THE COLLECTION OF PLANTS FROM THE BROMELIACEAE FAMILY OF THE BOTANICAL GARDEN OF THE UNIVERSITY OF CRAIOVA

Sonia CRUCERU

University of Craiova, "Alexandru Buia" Botanical Garden
Str. Ctin Lecca No. 32, 200217, Craiova, Romania
Email: crucerus@yahoo.com

Abstract

Bromeliaceae are plants native to the tropical and subtropical regions of the New World, with one exception (Pitcairnia feliciana (A. Chev.) Harms & Mildbr which is native to West Africa. In America, the distribution area extends from Chile and Argentina to Brazil, Central America, the Caribbean, and the southeastern United States.

The collection of plants from the Bromeliaceae family, existing in the greenhouses of the Botanical Garden of the University of Craiova, is represented by 31 taxa belonging to the genera: Aechmea, Acanthostachys, Billbergia, Cryptanthus, Deuterocohnia, Dyckia, Guzmania, Neoregelia, Nidularium, Puyatcairnia, Vriesea, Tillandsia. Bromeliaceae are considered a very good example of adaptive radiation from mesic to xeric, from terrestrial to saxicolous or epiphytic, and from sea level to high altitude areas.

Key words: bromeliaceae, epifite, terofite saxicole

INTRODUCTION

Bromeliaceae are plants native to the tropical and subtropical regions of the New World, with one exception (*Pitcairnia feliciana* (A. Chev.) Harms & Mildbr) which is native to West Africa. In the Americas, the distribution area extends from Chile and Argentina to Brazil, Central America, the Caribbean, and the southeastern United States. The family Bromeliaceae, now included in the Order Poales, contains over 3,000 species grouped into 8 subfamilies and 78 genera. They thrive in a wide variety of habitats, including tropical forests, savannas, and deserts; they are particularly abundant in areas of high humidity such as the Amazon basin and the Andean mud forests. Many species are adapted to epiphytic growth and can be found on other plants or even buildings, others are therophytes, or saxicolous on rocks. They are monocotyledonous, herbaceous plants, sometimes very large (*Puya raimondii* Harms) or quite small, only a few centimeters. The roots are usually present, poorly developed in epiphytic taxa, stems often very short, alternate, simple, rigid leaves, sometimes spiny on the edges, generally arranged in a rosette that forms a cup where rainwater collects. The arrangement of the leaves in a rosette, in addition to the advantage of accumulating water, also allows the development of communities of insects, arachnids, frogs, etc., whose organic waste is used by the plant itself. (https://monaconatureencyclopedia.com).

The leaves are often colored, have shades of green with spots or stripes in colors such as red, yellow, white, or cream. There are species in which the leaves are covered with microscopic structures called trichomes, which absorb water and nutrients directly from the air. The inflorescences are terminal or lateral, from sessile to scapular, the flowers are brightly colored in shades of red, pink, orange, yellow and blue. Each flower has a colored bract at the base that often gives ornamental value to the plant. The flowers are grouped in spikes, racemes or panicles. Pollinators can be insects, hummingbirds or bats. The fruit is a capsule or berry with numerous feathery seeds, winged or not. This botanical family includes essentially hermaphrodite

species, but there may also be dioecious (Hechtia schottii Baker.) or monoecious (Tillandsia achyrostachzs) species. A special species is Tillandsia usneoides (L.) L. popularly called Spanish moss or old man's beard. It is distinguished by its silvery, pendulous leaves and stems, which attach to tree branches without taking nutrients from them; it is also found on stones and even on electricity cables where it forms suspended structures of 6-8m in length. It is an epiphytic species that absorbs water and nutrients through its own leaves from the air and from the rain that falls on it. (https://en.wikipedia.org).
Ecologically, bromeliads play an important role in their native ecosystems, providing habitat and food sources for a variety of organisms. They are very important in forest ecosystems, where they can serve as mini-ecosystems themselves, supporting a diverse range of invertebrates, amphibians and other small animals; they are highly valued for their ability to absorb and retain water, which can help prevent soil erosion, improve soil quality and mitigate flooding. (https:// w.w.w.botanicohub.com). A large number of species are at risk of extinction (›40%) due to the reduction of their habitat, especially tropical forests (https.//w.w.w.anjardin.info). According to IUCN (International Union for Conservation of Nature) criteria, the Bromeliaceae family has 30 species classified as endangered (CR), 94 species classified as endangered (EN), 87 species classified as vulnerable (VU) and 31 species classified as near threatened (NT).
(https://www.monaconatureencyclopedia.com)

MATERIALS AND METHODS

The collection of plants from the Bromeliaceae family is represented by 31 taxa belonging to the genera: *Aechmea*, *Acanthostachys*, *Billbergia*, *Cryptanthus*, *Deuterocohnia*, *Dyckia*, *Guzmania*, *Neoregelia*, *Nidularium*, *Pitcairnia*, *Puya*, *Vriesea*, *Tillandsia*. They are epiphytic, therophytic and saxicolous species. The existing collection was enriched with new taxa (*Aechmea gigantea* Baker, *Deuterocohnia brevifolia* (Griseb.) M.A. Spencer &L.B.Smith., *Puya mirabilis* (Mez) L.B.Sm., *Tillandsia usneoides* (L.) L. etc.), which were obtained through the exchange of seeds and plant organs with similar institutions in the country and abroad. Some of the bromeliads in the greenhouse are monocarpic, they bloom and die after forming new plants at the base, between the leaves, which they nourish until we can detach them, when they reach at least a third of the size of the mother plant and we can plant them separately. There are species that we multiply by dividing the bush, these develop more rosettes over time but there are also taxa that bloom and produce seeds through which we manage to obtain new plants (*Dyckia*, *Aechmea gigantea*, *Pitcairnia*, *Puya*).

RESULTS AND DISCUSSIONS

The greenhouses of the Botanical Garden of Craiova house a collection of plants from the Bromeliaceae family, comprising 31 taxa in 4 subfamilies and 15 genera. (Table 1.) Bromeliads are a fascinating group of plants that include epiphytes, therophytes or saxicolous plants. From the point of view of ecological requirements, bromeliads are warm and humid greenhouse plants. The optimum temperature is between 18-28^{0}C depending on the species, even in winter the temperature should not drop below 15-16^{0}C. They require moderate humidity at the substrate level, but they need high atmospheric humidity, of 80-85%. They prefer partial shade, tolerate shade well, but the color of the leaves and flowers loses its intensity. They are renowned for their striking foliage and vibrantly colored flowers, and can thrive in a variety of environments, from lush tropical forests to arid deserts, from high latitudes and altitudes to lowlands in the Neotropics. Along with orchids and other exotic plants, they can cling to trees, cling to rocks, or grow directly on the ground in forests or deserts. Many bromeliads are cultivated as ornamental plants for their colorful foliage and showy flowers. The pineapple (Ananas comosus) is the best-known member of

this family, cultivated for its fruit in tropical regions around the world. Certain species were once used by the Aztecs, Mayans, and Incas as food, medicine, and ornament in sacred ceremonies. Many have been used for centuries in folk medicine by Native Americans. More recent research confirms beneficial diuretic and respiratory effects. Extracts of some bromeliads are reported and used as anti-inflammatory, anticoagulant, and antitumor agents. Bromeliaceae are plants that bring an exotic touch to interior spaces, be they homes or offices; they decorate through the shape and color of their foliage and through the inflorescences that appear in the middle of the rosette of leaves.

Table1.

Taxon name	Subfamily	Common name	Geographical distribution	Biological form
Aechmea bromeliifolia (Rudge) Baker ex Benth. &Hook.f.	Bromelioideae		Guatemala, Belize, Columbia, Peru, Argentina	therophyte or epiphyte
Aechmea fasciata (Lindl.) Baker	Bromelioideae	silver vase	Southeast Brazil	epiphyte
Aechmea fulgens Brongn. Var.discolor (C.Morren) Brongn.ex Baker	Bromelioideae	coralberry	Notrtheast Brazil	epiphyte
Aechmea gigantea Baker	Bromelioideae		Venezuela	epiphyte
Aechmea lueddemanniana (K.Koch) Mez	Bromelioideae		Belize, Costa Rica, Guatemala, Mexic,	epiphyte
Aechmea recurvata (Klotzsch) L.B.Sm.	Bromelioideae		Brazil, Paraguay, Uruguay, Argentina	epiphyte
Aechmea weilbachii F. Dietr.	Bromelioideae		Brazilia	epiphyte
Ananas comosus (L.) Merr.	Bromelioideae	pineapple	Costa Rica, Tropical South America	therophyte
Acanthostachys strobilacea (Schult.&Schult.f.) Klotzsch	Pitcairnioideae	Pinecone Hanging Bromeliad	Brazil, Argentina, Paraguay	epiphyte
Billbergia decora Poepp.&Endl.	Bromelioideae		Western South America to northern Brazil	epiphyte
Billbergia nutans H. Wendl.	Bromelioideae	Queen's-tears	Brazil, Paraguay, Uruguay, Argentina	epiphyte
Billbergia saundersii W. Bull	Bromelioideae		Central America, Peru, Brazil, Bolivia	epiphyte
Billbergia vittata Brongn. ex C. Morel	Bromelioideae		East Brazil	epiphyte
Bromelia karatas L.	Bromelioideae		Mexic, Tropical America	therophyte
Cryptanthus acaulis (Lindl.) Beer	Bromelioideae	The earth star plant	Brazil	therophyte
Cryptanthus acaulis (Lindl.) Beer var. ruber	Bromelioideae			therophyte
Cryptanthus bahianus L.B.Sm.	Bromelioideae		Brazil	therophyte
Cryptanthus bivittatus (Hook.) Regel	Bromelioideae	Red star	Brazil, South America	therophyte
X Cryptbergia " Rubra"		Red bromelia	South America	epiphyte
Deuterocohnia brevifolia (Griseb.) M.A. Spencer&L.B.Sm.	Pitcairnioideae		Bolivia, Argentina	therophyte, saxicol
Dyckia brevifolia Baker	Pitcairnioideae	sawblade	Brazilia, America de Sud	therophyte, rheophyte
Guzmania lingulata (L.) Mez	Tillandsioideae	droophead tufted airplant or scarlet star	Southeast Mexic , Tropical America	epiphyte, saxicol
Neoregelia carolinae (Beer)L.B.Sm.	Bromelioideae	blushing bromeliad	Southeast Brazil	epiphyte
Neoregelia spectabilis (Moore)L.B.Sm.	Bromelioideae	fingernail plant	Brazil	epiphyte, therophyte
Nidularium innocentii Lem.	Bromelioideae		Brazil, Panama	epiphyte
Nidularium striatum Hort.	Bromelioideae			epiphyte
Pitcairnia pulverulenta Ruiz&Pav.	Pitcairnioideae		Peru	therophyte

Tillandsia cyanea (A.Dietr.) E.Morren	Tillandsioideae	pink quill	Ecuador, Mexic, Argentina	epiphyte
Tillandsia schiedeana Steud.	Tillandsioideae		Central America, Mexic, Columbia, Venezuela	saxicol
Tillandsia usneoides (L.)L.	Tillandsioideae	Spanish moss	Southeast USA, tropical and subtropical America	epiphyte
Vriesea splendens	Tillandsioideae	flaming sword	Venezuela, Guiana	epiphyte

CONCLUSIONS

The collection of plants from the Bromeliaceae family includes 31 taxa grouped into 15 genera and 4 subfamilies. Some of the taxa presented bloom and form fruits and seeds through which we can multiply them (*Dyckia*, *Puya*, *Pitcairnia*); in the vast majority, propagation is achieved through the shoots formed by the mother plant or by dividing the bush. The material from the collections of living plants existing in botanical gardens is important, given the fact that a large number of species are in danger of extinction due to the reduction of their living environment, especially tropical forests. Bromeliads are highly appreciated plants, which decorate with the shape and color of their foliage and with their brightly colored inflorescences, they are relatively easy to grow plants, which bring an exotic touch to interior spaces, homes or offices.

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