FLORAL MORPHOLOGY AND EMBRYOLOGY IN SOME TAXA OF THE CANELLACEAE

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INTRODUCTION

The family Canellaceae has not been investigated from the point of view of embryology or floral morphology. Schnarf (1931) lists this family as inviting embryological study along with Lactoridaceae, Himantandraceae, Eupomatiaceae, Gomortegaceae, Monimiaceae and Hernandiaceae. Rather extensive taxonomic deliberations combined with scanty anatomical studies of the taxa of the Canellaceae have yielded data which are conflicting in themselves as to the exact placement of the family in the systems of classification. The general trend has been to adjudge the Canellaceae to the Parietalean complex with various degrees of relationship to families like the Violaceae, Bixaceae, Flacourtiaeeae and Koeberliniaceae. A comparative morphological study of the family combined with an intensive study of wood anatomy has convinced the present author that the Canellaceae is to be located in the Ranalian group of families with monocolpate pollen, “ethereal oil cells” and trilacunar node (Group B of Money, Bailey and Swamy, 1950). On the evidence obtained from wood anatomy Wilson (1960) has concluded that the family is more nearly related to Eupteleaceae, Dilleniaceae, Eupomatiaceae, Illiciaceae and Schisandraceae of the woody Ranales than to the families of Parietales. The present study sums up the data obtained from an investigation of floral anatomy and embryology in relation to the systematic position of the Canellaceae.

MATERIAL AND METHODS

Melchior and Schultze-Motel (1959) recognize six genera and twenty species as constituting the taxa of the family. The genera are Canella, Cinnamodendron, Warburgia, Cinnamosma, Capsicodendron and Pleodendron.

In the embryological study presented here, fresh and killed materials of Canella alba Murray, obtained through the courtesy of the Director, Atkins
Gardens, Cienfuegos, Cuba and those of *Warburgia ugandensis* Sprague and of *Warburgia stuhlmannii* Engl. obtained through the courtesy of the Sylviculturist, Forest Department, Lushoto, Tanganyika, were used. Materials for anatomical study were obtained from herbarium specimens. Of these, *Cinnamosma madagascariensis* Danguy was obtained from the herbarium specimen supplied by the Director, National Museum of Natural History, Paris. I am thankful to the above institutions and personnel for the gift of materials used in the present study.

Customary methods of dehydration and embedding were followed. Iron-alum haematoxylin in combination with erythrosin or fast green was used for staining.

**Observations**

*Floral anatomy*

The exomorphic features of the flowers in the Canellaceae are rather uniform and stabilized. The norm may be taken to represent a trimerous calyx, the basal part having united in the form of a cup; one or two whorls of petals, the number of which is subject to slight variation within each genus; a syngenesious androecium in which the component stamens are variable in number (generally in multiples of five) and a superior gynoecium constituted of two to six carpels. The ovules are numerous on parietal placentae and semi-anatropous.

While the petals are free in most of the genera, those of the genus *Cinnamosma* exhibit a particular trend of specialization in having undergone lateral fusion for a greater length.

The pattern of floral vascularization appears to be as stabilized as the exomorphic features with little variation, thereby rendering it possible to visualize a norm. The variations concern the degree of proliferation of the vascular strands of the pedicel corresponding to the number of appendages borne by the flower.

A major variation in the exomorphic feature is, as mentioned above, the gamopetalous condition in *Cinnamosma*. With these considerations in mind, the vascular anatomy of *Warburgia stuhlmannii* (representing norm), of *Cinnamosma madagascariensis* (representing variation) and of *Canella alba* has been described in the following paragraphs. The terminologies employed in the description are patterns as seen in successive serial transverse sections from the base to the apex of the flower, and the terms do not imply developmental connotations.