

**ALLELOPATHIC EFFECTS OF SELECTED PLANT EXTRACTS  
ON GERMINATION, SEEDLING AND PLANT GROWTH OF  
SELECTED WEEDS**



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## ABSTRACT

The present study was undertaken to assess the allelopathic suppressive effects of *Thevetia peruviana* L. and *Nerium oleander* L. vinegar leaf extracts on Purple nutsedge (*Cyperus rotundus* L.) tuber germination and seedling growth, yellow nutsedge (*Cyperus esculentus* L.) plant growth and purple nutsedge (*Cyperus rotundus*L) plant growth at the Crop Science Laboratory, Faculty of Agriculture, Eastern University, Sri Lanka from January to April 2019. Following treatments were imposed: T1(Control distilled water), T2 (100% coconut Vinegar) , T3(100% *Nerium oleander* dry leaves extract) ,T4(75% *Nerium oleander* dry leaves extract), T5(50% *Nerium oleander* dry leaves extract), T6 (100% *Nerium oleander* fresh leaves extract), T7( 75% *Nerium oleander* fresh leaves extract),T8 (50% *Nerium oleander* fresh leaves extract),T9 (100% *Thevetia peruvian* dry leaves extract), T10 (75% *Thevetia peruvian* dry leaves extract ) , T11 (50% *Thevetia peruvian* dry leaves extract), T12(100% *Thevetia peruvian* fresh leaves extract), T13 (75% *Thevetia peruvian* fresh leaves extract) and T14 (50%*Thevetia peruvian* fresh leaves extract).

The first experiment was arranged in a completely randomized design with fourteen treatments and three replications. Uniform sized tubers were soaked in different plant extracts as per treatment structure for a period of two hours before planting. Then leaf extracts were applied to germinating tubers in pots at two days interval for three times. All the agronomic practices were followed uniformly. Germination percentage (%), Radical length (cm), Plumule length (cm), Seedling length(cm), Seedling dry weight(g) and Seed vigour index were measured at fourteen days after application of first treatments. Analysis of variance was performed to determine the effect of

treatments on measured parameters and treatment means were compared by Duncan's Multiple Range Test ( $p < 0.05$ ). Results revealed that germination and seedling growth parameters of purple nutsedge (*Cyperus rotundus* L.) were significantly affected by different concentrations and forms of *Thevetia peruviana* and *Nerium oleander* vinegar leaf extracts. The lowest performances were measured in treatment applied with 100 and 75% *Nerium oleander* dry leaves extracts and 100% *Thevetia peruviana* dry leaves extract. This study found that vinegar leaf extracts of *T. peruviana* and *N. oleander* has the allelopathic suppressive effects against purple nutsedge tuber germination and seedling growth.

The second experiment was arranged in a completely randomized design with fourteen treatments and three replications. Yellow nut sedge seedlings (two to three weeks old) were collected and were planted in prepared pots. They were allowed to grow for a period of 14 days. Leaf extracts were applied to foliage (2ml per plant) of the seedlings at two days interval as per treatment structure for four times. All the agronomic practices were followed uniformly. Number of plants died was measured at fourteen days after application of first treatments. Data were analyzed with Friedman's non-parametric analysis of variance. Results divulged that, yellow nutsedge (*Cyperus esculentus* L.) plant growth was significantly affected by vinegar leaf extracts of *Thevetia peruviana* and *Nerium oleander*. Significantly highest number of plants (100%) died in *T. peruviana* 100% dry leaf extract applied treatment. The inhibitory potential of vinegar leaf extracts of *T. peruviana* and *N. oleander* species were increased with increasing extract concentrations in wet and dry forms. It was observed the dry leaf extracts of *N. oleander* and *T. peruviana* have potent allelopathic activity than wet forms of respective leaf extract. It was also

found that leaf extract of *T. peruviana* has higher allelopathic suppressive effect on yellow nutsedge than *N. oleander* on yellow nutsedge.

The third experiment was arranged in a completely randomized design with fourteen treatments and three replications. Uniform sized tubers of *Cyperus rotundus* were obtained before the commencement of the experiment. They were cleaned using distilled water and planted in prepared pots. *Cyperus rotundus* plants were allowed to grow for a period 14 days. Leaf extracts were applied to foliage (2ml per plant) of the seedlings at two days interval as per treatment structure for four times. All the agronomic practices were followed uniformly for all the treatments. Number of plants died was measured at fourteen days after application of first treatments. Data were analyzed with Friedman's non-parametric analysis of variance. Results disclosed that purple nutsedge (*Cyperus rotundus* L.) plant growth was significantly affected by vinegar extracts of *Thevetia peruviana* and *Nerium oleander*. Significantly highest number of plants (100%) died in 100 and 75% *Nerium oleander* dry leaves extracts and 75% *Nerium oleander* dry leaves extract and 100% *Thevetia peruviana* dry leaves extract applied treatments. It was observed that dry leaf extracts of *N. oleander* have potent allelopathic properties than wet forms of respective leaf extract. It was noticed that, vinegar extracts of *T. peruviana* has suppressive effect against purple nutsedge in dry form only. It could also be stated that leaf extract of *N. oleander* has higher allelopathic suppressive effect on purple nutsedge than *T. peruviana*.

**Keywords:** Allelopathic suppressive effects, *Cyperus esculentus* L., *Cyperus rotundus* L., *Nerium oleander* L., *Thevetia peruviana* L.

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