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## *In vitro* study of *Eruca sativa* Mill., seeds in Kalaburagi region, Karnataka, India

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### **Abstract**

*Eruca sativa* Mill., a plant belonging to family Brassicaceae commonly used as salad vegetable. The cultivation of *Eruca sativa* plant has most of the Mediterranean countries. Since ancient time *Eruca sativa* is used for medicinal and commercial plant. It has highest nutrients and minerals. The present study reveals that the germination of *Eruca sativa* seeds on medium by vitro condition. It shows that there is good germination short interval of harvested seeds than the long day stored seeds.

**Keywords:** *In vitro*, Seeds, PDA medium, *Eruca sativa*, Kalaburagi

### **1. Introduction**

*Eruca sativa* is an endemic species of the Brassicaceae family which produced mostly in Mediterranean countries such as Italy, Greece and Turkey. The common name of *Eruca sativa* is of various *Viz.*, Rocket, Gergeer, Jarjeer, Taramera, *etc.*. It is a dark green annual plant, about 20 to 50 cm in height, with a spicy-pungent taste [1, 2]. Since ancient times, the rocket plant has been a source of nutrition, an aphrodisiac and a medical plant, and has other uses [3]. The study of *Eruca sativa* seeds germination and affected fungi determined in this experiment.

### **2. Materials and methods**

Kalaburagi is a semiarid region of the Deccan plateau of north-eastern district of Karnataka. Gulbarga University (17°18'46.62"N, 76°52'27.32"E) situated 10km away from the city. The experimental field is located at Department of Botany, Gulbarga University, Kalaburagi. *Eruca sativa* seeds sample were collected from Saudi Arabia. These Saudi seeds were cultivated in the open field department of Botany, Gulbarga University, Kalaburagi. After the harvest of the *Eruca sativa*, the newly seeds were named as Indian seeds. From both seeds, the experiments of study of germination of seeds on PDA medium was carried out in Mycology and Plant pathology laboratory, department of Botany, Gulbarga University, Kalaburagi.

Saudi seeds and Indian seeds of *Eruca sativa* samples were initially subjected to surface sterilization with absolute sterile distilled water. The seeds samples were incubated in Petri plate on PDA medium at room temperature for 5–7 days and observed daily. Then, calculate the number of germination of seeds at 3<sup>rd</sup> day and 5<sup>th</sup> day of experiment and observed the fungi affected on seeds during the experiment.

### **3. Results and Discussion**

An experiment was conducted on both Indian and Saudi seeds on PDA medium. Total 100 seeds of Saudi and 100 seeds of Indian selected to incubate on 10 Petri plates of 20 seeds per plate. The germination data are record every 24 hours of interval then find out the mean value on 3<sup>rd</sup> and 5<sup>th</sup> day. After 5<sup>th</sup> day, the complete growth of pathogens in the petriplate observed. The number of germination in Indian seeds and Saudi seeds are 66% and 28% and affected by fungi on 20 and 18 seeds on 3<sup>rd</sup> day of observation. Whereas, the germinated of Indian seeds and Saudi seeds are 24% and 18 % and affected by fungi on 79 and 99 seeds at 5<sup>th</sup> day. *Aspergillus niger*, *A. flavus*, *A. fumigates*, *Pencillium sp.*, *Neurospora sp.*, fungi are associated, with Indian seeds and *A. niger*, *A. flavus*, *A. fumigates*, *Mucor sp.*, *Pencillium sp.*, with Saudi seeds (Table 1 & 2). So, it shows that, the gradually decreased in seed germination and loss of seed viability by affecting the different fungi.

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The review of literature shows that, the seed germination is one of the biological processes most sensitive to stress conditions particularly salt stress.

For chromosomal study of Rocket, the seeds were germinated on moist filter paper in Petri dishes kept in the dark at room temperature [4]. Taramira seeds can be stored at room temperature for two seasons and it maintains the population structure by lessening generation interval [5]. The leaves of *Eruca sativa* used as salad and medicines for stimulant, stomachic, diuretic, and antiscorbutic activity [6]. Tissue culture techniques of genetic improvement, the *Eruca sativa* cultivars are grows from seeds or transplants. Seeds are sown 0.5 to 1 cm deep in rows 15 to 20 cm apart. Soaking of seeds

of *E. sativa* in water for 6 h and then sowing in the evenings for improved germination [7]. The mucilaginous seeds of *E. sativa* used as biocontrol agent for the larvae of the insect *Culex quinquefasciatus* and *Aedes aegypti* [8]. The seed mucilage of *E. sativa* plant was described to have great potential as a commercial hydrocolloid in food industry [9]. The nutrient elements in *Eruca sativa* was found as 4.32% N, 0.25% P, 5.13% K, 2.95% Ca, 0.58% Mg, 799.88 mgkg<sup>-1</sup>Na, 350 mgkg<sup>-1</sup> Fe, 5.36 mgkg<sup>-1</sup>Cu, 40.58 mgkg<sup>-1</sup> Mn and 64.86 mgkg<sup>-1</sup> Zn [10]. The present paper tried to study the germination of seeds in laboratory conditions. So, the comparative study of Indian and Saudi *Eruca sativa* seeds was reported by *in vitro* condition during this experiment.

**Table 1:** The description of number of seeds germination and affected fungi on PDA media

Plate No.	No. of seeds incubated on PDA	Indian seeds (IS)			Saudi seeds (SS)		
		3 <sup>rd</sup> day			3 <sup>rd</sup> day		
		Total germination	Total effect of seeds by fungi	Name of associated Fungi	Total germination	Total effect of seeds by fungi	Name of associated Fungi
1	20	16	3	<i>A. niger, Neurospora sp.</i>	5	2	<i>A. niger, Pencillium sp.</i>
2	20	11	8	<i>A. niger, A. fumigates,</i>	7	5	<i>A. niger, A. fumigates, Mucor sp.</i>
3	20	12	2	<i>A. flavus, Mucor</i>	3	5	<i>A. niger, Pencillium sp.</i>
4	20	17	1	<i>A. niger,</i>	5	3	<i>A. niger,</i>
5	20	10	6	<i>A. niger, Pencillium sp.</i>	8	3	<i>A. fumigates,</i>
Total	100%	66%	20 seeds		28%	18 seeds	

**Table 2:** The description of number of seeds germination and affected fungi on PDA media

Plate no.	No. of seeds incubated on PDA	Indian seeds (IS)			Saudi seeds (SS)		
		5 <sup>th</sup> day			5 <sup>th</sup> day		
		Total germination	Total effect of seeds by fungi	Name of associated Fungi	Total germination	Total effect of seeds by fungi	Name of associated Fungi
1	20	5	20	<i>A. niger, Pencillium sp.</i>	5	20	<i>A. flavus, A. niger, Pencillium sp.</i>
2	20	3	17	<i>A. niger, A. fumigates, Mucor</i>	2	19	<i>A. niger, A. fumigates, Mucor sp.</i>
3	20	6	13	<i>A. fumigates</i>	4	20	<i>A. niger,</i>
4	20	4	14	<i>Mucor sp.</i>	5	20	<i>A. niger, Neurospora sp.</i>
5	20	6	15	<i>Neurospora sp.</i>	2	20	<i>A. niger, Mucor sp.</i>
Total	100%	24%	79 seeds		18%	99 seeds	

#### 4. Conclusion

The experiment proves that, the germination of *Eruca sativa* seeds on PDA medium grows on increase and less affected by fungi after the immediate harvest. But, the seeds are less germinated and high affected by fungi during more interval of time. So it indicates loses the vigor in seeds of *Eruca sativa* at long time from harvest.

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#### 6. References

- Morales M, Janick J. Arugula: A promising specialty leaf vegetable. In: Trends in New Crops and New Uses. Janick J, Whipkey A (eds.). Alexandria, VA: ASHS Press
- Sharma MM, Dhingra M, Dave A, Batra A. Plant regeneration and stimulation of *in vitro* flowering in *Eruca sativa* Mill. Afr. J. Biotechnol 2012;11(31):7906-7911.
- Yaniv Z, Schafferman D, Amar Z. Traditional uses and biodiversity of rocket (*Eruca sativa*, Brassicaceae) in Israel. Econ. Bot 1998;52(4):394-400.
- Blangiforti S, Venora G. Cytological study on Rocket species by means of image analysis system. International Plant Genetic Resources Institute 1997, 36-40.
- Divakara Sastry EV. Taramira (*Eruca sativa*) and its Improvement - A Review. Agric. Rev 2003;24(4):235-249.
- Bhandari DC, Chandel KPS. Status of rocket germplasm in India: research accomplishments and priorities. In S. Padulosi, D. Pignone, eds. Rocket: A Mediterranean Crop

- for the World. International Plant Genetic Resource Institute, Rome 1996, 67.
7. Bianco VV. Rocket, an ancient underutilized vegetable crop and its potential. In S. Padulosi, eds. Rocket Genetic Resources Network. Lisbon, Portugal 1995, 35-57.
  8. Gajra Garg and Vinay Sharma. *Eruca sativa* (L.): Botanical Description, Crop Improvement, and Medicinal Properties, Journal of Herbs, Spices & Medicinal Plants, 2014;20(2):171-182.
  9. Koocheki A, Razavi SMA, Hesarinejad MA. Effect of extraction procedures on functional properties of *Eruca sativa* seed mucilage. Food Biophys 2012;7:84-92.
  10. Neriman Tuba Barlas, Mehmet Eref Irget, Mahmut Tepecik. Mineral content of the rocket plant (*Eruca sativa*) African Journal of Biotechnology 2011;10(64):14080-14082.