BIOSYSTEMATICS OF INDIAN PLANTS

II. The Problem of Centaurium pulchellum Complex

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ABSTRACT

The genus Centaurium is represented in Amritsar District by three types of plants, distinguishable chiefly on the basis of flower-colour. The three races possess different chromosome numbers: white, \( n = 18 \); purple, \( n = 27 \); and cosmos, \( n = 28 \).

A new basic number, 9, has been found to exist in the genus.

The white-flowered (4x) and purple-flowered (6x) races are, in all probability, alloploid in character. The exact nature of the cosmos-flowered race \( n = 28 \), however, is not known at present. It may either be an octoploid on the basic number 7, or a secondary polyploid from the hexaploid of \( x = 9 \) \( (2n = 56 = 6x + 2 = 54 = 2) \). All the three colour-forms have been referred to \( E. ramosissima \) Pers. now called \( C. pulchellum \) (Sw.) Druce by most taxonomists. However, the present investigation reveals that none of the races conforms strictly to this or to any other Indian species described by Hooker (1883). It appears that all or most of these species have arisen after extensive interspecific hybridization, which has resulted in a complete reticulation of characters. Furthermore, \( C. pulchellum \) in itself is a complex with \( n = 10, 18, 20, 27, 28 \). In order to have a clear picture of the relationships of the Indian forms vis-a-vis their European counterparts, it is essential to conduct a well-planned biosystematic investigation based on samples from the entire range.

The taxonomic tangle and synonymy needs to be clarified by reference to the type material.

The genus Centaurium Hill (Syn. Erythraea Borck.) is represented in India by Erythraea ramosissima Pers., E. roxburghii G. Don, E. babylonica Griseb. and E. meyeri Bunge. (Hooker, 1883). All the four species, as is evident from the description given in the Flora of British India (Hooker, 1883), are very closely related. As a result, their taxonomic boundaries have been a
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mattered of controversy among taxonomists. Some authors as Hooker (loc. cit., p. 101) significantly stated, refer all these species as varieties of *E. ramosissima*, while others, including Hooker, consider them as distinct species.

Out of the above four species *E. ramosissima* Pers. now generally known as *C. pulchellum* (Sw.) Druce* occurs in the plains of Punjab (India). The description of the species given by Kashyap and Joshi (1936) embraces all the three forms discovered by the present writers in the Amritsar District. These forms are distinguishable on the basis of flower colour. Following the standards given by Maerz and Paul (1930), the three forms may be referred to as white, purple and cosmos (a shade of pink). The plants are not only true breeding for the flower colour, but associated with these colours are some distinct morphological characteristics.

In view of the cytological heterogeneity already reported in *C. pulchellum* (Table II), and the fact that the three colour races (white, purple and cosmos) discussed here are distinct cytologically (*n* = 18, 27 and 28 respectively; Khoshoo, Khushu and Singh, 1961), this collective species is a worthwhile subject for a cytotaxonomic study.

**Observations**

As indicated earlier, the three races met with in Amritsar are recognizable chiefly on the basis of the colour of their flowers. A comparative morphological analysis is given in Table I. Some important features have, however, been mentioned below.

All the three races occur in exactly the same kind of habitat, *i.e.*, in cultivated fields and on the banks of a drain around Amritsar. Often the three occur together. However, the purple-flowered race is more commonly found than the other two. The voucher material is deposited in the Herbarium, Panjab University, Chandigarh.

**White-Flowered Race (n = 18)**

Height 3.5–19.2 cm., stem quadrangular, sparsely or very leafy; cymes repeatedly biparous, fastigiate or wide; flowers in clusters, sub-sessile or pedicellate, bracts more or less prominent, corolla-tube slightly longer than the calyx, lobes white (Plate III, Fig. 1; Text-Fig. 1).

*Some treat it as *C. ramosissimum* Druce (see Maheshwari, 1963), while others treat it equivalent to *E. pulchellum* (Sw.) Druce (see Zeilmer, 1961, Druce, 1932, etc.). The latter view is followed here. At any rate, it indicates the existing taxonomic confusion and the need for critical work.*