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In vitro seed germination of *Trigonella foenum-graecum* L. A marvelous herb

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Abstract
A Study was conducted to access the *in vitro* germination and subsequent morphogenetic potential of seed of *Trigonella foenum-graecum* L. A Marvelous herb. Murashige and skoog's (MS) medium used throughout the series of experiment. Seeds were inoculated on MS medium or basal medium in different concentration of Phytohormone BA, Gibberellic acid (GA_3). In *Trigonella* result obtain on both hormone. But high percentage of result obtain on 10mg/l BA than GA_3. Green callus is also found in 5mg/l BA. Elongation of shoot was also found in both hormone.

Keywords: *Trigonella foenum-graecum*, marvelous herb, fabaceae, fenugreek, aromatic

Introduction
Trigonella is an annual medicinal [2, 4, 8] herbs belonging to family (Fabaceae). It is emerging as a marvelous herb with a rich historical and religious background. It is commonly known as Fenugreek. It is cultivated in warm temperature and tropical regions. It cannot grow in the shade. It is cultivated throughout the country [1].

Morphology of the plant
Trigonella is an annual flowering plant. It is about 0.6 m in height. The plant prefers light (sandy) medium (loamy) and heavy (clay) soils. Leaflets 2-2.5cm long, oblanceolate, oblong. Flowers are axillary and cream in colour. It is in flower from June to August. The fruit is called Pod. Each mature brown pod contains 20 small yellow to brownish yellow seeds. Fig. (1, 2).

Fig 1: Trigonella foenum–graecum (whole plant)

Fig 2: Seed Explant

It is traditionally used as medicine [3]. Because the seeds are used in fever, diabetes, arthritis. Fenugreek is hot aromatic, carminative, hypoglycaemic, anti-inflammatory, Anticancer mild laxative and lactogenic herb [5]. The leaves are good source of choline [6]. Vitamin E is also present in the leaves of Fenugreek.

Material and Methods

Fresh and healthy seeds of *Trigonella* was collected from residential area. Seeds were pre soaked for 6 hours. Seeds were rinsed with running tap water, 5 minutes, washing and disinfecting the seeds in 0.1 - 0.2% solution of $Hgcl_2$ 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_3).

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 MS [7] medium or basal medium in different concentration of BA and GA_3. In basal medium germination process 50%. Only roots were produced, after 6 days. Maximum germination is found in (10%) concentration of hormone. Best result was obtained on MS+ BAP (10mg/l). In this 90% shoot formation occurs. Green callus is also found in one seed after 19 days. This callus is found in 5mg/l BA. Elongation of shoot was also found on 10mg/l BA. Fig. (3,4,5). This is shown in Table -1.

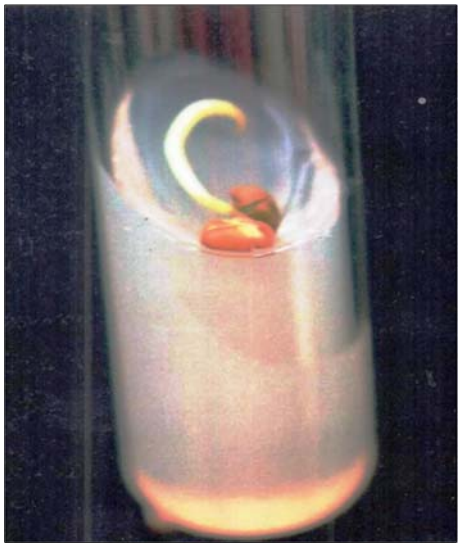

Fig 3: Seed Explant showing only root formation on basal medium

Fig 4: Seed Explant Showing Green Callus on MS+ 5mg/l BAP

Fig 5: Seed Explant showing elongation of shoot on MS+ 10 mg/l BAP.

Table 1: Effect of different concentration of growth regulators BA on seed germination of *Trigonella foenum- graecum*

No. of seeds	Medium	Hormonal concentration (mg/l-1)	Germination response	% response	Callus formation
16	MS	Basal	Only root formation after 6 days	50%	-
16	MS+ BA	0.5	No response	-	-
16	MS+ BA	1	Shoot formation	50%	-
16	MS+ BA	2	Shoot formation	50%	-
16	MS+ BA	5	Shoot formation	60%	Callus formation after 19 days
16	MS+ BA	10	Shoot formation, Elongation of shoot	90%	-

Another Phytohormone GA_3 used in various concentrations. In basal medium Germination process 50%. Only roots were produced after 6 days. Maximum germination found in high % of GA_3. Thick rooted plantlet was found on MS+ 5mg/l GA_3. Elongation of shoot was also found on MS +10 mg/l GA_3. Fig. (6, 7, 8). This is shown in Table -2.

Fig 6: Seed Explant showing only root formation on basal medium

Fig 7: Seed Explant Showing thick rooted plantlet on MS + 5 mg/l GA_3

Fig 8: Seed Explant Showing Elongation of shoot on MS+ 10 mg/l GA_3.

Table 2: Effect of different concentration of growth regulators GA_3 on seed germination of *Trigonella foenum – graecum*

No. of seeds	Medium	Hormonal concentration (mg/l -1)	Germination response	% response	Callus formation
16	MS	Basal	Only root formation after 6 days	50%	-
16	MS+ GA_3	0.5	No response	-	-
16	MS+ GA_3	1	Shoot formation	25%	-
16	MS+ GA_3	2	Shoot formation	40%	-
16	MS+ GA_3	5	Thick rooted plantlet	50%	-
16	MS+ GA_3	10	Elongation of Shoot	70%	-

Discussion

In vitro seed germination of *Trigonella* could be possible. *In vitro* seed germination I used two phytohormone, BA and GA_3in different concentration. In both phytohormone germination was found. But best result was obtained in BAP than GA_3. Medicinal plants have been always considered a healthy [10] source of life for the people. Demand for this medicinal plant [9, 11] 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 *Trigonella* is greatly desirable from pharmaceutical view point.

Conclusion

It is concludes that the seeds of *Trigonella foenum - graecum* 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 the progress to develop *in vitro* protocols for isolation of the active constituents of pharmaceutical importance in *Trigonella-foenum –graecum* – A marvelous Herb.

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References

1. Toppo FA, Akhand R, Pathak AK. Pharmacological action and potential uses of *Trigonella foenum - graceum*: a review article. Asian journal of pharmaceutical and clinical Research 2420092938, 2009.
2. Jayaweera DMA. Medicinal plant: Part III. Peradeniya, Srilanka: Royal Botanic Garden, 1981, 225.
3. Kapoor LD. Traditional use of medicinal plants. Ayurvedic Medicinal plants, 2001, 327.
4. Khare CP. Encyclopedia of Indian medicinal plants. New York: Springes Verlag berlin Heidelberg, 2004.
5. Mishkinsky JS, Gold Schmied A, Joseph B, Ahronson Z, Sulman FG. Hypoglycaemic effect of *Trigonella foenum - graecum* alkaloids in alloxan-diabetic and normal rats. Pahlavi Med J 1977;8(1):14-25.
6. Mukherjee PK, Kumar V, Mal M, Houghton PJ. Acetyl cholinesterase inhibitors from plants phytomedicine 2007;14(4):289-300.
7. Murashige T, Skoog F. A revised medium for rapid growth and bioassays with tobacco tissue cultures. Physiol. Plants 1962;15:473-479.
8. Prajapati, Purohit, Sharma, Kumar. A handbook of medicinal plants – A complete source book; Published by agrobios (India), 2003, 523.
9. Rastogi, Mehrotra BN. compendium of Indian medicinal Plants", PTD, New Delhi 1990;II:422.
10. Yadav R, Kaushik R, Gupta D. The health benefits of *Trigonella foenum–graecum* a review Int. I. Eng, App1 2011;(1):32-35.
11. Sharma PC, Yelna MB, Dennis TJ. Database on medicinal plants used in Ayurveda, New Delhi, 2005, 420-440.