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GENETIC DIVERSITY FOR LIMA BEAN SAMPLES

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INTRODUCTION: One of the main crops and income and alternative food source for the population from Northeast region of Brazil is the lima bean (*Phaseolus lunatus*), besides an important source of protein for the rural population from South America and Africa. It is consumed either as fresh or dried beans. The characterization of *Phaseolus lunatus* germplasm has a significant impact on the improvement of crop plants and could help to improve the knowledge about genetic variability and differentiation patterns. Thus, this work aimed to evaluate genetic diversity among 24 lima bean samples using quantitative and qualitative descriptors by multivariate procedures.

MATERIAL AND METHODS: 24 lima bean samples from Lima Bean Germplasm Active Bank from Federal University of Piauí were evaluated with basis in morphoagronomic descriptors: days to flowering (DFL), days to maturity (DM), number of pod per plant (NPP), length (LP) and width (WP) of the pod and number of seeds per pod (NSP). The experimental design was a lattice 5x5 with four replications, arranged in plots with four lines of five meters long, spaced 1.0 m x 1.0 m. Cultural practices were the commonly used for lima bean crop. The genetic divergence among the samples was estimated and the grouping by Tocher method, with the employment of the Mahalanobis distance, as measure of dissimilarity. The relative contribution of each trait for divergence (SINGH, 1981) was estimated.

RESULTS AND DISCUSSION: Significant differences ($p < 0.01$) were observed among samples for number of pod per plant (NPP), length (LP) and width (WP) of the pod (Table 1). NPP ranged from 14.11 (UFPI-494) to 291.16 (UFPI-220), while LP and WP traits ranged from 49.84 (UFPI-220) to 99.85 (UFPI-276) and 12.20 (UFPI-251) to 17.62 (UFPI-468), respectively. DFL, DM and NSP traits presented average of 92.60 days, 150.18 days and 2.6 seeds per pod, respectively. It was observed that the sample UFPI-220 showed greater number of pod per plant and smaller length (LP) of the pod, indicating the existence of negative correlation among these traits. Genetic dissimilarity measures among 24 samples showed lower limit of 0.54 (UFPI-470 and UFPI-582) and upper limit of 35.60 (UFPI-468 and UFPI-220). Tocher's method allowed formation of three groups. It is important for parents' choice. Since the new hybrid to be established must be based on the magnitude of their dissimilarities and potential *per se* of the parents. Genotypes grouped into groups more distant genotypes collected in more distant groups give an indication they are dissimilar, as can be potential combinations. Group I contains 75% of the samples, with superior averages for WP trait; group II composed by samples UFPI-278, UFPI-251, UFPI-230, UFPI-243 and UFPI-220, with superior averages for NPP trait; group III formed by only one sample (BF1113). The relative contribution of each trait (Table 1) indicated that the width of the pod (35.23%), number of pod per plant (22.52%), and length (20.82%) were those who most contributed the total divergence (78.57%) among the samples of lima beans evaluated.

CONCLUSIONS: UFPI-468 and UFPI-220 samples were most divergent. Width of the pod was the trait that most important for genetic divergence.

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Table 1. Means and relative contribution of each trait for genetic divergence among 24 lima bean samples for traits follows: days to flowering (DFL), days to maturity (DM), number of pod per plant (NPP), length (LP) and width (WP) of the pod and number of seeds per pod (NSP).

Samples	DFL	DM	NPP	LP	WP	NSP
UFPI-032	94.02 a ^{1/}	149.77 a	54.01 c	82.97 a	16.59 a	2.95 a
UFPI-121	90.97 a	151.30 a	153.17 b	65.40 c	14.25 b	2.80 a
UFPI-123	92.77 a	136.18 a	39.97 c	66.57 c	14.65 b	2.17 a
UFPI-177	93.92 a	154.10 a	96.83 c	70.91 b	16.41 a	2.55 a
UFPI-220	91.87 a	144.15 a	291.16 a	49.48 c	13.27 c	2.77 a
UFPI-222	90.92 a	162.25 a	159.14 b	60.80 c	14.26 b	2.37 a
UFPI-228	92.85 a	157.07 a	53.79 c	56.34 c	14.05 b	2.95 a
UFPI-230	89.50 a	150.82 a	169.93 b	56.61 c	12.40 c	2.55 a
UFPI-243	91.12 a	155.85 a	211.62 a	61.56 c	13.72 b	2.62 a
UFPI-251	91.85 a	149.25 a	142.10 b	59.49 c	12.20 c	2.50 a
UFPI-274	89.40 a	156.67 a	18.33 c	70.83 b	14.93 b	2.50 a
UFPI-275	94.47 a	157.62 a	81.68 c	77.90 b	17.30 a	2.82 a
UFPI-276	95.60 a	130.87 a	90.08 c	99.85 a	15.66 a	2.55 a
UFPI-278	92.40 a	143.07 a	123.56 b	67.83 c	15.35 a	2.60 a
UFPI-463	91.80 a	159.14 a	63.81 c	78.15 b	15.60 a	2.60 a
UFPI-465	93.55 a	143.22 a	101.78 c	62.21 c	14.26 b	2.95 a
UFPI-468	91.02 a	150.97 a	29.75 c	86.20 a	17.62 a	2.58 a
UFPI-470	91.80 a	152.87 a	41.06 c	74.35 b	16.32 a	2.80 a
UFPI-483	98.05 a	145.10 a	42.78 c	71.73 b	14.17 b	2.52 a
UFPI-494	98.90 a	155.47 a	14.11 c	65.51 c	16.39 a	2.72 a
UFPI-500	91.22 a	146.10 a	91.75 c	73.58 b	15.99 a	2.62 a
UFPI-515	92.02 a	143.07 a	46.78 c	72.18 b	15.28 a	2.30 a
UFPI-579	93.27 a	150.55 a	94.12 c	58.88 c	13.86 b	2.52 a
UFPI-582	92.50 a	154.64 a	21.65 c	78.69 b	16.61 a	2.70 a
Média	92.60	150.18	95.09	69.43	15.04	2.60
CV (%)	5.94	11.05	71.31	16.00	11.37	7.79
S. _j (%)	4.74	5.59	22.52	20.82	35.23	11.10

^{1/} Values in the same column followed by the same letter are not different by Scott-Knott test (p<0.05).

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