

ORNAMENTAL PLANTS FROM THE *COMMELINACEAE* AND *PIPERACEAE* FAMILIES EXISTING IN THE GREENHOUSES OF THE BOTANICAL GARDEN "AL. BUIA" FROM CRAIOVA

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Abstract

Greenhouses of the Botanical Garden "Al. Buia" in Craiova house a varied collection of plants, belonging to numerous families. In this paper, species from the families *Commelinaceae* and *Piperaceae* are presented.

The family *Commelinaceae* includes herbaceous plants, rarely lianas, native to tropical and temperate regions of the world, except Europe. In the greenhouse, this family is represented by ornamental species of the *Callisia*, *Cyanotis* and *Tradescantia* genera.

The family *Piperaceae* comprises herbaceous plants, subshrubs or lianas, rarely trees, with simple, entire leaves, with stipules, often succulent and with small, bisexual or unisexual flowers, grouped in spikes or spadix. They are plants that grow spontaneously in tropical or subtropical areas around the world, but the greatest diversity is found in the Americas in a wide range of habitats being distributed from the southern United States of America to Chile and Argentina. In the greenhouses of the Botanical Garden this family is represented by two genera: *Piper* and *Peperomia*. In addition to the decorative effect, numerous representatives of the *Piperaceae* family are used as a food ingredient (*Piper longum*, *Piper nigrum*, *Peperomia pellucida*) and in traditional medicine to treat a wide variety of conditions: inflammatory diseases, gastrointestinal and respiratory tract disorders, acne, kidney diseases.

Therefore, disseminating information about the existing ornamental plants in the greenhouses of the Botanic Gardens on the one hand supports their botanical value and on the other hand represents another step for environmental education.

Key words: the *Commelinaceae* and *Piperaceae* families, Greenhouses, Botanical Garden, Craiova

INTRODUCTION

Preserving, valorizing and transmitting cultural heritage is one of the important missions of a botanical garden. Through the plant collections it owns, preserving the landscape style that was created, the herbarium, the museum etc., a botanical garden is an important part of the cultural, historical and economic heritage of a region (Sârbu Anca, 2001).

In the current context, an important mission of the botanical garden consists in the conservation of biodiversity. Traditionally, botanic gardens have focused especially

on *ex situ* plant conservation, giving priority both to endangered indigenous taxa and to those that come from different regions of the globe from natural habitats where they are in danger of extinction.

Promoting environmental education and collections in the direction of biodiversity conservation is an important goal for the Botanical Garden in Craiova. Thus, in this work are shown the species from the families *Commelinaceae* and *Piperaceae* from the varied collection of ornamental plants of the Greenhouses of the Botanical Garden "Al. Buia" Craiova.

The family *Commelinaceae* includes, in the greenhouse, ornamental species of the genera *Callisia*, *Cyanotis* and *Tradescantia*.

The family *Piperaceae* is represented in greenhouses by two genera: *Piper* and *Peperomia*.

MATERIALS AND METHODS

The species of ornamental plants from the families *Commelinaceae* and *Piperaceae* present in the collection of the Botanical Garden „Al. Buia” have been obtained over time from plant material (seeds or cuttings) received as part of the exchange carried out with other botanical Gardens or

institutions with similar concerns in the country and abroad. For each species from Table the updated scientific name is presented, according to the specialized literature, family, geographical distribution, life span, biological form, conservation status where appropriate (it is specified for species that are endangered in their natural habitats), and various observations.

RESULTS AND DISCUSSIONS

The species from families *Commelinaceae* and *Piperaceae* existing in the greenhouse collection of the Craiova Botanical Gardens are presented in the table below:

Species / [Family]	Geographical Distribution	LS, LF	CS	Various observations
<i>Callisia navicularis</i> (Ortgies) D. R. Hunt [Comelinaceae]	NA (Mexico)	P, subshrub		Succulent ornamental plant, by foliage or form; in natural habitats grows primarily in the desert or dry shrubland biome(s).
<i>Cyanotis somaliensis</i> C. B. Clarke [Comelinaceae]	Endemic to Somaliland in East Africa	P, subshrub		Succulent ornamental plant; in natural habitats grows primarily in the desert or dry shrubland biome(s).
<i>Tradescantia fluminensis</i> Vell. [Comelinaceae]	SA	P, E, subshrub		Ornamental plant; in natural habitats grows primarily in the wet tropical biome(s); it has environmental uses and as a medicine (Míguez Clara et al. 2022).
<i>Tradescantia pallida</i> (Rose) D. R. Hunt [Comelinaceae]	Mexico	P, subshrub		Ornamental plant; in natural habitats grows primarily in the seasonally dry tropical biome(s); it has environmental uses and as a medicine (Diazgranados et al. 2020).
<i>Tradescantia sillamontana</i> Matuda [Comelinaceae]	Endemic to northeastern Mexico.	P		Succulent and xerophytic ornamental plant; one of the most attractive species of <i>Tradescantia</i> ; in natural habitats grows primarily in dry areas; and can also be found in Europe (Spain and Italy) as a neophyte (Lafage et al. 2020).
<i>Tradescantia zanonii</i> (L.) Sw. [Comelinaceae]	Mexico, Tropical America	P, subshrub		Ornamental plant; in natural habitats grows primarily in the wet tropical biome(s); it is used

				to treat unspecified medicinal disorders and as a medicine (Diazgranados et al. 2020).
<i>Tradescantia zebrina</i> Bosse [Commelinaceae]	Mexico, CA	P		Succulent ornamental plant; It is naturalized in parts of Asia, Africa, South America, Australia, and various oceanic islands; causes contact dermatitis (Dugdale et al. 2015).
<i>Peperomia camptotricha</i> Miq. [Piperaceae]	Endemic to Mexico	P, E	VU	Ornamental plant; Herbaceous perennial, E, S or T, in natural habitats it grows mainly in humid tropical areas.
<i>Peperomia caperata</i> Yunck. [Piperaceae]	SA (Brazil)	P, E		Ornamental plant.
<i>Peperomia caperata</i> Yunck. "Red Ripple" [Piperaceae]	SA (Brazil)	P, E		Ornamental plant.
<i>Peperomia clusiifolia</i> (Jacq.) Hook. [Piperaceae]	CA, SA (Brazil); They are also found in West Indies, is endemic to Jamaica	P, E		Is an ornamental plant, is a succulent, commonly grown as a potted houseplant due to its ability to thrive indoors. In natural habitats it grows mainly in humid tropical areas.
<i>Peperomia flexicaulis</i> Wawra [Piperaceae]	Brazil	P, E		Ornamental plant.
<i>Peperomia glabella</i> (Sw.) A. Dietr. [Piperaceae]	NA (Mexico, Cuba, West India), CA, SA (Brazil)	P, E	LC	Ornamental plant; LC in Veracruz (Mexico); E or S, T; It has also been found in disturbed environments (Vergara-Rodríguez et al. 2017).
<i>Peperomia incana</i> (Haw.) A. Dietr. [Piperaceae]	Brazil	P		Herbaceous perennial, ornamental plant.
<i>Peperomia maculosa</i> (L.) Hook. "Smaragd" [Piperaceae]	CA, SA	P, E.	LC	E, T or S, in natural habitat in tropical humid, tropical semi-deciduous, humid montane, and oak forests. Notes: Edible, known as "oreja de burro" (donkey ear). Ornamental because of the large shiny leaves with white midrib. Medicinal use: treatment of erysipelas (Vergara-Rodríguez et al. 2017).
<i>Peperomia magnoliifolia</i> (Jacq.) A. Dietr. [Piperaceae]	CA, SA, NA	P, E	LC	E or T, in natural habitats in tropical humid, tropical semi-deciduous, humid montane, and oak forests. LC in Veracruz (Mexico). (Vergara-Rodríguez et al. 2017). Ornamental plant.
<i>Peperomia magnoliifolia</i> (Jacq.)	CA, SA	P, E		Ornamental plant.

A. Dietr. " <i>Variegata</i> " [Piperaceae]				
<i>Peperomia obtusifolia</i> (L.) A. Dietr. [Piperaceae]	NA, CA, SA	P, E	LC in NA	Ornamental plant; T or S, in natural habitats in tropical humid, tropical deciduous, tropical semi-deciduous, humid montane, oak, and pine-oak forests, as well as in citrus and coffee plantations and secondary forests. LC in Veracruz (Mexico). (Vergara-Rodríguez et al. 2017). It can be confused with <i>P. magnoliifolia</i> (Jacq.) A. Dietr., but has hirtose peduncles and petioles and larger and fruits (0.8-1 mm long.) (Melo et al. 2016).
<i>Peperomia rotundifolia</i> (L.) Kunth [Piperaceae]	NA (Mexico, West Indies), SA, CA, South Africa	P, E	LC	Notes: Edible; In Mexico is used as condiment. In some regions, it is known as "caminante" (walker). LC in Veracruz, Mexico (Vergara-Rodríguez et al. 2017). Ornamental plant.
<i>Peperomia scandens</i> Ruiz et Pav. [Piperaceae]	CA, SA	P		Ornamental plant.
<i>Peperomia scandens</i> Ruiz et Pav. " <i>Variegata</i> " [Piperaceae]	CA, SA (Brazil, Peru)	P		Ornamental plant.
<i>Peperomia verticillata</i> (L.) A. Dietr. [syn. <i>Peperomia rubella</i> (Haw.) Hook.] [Piperaceae]	West Indies, Endemic to Jamaica	P		Small succulent-like houseplant.
<i>Piper longum</i> L. [Piperaceae]	Indo- Malaezia	P, subshrub		Food, aromatic herb, pharmaceutical.
<i>Piper nigrum</i> L. [Piperaceae]	India	P, subshrub		Food, aromatic herb, pharmaceutical; It is cultivated for the fruit, which is usually dried and used as a spice and seasoning; Traditional medicine; Pepper oil is also used as an ayurvedic massage oil and in certain beauty and herbal treatments (Dosoky et al. 2019).

Note. LF (Life Form): E = epiphytic, LS (Life Span): P = perennial; CS (Conservation Status): VU = Vulnerable, LC = Least Concern; Geographical Distribution: NA = North America, CA = Central America, SA = South America; other abbreviations: S = saxicolous; T = terrestrial.

Family *Commelinaceae* includes herbaceous plants, rarely lianas, native to tropical and temperate regions of the world. In the greenhouses this family is

represented by the ornamental species *Callisia navicularis*, *Cyanotis somaliensis*, *Tradescantia fluminensis*, *T. pallida*, *T.*

sillamontana, *T. zanonina* and *T. zebrina* (Table).

Some species of *Tradescantia* are neophytes (*Tradescantia zebrina* and *T. sillamontana*). *T. zebrina* is classified as a Category 1b Invasive Species in South Africa, and thus may no longer be planted or propagated. This species is used as an ornamental plant, but tends to become invasive if escaped from cultivation. *T. zebrina* causes contact dermatitis. Skin irritation may result from repeated contact with or prolonged handling of the plant - particularly from the clear, watery sap - a characteristic unique to *T. zebrina* (https://en.wikipedia.org/wiki/Tradescantia_zebrina).

Family of *Piperaceae* comprises herbaceous plants, subshrubs or lianas, rarely trees, with simple, entire leaves, with stipules, often succulent, and with small, bisexual or unisexual flowers.

Are plants that grow spontaneously in tropical or subtropical areas around the world, but the greatest diversity is found in the Americas in a wide range of habitats, being distributed from the southern US to Chile and Argentina. In the Botanical Gardens greenhouses this family is represented by two genera: *Piper* and *Peperomia* (Table).

Peperomia Ruiz. et Pav. is the second largest genus in the *Piperaceae*, after the *Piper* genus. Includes about 1600 taxa (Samain et al. 2009). Many species of *Peperomia* are endemic to the Andes and Amazon regions of South America (de Figueiredo & Sazima, 2007; Frenzke et al., 2015) and some species are endemic to Mexico (Vergara-Rodríguez et al. 2017). About 45% of *Peperomia* species in Veracruz (Mexico) belong to a threatened category, mainly due to the continuous loss and fragmentation of

natural habitats (Vergara-Rodríguez et al. 2017).

By cultivating in botanical gardens, the maintenance of the species is ensured and possibly the repopulation of the natural habitats if it were to disappear from there. From the *Peperomia* species originating in Mexico, which are present in the collection of the Botanical Gardens greenhouses in Craiova, a *Peperomia camptotricha* is considered vulnerable in natural habitats, and the other species *Peperomia obtusifolia* has status of least concern in Mexico. Thus, the *ex situ* conservation of these species that are endangered in their places of origin is achieved by their culture in Botanical Garden of Craiova.

Peperomia species are commercialized for their ornamental value, but in their countries of origin many are also used in traditional medicine or as food species.

Piper longum - green pepper, was first mentioned by Hippocrate a who described this species as a medicine rather than a spice. The fruit contains a large number of compounds with pharmacological importance and wich have an anti-inflammatory, anti-obesity, cardioprotective, antifungal, coronary vasodilator role.

Piper nigrum - black pepper, also contains a multitude of bioactive compounds with potential pharmaceutical applications: antiinflammatory, antitumor, antidiarrheal, antidepressant, antioxidant etc.

CONCLUSIONS

In the plant collection of the greenhouses, family *Commelinaceae* is represented by one species of the genus *Callisia*, one species of genus *Cyanotis* and five

species of the genus *Tradescantia*. Family *Piperaceae* includes 12 species of *Peperomia*, four cultivars and two species of the genus *Piper*.

The presented taxa reproduce vegetatively and are mainly plants with ornamental value, some species also have food and pharmaceutical importance, and a few species are endangered in their natural habitats. By cultivating in botanical gardens, the maintenance of the species is ensured and possibly the repopulation of the natural habitats.

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