

**GENETIC DIVERSITY OF THE NORTH MEDITERRANEAN
POPULATIONS OF *CHONDROSTOMA* (CYPRINIDAE)**

²Jasna Vukić, ¹Radek Šanda

**PHYLOGEOGRAPHY OF THE NORTH MEDITERRANEAN
POPULATIONS OF *ALBURNUS ALBURNUS* COMPLEX
(CYPRINIDAE)**

¹Radek Šanda, ²Jasna Vukić, ³Ivana Buj, ⁴Ivan Bogut

¹National Museum in Prague, Department of Zoology

²Department of Ecology, Faculty of Science, Charles University, Prague

³Department of Zoology, Faculty of Science, University of Zagreb

⁴Institute of Special Zootechniques, Josi Juraj Strossmayer University, Osijek, Croatia

genus *Chondrostoma*: benthic fishes, lower mouth with
horny layer on lower lip, important in recreational fisheries
- recently considerable taxonomic revision



Chondrostoma nasus

genus *Alburnus*: pelagic fishes, upper mouth, important locally in commercial fisheries (Prespa, Skadar, Ohrid lakes)

- recently considerable taxonomic revision

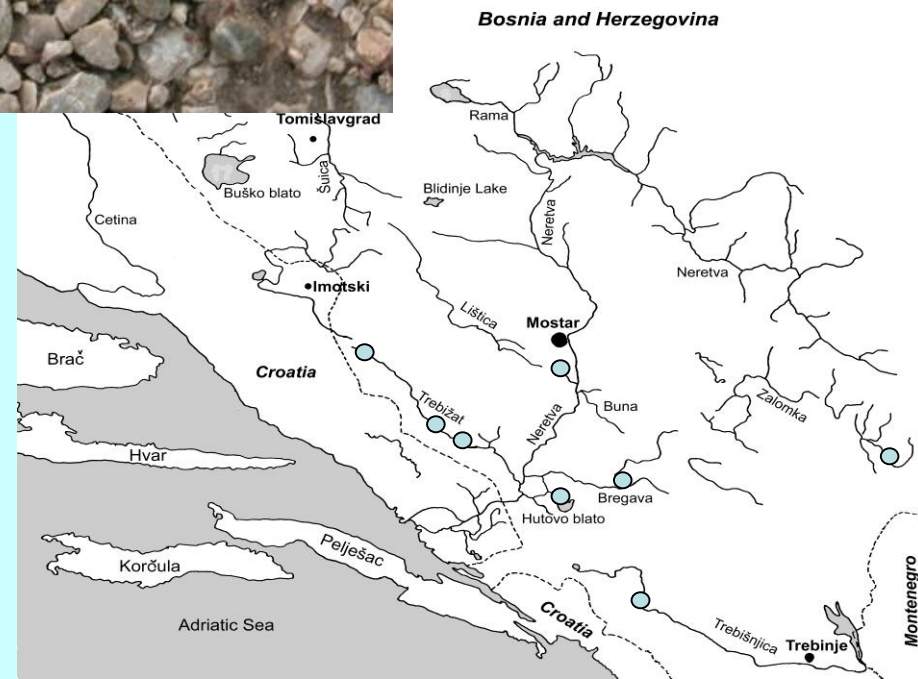


Alburnus scoranza

Alburnus neretvae Buj, Šanda & Perea, 2010



Buj, I., Vukić, J., Šanda, R., Perea, S., Čaleta, M., Marčić, Z., Bogut, I., Povž, M. & Mrakovčić, M. Morphological comparison of bleaks (*Alburnus*, Cyprinidae) from the Adriatic Basin with the description of a new species. *Folia Zoologica*, 2010, 59 (2): 129-141.



Aims

to study the genetic diversity of *Alburnus* and *Chondrostoma* populations from the area of the northern Mediterranean, and to resolve their phylogenetic relationships and taxonomy

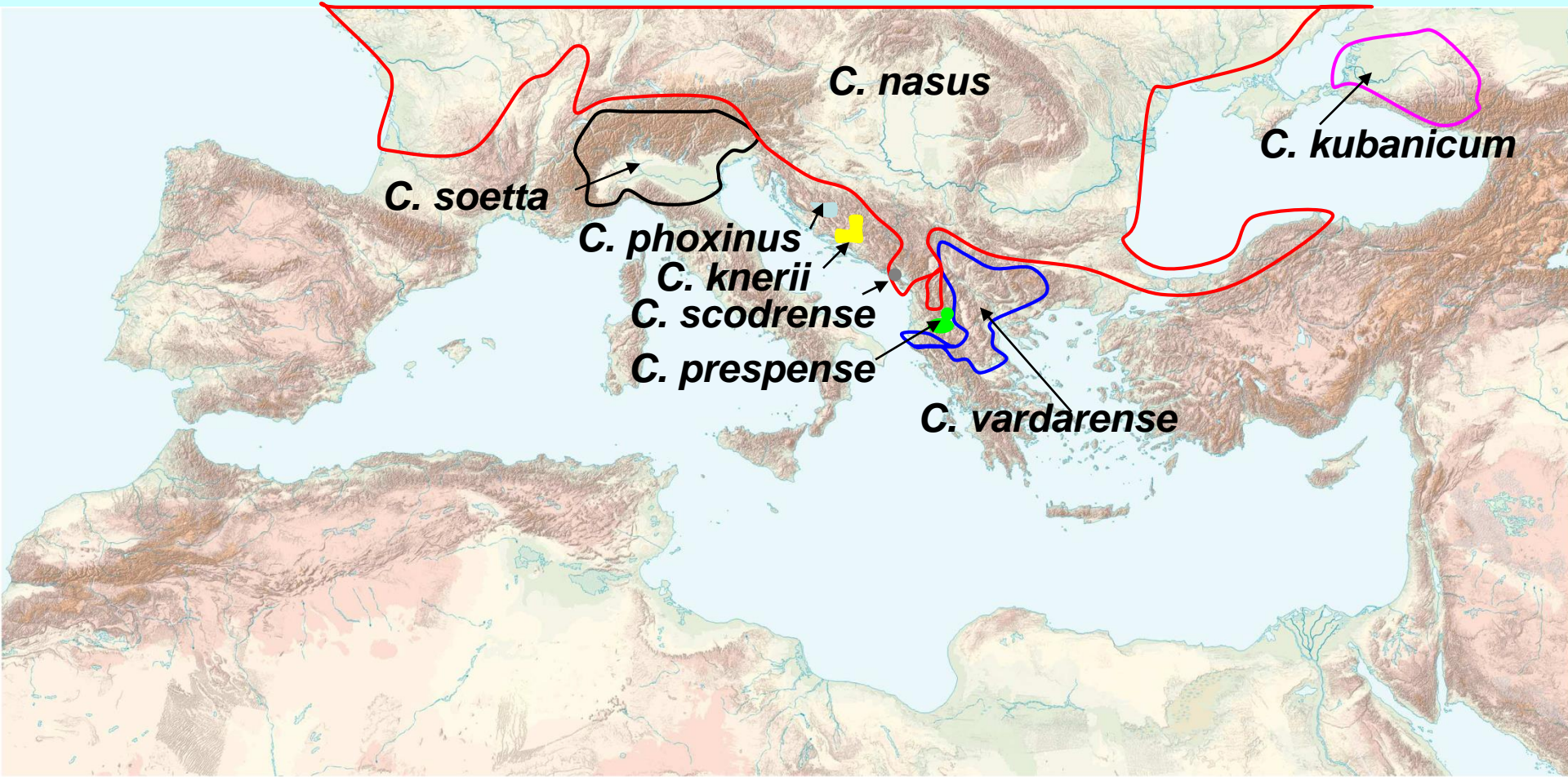
Methods

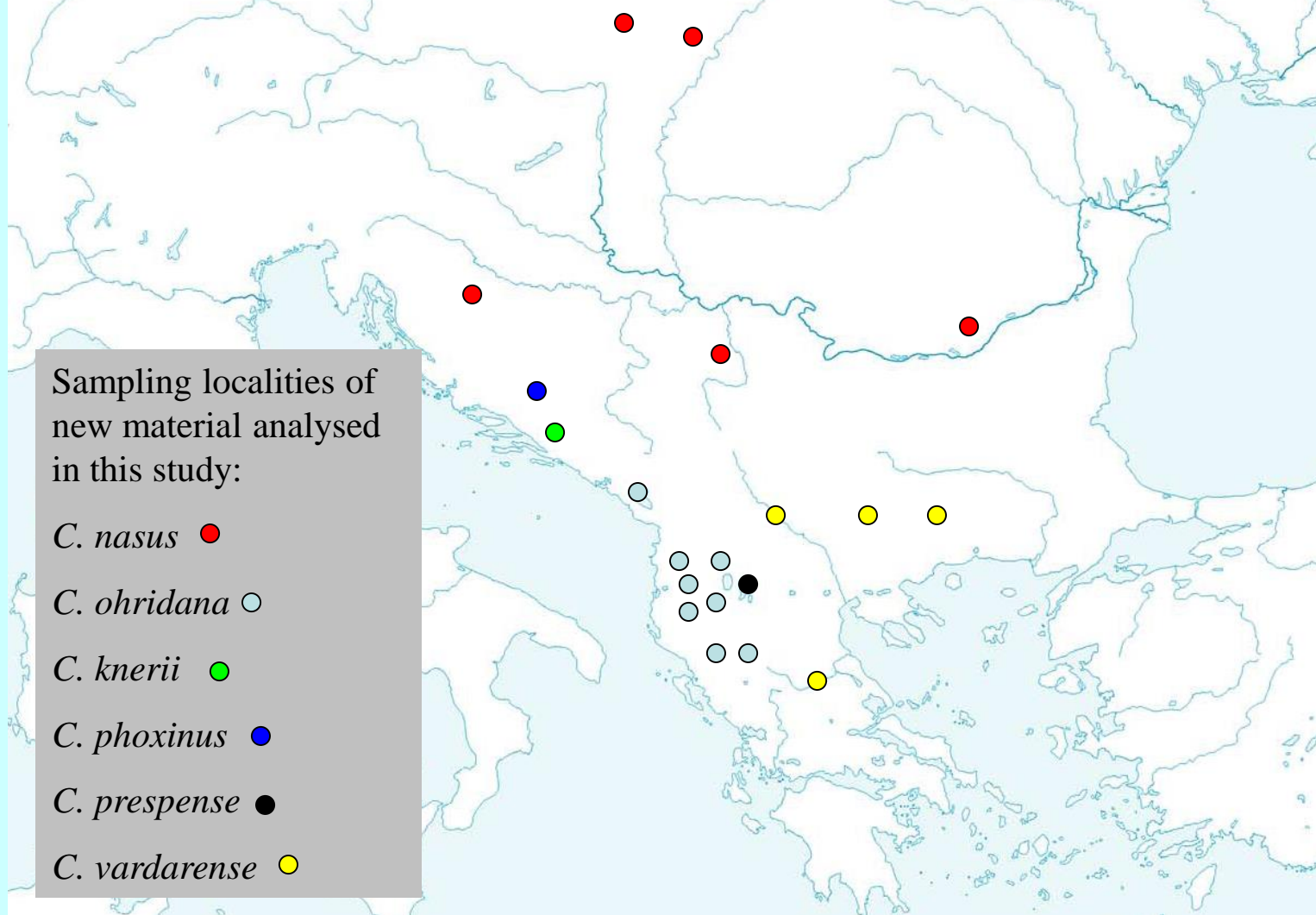
- extraction of DNA
- amplification of mitochondrial cytochrome b gene
- sequencing
- model of evolution (Modeltest)
- Bayesian methods of phylogenetic inference (Mr. Bayes)
- haplotype network (Network)

Chondrostoma

Distribution of European species of genus *Chondrostoma* according to Elvira (1987) and Kottelat and Freyhof (2007)

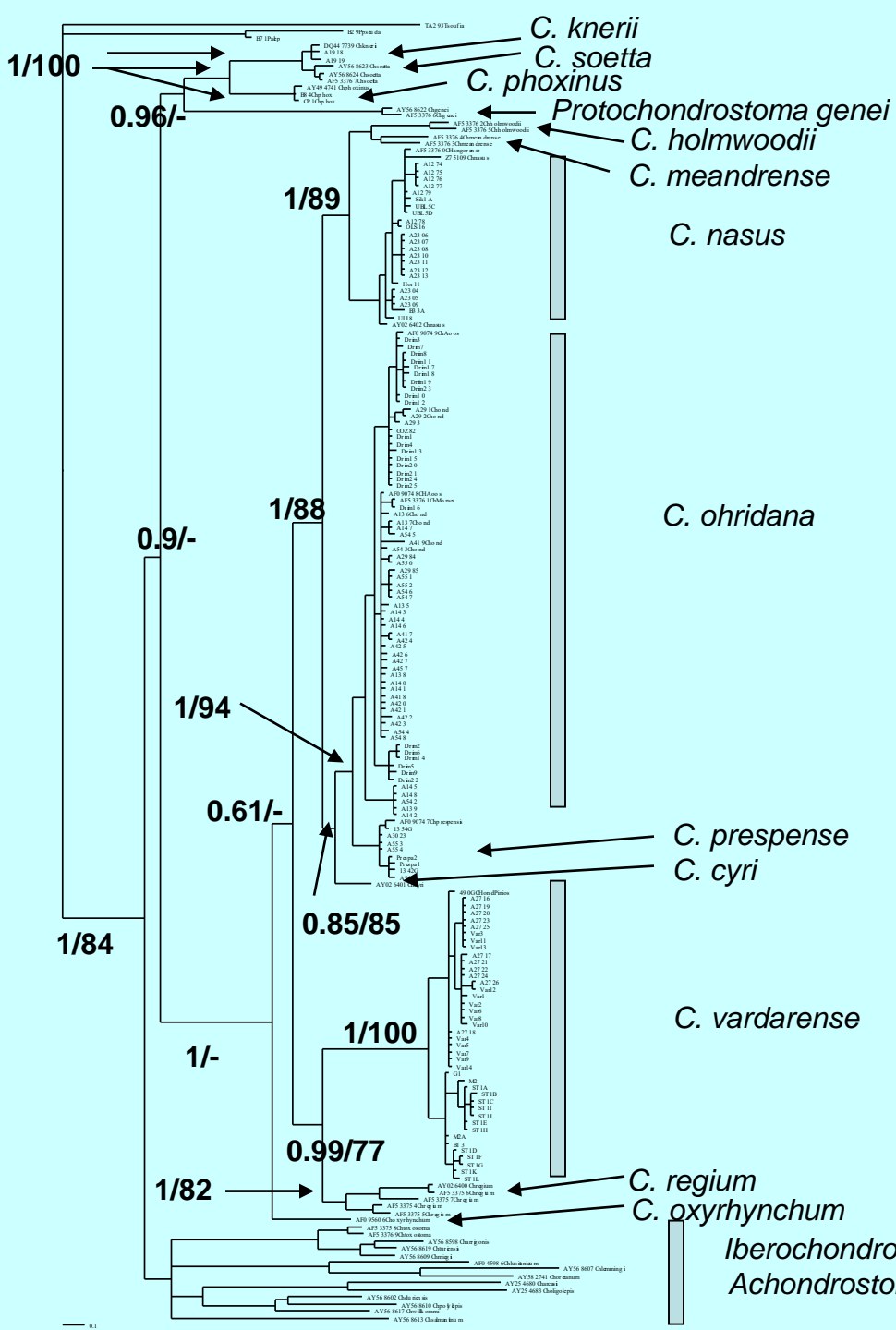
further several species in Near and Middle East nad Caspian basin





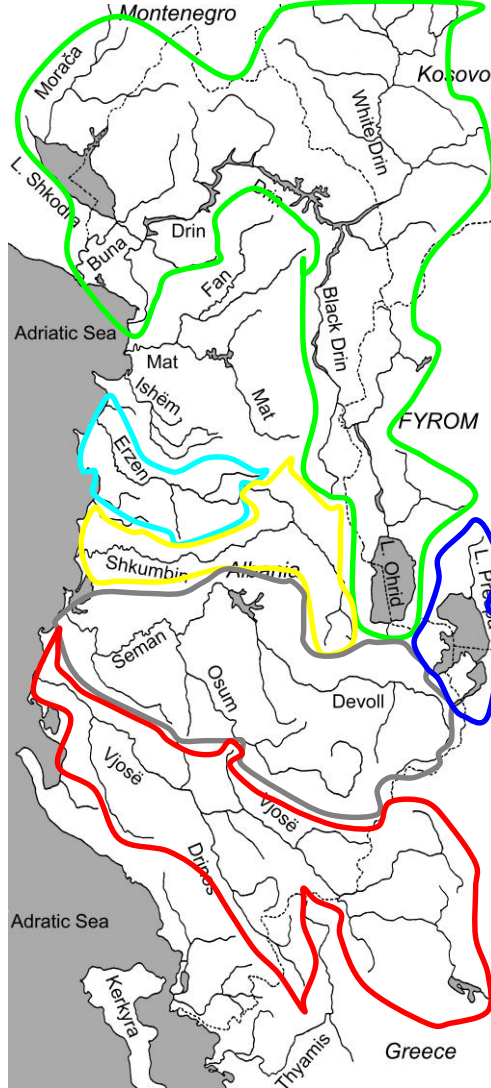
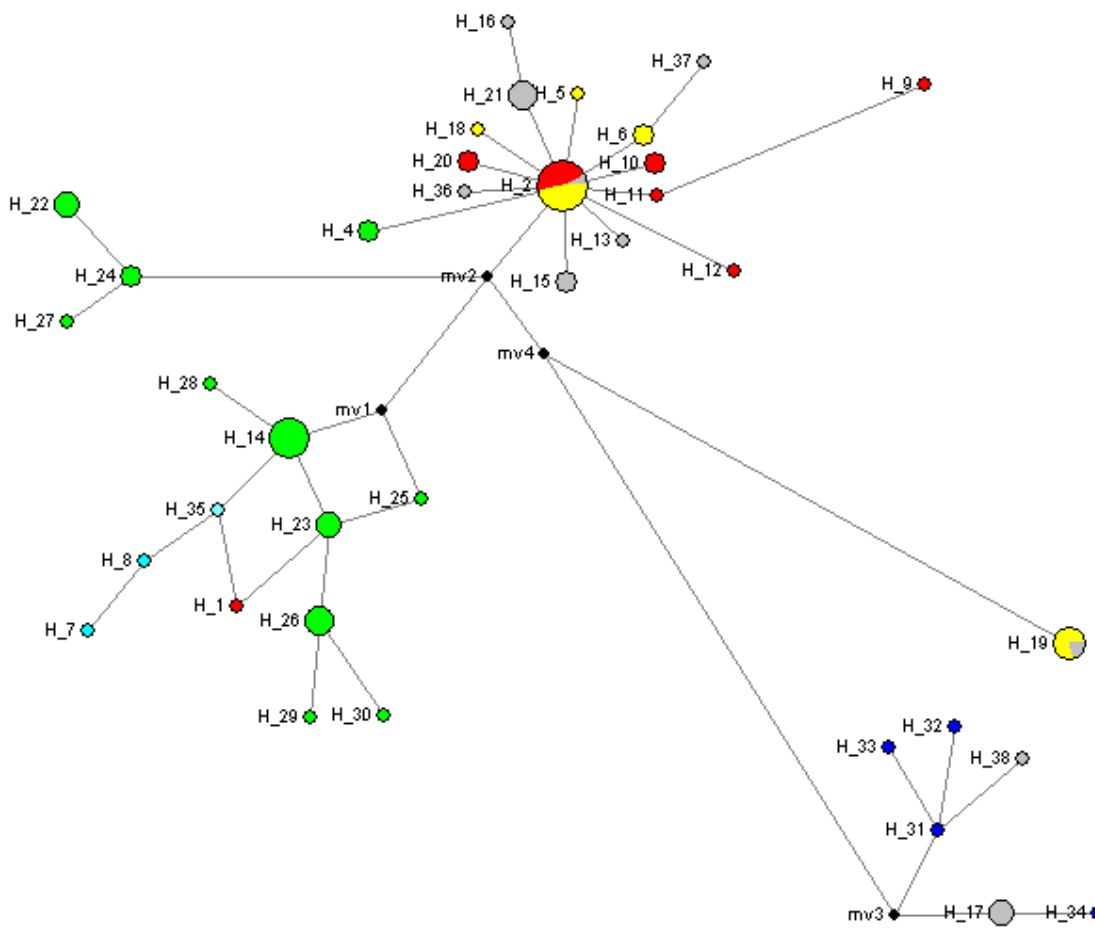
Additional sequences available from GenBank: *C. angorensis*, *C. soetta*, *C. regium*, *C. oxyrhynchum*, *C. cyri*, *C. holmwoodii*, *C. meandrensis*

Chondrostoma



Chondrostoma

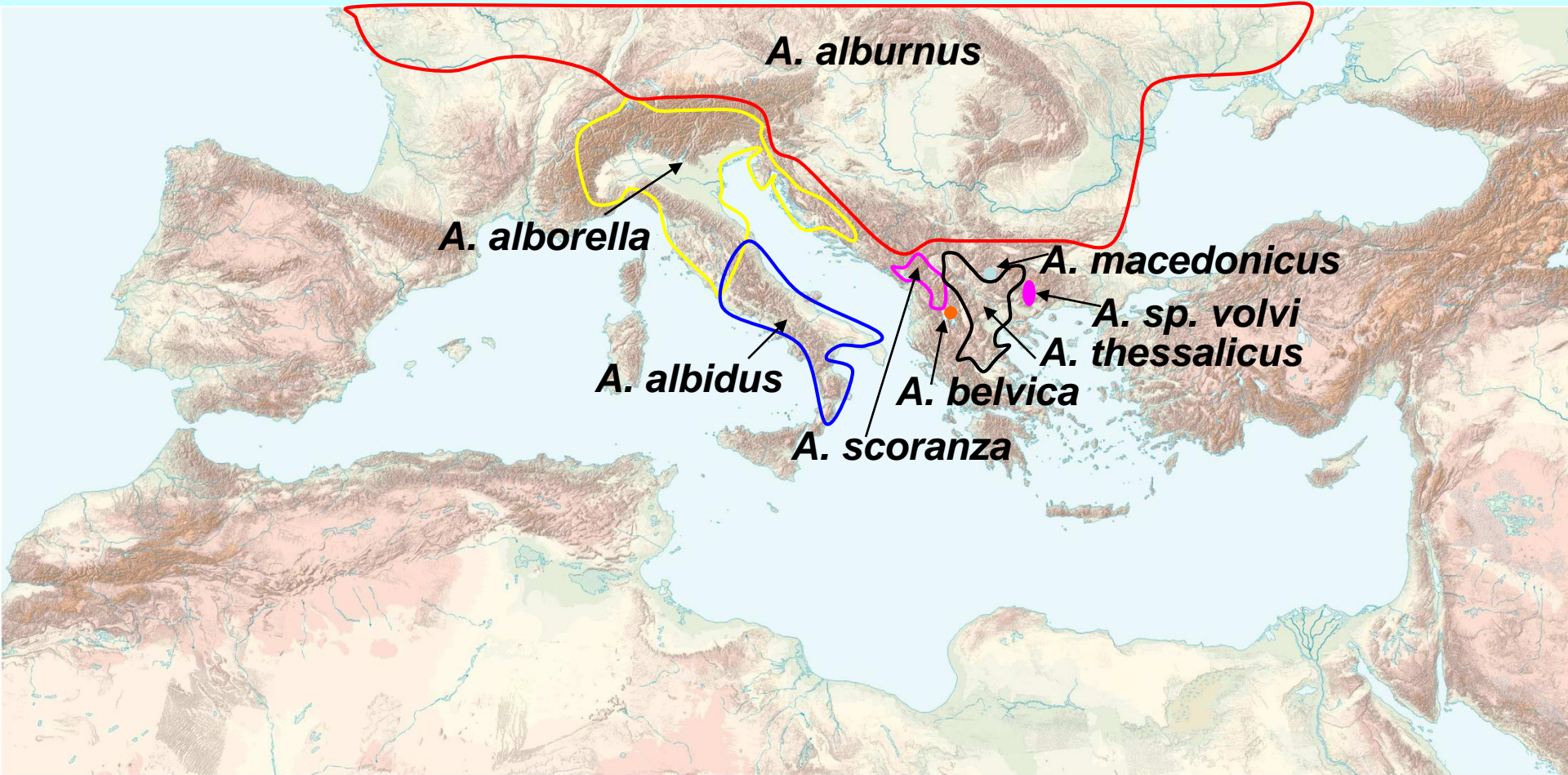
Haplotype network of *Chondrostoma* from Ohrid – Drim – Skadar and other basins of Albania

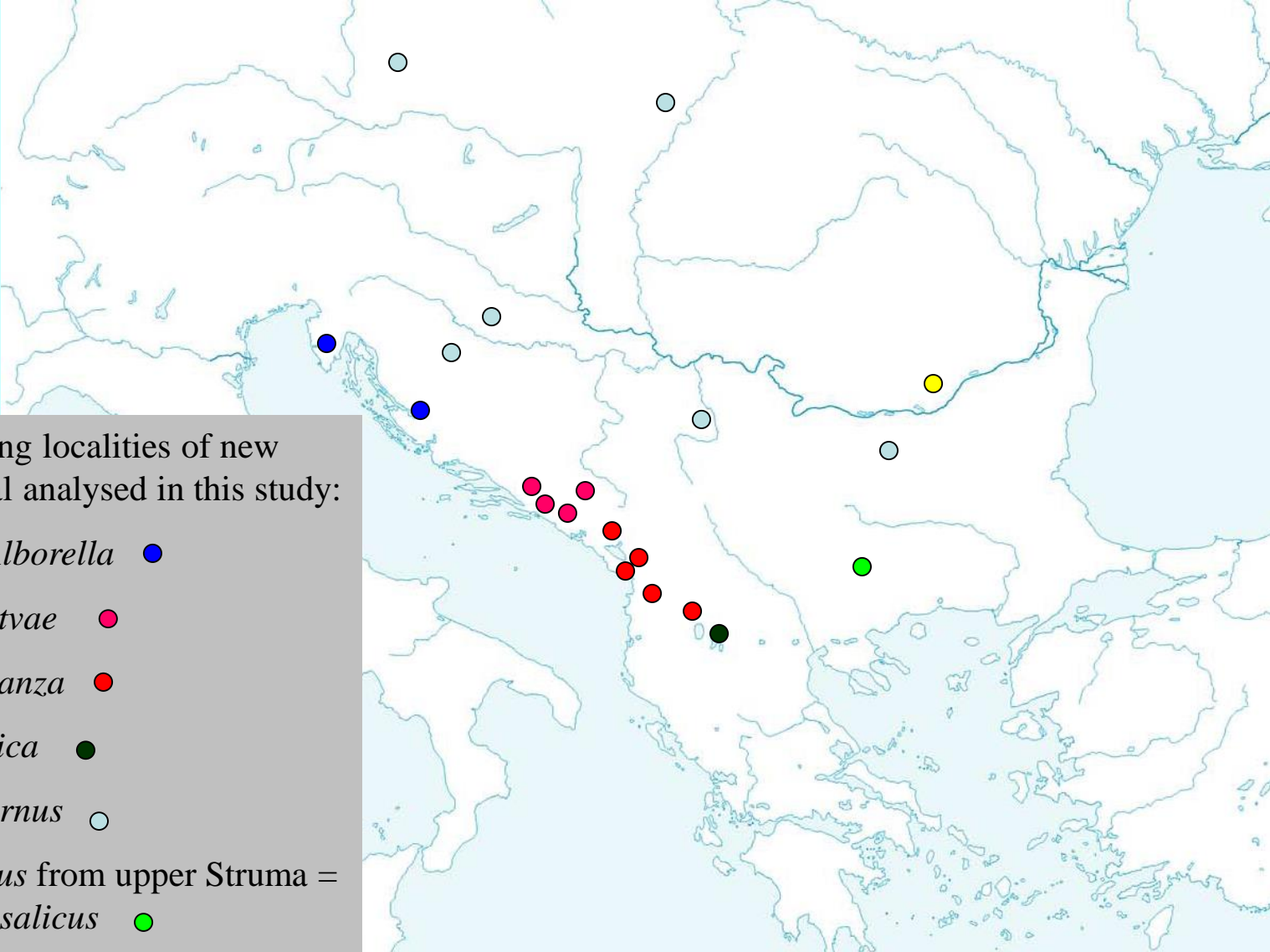


Albania

Distribution of European species of *Alburnus alburnus* group according to Kottelat and Freyhof (2007)

Numerous further species, mainly from *A. chalcoides* species group, in Aegean and Black Sea basins in Europe, Near and Middle East and Caspian basin.





Sampling localities of new material analysed in this study:

A. cf. Alborella ●

A. neretvae ●

A. scoranza ●

A. belvica ●

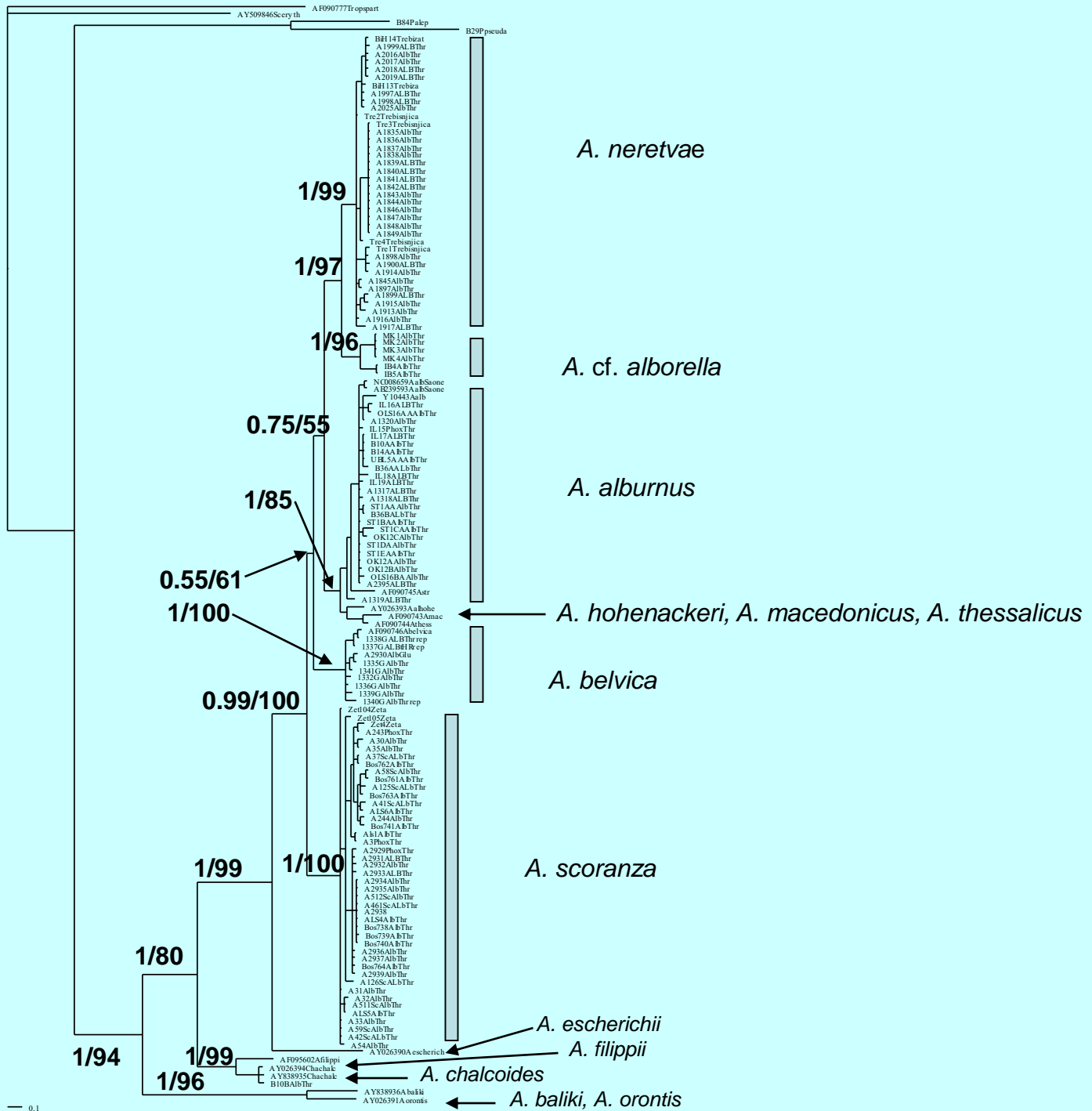
A. alburnus ○

Alburnus from upper Struma =
cf. thessalicus ●

A. chalcoides ●

Additional species available from GenBank: *A. hohenackeri*, *A. macedonicus*, *A. thessalicus*, *A. chalcoides*, *Alburnus* from lower Struma, *A. filippii*, *A. mossulensis*, *A. orontis*, *A. baliki*, *A. escherichii*

Alburnus



Conclusions

Chondrostoma:

- populations from Ohrid –Drim–Skadar System and basins of Albania
 - form a separate clade with high haplotype diversity
 - do not belong to *C. vardarense* or *C. nasus*
 - most related to *C. prespense*
- populations from north Mediterranean related to Asian species

Alburnus:

- well resolved relationships within studied taxa
- population from Neretva (Croatia) is a new species
- the status of the species from the Aegean Sea basin is unclear

Acknowledgements

These studies were supported by the research grant of the National Museum in Prague and SYNTHESYS projects, conducted in Museo Nacional de Ciencias Naturales in Madrid.