

EXPLORING THE PHENETIC AND GENETIC DIVERSITY
OF GENERA *Tephrosia* AND *Flueggea* (VERN: PILA) AND
DEVELOPING EFFECTIVE PROPAGATION SYSTEMS

Submitted by

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(FGS/01/02/01/2012/01)

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A thesis submitted to the Faculty of Graduate Studies, University of
Kelaniya

in fulfilment of the requirements for the degree of

Master of Philosophy in Botany



October 2015

Abstract

Tephrosia and *Flueggea* (vern: Pila) have shown popularity as ingredients in traditional therapeutic systems in Sri Lanka due to their strong antioxidant activity. Problems associated with the vernacular names of material used in such preparations are often adulterated in commerce. Therefore, phenotypic and genotypic characterization and establishment of effective propagation systems of these demanding taxa are timely requirement. A questionnaire survey was carried out to evaluate the medicinal uses and distribution of both genera. Phenetic analysis and multi access key were performed using PAST and DELTA software respectively. ITS and *trnH-psbA* regions of plant leaf DNA of *Tephrosia* species were aligned with ClustalW2 Multiple Sequence Alignment software to interpret similarities. Distribution pattern of leaf phenolics, flavonoids and anthocyanidins were analysed in both genera. Suitable seed dormancy breaking method, potting medium and stem cutting types were determined to develop suitable propagation systems for both genera. Interspecific relationships of *T. noctiflora*, *T. purpurea*, *T. villosa*, *T. pumila*, *T. maxima* and *T. tinctoria* were inferred with respect to phenetic analysis, gene sequences of *trnH-psbA* and ITS regions and distribution pattern of leaf phenolics, flavonoids and anthocyanidins. Intraspecific variations of *F. leucopyrus* in different climatic zones were derived with respect to phenetic analysis and distribution pattern of leaf phenolics, flavonoids and anthocyanidins. Seed soaking in Con. H₂SO₄: H₂O; 3:1 for 25 minutes was determined as the suitable dormancy breaking method and suitable potting medium was found to be varied for species of genus *Tephrosia*. Hard wood cuttings of *F. leucopyrus* were effectively established in sand potting medium.

Key Words: *Tephrosia* spp., *F. leucopyrus*, phenetic analysis, genetic variations, propagation system