The comparative morphology of the Alangiaceae VI. On the foliar anatomy of two new species of *Alangium*

E GOVINDARAJALU
Department of Botany, Presidency College, Madras 600 005

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Abstract. The laminae and petioles of two recently named species of *Alangium* (*A. circulare* and *A. grisolleoides*) have been investigated. The placement of *A. circulare* under Conostigma section of Bloembergen on exomorphic grounds is justified and strengthened on the basis of its leaf anatomy. Likewise the position and relationships of *A. grisolleoides* that have been controverted is now accorded a place under Bloembergen's section Rhytidandra based on its foliar anatomy and the preliminary observations on wood anatomy.

Keywords. Alangiaceae; foliar anatomy; *Alangium circulare; A. grisolleoides*.

1. Introduction

All the previous contributions of the series (Govindarajalu 1961a, b; 1962 a, b; 1972; Govindarajalu and Swamy 1956) based on a critical study of 15 out of 18 species of *Alangium* as recognised by Bloembergen (1939) have clearly indicated not only the occurrence of a wide spectrum of anatomical variability among different taxa of this genus but confirmed his subgeneric groupings of the species within the genus. Recently the author had the benefit of examining from this standpoint the leaf materials of two more species of this genus discovered subsequent to the publication of Bloembergen's work (1939) and the results of their anatomical study have become the theme of the present work. As shown below these two new species show relationships both in terms of their exomorphic and endomorphic features to the sections Conostigma and Rhytidandra respectively (Bloembergen 1939).

2. Materials and methods

The midportions of the siccate materials were selected and revived by boiling them in water containing 'det' (commercial detergent) and glycerine. Such revived materials were fixed in AFA and sections were cut with the help of rotary microtome at a thickness of 12 μm and stained with safranin and fast green following
the customary procedures of embedding and staining (Johansen 1940). Clearing of the lamina was done with 5% NaOH followed by the treatment with saturated solution of chloral hydrate (Arnot 1959) and finally stained with haematoxylin and also with safranin.

3. Observations

3.1. *Alangium circulare* Stone and Kochummen

*Leaf*: *Abaxial epidermis, surface view*

Cells uniform in size and shape with curved anticlinal walls; cell walls conspicuously thickened, pitted (figure 18). Stomata (L. 23·4–32·4 μm; W. 27·0–36·0 μm), anomocytic (although resembling spuriously cyclocytic stomata, the surrounding cells are not subsidiary cells), subcircular (figure 15), abundant, apparently sunken because of the thickness of cuticle although occurring superficially in line with the epidermal layer; epidermal cells exceedingly thick-walled with convolutions (figure 15) thereby presenting a characteristic relief pattern. Hairs (L. 48·0–72·0 μm), unicellular, thick-walled, sickle-shaped with reduced lumina, solitary or clustered, each cluster containing 2–6 stellate-peltate hairs (figure 14) occurring along with groups of relatively thin-walled, 2 celled hairs and each group containing 4–6 hairs (figure 20). Epidermal crystal (druse) bearing idioblasts common, usually occurring in pairs in the form of cysts (figure 24).

*Vasculation*

Veins thick, coarse, each one of them enveloped by lobed parenchyma as observed in other members of the section *Conostigma* (Govindarajalu 1961b; 1972).

*Leaf*: *Adaxial epidermis, surface view*

Stomata absent; other details as in abaxial surface.

*T.S. lamina*

Lamina dorsiventral (figure 1), c. 252·2 μm thick. Cuticle on either surface c. 18·0 μm thick, smooth except on the midrib where it is undulate and thicker (c. 27·0 μm thick). Epidermis: adaxial epidermal cells radially elongated, uniform in size and shape, thick-walled; abaxial epidermal cells isodiametric, somewhat variable in size and shape, thin-walled; both adaxial and abaxial epidermal cells in the midrib relatively narrow, 2–3 times longer than broad. Stomata apparently sunken (figure 16), see abaxial surface; guard cells unevenly thickened; outer and inner ledges present (figure 16); substomatal chamber very narrow (figure 16). Hairs: uncinate (L. 36·0–40·5 μm), moderately thick-walled occurring solitarily in crypts on the adaxial surface of the midrib (figure 19) and superficially in stellate-peltate groups on the abaxial surface of the midrib (figure 21). Hypoderms in the midrib region abaxially 6–7 layered, adaxially 2–3 layered, collenchymatous consisting of tangentially flattened cells. Mesophyll consisting of