

SECTION A

(Flower colour and capitulum conformation in the Garden Zinnia)

I. INTRODUCTION

The wide variation found in colour and conformation of the "flowers" of the Garden Zinnia, Zinnia elegans, Jacq., poses an interesting problem in the genetics of these characters. Although there are numerous references to Zinnias in the literature, particularly in horticultural periodicals, they deal mainly with culture and disease control and no published work on genetics can be found. The Zinnia is widely grown in the U.S.A. and by 1939 there had been such a rapid increase in the number of varieties and strains, with an accompanying increase in the variability within varieties and strains, that E.I. Wilde, et al (1939) decided to run a complete field trial of all the varieties listed in the American seed and nursery catalogues. From the results of this trial they were able to make recommendations to the trade for the improvement of Zinnia quality. Among the 194 samples tested they recorded 14 different capitulum conformations and a very wide range of colour tints and shades.

The Zinnia, being a member of the family Compositae, has a capitulum type flower and like most composites favours limited out-crossing in older, first-opened flowers, while later flowers are evidently selfed. The aggregation of the individual flowers into a capitulum facilitates cross-pollination by insects by making the "flowers" more conspicuous and placing a large number of flowers in a restricted area. The capitulum may be of ligulate or discoid florets or show various combinations of the two types, varying from one peripheral row of ligulate florets and many discoid ones to many ligulate florets with few or no discoid ones. The ligulate florets are pistillate and the discoid ones hermaphrodite. The stamens of the discoid florets may be modified into

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petal like structures known as petaloids and this gives rise to the "semi-double" and "double" types found. Thus, this type of structure raises the problem of a practical method of controlled pollination on the fairly large scale necessary for genetical studies. The object of this investigation was to suggest such a method and, if successful, to start work on the genetics of these characters. Other relevant factors such as cytology and flower pigment chemistry were also investigated.