

## Plant Phylogeny Posters – Concise Overviews of Plant Phylogeny now in Czech and Slovak

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*Abstract:* The Plant Phylogeny Posters (PPP) project is a free and regularly updated portfolio providing details of phylogenetic relationships of extant lineages of plants in a clear and appealing format for academia and general interest groups. The portfolio consists of three main posters: Angiosperm Phylogeny Poster (APP), Tracheophyte Phylogeny Poster (TPP), Bryophyte Phylogeny Poster (BPP), plus 30 posters of selected orders and families of angiosperms. Each poster depicts a tree showing the evolutionary relationships of a particular group on the level of orders, families, or genera also listing important apomorphic, plesiomorphic and diagnostic traits. The electronic format of these posters allows for regular updates based on most recent research results – thus the topology of the trees is largely up-to-date. All posters are freely available on ResearchGate and on the webpages of the authors.

*Keywords:* plant phylogeny, posters, educational tools, languages, teaching.

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Investigations into the phylogeny of plants – the search for pieces of evidence of evolutionary relationships – has become much easier than ever before. Recent advanced technologies of mass high-throughput sequencing are enabling more samples to be processed within a much shorter period providing immense amounts of data for analyses (e.g., Lemmon & Lemmon 2013). Faster computational algorithms help to process massive data and generate more robust phylogenetic trees that depict evolutionary relationships in a new light. Advanced molecular methods help us to better understand the immense variation of morphological and biochemical features within the plant kingdom.

A few decades ago, a major conceptual and technological shift occurred with the advent of digital data processing. The internet provides free content to anyone with a computer or other smart device. Nowadays, such useful encyclopedic sources as the Angiosperm Phylogeny Website (Stevens 2001 onward) or the Tree of Life (Hinchliff et al. 2015), which are regularly updated, reflect the constant progress of our understanding of the evolutionary relationships among organisms. ResearchGate, a broadly acknowledged and very useful online academic social networking platform, has enabled worldwide dissemination and sharing of all kinds of research results – currently without membership fees!

The Plant Phylogeny Poster (PPP) project (Cole 2021) is a free and regularly updated portfolio of depictions of phylogenetic relationships of extant lineages of plants in a clear and appealing format for the global academic community and the interested public. The idea was conceived by Theodor C. H. Cole (then at the University of Heidelberg) who intended to provide basic phylogenetic, morphological, geographical, and phytochemical information for teaching plant systematics in a visually appealing format. The project was soon supported by Hartmut H. Hilger (Freie Universität Berlin), Peter H. Raven, and Peter F. Stevens (both Missouri Botanical Garden) which led to the production of the first German and English versions of the Angiosperm Phylogeny Poster APP (Cole et al. 2019) – this poster now exists in 30 languages! More than 130 botanist educators from all around the world have joined the project and have contributed translations of the posters into their national languages. In 2019, Ľuboš Majeský and Pavol Mártonfi joined the project and are now coordinating the translation of the posters into the Slovak and Czech languages.

While translating these posters, colleagues have made efforts to further refine the botanical terminology in their own language if adequate terms had not previously existed. While international communication in science is chiefly in English, the language of teaching, at least at the graduate level, usually is that spoken in the particular country. Students learn concepts and terminology in their own mother tongue. Thus, by making this available in many languages, it is possible to spread the content into a broader global community of botanists, biologists, scientists, and the interested general public.

The portfolio of the PPP consists of three main posters: Angiosperm Phylogeny Poster (APP), Tracheophyte Phylogeny Poster (TPP), Bryophyte Phylogeny Poster

(BPP) and 30 poster titles of selected orders and families of angiosperms. Each poster depicts an overview of relationships of a particular group on the level of orders, families, or genera also listing important apomorphic, plesiomorphic, and diagnostic traits. Presented phylogenetic relationships are derived from relevant and latest works, which are referenced on every single poster. All posters are freely available on ResearchGate and on the pages of the authors, each poster with its own DOI (Digital Object Identifier), and some have been published as preprints. The electronic format of these posters allows for regular updates based on most recent research results – thus the topology of the trees is largely up-to-date. A list of all current 250 posters (May 2021) with respective links is available on ResearchGate (Cole 2021).

The authors welcome cooperations for further expanding the Czech and Slovak portfolio.

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