

# INTRODUCTION

India is leading towards 21 century with development in all fields including agriculture. To satisfy the demand of increasing population of India 'Maximum agricultural production' is the best answer. Thus, now a day's maximum technologies have been developed & maximum research has been carried out to improve quality as well as quantity of agricultural production.

There are many barriers in agriculture which always disturbs the good seed production in farming, 'Weed' is one of them; Unwanted plant at unwanted place is generally considered as "Weed" which always compete with crop plant for it's food, shelter & life. Due to such weeds, Food grain production in India is badly reduced. Thus, there is a need to pay an attention towards the weed Science means nature, type, life cycle of weed & its effect on main crop plant. All this necessary lead to the development of new aspect of science i.e. "Allelopathy".

Allelopathy refers to the beneficial or harmful effects of one plant to another plant; both crop & weed species by the release of chemicals from plant parts. Allelopathy is term coined for natural phenomenon of plant to plant interaction under natural conditions. The different weed species compete with crop plants for nutrients, water & other resources resulting into heavy losses in yield and quality. In addition to this they increase the cost of cultivation. Rice (1974) defines allelopathy as any direct or indirect effect by one plant, including microorganism, on another through the production of chemical compounds that escape into the environment & subsequently influence the growth & development of neighboring plants.

The allelopathic effect of one plant upon another is so striking that competition for a common resource does not seem adequate to explain the observation. In organism communities, many species appear to regulate one another through the production & release of chemical attractants, stimulators, or inhibitors (Putnam & Tang, 1986). The Chemicals that bring about allelopathic influences between the plants & other organisms are called allelochemicals (Whittkar & Fenny, 1971). Chemicals like phenolic compounds, flavonides, terpenoids alkaloids, steroids, carbohydrates & amino acids with mixture of different compounds sometimes having greater allelopathic effect than individual compounds alone. Further more physiological & environmental stresses, pests & diseases, solar radiation, herbicides,

& less than optimal nutrient moisture & temperature levels can also affect allelopathic weed suppression. Different plant parts including flowers, leaves, leaf litter & mulch, stem bark, roots and their derived compounds can have allelopathic activity that varies over a growing season. Allelopathic chemicals can also persist in soil, affecting both neighboring plants as well as those planted in succession. Although derived from plants, allelochemicals may be more biodegradable than traditional herbicides but may also have undesirable effects on non-target species, necessitating ecological studies. Rice (1984) & Putnam (1985) reported that allelochemicals are present in virtually all plant tissues i.e. leaves, fruit, stems & roots. These allelochemicals are realized by such processes as volatilization, root exudation, leaching and decomposition of plant residues.

Commonly cited effects allelopathy includes reduced seed germination & seedling growth like synthetic herbicides. However, known sites of action for some allelochemicals include cell division, pollen germination, nutrient uptake, photosynthesis & specific enzyme function. Allelopathy can affect many aspects of plant ecology including occurrence, growth, plant succession the structure of plant communities, dominance, diversity and plant productivity. Early research grew out of observations of poor, generation of forest species, crop damage, yield reductions, replant problems for tree crops, occurrence of weed free zones & other related changes in patterns or vegetation. The growth inhibiting of one plant to another differs from species to species. It is now realized that the presence of neighboring plant species can have a significant influence on seed germination, growth and yield of crop plants. Study of such allelopathic effects will become more prominent to future agricultural systems because of decreasing farm size, intensive farming & increasing need of some common prominent weed species, which occur widely in the agriculture field of this region on the seed germination & seedling growth.

Present investigation is allelopathic interaction of *Celosia argentea* L. crop plants i.e. Mung and Bajra; Generally Mung & Bajra imp crop plants in India, specifically in Maharashtra. Among them Bajra is the Staple Food of rural area & it is more nutritious. While Mung is also important crop plant having high amount of carbohydrates, proteins as well as vitamin. *Celosia argentea* L. serves as important weed affecting growth, quality & quantity in production of Mung and Bajra. Thus in

present investigation, maximum attention was paid to study the interaction of *Celosia argentea* L. on Mung and Bajra.

The dissertation consist of five chapters. The first chapter includes general information about the allelopathy and allelochemical, their effects on living organisms & scope of the present study. A presize review of the work is compared in the second chapter of 'Review of literature'. Different analytical methods & procedure followed during the work are described in the third chapter of material & methods. Results obtained are discussed with reference to recent literature in the fourth chapter 'Result & Discussion'. Significant findings of the present study are summarized in last chapter of 'Summary & Conclusion'.