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MORPHOLOGICAL,MOLECULAR AND BIOCHEMICAL CHARACTERIZATION OF *PHASEOLUS* L. LANDRACES FROM MARCHE REGION

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RAPD, POX, phenol, flavonoids, antioxidant activity

A total of 18 bean accessions belonging to the species *P. coccineus* L. and *P. vulgaris* L., collected throughout the Marche region, were characterized at morphological, molecular and biochemical level to study their genetic relationships. Two accession of *vigna sinensis* L.were also used as outgroups. The morphological characterization was carried out in open field at CREA, Monsampolo del Tronto considering different agronomic traits. Eleven POX (Peroxidase Gene Polymorhism) and 14 RAPD (Random Amplified Polymorphic DNA) markers, were used for molecular characterization. Both markers were highly polymorphic; out of 174 total amplified bands, 170 were polymorphic (98 %). The POX markers resulted more informative than RAPDs as showed by PIC (0.308 and 0.299), resolving power (8.443 and 7.227) and marker index (4.69 and 4.03) values. Both morphological and molecular data grouped all the accessions on the basis of the species and the geographical area of cultivation. The accession named " Fagiolo di Gerosa" (*P. vulgaris*) resulted the most similar to the commercial variety from which it is distinguished for the seed color that has been differentiated over the years. This result confirms the importance of this accession as "biodiversity" that needs to be preserved. Furthermore, the two accessions named "Fagiolo Laverino" (*P. vulgaris*), both cultivated in the same area resulted genetically different. Similar pattern was observed in phenols, flavonoids and antioxidant activity grain composition. Among *P.vulgaris* accessions a great variability in the chemicals content was observed: some showed high values of all the three parameters analysed (i.e. "Fagiolo nano"), others showed a great variability among them as "Tabacchino" with higher flavonoids but less phenol and antioxidant content and "Uovo di Quaglia Tarragoni" with higher phenol and antioxidant but lower flavonoids. The *P. coccineus* accessions showed the lowest value of the antioxidant activity, confirming the different nutritional value of the species considered. The accession "Fagiolo del metro" (*vigna sinensis* L.) had the highest level of phenols and antioxidant activity, significantly different from all the accessions, supporting the molecular data. This work, confirms the validity of the approaches used to unravel the homonymy and synonymy and to assess the commercial and nutritional value of the local genetic bean resources.