

# SELECTION AND UTILIZATION OF NON-TRADITIONAL TREE TAXA FOR URBAN GREENERY

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Urban environment is associated with extreme conditions and negative factors, that reduce the vitality of trees and worsen the establishment of new plantings. In addition to harmful substances in the environment and the risk of mechanical damage, serious problems of urban green area are water deficit and high temperature. The current planning and design concepts are therefore aimed at creation of the natural plant communities with a high potential adaptability to extremes in the environment. There are included species of the native flora, that have evolved and adapted to life on dry locations with temperature extremes.



Service tree growing in the Wertheimsteinpark in Vienna, Austria



Wild pear in a residential complex in Nitra, Slovakia

**Advantages of the native woody plant species:** adaptable species, effective in stabilization of the environmental conditions, probably lower costs for their establishment and aftercare, broad base of their genetic sources in the landscape and large basis for selection of the most suitable phenotypes.

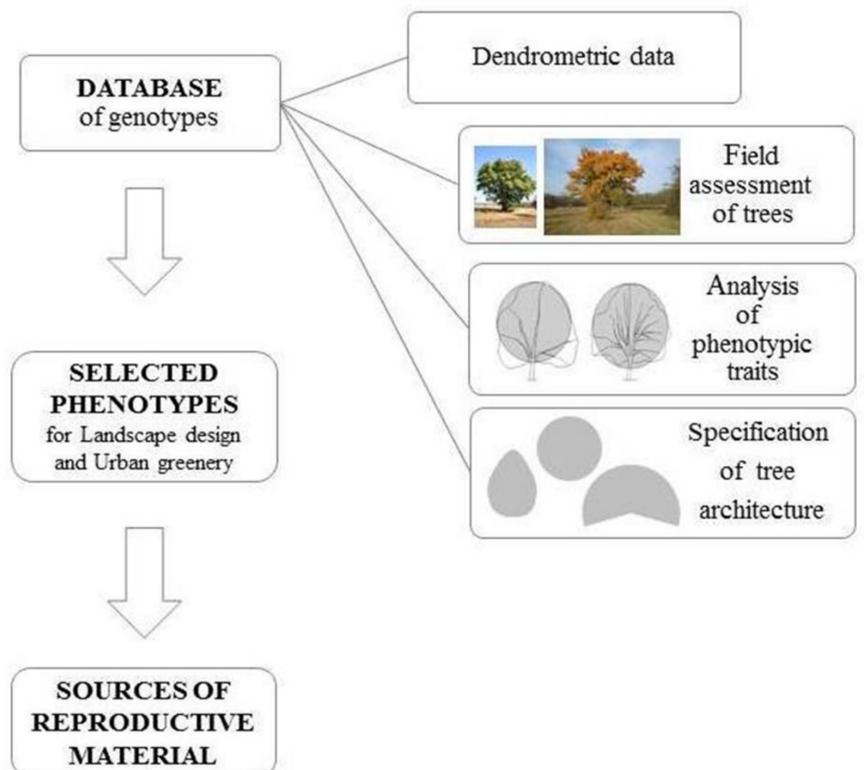
**Disadvantages:** lack of qualified sources of the reproductive material, missing technologies for effective production of young plants, little experience with their establishment and limited information about their growth rate and systems of maintenance.

The starting points of selection are ecological requirements of particular tree species, their growth characteristics and aesthetic properties. Reactions of woody plants to drought conditions and limited space within root zone, as well as changes of their phenological activity are criteria for evaluation of their adaptability in urban environment.

Utilization of the non-traditional woody plants requires qualified sources of their reproductive material with suitable phenotypic traits. Aim of the project is assessment of the phenotypic structure and properties of the natural genetic resources within native flora (important step for establishment of the qualified sources of reproductive material).

Our research is focused on two "model" woody plants – wild pear (*Pyrus pyraeaster* L. Burgsd.) and service tree (*Sorbus domestica* L.), both with distinctive seasonal dynamics. These taxa are considered to be light demanding woody plants with similar ecological requirements on environmental conditions. However, their adaptability and response to water scarcity are different. Within experiments held in the juvenile stage of growth (Paganová & Jureková 2012), service tree preferentially distributed higher amount of dry mass to roots (S:R = 0,70), while distribution of dry mass between underground and upper organs of wild pear was rather balanced (S: R = 1.11). The investments of assimilates were also different - service tree created significantly larger leaf area and wild pear used assimilates for construction of the leaf mesophyll structures. Both species maintained balanced leaf water content, even in conditions of water scarcity.

Preliminary data obtained within field study documented distinctive variability of the phenotypic parameters for both species. According to the field data we attempted to define the range of structural parameters of trees which are typical for high-quality phenotypes. Within a short period of time will be assembled database of the qualified sources of reproductive material for wild pear and service tree phenotypically suitable for urban conditions.



Assessment and selection of the non-traditional woody plants for urban greenery in Slovakia

#### Acknowledgement:

The research is supported by grant project VEGA 1/0246/13 entitled "Water-use strategies of the xerophytic woody plants and perennials in urban conditions". The poster was supported by the project: Development of International Cooperation for the Purpose of the Transfer and Implementation of Research and Development in Educational Programs conducted by the Operational Program: Education, ITMS code: 26110230085

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