

Morphological and Phylogenetical Studies in the Genus *Nepenthes*

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After investigations of the systematic position of the Dioncophyllaceae (Schmid, 1964), the homologies of the pitcher of *Nepenthes* are discussed again (Schmid-Hollinger, 1970). The lid is interpreted as the apical part of the lamina and the spur as true apex of the leaf. Two strong lateral veins only enter the lid and form - by basal branching and fusing - a false midvein.

Special (teratological) bracts of *N. distillatoria* (Schmid-Hollinger, 1974) favour the hypothesis of micro-evolution rather than that of saltation, that means that such an elaborate organ like a pitcher was built up step by step and not by of macro-evolution.

The hairs of the Nepenthaceae (Schmid-Hollinger, 1971) show a great diversity: Simple multicellular, toothed tufted, rosette and arachnoid hairs. Simple, unbranched hairs are considered as primitive, arachnoid ones as derived. Phylogenetically derived species show branched hairs already in early ontogenetic stages. Below the peristome on the outside of the pitcher wall every species has a stripe of peculiar hairs. This is the zone where the developing lid is pressed on the outside of the pitcher wall.

The western species of the genus *Nepenthes* form a natural group. They are a model for phylogenetic research (Schmid-Hollinger, 1979). The recently described species *N. masoalensis* (Schmid-Hollinger, 1982) is a close relative to *N. madagascariensis*. Androphores and seeds are significantly shorter in this new species than in *N. madagascariensis*. The western group as a whole is characterized by panicles and has always unbranched hairs. among this group *N. pervillei* is highly derived and shows many reductions. Long shoot pitchers are normally suppressed. Differences concern the shape of the ovary, the tendency to reduce the number of carpels per female flower and the reduction of the wings of the seeds. The latter feature may be easily interpreted as analogous to the wingless flies on the islands of Kerguelen.

In this fascinating family many gaps of knowledge exist (Schmid-Hollinger, 1994). They should be filled in the near future. A deeper understanding of the pitcher is required, but the relations between pitchers and animals need more observations (Schmid-Hollinger, 1997) and experiments as well.

References

- Schmid, R. 1964, Die systematische Stellung der Dioncophyllaceen. Bot. Jahrb. Syst. 83, 1-56.
 Schmid-Hollinger, R. 1970, *Nepenthes*-Studien I. Homologien von Deckel (operculum, lid) und Spitzchen (calcar, spur). Bot. Jahrb. Syst. 90, 275-296.
 Schmid-Hollinger, R. 1971, *Nepenthes*-Studien II. Die Haare der Nepenthaceen und ihre phylogenetische Bedeutung. Bot. Jahrb. Syst. 91, 61-90.
 Schmid-Hollinger, R. 1974, *Nepenthes*-Studien III. Brakteen-Sonderformen an der Basis von *Nepenthes*-Blütenständen. Bot. Jahrb. Syst. 94, 437-448.
 Schmid-Hollinger, R. 1979, *Nepenthes*-Studien V. Die Kannenformen der westlichen *Nepenthes*-Arten. Bot. Jahrb. Syst. 100, 379-405.
 Schmid-Hollinger, R. 1982, Népenthacées. Famille 86, Flore de Madagascar et des Comores, 41-51.
 Schmid-Hollinger, R. 1994, More knowledge about *Nepenthes rhombicaulis*. Carniv. Pl. Newslett. 23, 62-63.
 Schmid-Hollinger, R. 1997, *Nepenthes macfarlanei*: Prey found in ground pitchers. Carniv. Pl. Newslett. 26, 46-49.