Transactions of the Botanical Society of Edinburgh

Publication details, including instructions for authors and subscription information:

<http://www.tandfonline.com/loi/tped18>

A Method of Injection-Staining Plant Vascular Systems

R. A. Robertson M.A., B.Sc.

Published online: 01 Dec 2010.

To cite this article: R. A. Robertson M.A., B.Sc. (1897) A Method of Injection-Staining Plant Vascular Systems, Transactions of the Botanical Society of Edinburgh, 21:1, 54-56, DOI: [10.1080/13594869709441283](https://doi.org/10.1080/13594869709441283)

To link to this article: <http://dx.doi.org/10.1080/13594869709441283>

PLEASE SCROLL DOWN FOR ARTICLE

Taylor & Francis makes every effort to ensure the accuracy of all the information (the "Content") contained in the publications on our platform. However, Taylor & Francis, our agents, and our licensors make no representations or warranties whatsoever as to the accuracy, completeness, or suitability for any purpose of the Content. Any opinions and views expressed in this publication are the opinions and views of the authors, and are not the views of or endorsed by Taylor & Francis. The accuracy of the Content should not be relied upon and should be independently verified with primary sources of information. Taylor and Francis shall not be liable for any losses, actions, claims, proceedings, demands, costs, expenses, damages, and other liabilities whatsoever or howsoever caused arising directly or indirectly in connection with, in relation to or arising out of the use of the Content.

This article may be used for research, teaching, and private study purposes. Any substantial or systematic reproduction, redistribution, reselling, loan,

sub-licensing, systematic supply, or distribution in any form to anyone is expressly forbidden. Terms & Conditions of access and use can be found at <http://www.tandfonline.com/page/terms-and-conditions>

be kept in view in an attempt to locate this wood in its systematic position are—the pores, rays, indistinct rings, and especially “spurious rings” of soft tissue. Somewhat similar rings occur in a few British woods, but there the tissue forming the rings is of different histological structure, or is differently arranged. The indistinctly marked “annual ring” is an attribute of tropical rather than of temperate wood. Spurious rings, as seen in the fossil, are of common occurrence in tropical trees, and have been used as diagnostic characters in the classification of such timber, and in the identification of even families and genera.

They occur in the wood of species of Anonaceæ; Sapotaceæ, and Ebenaceæ. They are very common in tropical Leguminosæ; occur also in Guttiferæ, Celastraceæ, Meliaceæ, Boraginæ, and Urticaceæ.

Recent woods, showing structural peculiarities most closely identical with those of the stem described, are found in the orders—Leguminosæ, Urticaceæ, Sterculiaceæ, Combretaceæ, and Boraginæ, the genus *Cordia* of the last-named order presenting woods of very similar character, while the tropical woods of the four first-mentioned are distinguished by slight differences in the medullary rays and the distribution of the pores.

REFERENCES.

- Gamble's Manual of Indian Timbers.
 Marshall Ward: Timber.
 Witham: Observations on Fossil Vegetables.
 Houlbert: Annales des Sciences Naturelles, 7th Series xxii.
 Laslett: Timber and Timber Trees.

PLATE.

Reproduction of a photomicrograph of the surface of fossil, taken with 1 inch objective by Method II., described on page 49.

A METHOD OF INJECTION-STAINING PLANT VASCULAR SYSTEMS. By R. A. ROBERTSON, M.A., B.Sc.

(Read 8th April 1897.)

There is the well-known method of Von Höhncl (Pringsheim's Jahrbücher, xii., 1879, p. 47) of taking advantage of the negative pressure of a strongly transpiring branch or shoot. The vessels of such a branch, if cut

FOSSIL WOOD.

under a stain, as eosin, will be found injected to a considerable distance. There is also a method of injection by means of the filter pump (Darwin's Physiology of Plants, p. 87). But there are many specimens which do not lend themselves to injection by either of these methods. I find the following simple method extremely useful both for class purposes and for private work. The apparatus once set agoing requires little attention, and a large number of specimens for laboratory work may be injected in succession in a short time with a minimum amount of trouble. I submit a few sections of stems injection-stained by this method, to show the amount of penetration it is capable of giving.* The practical worker will, however, find it useful for all kinds of plant members.

To the end of a large glass funnel a length of india-rubber tubing is securely wired. The funnel is fixed at a convenient height, and the lower end hangs free eight feet or more in length; at the lower end is fixed a compressor clip. The stem, air-dried (I show an *Aspidium* stem injected after lying in laboratory for years), preserved in spirit, or fresh (perhaps in many cases preferably the latter), has its end cut smooth and circular, and securely wired into the lower free end of the tube. In the case of delicate stems, it is preferable to lute with Canada balsam or asphalt to avoid crushing. A beaker is placed beneath to catch the escaping fluid. The funnel and tube are now filled with a weak aqueous solution of fuchsin, the compressor clip removed, and the stem left to itself for a few hours. At the end of that interval it will be found that a considerable quantity of the stain has passed through the conducting elements, staining them *en route*. One advantage of using the living stem is that the stain is pretty well confined to the conducting elements, and hence a good differentiation staining may afterwards be obtained. The compressor clip is again applied, and the stem removed and transferred to a duplicate tube containing a solution of weak picric acid. This washes out the stain held in the conducting elements by capillarity, and darkens the stained elements, and at the same time fixes the tissues.

* *Aspidium* stem (air-dried); *Cycas* stem (fresh); *Dracæna* (spirit material).

When the picric acid comes through clear, the stem is ready for the next part of the process. It is removed, and, if intended for sectioning purposes, is cut up into small pieces and placed in alcohol of at least 90 per cent. strength. In this it is decolorised, and after a few days is in good condition for sectioning purposes. The liquified elements of the conducting system are stained a fine pink. A good contrast is obtained by ground staining with hæmatoxylin on the slide. If the stem be intended for dissection of vascular system, the picric injection may be omitted and the preparation allowed to lie for a time in weak picric acid, and then preserved in alcohol until required.

PYRUS ARIA AND ITS VARIETIES IN ARRAN.

By Rev. DAVID LANDBOROUGH.

(Read 8th July 1897.)

I know the island of Arran well, and it seemed to me strange that its Rare *Pyrus* should be confined to a small portion of the north. There are places in other parts of the island seemingly suitable for its growth. Might it not also be found in some of these? I determined to search Arran for it. I wished, further, to ascertain if it could not be had in additional varieties; and if the varieties were accidental, or resulted from discoverable causes. This led to several excursions. I mention the principal:—

UNSUCCESSFUL EXCURSIONS.

First.—At the end of May, with one of my sons, I started from Brodick, in the centre of the east coast; went up Glen Rosa to the Garbh Allt ($2\frac{1}{2}$ miles); ascended this stream; descended into Glen Iorsa; forded it; ascended the connecting stream to Loch Tana; thence to Loch Dubh; descended Glen Schaftigill; passed into Allt-na-h-Airidhe; descended to Dougrie; thence to Shedog Inn.—Twelve hours afoot.—No success.

Second Excursion.—Next day we took, for four miles, the road to Brodick; at Glen Loig, turned up the Craigan, the most considerable glen running southward through the