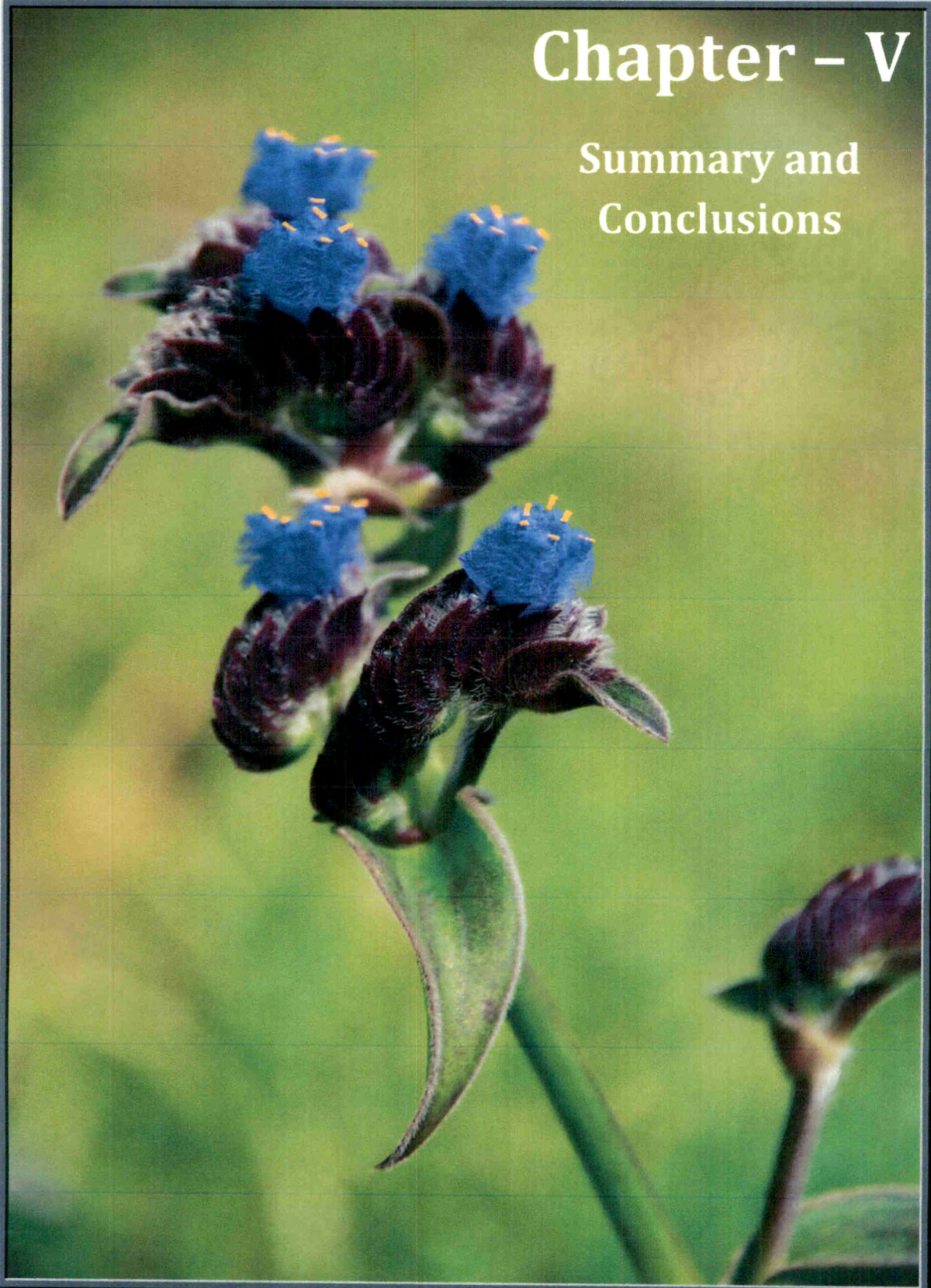


Chapter – V

Summary and Conclusions



A. COLLECTION, IDENTIFICATION, DISTRIBUTION AND PRESENT STATUS OF FAMILY COMMELINACEAE FROM THE STUDY AREA: 1 genera?

1. In India, family Commelinaceae is represented by about 85 species belonging to 14 of which 36 species belonging to 10 genera including 6 endemic taxa have been collected from different localities mostly from Maharashtra and Karnataka.
2. The germplasm of about 20 species of Commelinaceae is maintained in the Botanical Garden.
3. During the field survey the species such as *Commelina benghalensis*, *C. diffusa*, *Cyanotis axillaries*, *c. cristata* and *Murdannia nudiflora* were found to be most abundant and wide spread. The species such as *Cyanotis concanensis*, *C. fasciculata* var. *glabrescens*, *C. tuberosa*, *Murdannia lanuginosa* and *M. brownii* found to be occurring at high altitudes on lateritic plateaus and restricted in their distribution.
4. *Belosynapsis vivipara* found to be growing on well shaded large boulders in the water courses and on the moss covered tree trunks as epiphyte.
5. During present work one new species, *Murdannia brownii* Nandikar & Gurav was described.

B. ANATOMICAL STUDIES:

1. During the present work the root anatomy of 4 species, leaf anatomy of 6 species, epidermal study of 4 species and stem anatomy of 3 species was carried out. The anatomical characterization of *Murdannia lanuginosa* is first time investigated and found to be useful to establish relationship between genera *Murdannia* with *Commelina*.

The spiderwort family Commelinaceae is a wide-spread family distributed all over the world. It comprises about 41 genera and 640 species widely distributed in the tropical and sub-tropical regions of the world. The family Commelinaceae is represented in India with 14 genera and 85 species including 19 endemic species. Peninsular India and the foothills of Himalayas to Thailand and Southwestern China is major center of diversity for Commelinaceae. According to Ahmedulká and Nayar (1987) there are 17 species and 3 infra-specific taxa of the family endemic to Peninsular India. As compared with Northern Peninsular India, the species diversity in Commelinaceae is much higher in southern parts. On the other hand many of the species are endemic to the small range of their distribution. For Maharashtra, the family is represented by 10 genera and 51 species.

The members of family show wide range of variation in their morphological, anatomical as well as cytological characters. However, it forms a natural assemblage of well defined genera though their interrelationships are still controversial. It was found from literature survey that many of the species are little known for their various aspects. The anatomical and palynological marvels of many species are remained unravel. The available literature indicated that most of the work on Indian Commelinaceae dealt with taxonomical and cytological work. But these efforts are still insufficient for revelation of this highly evolved and very diverse group which is still in evolutionary flux. Considering these points as well as importance of members of family Commelinaceae such as ornamentals, diversification and evolution, a multidisciplinary study and reassessment of the family in Western Ghats is necessary.

In the present investigation the attempts have been made to study the members of family Commelinaceae for their distribution and present status, and cytology, anatomy, palynology and cladistic analysis of some representative taxa.

The important findings of the present work can be summarized as follows:

2. In the cross sectional view of *Cyanotis fasciculata* leaf the typical hydrophytic features were observed comprising aerenchyma chambers.
3. The amphistomatic stomata with 6 subsidiary cells is the characteristic feature of genus *Murdannia*, however, in *M. semiteres* presence of hypostomatic stomata with 4 subsidiary cells found to be an exception but quite significant.

C. PALYNOLOGICAL STUDIES:

1. In the present work 9 species belonging to 3 genera were investigated for their pollen morphological studies. Pollen grains in all the species under study were found to be heteropolar, monosulcate and elliptic to bean shaped.
2. The spinules or warts on pollen surface (exine) were found to be blunt and randomly arranged in all the species under study except in *Commelina benghalensis*.
3. In all the *Murdinnia* species under study monomorphic pollen structure was observed which can be treated as generic character.

D. CYTOLOGICAL STUDIES:

1. Meiotic studies in *Murdannia semiteres* have proved the haploid chromosome number $n = 6$ which confirms earlier report by Kar.mathy and Rao (1964).
2. Meiotic studies in *Cyanotis adscendens* shown abnormal chromosome count, $n = 12$ which is in congruence with the earlier report of Raghvan and Rao (1961).
3. The karyotype analysis of *commelina benghalensis* resulted in diploid chromosome number $2n = 22$ and slightly symmetrical architecture of karyotype. These results are similar to the earlier reports by Sharma (1955)

and Bhattacharya (1975). However, secondary constrictions are not observed in present investigation.

4. The karyotype analysis of *Cyanotis adscendens* was carried out first time here and it was found different form than earlier studied forms of *Cyanotis tuberosa* var. *adscendens* not only in diploid number but also in karyotype architecture.
5. A new cytotype of *Callisia fragrans* was first time investigated during the present study in which diploid chromosome number was found to be $2n = 18$. In earlier works it has been reported as $2n = 12$. The moderately asymmetrical karyotype architecture of *C. fragrans* indicates that the genus *Callisia* may be unstable and under evolution.

E. SEED MORPHOLOGY:

1. In present study the seeds of 22 species belonging to 8 genera were investigated for their morphology. The important generic characters were confirmed in almost all the genera.
2. Genus *Commelina* shows globular or ovoid type of seeds with lateral embryotega while terminal embryotega is the characteristic of genus *Cyanotis*.
3. The seed morphological attributes in *Belosynapsis vivipara* (syn. *Cyanotis vivipara*) shows marked similarities with its allied genus *Cyanotis*.
4. The seeds in genus *Murdannia* were found to be varying in shape and with dorsal to semilateral embryotega while in genus *Rhopalephora* seeds are flat and with lateral embryotega.

F. CLADISTIC ANALYSIS OF GENUS MURDANNIA:

1. The cladistic analysis was undertaken to provide first approximation of the ancestral relationships among the species of genus *Murdannia*. From the present investigation it was found that most of the clusters suggest ~~the~~ high degree of uncertainty in assessing the homology of structures within genus.
2. Apart from the sister group- *Gibbasis* another out group of cluster is formed by *Murdannia semiteres* and *M. juncoides*. This finding strongly supports to set aside these species from the group.

From the foregoing account it is concluded that the family Commelinaceae are very diverse as per as its morphology, anatomy, palynology, cytology and phylogeny is concerned. The report of one new species and a new cytotype and unraveling anatomical, palynological and phylogenetic marvels from the present investigation indicate that there is ample scope to study the detailed features and evolutionary trend in this continuously evolving family Commelinaceae.