

## Identification of an extra early maturing accession IC 0624520 of fenugreek (*Trigonella foenum-graecum* L.)

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### Abstract

Fenugreek is well known as “methi” belongs to family Fabaceae and sub-family Papilionaceae is native of Mediterranean regions. It is a popular seed spice crop of India having good medicinal value. An accession IC 0624520 identified at ICAR-NBPGR Regional Station Jodhpur which starts flowering at 48 days after sowing and matures in 93 days only. It matures about 30-40 days early in comparison to normal existing improved cultivars, which takes 120-140 days. Plant ideotype of this accession is semi-erect to spreading type. Plants of this variety can resist the powdery mildew disease and terminal heat losses caused due to high temperature at the end of season.

**Key words:** Early maturing, fenugreek, germplasm, IC 0624520.

Fenugreek (*Trigonella foenum-graecum* L.) popularly known as “Methi” and well known for its aromatic, condiment, carminative, medicinal and pharmacological properties. This diploid (2n=16) autogamous species belongs to family Fabaceae and sub-family Papilionaceae is one of the oldest multipurpose commercially important spice crop mainly cultivated for seeds and leaves. Fenugreek is an important leafy vegetable that is quite popular in India. It is cultivated for leafy vegetable, condiment and medicinal plant. It belongs to the family leguminaceae. India is the largest producer of fenugreek vegetable. Rajasthan is considered as “fenugreek bowl” of the country. It is third major seed spice after cumin and coriander in India. Its leaves are consumed as green leafy vegetables and seeds are used for condiments and flavouring food preparations in India. Fenugreek is originated in Near East Mediterranean regions (Duke *et al.*, 1981) and widely cultivated in India, Egypt, Pakistan, France, North Africa, East Africa, England, Ethiopia, Morocco and China (Mcet *et al.*, 2009; Kakani *et al.*, 2010 and Helambe and Dande, 2012). In India, it is cultivated in Rajasthan, Gujarat, Madhya Pradesh, Uttar Pradesh, Haryana, Himachal Pradesh, Tamil Nadu and Andhra Pradesh (Maloo *et al.* 2020). Rajasthan, Gujarat and Madhya Pradesh are major fenugreek producing states contributing more than 85% production of the country. The germplasm collections are significant source of gene complex reservoir for economically important traits

as they consist of untapped genetic diversity prerequisite in formulating efficient scheme for crop breeding. The present production potential and development of superior varieties in fenugreek is impeded by paucity of information about genetic variability and genetic relationship among species (Marzaugui *et al.* 2009). The maximization of seed yield, development of cultivars for early maturity and resistance to biotic and abiotic stresses are the major objectives of fenugreek breeding. Therefore, knowledge of extent and pattern of the existing variability in germplasm of fenugreek is indisputably essential to understand the crop biometrics for further genetic improvement.

In view of generating productive and adaptive varieties for harsh and hostile climatic conditions the shortening of crop duration remained desirable trait to be identified in germplasm of fenugreek. There are two types of fenugreek: (i) non-scented-which is quick growing, upright and bears white flowers (ii) scented—a slow-growing plant which is mainly confined to North India. The all released scented varieties of fenugreek have been grouped in late maturity (>130 days), based on their maturity period. The released variety Pusa Early Bunching matures in 125-130 days, otherwise none of the accessions or released varieties identifies for North Indian conditions matures earlier than 130 days. Fenugreek germplasm characterization and evaluation has been a continuous programme at ICAR-NBPGR

Regional Station, Jodhpur. During rabi 2013-2014 an accession IC 0624520 was identified to be matured uniformly in 93 days. It takes 48 days to 50% flowering and 55-57 days in complete and uniform flowering of all plants in a plot. Likewise it matures only in 90-93 days, thus it matures 30-40 days earlier in comparison to normal existing improved cultivars, which takes 120-130 days. The early maturity of this accession has been verified during subsequent years 2014-15, 2015-16 and 2016-17 with check variety Maher-1 (MH-1). The data are presented in Table 1. This is the first accession of fenugreek that has been reported from ICAR-NBPGR Regional Station, Jodhpur that matures in 90-93 days (Figure 1). This accessions produce high aroma in addition to being early in maturity. Being early in maturity (93days) Fenugreek accession IC 0624520 escapes terminal heat stress, generally recurring at later stage of the crop. There was also lesser attack of powdery mildew disease incidence on this accession. Late maturing varieties (>130 days) as a rule generally suffer from the terminal heat stress and diseases. Thus this identified early maturing accession can be used in breeding programme of fenugreek to shorten the crop duration.



**Fig. 1:** Extra early maturing Fenugreek accession IC 0624520

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**Table 1:** Performance of fenugreek germplasm for days to 50% flowering, flowering uniformly and days to maturity during 2013-14 to 2016-17

Germplasm	Days to 50% Flowering				Days to flowering uniformly				Days to Maturity						
	2013-14	2014-15	2015-16	2016-17	Average	2013-14	2014-15	2015-16	2016-17	Average	2013-14	2014-15	2015-16	2016-17	Average
IC-0624520	48.00	55.00	51.00	52.00	51.50	57.00	55.00	56.00	54.00	55.50	92.00	95.00	89.00	96.00	93.00
EC-510704	69.00	71.00	66.00	75.00	70.25	80.00	82.00	79.00	85.00	81.50	128.00	130.00	132.00	129.00	129.75
EC-510561	72.00	75.00	76.00	74.00	74.25	85.00	83.00	84.00	81.00	83.25	132.00	134.00	130.00	134.00	132.50
EC-510564	74.00	71.00	79.00	72.00	74.00	80.00	83.00	84.00	85.00	83.00	132.00	134.00	136.00	132.00	133.50
EC-510565	68.00	64.00	60.00	69.00	65.25	83.00	80.00	78.00	82.00	80.75	131.00	130.00	133.00	130.00	131.00
EC-510566	75.00	73.00	70.00	73.00	72.75	84.00	84.00	80.00	85.00	83.25	129.00	130.00	136.00	135.00	132.50
EC-510567	67.00	64.00	65.00	71.00	66.75	72.00	70.00	72.00	76.00	72.50	128.00	131.00	130.00	127.00	129.00
EC-510568	62.00	64.00	62.00	63.00	62.75	71.00	71.00	70.00	69.00	70.25	126.00	129.00	134.00	125.00	128.50
EC-510569	72.00	67.00	73.00	70.00	70.50	80.00	78.00	82.00	78.00	79.50	129.00	128.00	127.00	128.00	128.00
EC-510570	59.00	64.00	63.00	66.00	63.00	67.00	71.00	72.00	74.00	71.00	130.00	132.00	129.00	129.00	130.00
Maher-1	59.00	60.00	57.00	58.00	58.50	69.00	68.00	69.00	72.00	69.50	131.00	134.00	130.00	129.00	131.00
C.D.(0.05)	3.341	3.155	2.959	3.461	3.098	3.008	1.704	3.534	3.246	3.916	6.317	6.876	5.692	5.362	6.177
SE(m)	1.124	1.062	0.996	1.165	1.043	1.012	0.574	1.190	1.093	1.318	2.126	2.315	1.916	1.805	2.079
SE(d)	1.590	1.502	1.409	1.648	1.475	1.432	0.811	1.682	1.545	1.864	3.007	3.273	2.709	2.552	2.940
C.V.	2.955	2.779	2.629	2.987	2.724	2.330	1.325	2.744	2.476	3.026	2.919	3.134	2.596	2.467	2.832

Based on Nuclear Ribosomal DNA, Internal Transcribed Spacer and RAPD Analysis. *Plant Mol Biol Rep.* 29:315-323.

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