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EFFECT OF BAP AND KINETIN ON SPORE GERMINATION IN *NOTOTHYLAS KHASIANA* UDAR ET SINGH

B.L. CHAUDHARY AND VANDANA VIJAIVARGIYA

Bryology laboratory, Department of Botany, College of Science,
Mohan Lal Sukhadia University, Udaipur.
email- vandanavijay80@yahoo.co.in

The spore, first cell of gametophytic generation, is a specialized structure with a potential of developing in to a new individual. BAP and kinetin stimulate the spore germination in *Notothylas khasiana* is reported. However, stimulatory influence of BAP was greater as compared to kinetin. Spore generation was maximum in 10 ppm of BAP followed by 5 ppm and 1 ppm concentration. Further higher concentration of both proved to be inhibitory.

Key words : AP, Gametophytic generation, Kinetin, *Notothylas khasiana*, spore.

Bryophytes are an important component of the vegetation in many regions of the world. Little work has been done on effect of the growth regulators on morphogenesis of bryophytes.

Spore serves as a mean of multiplication of the particular plant year after year. The process of germination of spore depends on many factors. Different concentrations of growth regulators effect the time period required for spore germination. Present studies were undertaken to test effect of BAP and Kinetin on spore germination in Notothylas.

MATERIALS AND METHODS

The undehisced capsules of *Notothylas khasiana* were surface sterilized with two per cent solution of calcium hypochlorite for the preparation of spore suspension in double distilled water. Capsules were punctured with the help of sterile needles, spores were released. 0.01 ml of well shaken spore's suspension which contains approximately 30 spores was spread on whatman's filter paper no. 1 moisten with Half Knop's liquid culture medium and different concentrations of growth hormones. The cultures were maintained at 25±2°C temperature. Three replicates were used in each case and observations were recorded using Olympus stereoscopic binocular microscope.

RESULTS AND DISCUSSION

Different concentrations of growth hormones with HKM influence the spore germination in *Notothylas khasiana.* Stimulatory influence of BAP was greater as compared to kinetin. However, lower concentrations of growth regulators show promotory effect while higher concentrations show inhibitory effect. (Table 1)

Kinetin

10th day: In this growth regulator, maximum percentage of spore germination was 77.70, observed at 5 ppm. It decreased, with increase in concentration in all the remaining concentrations, and beyond 10 ppm even it was lower than the control (46.62).

20 day: With the passage of time, percentage of spore germination also increased. Percentage of spore germination was 49.95, noticed in control. A progressive increase was noted in germination percentage up to 5 ppm and at the same concentration germination percentage was maximum (79.92). Thereafter, it decreased continuously with the increasing

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concentrations. However, it was lower as compared to control beyond 10 ppm.

30th day: The highest percentage of spore germination was 86.58, observed at 5 ppm. concentration of this growth regulator. At the concentrations of 1 to 10 ppm the percentage of germination was higher and beyond this it was lower as compared to control (52.17).

BAP

10th day: Data presented in Table 4.2 reveal that the percentage of spore germination was 46.62 in control. BAP promotes spore germination up to 30 ppm in comparison to control and it was maximum (88.80) at 10 ppm. Beyond 10 ppm, a continuous decrease in spore germination percentage was observed. At 40 and 50 ppm germination percentage were lower than the control.

TABLE 1: Showing effect of growth hormones on spore germination of *Notothylas khasiana* Udar et Singh in Half Knop's liquid medium.

	On 10th day		On 10th day		On 10th day	
Conc(inppm)	Kinetin	BAP	Kinetin	BAP	Kinetin	BAP
Control	46.620	46.620	49.950	49.950	52.170	52.170
1ppm	71.040	74.370	74.370	76.590	74.370	82.140
5ppm	77.700	79.920	79.920	83.250	86.580	88.800
10ppm	75.480	88.800	77.700	93.240	78.810	95.460
20ppm	42.180	68.820	44.400	69.930	46.620	75.480
30ppm	28.860	51.060	28.860	58.830	34.410	59.940
40ppm	24.420	39.960	26.640	42.180	29.970	46.620
50ppm	18.870	36.630	22.200	39.960	24.420	39.960

20th day: The highest percentage of spore germination i.e. 93.24 was recorded at 10 ppm. With increase in concentration, a gradual decrease in spore germination percentage was noted; but it was lower as compared to control (49.95) beyond 30 ppm.

30th day: Time period positively effect the process of spore germination i.e. with the increase in time period, percentage of spore germination also increased. In control, percentage of spore germination was 52.17. It increased with the increase in concentration up to 30 ppm in comparison to control. However, maximum percentage of germination (95.46) was noted at 10 ppm. As compared to control, spore germination was lower at 40 and 50 ppm.

Szweykowaska (1963) made studies on kinetin induced formation of gametophyte in dark culture of *Ceratodon purpureus.*

Pogonatum aloides did not respond to kinetin for spore germination. (Sood ,1972)

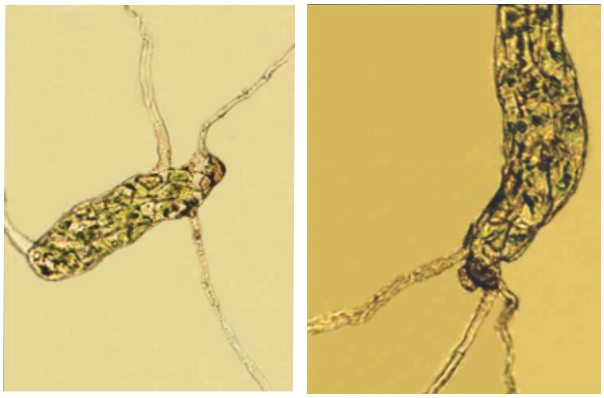
Vyas (1984) while studying the effect of growth regulators on spore germination of *Plagiochasma appendiculatum,* found that growth regulators have enhancing effect on spore germination.

Khuntaila (1991), while studying the effect of growth regulators (Kinetin, IAA and GA) on spore germination of *Semibarbula orientalis,* observed that percentage of spore germination was the maximum in kinetin, followed by GA and IAA.

Chaturvedi and Vashistha (2002) observed the effect of some auxins (2, 4 di chloro phenoxyacetic acid, indole 3 acetic acid, β naphtoxy acetic acid) and three cytokinins (6-Benzyl amino purine, 6-y Methyallyl amino purine, 6-Furfuryl amino purine) on protonemal growth and differentiation in the moss Bryum capillarae L. ex. Hedw.

Chopra and Mehta (1987) studied the effect of some growth regulators on growth and fertility in male clones of moss *Microdus brasiliensis.*

Cytokinins are chemicals which promote cytokinesis in cells of various plant origins (Skoog *et al*. 1965,vide Fox 1969). The most important aspect of cytokinin action is increased mitosis (cell division) which



30 ppm BAP 5 ppm Kinetin

Effect of growth hormones on spore germination of *Notothylas khasiana* Udar et Singh in Half Knop's liquid medium.

involves increased synthesis of nucleic acids and proteins. Cytokinin treatment may induce protein synthesis by increasing one or more aspects of transcriptional and translational activities. Cytokinin may increase m-RNA and t-RNA content, which are involved in protein synthesis. Several enzymes are known to increase during cytokinin treatment. These enzymes include those catalyzing a variety of chemical reactions of diverse nature. Some examples are nitrate reductase, thiamine, methylpherase, proteases, nucleases, α-amylase, some photosynthetic enzymes and some enzymes of thiamine synthesis. An increased enzyme activity may be the result of increased nucleic acid and protein synthesis.

However, results of the present work are in contrast to Sood (1972) in *Pogonatum aloides* and similar with Vyas (1984) in *Plagiochasma appendiculatum*, Khuntaila (1991) *in Semibarbula orientalis* who found enhancing effect of growth regulators on spore germination.

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