

Polyembryony in *Sarcococca ruscifolia*, Stapf.

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With two figures in the text.

THE number of Angiosperms in which Polyembryony has appeared as an occasional or habitual feature of their reproductive processes is comparatively small, and present-day botanical literature is singularly barren of further additions to the list. A new case of polyembryony is therefore of interest, more particularly if it be found in a Family which has not previously furnished any example of the phenomenon. Such a case has recently come to light in the embryogeny of *Sarcococca*, and, so far as is known to the writer, this is the first mention of a departure from the normal mode of embryo-formation in a member of the Buxaceae.

While examining fruits of *Sarcococca ruscifolia*, which had been brought to the Botanic Garden Laboratory from an estate in East Lothian, it was discovered that fully one half of the ripe seeds contained more than one embryo, there being usually, in each seed, two fully-formed embryos with radicle, plumule and cotyledons, and a varying number of minute, immature embryos in various stages of development.

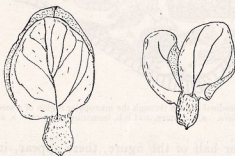


FIG. 1.—Two embryos from a seed of *Sarcococca ruscifolia*. $\times 10$.

The only apparent distinction between the two mature embryos taken from any one of these seeds was a difference in size, and it

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is a matter for conjecture whether both of these embryos might not have developed, *pari passu*, into seedlings had the seed been allowed to germinate. Two such embryos are shown in fig. 1.

A further supply of seed was obtained from plants of the same species growing in the Royal Botanic Garden, and these were also found to be polyembryonate; in one case, as many as seven embryos, showing different degrees of development, being isolated by dissection from a single seed.

The problem of the origin of these several embryos was not one which could be solved satisfactorily by an investigation of the material then available; but, by removing the endocarp, and embedding the seed in paraffin, it was possible to obtain a series of sections in which the relative positions of the embryos, and their relationship to the tissues within the seed, could be demonstrated. The anatomical features disclosed by these preparations can best be illustrated by reference to fig. 2, which is a camera lucida drawing of a longitudinal section through the micropylar region of a ripe seed.

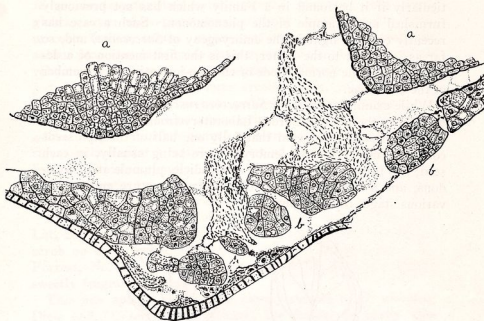


FIG. 2.—Longitudinal section through the micropylar region of a seed of *Sarcococca ruscifolia*. a,a, mature, and b,b, immature embryos. $\times$ about 100.

In the upper half of the figure, there appear, in section, the radicle apices of two embryos similar to those represented in fig. 1, while, in the lower, micropylar area, intermixed with the disorganised tissue, there can be seen a number of distinct cell-masses which are the immature embryos referred to above.

From the figure, it will be seen that the position of these immature embryos in the disintegrating tissue at the apical end of the seed is somewhat suggestive of their genesis in the nucellus of the ovule at an earlier period of growth. This derivation of embryos from sporophytic tissue outside the embryo-sac is by no means an uncommon feature of certain forms of polyembryony, and has been observed in both Monocotyledons and Dicotyledons by various investigators.

In the Euphorbiaceae, for example, it has been established by the researches of Strasburger* on *Coelebogynne ilicifolia* (*Alchornea*), and by the later work of Hegelmaier† on *Euphorbia dulcis*, that embryos produced by these two polyembryonic species have their origin in the nucellus. Bearing in mind the close relationship existing between the Euphorbiaceae and Buxaceae, it might be reasonably inferred that the undifferentiated embryos in the seed of *Sarcococca* have arisen from the same ovular tissue.

Whether the fully-developed embryos shown in fig. 1 originated in like manner, or in some other way, is a debatable point at this stage. Absolute proof regarding the morphological origin of both the mature and immature embryos in the seed of *Sarcococca ruscifolia* can only be attained by a study (which is now being prosecuted) of the whole process of embryo-building throughout the entire period of maturation. All else is pure speculation.

* E. Strasburger in Zeitschr. Naturwiss. Jena, xii (1878), p. 659.

† F. Hegelmaier in Ber. Deut. Bot. Gesell., xxi (1903), p. 6.