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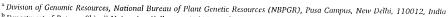
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Seed coat polymorphism in Vigna section Aconitifoliae in India

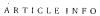
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ABSTRACT

The seed coat polymorphism of 50 accessions representing five species of Vigna section Acontifoliae (subgenus Ceratotropis) was investigated using scanning electron microscopy (SEM) in order to evaluate the interspecific and intraspecific variations of various morphoanatomical seed traits. Seed shape, hilum structure aril and testa pattern were examined. The seed coat pattern was found to be a significant character for species delimitation. The testa cell size and ornamentation showed distinctive intra- and interspectific variations across the examined species. The results revealed that the wild accessions of V. aconatifolia (1-aco and II-aco), V. indica (1-ind and IIind), V. stipulacea (I-sti, I-sti, II-sti, III-sti and VI-sti) and V. trilobeta (I-tri, II-tri) have different seed coat types. In the present study, only a single seed coat pattern was recorded for the andemic, threatened species V. khan dalensis. Finally, the congruency of seed coat patterns optimized onto an aDNA-ITS phylogeny was discussed.

1. Introduction

Vigna Savi is a pantropical genus that comprises 104 species (Lewis et al., 2005). The species of Vigna are known as an important source of food worldwide (Smart, 1990). The genus is divided into five subgenera, among which Ceratotropis (Piper) Verdc. is widely distributed in Asia and is also known as the Asian Vigna (Tomooka et al., 2002b). India is rich in species diversity and has 24 species of the subgenus Ceratotropis (Babu et al., 1985; Sanjappa, 1992; Bisht et al., 2005; Yaday et al., 2014). The subgenus Ceratotropis exhibits diverse morphological characteristics based on which it is divided into three sections, namely Ceratotropis Tomooka & Maxted, Aconitifoliae Tomooka& Maxted and Angulares Tomooka & Maxted (Tomooka et al., 2002a). Morphological and molecular phylogenetic studies of the species belonging to the subgenus Ceratotropis have confirmed the sectional classification proposed by several authors (Maréchal et al., 1978; Tomooka et al., 2002b; Bisht et al., 2005; Yadav et al., 2014; Takabashi. et al., 2016; Unidale et al., 2017a, 201 7e).

Vigna section Aconitifoliae consists of six species viz. V. aconitifolia (Jacq.) Maréchal, V. aridicola N. Tomooka et Maxted, V. indica T.M. Dixit, K.V. Bhat & S.R. Yadav, V. khandalensis (Santapau) Raghvan et Wadhwa, V. trilobata (L.) Verdc. and V. stipulacea (Lam.) Kuntze, among

which two have been domesticated (V. acontifolia (Jacq.) Maréchal and V. stipulacea Kuntze (Dixit. 3034). The species of section Acontifoliae have been delimited on the basis of wide morphological variations. Vigna aconitifolia has linear to lanceslare lobed leaflets, V. stipulacea consists of large stipules and V. khandal-nsis shows foliaceous stipules and erect habit, which distinguish them from the other species of section 'Aconitifoliae. The seeds of V. mil. bara possess a protruding hilum and a well-developed aril, whereas those of V. indica have rough, substriate testa and undeveloped aril () - ... with a Marting desired at 2011; Condate of all 199 (5).

The wild relatives of cultivated plants serve as potential genetic resources for improving crops. This requires to evaluate the intrinsic diversity and valuable genes of different populations. However, the inadequacy of information pertaining to the intraspecific micro-morphological polymorphism in section Acoutafoliae hampers the improvement and effective utilization of wild Vigna species. Hence, it is imperative_to_comprehensively assess the intraspecific diversity amongst the species of section Acommolism.

The micro-morphological characters of the seed have offered unique and reliable data for species delimitation (1000 and the 1979; Atomat and Rangaswamy, 1984; Chandel St. E. 1991; Nath and Dasgupta. 2015; Umdale et al., 2017b) and intraspecific polymorphism in the

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