Woody plants: Trees and shrubs

A group of plants with a woody stem. These are generally the most long-lived individuals in the garden, and deciding on their application in plantings requires the greatest experience and responsibility in long-term planning.

The significance of individual taxa is highly specific. Woody species in planting can have different operating descriptions in terms of their mission, spatial significance and reliability of fulfilment of their mission. An example is represented by the **"skeletal" wood - basic**. These belong to the range of woody plants with the most reliable health status and represent the most perfectly proven taxa in the given climatic conditions. They form the basic skeleton of the garden; they allow defining basic and long-term stable ideas on space with a high degree of probability. The risk of their failure is minimal. These are usually the most significant species as to their size, but for the purposes of smaller landscaping, there are, of course, also adequate spatially less robust cultivars available, corresponding to the specific garden. **"Filling" or supplementary woods** complete and enrich the planting. They can also belong to a range of very attractive, but perhaps less reliable species. Their mission is to diversify and develop the basic concept. In this case, the risk of possible failure, short-lividness, reduced phytopathological or climatic resistance can also be accepted. In the event of the extinction of such an individual in planting, the basic concept should not be seriously disrupted and the situation could be remedied. A specific group consists of temporarily applied woody plants, for example in the new housing estate of cities where the requirement for quick achievement of the result has prevailed. These are species with rapid development and shorter life, for example from the assortment of *Populus* (Poplar), or *Acer negundo* (Ash Maple). These and similar **"temporary" tree species** need to be programmatically replaced by target trees over time.

Wood plant species by origin:

• Domestic / native / indigenous species

The term "domestic" or "native" plants should not be understood too dogmatically. Vegetation referred to as "native" is perceived as "autochthonous" in the country during its latest natural climatic and geological development. Such a long-term stable plant composition has developed in the given area in accordance with stable abiotic conditions. However, it is known that the climate in the individual geological eras of this planet has locally changed significantly and there has been migration, adaptation, but also extinction of species in connection with such changes. Many of the original plants are unable to develop fully due to the shift in the country's climatic characteristics. Claims of the so-called autochthonous vegetation may not be in accordance with the changed climate, especially in large cities, where, due to the consequences of human activity, a spontaneously different composition of organisms settles - not excluding the plant component. Thus, for the greenery applied in strongly changed urbanisation conditions, it is true that a more suitable solution is a functioning non-original suitably chosen species of woody plant rather than none, or the existing taxon with failures, the so-called autochtonous wood which cannot adequately handle the changed environment.

• Alien / imported / introduced species

In addition to the plant species that appropriately diversify and enrich our surroundings, there are also species whose introduction into our country is evaluated negatively. It is appropriate to limit or regulate spreading of the species with the ability to aggressively suppress our native vegetation even in places where the original flora could be preserved. The notorious woody plants of this category

include e.g. *Ailanthus glandulosa / altissima*, (alien / glandular ailanthus) *Acer negundo*, and *Robinia pseudoacacia* (White Acacia).

• Cultivated varieties = cultivars

Hybrid and selected progeny of the parental plant species have purposefully altered their characters towards increased productivity, production quality, higher aesthetic value, but in many cases it is also possible to achieve higher viability and resistance to various loads. At present, the use of cultivars significantly affects the composition of woody plants in the country. Despite the successes attained in the area of plant breeding, it is necessary to respect sound conservatism and moderation, especially in the assortment of woody plants, and to support the planting of native species wherever it is still possible.

Ground-covering, stunted woody plants and enchanter's night-shades

Stunted cultivars of woody plants, intended for planting in smaller landscaping, alpine rock gardens, are very popular, but they are also often the preferred assortment for cultivating bonsai. The basic feature of stunted trees is a more compact development and denser branching compared to their original botanical species. They can also be carriers of other attractive properties (colour, habitus, ecological resistance…) extending their application in gardening. The assortment of compactly growing woody plants is constantly expanding and currently includes a number of colour and shape mutations. Stunted varieties have often emerged during horticultural history as random mutations and, after verifying the stability of new traits, have been propagated in a vegetative way: cuttings or grafting. Many of the cultivars obtained in this way have found wide application in the formation of gardens and have been assigned a generally accepted cultivar designation.

Many enthusiasts of cultivating of stunted woody plants still have a pleasure to look for random mutations in the treetops. Densed branching and the characteristically compact formation can appear as a random phenomenon on various woody plants. By watching the treetops more closely, we may be lucky and discover such a new formation in native tree species, but also in parks and collection gardens with planting of alien trees. These randomly discovered mutations are transferred by collectors by grafting on the rootstock after acquisition, and in the case of new findings we speak of an "enchanter's night-shade". Until the generally accepted cultivar designation is adopted in practice, the name of the site or another indication associated with the name of the original woody species on which the enchanter's night-shade was discovered is most often used for identification. In exterior plantings on the central exhibition area of the Botanic Garden, we have several such unique coniferous specimens.

Ground-covering woods mean a significant benefit for garden formations from the aesthetic point of view, and they also offer an opportunity for a considerable rationalisation of maintenance. It is expedient to use compact thick plantings of deciduous tree cultivars for purely rational reasons. Ground-covering woods are suitable for small areas, hard-to-reach parts of the land on its perimeter, sloping parts of gardens and parks, etc. Erosion protection is a very important function. The most frequently used taxa include ***Cotoneaster horizontalis***, ***Cotoneaster* d*ammeri* ´Skogholm´**, ***Cotoneaster dammeri* ´Maior´**, ***Cotoneaster sdalicifolius* ´Repens´, *Cotoneaster dammeri* ´Coral Beauty´....** Universal use is offered by relatively little widespread ***Symphoricarpos chenaultii* ´Hancock´.**

Highly light-exposed areas can be widely occupied by cultivars of light demanding species, such as the ***Salix caprea* ´Pendula´, *Salix integrifolia* ´Pendula´, *Salix reticulata*, *Salix purpurea* ´Gracilis´** willows and others. Sunny slopes may also be stabilised with the help of many cultivars of compactly

growing pines, especially ***Pinus mugo*** ´**Mughus**´and ***Pinus mugo*** ´**Pumilio**´. Many other coniferous tree species are used in practice for ground-covering purposes, such as ***Juniperus horizontalis*** and its colour varieties and ***Microbiota decussata***.

Evergreen and, from the viewpoint of light requirements, universally applicable lying goggles find universal use, e.g. ***Euonymus fortunei*** ´**Emerald´n´ Gold´, *Euonymus fortunei*** ´**Emerald Gaiety´, *Euonymus fortunei*** ´**Blondy**´. Ivy (***Hedera helix***) will also cover shady places on larger areas. In addition to the original species, a whole range of varieties is available. One of the most attractive is ***Hedera helix*** ´**Goldheart**´.

Areas formed by undergrowth cover vegetation create a basic framework in which it is possible to place other solitary specimens and thus to incorporate aesthetically impressive and in terms of their rational maintenance undemanding plantings.

Evergreen trees and conifers

Evergreen broad-leaved species in the Botanical Garden area - examples:

Aucuba japonica ´**Variegata**´

Euonymus fortunei **Emerald´n´ Gold´**

Euonymus fortunei ´**Emerald Gaiety**´

Euonymus fortunei ´**Sunspot**´

Euonymus japonica **kultivary**

Hedera helix

Hedera colchica ´**Sulphur Heart**´

Ilex aquifolium

Ilex **x** ***altaclerensis*** ´**Golden King**´

Lonicera pileata

Magnolia grandiflora

Prunus laurocerasus

Viburnum carlesii

Viburnum rhytidophyllum ´**Pragense**´

Broad-leaved trees with a year-round active assimilation area are attractive, but it is their year-round leaf activity that can cause more serious occasional damage during the winter in the temperate zone. An exceptional position in the assortment is taken by broad-leaved tree species with the ability of an alternative way of overwintering. Some shrub species may lose their leaves without any further damage if unfavourable weather conditions occur in winter (hard frost + cold wind + strong sun). Due to this ability to vary the degree of preservation of the leaf area according to external conditions, we refer to them as semi-deciduous trees.

Examples:

Cotoneaster dammeri **´Skogholm´**

Ligustrum ovalifolium **´Aureovariegatum´**

Conifers are represented by several species. In the Ecological Educational Area and in its immediate vicinity, we may pinpoint the following most important of them:

Abies alba

Abies alba **´Compacta´**

Abies alba **´Pendula´**

Abies alba **´Fastigiata´**

Abies arizonica **´Compacta´**

Abies pinsapo **´Glauca´**

Abies **– further botanical species and their hybrids, also the enchanter's night-shades (see previous chapter Ground-covering, stunted woody plants and enchanter's night-shades)**

Chamaecyparis lawsoniana

Chamaecyparis lawsoniana **´Elwoodii´**

Chamaecyparis lawsoniana **´Fletcheri´**

Chamaecyparis lawsoniana **´Wissel´s Saguaro´**

Chamaecyparis pisifera

Chamaecyparis **– other cultivars**

Juniperus communis **´Sentinel´**

Juniperus **sabina**

Juniperus scopulorum **´Skyrocket´**

Juniperus virginiana **– botanical species**

Juniperus **– other cultivars**

Picea abies **´Nidiformis´**

Picea glauca **´Conica´**

Picea omorica

Picea **- cultivars**

Picea pungens **´Argentea´ and *Picea pungens*** **´Koster´**

Pinus Coulteri

Pinus mugo

Pinus nigra

***Pinus nigra* ´Fastigiata´**

***Pinus nigra* ´Molette´**

Pinus sylvestris

***Pinus sylvestris* ´Aurea´**

Sequoiadendron giganteum

***Sequoiadendron giganteum* ´Pendula´**

***Sequoiadendron giganteum* ´Glauca´**

***Thuja occidentalis* ´Elwangeriana Rheingold´**

***Thuja occidentalis* ´Globosa´**

***Thuja occidentalis* ´Malonyana´**

***Thuja occidentalis* ´Smaragd´**

***Thuja occidentalis* ´Tiny Tin´**

***Thuja plicata* ´Zebrina´**

***Taxus baccata* – various forms**

Torreya californica

Deciduous coniferous species have a special position in the assortment:

Larix decidua

***Larix decidua* ´Diana´**

***Larix decidua* ´Fastigiata´**

***Larix decidua* ´Pendula´**

Metasequoia glyptostroboides

Taxodium distichum

***Taxodium distichum* ´Pendula´**

Obrázky

Significant solitary broad-leaved trees

In the collection gardens, arboretums and parks, there are several generally recognised most attractive woody plants. These undoubtedly include blooming taxa such as common species of magnolias, ***Magnolia* x *soulangeana, Magnolia stellata, Magnolia liliiflora***, or, conversely, rare species such as ***Magnolia grandiflora*, *Magnolia tripetala***.

At the entrance to the Ecological Educational Area, there is a scarcely spread solitary tree, ***Morus nigra*** **´Compacta´** (black mulberry – a compact cultivar). This is an interestingly growing specimen that does not produce any fruit (the blossoms are sterile).

Liriodendron tulipifera, Paulownia tomentosa, exotic dogwoods ***Cornus kousa, Cornus florida***, as well as the native species ***Cornus mas*** are also very popular in our collection plantings. Smaller trees with long-lasting and expressive blooming include ***Koelreuteria paniculata*** and pink-blooming golden rain tree (***Robinia hispida***). The most important solitary trees undoubtedly include sakura, the so-called **Japanese cherries** (***Prunus serrulata*** **´Amanogawa´**, ***Prunus serrulata*** **´Kanzan´**, ***Prunus subhirtella*** **´Pendula´** or shrub species ***Prunus triloba*** and ***Prunus tomentosa***). More robust species of attractive shrubs offer impressive blooming in different periods of spring and summer. The most spectacular include, for example, the compact cultivar of Goldfinch ***Forsythia*** ´Maluch´, the lilac varieties ***Syringa vulgaris*** and ***Syringa josikaea***, the small lilac ***Syringa meyeri*** **´Palibin´**. Abundantly blooming massive shrubs attract butterflies, such as cultivars of ***Buddleja davidii*** and the botanical species of ***Buddleja alternifolia***.

Last but not least, climbing trees such as the Chinese wisteria ***Wisteria sinensis*** and the ***Campsis radicans*** attract attention.

The representation of heathland plants in the area of the Botanical Garden of P. J. Šafárik University is merely symbolic. This is related to naturally determined climatic and soil constraints. Very attractive blooming shrubs may be seen in one place near the lower small lakes, e.g. rhododendrons (***Rhododendron sp.***), azaleas (***Azalea mollis***), pieris (***Pieris japonica***).

Obrázky