SUMMARY AND CONCLUSIONS

SUMMARY AND CONCLUSIONS

The present dissertation deals with, 'Morphotaxonomical studies of weeds in some dicot crops around Satara'. It is based on one-year weed survey (2006-07). The work is presented in six parts. Introductory part emphasizes concept, importance and types of weeds.

Part two deals with review of literature pertaining to weed floristics, crop-weed competition, allelopathic potential of weeds and crops, medicinally important weeds, weed ecology, weed control, weed management, morphology and anatomy of weeds.

Third part deals with the methodology followed for investigation and explains aims and scope of problem under investigation. The main features emerging out of present study have been discussed with reference to relevant work done in other parts of India in chapter fourth. Fifth Chapter gives Summary and conclusions. While chapter six gives detailed reference to the literature cited in the text of the dissertation. Important findings of the present work can be summarized as follow,

1. The dicot crop fields selected for survey of weeds in rabi and kharif season were Chick pea (*Cicer arietinum* L.), French bean (*Phaseolus vulgaris* L.), Hyacinth bean (*Lablab purpureus* L), Pea (*Pisum sativum* L.), Mat bean (*Phaseolus aconitifolius* Jacq.), Green gram (*Phaseolus aureus* L.), Piegeon pea (*Cajanus cajan* Millsp.), Black gram (*Phaseolus mungo* L.), Potato (*Solanum tuberosum* L.), Brinjal (*Solanum melongena* L.), Chilli (*Capsicum annuum* L.), Tomato (*Lycopersicon esculantum* Mill.), Soybean (*Glycine max* (L) merr.), Groundnut (*Arachis hypogaea* L.) etc. Since these are important crops in Satara Tahsil.
2. Seventy-four weed species representing twenty-two families of angiosperms were collected in rabi fields of study area. Major weed contributing families were Asteraceae (19 genera and 19 species), Euphorbiaceae (5 genera and 8 species), Fabaceae (5 genera and 7 species), Amaranthaceae (3 genera and 5 species) and Lamiaceae (3 genera and 4 species).
3. Cyperaceae, Poaceae and Commelinaceae families contributed monocotyledonous weeds.
4. Proportion of dicotyledonous weeds to monocotyledonous in rabi weeds is 5.3:1.

5. Eighty weed species representing twenty-six families of angiosperms were recorded in Kharif season in the study area. Major weed contributing dicotyledonous families were Asteraceae (16 genera and 16 species), Euphorbiaceae (4 genera and 6 species), Amaranthaceae (4 genera and 6 species), Fabaceae (3 genera and 4 species) and Convolulaceae (3 genera and 3 species) significantly. Thus dicot weeds are dominat than monocot weeds.

6) Commelinaceae, Cyperaceae, Poaceae families contributed monocotyledonous weeds.

7) Proportion of dicotyledonous weeds to monocotyledonous weeds in kharif season is 2.8:1.

8) Thus under both kharif and rabi seasons dicotyledonous weeds are significantly more dominant than monocot weeds with respect to species diversity.

9) Hundred and one weed species belonging to twenty-seven families were recorded from study area during the year 2006-07. The proportion of dicotyledonous weeds to monocotyledonous weeds was 3.8:1. Weed contributing families in descending order were Asteraceae (19 genera and 19 species), Poaceae (14 and 16), Fabaceae (7 and 9), Euphorbiaceae (5 and 8), Amaranthaceae (4 and 6). Nineteen families and fifty-six genera of angiosperms weed were common in both seasons. While seventeen weed species of dicotyledonous found only in kharif season and seventeen weed species of dicotyledonous occur only in rabi season. Ten monocotyledonous weeds were recorded only in kharif season. Proportion of dicotyledonous weeds to monocotyledonous weeds was more in rabi as compared to kharif. This indicates that in kharif season monocot weeds are more in number than rabi season.

10) Percentage of exotic elements in the weed flora was 30.6. Thirty one weed species out of hundred and one were recorded as exotic species. They belong to ten classes of exotic plants of which pantropical class appeared dominating and contributed one-third exotic species.

11) *Crotolaria filipes* of family papilinaceae was recorded as endemic plant to Maharashtra in the present work.

12) According to the density, in rabi season *Brachiaria eruciformis* (9.59) stood first followed by *Cyperus rotundus* (8.92), *Parthenium hysterophorus* (4.63), *Portulaca oleracea* (2.39) and *Euphorbia geniculata* (2.30).

13) With respect to abundance, rabi weeds in descending order were *Cyperus rotundus* (34.17), *Brachiaria eruciformis* (26.36), *Echinochloa colona* (18.25), *Eragrostis Japonica* (10.28) and *Dinebra retroflexa* (9.75).

14) Five dominant rabi weeds in descending order according to frequency were *Parthenium hysterophorus* (50.28%), *Euphorbia geniculata* (34.27%), *Portulaca Oleracea* (34.08%), *Brachiaria eruciformis* (32.96%) and Euphorbia *hirta* (28.43%).

15) Dominant rabi weeds according to the criteria of frequency class, frequency percentage and density were 80% similar but according to abundance first five dominant weeds belong to monocotyledons and were dissimilar to the list obtained by using density and frequency class.

16) Depending upon the density five dominant weeds in kharif were *Ageratum conyzoides* (9.49), *Parthenium hysterophorus* (5.93), *Cyperus rotundus* (5.10), *Dinebra retroflexa* (3.89), *Mollugo pentaphylla* (2.48).

17) Five dominant weeds according to abundance were *Ageratum conyzoides* (17.99), *Dichanthium annulatum* (16.5), *Cyperus rotundus*(15.49), *Isachne elegans*(13.00), *Cyperus compressus* (12.3).

18) Five dominant weed species according to frequency were *Ageratum conyzoides* (52.78%), *Parthenium hysterophorus* (49.4%), *Acalypha indica* (39.8%), *Dinebra retroflexa* (39.5%), *Alternanthera sessilis* (34.2%).

19) On the basis of results obtained by using three parameters density, frequency and abundance *Ageratum conyzoides* stands first in the list.

20) Dominant weeds were identified from the weed flora by considering frequency percentage. The list in descending order *Ageratum conyzoides, Parthenium hysterophorus, Acalypha indica, Dinebra retroflexa, Euphorbia geniculata, Alternanthera sessilis, Portulaca oleracea, Brachiaria eruciformis, Cyperus rotundus, Mollugo pentaphylla, Euphorbia hirta, Euphorbia rosea, Physalis minima, Launaea procumbens, Amaranthus viridis, Arthraxon hispidus, Phyllanthus amarus, Tridax procumbens, Commelina subfruticosa, Eclipta prostrata.*

21) The proportion of dicotyledonous weeds to monocotyledonous weeds in selected weed species was 3:1. Asteraceae and Euphorbiaceae contribute five dominant weed species each while Amaranthaceae contributes two species. Portulacaceae, Molluginaceae and Solanaceae are with one species each. In monocotyledonous

families Poaceae contributes 3 weed species and one species each by Cyperaceae and Commelinaceae families.

22) Morphotaxonomical studies reveled that, within the crop field, microhabitat exists and accordingly weeds show minor variations in third leaf angle, average length of internode and root length.

23) Microhabitats in the crop field identified in the present work were, (I) Weeds growing in field under the standing crop – *Acalypha indica, Ageratum conyzoides, Arthraxon hispidus, Mollugo pentaphylla, Parthenium hysterophorus, Physalis minima, Tridax procumbens.* (II) Weeds growing in open area of the field towards bunds - *Alternanthera sessilis, Brachiaria eruciformis, Dinebra retroflexa, Euphorbia hirta, Euphorbia rosea, Launaea procumbens, Parthenium hysterophorus, Phyllanthus amarus.*(III)Weeds growing nearby water logged areas of the crop field - *Amaranthus viridis, Commelina subfruticosa, Cyperus rotundus, Eclipta prostrata, Euphorbia geniculata, Portulaca oleracea.*

24) All the selected weeds were amphistomatic (except *Cyperus)* and their stomatal index of lower epidermis was higher than the stomatal index of upper epidermis.

25) All the dominant dicotyledonous weed species showed anomocytic type of stomata(except *Portulaca)* but in monocotyledonous weeds the types were graminaceous and commelaniacious.

26) Based on the Kranz anatomical studis in selected weeds, it is indicated that 25% selected weeds have C_3 photosynthesis and 75 % weeds have C_4 pathway of photosynthesis.

27) Seventy percent selected weed species showed wavy outline of stem. In selected weed species Chlorenchymatous hyphodermis was universal in occurrence.

28) Stored material in the form of raphides was observed in the cells of *Ageratum conyzoides* while spheraphides in the cells of *Portulaca oleracea* and *Phyllanthus amarus* and tannin was observed in the cells of *Amaranthus viridis.*

29) Laticifers were observed in the stem sections of *Euphorbia hirta, Euphorbia rosea, Launaea procumbens.*

30) Vascular bundles in weeds show transition from distinct vascular bundles to continuous vascular cylinder to scattered arrangement of vascular bundles due to formation of medullary vascular bundles. This transistion in vascular bundles of weeds can be correlated with change in habit of weeds i.e from woody herbaceous to herbaceous to extremely herbaceous.

31) Hollow pith was observed in the stem of *Euphorbia geniculata.*

32) Spiral thickenings on vessels are observed in all weed species under study. It is concluded that, in weeds secondrary growth is not well developed. Also there is a limited function of conduction and mechanical support for vessels. Therefore in weeds lignification becomes less and hence we get preliminary type i.e. spiral thickning and other types of thickening become rare.

33) Present investigation concludes that weeds form a homogenous ecological group which is characterized by (a) Herbaceous habit (b) Wavy or angular outline of stem (c) Amphistomatic nature of leaf (d) Ranunculaceous type of stomata (e) Lower epidermis with higher stomatal index (f) C4 pathway of photosynthesis (g) Secondary growth in stem is not well developed (h) Universal occurrence of hypodermal chlorenchyma (i) Vascular bundles show transistion from discontinuous to scattered. (j) Vessels with spiral thickenings.