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STUDY OF PHENOLIC COMPOUNDS IN THE ANALYSIS OF HYBRID NATURE OF *CLERODENDRUM SPECIOSUM* D'OMBRAIN[1]

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ABSTRACT

Bailey (1949) has considered *Clerodendrum speciosum* D'Ombrain of the family Verbenaceae a hybrid of *C. thomsonae* Balfour & *C. splendens* G. Don. on morphological ground. No other studies have been made in support or against of the contention. Phenolic compounds are the products of leaf metabolic pathways. Generally, a hybrid tends to retain the summation of species specific phytochemical compounds of the parents. Therefore, two dimensional thin layer chromatographic analysis of phenolic compounds were made in the hybrid species *C. speciosum* and one of its putative parent *C. thomsonae*. The appearence of large number of common phenolic spots in the chromatogram suggests the hybrid nature of *C. speciosum* derived from *C. thomsonae*.

INTRODUCTION

Bate-Smith (1958, 1961) has given a large amount of information about plant phenolics as taxonomic guides. Phenolic constituents, at least in parts, belong to the products of leaf metabolic pathways. Alston (1965) has made chromatographic studies of such compounds in the study of introgressive hybrdization. Such study in groups containing obligate apomicts has been made by Asker and Frost (1970B). Bailey (1949) has considered *C. speciosum* a hybrid of *C. thomsonae* and *C. splendens* on morphological ground. No further studies were made in support/contradict of this contention. Generally, a hybrid retains the species specific characters of the parents. In the present investigations phenolic compounds were studied by two dimensional thin layer chromatographic method in *C. speciosum* and *C. thomsonae* to examine hybrid nature of *C. speciosum*.

MATERIALS AND METHODS

For the analysis of phenolics and related compounds fresh basal leaves of both the taxa under investigation were finely chopped and put in 10 ml. of methanol containing 1% IN HCl. It was stored in dark for 48 hours at room temperature (30°C±2°C) and than its concentration was made about 1 ml. under reduced pressure. About 10 drops of sample were spotted at the starting point of a plate coated with silicagel G powder (Stahl, 1969). The spotted plate was chromatographed in the 1st dimension for two hours with toluene : chloroform : acetone (40 : 25 : 35). After

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drying overnight the plate was chromatographed for 2 hours in the second dimension with chloroform : methanol (15 : 1). Again it was dried and examined. Green colours of pigments were observed at the extreme ends of the chromatograms. The plates were treated with ammonia vapour, iodine vapour and 1% lead acetate as recommended by Block *et al.* (1958) to distinguish spots of phenolics. Ammonia vapour gave good distinct colour in visible day light. No attempt was made to determine the chemical nature of the compounds.

All spots were copied onto semi-transparent paper. The relative location of each spot was used as a criterion for comparasion and specification.

OBSERVATIONS

On the basis of spot visualisation in day light, eleven spots, in addition to three spots of pigments, were observed in *C. speciosum*. In *C. thomsonae* 13 spots of phenolics, besides 4 spots for pigments were recorded (Fig. 1). Spot number 3, 6 and 12 seem to be species specific in *C. thomsonae*. In *C. speciosum* spot number 2 is species specific in its colour and profile. Red colour spot number 12 of *C. thomsonae* is totally absent in *C. speciosum*. Thus, spot number 12 of red colour in *C. thomsonae* is absolute specific.

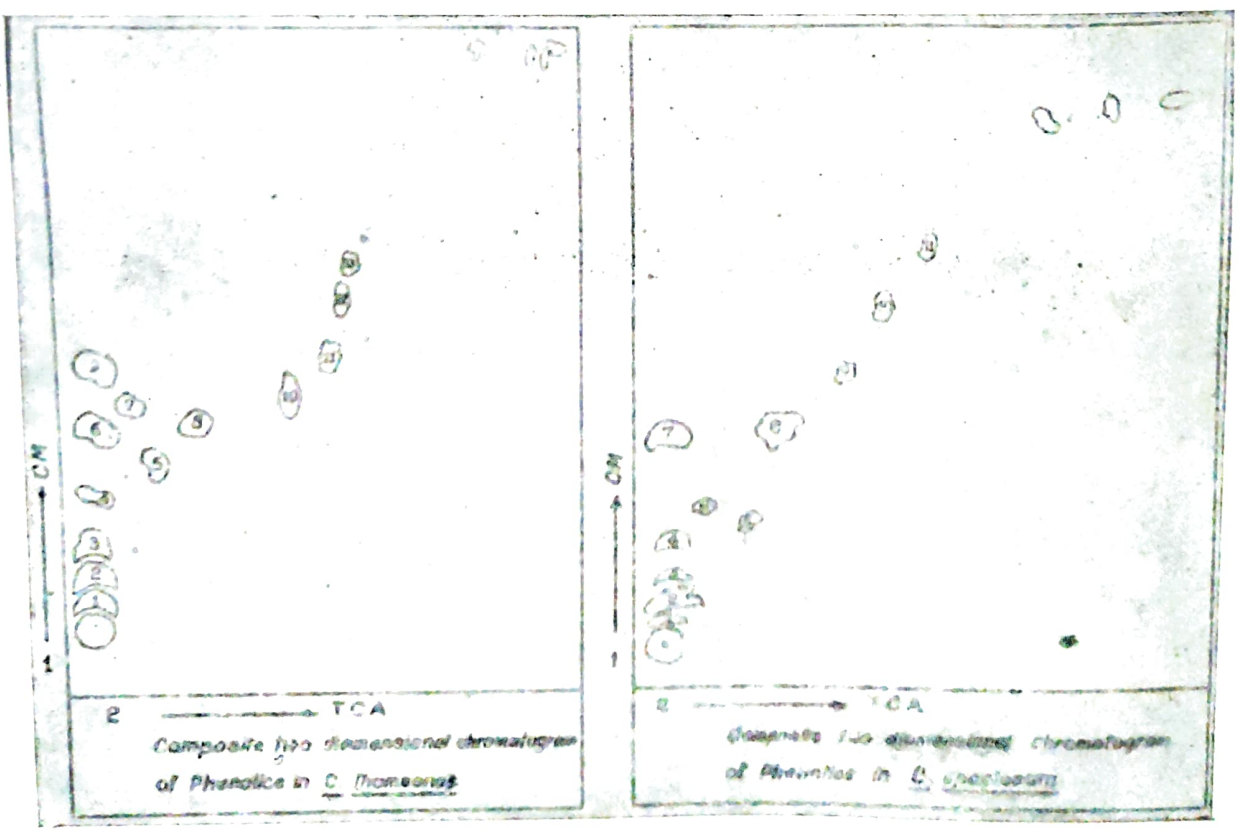

Fig. 1

DISCUSSION

From the above studies it is clear that large number of phenolic spots are common in hybrid species *C. speciosum* and one of it putative parents *C. thomsonae*. Besides, one or two spots are species specific which separates the two species. The appearance of large number of common spots in addition to specific phenolic spots, suggests the hybrid nature of *C. speciosum* derived from *C. thomsonae*. Cytological studies (Sharma and Mukhopadhyaya, 1963; Choudhary, 1978) also suggests that *C. speciosum* ($2n=48$) might have originated from *C. thomsonae* ($2n=50$) and *C. splendens* ($2n=46$).

Since *C. thomsonae* and *C. splendens* are known from widely separated areas of Africa, it seems improbable that *C. speciosum* is a natural hybrid of these parents. However, the hybridisation might have taken place in cultivation. Whether *C. speciosum* is a hybrid of *C. thomsonae* and *C. splendens* as suggested by Bailey (1949) could finally be decided experimentally only when their interspecific hybrid is raised and various characters are compared to *C. speciosum* by Anderson's (1949) method of extrapolation.

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