



INTRODUCTION

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Passiflora a polytypic genus having approximately 400 species, mostly woody or herbaceous vines and out of these about 360 species are native to tropical and subtropical North and South America and adjacent islands. The remaining ones are indigenous to south eastern Asia, a number of South Pacific Islands and Madagascar (Killip,1938). Man has been instrumental in disseminating many of the species with edible fruits or with highly coloured attractive flowers and representative of the genus are now to be found in most tropical lands throughout the world. From early days the showy flowers and leaves of Passiflora attracted the attention of the horticulturists and gardeners and attempts have been made to introduce the ornamental ones for the decoration of their gardens. In India, out of 25 species of the passion flowers, as many as 20 are introduced and some of them are naturalized or yet in a state of naturalization (Chakravarty,1948). In Florida, cultivation of various introduced Passiflora species has been attempted for almost 100 years.

Passion fruits are of value not so much for their nutritional characteristics as for their exceptional aromas which they contribute to drinks and desserts. Nevertheless, these fruits are good sources of Vitamin-A and niacin. Lack of niacin in human body leads to madness. The purple

passion fruit (Passiflora edulis Sims.) was first processed commercially some 50 years ago in Australia, one of the few countries where this fruit is regarded as 'an everyday commodity'. Chief passion fruit producing countries after Australia (including the territory of Papua and New Guinea) are South Africa and some East African countries. The yellow passion fruit (Passiflora edulis Sims. f. Flauicarpa Degner) entered commercial cultivation more recently and is grown principally in Hawaii and Fiji. Other countries now undertaking to grow this form, are Brazil (where it is native), Indonesia, Malaysia, the Phillipines and Taiwan among others. (Whitaker,1972). Passiflora incarnata were introduced in USSR as a valuable medicinal crude drug source by Robinvich (1974). The drug from the leaves of P.incarnata has a great importance not only in India but all over the world in the treatment of Insomnia and Psychoneurosis.

A survey of the previous work as mentioned under the heading 'Review of Literature' informs that very little cytogenetic work has been done in the genus Passiflora. Majority of work deals with chromosome numbers of various species of Passiflora (Storey,1950; Beal,1969,1971,1972 and 1975a). Pollination ecology and floral biology in P.incarnata were studied by Hardin (1972) and described it as entomophilous and facultative autogamous weed. Also there is voluminous work on the introduction,acclimatization, pest and disease control, and agronomic studies in some edible species (Patridge,1972; Patterson,1976; Brodrick,1976 and Graca,1976).

It was therefore thought advisable to undertake cytogenetic studies in the genus Passiflora with special reference to P. incarnata.

The present dissertation includes : Mitosis and Karyotype analysis in P. incarnata; orcein, Trypsin Orcein and Giemsa banding; Meiotic studies; pollen incompatibility; Effect of colchicine; and Effects of chemical mutagens Diethyl sulphate and N-Methyl-N'-Nitro-N-nitrosoguanidine on P. incarnata.