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“STUDY OF THE SEED GERMINATION SOME PLANTS SPECIES OF ACANTHACEAE FAMILY OF *PERISTROPHE BICALYCOLATA* AND *ADHATODA VASICA* INFLUENCE OF VARIOUS CHEMICAL TREATMENTS”

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ABSTRACT

Both plants seed show dormancy and have not show 100% germination. Studies were conducted to break the dormancy of seed by various chemical treatments. Among the chemical treatment given to these plants are treatment of conc. sulphuric acid, Copper Sulphate, Sulfa drugs, Antibiotics and fumes show variation in both the plants, Sulphuric acid helped *P.bicayculata* in germination but have negative effect on *A. Vasica*. Antibiotic have negative effect on the species of plants. But treatment with cow dung cake fumes show increase in percentage germination of both the species of plants, treatment with growth parameters show variation in percentage germination when treated with GA. and 1AA.



KEYWORDS: Plants, Seeds, Germination and Treatments.

INTRODUCTION

Seed are the first link in the food chain and retain the life of plant and earth through there viability and nutritive value for 5000 years peasants have produced their own seeds selecting storing, rowing and letting, nature takes its own course in the food chain. There is always a content effort from formers, researches and scientist all over the world to produce good quality seeds. The seed germination studies have been done from a variety of angles a number of factors appears to influence the process of germination different type of dormancies, occurrence of ecotypes, permeability, levels of the seed coat drought resistance mechanism, polymorphism, differential precipitation of light and temperature have attract the attention of researchers for germination studies the nature of germination regulating mechanism in seeds, seed represent the initiation and termination of development phase and seed germination represents the commencement of subsequent growth phase.

During these days germination and dormancy of several plants have been studied by Amen (1963-1968) vagis (1964) Wareing (1965) Dubey (1987) and Salgane et.al. 1990, Rajamanickam et.al. (2002) Ratan & Reddy (2004), Dhoran & Guddhe (2012).

MATERIAL AND METHODS:

Seeds were collected from well matured fruit as per method suggested by Pandeya et.al. (1968). The seeds germination method used growing seedling was followed by Frankland and Wareing (1960)

for Lettuce. The seeds of *P.bicalyculata* and *Adhatoda Vasica* of average uniform size were selected disinfected and thoroughly washed seeds were soaked in distil water over a moister filter paper in petridish each petridishes were containing 8 ml of distil water and 50 seeds and observed every days.

Treatment with cons. Sulphuric acid: Treated with cons. H₂SO₄ desirable time and seeds were removed thoroughly washed and set for germination.

Treatment with copper sulphate: 5% of copper solution seeds were treated for desirable periods and washed thoroughly before seeding for germination.

Treatment with sulpha drugs and subamycin: 5% solution was prepared of sulphadizine, sulphaguanadine and subamycin and seeds were set for germination in these solution.

Treatment with fumes: Soaked seeds were placed on a sieve plate and from a distance of 50 cm fumes from a cow dung cake passed through the plate. Treatment was given for desirable period before setting for germination.

Hormonal treatment: Preparation of stock solution of indole acidic acid (IAA) and Gibberellic acid (GA) were prepared of different cons. ppm solution and treatment given to seeds for desirable period before setting for germination.

RESULT AND DISCUSSION:

Table 1: Effect of H₂SO₄ on percentage germination

Sr.No.	Treatment time in minutes	No.of seeds given in treatment	% of seeds germinaton	
			<i>P.bicalyculata</i>	<i>A.vasica</i>
1.	1	50	96±3	32±2
2.	3	50	99±1	20±1
3.	5	50	80±2	16±1
4.	7	50	64±2	12±1
5.	9	50	30±2	8±0
	Control	50	70	56

Table 2: Effect of fumes on percentage germination

Sr. No.	Treatment time in minutes	No. of seeds given in treatment	% of seed germination	
			<i>P.bicalyculata</i>	<i>A.vasica</i>
1.	5	50	96±3	60±3
2.	10	50	90±2	80±2
3.	15	50	80±3	68±2
4.	20	50	70±2	72±2
5.	25	50	46±1	64±1
6.	30	50	30±1	44±1
	Control	50	70	56

Table 3: Effect of 5% copper sulphate and sulfa drugs (sulfadiazine sulfagonadin) and 5% subamycin on percentage germination

Sr.No.	Treatment of time in hours	No.of seeds given in treatment	Percentage of seed germination							
			CuSO ₄		sulfadiazin		sulfagonadin		Subamycin	
			<i>P.b.</i>	<i>A.v.</i>	<i>P.b.</i>	<i>A.v.</i>	<i>P.b.</i>	<i>A.v.</i>	<i>P.b.</i>	<i>A.v.</i>
1.	6	50	16±2	56±1	92±13	52±2	90±3	56±2	42±2	44±2
2.	12	50	12±1	56±2	92±2	48±1	88±3	52±2	42±2	40±1
3.	24	50	4±1	32±1	78±2	32±1	80±2	20±1	10±1	8±1
4.	48	50	2±1	20±1	70±2	16±1	72±2	20±1	2±1	0±0
	control	50	70	56	70	56	70	56	70	56

Table 4: Effect of different concentration of growth Hormones Gibberellin and Indole acetic acid on percentage of seeds germination in *P.bicalyculata* and *A. vasica*.

S.No.	Different concentration of growth hormones in ppm	No. of seeds given treatment	Percentage of seeds germination			
			Gibberellin		Auxin(Indole Acetic Acid)	
			<i>P.b.</i>	<i>A.v.</i>	<i>P.b.</i>	<i>A.v.</i>
1.	5	50	70±3	56±2	70±3	56±2
2.	10	50	76±3	60±2	76±2	60±3
3.	25	50	96±3	64±3	96±3	68±3
4.	50	50	60±2	72±2	66±2	80±2
5.	100	50	30±1	60±2	50±2	80±3
	control	50	70	56	70	56

Symble – *P.b.*= *Peristrophe. bicalyculata*, *A.v* = *Adhatoda vasica*

The seeds of *P. bicalyculata* and *A. vasica* show dormancy. It was conformed by germination seeds of both plants. Dormancy occur in large number of seeds C.F. Crocker, 1938, Barton & Crocker 1948, Barton 1965 a,b, Mayer & Mayber 1963, Mishra et al. 1990 Rao and Reddy 1990 Athya 1990. Reason which can be assigned for the cause of dormancy are impermeability of seeds coat, presence of endogenous inhibitor in the seed, immature embryo and specific requirement of seed (Wareing and Phillips 1970).

Many fresh seeds show hard seed coat dormancy the presence of hard seed coat in addition to the inhibitors which may be responsible for dormancy in further supported chemical scarification method. Rao (1990) remove the seed coat dormancy of *China dodder* and *Cuscuta chinensis* by scarification in con. H₂SO₄ for less than five minute treatment. Athya (1990) on sine forest tree seeds Khan (1990) *Indigofera hochsteteri* observed that there is increase in percentage of germination. Present work confirm the early work presented by different authors. In the *P. bicalyculata* the percentage germination goes up to 100% by three minute treatment where as in *A vasica* percentage germination reduces. It indicate that seed coat is very soft and seed cannot resist the treatment. Plants belong to some family having different seed character is a characteristic plant.

Seeds were treated with different chemicals e.g. CuSO₄, sulfa drugs subamycin. Results show inhibitory effect in both the sp. of plants while treated with CuSO₄ and in case of sulpha drugs *P. bicalyculata* show increase in germination percentage but have inhibitory effect on *A. vasica*. This indicate that seeds do not accept all the chemicals favorably but some chemicals are accepted by one sp. and not by other sp. This also confirms the result of less production due to chemical pollution caused by industries. Such result are also reported by different workers from time to time. Chavon et al. Sharma et al (1990) on *Hygrophila auriculata*.

Treatment with firms show increase in percentage of germination in both the sp. of *P. bicalyculata* and *A vasica*. This confirms the early work of Panija (1960) on Paddy, Chatterji (1975) on *Abutilon indicum*. Chowdhary and Singh (1960) reported that the growth regulators have role of better germination and quicker growth and higher yields in tomato. Frankland (1960) also found that the Gibbrallic acid stimulation germination of different kinds of seeds, Banerji and Lallorya. (1966) reported that rate of GA. and Kintein on metabolism during germination in Cucurbita seedlings, Parihar et al (1990) *Chrysopogen fulvus* Beohar (1990) *Vicia faba*, Gupta (1990) on *Cicer arietnum* Rajamanickam et al. (2002) *Edmblica affinalis* Ratan et al. (2004) *Annona squamosa* and Dhoran et al (2012) *Asparagus* Sp.

Present study show increase in percenrtage of germination in 25 ppm in the case of *P. bicabyculata* and same cons. is also effective in *A vasica*. But at 50 ppm percentage germination decrease in *P. bicalyculata* and it is optimum in *A. vasica* while the seed seeds were treated with IAA it is observed that the 25 ppm cons. promotes germination in *P. bialyculata* and that higher cons. decreases

the percentage while in *A. vasica* 50 ppm optimums and so in 100 ppm., These result confirms that work of earlier workers which show that growth regulator help in increasing the percentage of germination but up to certain cons. after which it reduces the percentage.

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