



On the Septa across the Ducts in *Bougainvillea glabra* and *Testudinaria elephantipes*

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Mr John Sadler *on the Flowering of Yucca gloriosa*, L. 121

panicles do not spread so much. In this last character they resemble *Y. aloifolia*, figured in "Bot. Mag." in 1815, t. 1700, a species apparently of early introduction into this country from America, as we read of it as having been cultivated in the king's garden at Hampton Court in 1696.

Y. gloriosa was first discovered in Carolina by Michaux, growing near the sea-coast. It has long been known in the gardens of Britain, as both Parkinson and Gerard notice it. It was figured in "Bot. Mag." in 1810, t. 1260.

During the severe winter of 1878-79, the plants had their leaves much broken down by heavy snows, but otherwise they did not suffer. The species is very hardy, and ought to be more extensively planted as an ornamental evergreen, especially in town gardens, as no plant will resist better the evil influences of continual smoke and dust.

The general flowering of the Yuccas this autumn, in various parts of the country, I attribute to the favourable summer and autumn of last year (1878) for maturing their growths.

Besides *Y. gloriosa*, there were other three dwarf species in flower on the Rock Garden at the same time, viz., *Y. filamentosa* ("Bot. Mag." 1806, t. 900), which was in cultivation as far back as 1675; *Y. flaccida*, introduced in 1816; and *Y. Antwerpensis*, a beautiful species, with a panicle of about 2½ feet high of handsome cream-coloured flowers.

The accompanying plate was taken from a photograph of a portion of the Rock Garden, executed by George A. Panton, Esq. The Society is indebted to the proprietors of the "Gardeners' Chronicle" for the electrotype.

On the Septa across the Ducts in Bougainvillea glabra and Testudinaria elephantipes. By Professor DICKSON, M.D. (Plate III.)

(Read 11th December 1879.)

Bougainvillea glabra.—In *Bougainvillea*, as in some other Nyctyaginaceæ, there is a central large-celled parenchyma in which isolated and definite primary fibro-

vascular bundles are scattered, very much as in a monocotyledon. The diameter of the stem is increased, from year to year, by the formation of secondary bundles, with intervening smaller-celled parenchyma, out of a persistent meristem, or extra-fascicular cambium, beneath the rind, somewhat as in the monocotyledonous *Dracaena*. On the inner side of the rind, just outside this meristem, long fibres, resembling bast fibres, occur, singly or in bundles of two or three together. It will thus be seen that in the rind, here, the appearance of ordinary dicotyledonous structure is curiously simulated. The cambium-like meristem and the bast-like fibres in *Bougainvillea*, however, are both *extra-fascicular*. In the fibro-vascular bundles the dotted ducts are of peculiar character. They are formed from comparatively short cells applied to each other by horizontal extremities. Most of the horizontal septa between the component cells become perforated in the ordinary way by the formation of a large round hole; but a certain number—say one in six or seven—of the septa persist as diaphragms, which exhibit thickening in the form of a very beautiful hexagonal reticulation. The spaces of the mesh-work are not perforated, but are closed by a thin membrane.

Testudinaria elephantipes.—The fibro-vascular bundles here are somewhat peculiar, in exhibiting usually from two to four isolated strands of soft bast. The ducts vary much in size; but there are usually two of very large calibre (about $\frac{1}{100}$ of an inch) in each bundle—a very common occurrence in monocotyledons. The ducts are formed of much elongated cells—fully half an inch in length—applied to each other by more or less oblique extremities, the obliquity being often so great that the septa become nearly vertical, and, of course, much elongated. In form these septa are more or less elongate-oval, with narrowed and almost pointed extremities. They are exquisitely marked, in the middle with transversely elongated pits exhibiting irregularly scalariform arrangement; this passing rather suddenly towards the extremities into very minute dotting. Like the persistent septa across the ducts in *Bougainvillea* those in *Testudinaria* are imperforate.

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As I have already said, the component cells of the ducts in *Testudinaria* are fully half an inch in length. The parenchyma-cells immediately surrounding them are comparatively short (about $\frac{1}{2} \frac{1}{50}$ of an inch), from which it is evident that the duct-cells must have been formed long before the adjacent cells had ceased to multiply by division.

In the ducts of the two plants above referred to, we have what appears to be a very exceptional, if not hitherto unknown, peculiarity, viz., the occurrence of imperforate septa: indeed, in *Testudinaria* the technical character of a duct as a cell-fusion is altogether absent. Something similar to the structure in *Bougainvillea* is, however, described by Sanio ("Bot. Zeitung," 1863, p. 123) as occurring in an *Avicennia*. He says "either the wide vessels of this plant, which form the greater part of the wood, exhibit as perforation a large hole sharply defined from the rest of the transverse partition, or this hole is covered across by a membrane which exhibits bordered open pitting of the most varied kind" ["*die verschiedenartigste behöfte offene Tüpfelung*"]. In this description Sanio seems to view the pits as perforations—but it may be that the case is identical with what I have described in *Bougainvillea*.

Report on Temperatures and Open Air Vegetation at the Royal Botanic Garden, Edinburgh, from November 1879 till July 1880. By Mr JOHN SADLER, Curator.

In my last report, I stated that the winter of 1878-79 was the most severe and protracted that had been experienced for many years. From the beginning of November 1878 to the middle of February 1879 the ground was frozen to such an extent that no cultivation or transplanting could be carried on, the frost having entered the ground to the depth of 18 inches. The winter of 1879-80 was also very severe, and the hard frosts at the beginning of December did much injury to vegetation at the Royal Botanic Garden. This arose, I believe, from the unripened nature of the wood, owing to the summer and autumn of 1879 being cold, wet, and sunless (see p. 128).

Fig. I. $\frac{33}{1}$



