

EXOTIC USEFUL PLANTS CULTIVATED IN THE GREENHOUSE COMPLEX OF THE BOTANICAL GARDEN FROM IAȘI (NOTE II)

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Abstract: The paper presents fifty-eight different exotic species of medical interest cultivated within the Greenhouse Complex of the Botanical Garden from Iași. The classification of the species has been made according to the family, the origin, the lifetime, the type of greenhouse and the harvested part of the plant. The medicinal properties of the species known only as decorative are presented too.

Key words: medicinal plants, exotic plants, greenhouse, Botanical Garden

Introduction

In the Greenhouse Complex of the Botanical Garden from Iași are cultivated many tropical and subtropical plants with different usage. Among these, in the first paper (note) have been presented the plants used as food supplement (forty-five species).

As a results of the previous observations, this study contains information about the plants with medicinal properties, the majority being decorative.

The Phytotherapy, which has already overcome the area of popular medicine, is accepted today as an alternative therapy to the modern medicine. Lately, in our country and abroad, too, people tend to use a greater number of herbal products which contain either the herbal drugs or the extracts obtained from its.

It is a great opportunity to be able to do research, to present and inform the specialists and the visitor public about the herbs with therapeutic properties.

The exotic tropical and subtropical plants with medicinal properties are generously represented in dendro-horticultural collections.

Insufficient detailed information concerning the classification criteria, the producing technology or the breeding process especially for the exotic taxons grown in our climate conditions motivates our research.

Knowing the proven pharmacological activity we emphasized the aspect of the harvested part of the plant and the utilization of the herbal drug or the preparations obtained from its in therapy.

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Materials and methods

We have based our study research on the fifty-eight exotic tropical and subtropical plants with medicinal properties available in the collections in the Greenhouse Complex of the Botanical Garden from Iași.

The sources of the material come from international and internal exchange (seeds and cuttings) or from donations (plants and seeds).

All the species are listed in the alphabetical order of the latin names, along with information concerning: the origin, the lifetime, the type of greenhouse and the harvested part of the plant.

We presented, also, information about the uses of the herbal products, both in popular and modern medicine, in their origin area.

Results and discussions

The medical interest on the herbal products is increasing, mainly due to the frequent notes in mass-media lately.

It is considered today, in the world, that around 70% of mankind uses phytotherapy to treat most different diseases. In Romania the phytotherapy comes back up to date.

If the native plants are more or less known, the exotic plants considered mainly decorative are presented as described by foreign botanists and pharmacists.

So far it is known that out of the 200.000 species studied as medicinal herbs at least 20.000 are already researched and the list is not finished yet.

The continuing improvement of the researches in the field and even the reevaluated empiric old cures has given during the years great surprises.

Today it is known that the resin product “*Mastix*”, extract of *Pistacia lentiscus*, it is used to obtain the dental cement, and *Carica papaya* it is prescribed in intestinal worm control.

In the followings there are presented some of the medicinal uses of the studied exotic species: tonic, astringent: *Pastinaca lentiscus*; anti-diarrhoeal: *Psidium guajava*, *Opuntia ficus-indica*; antibacterial: *Hedera helix*; in pulmonary diseases: *Areca catechu*; antiviral: *Eucalyptus globulus*; for uterus contraction after birth: *Acacia nilotica*; in the nervous system diseases: *Prunus laurocerasus*, *Passiflora incarnata*; in the circulatory diseases: *Cupressus sempervirens*, *Lavandula latifolia*, *Nerium oleander*; diuretics: *Arbutus unedo*, *Camellia sinensis*, *Ruscus aculeatus*; stimulants: *Alpinia officinarum*; hallucinogens: *Lophophora williamsii*, *Ipomoea violacea*; analgesic and bactericidal in stomatology: *Syzygium aromaticum*; for the obtaining of synthetic steroidal hormones: *Dioscorea batatas*, *Agave americana*; as food (supply): *Elettaria cardamomum*, *Dioscorea bulbifera*, *Ceratonia siliqua*, *Persea americana*, *Stevia rebaudiana*, *Theobroma cacao*; antiplatelet agents: *Abrus precatorius*, *Ananas comosus*, *Myrtus communis*; laxative: *Aloë ferox*, *Ficus carica*, *Ilex aquifolium*; vitamin supplements: *Citrus limon*, *C. paradisi*, *C. reticulata*, *C. sinensis*, *Punica granatum*; in liver diseases: *Olea europaea*, *Mangifera indica*, *Oryza sativa*, *Piper nigrum*, *Carica papaya*; immunomodulators: *Saccharum officinarum*; in respiratory diseases: *Drosera rotundifolia*, *Cinnamomum camphora*.

The studied plants belong to thirty-six botanic families.

The 58 taxons with medicinal properties cultivated in the Greenhouse Complex of the Botanical Gardens from Iași (table no.1) have been systematized according to the

lifetime: trees, shrubs, sub-shrubs (41 taxons) and herbaceous plants (17 taxons), out of which 14 are perennial and 3 are annual plants.

The culture of medicinal greenhouse plants is directly influenced by the pedoclimatic conditions in which the plants have grown.

Considering the origin of the 58 taxons involved in the study and accordingly with special demandings, a cultivation repartition can be made: in cold greenhouses (24 taxons), in temperate greenhouses (14 taxons), in warm greenhouses (20 taxons).

In the first greenhouse category, during the winter-time, the temperature is between 5-12⁰C; during summer-time the temperature is maintained at 16-20⁰C.

The plants of the temperate greenhouses need in winter a temperature between 8-10° C, in summer, the temperature is 18-20° C; and the plants of the warm greenhouses need a temperature of 18-20° C in winter and 20-25° C in summer.

The plants in warm greenhouses have special demanding cultivation similar to those of the temperate greenhouses, with the distinction that the lasts need a higher humidity in the atmosphere.

In general, the plant watering is accordingly with the vegetation period meaning that it is less in the winter, more frequent in the spring and abundant in the summer (the active time). In the autumn the decreasing of watering program coincides with the slowing dawn of the vital functions, except the plants with hibernal vegetation.

During the summer-time some of the taxons (*Arbutus unedo*, *Buxus sempervirens*, *Camellia sinensis*, *Ilex aquifolium*, *Nerium oleander*) grown in flower pots or tubs are taken out in the garden, but kept away from direct sunlight.

Our own experiments have shown that the best soil mixture, for a good growth of the involved taxons in greenhouse conditions, is made out garden soil, leaves soil, coniferous soil, manure and sand (2:2:1:1:1).

Complex fertilizers NPK (solved in water, in a concentration of 0,3-0,5% - nutritive solution on the soil) have been used once a week in the summer time. Also, it is necessary to provide a good draining for the culture pots (flower ceramic pots, wooden tubs).

The multiplication of these plants as seeds and can be realized through: seeds (*Cassia fistula*, *Cassia angustifolia*, *Coffea arabica*, *Theobroma cacao*, *Eucalyptus globulus*, *Stevia rebaudiana*, *Abrus precatorius*, *Punica granatum* etc). Vegetative multiplication is possible through: cuttings (*Coffea arabica*, *Olea europaea*, *Rosmarinus officinalis*, *Passiflora incarnata*, *Piper nigrum*, *Hedera helix*, *Buxus sempervirens*, *Vanilla planifolia* etc.); suckers (*Agave americana*, *Aloë ferox*, *Elettaria cardamomum*); grafting (*Citrus limon*, *C. maxima*, *C. paradisi*, *C. reticulata*, *C. sinensis*).

The cultivation in greenhouse conditions. Some of thees plants have fructified: all species of *Citrus* sp., *Aloë barbadensis*, *A. succotrina*, *Passiflora incarnata*, *Abrus precatorius*, *Agave americana*, *Coffea arabica*, *Drosera rotundifolia*, *Opuntia ficus-indica*, *Punica granatum*, *Oryza sativa*, *Theobroma cacao*.

For each herb only the richest parts in active compounds are harvested (table no.1).

Conclusions

1. This paper presents 58 taxons of exotic plants with medicinal properties from the culture collection of the Greenhouses Complex of the Botanical Gardens from Iași.
2. The study material includes 36 botanical families. The majority (41 species) are trees, 14 are perennial herbaceous plants and 3 are annual herbaceous plants.
3. We have realized the classification of these plants, listing them in the alphabetical order of their latin names, according with their origins, the lifetime, the type of greenhouse and the harvested parts.
4. For some of the species cultivated only as decorative, there are listed its medicinal properties.
5. As the study has shown that the tropical and subtropical plants have adapted quite-well to protected spaces, meaning that they bloom and fructify.

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Cassia angustifolia Vahl



Elettaria cardamomum (L.) Maton



Olea europaea L.



Arbutus unedo L.



Ficus carica L.



Lophophora williamsii (Lem. ex Salm-Dyck) Coult



Oryza sativa L.



Rosmarinus officinalis L.



Theobroma cacao L.

Table 1
Exotic taxons having medicinal properties

Nr. crt.	Latin name	Family	Origin	Life form	Greenhouse type	Harvest edparts
1.	<i>Abrus precatorius</i> L.	Fabaceae s. l.	Africa, Asia, Central America	shrub, liane	warm	leaves, roots, whole plant, seeds
2.	<i>Acacia nilotica</i> (L.) Delile	Fabaceae s. l.	Africa, Tropical Asia	tree	temperate	leaves, fruits, bark
3.	<i>Adiantum capillus-veneris</i> L.	Adiantaceae	Tropical America	perennial	cold	fronde
4.	<i>Agave americana</i> L.	Agavaceae	Central America	perennial	temperate	leaves
5.	<i>Aloë barbadensis</i> Mill.	Liliaceae	South Europe, Canare Islands, South America	low shrub	temperate	aerian part
6.	<i>Aloë ferox</i> Mill.	Liliaceae	South Africa	tree	temperate	leaves
7.	<i>Aloë succotrina</i> Lam.	Liliaceae	South Africa	shrub	temperate	aerian part
8.	<i>Alpinia officinarum</i> Hance	Zingiberaceae	South China	perennial	warm	roots
9.	<i>Ananas comosus</i> (L.) Merr.	Bromeliaceae	Brasil	perennial	warm	leaves, stems, fruits
10.	<i>Arbutus unedo</i> L.	Ericaceae	South Europe	shrub	cold	leaves and roots
11.	<i>Areca cathechu</i> L.	Arecaceae	Malaysian arhipelago	tree	warm	leaves, fruits, seeds
12.	<i>Buxus sempervirens</i> L.	Buxaceae	Mediterranean Region	low shrub	cold	root, leaves
13.	<i>Camellia sinensis</i> (L.) Kuntze	Theaceae	Japan, China, Korea	shrub, tree	cold	leaves
14.	<i>Carica papaya</i> L.	Caricaceae	Mexic, Molluce Islands	tree	warm	fruct, whole tree
15.	<i>Cassia angustifolia</i> Vahl	Fabaceae s. l.	Tropical Africa	shrub	warm	fruits, leaves
16.	<i>Cassia fistula</i> L.	Fabaceae s. l.	Tropical Asia	tree	warm	fruits, leaves, roots
17.	<i>Ceratonia siliqua</i> L.	Fabaceae s. l.	Mediterranean Region	shrub	cold	fruits, seeds
18.	<i>Cinnamomum camphora</i> (L.) Siebold	Lauraceae	China, Japan	tree	warm	roots, whole aerian part
19.	<i>Citrus limon</i> (L.) Burm.	Rutaceae	South-East Asia	tree	cold	fruits
20.	<i>Citrus maxima</i> (Burm.) Merr.	Rutaceae	Malaysian Arhipelago	tree	cold	fruits
21.	<i>Citrus paradisi</i> Macfarl	Rutaceae	South-West Asia	tree	cold	leaves, fruits
22.	<i>Citrus reticulata</i> Blanco	Rutaceae	China, Indonezia	shrub-tree	cold	fruit
23.	<i>Citrus sinensis</i> (L.) Pers.	Rutaceae	China, Indonezia, Birmania, India	shrub	cold	fruits, leaves, flowers
24.	<i>Coffea arabica</i> L.	Rubiaceae	Tropical Africa	tree	warm	seeds
25.	<i>Cupressus sempervirens</i> L.	Cupressaceae	Mediterranean Region	tree	cold	immature cones, alive branches

26.	Dioscorea batatas Decne.	Dioscoreaceae	China, Korea, Japan	perennial herbaceous, liane	warm	buds, tubercles, seeds
27.	Dioscorea bulbifera L.	Dioscoreaceae	Tropical regions	perennial herbaceous, liane	warm	buds, tubercles, seeds
28.	Drosera rotundifolia L.	Droseraceae	Temperate Europe	perennial	cold	aerian parts
29.	Elettaria cardamomum (L.) Maton	Zingiberaceae	Sri Lanka, India	perennial	warm	seeds
30.	Eucalyptus globulus Labill.	Myrtaceae	Australia	tree	temperate	leaves
31.	Ficus carica L.	Moraceae	Mediterranean Region	shrub	cold	fruits
32.	Hedera helix L.	Araliaceae	Europa	perennial, liane, herbaceous	cold	leaves, stem
33.	Ilex aquifolium L.	Aquifoliaceae	Central Europe and the South, North Africa, West of Asia to China	shrub-tree	cold	root, leaves
34.	Ipomoea violacea L.	Convolvulaceae	Tropical America	annual grabbing	temperate	seeds
35.	Laurus nobilis L.	Lauraceae	Mediterranean Region	shrub	cold	leaves, fruits
36.	Lavandula latifolia (L.) Medik.	Lamiaceae	Mediterranean part	low shrub	temperate	flowers
37.	Lophophora williamsii (Lem. ex Salm-Dyck) Coult.	Cactaceae	S.U.A., Mexic	perennial	temperate	aerian part
38.	Mangifera indica L.	Anacardiaceae	India	tree	warm	bark, leaves, fruits, seeds
39.	Myrtus communis L.	Myrtaceae	Mediterranean Region	shrub	cold	leaves, seeds
40.	Nerium oleander L.	Apocynaceae	Mediterranean Region	shrub	cold	leaves, roots
41.	Olea europaea L.	Oleaceae	Mediterranean Region	tree	cold	leaves, fruits
42.	Opuntia ficus-indica (L.) Mill.	Cactaceae	Tropical America	shrub	temperate	flowers, fruits
43.	Oryza sativa L.	Poaceae	Indochina, Indonezia, Filipine	annual	temperate	seeds, roots
44.	Panax ginseng C.A. Meyer	Araliaceae	Far East	perennial	cold	root
45.	Passiflora incarnata L.	Passifloraceae	South Regions of U.S.A.	perennial, herbaceous, liane	temperate	aerian parts
46.	Persea americana Mill.	Lauraceae	Central America	shrub	warm	fruits, bark
47.	Piper nigrum L.	Piperaceae	Tropical India (Malabar coast)	shrub, liane	warm	fruits

48.	Pistacia lentiscus L.	Anacardiaceae	Mediterranean Region	shrub	temperate	stem
49.	Prunus laurocerasus L.	Rosaceae	South-East Europe, Middle East	shrub	cold	leaves
50.	Psidium guajava L.	Myrtaceae	Tropical America	tree	warm	seeds
51.	Punica granatum L.	Punicaceae	South and East Europe to Hymalaia	shrub-tree	cold	bark roots and stem, fruits, seeds
52.	Rosmarinus officinalis L.	Lamiaceae	Mediterranean region	low shrub	cold	leaves, blooming
53.	Ruscus aculeatus L.	Liliaceae	South Europe, North Africa	low shrub	cold	root, rhizoms
54.	Saccharum officinarum L.	Poaceae	Tropical India	perennial	warm	stem
55.	Stevia rebaudiana (Bertoni) Hemsl.	Asteraceae	Brasil, Paraguay	annual	temperate	aerian part
56.	Syzygium aromaticum (L.) Merr. et L.M.Perry (sin. Eugenia caryophyllata Thunb.)	Myrtaceae	Sonde Arhipelago, Mauritius Island, Madagascar	tree	warm	flower-buds
57.	Theobroma cacao L.	Sterculiaceae	South and Central America	shrub	warm	seeds
58.	Vanilla planifolia Andrews	Orchidaceae	Tropical America	perennial, herbaceous, lians	warm	fruits