SIGNIFICANT ROLE OF TAXUS LEAF MUCILAGE IN THE WATER-BALANCE

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Taxus baccata is a hydrostable tree whose leaves contain mucilage. The mucilage content, determined gravimetrically, shows annual variations from 3 to 6 % of dry weight. From histological investigations a localization of the mucilage in the vacuoles of mesophyll cells can be seen. It is a heteropolysaccharide with a peptidic constituent, not separable from the carbohydrate fraction by phenol extraction and gel chromatography. Feeding experiments with $^{14}CO_2$ demonstrated that shortly after synthesis the mucilage still may be metabolized, but the activity after more than 48 h is retained for at least 6 weeks. Isolated and dried mucilage has a high water binding capacity; at 96 % relative humidity it equilibrates to 180 %, and at 100 % rel. hum. to 280-300 % of its dry weight, therefore there is a great variation in this physiologically interesting interval. From the total mucilage content and volume of the cells the mucilage content of the vacuoles can be estimated at 5 to 11 %, which must give rise to a high matric potential. It is concluded that the water binding capacity of the mucilage plays an important role in stabilizing the water relations of taxus needles. Starvation experiments show that the mucilage is not a reserve substance.