

Morphological and biochemical investigation of five *Solanum* species

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Solanaceae is one of the families with a number of important agricultural plants as well as many toxic plants. In the present investigation a comparative and comprehensive leaf, branch, fruit and seed have been analyzed and complemented with leaf proteins for identifications. As expected taxonomical characters within *Solanum* species revealed great morphological differences. Some *Solanum* species are phenotypically close to each other, but have different taxonomic status. These morphological similarities lead to difficulty in identification of these species. Hence, a study was undertaken to understand the similarities and dissimilarities at morphological and protein level. Molecular weight of the protein of the five species varied from 199.53kD to 1.78kD. The result showed *S. surattense* and *S. trilobatum* were closer morphologically whereas, *S. surattense* and *S. melongena* were closer at protein level.

Key words : Solanaceae, SDS-PAGE, Paired affinity, Similarity, Phylogeny

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INTRODUCTION

The Solanaceae is a large family comprised of over 3000 species. It is the third economically important plant family and ranks the first in terms of vegetable crops and number of important medicinal plants. Plant morphology deals with the external characteristics of plants. It deals with the structure, development and modification of the various plant parts like roots, stem, leaf, inflorescence, flower, fruit and seed. Morphology forms are the fundamental basis for the study of plant taxonomy. Taxonomic classification of plant species basically depends on the morphological and anatomical characters, these features are changeable and sometimes difficult to observe, so it is necessary to be supported by molecular techniques, in which molecular markers are used to detect the genetic variability. Molecular markers are biochemical constituents (e.g. secondary metabolites in plants) and macromolecules, viz., proteins and deoxyribonucleic acids (DNA) that play a very important role in taxonomy, physiology, embryology, plant breeding, ecology, genetic engineering etc. SDS-PAGE (Sodium dodecyl sulphate) has been used successfully to resolve taxonomic and evolutionary problems of several plants

(Khan, 1992; Rabbani *et al.*, 2001). In this technique protein is separated according their molecular weights. Resolution of this technique is very high and more than ten bands can be detected (Bartke *et al.*, 1966). Therefore, it could be a reliable tool for taxonomic purposes. *Solanum* species were selected to study the morphological and protein profile.

RESEARCH METHODOLOGY

The following *Solanum* species, *Solanum nigrum* L., *Solanum torvum* Sw., *Solanum trilobatum* L., *Solanum surattense* Burm. and *Solanum melongena* L. were collected from Tirunelveli region. The collected materials were stored in deep freezer (-70°C) for SDS-PAGE analysis.

Morphological studies:

The taxonomic characters of the selected *Solanum* species were studied by using dissection microscope. Morphological characters were divided into two main categories.

- Vegetative characters
- Reproductive characters