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EFFECT OF AQUEOUS EXTRACTS OF DIFFERENT PARTS OF ETHNOMEDICINAL PLANTS FROM KINWAT FOREST ON SEED GERMINATION

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ABSTRACT

In present study effect of seven ethnomedicinal aqueous plant extracts of 10% solutions with their different parts were tested on seed germination of some crop plants of the area. The *Dioscorea bulbifera, Andrographis paniculata, Hymenodictyon obovatum* showed considerable positive effects on germination of some treated seeds, Simillarly *Riccinus communis* showed positive results in seeds of Groundnut and Jowar. The seed abnormalities were also observed. *Hygorphilla schulli* and *Tacca leontopetaloides* showed less stimulating for some seeds. The stimulatory effect of plant extracts measured in terms of shoot and root length after '10' days.

Figure : 01 References : 09 Tables : 07

KEY WORDS : Ethnomedicinal plant extracts, Germination, Kinwat Forest, Seed, Some crop plants

Introduction

'Ethnobotany' is defined as, a totally natural and traditional relationship and an interaction between man and his surrounding.[6] In a broad sense the ethnobotany is applied to the natural and direct relationship with plant and people at any level of antiquity, primitiveness or accumulation even to the most sophisticated gentlemen and women. In general ethnobotany is a scientific relationship with aboriginal people and plants. Ethnobotanical studies were carried out as Ethnotaxonomy, Ethnomycology, Ethnoecology, Ethnobryology, Ethnomedicobotany [9]. In present study the focus was on ethnomedicinal plant-potential to enhance the germinability in some crop plants.

Kinwat is a popular tribal Taluka in Marathwada in Nanded district of Maharashtra State. It is rich in vegetation, valleys, mountains with ample forest and declared as reserved forest by Govt. of Maharashtra. The Kinwat forest has a huge wealth of medicinal plants. It is situated on the bank of Penganga river with boundaries of Andhra Pradesh on east and Vidharbha on west (19^0 N Latitude, 77-78^0 N longitude). Penganga is the main river flowing in the region and covered major area of the forest . Kinwat is situated at an average height of 366 m above mean sea level. The type of the forest in the study area is dry deciduous.[3,7]

This region is very rich from ethno-medico-botanical point of view and also rich in floristics. Tribals of study area are unknown about the importance of documentation, conservation and scientific utilization of plants as well as their antimicrobial properties. Considering all these facts the present topic was selected for investigation.

The seed germination is the most important and initial event in the regeneration of the plant. Growth of embryo in a seed to produce a new plant after period of dormancy of seed. In order to germinate a seed needs favourable conditions of different environmental factors. Germination is a resumption of active growth of an embryo, various physiogical changes occur during the process of seed germination and acts positively and negatively on further growth. During these physiological changes how the extracts of some ethnomedicinal plants influence on germinating seeds two of each from cereals, pulses and oil seeds were tried to find out in the present study. The ethnomedicinal plants of this region have alleopathic potential,

major allelochemical found in plants with documented allelopathic activity are phenolic compounds. It is accepted in literature that phenolic compounds that allow concentrations are stimulatory to germinate the seeds.[4,8]

Material and Methods

The plant materials were collected from different localities of Kinwat forest. The plant parts were like leaves of *Andrographis paniculata, Ricinus communis,* bark of *Hymenodictyon obvatum,* tubers of *Dioscorea bulbifera , Tacca leontopetaloides* and roots of *Curculigo orchioides, Hygrophila schulli* in October –Nov-2010.

These plant materials in form of different parts were brought to the laboratory and washed with tap water to remove the dirt and followed by distilled water. The materials were cleaned with filter paper and then cut into small pieces and allowed to dry these materials at room temperature in a shade for about 10-15 days according to need. The dried plant materials were made into powder. The powdered form of materials were placed in airtight containers to prevent from moisture and contamination . The aqueous extracts were prepared through soxhlet extractor by extracting 10 g. of powder with 100 ml. of distilled water for 4-5 hrs. *i.e.* 10% extracts were prepared. [2.]

Seeds of crop plants two of each from careals like Wheat and Jowar, pulses like Moong and Gram and oils like Groundnut and Safflower were collected from local market. Apparently healthy seeds of two of these crop plants were selected separately. They were washed and surface sterilized with 1% $HgCl_2$ before the treatment of plant extracts. For germination of seed pairs of white blotter paper of 8.5 cm diameter were jointed soaked in sterilized distilled water and placed in sterilized coring petriplates of 10 cm. diameter. Five seeds per plate were placed at equal distance on moist blotter to provide sufficient space for the growth of shoot and root initials. The sets were arranged in triplicates 10 ml of plant extracts poured in each plate and every sixth plate was kept only with distilled water without the plant extracts and used as control. The plates were placed at room temperature of 25 ± 2ºC for seven days. The germination percentage was calculated by the formula: -

$$GP = \frac{\text{Number of Germinated Seeds}}{\text{Total number of seeds}} \times 100$$

The observations in terms of percentage of seed germination , length of root initials, length of shoot initials, abnormalities in treated and untreated seeds were noted in the Tables.

Results and Discussion

The obtained results of % seed germination are very significant and noted in Table No. 01 to 07 . As per the results the categories of the seeds two from each of the cereals, pulses and oil seeds were utilized. The overall % seed germination were simulated in presence of all test extracts. There was variation in the degree of percentage seed germination in seeds of different crop plants in presence of different ethno-medicinal plant extracts. It is interesting to note that, very minor abnormalities were observed in root and shoot initial in rare cases among the all tested seeds. Results are more significant on the basis of data, the % seed germination of the moong is highest and as same as to the control but it is very significant to note that the root and shoot initials were simulated in presence of leaf extract of *Andrographis paniculata* and tuber extract of *Dioscorea bulbifera* and leaf extract of *Ricinus communis*. Similar results were observed in presence of root extract of *Curculigo orchioides* and bark extract of *Hymenodictyon obovatum* in case of gram. In case of Jowar the prominent result was obtained as compared to control in presence of root extract of *Hygrophilla schulli*. Percentage seed germination was highest one and length of root and shoot initials were promoted.

The tuber extract of *Tacca leontopetaloides* was more benefited in % seed germination of wheat, in which length of root and shoot initials were found to be promoted.[1,5] It clearly suggests that their broad range of the germination in presence of different extracts gives an idea, that the nature of chemical compounds of different medicinal plants produce the stimulatory effect and it is beneficial to healthy and more germination. Therefore if the seeds are treated with plant extracts at the time of sowing, it would be beneficial for cultivation.

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