

## Studies on physical and chemical properties of velvet bean, an underutilized wild food legume

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**ABSTRACT :** The present investigation was carried out to ascertain physical and chemical properties in the fractions of two different germplasm of velvet bean, an underutilized wild food legume (Valanadu – black and Kailasanadu – white). VB registered for higher values both for complex and basic geometric traits in the studied fractions than KW. Solid density, porosity and surface area of VB ranged from 0.17 to 0.25 (g/cm<sup>3</sup>); 136.38 to 259.67 (%) and 375.89 to 651.26 (mm<sup>2</sup>), respectively and significantly differed in fractions ( $p < 0.05$ ). But it was less significant for chemical traits in fractions and germplasm. Crude protein, crude fat and moisture contents were higher in VB germplasm *i.e.*, 22.65 to 29.67% (DM); 6.01 to 8.05%; 6.72 to 9.56% (w.b) whereas, the lowest coefficient static fraction was noticed against stainless steel surface than on other studied materials in both the germplasm. Whereas, angle of repose ranged between 26.43 and 30.23° for VB; 30.82 and 35.98° for KW. To sum up, germplasm VB exhibited significance physical and chemical properties for further processing for industrialization and commercialization.

**Key words :** Germplasm, Physical and chemical properties, Velvet bean, Western ghats, Wild food legume

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### INTRODUCTION

Legumes comprised as important food stuff and are chief economic sources of protein in the diets of economically weaker sections of population. Now-a-days, research is being geared up for the exploitation of underutilized legume seeds as a cheap source of vegetable protein. Underutilized species are those which potential not yet fully exploited to contribute to food security and poverty alleviation (Bhat and Karim, 2009). Velvet bean, *Mucuna pruriens* (L.) DC. var. *utilis* (wall ex Wight Br.), is an underutilized tropical legume comprising of protein (20%), carbohydrates (65%), fat (15%) together with several minerals and vitamins. It is also found that these plants species rich in bioactive compounds like *mucunine*, *mucunadenine* and other

quinone compounds (Gurumoorthy *et al.*, 2008). Recently, for the last two decades enormous research effort has been carried out and documented with reference to nutritional / anti-nutritional factors and different processing aids to minimize/eliminate ANF's to a greater extent. Furthermore, major research projects were undertaken to reduce / completely to eliminate or deactivate certain anti- nutritional factors by traditional and technological methods (Eilitta *et al.*, 2003). At the outset, research findings are paved the way for commercial exploitation of these pulses both for nutrition and therapeutic purposes. However, only limited information is available with regard to physical properties of velvet bean (Rich and Teixeira, 2005; Ezeagu *et al.*, 2003). In order to design and develop of machine(s) / equipment(s) for handling, conveying, grading, drying and packaging, it is necessary to determine their physical properties as a function of moisture content. Bulk density, true density and porosity can be useful in sizing grain hoppers and storage facilities. In turn, they can affect the rate of heat and mass transfer of moisture during aeration and drying processes. Grain bed with low porosity will have greater resistance in preventing escape of water vapour during drying process,

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