



International Journal of Research in Agronomy

E-ISSN: 2618-0618
P-ISSN: 2618-060X
© Agronomy
NAAS Rating (2026): 5.20
www.agronomyjournals.com
2026; 9(3): 396-398
Received: 12-12-2025
Accepted: 15-01-2026

Ravilumar B

Associate Professor, Department of
Plant Pathology, COH, Sirsi,
Karnataka, India

Dhanraj P

Assistant Professor, Department of
PSMA COH, Sirsi, Karnataka,
India

Vinay Kumar MM

Assistant Professor, Department of
Entomology HREC, Devihosuru,
Karnataka, India

Prabhudev Ajappalavar

Professor, Department of
Vegetable COH, Sirsi, Karnataka,
India

Ashoka N

Assistant Professor, Department of
Agricultural Economics, COH,
Sirsi, Karnataka, India

Screening of Ajwain (*Trachyspermum ammi* L.) genotypes for growth and seed yield attributing traits

**Ravilumar B, Dhanraj P, Vinay Kumar MM, Prabhudev Ajappalavar and
Ashoka N**

DOI: <https://www.doi.org/10.33545/2618060X.2026.v9.i3f.5226>

Abstract

Ajwain (*Trachyspermum ammi* L.) also known as Bishop's weed is an annual herbaceous plant belonging to family Apiaceae bearing grayish brown seeds. The research experiment on “Evaluation of Ajwain (*Trachyspermum ammi* L.) genotypes for growth and seed yield attributing characters” was conducted at Horticultural Research & Extension Centre, Devihosur, Haveri, University of Horticultural Sciences, Bagalkot, Karnataka during Rabi season (2022-23) to know the different Ajwain genotypes performance for growth and seed yield attributing characters and the results revealed that the genotype C-1 recorded significantly the highest plant height (122.90 cm) at harvest stage, primary branches (5.60 No./plant), secondary branch (12.0 No./plant), umbels (127.80 No./plant), number of umbellets (42.00/umbel), No. of seeds (126.0/umbel), seed yield per plot (0.067g) and seed yield (710 kg/ ha) at harvest stage and which was followed by the genotype DAC-5. While, the lowest plant height (92.10 cm), number of primary and secondary branches (4.50 & 9.20 No./plant), umbels (93.10/plant), umbellets (34.00/umbel), No. of seeds (100.60/umbel), seed yield per plot (0.04 g) & seed yield per ha (390 kg/ha) was recorded by the genotype DAC-7.

Keywords: Ajwain, genotypes, plant height, umbel, umbellets, seed yield

Introduction

Ajwain (*Trachyspermum ammi* L.), commonly known as carom seed, is an annual herbaceous plant belonging to the family Apiaceae. It is believed to have originated in the eastern Mediterranean region, possibly Egypt, and later spread to India through the Near East. The plant produces small, oval-shaped, greyish-brown seeds that are widely valued for their culinary and medicinal uses. Ajwain seeds are known for their pungent taste and possess several therapeutic properties, including carminative, digestive, laxative, diuretic, and stimulant effects. They are commonly used in food products such as pickles, biscuits, confectionery items, and beverages. In traditional medicine, ajwain is widely used to treat indigestion and gastrointestinal disorders. The seeds contain about 2–4.4% essential oil, commonly referred to as ajwain oil, which is brown in colour. The major constituents of this oil include thymol (36.5–41.1%), p-cymene (20.9–27.2%), and γ -terpinene (25.9–35.7%). This oil exhibits several biological activities such as anti-inflammatory, antimicrobial, antifungal, antioxidant, anthelmintic, analgesic, and antispasmodic effects. Thymol, the principal component, is widely used in toothpaste, perfumery, and in the formulation of medicinal products like lotions and ointments. It also plays a role in controlling resistant microbial pathogens and is considered a plant-based herbal antimicrobial agent. Ajwain is known by different regional names, such as “omum” in Tamil and “vamu” in Telugu. Major ajwain-producing countries include India, Iran, Egypt, Afghanistan, Pakistan, and regions of North Africa. In India, it is predominantly cultivated in Rajasthan, Gujarat, Madhya Pradesh, Andhra Pradesh, Telangana, Uttar Pradesh, Bihar, Tamil Nadu, and West Bengal. Rajasthan and Gujarat are the leading producing states, with several districts contributing significantly to its cultivation. During 2019–20, ajwain was cultivated over an area of 37,810 hectares in India, with a production of 27,920 metric tonnes and an average productivity of 738.43 kg/ha. India exports ajwain to countries such as the UAE, Saudi Arabia, Malaysia, Indonesia, Singapore, Pakistan, and the USA. Despite its recognized importance in

Corresponding Author:

Ravilumar B

Associate Professor, Department of
Plant Pathology, COH, Sirsi,
Karnataka, India

traditional medicine and its export potential, ajwain has received relatively limited scientific attention for improving yield and quality traits (Meena *et al.*, 2015) ^[9]. The success of crop improvement programmes largely depends on the availability of sufficient genetic variability and its effective utilization. Although several improved varieties have been developed, there is still considerable scope for further improvement across different agro-climatic regions. Therefore, both conventional and modern breeding approaches are needed to enhance the adaptability and productivity of ajwain. The present study was undertaken to evaluate the performance of nine genotypes, namely DAC-1, DAC-2, DAC-3, DAC-4, DAC-5, DAC-6, DAC-7, along with two check varieties (C-1 and C-2), collected from different parts of the country under the All India Coordinated Research Project (AICRP) on Seed Spices.

Materials and Methods

The field experiment was conducted at Horticultural Research & Extension Centre, Devihosur, Haveri, University of Horticultural Sciences, Bagalkote, Karnataka during rabi season (2022-23) to know the different ajwain genotypes performance for growth and seed yield. The center is located in Northern transitional agro-climatic zone (zone-8) at 14° 0' 47" latitude and 75° 0' 21" E longitudes & 563 m above MSL. Soil type is black with medium depth. The annual rainfall is 750 mm. The mandate crops are chilli and seed spices. There were nine different Devihosur fennel collection genotypes viz., DAC-1 DAC-2, DAC-3, DAC-4, DAC-5, DAC-6, DAC-7 & C-1, C-2. The experiment was laid out in a Randomized Block Design (RBD) with a single factor, and the treatments were replicated twice. Under limited irrigation conditions, all recommended agronomic practices were followed to ensure the production of quality seeds. As fennel is a cross-pollinated crop with a high degree of natural outcrossing, an isolation distance of 200 m was maintained from other fennel fields to prevent contamination and to obtain genetically pure seed. Rouging was carried out rigorously at different growth stages, including vegetative, flowering, and seed maturity, to maintain seed quality. Observations were recorded from five randomly selected plants in each replication for all genotypes. The parameters studied included plant height, number of primary and secondary branches, number of umbels per plant, number of umbellets per umbel, number of seeds per umbel, seed yield per plot (g), and seed yield per hectare. Seed yield per hectare was calculated based on net plot yield. All

yield-related observations for different genotypes and check varieties were recorded carefully and subjected to appropriate statistical analysis.

Results and Discussion

The results obtained from the present investigation on performance of different genotypes of Ajwain differed significantly with respect to growth and seed yield attributing characters during 2022-23 as presented in table.1 & 2. The analysis of variance was calculated for all growth and seed yield parameters of different genotypes of ajwain and mean of different parameters were presented and results were revealed that, the significant maximum significantly highest plant height (122.90 cm) at harvest stage, primary branches (5.60 No./plant), secondary branch (12.0 No./plant), umbels (127.80 No./plant), number of umbellets (42.00/umbel), No. of seeds (126.0/umbel), seed yield per plot (0.067g) and seed yield (710 kg/ ha) at harvest stage and which was followed by the genotype DAC-5. While, the lowest plant height (92.10 cm), number of primary and secondary branches (4.50 & 9.20 No./plant), umbels (93.10/plant), umbellets (34.00/umbel), No. of seeds (100.60/umbel), seed yield per plot (0.04 g) & seed yield per ha (390 kg/ha) was recorded by the genotype DAC-7. This might be due to the differences of genotypic potentiality among the different genotypes and acclimatization of the particular genotype to the season, location and management practices. The morphological differences among the genotypes are may be due to the genetic constituents of the particular genotype. The similar results were reported by Malhotra and Vashista (2007) ^[7] in dill and Balai *et al.*, (2011) ^[2] in coriander. These results are also conformity with Selvarajan and Chezhiyan (2001) ^[11] Hellal *et al.*, (2011) ^[5] and Kushbhu Kumari *et al.*, (2017). Genetic potentiality of a particular genotypes with proper management of the crop will enhanced the crop growth in terms of number of branches per plant also reported by Kumar *et al.*, (2002) Similar findings were reported by Solanki *et al.*, (2014) ^[13] & Raut *et al.*, (2020) ^[10] in dill and Jyothi *et al.*, (2017) ^[6] & Dhakad *et al.*, (2017) ^[3] in Coriander. And genotypes were highly significant for all the characters indicating that the presence of genetic diversity in the material (Table 1) Sengupta *et al.*, (2014) ^[12] Ghanshyam *et al.*, (2015) ^[4] and Mamatha *et al.*, (2017) ^[8] reported the same findings in thirteen genotypes of fennel evaluated at Vegetable Research Farm, Department of Horticulture, JNKVV, Jabalpur.

Table 1: Evaluation of Ajwain Genotypes for growth attributes during 2022-23

Genotypes	Plant height (cm)	Primary branches (No./plant)	Secondary branch (No./plant)	Umbels (No./plant)	Umbellets (No./plant)
DAC-1	106.3	5.1	11.1	117.5	36.3
DAC-2	107.0	5.3	11.7	109.0	35.2
DAC-3	116.4	5.1	11.2	113.4	35.1
DAC-4	116.3	5.4	11.3	110.8	35.9
DAC-5	120.6	5.5	11.9	118.2	37.0
DAC-6	118.4	5.3	11.4	117.8	36.1
DAC-7	92.1	4.5	9.2	93.1	34.0
C-1	122.9	5.6	12.0	127.8	42.4
C-2	115.5	5.0	10.9	112.2	36.6
Mean	112.80	5.2	11.2	113.2	36.5
SEM	15	0.75	0.50	14	24
CD@5%	45	1.25	1.5	42	72
CV%	6.24	4.5	5.56	4.50	4.5

C-1: AA1 C-2:AA2

Table 2: Evaluation of Ajwain Genotypes for yield attributes during 2022-23

Genotypes	Number of seeds/ Umbel	Seed Yield (Plot yield/g)	Seed Yield (Kg/ha)
DAC-1	108.3	0.044	530
DAC-2	108.8	0.041	540
DAC-3	107.6	0.041	510
DAC-4	116.0	0.052	530
DAC-5	121.6	0.064	600
DAC-6	105.9	0.043	510
DAC-7	100.6	0.040	390
C-1	126.0	0.067	710
C-2	110.3	0.052	520
Mean	111.7	0.044	538
SEM	1.25	0.015	0.045
CD@5%	3.75	0.035	0.135
CV%	6.30	7.50	6.30

C-1: AA1 C-2:AA2

Conclusion

Among the evaluated ajwain genotypes, C-1 exhibited superior performance, particularly in terms of growth parameters and seed yield. Hence, this genotype can be considered a promising candidate for future crop improvement and breeding programmes.

References

1. Anonymous. (*Trachyspermum ammi* L.) germplasm. Journal of Spices and Aromatic Crops. 2015;24(2):119-123.
2. Balai LR, Keshwa GL. Effect of thiourea on yield and nutrient uptake of coriander (*Coriandrum sativum* L.) varieties under normal and late sown conditions. Journal of Spices and Aromatic Crops. 2011;20(1):34-37.
3. Dhakad RS, Sengupta SK, Lal N, Shiurkar G. Genetic diversity and heritability analysis in coriander. Pharma Innovation Journal. 2017;6(8):40-46.
4. Ghanshyam, Dodiya NS, Sharma SP, Jain HK, Dashora A. Assessment of genetic variability, correlation and path analysis for yield and its components in ajwain (*Trachyspermum ammi* L.). Journal of Spices and Aromatic Crops. 2015;24(2):742-746.
5. Hellal FA, Mahfouz SA, Hassan FAS. Partial substitution of mineral nitrogen fertilizer by bio-fertilizer on *Anethum graveolens* L. plant. Agricultural and Biological Journal of North America. 2011;2(4):652-660.
6. Jyothi K, Mishra RP, Sujatha M, Joshi V. Genetic variability, heritability and genetic advance for yield and its component in indigenous collection of coriander (*Coriandrum sativum* L.) germplasm. International Journal of Pure and Applied Bioscience. 2017;5(3):301-305.
7. Malhotra SK, Vashishtha BB. Response of Indian dill (*Anethum sowa*) and European dill (*Anethum graveolens* L.) varieties to different agro-techniques. Indian Journal of Agricultural Sciences. 2007;77(8):519-522.
8. Mamatha NC, Tehlan SK, Srikanth M, Ravikumar T, Batra VK, Karthik RP, Nalla MK. Mean performance of 150 fenugreek (*Trigonella foenum-graecum* L.) genotypes for yield and yield contributing traits. International Journal of Pure and Applied Bioscience. 2017;5(3):1097-1102.
9. Meena SS, Solanki RK, Kakani RK, Kumari S. Genetic variability studies in ajwain (*Trachyspermum ammi* L.).
10. Raut U, Ghawade SM, Mali VV, Dahatonde KA, Sawant BS. Genetic variability, heritability and genetic advance in dill (*Anethum graveolens* L.) genotypes. International Journal of Current Microbiology and Applied Sciences.

2020;Special Issue 11.

11. Selvarajan S, Lund LR, Takeuchi T, Craik CS, Werb Z. A plasma kallikrein-dependent plasminogen cascade required for adipocyte differentiation. Nature Cell Biology. 2001;3(3):267-275.
12. Sengupta SK, Verma BK, Naidu AK. Genetic variability study in fennel (*Foeniculum vulgare* Mill.). International Science Journal. 2014;1(1):1-8.
13. Solanki SK, Dodiya NS. Assessment of genetic variability and correlation for yield and its component characters in dill (*Anethum graveolens* L.). International Journal of Plant Sciences. 2014;9(1):234-236.