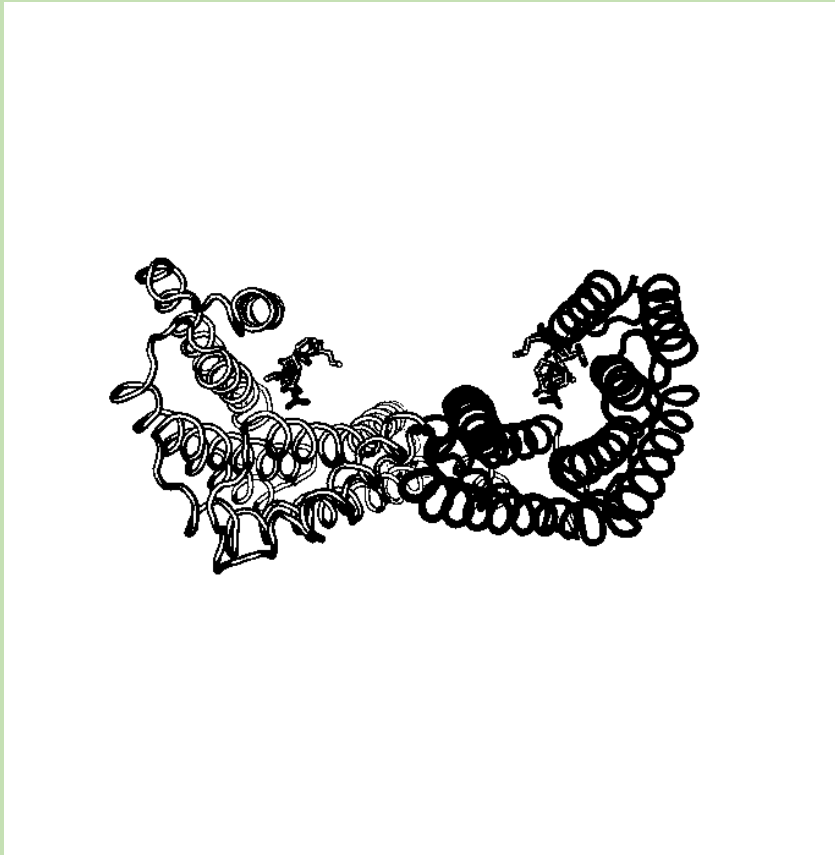


Molecular phylogeny of plant 14-3-3 proteins family



Mikhaylova Yu.V.

Komarov Botanical Institute Institute RAS, St. Petersburg, Russia

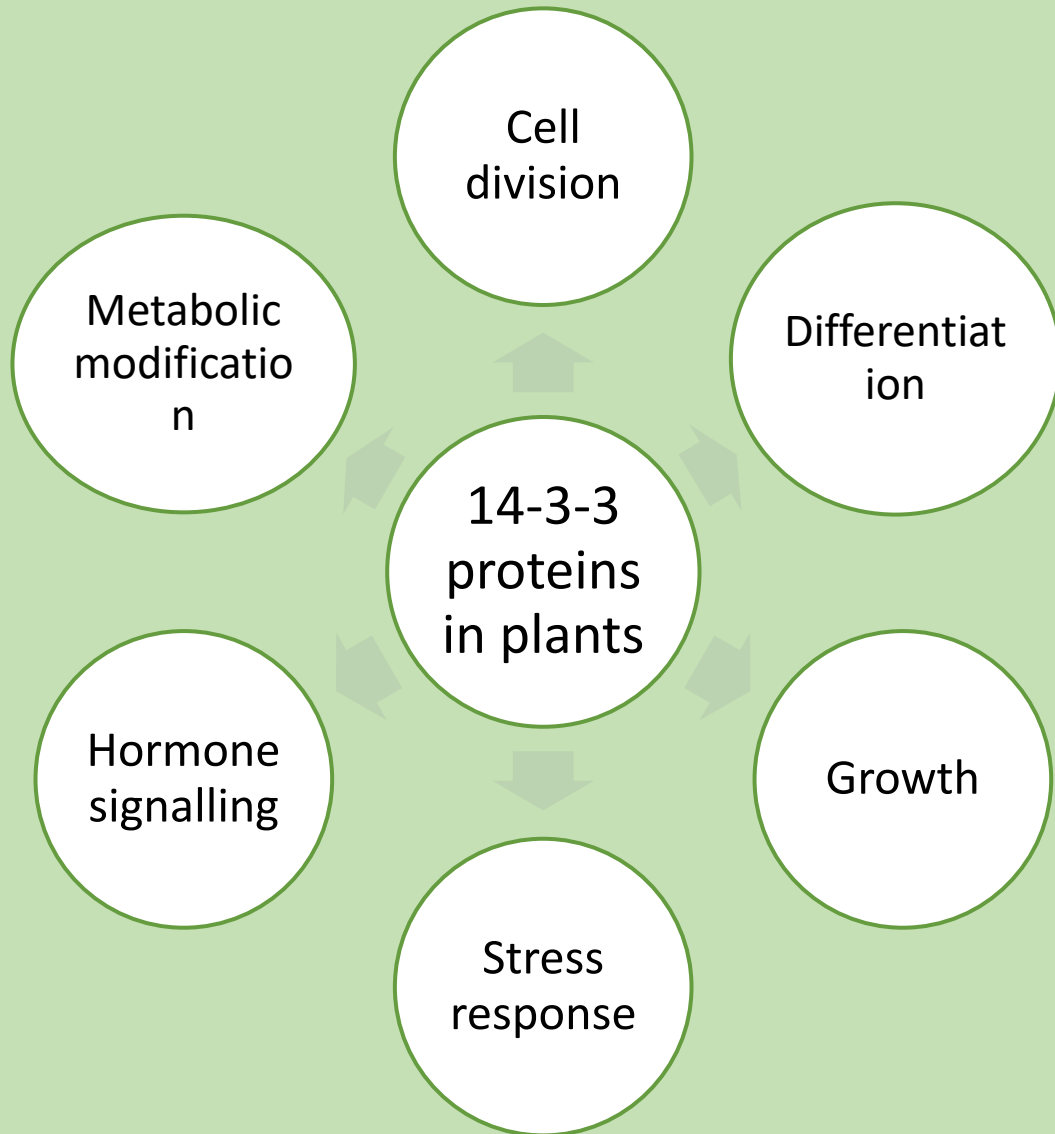
YMikhaylova@binran.ru

Shishova M. F.

St. Petersburg State University, St. Petersburg, Russia

mshishova@mail.ru

14-3-3 proteins regulates various processes in plants

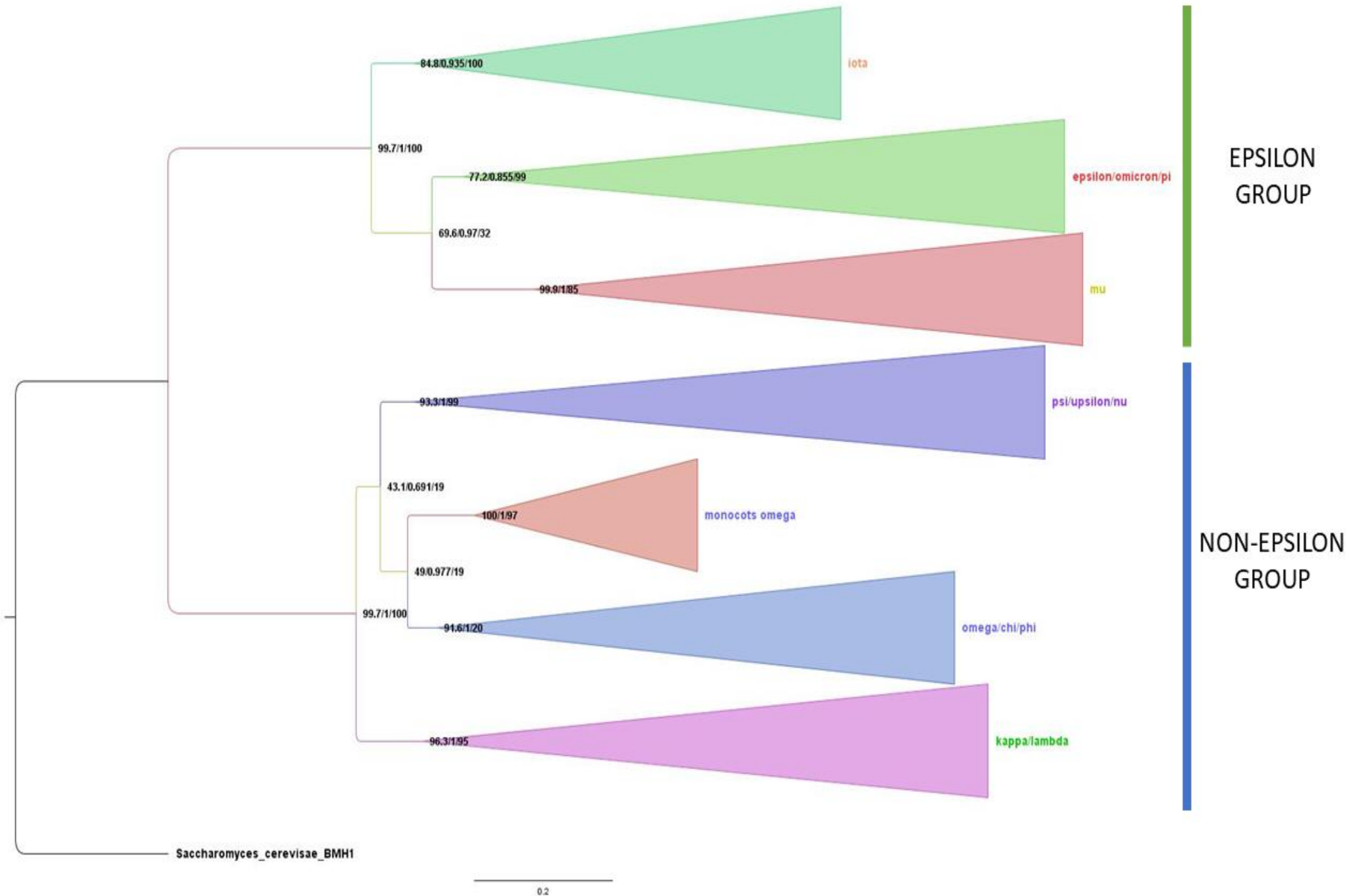


- Conservative protein spread family
- Phosphate-dependent modulators of protein-protein interaction
- Homo and heterodimers
- Various isoforms
 - *Arabidopsis thaliana* – 15 isoforms (epsilon, iota, kappa, lambda, mu, nu, omicron, pi, upsilon, phi, chi, psi, omega)
 - *Nicotiana tabacum* – 17 isoforms
 - *Oryza sativa* – 8 isoforms

In this study, to explore origin of multiple isoforms of 14-3-3 proteins we employed evolutionary analysis in broad phylogenetic scale

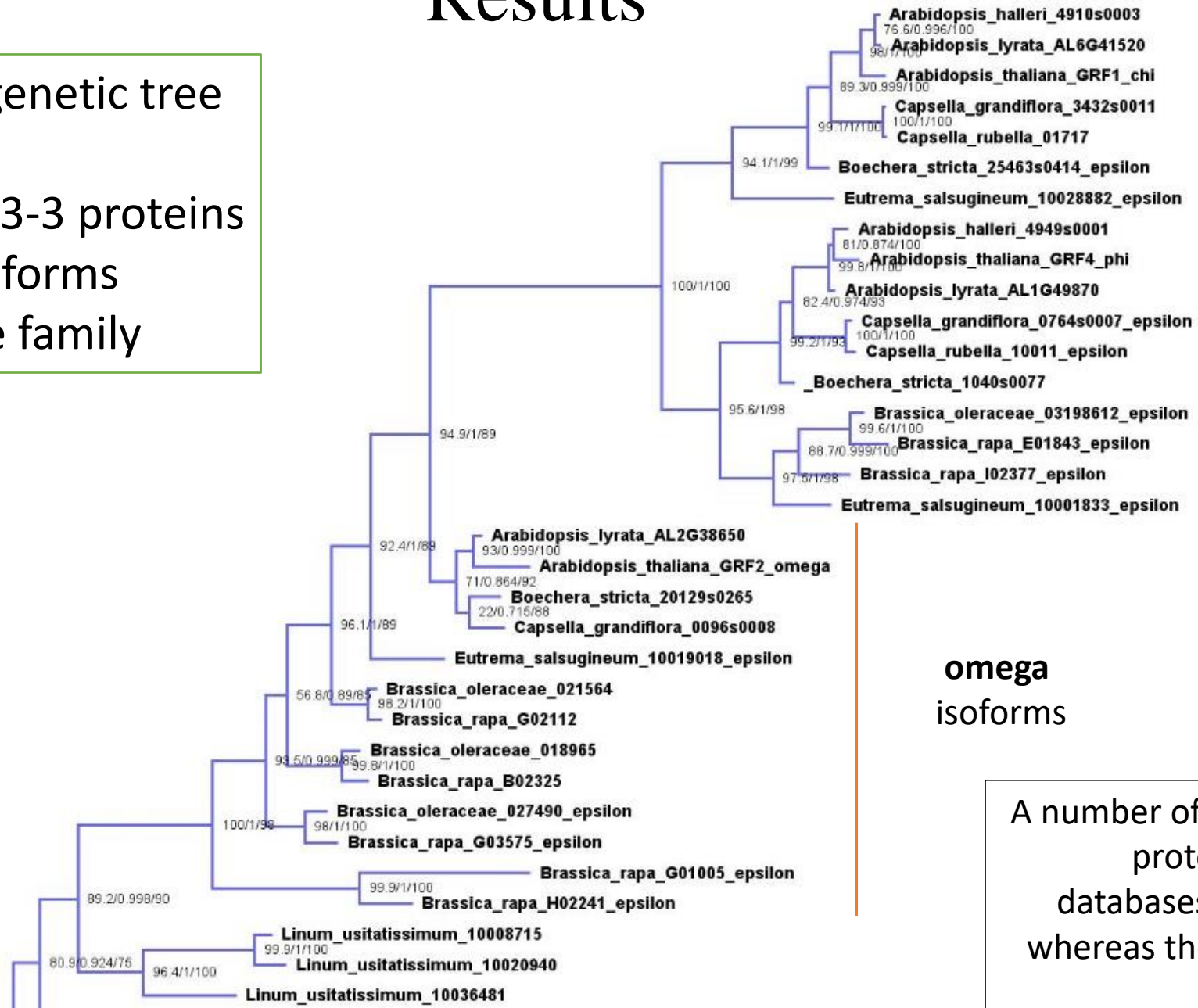
Results

Phylogenetic tree representing relationships between main subfamilies of plant 14-3-3 proteins. Numbers on the branch are statistical support according aLRT/aBayes/UltraFast bootstrap. 455 sequences from 42 plant species (monocots, dicots and *Amborella*) were analysed, yeasts were used as outgroup.



Results

Fragment of phylogenetic tree representing relationships of 14-3-3 proteins in **omega**-group isoforms within Brassicaceae family



chi
isoforms

phi
isoforms

omega
isoforms

A number of sequences of 14-3-3 proteins are annotated in databases as epsilon isoforms, whereas they are closely related to non-epsilon group

Conclusion

- The split on **epsilon** and **non-epsilon** isoforms types is ancient and took place in the early period of plants evolution, before diversification on monocots and dicots.
- Ancestral forms of **epsilon**-group, **iota**-group, **psi**-group and **kappa**-group 14-3-3 isoforms diverged in common ancestor of all flowering plants. Later in common ancestor of monocots and eudicots **mu** and **omega** groups segregated from epsilon and psi, respectively.
- **omicron**, **pi**, **phi**, **chi**, **nu** and **lambda** isoforms in *Arabidopsis thaliana* resulted from subsequent whole genome duplication events during Brassicaceae evolution

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