

Phenotypic study of bean seeds harvested from L 47BBA and L 79BB

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Abstract
 In Romania, normally, the bean (*Phaseolus vulgaris* L.) is considered a self-pollinated plant. Vegetable Research and Development Station (V.R.D.S.) Buzău possess a bean germplasm collection presenting over 450 accessions. In 2020, a high percentage of allogamy was found in cultivated accessions. This paper presents the study of two climbing bean accessions seeds sown. For each accession sown, there were taken into study nine new biotypes harvested. The seeds sown represented the control variant for the analysis of the harvested biotypes. The seeds were evaluated in what it concerns quantitative (100 seed weight, length, thickness and width) and qualitative characteristics (seed color and shape). The mean weight of 100 seeds at V₁ was 39.41g (higher value than the control variant – 36.38g) and at V₂ the mean weight (43.81g) was smaller than control variant (46.95g). The variability coefficient for this parameter had a medium value (V₁ 11.42% and V₂ 16.72%), the other analyzed parameters had a small variability. The main colors of the control seeds were brown (V₁ – medium and V₂ –dark). At V₁ there were white seeds (1.5.), and at V₂ khaki (2.9.)

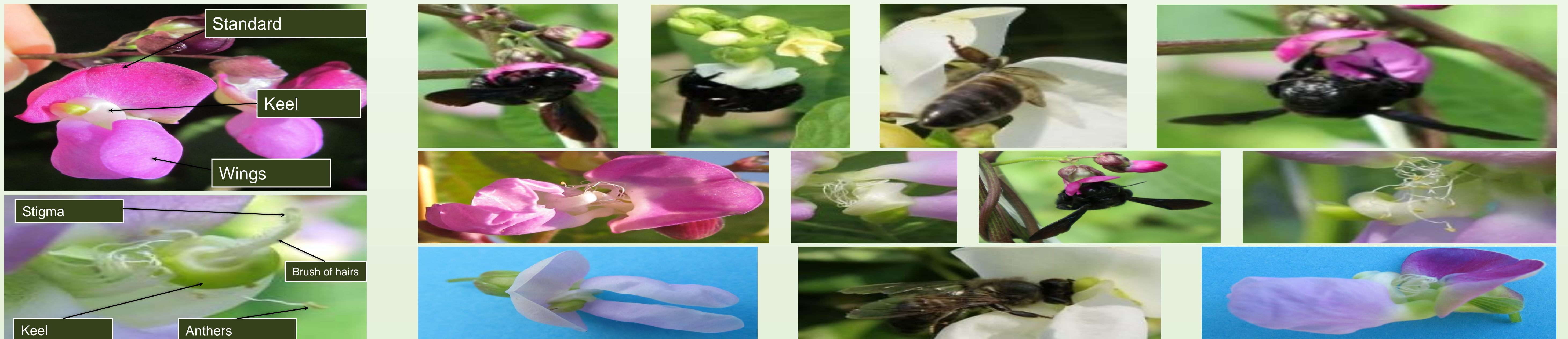
Keywords: *Phaseolus vulgaris* L., germplasm collection, qualitative characteristics, quantitative characteristics.

In South and South-East Romania there are favorable conditions for growing common bean production, as well as a great tradition in cultivation. Collecting and conserving biodiversity, in what it concerns bean, represents one of the main activity objectives for the Vegetable Research and Development Station (V.R.D.S.) Buzău. Thus, in 2010 started the collecting of local bean population from the main vegetable areas in Romania. Bean germplasm collection of V.R.D.S. Buzău contains over 450 accessions.

The specialty literature mentions that bean is highly self-pollinated, and only 0.2-0.5% cross-pollinated.

Over time, in what it concerns some accessions, the phenotypic instability phenomenon has been more intensive because of some particularities concerning flower morphology.

This germplasm collection was cultivated in green – house covered with polyethylene. The green house's ventilation space permitted the access of insects.



Studying flower aspect at local population that presented a high variability percent there was observed that stigma and anthers were no longer protected by the keel. Under the pressure of different insects (especially bees) the stigma get out of the keel and have contact with the full of pollen bees feet from another flower or it comes off and leaves free the stigma and the anthers.

The style turning over inside the keel is foreclosed by the brush of hairs near the stigma and also because of the style scrolling degree.

At the proveniences that present such flower morphology, the pollination is allogamy and can be made by insects (entomophily) and by wind (anemophily).

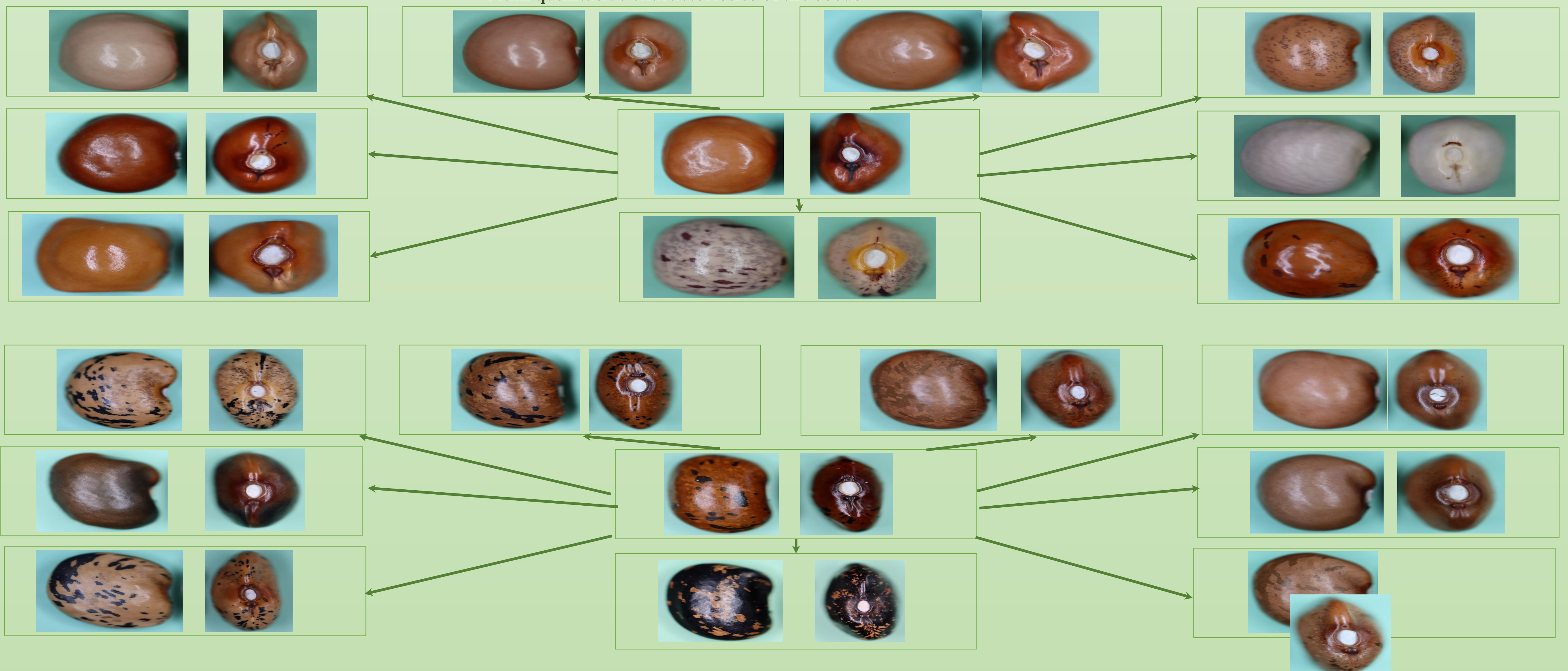
The biological material (climbing accessions) was cultivated according to the common production technology recommended for this area by the specialty literature.

Main quantitative characteristics of the seeds

| V ₁ | 100 seeds mass (g) | Seeds dimensions (mm) | | | Length/ Width | Width/ Thickness |
|----------------|-----------------------|-----------------------|---------|-----------|---------------|------------------|
| | | Length | Width | Thickness | | |
| 1 Mt | 38.82 cd ^a | 13.32 abc | 8.27 b | 5.96 ab | 1.61 | 1.39 |
| 1.1. | 38.73 bc | 13.56 abc | 8.82 a | 5.24 c | 1.54 | 1.68 |
| 1.2. | 36.24 cd | 12.82 cde | 7.78 cd | 5.93 ab | 1.65 | 1.31 |
| 1.3. | 41.45 bc | 13.68 ab | 8.76 a | 5.92 ab | 1.56 | 1.48 |
| 1.4. | 38.63 bc | 13.97 a | 7.08 e | 5.39 bc | 1.97 | 1.31 |
| 1.5. | 37.21 cd | 12.17 def | 7.61 d | 5.80 bc | 1.60 | 1.31 |
| 1.6. | 48.52 a | 12.53 de | 8.82 a | 6.51 a | 1.42 | 1.36 |
| 1.7. | 43.19 b | 12.11 ef | 8.44 ab | 6.47 a | 1.44 | 1.30 |
| 1.8. | 32.25 d | 11.47 f | 7.75 cd | 5.98 ab | 1.48 | 1.30 |
| 1.9. | 41.53 bc | 12.93 bcd | 8.14 bc | 6.46 a | 1.59 | 1.26 |
| Mean | 39.41 | 12.86 | 8.15 | 5.97 | 1.59 | 1.37 |
| Stand. var. | 4.50 | 0.80 | 0.59 | 0.43 | 0.16 | 0.13 |
| CV% | 11.42 | 6.49 | 7.21 | 7.25 | 9.86 | 9.21 |
| Max | 48.52 | 13.97 | 8.82 | 6.51 | 1.97 | 1.68 |
| Min | 32.25 | 11.47 | 7.08 | 5.24 | 1.42 | 1.26 |

| V ₂ | 100 seeds mass (g) | Seeds dimensions (mm) | | | Length/ Width | Width/ Thickness |
|----------------|-----------------------|-----------------------|---------|-----------|---------------|------------------|
| | | Length | Width | Thickness | | |
| 2 Mt | 46.95 bc ^a | 14.23 c | 8.13 cd | 5.88 bc | 1.75 | 1.38 |
| 2.1. | 57.67 a | 16.13 a | 9.25 a | 6.41 a | 1.74 | 1.44 |
| 2.2. | 42.97 d | 14.16 c | 8.53 b | 5.35 e | 1.66 | 1.60 |
| 2.3. | 45.63 bcd | 14.28 c | 8.23 bc | 6.00 bc | 1.74 | 1.37 |
| 2.4. | 44.81 cd | 13.73 cd | 7.81 de | 6.11 ab | 1.76 | 1.28 |
| 2.5. | 31.15 f | 12.39 f | 7.41 f | 5.30 e | 1.67 | 1.40 |
| 2.6. | 38.17 e | 13.40 de | 8.54 b | 5.48 de | 1.57 | 1.56 |
| 2.7. | 46.11 bcd | 14.97 b | 8.39 bc | 5.72 cd | 1.79 | 1.47 |
| 2.8. | 48.40 b | 15.43 b | 9.03 a | 5.91 bc | 1.71 | 1.53 |
| 2.9. | 36.22 e | 12.79 ef | 7.74 ef | 5.43 de | 1.65 | 1.43 |
| Mean | 43.81 | 14.15 | 8.31 | 5.76 | 1.70 | 1.45 |
| Stand. var. | 7.33 | 1.15 | 0.57 | 0.37 | 0.07 | 0.10 |
| CV% | 16.72 | 8.14 | 6.89 | 6.34 | 3.82 | 6.61 |
| Max | 57.67 | 16.13 | 9.25 | 6.41 | 1.79 | 1.60 |
| Min | 31.15 | 12.39 | 7.41 | 5.30 | 1.57 | 1.28 |

Main qualitative characteristics of the seeds



Thank you!