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AN ALLELOPATHIC EFFECT OF WEED ON SEED GERMINATION AND SEEDLING GROWTH IN SOME PAPILIONACEAE PLANTS

BY

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SUMMARY

Patan district is having historical background. Out of 7 talukas of Patan district I have studied three talukas viz; Sidhpur, Patan, and Harij. The climate of this district is characterized by a hot summer and general dryness in the major part of the year. The annual rainfall in the district is 623.9 mm. in the year. Wheat, spices, cotton, bajara, fodder, pulses and oil seeds are major crops in the district.

During the enumeration of weed flora cultivated fields of pulse in Patan district total 73 weed species belonging to 7 pulses are recorded. Out of these 59 weed species belong to dicotyledonae and 14 to monocotyledonae. In *Cajanus cajan* and *Cicer arietinum* of Patan district are dominant by *Euphorbia thymifolia.* Close associations of some of the weed species with crop species are also observed, while in *Vigna angularis* and *Vigna radiata* are dominant by *Digera muricata* and *Cynodon dactylon.* Lowest frequency of *Ipomoea aquatic*, *Crotalaria retusa* and *Leucas cephalotes* has been observed in various fields of pulse. In seed germination of *Cajanus cajan,* the highest inhibitory effect on percentage seed germination has been found in 4% concentration of *Evolvulus alsinoides* (28%)

and 6% concentration of *Euphorbia thymifolia* (64%) as compared to control (60% and 96%) after two and four days respectively. At the 6% concentration of *Ipomoea aquatic* reported highest inhibitory effect on percentage seed germination after two days (16%) and after four days (28%) as in *Cicer arietinum.* In *Vigna radiata* after two days1% concentration of entire plant extract of *Panicum colonum* encouraged the percentage seed germination (82%) as compared to control (76%) whereas at 6% concentration of *Digera muricata* and *Leucas cephalotes* maximum inhibitory effect has been observed (36% and 52%) after two and four days. Three different concentrations i.e. 2%, 4% and 6% for each part of weed plants i.e. root, stem, leaf and inflorescence extract s are prepared.

The measurement of root and shoot length of the seedling has been recorded after 5thday, 10 days and 15 days. Four weeds *(Euphorbia thymifolia*, *Evolvulus alsinoides*, *Leucas cephalotes* and *Tephrosia purpurea)* Showed inhibitory effects on seedling growth of *Cajanus cajan.* The allelopathic effect of stem extract of *Tephrosia purpuria* showed promoting effect on shoot and root lengths as compared to control after 5, 10 and 15 days of the *Cajanus cajan*. In compare to control (DDW), out of the four weed species the different extracts of *Evolvulus alsinoides* effect most inhibit on root and shoot growth. In *Cicer arietinum* it has been observed that weed species (*Euphorbia thymifolia*, *Cressa cretica*, *Ipomoea aquatica* and *Chrozophora tinctoria*) as the concentration increase the inhibitory

effects on shoot and root lengths progressively increased. In *Euphorbia thymifolia* 2% and 4% concentration of root extract stimulate effects on shoot and root growth as compare to control after 10 and 15 days respectively. Of the four weed species *Ipomoea aquatica* influences the maximum reduced on the shoot and root growth after 5, 10 and 15 days. All four weeds (*Crotalaria retusa*, *Digera muricata*, *Leucas cephalotes* and *Panicum colonum*) except *Panicum colonum* progressively increasing the concentration of all weed part extract gradually reduced the growth of the shoot and root lengths of *Vigna angularis*. In compare to control (DDW) 2% concentrations of stem and leaf extract as well as inflorescence extract stimulate shoot and root lengths whereas 2% concentration of root extract similar effect to the control (1.8 cm) has been observed after 10 days. Out of the four weeds *Digera muricata* have highest inhibitory effect on the shoot and root lengths after days (5, 10 and 15 days).

In *Vigna radiata* it has been observed in (*Crotalaria retusa*, *Digera muricata*, *Leucas cephalotes* and *Panicum colonum*) all species that increasing of concentration gradually reduction of shoot and root growth. The *Digera muricata* showed highest inhibition effect on shoot and root lengths as compare to the remaining weed species in all days. In *Panicum colonum*, root, stem and leaf and inflorescence extracts stimulate the shoot and root growth have been observed as compare to control in *Vigna radiata*.

The use of allelopathic crops can definitely reduce the cost of weed control. Allelochemicals with negative allelopathic effects are an important part of plant defense against herbivore. The purpose of this on-going study is to determine the effects of a range of crop on target weed species, general weed growth and their influence on Papilionacaeus plants. We can get the knowledge about allelopathic effect and also can know about positive and negative effects of weeds on crop or vise a versa. In future we can recommend about crops improvement.