

SEM observations on the seed coat structure of market samples of Atmagupta [*Mucuna pruriens* (L.) DC.]

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SUMMARY

Adulteration in market samples is one of the greatest drawbacks in promotion of herbal products from India. Plant samples in the market are stored under undesirable conditions over the years and often contain a mixture of other plant species, thus adversely affecting their bioefficacy. Market samples of 'Atmagupta' an Indian Ayurvedic and Siddha drug contain seeds of seven taxa. Seed morphology standards could help in identification where a seed may look similar in external appearance. SEM study is of great help in distinguishing the seeds based on their seed coat diagnostic characters to differentiate seed of *Mucuna pruriens* (L.) DC., the genuine, with that other taxa adulterant or substitutes.

Key words : SEM, Hilum, Raphae, Adulterants, Substitutes, Spermoderm

Use of herbal drugs is ever increasing worldwide together with their demand. Concomitant with increase in demand and scarcity, adulteration of herbal raw drugs is also more common; 'Atmagupta' [*Mucuna pruriens* (L.)DC.] is one of the important herbal drug most commonly used in Indian system of medicine. The seeds of this plant have been used as food tonic and aphrodisiac (Vasudeva and Shanpru, 1981) by many tribal communities in India since many centuries. *M. pruriens* possess valuable medicinal properties and it has been studied for various activities like anti-diabetic (Akhtar *et al.*, 1990); aphrodisiac, anti-neoplastic, anti-epileptic, antimicrobial activities (Sathiyarayanan and Arulmozhi, 2007). Its learning and memory enhancement has been detailed by Poornachandra *et al.* (2005) just as its aphrodisiac and antivenom activities have been detailed, respectively by Rajendran *et al.* (1997), Shukla *et al.* (2007), Guerranti *et al.* (2002) and Fattepur and Gawade (2008). The seeds of this plant are collected mostly in the wild. Various species of *Mucuna* are being sold in the market under the trade name "Atmagupta". Our preliminary survey in Tamil Nadu (Vijayambika, 2003) also revealed that seeds of seven species *Mucuna pruriens*, *M. cochinchinensis*, *M. deeringiana*, *M. utilis*, *M.*

atropurpurea, *Canavalia ensiformis*, and *C. virosa* are sold as 'Poonaikali' (Tamil vernacular name of *M. pruriens*). The reason for trading of different seeds in the same vernacular name may be ignorance or intentional or confusion in the identity. The present investigation was aimed at studying pattern of seed ornamentation of all the market samples of 'Atmagupta' or 'Poonaikali' through Scanning Electron Microscope (SEM) and make an effort to evolve diagnostic characters to distinguish the authentic one with their adulterants or substitutes.

Seed coat micromorphology has provided useful information on identification, 'Poonaikali', the velvet bean comes under the most important family Fabaceae. Seed coat exhibit complex and highly diverse morphology and anatomy, providing valuable taxonomic characters. The aim of this study is to give a complete description of the surface structures of the seeds of seven marketed species. Heywood (1971) suggested the use of SEM as a tool for providing detailed information on spermoderm morphology in seed identification.

MATERIALS AND METHODS

Dried seeds were used for this study. A portion of seed coat below the hilum was cut off using a sharp blade and mounted as specimen stub using double adhesive tape. Samples were coated with gold using a Hitachi HVS 5 GB Vacuum evaporator to a thickness of 100 Å. Coated samples were viewed in a Hitachi S-450 scanning electron microscope operated at 20KV and photographed.

RESULTS AND DISCUSSION

Seeds of different samples of 'Poonaikali' were purchased from drug stores from different places of Tamil

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