Molecular Markers for Phylogenetics of Onobrychis Species

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INTRODUCTION

This project forms part of an EU funded project entitled “Healthy Hay”; the re-invention of sainfoin: an example of a novel resource for sustainable agriculture. A new sainfoin breeding programme has been initiated. NIAB is evaluating the agronomic and morphological characters of a germplasm collection and the genetic characterisation as been initiated. Partners are currently assessing our plant material for biological, environmental impact and tannins characterisation and quantification.

Onobrychis vicifolia

- A fodder legume with a long cultivation history
- Agronomic potential: low-input crop, soil improving crop
- Biological potential: High nutritional value, high palatability, non-bloating forage, anthelmintic properties, reducing methane outputs from ruminants
- Ornamental flowers attracting wide range of insects. Allow production of high quality honey

Germination collected

- 355 accessions of Onobrychis sp.
- Most are O. vicifolia: wild and cultivated, giant and common types

Phenotypic characterisation: a great diversity within and between accessions observed

- Field evaluation on replicated 1.5 m² plot on agronomic (yield, re-growth, flowering time, survival, diseases and pests) and morphological characteristics (inflorescence, leaf, stems, habit and homogeneity)

Phylogeny will allow to gain knowledge on cultivation history of O. vicifolia

Germinations of Onobrychis sp.

Karyotyping studies

Mostly accessions of O. vicifolia are tetraploid (whether giant or common) but a few of the wild types are diploid

Ploidy of other Onobrychis sp. also investigated

O. vicifolia genome size of about 2.5pg

Determination of genome size using Zea maize as a reference and PI as staining agent

Example of 7 polymorphic regions between 3 samples with one similar primer combination Eco+3 Mse+3

Fingerprinting

- Capillary electrophoresis based AFLP fingerprinting work is ongoing
- Polymorphic regions observed
- Specificity and discriminatory power of the system needs improvement
- The taxonomy of the Onobrychis genus is being investigated, many of the species appear to be sub-species
- Phylogeny will allow to gain knowledge on cultivation history of O. vicifolia

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