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The Correlation Indicators and Traits of Morpho-economic Characteristics of Foreign and Local Genotypes of Mungbean in the Field Conditions of the Tashkent Region

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

The article reveals the morphological and economic characteristics of plants of 25 local and foreign genotypes of mung bean crops in the field conditions of Uzbekistan: the height of the main stem, the distance between the ground and the branch, the number of the bearing yield branches, number of pods per plant, the pod weight, the pod length, number of grains in a pod, one pod in a pod, grain weight and the weight of 1000 grains as well as the results of their correlation analysis.

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According to the morphological and economic characteristics of plants of 25 local and foreign genotypes of mung bean crops in the field conditions of the Tashkent region it was determined that the local varieties Durdona, Baraka, Barkaror, Marzhon, the local line of L-8, L-22, L-88, L-92, and foreign lines AVMU2003, AVMU2004, AVMU1681, AVMU2002 have higher rates compared to other varieties and lines. It has been found that there is a strong positive relationship between the number of grains in a pod and the weight of grains in a pod, as well as the weight of grains in a pod at a weight of 1000 grains.

Keywords: Vigna radiata L.; mung bean; traits; plant height; cultivar; pod; morphology.

1. INTRODUCTION

Mung bean *Vigna radiata* L. Wilzeckt belonging to the Fabaceae family, I a very valuable and short-lived legume, which is rich in protein, highly adaptable adaptable to the environment, increasing soil fertility through biological nitrogen fixation [1].

Mungbean [*Vigna radiata* (L.) Wilczek] is a highly nutritious, early maturing, and broad-spectrum adaptable grain legume crop majorly cultivated in South Asia, Southeast Asia, and Australia [2]. It is also highly demanded in western countries as a plant-based protein source [3]. It is readily digested, with 22–28% of seed protein, 1–1.5% fat, and 60–65% carbohydrates, as well as different vitamins, minerals, and various antioxidants [4]. Due to its nutritional value, mungbean is being exploited in many ways according to local taste demands. It is commonly eaten as “dal” soup, but may be processed to make noodles, porridge, curries, ice cream, cakes, bean paste, soups, sweets, and flour [5]. The seeds may be consumed as a dry bean, sprouting gram, or split dal in everyday meals in India and Bangladesh [6], or as vegetable bean sprouts [2]. Mungbean seeds, fodder, and haulms may also be utilized as fertilizer and animal feed [7]. Moreover, it requires minimum input of water and fertilizer and can grow in harsh environmental conditions over a broad range of temperate and tropical climates [8]. However, due to limited breeding efforts in Asia, there is a huge knowledge gap in major agronomic traits such as seed size, shape, and colour. Those are important for varietal improvement; therefore, these grain quality traits may be a vital area for research and breeding initiatives [9].

The cultivation of leguminous crops, including early spring mung beans after harvesting winter wheat, potatoes, mustard and sugar cane, provides the most favorable conditions for increasing soil fertility by introducing a large amount of organic matter, micro- and macroelements, and high biomass value. in ecologically degraded regions. However, the high cost and limited labor force for hand-picking hinder the widespread introduction of summer mung bean, as the plant has low stem height, bent and grow in bush form, high humidity caused by climatic vagaries (early rains), and diseases and pests cause reduced yields. When directly harvesting mung bean, the strength of the plant stem, its upright growth and branching make it possible to harvest in a combine harvester. As a result of the research, a mung bean variety with a high stem, upright growth, large and transparent grain, ideal characteristics for mechanized harvesting, was selected and introduced into production [10].

The high yield as well a high stress resistance and wide adaptability are important characteristics of the variety, especially for photoperiod and temperature sensitive crops.

Mung bean is a common short day plant traditionally grown in Asian countries and consumed all over the world. However, until recent decades, relatively little research has been done on its genetic improvement. Zhonglv 5 is a mung bean variety which has been created by crossbreeding in China at the beginning of the century. Since then, it has been played an important role in improving China's mung bean cultivation due to its high yield, stress tolerance and wide adaptability.

Years of cultivation and testing have shown that Zhonglv 5 is an early variety with a growing season of about 70 and 85 days in summer and spring, respectively. It is upright at a height of 60-70 cm; the stem is resistant to lodging. Each plant produces an average of 25 pods. Mature pods are black, 10 cm long, containing 10–13 seeds. Zhonglv 5 is fully suitable for mechanized assembly. Zhonglv 5 seeds are green and transparent, 1000 seeds weigh about 65-75g.

Protein content is 23.1-25.1%, starch content is 50.5-51.9% [11].

Supplying the population with food products has become an economic, social and political problem in our time, since with the growth of the population, the demand for food also increases. When solving this problem, great attention is paid to the provision of vegetable protein. Providing vegetable protein is solved in different ways. One such method is to plant more crops which are rich in protein, among these crops mung beans stand out for their protein content and quality. Mung bean grain contains 24-28% protein, 2-4% oil and 46-50% starch, 20% B vitamins, lysine, arginine. It can be used by adding 5-10% wheat flour.

In a 2010 study in Uganda, 112 mung bean genotypes were evaluated for sprouting resistance prior to harvest. Analysis of variance revealed significant differences between genotypes for all studied traits. The germination resistance ranged from 2.09% to 100% in studies and resistant varieties were selected [8]. The mung bean [*Vigna radiata* (L.) Wilczek] is one of the important agricultural crops in South Asia. The main production constraints include late heat stress in the summer season and pre-harvest germination in the rainy season, which greatly reduces its yield.

If the maturation period of varieties is reduced to 10-15 days without yield reduction, then the losses caused by these stresses can be avoided in its main production base. At the Legume Research Institute in Kanpur, India, two early mung bean genotypes were created that matured much earlier in the summer and rainy season by 45-48 days, i.e. 10-12 days earlier than the standard variety.

Both genotypes are resistant to mung bean yellow mosaic virus and released after state registration. The main morphological characteristics of these genotypes are short and erect plants, dark green ovate leaves, light yellow flowers, black pods at maturity, and bright green grains [12].

The mung bean [*Vigna radiata* (L) Wilczek] is one of the important early maturing leguminous plants in India. Historically, India has been the world's largest producer and consumer of mung bean product. Over the years, as a result of systematic breeding, new improved varieties have been created. However, its true performance potential has not yet been achieved for several reasons.

One of the main limitations is a number of abiotic stresses. The germination and flowering under high temperature stress, drought and salinity stress cause significant yield losses throughout the growing season of the crop. However, the breeding of mung bean varieties resistant to abiotic stresses did not give full results. This is due to the complex nature of these stressors and the complexity of assessment methods [13].

One of the main requirements for mung bean planting in a large scale is high protein content, resulting in a potential substitute for meat [4].

Among legumes, mung bean differs from other crops in nutritional value. Because the digestibility of the protein found in mung bean is 86% on average. The amount of protein in the mung bean varies depending on the plant variety, place of growth, weather conditions, fertilizers used and agrotechnological measures. Especially if the mung bean is grown as a secondary crop, the protein content of the grain is even higher [14].

The purpose of the research is the creation of new high-yielding varieties of mung bean, well adapted to local soil and climatic conditions, as well as the study of their biological properties.

2. METHODOLOGY AND METHODS

The field experiment were carried out in 2022 on the field site Durmon of the regional experimental base of the Institute of Genetics and Biology of Experimental Plants of the AS UzR, located in the Kibray district of the Tashkent region. This land plot is located 0.5 km northeast of the city of Tashkent, $41^0$20 north latitude, $69^0$18 east longitude, in the upper reaches of the Chirchik River, at an altitude of 398 meters above sea level.

The soil of the experimental field is low-humus, typical sierozem, medium-sandy in texture. The terrain is slightly sloping, non-saline, slightly affected by verticillium wilt. Groundwater is deep (7-8 m). The climate is highly variable, summer (June, July, August) is characterized by high heat, and winter (especially December and January) is characterized by a sharp drop in air temperature. The sunny days are 175-185 days, frost-free period is 200-210 days. The precipitation falls in autumn, winter and spring, and summers are dry. This requires artificial irrigation of mung bean.

Agrotechnical measures on the experimental plots were carried out in the order adopted in the experimental farm of Institute of Genetics and Plant Experimental Biology: in spring, the plots were cleared of wheat and plowed to a depth of 35 cm. In spring, at moderate air and soil temperatures, fertilizers, soil pulverization were applied in order to retain moisture in the soil and destroy growing weeds.

For watering plants during the growing season agrotechnical activities have been carried out. Mineral fertilizers were applied before planting by top dressing 3 times during the growing season (1st top dressing at the beginning of pod forming, the 2nd was during mass pod forming, the 3rd was during flowering). The annual norm of mineral fertilizers in pure state made up N 60 kg/ha, P_2O_5 -90 kg/ha and K_2O-30 kg/ha.

Sowing was carried out in the third decade of April according to the scheme 60x10x1 on the marked fields. The seeds are planted in the ground to a depth of 4-5 cm. They are sown in 3 replications, 2 rows in each replication, 25 seedbeds in each replication. The selection number of varieties and areas was 100 plants. Inter-row work and weeding were carried out in combination with irrigation.

As an object of the study the species of mung bean which belonging *Vigna radiata* L. Wilzeckt. the local varieties Durdona, Barqaror, Marjon, Andijon-1, Zilola, Baraka, and local lines L-8, L-22, L-88, L-92 and foreign lines AVMU1676, AVMU1677, AVMU1678, AVMU1679, AVMU1680, AVMU1681, AVMU1682, AVMU1683, AVMU1684, AVMU1685, AVMU2001, AVMU2002, AVMU2003, AVMU2004, AVMU2005 were used.

In the experiment, among the morphological and economic traits, the height of the main stem of the plant, the distance from the ground to the branch, the number of crop branches, the number of pods per plant, the weight of the pod, the length of the pod, the number of grains in a pod, the weight of one grain in a pod, and the weight of 1000 grains were determined by generally accepted methods.

The dispersion analysis of traits of Mung bean genotypes [15], [16] was carried out. The significance of differences between genotypes for each trait was Fisher's criterion (F), total experimental error (SD), mean difference error (SE) and the least significant difference ($P \leq 0.05^*$, $P \leq 0.01^{**}$ and $P \leq 0.001$ ***) levels were determined.

The correlation coefficient between traits [17] was determined. At the same time, at $r < 0,3$, the correlation between traits was weak, at $r = 0,3–0,7$, it was moderate, and at $r > 0.7$, it was strong.

3. RESULTS AND THEIR DISCUSSION

When studying the morphological and economic characteristics of plants of 25 mung bean genotypes in the experiment, the highest values of plant height were in the lines AVMU2002, L-88 and L-92 (103.0 ± 1.01 cm, 112.0 ± 1.26 cm, and 103.00 ± 2.11 cm, respectively), while the lowest rates were noted in the varieties Durdona and Zilola (63.0 ± 1.01 cm and 57.60 ± 0.38 cm, respectively). In the experiment, it was noted that the height of plants of some genotypes is mainly from 80 to 100 cm.

When determining the distance between the ground and the branch according to the morphological and economic characteristics of the mung bean, the highest rates were in the local genotypes Durdona, Marjona and L-8 (10.0 ± 0.10 cm, 10.0 ± 0.07 cm and 10.0 ± 0, 01 cm). cm, respectively), AVMU1679, AVMU1684 and AVMU1080 in foreign lines (10.0±0.12 cm, 10.40±0.13 cm and 10.80±0.27 cm, respectively), and the lowest values in foreign lines AVMU1676, AVMU1680 and AVMU1682 (6.80 ± 0.13 cm, 5.20 ± 0.13 cm and 6.0 ± 0.15 cm, respectively). It is noted that the distance between the ground and the branch in some genotypes was mainly from 8 to 10 cm.

When studying the traits of the number of harvested branches, the smallest values were noted for foreign lines AVMU1679, AVMU2002 and AVMU2003 (6.4±0.25 pcs., 6.20±0.25 pcs. and 6.20±0.13 pcs., respectively), while in local lines L-8, L-22 and L-88 (6.40±0.08 pcs, 6.20±0.17 pcs and 6.60±0.23 pcs respectively). The highest rates were noted in the local variety Durdona 9±0.24 pcs, and in foreign varieties AVMU1682 and AVMU1685 (10.0±0.37 pcs and 9.40±0.27 pcs, respectively). In 25 mung bean genotypes, it was found that the trait of the number of harvested branches was mainly from 7 to 9 pieces.

Table 1. Indicators of morpho-economic characteristics of foreign and local mung bean genotypes in field conditions of Tashkent region

Genotype	Height of plant (cm)	Distance between the ground and the branch (cm)	Number of yield branches (pcs)	Average number of pods per plant (pcs)	Pod length (cm)	Weight of pod (g)	Number of pod grain(pcs)	Weight of a grain in a pod(g)	Weight of 1000 grain (g)
	ME±SE	**ME±SE**	**ME±SE**	**ME±SE**	**ME±SE**	**ME±SE**	**ME±SE**	**ME±SE**	**ME±SE**
Durdona	63.0 ±1.01	10.0 ±0.10	9±0.24	41.0±2.20	10.29±0.15	0.94±0.02	10.6±0.24	0.63±0.02	54,8±0,08
AVMU1676	73.40 ±0.64	7.60 ±0.08	7 ±0.18	38.80±2.88	9.49±0.11	0.87±0.03	10.60±0.23	0.58±0.02	53,0±0,17
AVMU1677	89.4±1.03	7.60 ±0.13	7 ±0.30	33.80±2.65	8.56±0.12	0.88±0.02	10.70±0.24	0.61±0.01	53,4±0,08
AVMU1678	83.4±0.64	6.80±0.13	7 ±0.18	40.60±2.42	8.98±0.11	0.82±0.02	9.80±0.26	0.57±0.01	53,4±0,14
Zilola	79.6±0.55	9.80 ±0.07	8.2±0.07	47.80±2.71	8.98±0.11	0.82±0.02	9.80±0.26	0.57±0.01	59,8±0,05
AVMU1679	89.0 ±1.12	10.0 ±0.12	6.4 ±0.25	41.00±3.23	8.96±0.18	0.75±0.03	10.0±0.36	0.49±0.02	44,5±0,12
AVMU1680	57.60 ±0.38	5.20 ±0.13	7.20 ±0.25	43.40±3.03	8.70±0.11	0.71±0.02	9.80±0.17	0.49±0.01	50,30±0,09
AVMU1681	91.4 ±2.54	9.60 ±0.13	6.80 ±0.13	38.80±2.55	9.42±0.09	0.99±0.02	11.00±0.31	0.71±0.02	62,1±0,15
Marjon	86.0±0.63	10.0 ±0.07	8.40 ±0.17	28.00±0.95	9.70±0.13	1.04±0.03	8.60±0.24	0.71±0.02	71,4±0,07
AVMU1682	77.40±0.74	6.0 ±0.15	10.0 ±0.37	48.40±2.33	8.16±0.09	0.69±0.01	9.50±0.23	0.46±0.01	44,9±0,15
AVMU1683	77.40 ±3.03	8.60 ±0.55	8.20 ±0.22	30.0±0.97	9.19±0.15	0.80±0.03	10.80±0.34	0.54±0.02	49,8±0,20
AVMU1684	89.80 ±0.43	10.40±0.13	7.0±0.11	40.80±1.88	9.20±0.14	0.77±0.03	9.70±0.33	0.52±0.02	52,2±0,14
Barqaror	78.0±0.86	9.80 ±0.20	7.0 ±0.28	21.00±1.12	10.98±0.06	1.14±0.03	8.80±0.25	0.71±0.02	80,2±0,15
AVMU1685	85.40 ±1.30	8.20 ±0.20	9.40 ±0.27	52.80±2.17	8.74±0.08	0.79±0.03	9.40±0.38	0.53±0.02	53,40±0,26
AVMU2001	82.80±0.66	9.20 ±0.13	8.20 ±0.13	41.00±0.99	8.93±0.08	0.85±0.01	10.80±0.22	0.59±0.01	51,80±0,23
AVMU2002	103.0 ±1.01	8.40 ±0.23	6.20 ±0.25	46.40±3.16	9.49±0.11	0.95±0.02	10.50±0.26	0.67±0.01	67,30±0,30
Baraka	70.80 ±0.96	8.0 ±0.24	8.0±0.21	23.20±1.24	9.45±0.10	0.99±0.03	11.00±0.28	0.74±0.03	62,9±0,20
AVMU2003	87.00±0.86	10.80±0.27	6.20 ±0.13	37.40±1.76	10.82±0.13	1.24±0.03	10.60±0.31	0.88±0.03	74,8±0,28
AVMU2004	94.0±0.98	8.0 ±0.41	8.20 ±0.27	42.60±2.13	9.85±0.13	1.02±0.04	9.40±0.41	0.64±0.03	67,20±0,25
AVMU2005	80.00 ±1.60	9.20±0.20	7.60±0.13	33.00±0.73	9.56±0.08	0.87±0.01	9.30±0.31	0.54±0.01	59,40±0,14
L-8	71.20±1.67	10.0 ±0.01	6.40±0.08	36.60±0.83	10.01±0.08	1.04±0.03	11.00±0.29	0.75±0.03	69,7±0,10
L22	98.00±1.65	8.40±0.29	6.20±0.17	39.40±1.80	9.74±0.08	1.01±0.02	12.00±0.16	0.72±0.01	56,6±0,28
L-88	112.0±1.26	9.60±0.13	6.60±0.23	36.20±1.27	10.90±0.12	0.91±0.03	10.10±0.23	0.62±0.02	60,80±0,21
L-92	103.00±2.11	9.80±0.38	8.20±0.29	14.40±0.27	9.70±0.10	1.05±0.02	11.00±0.16	0.76±0.01	59,70±0,17
Andijon 1	91.00±1.72	8.80±0.20	8.60±0.17	80.60±3.21	10.88±0.14	0.76±0.02	9.70±0.28	0.52±0.02	50,50±0,07

The highest indicator of the number of pods per plant wass 80.60±3.21 pcs. in the local variety Andijan-1, and the lowest - in the varieties Marzhon, Barkaror, Baraka (respectively 28.00±0.95 pcs., 21.00±1.12 pcs. and 23.20±1.24 pcs.), and in the ridge L-92 this indicator was14.40±0.27 pcs. It has been established that the number of pods per plant ranged from 30 to 50, mainly in foreign varieties.

The lowest bean length indicator was 8.16±0.09 cm in the foreign variety AVMU1682, and the highest in the local varieties Durdona, Barkaror and Andijan-1 (respectively 10.29±0.15 cm, 10.98±0.06 cm and 10.88±0.14 cm) and AVMU2003, it was found in lines L-8 and L-88 (10.82±0.13 cm, 10.01±0.08 cm and 10.90±0.12 cm respectively).

Among the 25 mung bean genotypes, the highest pod mass index was in the local varieties Marzhon and Barkaror (1.04±0.03 g and 1.14±0.03 g, respectively), as well as in the varieties AVMU2003, AVMU2004, L-8, L -22 and L- 92 lines were determined (1.24±0.03 g, respectively) 1.24±0.03 g, 1.02±0.04 g, 1.04±0.03 g, 1.01±0.02 g and 1.05±0.02 g). AVMU 1683 had the lowest indicator in the foreign range - 0.69 ± 0.01 g. Under the conditions of the field experiment, it was noted that the mass of the pod of mung bean genotypes mainly ranged from 0.75 g to 0.10 g.

The highest indicators of the number of grains in the pod genotypes in mung bean genotypes amounted to 11.00±0.31 pcs. in the foreign line AVMU1681, and in local varieties and lines Baraka, L-8, L-22 and L-92 (respectively 11.00±0.28, 11.00±0.29, 12.00±0.16 and 11.00±0.16 pcs). The lowest indicator of the number of grains in a pod was noted in the local varieties Marzhon and Barkaror (8.60±0.24 and 8.80±0.25 pcs., respectively).

The highest indicator of the mass of one grain in a pod was 0.88±0.03 g for the foreign line AVMU 2003, and the lowest values were noted for the foreign lines AVMU1679, AVMU1680 and AVMU1682 (0.49±0.02 g, 0.49 ±0.01 g). and 0.46±0.01 g, respectively). In 25 mung bean genotypes, it was found that the weight of one grain in the pod was mainly in the range from 0.50 to 0.80 g.

The lowest values of the weight of 1000 grains were noted in the foreign lines AVMU1679, AVMU1683 and AVMU1684 (44.5±0.12 g, 44.9±0.15 g and 49.8±0.20, respectively), and the maximum value was recorded in Barqaror variety at 80, 2±0.15 g. In the field conditions of the Tashkent region, the weight of 1000 grains was determined mainly from 50 to 75 g.

In the experiment, when analyzing 9 traits of 25 mung bean plants, the average height of mung bean plants in the Tashkent region was 60.87 cm, the distance between the ground and the branch was on average 6.41 cm, the average yield branches was 8.87 pcs., average number of pods per plant was 38.49 pcs., the pod length was 9.72 cm, average number of pods was 10.37 pods, the pod weight was 0.96 grams, the weight of per pod made 0.65 grams, the average weight of 1000 pods made 59.06 grams.

In the experiment, the correlation of morphological and economic characteristics of 25 genotypes was studied. It was found that there is a positive mean (r=0.68 and r=0.45) between the height of the plant and the distance from the ground to the branch and the number of pods (respectively r=0.68 and r=0.45), and the average number of pods per plant is negative on average, i.e. r = -0.51. The yield branches were noted as the mean positive (r=0.64) value between the trait of the number of branches and the trait of the average number of pods per plant. The trait of the average number of pods per plant was moderately negative (r=-0.43 and r=-0.48, respectively) between pod weight and 1000 grain weight. Average positive (r=0.57, r=0.51 and r=0.51) correlations between the length of the pod and the weight of the pod, the weight of one grain in the pod and the weight of 1000 grains were noted.

The mass of one grain in a bean is strongly positive, r = 0.87, and the correlation between the mass of 1000 grains is moderately positive, r = 0.68. There was a strong positive correlation r = 0.87 between the weight of one grain in a pod and the weight of 1000 grains.

The information on correlations and variability between agronomic traits and yields is important to support mung bean breeding programs. During the dry season of 2005, a total of 350 varieties of mung bean were evaluated at the Food Crop Research and Development Center in Bogor, Indonesia.

The variation between mung bean genotypes was found to be traitificant for most of the traits

Table 2. General indicators of morphological and economic characteristics of the mung bean

Indicators	Mean	Standard error	Sigma	Limit
Plant height (cm)	60,87	2,78	13,92	55,13-66,63
Distance between the ground and the branch (cm)	6,41	0,21	1,07	5,97-6,86
Number of yield branches (pcs)	8,97	0,18	0,93	8,59-9,36
Average number of pods per plant (pcs)	38,49	2,11	10,56	34,13-42,86
The pod length (cm)	9,72	0,12	0,61	9,47-9,98
The pod weight (g)	0,96	0,03	0,14	0,9-1,02
Number of pods(pcs)	10,37	0,12	0,61	10,12-10,63
The weight of per pod(g)	0,65	0,02	0,09	0,61-0,69
The weight of 1000 grain(g)	59,06	1,87	9,34	55,21-62,92

Table 3. Mutual correlation of morphological and economic characteristics of mung bean

	Plant height (cm)	Distance between the ground and the branch (cm)	Number of yield branches (pcs)	Average number of pods in a plant (pcs)	The length of pod (cm)	The weight of pod (g)	Number of grain in a pod (pcs)	The weight of pod grain(g)	The weight of 1000 grain (g)
Plant height (cm)		0,68***	-0,01	-0,51**	0,14	0,28	0,45*	0,39	0,17
Distance between the ground and the branch (cm)			-0,02	-0,22	0,26	0,21	0,18	0,24	0,01
Number of yield branches (pcs)				0,64***	0,07	-0,23	0,12	-0,08	-0,20
Average number of pods in a plant (pcs)					-0,04	-0,43*	-0,15	-0,47*	-0,48*
The length of pod (cm)						0,57**	-0,07	0,51**	0,51**
The weight of pod (g)							0,20	0,87***	0,68***
Number of grain in a pod (pcs)								0,36	-0,10
The weight of pod grain(g)									0,77***

studied, especially maturation time, plant stem height, number of pods per plant, and seed size. Among the yield components, the number of pods per plant and plant stem height were found to be positively correlated with yield but negatively correlated with grain size. The results of the analysis showed that the number of pods per plant and plant height had the greatest direct impact on grain yield [18].

Morphological characterization has been crucial in determining the genetic diversity of the mungbean. For the efficient evaluation, maintenance, and use of genotypes, the level of genetic diversity must be investigated [19]. Accurate genotypic descriptions and organization of genetic diversity would help to determine breeding strategies and facilitate appropriate choices for germplasm conservation. We have characterized the 25 mungbean genotypes using 9 morphological characteristics as per the standard list of descriptors for mungbean by IBPGR-Biodiversity.

The main objective of mungbean breeding programs around the world is to breed for high production potential, preferred grain quality, and resistance to abiotic and biotic stresses. These aims can only be fulfilled when there is significant genetic variation within the germplasm available to the breeders. To achieve the breeding aims, breeders regularly exchange germplasm locally and globally. Investigating the level of genetic diversity is vital for the proper evaluation, management, and exploitation of germplasm [19]. As the breeding program mostly depends upon the degree of genetic diversity, morphological characterization is regarded as an essential step in the description and categorization of crop genetic resources [20]. Screening for qualitative features is essential to define the plant, and has become vital for crop registration and certification [21,22].

4. CONCLUSION

According to the results of the experiment on the morphological and economic characteristics of the plants of 25 local and foreign genotypes of mung bean crops, it was established that local varieties Durdona, Baraka, Barkaror, Marjon, L-8, L-22, L-88, L-92 of local ranges and foreign lines AVMU2003, AVMU2004, AVMU1681, AVMU2002 have higher rates compared to other varieties and lines. It has been found that there is a strong positive correlation between the number of grains in a pod and the weight of a grain in a pod, and the weight of a grain in a pod has a strong positive correlation with the weight of 1000 grains.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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