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## *In vitro* seed culture of *Nigella sativa* L. A Miracle herb

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### Abstract

A study was conducted to access the *in vitro* germination and subsequent morphogenetic potential of seeds of *Nigella sativa* L. a miracle herb. Murashige and Skoog's (MS) medium used throughout the series of experiments. Seeds were inoculated on MS medium or basal medium in different concentration of Phytohormone BA, Gibberellic acid (GA<sub>3</sub>). In *Nigella* best result obtain in one seed on high concentration 10 mg/l BA. No seed germination was obtained in any concentration of GA<sub>3</sub>.

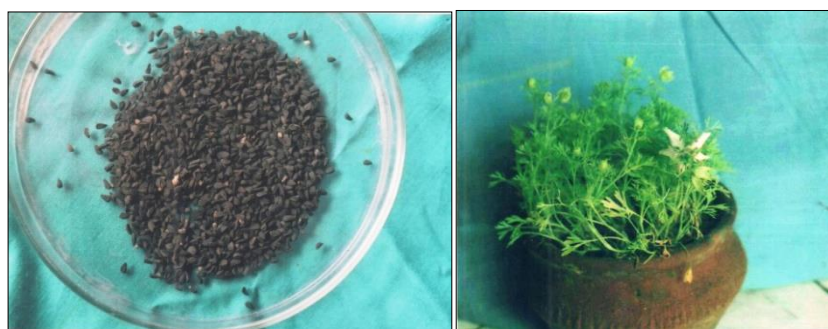
**Keywords:** *Nigella sativa*, miracle herb, ranunculaceae, black seeds, antitumor sterol, anti- cancer

### Introduction

*Nigella sativa* L. is an annual medicinal herb belongs to family (Ranunculaceae). It is emerging as a miracle<sup>[5]</sup> herb with a rich historical and religious background. Since many researches revealed its wide spectrum of Pharmacological<sup>[1]</sup> potential. *N sativa* is commonly known as black seed. *N sativa* is native to Southern Europe, North Africa Asia and South West Asia<sup>[9]</sup>. It is cultivated in many countries in the world. In India it is cultivated in Punjab, Assam, Bihar, Bengal.

### Morphology of the plant

*N. sativa* is an annual flowering plant which grows to 20-30 cm. (7.9-12 in.) tall, with finely divided, linear (but not thread like) leaves. The flowers are delicate, and usually pale blue and white colours, with 5-10 petals. The fruit is a large and inflated capsule, each containing numerous seed Fig (1,2)



**Fig 1:** *N. sativa* (Whole plant, white flower) Fig -2 Seed explant

The mature and dry seeds use as medicinal purpose and spice. *N. sativa* is pungent, aromatic and slightly bitter in taste. It has been used for medicinal<sup>[2]</sup> purpose for centuries both as a herb and pressed into oil in Asia, middle east and Arica. The seeds are antihypertensive, carminative, diuretic properties,<sup>[3, 4]</sup> *Nigella sativa* shows anticancer properties seeds contain many compounds such as nigellin, nigellone, alanine, arginine, beta sitosterol, antitumor sterol. In Islam it is regarded as one of the greatest forms of healing medicine available. The Islamic Prophet Muhammad once stated that black seed can heal every disease- except "death".

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## Material and methods

Fresh and healthy seeds of *Nigella* was collected from residential areas. Seeds were presoaked for 12 hours. Seeds were rinsed with running tap water, 5 minutes, washing and disinfecting the seeds in 0.1-0.2% solution of HgCl<sub>2</sub> for 2-3 minutes. Further washing then 2-3 distilled water in a aseptic condition. The sterilized seeds were inoculated on MS medium or basal medium in different concentration of Phytohormone i.e. Cytokinin BA and Gibberellin-Gibberellic acid (GA<sub>3</sub>).

## Results

The main objective of the study was to register the *in vitro* germination response for quick plantlet formation and also score the data for its conservation. For this purpose sterilized seeds were inoculated on different concentration (0.5,1,2,5 10 mg/l) of BA was added to MS medium [7] germination occurs in 10 days in (MS+ BA 10mg/l). After inoculation in one seed germinated percentage response is (about 2.5%). The germination process was slow. Shoot

formation was also found in one seed after (15) days. No seed germination was obtained in any concentration of GA<sub>3</sub>. Fig (3) This is shown in Table 1.



**Fig 3:** Seed germination and shoot formation from (MA+ BA 10mg/l) after 15 days.

**Table 1:** Effect of different concentration of growth regulators BA on seed germination of *N. sativa*

No. of seed	Medium	Hormonal Concentration (mg l <sup>-1</sup> )	Germination response	% response	Callus formation
10	MS + BA	0.5	No response	-	-
10	MS + BA	1	No response	-	-
10	MS + BA	2	No response	-	-
10	MS + BA	5	No response	-	-
10	MS + BA	10	1 seed shoot formation after 15 days	25%	-

## Discussion

*In vitro* germination of *Nigella* could be possible. *In vitro* seed germination. I used two phytohormone BA and GA<sub>3</sub> in different concentration. In *Nigella* best result obtain on high concentration 10mg/l BA in one seed. Demand for this medicinal plant [6, 8] is increasing in both developing and developed countries due to growing recognition of natural product being non – narcotic, having no side effect, easily available at affordable price. In this background *in vitro* studies on seed germination of *N. sativa* is greatly desirable from Pharmaceutical view point.

## Conclusion

It is concludes that the seeds of *Nigella sativa* L showed the potential for *in vitro* germination and can be used for the seedling production. The present *in vitro* studies may be the basis for further studies on biochemical aspects. Work is in progress to develop *in vitro* protocols for isolation of active constituents of Pharmaceutical importance in *N. sativa* - A miracle herb.

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