



## STUDIES ON BLOOMING AND BREEDING PATTERN, SEED OUTPUT, ETHNOBOTANY AND PHEONOLOGICAL STRATEGIES OF CRESS (*Lepidium sativum* L.) WITH ITS PROSPECTS FOR IMPROVEMENT

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**Abstract:** Cress (*Lepidium sativum* L.) is an annual herb that is well suited to all soils and climates, although it does not tolerate rains and frosts. It has a very rapid growth rate. It grows sub spontaneously in areas transformed by human, close to crops or human settlements. In our country it is cultivated as a winter crop for its valuable seeds. Most of the genetic improvement work on garden cress is being carried out in the CIS, with little or no work being done at present in our country. Mainly early cultivars with a prolonged production period and better cold tolerance are being developed. Cress can be grown and used like mustered. It germinates more slowly at low temperatures, the emergence period being three or four days longer. Shortening this period is an important rabi crop, cultivated for its valuable seeds. The crop is infested by numerous weeds which are considered as a permanent barrier in yield reduction. Ethnobotany of crop includes their edible uses, medicinal uses and other miscellaneous uses. Reproductive parts in flowering plants are born in a most conspicuous structure called flower. The control them of such studies is pollination and breeding pattern. The cress plant blooms during the month of November – January. The anthesis occurs during the day. The stigma is receptive during the time of flower open and remains whole day. Floral nectarines are present between androceium and gynoecium. It is obvious from the study that averages production of flower/plant were 1019 during the present investigation. The pollination value was maximum (85.00) in the month of December and minimum (77.70) in the month of November. Days required for ripening of fruits and seeds from the date of pollination were considered to be the duration of seed development. The fruits and seeds were collected and the number of seed/plant was recorded 1616. The seeds are small, light weighed with brown testa and thin pole tegman. Plant under study exhibits both open and insect pollination. However, maximum fruit setting is observed as a consequence of insect pollination. The species under study have a medium reproductive capacity. Due to adoption of improved production technology, the biological yield has been increased and cultivators can get handsome financial gain by cultivating this crop.

**Key words:** Blooming and breeding pattern, pollination seed output, ethnobotany, phonological strategies, cress plant, ripening.

### Introduction

India possesses all types of climatic conditions varying from north to south. Because of vast area and variety of agro – climates, a large number of medicinal and aromatic plants are found growing wild and has been considered as Botanical garden of the world and this botanical wealth constitutes numerous species including medicinal and essential oil containing plants (Kokate *et. al.*, 2005). Nature has provided a complete store house of remedies to cure all ailments of mankind.

Medicinal plants have curative properties due to the presence of various complex chemical substance of different composition, which are found as secondary plant metabolites in one or more parts of these plants. However, at present of health care but also as a source of income (Dwivedi *et. al.*, 2009). The use of medicinal plants in developing countries like India as a normative basis for the maintaining of good health has been widely observed. The high nutritional value, its reputed medicinal properties and its amenability for processing in a large number of

quite attractive for regions where other crops cannot be grown.

*Lepidium sativum* Linn. Commonly known as chansure (H), garden cress (E) belongs to family Brassicaceae is an annual, erect herbaceous plant, growing upto 50-75 cm (Hewson, 1982). The flowers have white or slightly pink petals; measuring 2 mm. seed are small and yield fixed oil. With regard to the anatomy of the leaf, stem and root, it has been divided into three botanical varieties: *vulgare*, *crispum* and *latifolium*. The latter is the most mesomorphic, *crispum* the most xeromorphic and *vulgare* intermediate. The chemical composition of seeds reveals the presence of protein (27.50-33.10), fat (6%), dietary fiber (75%), and potassium (945.15%). Edible oil is obtained from the seeds (Komarov, 1968, Huxley, 1992)

#### Materials and Methods

*Lepidium sativum* Linn. Belongs to family Brassicaceae is an important cash crop, mainly cultivated for its seeds, which possess medicinal and economic value. The plant is cultivated through our country for its valuable seeds during the month of October- November.

Data pertaining to ethnobotanical value of crop weeds were obtained as per method suggested by Jain and Goel (1995) and Dwivedi (2008) and by the natives of the study area. The observation related to reproductive biology of *Lepidium sativum* were made in experimental field during winter season of 2008 – 2009 and 2009-2010.

Blooming pattern and floral phenology studies were made with regard to floral bud growth, blooming period, floral morphology and number of flowers/plant as proposed by Kaul *et. al.*, (2005).

Studies regarding to pollination were made on natural cross/self pollination along with the breeding pattern and pollination value as suggested by Dwivedi (1986a). The studies were done on fruit and seed maturation and fruit and seed output as suggested by Pandey (1992).

To study the above various parameters including seeds/plant a field experiments were laid out during 2008-2009 and 2009-2010 in *rabi* season

with four treatments  $T_0$ ,  $T_1$ ,  $T_2$ ,  $T_3$ , in the field replicated three times. In laboratory some parameters were also studied by proper methods as suggested by various eminent workers.

#### Results and Discussion

The present research paper highlights the ecology and reproductive biology of cress. The species is cultivated in our country for its valuable seeds during the winter season. The general consideration of the problem is discussed below for the clarity and convenience. *Lepidium sativum* Linn is commonly known as Chansur, belonging to family Brassicaceae is native to South west Asia, which spread many centuries ago to western Europe. In our country it is grown during *rabi* season as cash crop. It is an annual, erect herbaceous plant, growing upto 50-75 cm. seeds are small and yields upto 58% of edible oil that can also be used for lighting and medicinal purpose. Germination is a crucial phase in the life cycle of seed plants. Germination percentage and rates are affected by external factors, seed viability and environmental effects. Germination mechanism plays an important role in the out ecology of a species (Mall and Dubey, 1966).

Data and Kaley (1968) have observed that dormant seeds can retain viability in moist soil for many years. The study results indicate that maximum germination (82%) occurred at depth 2 cm. No germination was recorded in the seeds sown beyond the depth of 4 cm. similar conclusions have been drawn by Ramesh Bbu and Josshi (1970).

*Lepidium sativum* L. bears small pedicel late, acinomorphic, bisexual, hypogenous, complete, tetramerous, cruciform and white flowers borne in dense racemes. There are two aspects of reproductive biology (Fryxell, 1957):

1. The natural mode of pollination, it is evident
2. The usual or possible mode of pollination. It is evident from the present study that plant under study exhibits both open and insect pollination. However, maximum fruit setting was observed as a consequence of insect pollination. From the it is obvious that plant do required 13-18 days for the development of flower from a tiny bud. The insect

visiting the flowers obtain pollen and nectar. Honey bees and better flies are major pollinators and play an evident from the present investigation that all the insect visitors of cress are not involved in pollen transfer. The plant studies give a maximum pollination value (85.3) in the month of December and minimum in the month of November. Mean while, the fruit set percentage in insect pollinated flowers was higher (113.6%) to that of natural open pollination (45.3%). It may be therefore concluded that insects visiting the flower do enhance the rate of fruit setting by promoting cross pollination earlier reported by Reddi and Reddi (1982).

### Summary and Conclusions

The paper based on present investigation highlights that *Lepidium sativum* L. is an annual herb that may be cultivated in many part of our country

for its valuable seeds as *rabi* crop. The present information is step to go ahead to achieve the sacred objects, to financial gain to the farmers and cultivators, and low cost medicine to the tribal and rural mass of our society, without any side effects.

Due to adoption of improved production technology the productivity (Biological yields) have been increased and cultivators can get handsome financial gain by cultivating this crop.

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