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ALLELOPATHIC EFFECT OF LEAF AQUEOUS EXTRACT OF Ageratum houstonianum ON SEED GERMINATION, ROOT LENGTH AND SHOOT LENGTH OF Arachis hypogaea (GROUNDNUT)

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INTRODUCTION

Our country India is agriculture rich country. In India different types of crops cultivated according to needs and climatic condition. More than 70% Indian population depend on agriculture. India is second largest agriculture country of world (after China).

During the cultivation of crops, the growing of some other plants has good effects on crop plants, and some other plants have bad effects on cultivated crop plants. Some weeds also grow around cultivated crops; mostly these weeds do bad effects on the cultivated crops.

Weeds are unwanted plants species, which grow around cultivated crops. Mostly weeds interfere growth and productivity of cultivated crops. The relation of weeds with cultivated crops from ancient time. An Australian scientist, **Hans Molisch,** gave the term 'allelopathy' in 1937. Molisch, also known as the father of allelopathy. The term allelopathy is made of two word – 'allelon' and 'pathos', both of which are greek words in origin . Molisch says that 'allelon' means 'mutual' and 'pathos' means 'suffering'.After Molisch, at different times, different scientists defined allelopathy, such as Whittaker and Freeny, E. Leon Rice, and others.

According to **Rice** (1984), any direct or indirect, beneficial or harmful impact that one plant has on another through the release of biochemicals into the environment is known as allelopathy. Allelopathy has an impact on the growth, quantity, and value of the product and is important in agricultural environments (Kohli et al., 1998; Singh et al., 2001).

According to Molisch, "Allelopathy is the method of biochemical interaction that occurs when one plant inhibits the growth of the other plant. He said that the chemicals that were released from the plants were called **allelochemicals**.

The peanut, often known as a groundnut, is a significant legume crop in tropical and also semiarid regions. It is a good source of human-using protein and vegetable oil. About 50% oil and more than 30% protein are found in groundnut seeds. Both abiotic and biotic factors affect the growth and production of groundnut. Abiotic factors involve temperature, drought, soil alkalinity, poor fertility of soil, deficiencies of nutrients, etc., and biotic factors include pests, weeds etc.

Plant *Ageratum houstonianum* belongs to the family Asteraceae. Genus Ageratum has more than 40 species, which are distributed all over the world. Perhaps, Ageratum *houstonianum is* originated from Central and South America. This plant, also known as flossflower or bluemink, is an annual shrub. This plant mostly grows in the cold season. It is used as an ornamental plant and has some medicinal value (**Letourneau D, 2020).** Plants are used as decoration in gardens, as ground covers, and also as cut flowers. In medicine, it is used as an antibacterial, diuretic, and in digestion. Flowers of this plant are fluffy, aster-like, mostly blue in color, and stems are covered by wool-like hairs. Plant may be 5–20 inches in height (**Nesom, 2006).** Due to colorful flowers, flowers attract agents for pollination, such as butterflies, bees, etc. This plant is also a source of natural dye.

METHODS AND MATERIALS

I selected groundnut as a test crop because groundnut is an oilseed crop. My present work started Sant Ganinath P.G. College's botany lab is located in Muhammadabad Gohna, Mau, Uttar Pradesh..This research site is situated 23 km east of district Azamgarh and 24 km west of district Mau.

POT CULTURE EXPERIMENT

The seeds of test crop purchase from Azamgarh UP. Seeds were sterilized using 1% mercuric chloride for about 20 minutes before sowing. After collection of weeds, leaves separated from the weeds plant and then washed with water to remove dust. After them, the same ratio of water and weeds separated leaves cut into small pieces and then mixed with water and left for 48 hrs. After 48 hrs, solutions were filtered using filter paper, and as a result, stock solution was prepared.Using distilled water and weed stock solution, different concentrations of filtrate were made, such as 25%, 50%, and 75%.

The pot culture method was conducted at Sant Ganinath Government P G College Muhammadabad Gohna Mau, Uttar Pradesh.. In this experiment, effect *Ageratum houstonianum* on groundnut crop seed germination, shoot length, and root length was seen.

Effect of *Ageratum houstonianum* seen at different concentration as 25%, 50%, 75% and 100%.The pots which uses for experiment, were prepared by using 3kg field soil in plastic pots. 10 certified healthy seeds of *Arachis hypogaea* (Groundnut) were sown in prepared pots. These prepared pots soil moistened at time to time using different concentration of weeds leaf and stem extract. 60 days after sowing the groundnut, seed germination, shoot length, and root length recorded for data preparing.

RESULT AND DISCUSSION

The allelopathic activity of *Ageratum houstonianum* leaf and stem extract at different concentrations on seed germination of *Arachis hypogaea*

At all concentrations of leaf extract of *Ageratum houstonianum*, groundnut seed germination was inhibited.

Groundnut seed germination is directly proportional to the leaf concentration. At control , 100% seed germination; at 25% leaf extract, 93% seed germination; at 50% leaf extract, 83% seed germination; at 75% leaf extract, 73.50% seed germination; and at 100% leaf extract, only 49.87% seed germination was seen.

The allelopathic activity of *Ageratum houstonianum* leaf and stem extract at different concentrations on root length of *Arachis hypogaea*

At four distinct concentrations, the impact of *Ageratum houstonianum* aqueous extract on *Arachis hypogaea* roots was examined. Root length data of *Arachis hypogaea* was collected at 30, 60, and 90 DAS.

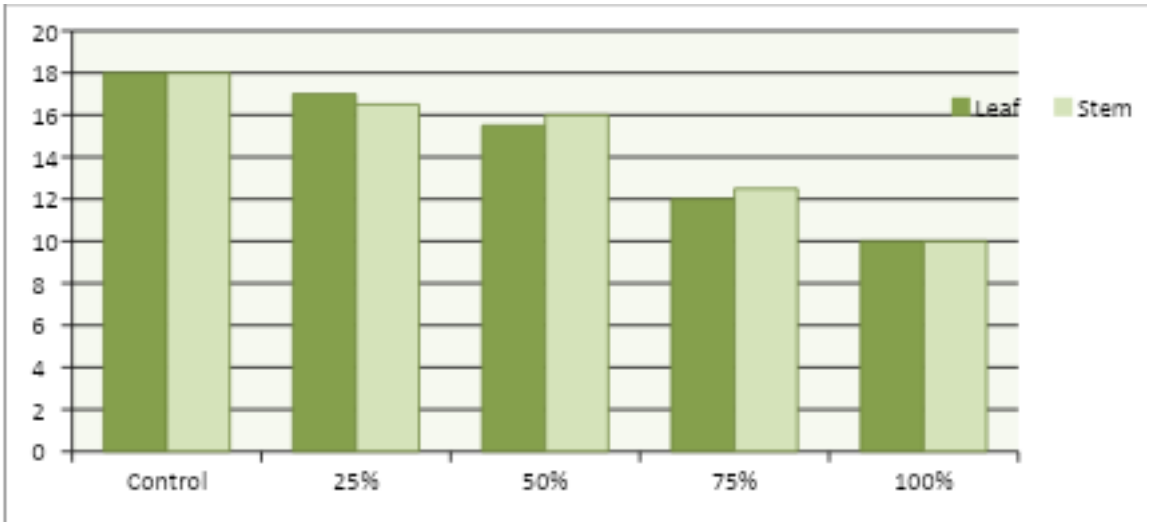
At 30DAS (leaf extract), at a control of 16cm root length, at 25% leaf extract = 16cm, at 50% leaf extract = 13.50 cm, at 75% leaf extract = 10 cm, and at 100% leaf extract =08cm root length of *Arachis hypogaea is* seen.

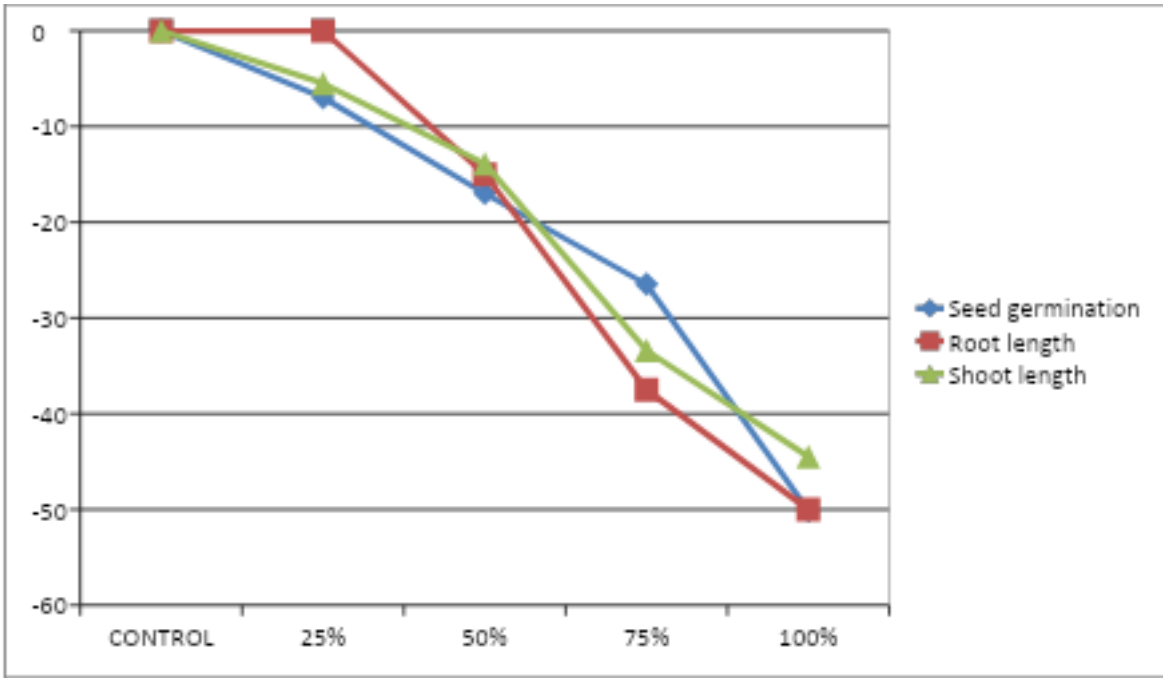
The allelopathic activity of *Ageratum houstonianum* leaf and stem extract at different concentrations on shoot length of *Arachis hypogaea*

At four distinct concentrations, the impact of *Ageratum houstonianum* aqueous extract on *Arachis hypogaea* shoots was examined. Shoot length data of *Arachis hypogaea* was collected at 30, 60, and 90 DAS.

At 30 DAS (leaf extract), at a control of 18 cm shoot length, at 25% leaf extract = 17 cm, at 50% leaf extract = 15.50 cm, at 75% leaf extract = 12 cm, and at 100% leaf extract = 10 cm shoot length of *Arachis hypogaea is* seen.

TREATMENT (%)	SEED GERMINATION (%)	ROOT LENGHTH (IN CM)	SHOOT LENGTH (IN CM)
Control	100.00	16.0	18.0
25	93.00 (-7)	16.0(0)	17.0(-5.5)
50	83.00 (-17)	13.5(-15)	15.5(-13.9)
75	73.50 (-26.5)	10.0(-37.5)	12.0(-33.4)
100	49.87 (-50.13)	08.0(-50)	10.0(-44.5)
CD at 5%	3.5	0.63	6.5





CONCLUSION

Allelopathy is a process in which allelochemicals, release from any part of plant which effect either negative or positive on the growth and germination of other crop plant. In present study, *Ageratum houstonianum* leaf extract effect was seen on percentage seed germination, root length and shoot length. At 100% leaf extract of Ageratum *houstonianum,* maximum (50.13%) percentage seed germination was seen. At 100% leaf extract, maximum percentage root length (50%) and shoot length (44.5%) was seen.

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