

**„Taxonomic revision of species from Pleurothallidinae subtribe (Orchidaceae)
from Guyana Upland”
Max Rykaczewski**

The subtribe Pleurothallidinae consists of 5100 accepted species, almost 1/5 of all known orchid species, which makes it the largest subtribe within Orchidaceae (Karremans 2016). Representatives of the subtribe are known from Florida Peninsula and Mexico, to Colombia and Ecuador, up to Argentina in the South and to Brazil in the East. Most species of Pleurothallidinae are epiphytes in primary forest, and some are lithophytic or terrestrial. Pleurothallidinae are characterized by single-leaved, non-pseudobulbous stems called ramicaul. Taxonomy of this subtribe is based mainly on the morphology and the classification is concerned generally on floral parts. In recent years, some suggestions were proposed, on the basis of molecular studies, for reclassification of the subtribe.

The research presented here are focused on the Guyana Upland region, less known territory occupied by Pleurothallidinae. As a result of examination of 848 herbarium specimens from 21 herbaria I confirmed 161 species of Pleurothallidinae grouped in 22 genera. The identification keys and detailed species descriptions are provided. Other outputs from the taxonomic revision are: the identification of one previously unknown species of *Muscarella* from Suriname, 2 new nomenclatoric combinations omitted previously by other authors, correction of wrongly designated type and proposing two lectotypes.

The phylogenetic relationship within Pleurothallidinae was made on the basis of bayesian analysis of molecular marker ITS (Internal Transcribed Spacer), comprised sequences for 51 out of 161 species found in the Guyana Upland. Furthermore, sequences for *Chamelophyton*, monotypic and endemic to Guyana genus, were obtained. As a result of molecular analyses a phylogenetic tree was obtained and six main clades were identified within it: 1) *Masdevallia*, 2) *Pleurothallis s.l. – Stelis s.s.*, 3) *Lepanthes*, 4) *Acianthera*, 5) *Myoxanthus-Barbosella-Chamelophyton* and 6) *Octomeria-Brachionidium*. The posterior probability for the clades ranged from 0.94 to 1.0. On the basis of the ITS matrix molecular clock analysis was performed to evaluate the divergence times for each genera identified in the region.

These data were then combined with informations about present species distribution, coded and analyses by software suitable for reconstruction of ancestral states. On the basis of results of this analysis it is possible to state that 1) multiple reciprocal migrations between Guyana Shield and Andean region occurred in the past, 2) the common ancestor for all

Pleurothallidinae lineages had originated in Andean region, however, it immediately speciated into five protoplasts of modern lineages and, 3) modern presence of *Myoxanthus* in Andean region is an effect of a recent migration from the Guyana Upland to Andes, 4) *Pleurothallis* species migrated from Antilles to the Guyana Upland.

The analyses of the geographical distribution allowed also to estimate the endemism level for Guyanian Pleurothallidinae and it has been evaluated here at 42.24%. Furthermore, the list of endemic species with habitat preferences are also provided.

The dissertation is the first comprehensive study of taxonomical diversity of Pleurothallidinae on the Guyana Upland. The presented results can be used in the future to plan an effective protection of studied orchids.