SUMMARY

In the present work a review of literature gives an idea of the importance of ecological studies of weed communities of different crops and necessity of ecophysiological investigations of problematic weed species.

Such studies are considered more important in view of changing pattern of agriculture and evolution of new chemical strategies to control weeds.

The present investigation has been carried out in the Bundelkhand region of Chaj district by selecting two village sites. The two study sites are situated on Chaj Rath road and Chaj Kanch road in villages Dakor and Minora, respectively. The soils of the former are black cotton and barna type. The agricultural fields are best suited for pulses and wheat crops.

Thirty species of weeds have been recorded from Minora site and fourteen species are recorded from Dakor site. Most abundant weeds of the area are *Alyssum monolifer*, *Amaranthus aspera*, *Amaranthus spinosus*, *Convulvulus arvensis*, *Chenopodium album*, *Phyllanthus sp.*, *Trigonella polycocca*, *Heterococcus contortus* and *Ambrosia maritima*.
**M. againstata** was found to be the most common and conspicuous weed of the study area. Thus weed has been found to inhibit the growth and production of 'rahi' and 'kharif' crops. Ecophysiological study of this weed has not been carried out in this area so far.

**M. againstata** is a member of family convolvulaceae, most commonly distributed in warmer part of the whole country. It thrives well on black cotton and moist alluvial soils.

The species propagates by profuse runner growth. Branches are given out in all direction which in turn further branch. At each node the runners produce roots, which quite often develop a strong hold. The ramets thus produced can develop into independent plants.

The young seedling of the species appear from late June to mid November. Phenological observations indicate that the weed seedlings emerge before the crop seedlings.

The plants contains two type of seeds, rounded and flattend with pale yellow and chestnut colours. The seed of **M. againstata** showed dormancy of about 2-3 months after ripening. The seeds covered by fruit wall. The germination of seeds improved after scarification of cut cover by mechanical or chemical means. Better germination of **M. againstata** seeds occurred when treated with conc.
sulphuric acid for 60 minutes and at a temperature of 35°C. Experiments of hormonal treatments temperature, boiling water etc. were found to be insignificant.

Plant obtained from Minora site showed better growth, more seed production, higher reproductive capacity, greater length of shoot and root than those of plants collected from Dakor fields. This may probably be due to the fact that *M. amarginata* plant prefer moist soil conditions. It was also noted that plants of *M. amarginata* need more watering to give better germination as compared to those which were grown in field irrigated at an interval of 2, 3, 4 and 5 days.

Experiments an absorption of water by main root of parent plant and roots of ramets indicate the main root have a major role in water absorption. The water absorbed by roots of ramets mostly passes towards growing spicas i.e., in the foreword direction. In the study area this weed grew at higher population, which caused reduction in yield and quality of the crops. The release of toxic substances from its different parts reduced the growth of crops and reduced yield indicating allelopathic effect of weed plant leachates on the crops.

Besides the normal weed crop competition, *M. amarginata* was found to show a strong allelopathic effect on associated crop. Release of phytotoxic substances from different plant
parts of weed, were found to have a growth retarding influence on crop plants.

Dilution of allelopathic substance by irrigation water reduced the phytotoxicity of leachates of the weed.

It was observed that the various plant parts of the weed contained varying amount of allelochemic substances. Thus maximum (72%) inhibition of crop seed germination was recorded in case of leachates obtained from roots, while it was minimum (25%) in case of stem leachates.

The decrease in germination inhibition from root and leaf extract to the extract made from stem, indicated that the allelopathic principle is produced in the leaves and is translocated to roots. On the other hand it is also possible that it is synthesized in another part of the plant and accumulated in the leaves and roots.

Salient features of the present work:

1. Phytosociological and phenological studies of weed flora of rice, wheat and jwar fields of Bundelkhand (Grai district).

2. Ecophysiological studies - seed germination and seedling growth in relation to different factors studied.
3. Growth performance of *M. arenaria* in relation to different environmental conditions has been observed.

4. Effect of various plant leachates of *M. arenaria* on associated crop seeds and seedling growth are studied.

5. Chemical control of *M. arenaria* by using different herbicides.