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ALLELOPATHIC EFFECT OF AQUEOUS STEM EXTRACTS OF *XANTHIUM STRUMANIUM* L.ON SEED GERMINATION, SEEDLING GROWTH AND BIOCHEMICALS OF COWPEA PLANT VAR-UPC 2586

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Short Profile

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ABSTRACT:
The present study was conducted to investigate the allelopathic effects ofstemextract of *Xanthium stumari um* L. weed plant oncowpea plant. The aqueous extracts of weed stem at25%, 50%, 75%, 100% concentration were applied to determine their effect on seed germination, seedling length , seedling dry weight, fresh weight and biochemical of test plant under laboratory conditions. The aqueous extracts of weeds under study caused stimulatory effects on seed germination; seedling length, dryweight, fresh weight and biochemical of crop, which increased progressively on increasing the concentration of weed plant part extracts. The effect caused by the stem extract of *Xanthium stumarium*L.found to stimulates growth rate.

KEYWORDS
Allelopathy, seed germination and weeds.

INTRODUCTION

Allelopathy is an important novel technology for achieving the goals and to alleviate the problems of environmental degradation. These techniques will serve as the key component for boosting productivity of arid, semiarid and irrigated agroecosystems. The mission the make Indian free of poverty, hunger, malnutrition and environmentally safe country by 2025 certainly calls upon proper management environmental agroecosystems holistic approach. The - old science of allelopathy has recently come in to time light as an alternative technology, playing a key role in sustainable agriculture. Allelopathy generally refers to any direct or indirect, harmful or beneficial effect of one plant on another through the production of chemical compounds that are released into the environment (Molisch, 1937, Rice, 1984). These donor plants may affect germination, growth and development of the recipient plant species (Einhellig1987). The invasive weeds are the plant species that are new to a specific area and have become dominant, replacing the native plant species. These are also known as the alien, exotic or introduce ones. Although allelopathy does not always cause negative effects to neighboring plants, throughout history it was probably easier to observe negative plant responses. In the 17th and 18th centuries, botanists relied strongly on a comparative approach. They compared both plant from and function, particularly in relation to nutrition.(An*et.al*.1998).

REVIEW OF LITERATURE

Narwal (2004) used the allelopathy in crop production. Allelopathy in some medicinal plants inhibition of germination & seedling growth of certain weeds and agriculture crops of Baramati in Pune district studied byDeokule (1995).Dhumal (2004) worked on Allelopathic potential of fern frond extracts for sustainable improvement of grain yield and quality of Sorghum.

Also Saswade (2007) studied on allelopathic potential of some dominant weeds of semiarid crop ecosystem in Newasa tehsil Dist. Ahmednagar (M.S.) Various workers like Iqbal (2009), Rajput (2008) studied on allelopathic effect of weeds on cotton crop. Determination of allelopathic effect of some invasive weed species on germination and initial development of grain legume crops legume crops was studied by Plamen (2010).

MATERIAL AND METHOD

Petri-dish bioassay:

The seeds of cowpea var-UPC 5286 were obtained from the M. P.K.V. RahuriVidyapith. The weed *Xanthium stumarium* was collected from the plant growing in thecowpea fields in the Newasatehsil of Ahmednagar in wet season.

The bioassay experiment was conducted in borosilicate glass Petri-dishes of 100x20 mm dimension. 50 gm of fresh weed plant leaves taken and crushed in distilled water, filter through cheese cloth and make 100ml extract. The distilled water used as control. Then 10 cowpea seeds were taken on Whatman no.1 filter paper in the each petriplate and moistened with 10ml of plant extract and incubated at room temperature. Three replicates for each treatment including control were maintained .The germination and seedling growth of each replicate was recorded in the notebook on daily basis. The reading was taken after 7 days. The germinated seeds were counted, while the shoots and root length weremeasured and expressed in terms of the average of the three replicates.The biochemical like protein, chlorophyll, Carbohydrate, Starch were estimated by standard methods given by

Sadashivam and Manikam() (Table I). Percentage inhibition over control and ANOVA variance was calculated.

% of Inhibition = (C- T/C) x 100

(Where C: control, T: treatment).

RESULT AND DISSCUTION

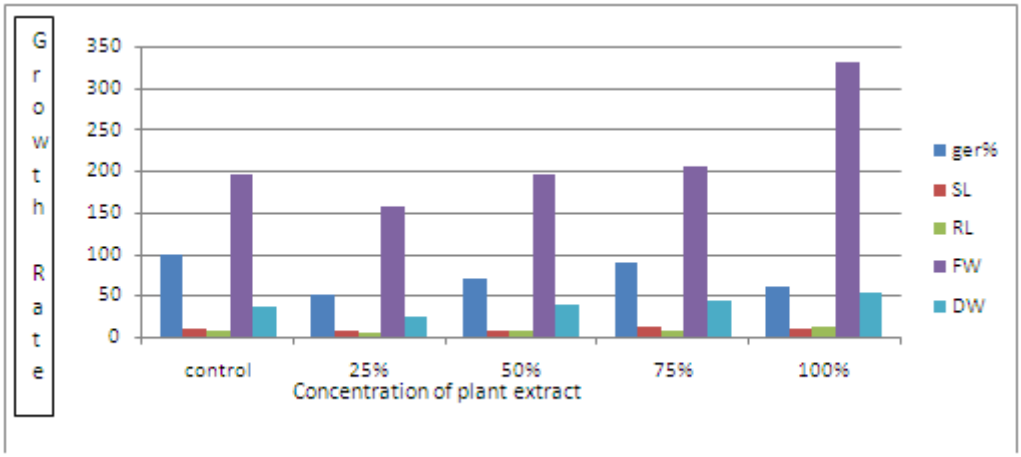
Allthe growth parameters were shows increased rate as concentrations increased.Kulkarni and Khilare (2013) reported the allelopathic effect of *Artemisia sp*. On germination of Jowar,Wheat,Vigna and Chickpea.They found that the root and shoot length in Cicer was increased with 0.250gm root powder of *Artemisia pallence* while 0.500gm root powder showed increase in root and shoot length of Vigna. For *Artemisia nilgirica* root extract (0.250gm) 100% seed germination were found in Jowar and Vigna leaf extract of some plant showed good result in Jowar and Vigna seed germination.The allelopathic potential of Celosia argentea and and Euphorbia hirta leaf extracts on seedling physiology of some field crops viz. Mungbean, Chickpea and sorghum. Thenstimulation in biochemicals was observed at low concentration (1.4%) but higher concentration is most inhibitory to test crops (Saswade and Dhumal, 2012).Hassan et.al (2012) showed stimulatory effect of some Botanical extracts on germination and seedling growth of *Sorghum bicolar* L.

Table.I -Effect of *Xanthium stumarium* L.stem extract on the seed germination and Seedlinggrowth of Cowpea plant

SR.NO	Treatment	Germination%	Shoot length[cm]	Root length[cm]	Fresh weight[mg]	Dry weight[mg]
1	Control	100	10.3	7	196	37
2	25%	50	6.5 (36.89)	4.5 (35.71)	158 (19.38)	23 (37.83)
3	50%	70	8 (22.33)	8.3 (-18.57)	195 (0.51)	38 (-2.70)
4	75%	90	11.5 (-11.65)	8.1 (-15.71)	204 (-4.08)	43 (-16.21)
5	100%	60	9.4 (8.73)	12 (-71.42)	330 (-68.36)	54 (-45.94)

Means differ significantly< 5 %,-inhibitory, +promotorySD+

Figure.I- Effect of *Xanthium stumarium* L.stem extract on the seed germination and Seedling growth of Cowpea plant



*Ger%-Germination Percentages Shoot length, RL-Root Length, FW-Fresh weight, DW-Dry weight.

Table No.2-- Effect of *Xanthium stumarium* L.stem extract on the Biochemical change in seedling of Cowpea plant

Sr.No.	Treatment	Chlorophyll	Carbohydrates	Starch	Protein
1	Control	2.4	71.1	174.6	49.3
2	25%	2.3	62.9	189.2	42.2
3	50%	2.5	69.2	170	48.3
4	75%	2.6	72.4	182.7	55.2
5	100%	3.1	80.3	193.8	60.2

Figure.I- Effect of *Xanthium stumarium* L.stem extract on the seed germination and Seedling growth of Cowpea plant

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