

## MISTLETOES AND ALBINO LEAVES AS TERMINAL SINKS FOR ELEMENTS NORMALLY RECYCLED BETWEEN XYLEM AND PHLOEM

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### *Mistletoe, albino leaves, mineral nutrients, phloem structure*

Conspicuous physiological similarities between hemiparasitic mistletoes and albino shoots were first demonstrated for the water relations of white orange shoots by Lo Gullo *et al.* (Tree Physiology, 27, 219-217, 2007). Our presentation extends the evidence to specifics of mineral nutrition by a comparison between leaves of an Asiatic mistletoe (*Scurrula elata* Edgew. Danser) on four hosts (*Rhododendron arboreum* Sm, *Lyonia ovalifolia* (Wall.) Drude, *Lindera pulcherrima* (Nees) Benth. ex Hook.f. and *Viburnum erubescens* Wall.) from different families, and white shoots of orange (*Citrus sinensis* L.) and oleander (*Nerium oleander* L.) on otherwise normal green trees.

Leaves of *Scurrula* and its hosts, as well as white and green leaves of *Citrus* and *Nerium* were collected in the field and analyzed for cations, sulfur and nitrogen with standard laboratory techniques.

Mistletoes and albino shoots had increased contents of potassium, phosphorus and copper when compared to host leaves or green leaves. The phloem of albino leaves shows anatomical characteristics of release phloem as defined by van Bel (Plant, Cell & Environment, 26, 125- 149, 2003).

The common denominator for these two otherwise very different systems is the inability to export via the phloem carbohydrates from the leaves of the hemiparasite into the host stems or from white into green shoots. Hemiparasites have no phloem connection with their hosts, while white leaves cannot load ions into the phloem because of a lack of sugars indispensable for co-transport across membranes.

The findings are examples of a "terminal sink phenomenon", an obviously general tendency toward the accumulation of ions normally recycled between xylem and phloem, in organs not capable to re-export them via the phloem. Other examples can be found among holoparasitic plants as well as in a number of edible bulbs, tubers, and fruits.