

Spermoderm patterns and complexity of seed surface configuration in weed species

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SUMMARY

A total 122 weed species of 37 angiospermic families representing different habitats of Warangal district, A.P. have been investigated for the exomorphological characters of the seed. The seed surface topography of 122 weed species was studied under light and scanning electron microscope. On the basis of habitat, weeds are classified in to three categories They are 1. wet field weeds. 2. dry field weeds and 3. weeds common to both dry and wet field crops. Each category further classified into four groups. a) broad leaved, b) grassy, c) cyperaceous and d) miscellaneous weeds. Based on their varying degree of spermoderm complexity, again each group is divided into simple, moderate and complex spermoderm patterns. Surface pattern of each and every weed seed was studied in detail under LM & SEM and analysed the complexity of surface pattern, habitat-wise and taxonomic group wise and noted the diversity in the form of spermoderm ornamentation. The present observations revealed that the moderate spermoderm is more prevalent in majority weed seeds. The weed species with complex sculpturing were found more in dry field conditions. An increasing trend towards complex sculpturing also noticed in seeds from wet to dry field weeds. Further, it was observed that the species with moderate and complex spermoderm patterns were found more in broad leaved weeds than others.

Key words: Spermoderm patterns, LM & SEM, Weed seeds, Seed surface configuration.

The epidermis is the functional boundary layer delimiting the seed and its environment. Therefore, all interactions invariably pass through this boundary layer of cellulose. Surface sculpturing can take different form and functions as stated by Martin and Juniper, (1970), Johnson, (1975), Eller, (1979) and Barthlott and Wollenweber, (1981).

Weeds, as a heterogenous group, exhibit considerable amount of diversity and variations with regard to their spermoderm. LM & SEM studies on seed surface proved to be the most powerful taxonomic tool presently available to achieve the accurate method of seed identification. This technology is hardly employed in weed seeds. In view of ever growing need to understand the weeds at one hand and inadequate data on weed seed morphology, on the other, the present study has been undertaken in order to supplement more information for the accurate identification of weed seeds and to design an efficient weed management programme.

MATERIALS AND METHODS

The seeds of 122 weed species were collected from different agricultural fields of Warangal District, Andhra Pradesh. Out of which 30 species belongs to wet field crops i.e., Paddy; 80 species pertain to dry field crops such as Maize, Jowar, Groundnut and Caster, etc. and 12

species found to be common in both dry and wet field crops. The above mentioned categories are again classified in to four groups following the method of Noda *et. al.*, (1985). They are a) broad leaved b) grassy c) cyperaceae and d) miscellaneous weeds.

All the seed specimens of weed species were studied under Olympus sterio binocular microscope. These were also subjected to scanning electron microscopic studies. For SEM studies stereoscan, S4-10 model, Cambridge Scientific instruments Limited, England, installed at Central Instrumentation Centre, Kakatiya University, Warangal has been used. Completely matured dry seeds were mounted on copper stubs by conductive silver paint adhesive (Silver Cement). Seeds were subsequently coated uniformly by gold following sputtering technique (Damblon, 1975), while rotating at an angle of 45° to the vapourising filament in vaccum. Such gold coated specimens were steroscanned at an accelerating voltage of 10-15KV and photographed at suitable magnification ranging from X50 to X1000. For every seed sample three exposures were made viz., complete seed, a portion of seed and an enlargement of spermoderm showing cellular details of primary, secondary and tertiary sculptures following Barthlott (1981). The negatives of SEM photographs were deposited at Department of Botany, Kakatiya University, Warangal.

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