ABSTRACT

Psophocarpus tetragonolobus (L.) DC., a potential backyard crop, has immense agricultural possibilities. The present study describes the floral biology of the plant and proposes successful micropropagation protocols.

A detailed description of the plant was prepared along with a diagrammatic sketch. The morphology and ultrastructure of the reproductive organs were studied. Cytochemical analysis of the stigma reveals the localization of starch, lipids and proteins at various developmental stages.

Thin cell layer nodal and stem explants gave maximum shoot formation, while whole tissue explants were inferior. The right cotyledon was superior to the left cotyledon in shoot regeneration. A three stage culture regime was necessary for successful callus regeneration – induction, maintenance and regeneration stages. BAP + GA₃ medium induced shoot elongation. Differentiated shoots were rooted to get healthy plantlets. Somatic embryos were initiated from leaf explants when 2,4-D induced callus was transferred to TDZ containing media and germinated in MS basal medium. About 90% survival of plants was obtained after hardening and acclimatization. RAPD and protein characterization revealed the clonal fidelity of the regenerants.

Biochemical analysis of organogenetic and embryogenetic calluses revealed the possible role of metabolites and enzymes during differentiation and also their protein and pigment content.

Key words: Winged bean, Psophocarpus tetragonolobus, Tissue culture, Thin cell layer explants, Right cotyledon, Left cotyledon, Reproductive biology, RAPD, Protein profile, Biochemical analysis