Seasonal and ontogenetic dietary changes of round goby (*Neogobius melanostomus*) in the exposed coastal waters of SE Baltic Sea

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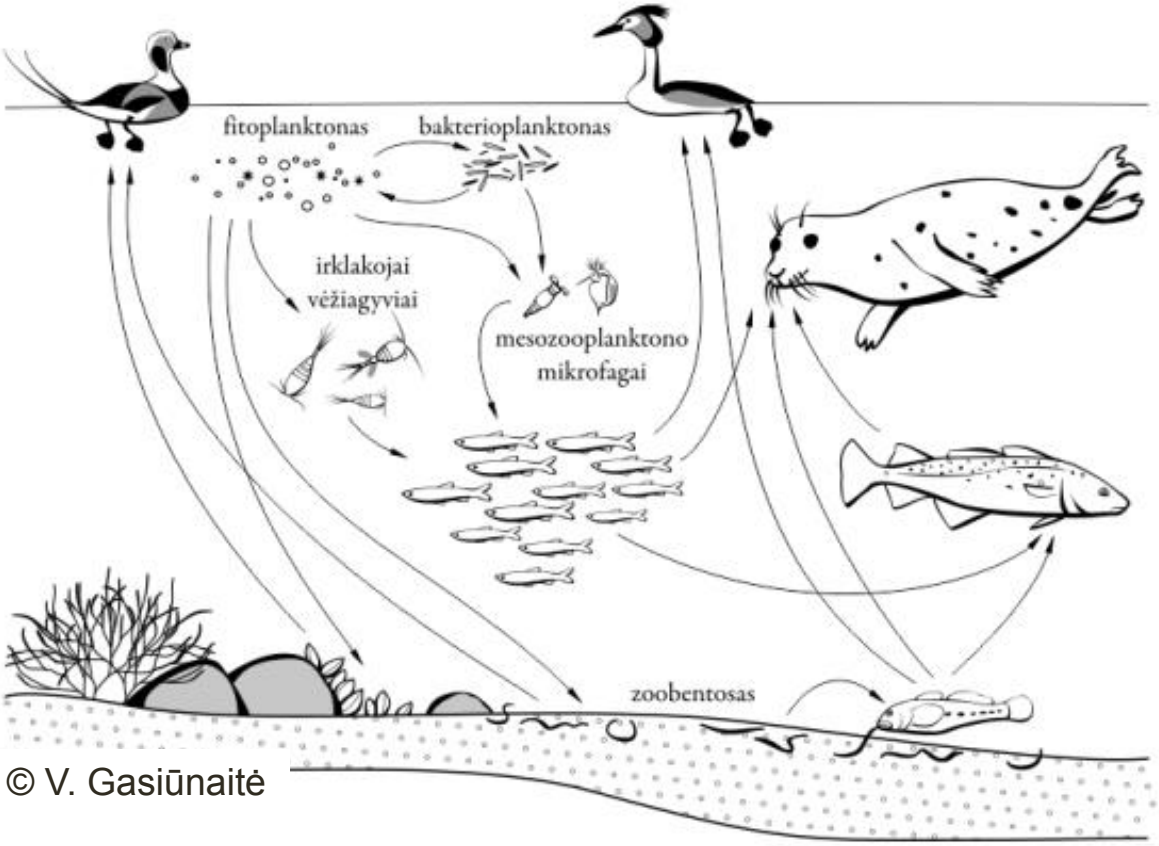
BONUS
SCIENCE FOR A BETTER FUTURE OF THE BALTIC SEA REGION

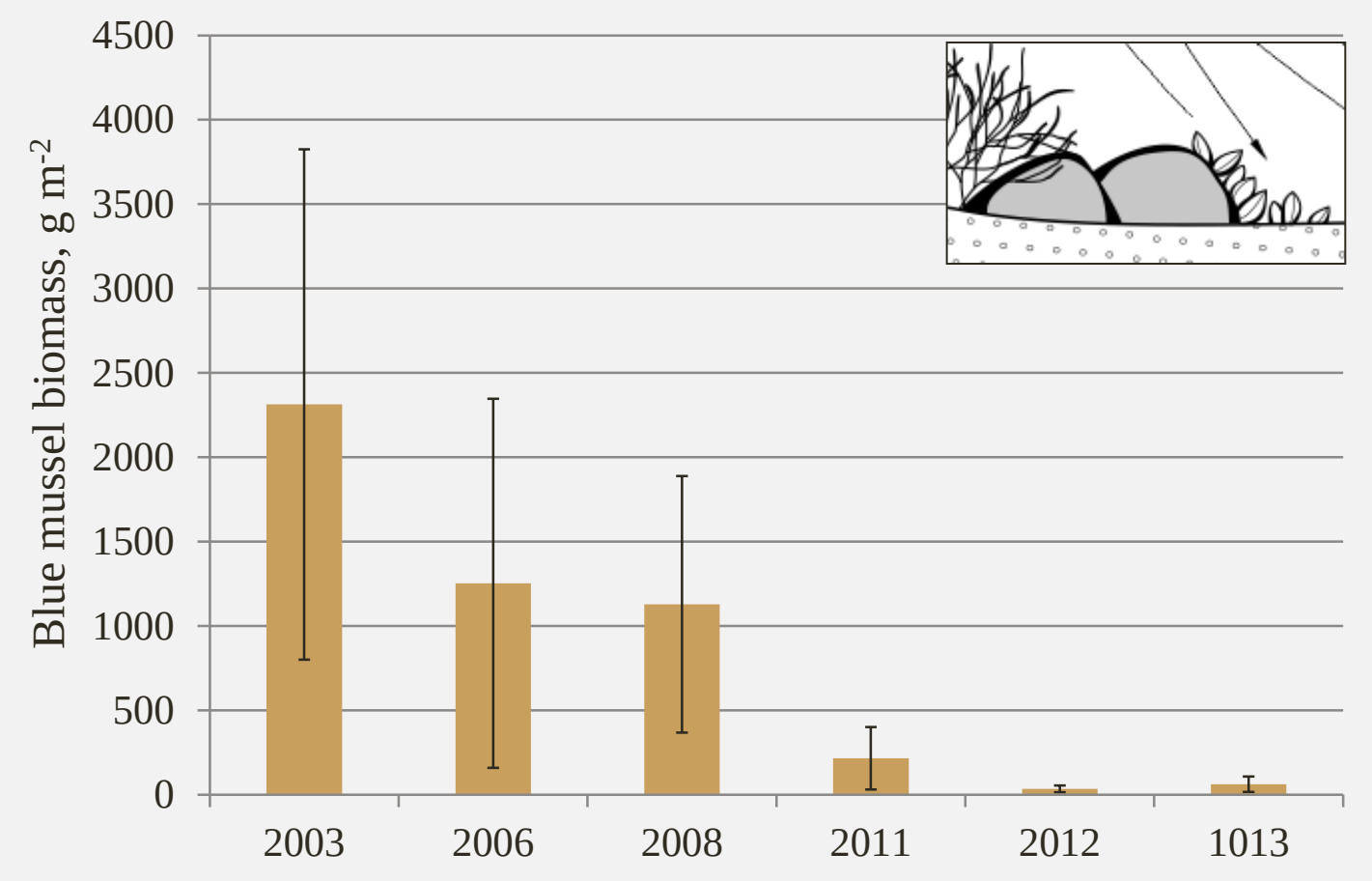
BIO-C3

Effects of round goby in the coastal ecosystem



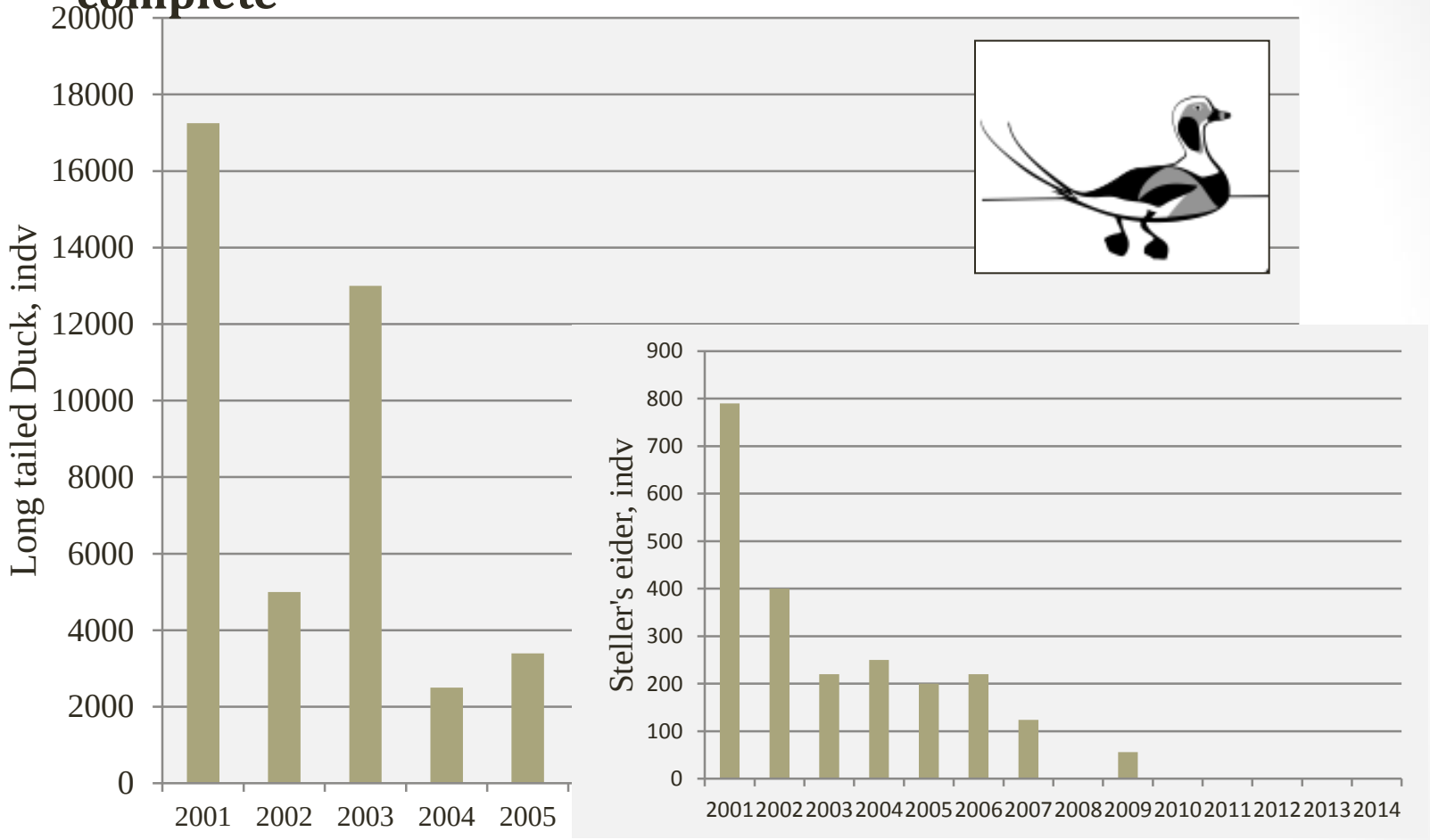
Round goby changes invaded ecosystem by reducing abundances of its feeding objects – predominantly molluscs, competing for food resources with native demersal fish and bird species or becoming an important component in the diet of piscivorous fish, birds and mammals.

In Lithuanian coastal areas *Mytilus* abundance at 0-15 m depth decreased ~95% during a decade after invasion of roundgoby



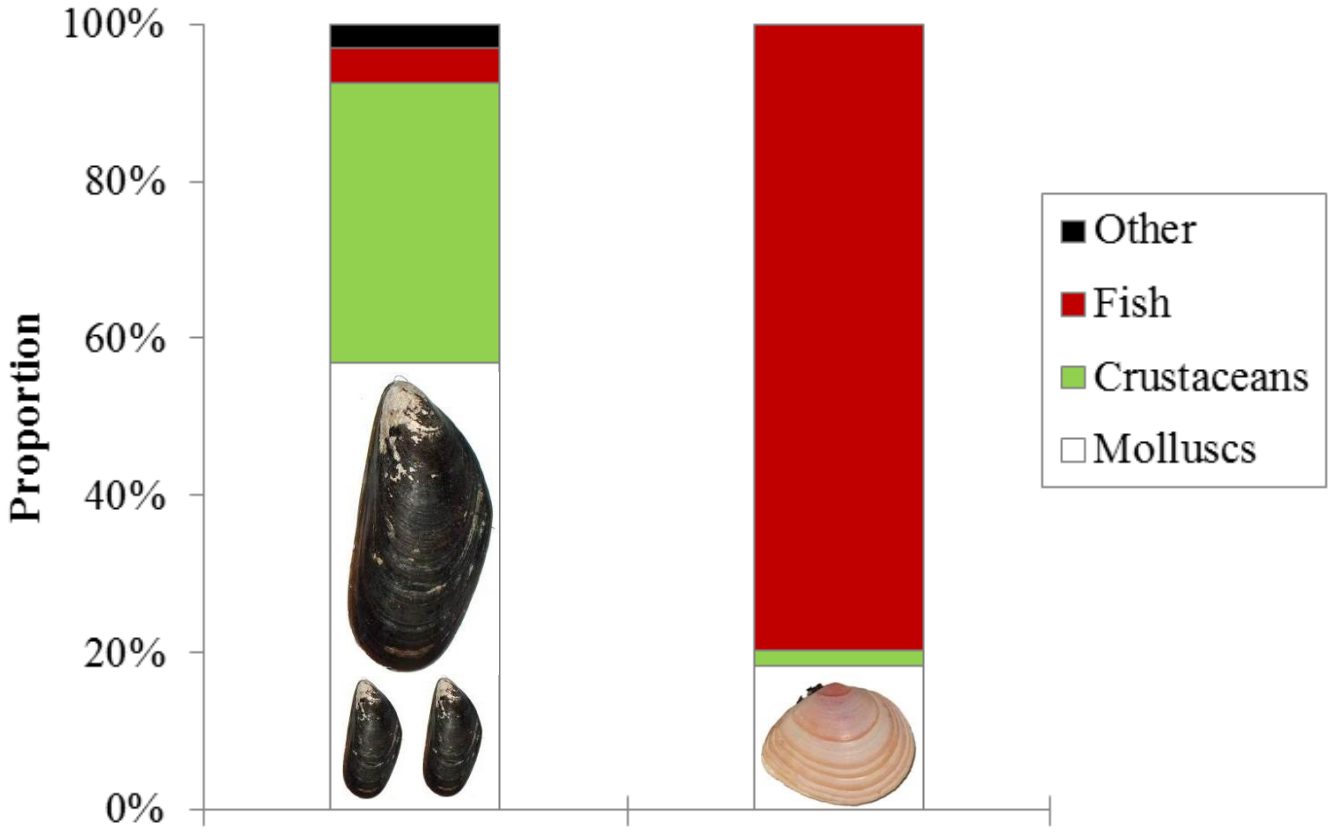
Stupelytė, 2014. Distribution and biomass dynamics of blue mussel (Mytilus edulis trossulus, (Gould, 1850)) in the Lithuanian coastal waters of the Baltic Sea. Bachelor's thesis

Mytilus decline coinsided with the decreased abundanced of wintering Long tailed Duck (Clangula hyamalis) and complete



1) Monitoring data of wintering waterfowl; 2) L. Šniaukšta Results of wintering waterfowl counts 2014. BIRDS The magazine of Lithuanian Ornithological Society 2014/1

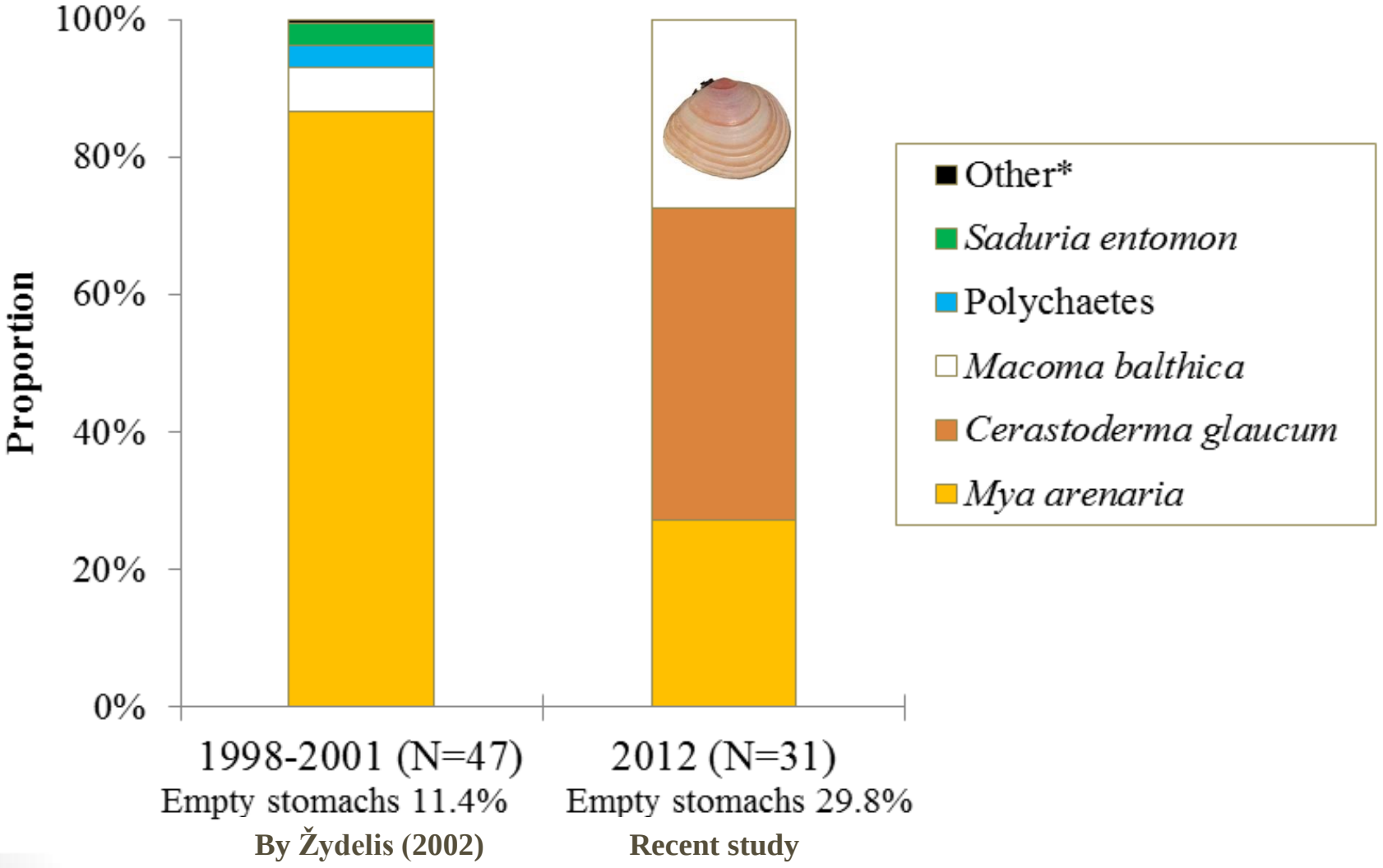
Diet composition of Long-tailed Duck



Rasa Morkūnė, Jūratė Lesutienė, Julius Morkūnas FOOD SOURCES OF WINTERING VELVET SCOTER AND LONG-TAILED DUCK ON THE SE BALTIC SEA: TRIPLE STABLE ISOTOPE AND GUT CONTENT ANALYSIS

Project
"Lithuanian Maritime Sectors' Technologies and Environmental Research Development"

Diet composition of Velvet Scoter



The main objective of the study was to determine seasonal and ontogenetic dietary changes of round goby in the soft bottom area adjacent to artificial substrate i.e. harbour mole

During May - October 2012, guts of 282 individuals were analysed

Skabeikis A., Morkūnė R. Barisevičiūtė and Lesutienė J. ***Seasonal and ontogenetic changes in the diet of round goby (Neogobius melanostomus) in the coastal waters of SE Baltic Sea (submited manuscript)***

Sampling area

Juveniles were collected using a trap at 2-3m depth, larger gobies using gill nets at 6-11m depth

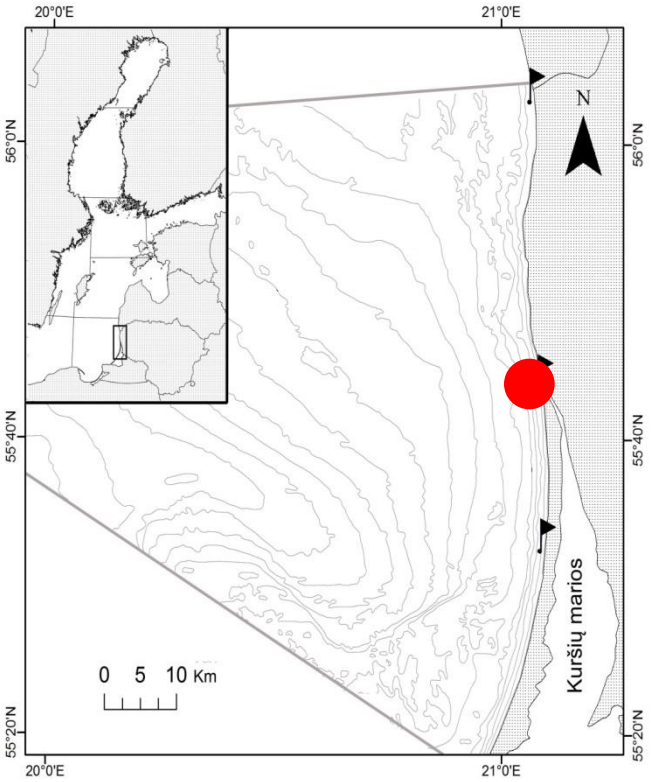
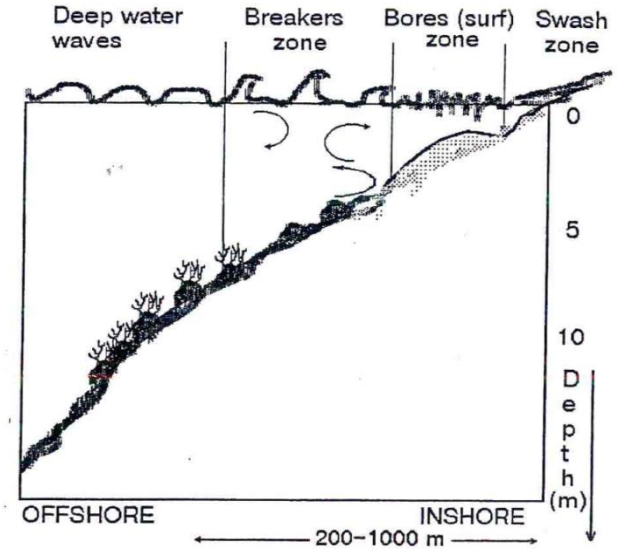


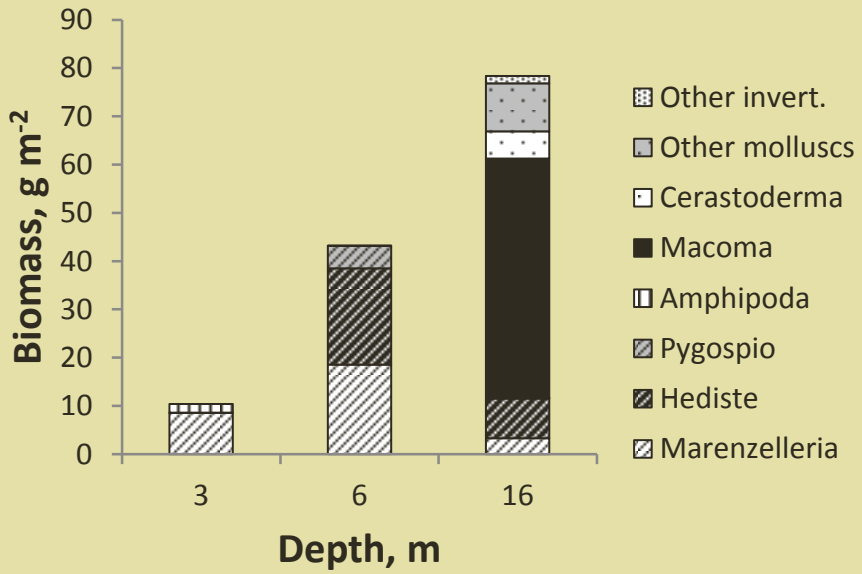
Figure 4 Wave exposure gradient (modified from Gudelis, 1993).



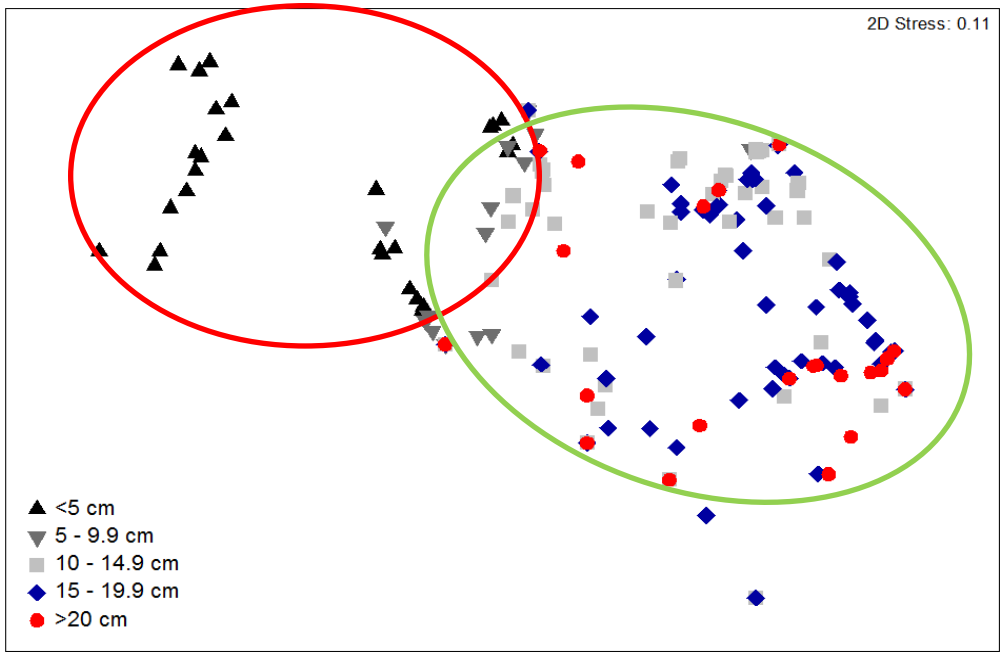
SAMPLING

Seabed at the sampling site is dominated by soft and sandy sediments, strongly affected by wave action

Soft bottom fauna is dominated by polychaetes at 2-3m depth and *Macoma balthica* at 6-11m.



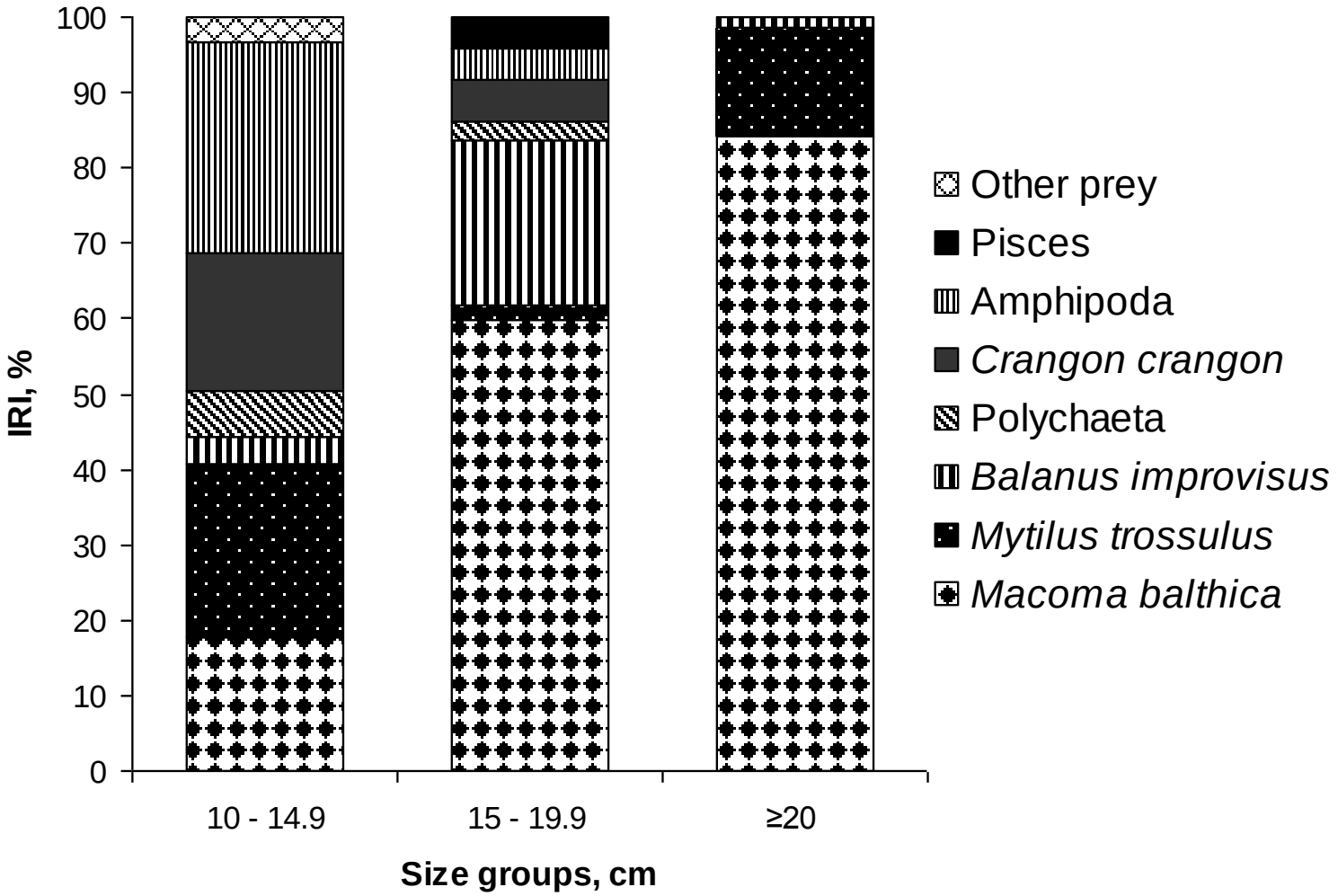
MDS ordination plot of biomasses of prey items, determined in the the guts of differently sized round gobies



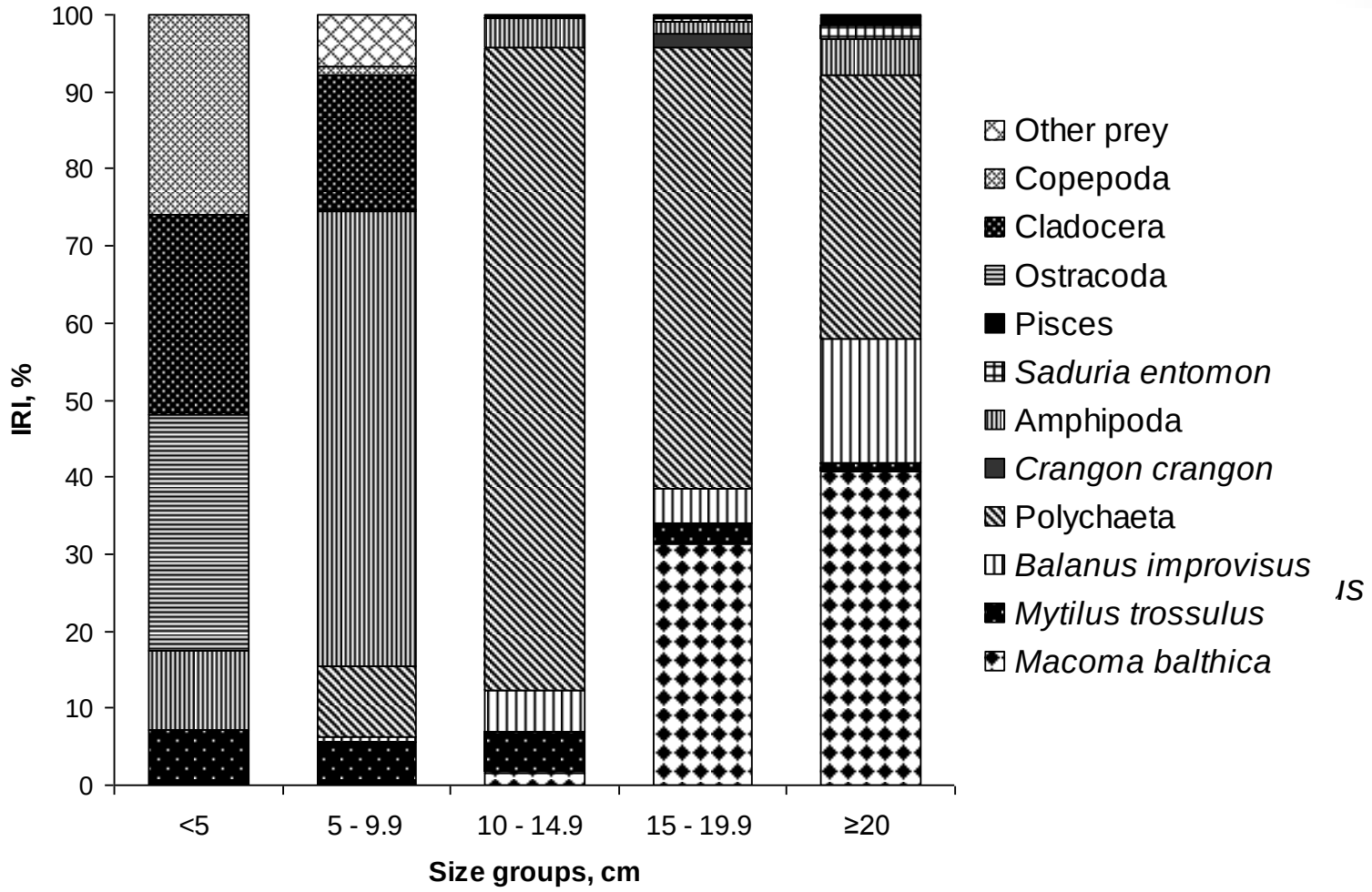
PERMANOVA results of season effect

Size group	Pseudo - F	P
<5 cm	1.169	0.317
5 - 9.9 cm	1.148	0.29
10-14.9 cm	2.652	**0.013**
14.9-19.9 cm	2.216	**0.049**
≥20 cm	1.743	0.118

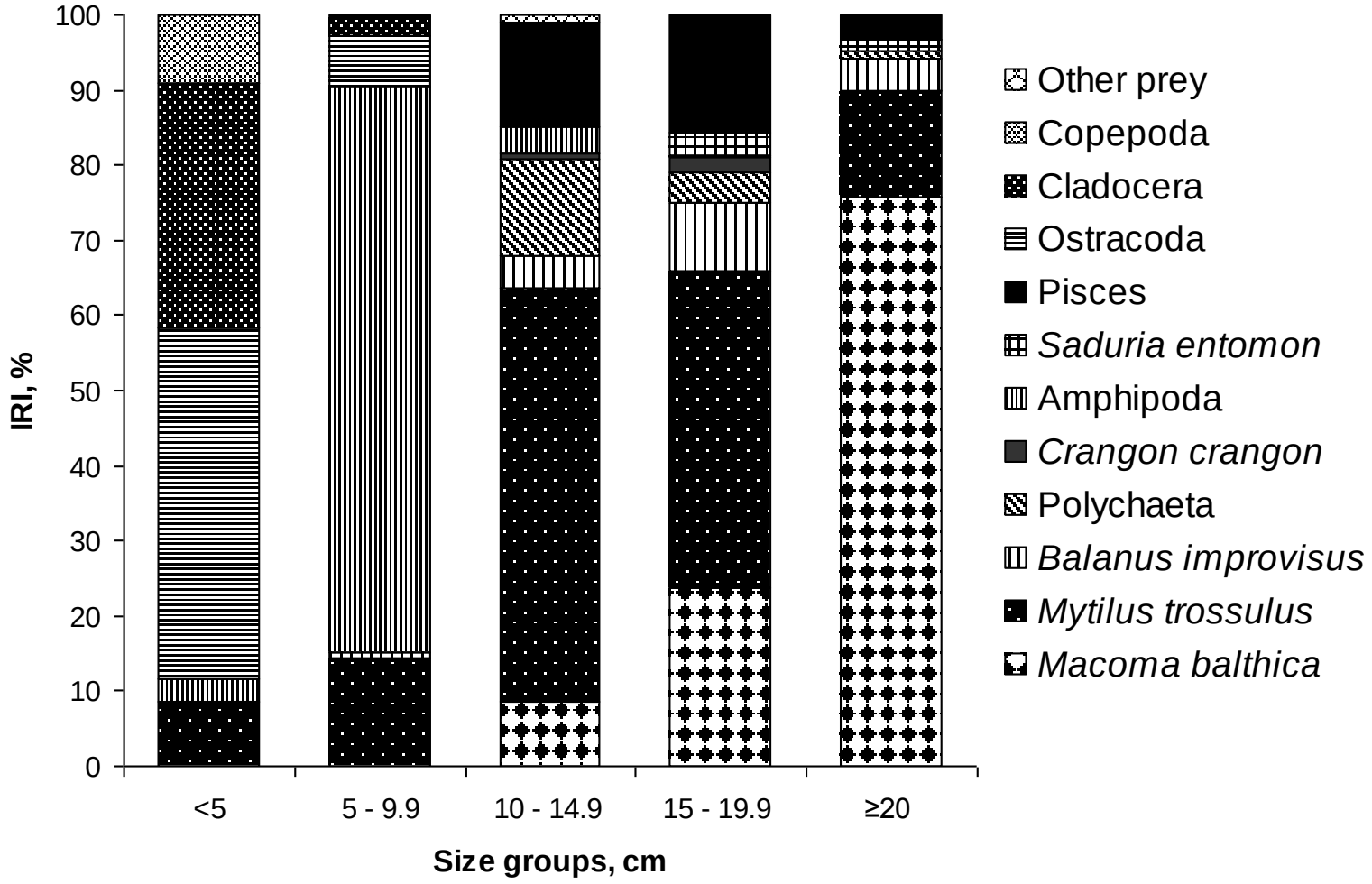
Spring


100
90
80
70
60
50
40
30
20
10
0
IRI, %
10 - 14.9
15 - 19.9
≥20
Size groups, cm
Other prey
Pisces
Amphipoda
Crangon crangon
Polychaeta
Balanus improvisus
Mytilus trossulus
Macoma balthica

Summer


100
90
80
70
60
50
40
30
20
10
0
IRI, %
<5
5 - 9.9
10 - 14.9
15 - 19.9
≥20
Size groups, cm
Other prey
Copepoda
Cladocera
Ostracoda
Pisces
Saduria entomon
Amphipoda
Crangon crangon
Polychaeta
Balanus improvisus
Mytilus trossulus
Macoma balthica

Autumn


100
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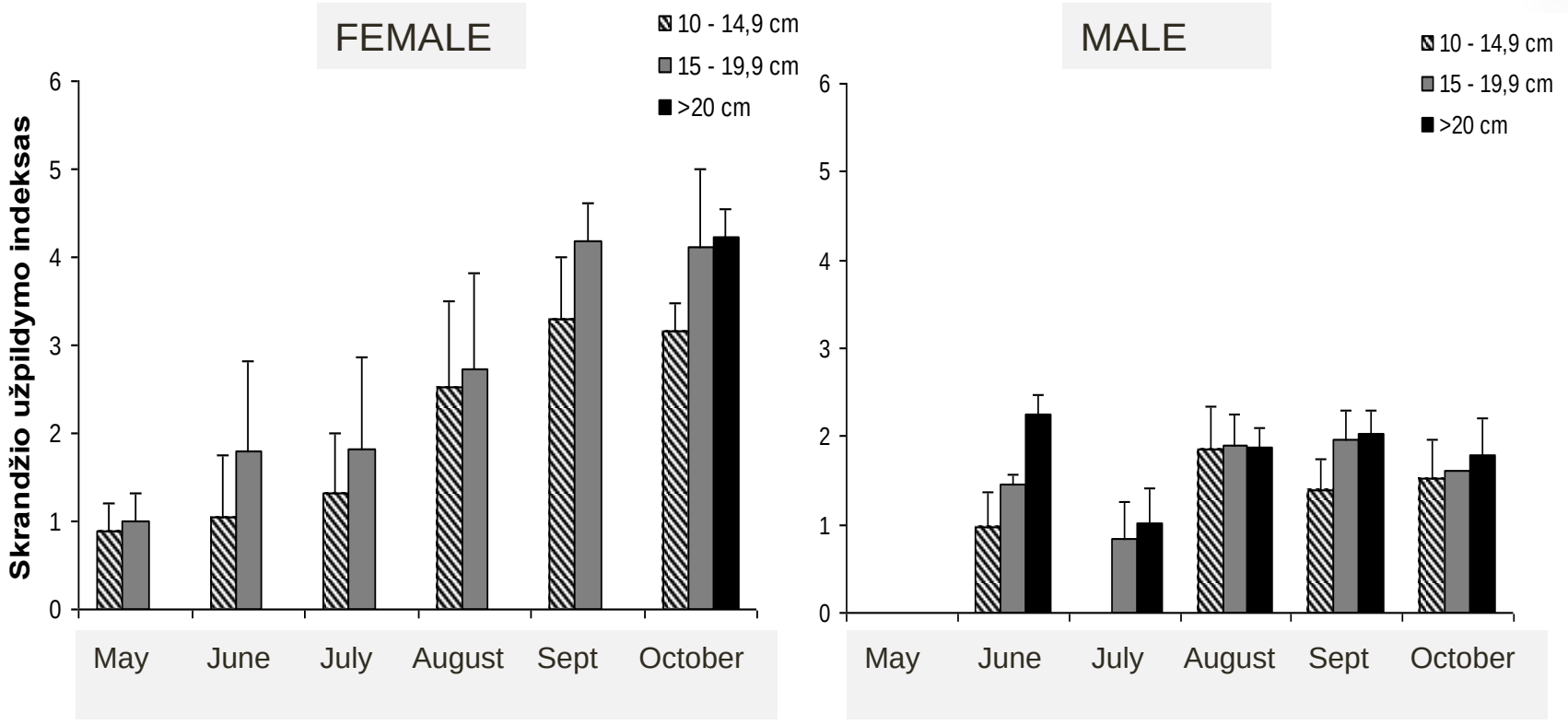
Polychaeta
Balanus improvisus
Mytilus trossulus
Macoma balthica

Dynamic of gut fullnes of female and male individuals



Conclusions

Juvenile round gobies forage on zooplankton, meiobenthic organisms and amphipods. Importance of mollusks in the diet increases significantly at the size of ≥10 cm.

The share of mollusks increases with a fish size. Largest specimens >20cm have relatively consistent diet composition with highest amounts of *Macoma*, while individuals of intermediate 10-20cm size switch to polychaetes during the summer, fish and other mollusks (*Mytilus*?) during the fall.

These findings indicate size specific partitioning of spawning-foraging grounds within the population of round goby. It seems that largest individuals occupy areas with the highest abundance of *Macoma*, while smaller individuals are pushed towards shallower waters with polychaete dominated benthic community.

Population size structure and spatial (depth specific) distribution of round goby should be investigated during the autumn to evaluate the mollusk prey loss in the bird diving areas.