

CHAPTER-IV

- SUMMARY AND CONCLUSION

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The study of Rust and Smut fungi is most fascinating; these fungi were extensively studied by large number of workers from the different parts of the world. The aspect of such study is quite diverse. Being so prominent and highly destructive especially the smuts, and produced hundreds of diseases systematically to the economically important plants i.e. the main sources of human foods. Mycologists as well as plant pathologists extensively studied these pathogens so as to understand their nature, morphology, cytology, taxonomy, physiology, pathogenisity and even the cultural studies. These two groups of fungi even though belonged to the same class, only have a few characters in common.

Even though a good number of rust and smut fungi have been extensively studied throughout the world, there are still certain regions where these fungi are still to be explored and awaiting for further systematic study. This has been justified well when certain visits were made to different localities in different seasons and when large number of rusts and smuts were collected. The area selected for present work is the South-Western part of the Maharashtra State, especially the Ghat region which is very rich mycologically. Among the fungi, particularly the rusts are unique because they exhibit a great diversity in the morphology of spore forms and host specificity.

Large number of collections of the rusts and smuts were made in different seasons of the year repeatedly from different mycologically rich localities and also from the grass lands and pastures. These collections were brought into the laboratory and studied by traditional mycological methods and equal importance has been also given to the hosts on which these fungi have been collected. Which gives the clue for their identification i.e. host based key. In the laboratory the infected plant or part of the plant i.e. leaf, leaflets, leaf sheathe, stem, flowers, fruits etc. were observed in detailed. Nature and intensity of infection, effect of infection on the plant as a whole or on a particular part of the plant, colour of pustules, spores etc. were observed and recorded. By scraping and taking sections of the infected part or simply by mounting the spores of unopened sorus in smuts either in water or lactophenol as mounting medium, slides were prepared with or without the stain i.e. cotton blue, or even permanent micropreparations were made by fixing and cutting the fresh material with microtome whenever necessary. Using the morphological characters and host species, the genera and also sometimes the species were identified with the help of most up-to-date literature and also variations observed were noted. In case of the new taxa raised, the materials were matched with the type species descriptions (type materials did not available

for study). The most conservative view has been adopted. In case of certain collections in which no perfect state spores were observed, then such collections were assigned to the respective form-genera for the time being as Aecidium dipcadi sp.nova, Uredo (Melampsora) phyllanthii sp.nova etc. and if possible their affinity have been predicted.

In the present investigation two orders viz. Uredinales and Ustilaginales from the Class Teliomycetes have been studied. From the order Uredinales 8 genera belonging to two families viz. Melampsoraceae and Pucciniaceae and 7 genera from the order Ustilaginales belonging to two families viz. Ustilaginaceae and Tilletiaceae have been studied. From the family Melampsoraceae, two genera have been investigated viz. Phakopsora Diet. and Coleosporium Lev., 4 species of these two genera have been worked/ ^{out;} 3 species of the genus Phakopsora Diet. and one species of Coleosporium Lev., in which one is a new species, one species recorded new to India and one species recorded new to the State. The species of the genus Coleosporium Lev. has been recorded on a new additional host. The second family of the order Uredinales i.e. Pucciniaceae is dominant and represented by 22 species and 2 varieties. These are belonging to 4 genera viz. Puccinia Pers., Uromyces (Link.) Unger, Ravenelia Berk., and Scopella Mains. Among these 4 genera, the genus Puccinia Pers. is

dominant and mostly graminicolous and represented by 14 species and 2 varieties. The second genus Uromyces (Link.) Unger represented by 6 species. Ravenelia Berk. by one variety and Scopella Mains by a single species. Out of these, one species has been proposed as a new i.e. Uromyces drimiae sp.nova, 7 species recorded new to the fungi of India, 8 species new to the State. The remaining have been recorded on the new hosts. A new species viz. Phakopsora erythrinae Patil has been restudied and assigned to P.erythrinae Gaum. reported from Java. A new combination of Ravenelia cassiaecola var. berkeleyi; which was previously known as Ravenelia berkeleyi Mund. and Thirum., a recent nomenclature, Ravenelia cassiaecola Atkinson var. berkeleyi (Mund. and Thirum.) Cummins and J.W.Baxter, proposed by Cummins and Baxter has been adopted here. New species from the form genera Aecidium Pers. i.e. Aecidium dipcadi sp.nova and Uredo Pers. i.e. Uredo (Melampsora) phyllanthii sp.nova have been raised.

From the order Ustilaginales both families have been studied and represented by 7 genera and 24 species. The family Ustilaginaceae is dominant and represented by 5 genera and 18 species and Tilletiaceae, 2 genera and 6 species. The species of the genera studied viz. Sorosporium Rud., Cintractia Cornu., Ustilago (Pers.) Roussel., Tolyposporium Woron. and Sphacelotheca deBary belonging to the family Ustilaginaceae

The genus Sorosporium Rud. is dominant and represented by 11 species in which 3 new species have been proposed. One species new to India, 13 species new to the State and 7 species have been recorded on the new hosts. An interesting, non-graminaceous anther smut viz. Ustilago commelinae Zundel has been recorded and studied for the first time in India. Second family Tilletiaceae represented by two genera viz. Tilletia Tul. and Melanotaenium de Bary. Three species of each genus have been studied. Two species belonging to the genus Melanotaenium de Bary have been proposed as new species, and one is recorded on a new host. Tilletia courtetiana R. and S. has been recorded for the first time in India and remaining two species have been recorded for the first time in the State. The statistical summary of the species of the rusts and smuts studied in the present investigation is given in the table.

Thus, the present work, taxonomical study of Rust and Smut fungi during this short period ($1\frac{1}{2}$ years) of time, quite a good number of taxa have studied and yield the good results and thus, the selection of the topic has been well justified.

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