

Variation of Yield Components in Some Coriander Accessions (*Coriandrum sativum* L.) of Ethiopia

Miheretu Fufa*

Adami Tullu Agricultural Research Center, PO Box 35, Ziway, Ethiopia

*Corresponding author: Miheretu Fufa, Adami Tullu Agricultural Research Center, PO Box 35, Ziway, Ethiopia, Tel: +251911530715; E-mail: miheretufufag@gmail.com

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Abstract

Though Ethiopia is a center of diversity coriander that cultivated for its income generation and local consumption, there is little information on its genetic variation. For a true assessment of the diversity of coriander, characterization and evaluation for its component traits should be considered essential. Twenty-five accessions of coriander were collected from potential growing areas of Arsi-Bale districts and evaluated for the variation of vegetative traits during 2012 at Sinana Agricultural Research Center in single plot of four rows. The result of the analysis revealed that there was a large variation among the accessions for most of the traits under study. The most variable was the number of basal leaf per plant ranging from 55 to 4 with a variance of 113.34 and a mean of 17.52. On the other hand, branching of the plant showed least variation ranging from 2 to 1 with a variance of 0.08. Next to the number of basal leaf, the accessions showed large variation with respect to the length of the longest basal leaf and the basal leaf with a range of 52 to 27 and 45.80 to 23.60 and a variance of 43.56 and 38.95 respectively. Foliation (9 to 1), habitus of the basal leaves (4 to 1), Blade Shape of Upper Stem Length (6 to 4), blade shape of the longest basal leaves (5 to 4) and Branching of the plant (2 to 1) showed a decreasing range of variation. The present study focused on the vegetative traits for the assessment of variation in coriander accessions. Including the generative traits in the characterization work is considered essential for assessment of the diversity of coriander.

Keywords: Coriander; Variation and vegetative traits; Genetic variation

Introduction

Coriander (*Coriandrum sativum* L.) is an annual herb used as spice and for medicinal purposes. The essential and fatty oil of the fruits are used as raw materials for industrial use and for further processing. The green herb is used as spice and vegetable [1]. Ethiopia has long been known as a center of origin and diversity for several plant species including Coriander [2]. In Ethiopia, coriander is grown mainly for income generation in addition to local consumption. It has been under research for the improvement of its yield and oil value.

Even though Ethiopia is a center of diversity for coriander that has diverse uses, there is limited information on the knowledge of the extent and magnitude of genetic variability of agronomic and quality traits [3]. The existence of sufficient level of genetic variability is a prerequisite for variety development as it determines the adequacy of the genotypes. This study was, therefore, designed to assess the variation that exists in coriander accessions for some important vegetative traits [4,5].

Materials and Methods

Twenty-five coriander landraces, collected from potential growing areas of Arsi and Bale, were evaluated at Sinana during 2012 for their genetic variation. The land races were sown on a plot area of 2.4 m² with 2-meter length and 30 cm between rows in single plot of four rows. Three times hoeing, and weeding was applied without fertilizer and chemical applications.

Data collection and analysis

Five plants were randomly selected for the measurement of the characters. A total of 8 characters were recorded according to the descriptors of International Plant Genetic Resource Institute (IPGRI) as given by Diederichsen [3]. Number of basal leaves, length of basal leaf, length of the longest basal leaves, habitus of the basal leaves, blade shape of the upper stem leaves, blade shape of the longest basal leaves, foliation and branching were the characters studied. Accession means were subjected to analysis using SPSS [6] to calculate the mean, minimum, maximum, range and variance for each trait.

Results and Discussion

The result of the variation analysis was indicated in Table 1. The accessions showed largest variation with respect to the number of basal leaf per plant ranging from 55 to 4 with a variance of 113.34 and a mean of 17.52. Next to the number of basal leaf per plant, the accessions showed maximum variation with respect to length of the longest basal leaf and length of the basal leaf per plant ranging from 52 to 27 and 45.80 to 23.60 with a variance of 43.56 and 38.95 respectively.

On the other hand, the least variable trait was the branching of the plant ranging from 2 to 1 with a variance of 0.08. Blade shape of the basal leaf and of the upper stem length showed lower variation next to the branching of the plant. The length of the basal leaf and the longest basal leaf ranged from 45.80 to 23.20 and 52 to 27, in centimeter, respectively with a mean value of 41.84 and 35.47. Habitus of the basal leaves and foliation of the plant ranged from 4 to 1 and 9 to 1 with a variance of 2.16 and 4.96 respectively.

Generally, there was variation among the accessions with respect to the vegetative traits studied. The characters that were assessed are

among the vegetative characters to be considered essential for characterization work and the primary evaluation of coriander, for a true assessment of its diversity. In the future evaluation, however, including the other vegetative characters and generative characters is also pertinent for the assessment of variability among the accessions of coriander germplasm. The study of Fufa [4] and Dyulgerov and Dyulgerova [1] also revealed that there was large variation among coriander accessions for most of the characters studied.

	Range	Minimum	Maximum	Mean	Variance
NBL	51.0	4.0	55.0	17.52	113.34
LBL	22.20	23.60	45.80	35.47	38.95
LLBL	25.0	27.0	52.0	41.84	43.56
HBL	3.0	1.0	4.0	2.08	2.16
BSL	1.0	4.0	5.0	4.16	0.14
BSUSL	2.0	4.0	6.0	4.48	0.43
FOLN	8.0	1.0	9.0	7.72	4.96
BR	1.0	1.0	2.0	1.08	0.08

Table 1: Mean and variation yield components in 25 Coriander accessions.

- NBL=Number of basal leaves per plant.
- LBL=Length of basal leaf.
- LLBL=Length of the longest basal leaf.
- HBL=Habitus of the basal leaves.

- BSL=Blade shape of the longest basal leaves.
- BSUSL=Blade shape of upper stem length.
- FOLN=Foliation.
- BR=Branching of the plant.

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