INTRODUCTION

The Compositae are the largest among the families of dicotyledons. It comprises about 1302 genera and 22,000 species (Turner, 1977b) and enjoys a cosmopolitan distribution with stricking concentration in the temperate regions, especially in the New World. Majority of the species are herbs and shrubs with trees showing very restricted occurrence. Members of the family are characterised by the invariable possession of an involucral head. Other frequent common features are 5-lobed gamopetalous corolla, presence of pappus and absence of normal calyx, syngenesious anther, unilocular inferior bicarpellate ovary and a single erect basal ovule. The family includes quite a large number of useful plants, many of them ornamental in nature. Some are important as sources of human food, and a few others are medicinally important.

The classification of the family as a distinct group dates as far back as the Greek antiquity (c.f. Small, 1919), and since then a number of classifications have been known on the family. The first comprehensive systematic treatment of the Compositae is the one by Bentham (1873). Bentham's classification was largely based on the work of Cassini, De Candole and Lessing. Some of the notable modern systematic treatments of the family are those by Cronquist (1955, 1977), Wagenitz (1976) and Carlquist (1966). More recently, a very comprehensive

classification has appeared in the book, 'Biology and Chemistry of the Compositae' (Ed. Heywood, et al, 1977) which contains the contributions of more than a dozen individuals on various tribes. This work is the first attempt to tackle the Compositae down to the generic level since Bentham. Although there is remarkable similarity among the various systems of classification, as pointed out by Turner (1977b), considerable controversy exists as to the phyletic interrelationships of the tribes. Regarding the affinities of the family also there is a great deal of difference of opinion.

Although it is well recognised that data of chromosome numbers and karyomorphological informations of related plant groups can be employed in tackling problems of taxonomic relationships, phylogeny and evolution, our present knowledge on the cytology of this large family is very inadequate and scattered. Actually the great bulk of the data available are confined to chromosome number reports, and that too chiefly on temperate species. Information on the cytology of taxa covering a reasonably large number of genera and tribes from a single geographical region is lacking except for the contributions of the schools led by Turner, Solbrig, Mehra etc. Although tropical South India hosts a large number of genera and species of this family, very little work has been done on the cytology of this group. The present work was undertaken as an attempt to fill this gap.

The first notable study on the cytology of this family was the one made by Babcock and his co-workers in the subtribe Crepidinae (Babcock, 1942, 1947, 1949; Babcock and Cameron, 1934; Babcock and Cave, 1938, Babcock and Elmsweller, 1936; Babcock and Jenkins, 1943; Babcock and Stebbins, 1937a, 1938; Babcock et al., 1937, 1942). They have made detailed studies on the systematics, evolution and phylogeny of the genus Crepis and the subtribe Crepidinae. Later, Stebbins et al (1953) have contributed a great deal to the knowledge of the cytology and phylogeny of the tribe Cichorieae. Turner and his co-workers made extensive cytological studies on the American, African and Australian members of the family, and contributed a great deal to the understanding of the cytotaxonomy, cytological evolution, etc. of the family (Turner, 1956, 1959, 1962, 1967, 1970, 1977a, 1977b; Turner, Beaman and Rock, 1961b; Turner and Ellison, 1960; Turner, Ellison and King, 1961a, Turner and Flyr, 1966; Turner and Irwin, 1960; Turner and King, 1964; Turner and Lewis, 1965; Turner and Powell, 1977; Turner, Powell and Cuatrecasas, 1967; Turner, Powell and King, 1962; Turner, Powell and Watson, 1973). Other significant contributions are those of Raven et al (1960, 1961), Solbrig et al (1964, 1969, 1972), Ornduff et al (1963, 1967), Payne et al (1964), etc. all forming a series of publications on different tribes like the Astereae, Heliantheae, Helenieae and Senecioneaee from North America. Huziawara has studied the karyomorphology of Eupatorium

and a number of other Japanese genera of the Astereae (Huziawara, 1941, 1954a, 1954b, 1954c, 1954d, 1955a, 1955b, 1955c, 1955d, 1956a, 1956b, 1957a, 1957b, 1957c, 1958a, 1958b, 1958c, 1962a, 1962b, 1962c, 1962d, 1965). Similarly, Arano (1956, 1957a, 1957b, 1962a, 1962b, 1962c, 1962d, 1963a, 1963b, 1963c, 1963d, 1964a, 1964b, 1964c, 1964d, 1965) has made detailed karyomorphological studies on different tribes of the Tubuliflorae.

Not much work has previously been done on the cytology of the Indian members of the family. The only comprehensive study on Indian Compositae is the one by Mehra and his co-workers. Their study is mostly confined to North Indian species especially from the temperate regions of the Himalayas (Mehra, 1977; Mehra et al. 1965; Mehra and Remanandan, 1974a, 1974b, 1975, 1976). Other important contributions on the Indian Compositae are those by Koul (1963, 1964a, 1964b, 1964c, 1964d, 1965, 1967, 1971) and Dey (1977).

The family is fairly well represented in South India with a large number of species distributed under 62 genera and 11 tribes (Gamble, 1921). During the present study a wide collection of over 150 species have been made, chiefly from the Kerala and Tamil Nadu regions of South India. Meiotic and/or mitotic chromosome studies have been made in 116 species covering 59 genera in 11 tribes. Detailed karyotype analysis has been made in 50 species. Results of the investigation are used along with previous data for a discussion on the cytological evolution and systematic relationships of the family.