ABSTRACT

Title of the Thesis	**:**	Bio-prospecting of selenium fortification in Mustard (*Brassica juncea* L.)
Name of student	**:**	Suhail Ashraf Shah
Registration No.	**:**	J-20-MBS-48
Major Subject	**:**	Plant Physiology
Name and Designation of Major Advisor	**:**	Dr. Bhav Kumar Sinha Associate Professor, Plant Physiology
Degree to be awarded	**:**	Masters of Science in Plant Physiology
Year of award of degree	**:**	2022
Name of University	**:**	Sher-e-Kashmir University of Agricultural Sciences & Technology, Jammu.

Abstract

The present study entitled, **"Bio-Prospecting of Selenium Fortification in Mustard (*Brassica juncea* L.)"** was carried out to study the effect of Selenium on germination and morpho-physiological growth of mustard (*Brassica juncea* L.) and the effect of Se for development of resistance against drought grown under pot conditions and effect of Se on morphological, biochemical and yield parameters. The experiment was carried at Division of Plant Physiology, Faculty of Basic Sciences SKUAST Jammu. Pusa bold variety of *Brassica juncea L*. was taken under study. The experiment was laid under completely Randomized Block Design with four replications and fifteen treatments. The foliar application of Se was given in vegetative and reproductive stage.

From the study it was demonstrated that the effect of different levels of Se on plant height, number of leaves/plant and number of branches/plant significantly higher in 4 ppm Se with 7 days WOW (178.6, 77.65, 12.37, respectively). Similarly fresh weight leaves, stem, root and silique (5.09, 38.40, 7.88, 36.92 g) and dry weight of leaves, stem, root and silique (2.94, 29.14, 5.80 and 31.94 g), respectively was observed in 4 ppm Se with 7 days WOW. However in case of biochemical parameters like chlorophyll content, *chl* a, *chl b*, total chlorophyll and total carotenoid, obtained maximum value (47.25, 1.31, 0.73, 1.94, 0.46), respectively in treatment 30 ppm Se with 7days of WOW. Expect that of pollen viability (63.45%), total soluble sugar (3.93 mg/g) and total starch (180.26 mg/g) which was obtained significantly highest in $T_{15,}$ T_2 and T_6, respectively. But In case of proline in 60 DAS (2.22 mg/g FW) and 90 DAS (1.81 mg/g FW) was obtained highest in T_{13}. However in case of relative stress injury the highest was obtained in $T_{8.}$

In case of growth parameters like RWLC (85.00 %) the highest value was obtained in control. Whereas, CGR (2.49 g/m/day), RGR (0.190 g/g/day), SLA (1351 cm^2/g), SLW (0.0023 g/cm^2) and LAD (87.44 cm2/day) maximum value was obtained in 4ppm Se with holding of water for 7 days.

For yield and quality parameters like Number of silique/plant(115.37), seed yield (42.60 g) and test weight (5.70 g) were found to be maximum in 4 ppm Se with 7 days WOW. Fatty acid analysis was found to be significantly highest in 30 ppm Se with 7 days WOW. However the Se content in seed (0.63 mg/kg) and Se content in soil (1.63 mg/kg) were found to be significantly highest in 30 ppm Se with 7 days WOW.

Thus, it can be concluded that treatment T_2 (4 ppm Se with 7 days WOW) resulted in significantly higher growth, yield attributes and yield. Besides this, Se also enhanced the chlorophyll, proline content significantly. Therefore, treatment T_2 (4 ppm Se with 7 days WOW), can be recommended as an effective approach of Se fortification for enhancing growth, and yield and quality of crop.

Keywords: Se, *Brassica*, chlorophyll, WOW.

Signature of Major Advisor **Signature of the Student**