paralicella tenuipes
one species only,
cosmopolitan distribution



Jażdżewska *et al.* (2021). *Front. Mar. Sci.*

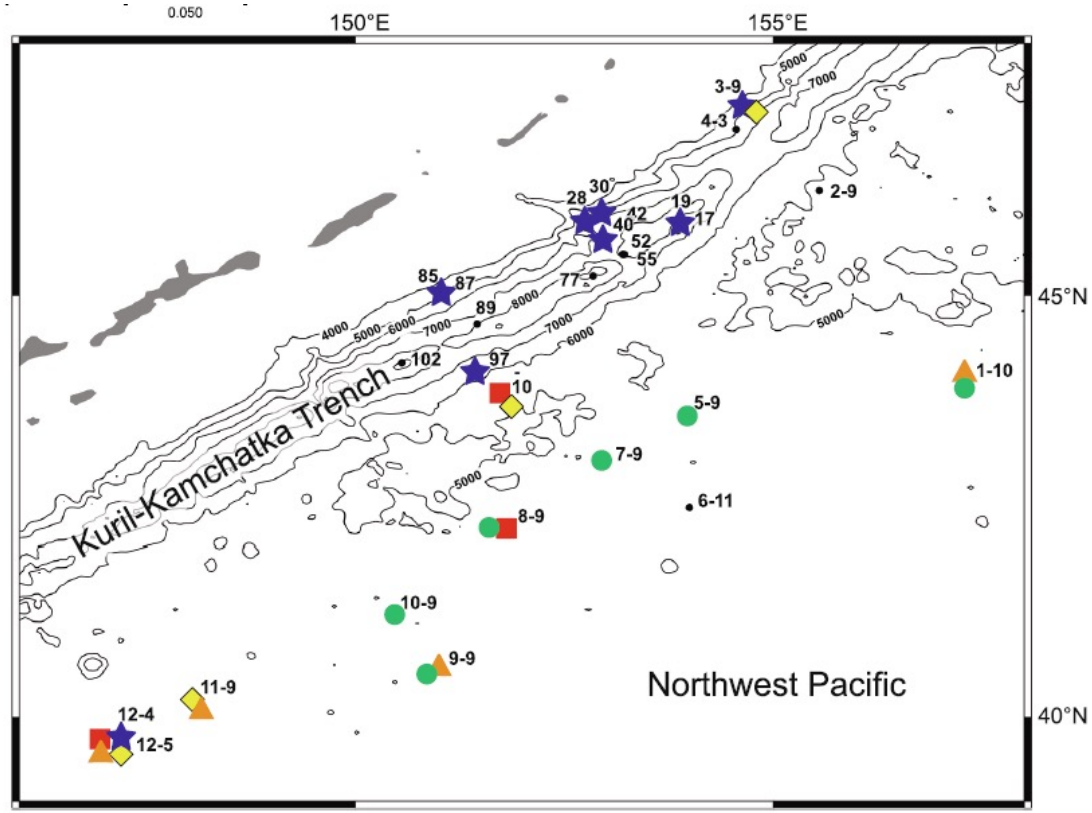
High diversity of NW Pacific Amphipoda

Amphipoda – family Eusiridae



***Eusirus* sp. 1** – both sides of the KKT

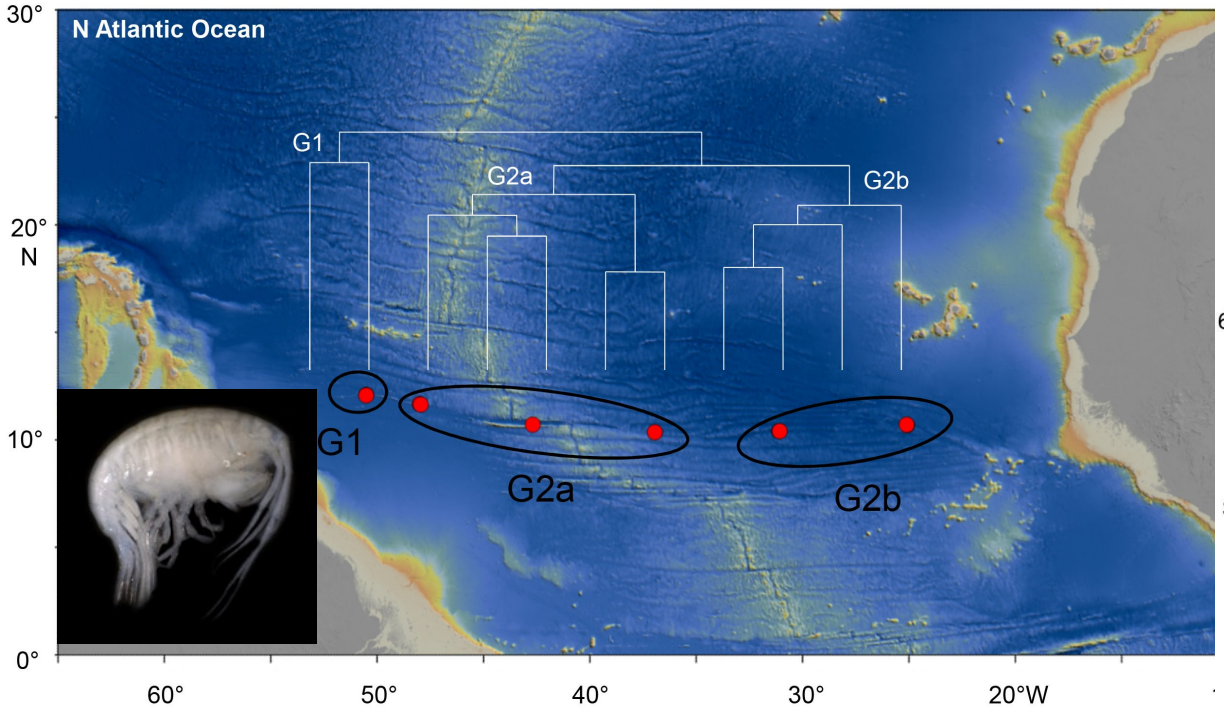
Rhachotropis saskia – both sides of the trench, molecularly confirmed 3000 m depth range

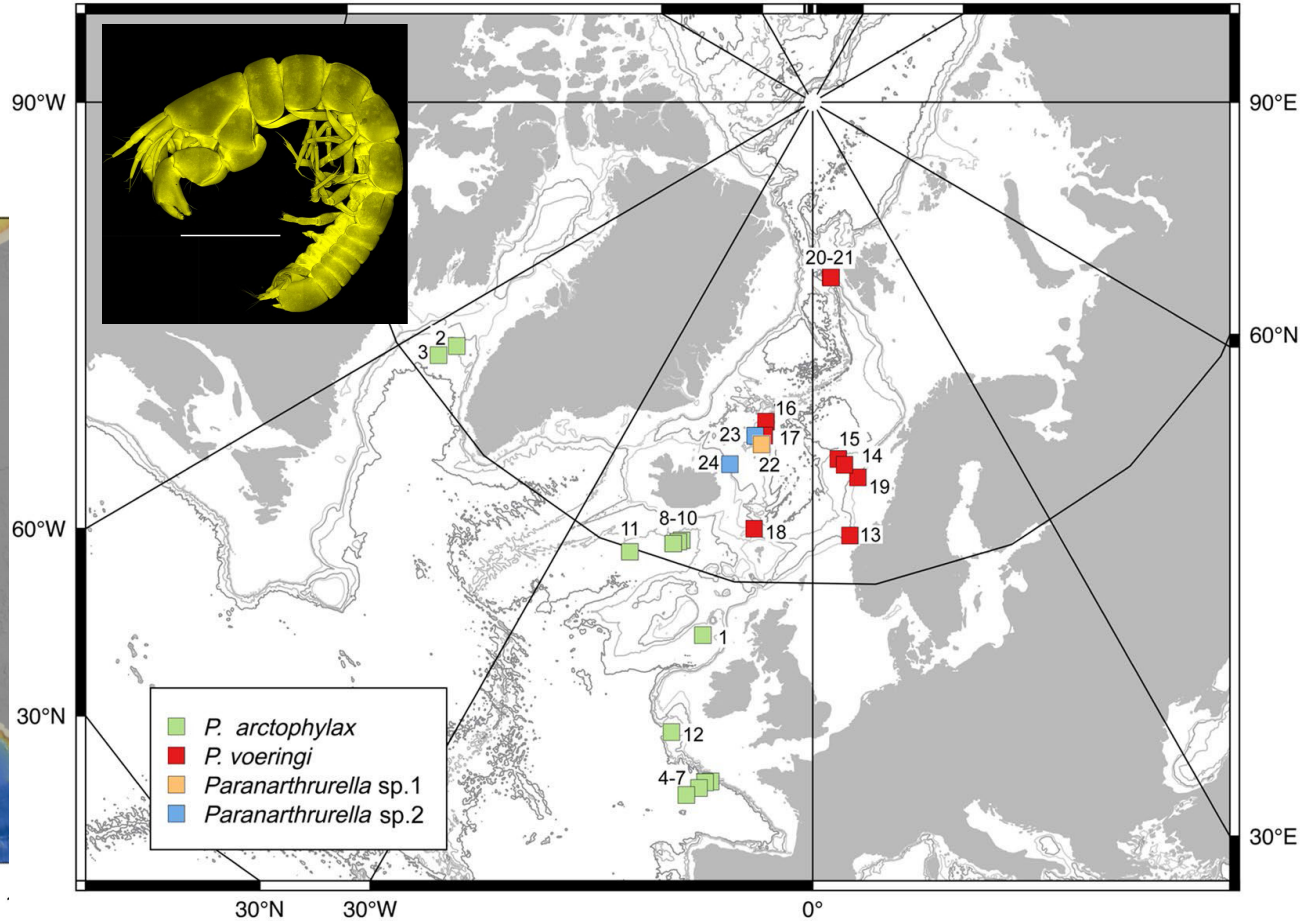


Jażdżewska & Mamos (2019). *Progr. Oceanogr.*

Deep-sea connectivity

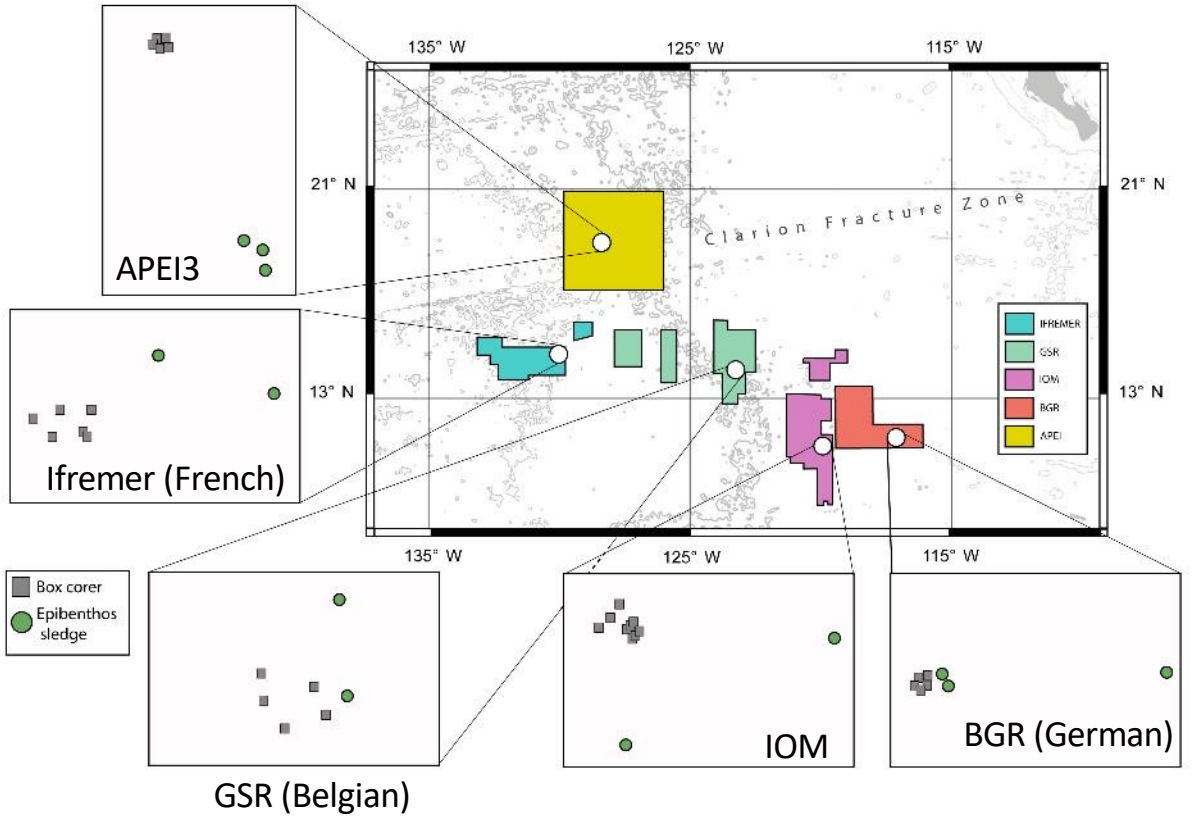
Amphipoda and Tanaidacea: MAR is a distribution barrier

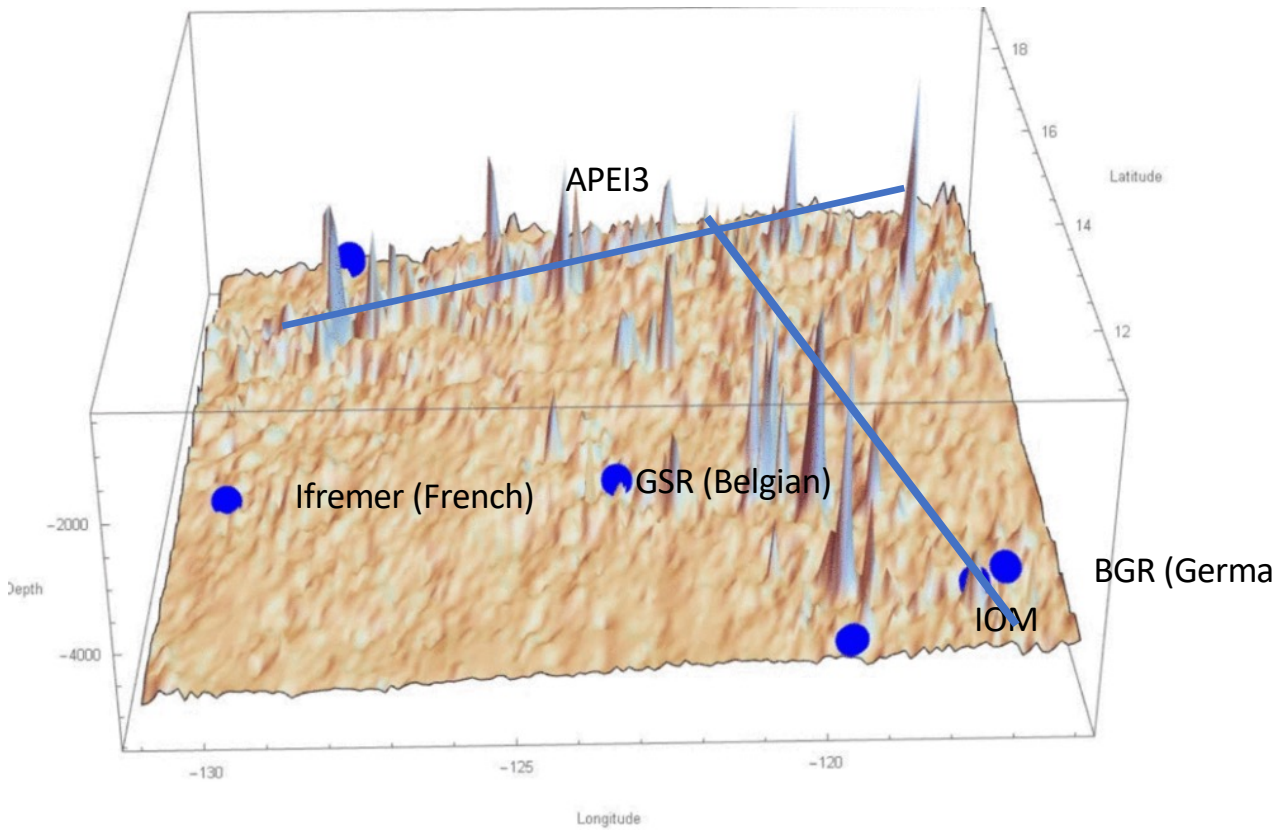




Frutos (2017); Blazewicz et al. (2019)

High diversity in contract Area of Central Pacific



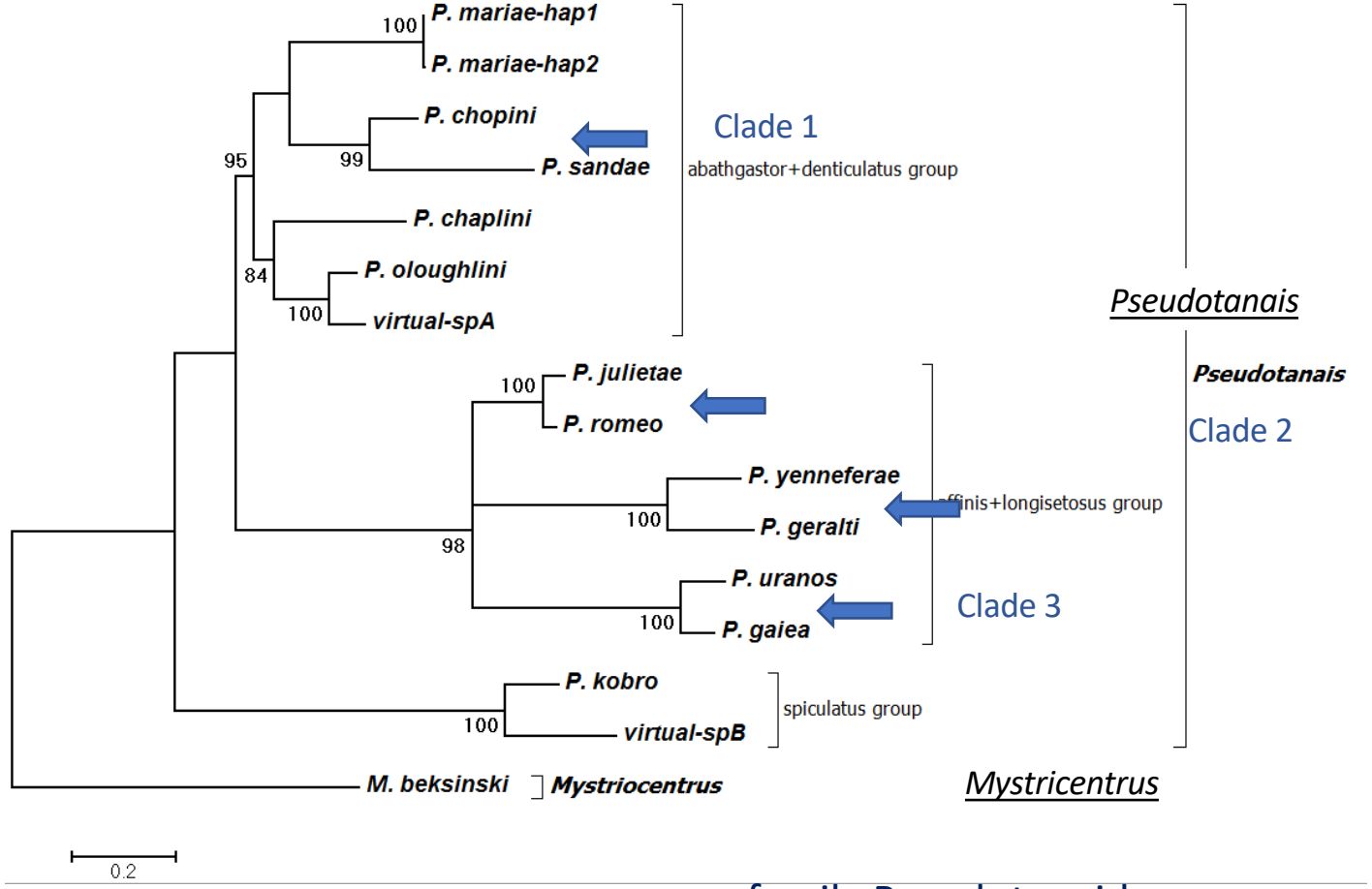


12 epibenthic sledges

35 box cores

High diversity in contract Area of Central Pacific

Tanaidacea are very diverse in mining contracting area



family Pseudotanaidae

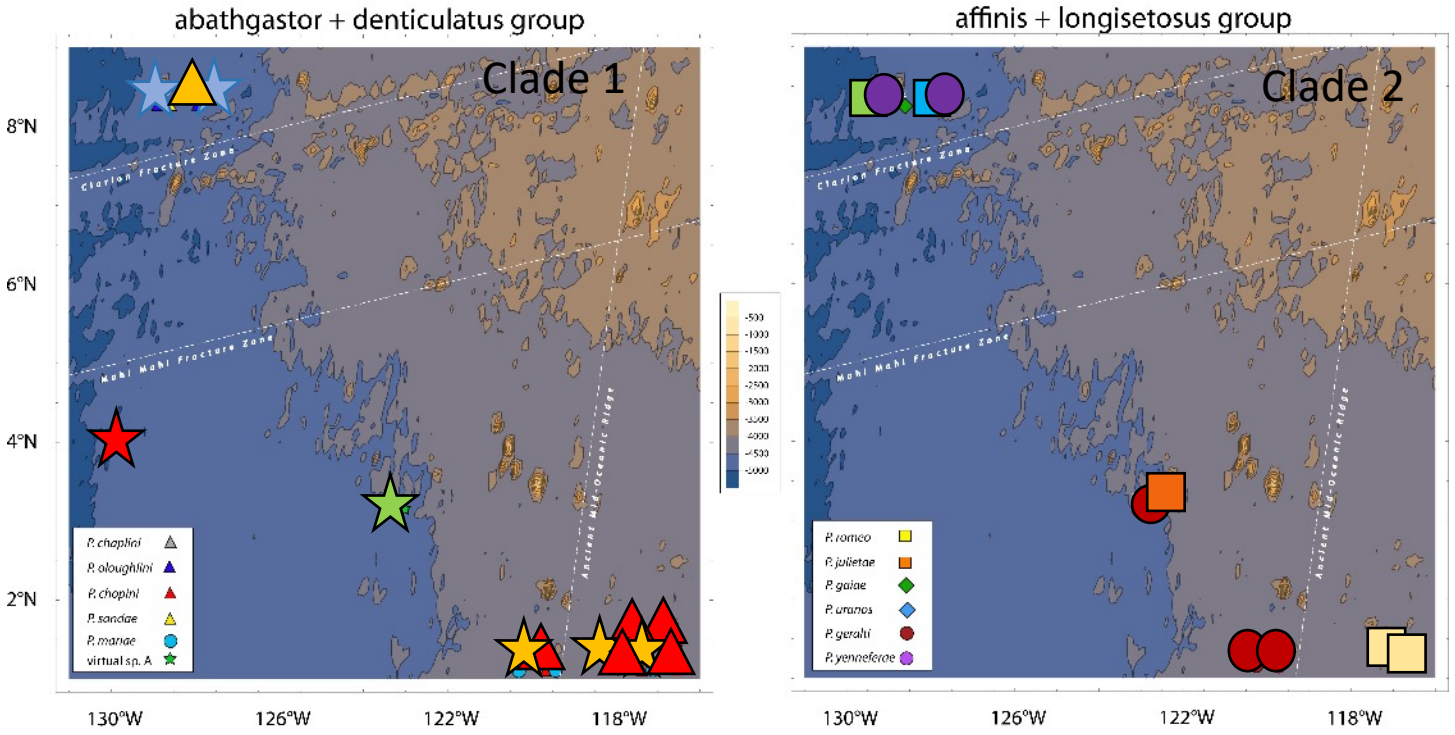
- 90 individuals
- 67 sequences
- COI: 611 bp
- 15 new species

Jakiel et al. (2019). *Sci. Rep.*

High diversity in contract Area of Central Pacific

Tanaidacea fauna is:

- different from mining-contract area and Area of Particular Environmental Interest (APEI3)
- mining activity decrease diversity



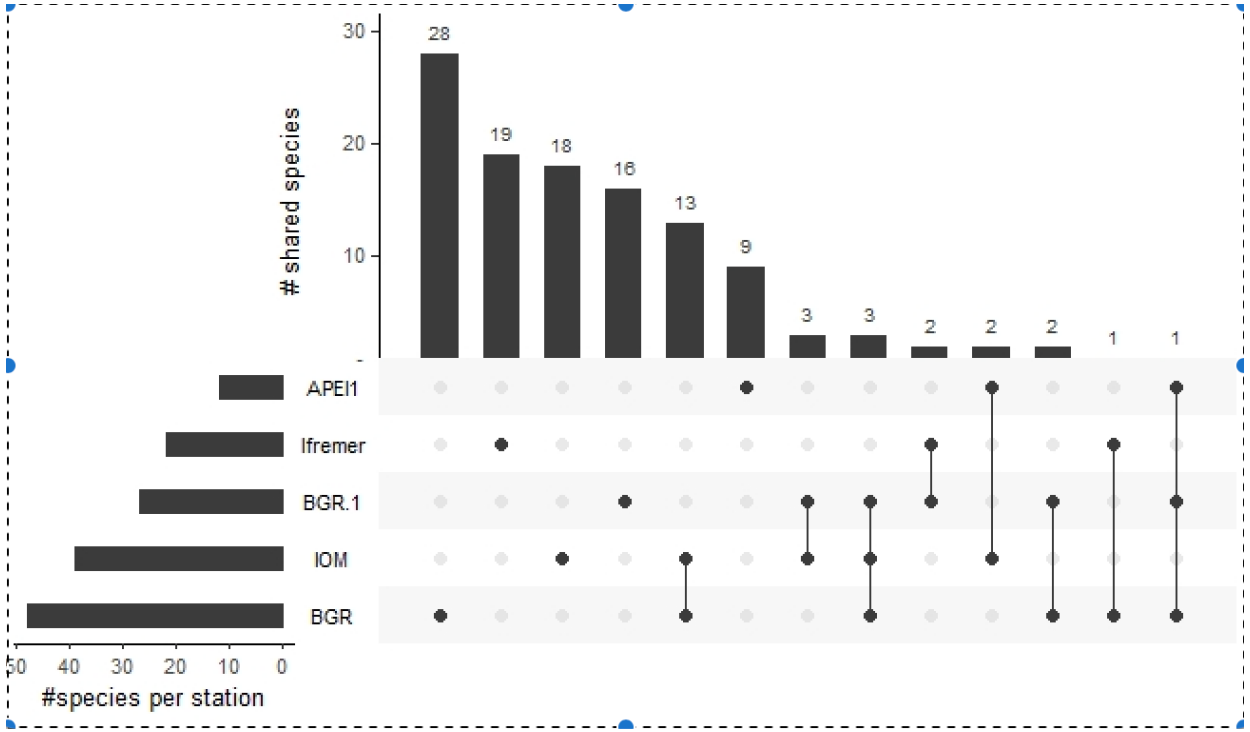
Tanaidacea – family Pseudotanaidea

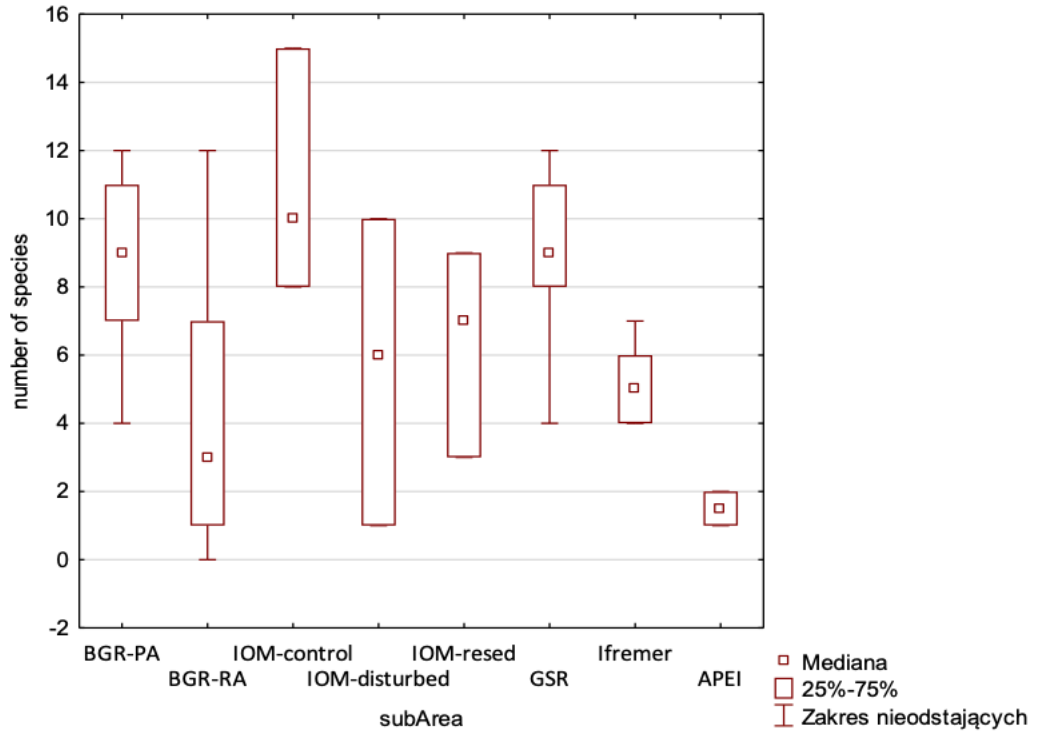
Jakiel et al. (2019). *Sci. Rep.*

High diversity of rare species in Central Pacific

Tanaidacea fauna is:

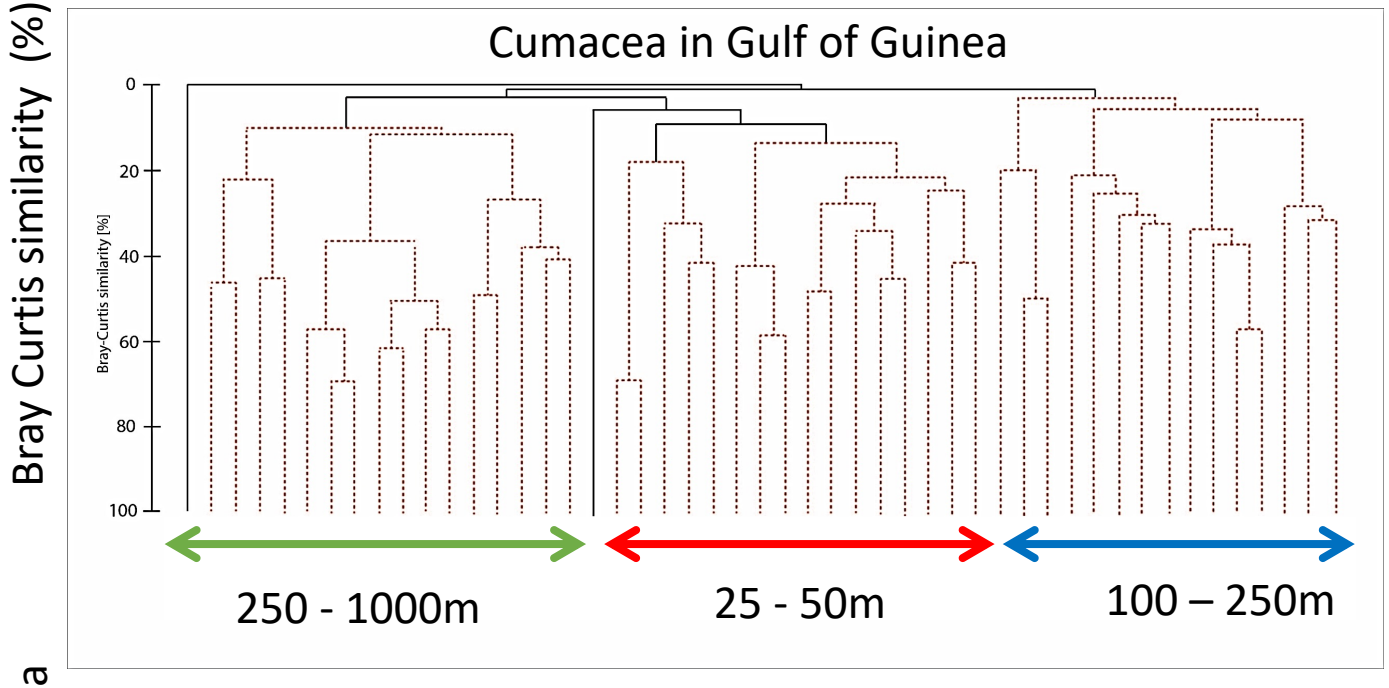
- different from mining-contract area and Area of Particual Environmetan Interest (APEI3)
- mining activity decrease diversity

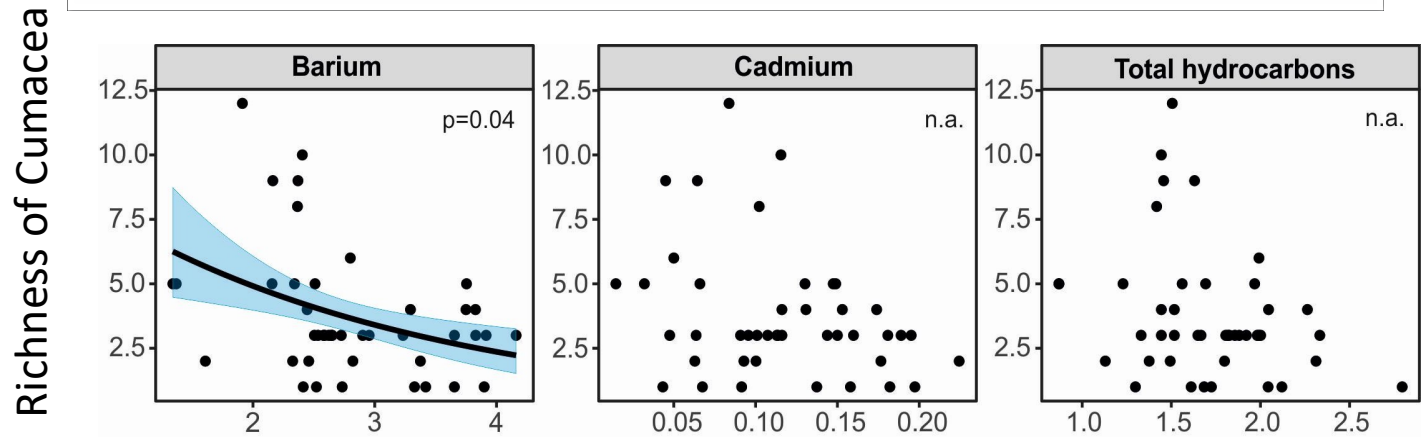




Błażewicz *et al*. (submitted).

Indicators for environmental conditions

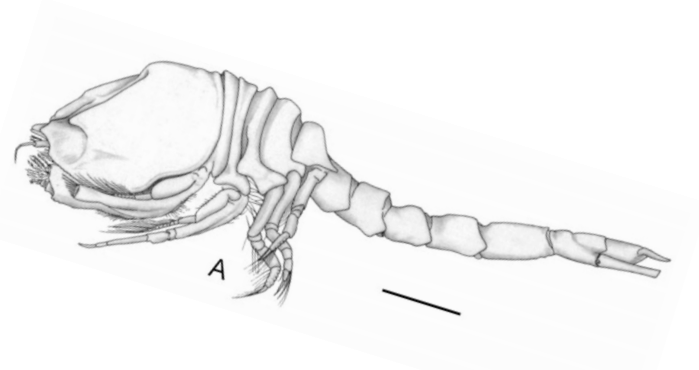




The highest species richness recorded in the shallows (25-50m) and on the slope (1000m).

Cluster analysis separated shallow water communities from deeper shelf and upper slope.

The most unique species composition was found at 1000 m



Stepień *et al*. (submitted). *Front. Mar*

Thank you for your attention