



A CONTRIBUTION TO UNDERSTANDING THE STRUCTURE OF AMPHIVASAL SECONDARY BUNDLES IN MONOCOTYLEDONS

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Secondary growth of monocotyledonous plants is connected with the activity of the monocot cambium that accumulates most of the derivatives inner to the cambial cylinder. These derivatives differentiate into (a) secondary bundles with the amphivasal arrangement, i.e. xylem composed of tracheids surrounds the phloem cells and (b) the parenchymatous secondary conjunctive tissue in which the bundles are embedded. The amphivasal secondary bundles differ in the arrangement of xylem cells as visible on single cross sections through the secondary body of the monocots. Apart from the bundles with typical ring of tracheids also the bundles where tracheids do not quite surround the phloem are present. We aimed to elucidate the cross sectional anatomy of the amphivasal secondary bundles with the use of the serial sectioning method which allowed us to follow very precisely the bundle structure along its length.

The studies were carried out with the samples of secondary tissues collected from the stem of *Dracaena draco* L. growing in the greenhouses of the Polish Academy of Sciences Botanical Garden – CBDC in Powsin and the Adam Mickiewicz University Botanical Garden. The material was fixed in a mixture of

glycerol and ethanol (1:1; v/v), dehydrated stepwise with graded ethanol series and finally embedded in epon resin. Afterwards, the material was sectioned with microtome into continuous series of thin (3 µm) sections, stained with PAS/toluidine blue and examined under the light microscope.

The results, described in details in JURA-MORAWIEC & WILAND-SZYMAŃSKA (2014), revealed novel facts about tracheids arrangement. Each amphivasal bundle is composed of sectors where tracheids form a ring as well as of such where tracheids are separated by vascular parenchyma cells. We hypothesize that strands of vascular parenchyma cells locally separating the tracheids enable radial transport of assimilates from sieve elements of the bundle towards the sink tissues, e.g. the monocot cambium.

References

- JURA-MORAWIEC J., WILAND-SZYMAŃSKA J. 2014. A novel insight into the structure of amphivasal secondary bundles on the example of *Dracaena draco* L. stem. *Trees* In print. DOI: 10.1007/s00468-014-1000-7