

Aquatic Ecosystem of Lake Baikal

Fish parasites & benthos

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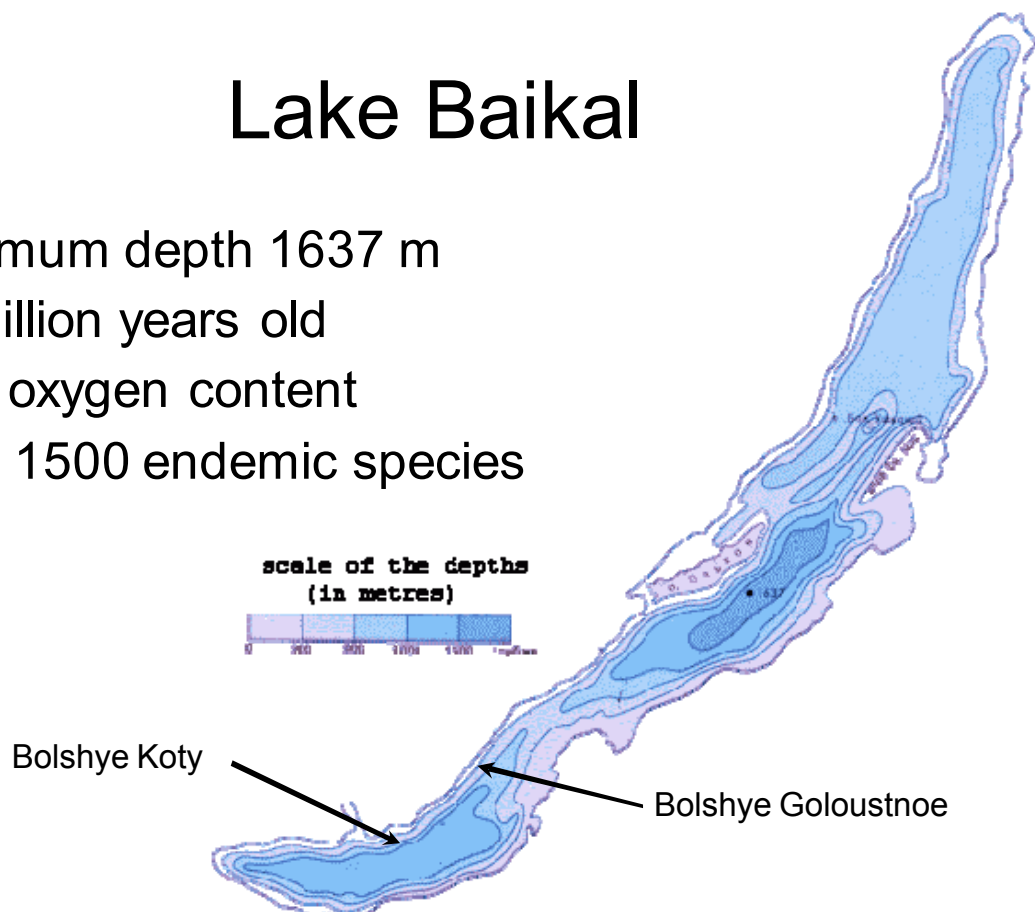
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Lake Baikal

- Maximum depth 1637 m
- 25 million years old
- High oxygen content
- Over 1500 endemic species



Purpose of our Study

- Learn about the aquatic ecosystem of Lake Baikal, especially fish parasites and the benthos
- Discuss how to use this information for environmental management of the Lake Baikal region



Parasitological Methods

- Sampling site: Bolshye Koty
- Instruments: net (14mm-mesh, 2m high, 15m long), stereo microscopes



Parasitological Methods

- Samples: fins, body cavity and digestive system, gills, skin, scales and eyes of fish
- Fix parasites in 70% spiritus vini



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Results

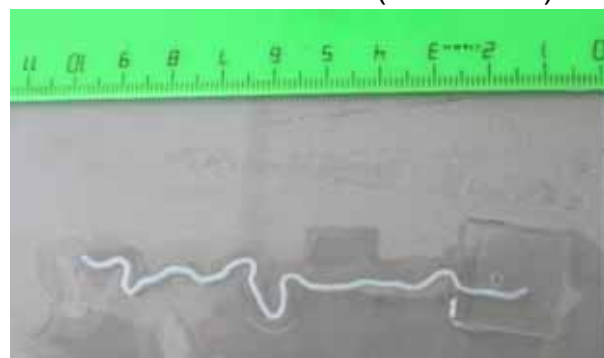
- 4 fish species
- Pelagic:
 - *Rutilus rutilus lacustris*
- Benthic:
 - *Phoximus phoximus*
 - *Paracottus knerii*
 - *Cottocomephorus grewingkii*



Proteocephalus exigus
(in intestine)



Contracaecum osculatum baicalensis
(in body cavity)



Triaenophorus nodulosus
(in liver)

Discussion of Fish Parasites

- A diversity of parasites = A healthy environment
 - Long history of evolution and mutual adaptations
- Parasites can be an important indicator of environmental conditions
 - Influenced by both the environment of their host and the external environment
 - Dynamics reflect even small fluctuations
 - Provide an integrative measure of the state of the environment (similar to top predators)
 - But they are difficult to measure

Benthic Methods

- Sampling site: Bolshye Goloustnoe
- Instruments: Dredge with 0.5mm-mesh net
- Samples from 5 depths: 6m, 12m, 25m, 50m, 100m

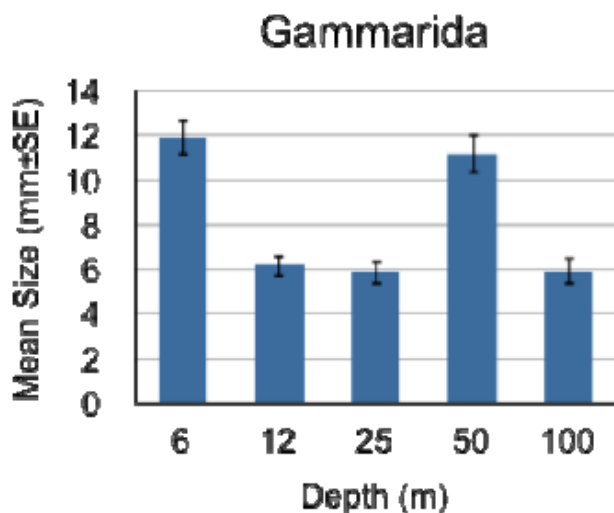


Benthic Methods

- Gammarida (Amphipoda) and Gastropoda
 - Gastropods only occurred down to 25m depth
- Sort 60 individuals into 6 size classes: <5mm, 5-10mm, 10-15mm, 15-20mm, 20-25mm, 25-30mm



Results: Gammarida

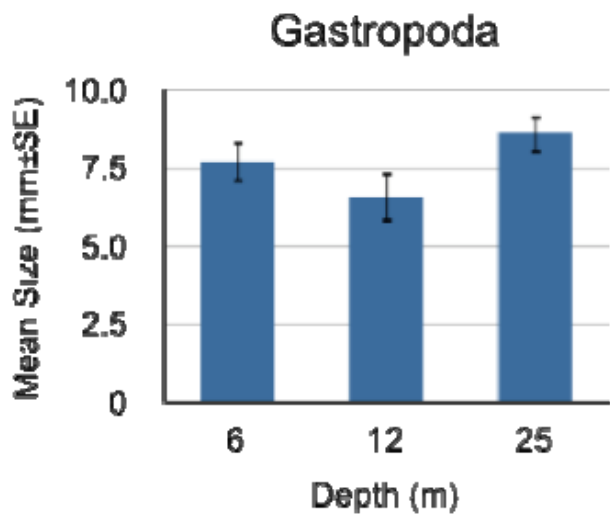


- Heterogeneous group
- 2 size peaks
- Reflect dominance of different groups:

Herbivores in shallow water and detritivores in deeper water



Results: Gastropoda



- Heterogeneous group
- Shallow water:
 - Lots of algae
 - Herbivorous
 - Palaearctic species
- Deep water:
 - Sandy bottom
 - Feed on detritus and microbes
 - Endemic species

Discussion

- Universally outstanding natural values: Unique **cold, oxygen-rich** benthic environment with **high endemism**
- Gammarida
 - 350 species, 99% endemic
 - Recent molecular studies suggest there may be up to 1000 species
 - Size up to 90 mm
- Gastropoda
 - 150 species, 74% endemic
 - Size up to 50 mm
- Simple size spectrum analysis suggests **depth-separated functional groups**

Conclusions

- Information from parasitological and benthic studies indicates a healthy aquatic environment of outstanding natural value
 - We need to know what to protect in Lake Baikal
 - Education is key
- Diversity of parasites and benthic invertebrates can be a good indicator of environmental conditions, but require expert knowledge to use them for monitoring



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Thank you for your attention
спасибо за внимание