

A PLETHORA OF PLANTS – COLLECTIONS OF THE BOTANICAL GARDEN, FACULTY OF SCIENCE, UNIVERSITY OF ZAGREB (6): SUBFAMILY TILLANDSIOIDEAE (BROMELIACEAE)

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Sandev, D.: *Plethora of plants – collections of the Botanical Garden, Faculty of Science, University of Zagreb (6): subfamily Tillandsioideae (Bromeliaceae)* Nat. Croat., Vol. 30, No. 2, 529–548, 2021, Zagreb.

In this paper, the plant lists of Tillandsioideae, subfamily of plants from 9 genera in the bromeliad family (Bromeliaceae), grown in the Zagreb Botanical Garden of the Faculty of Science from 1892 until 2021 are studied. Synonymy, nomenclature and origin of plant material were sorted. Lists of species, grown in the last 129 years have been constructed to show that during that period at least 82 taxa from the Tillandsioideae subfamily (3 from *Catopsis*, 6 from *Guzmania*, 63 from *Tillandsia* and 10 from *Vriesea*) inhabited the Garden's collections. Today we have 73 species and cultivars from 4 genera in Tillandsioideae subfamily: 3 from *Catopsis*, 5 from *Guzmania*, 57 from *Tillandsia* and 8 from *Vriesea*.

Key words: Zagreb Botanical Garden, historic plant collections, *Tillandsia*, *Catopsis*, *Guzmania*, *Vriesea*

Sandev, D.: *Obilje bilja – zbirke Botaničkoga vrta Prirodoslovno-matematičkoga fakulteta Sveučilišta u Zagrebu (6): Zbirka potporodice Tillandsioideae (Bromeliaceae)*. Nat. Croat., Vol. 30, No. 2, 529–548, 2021, Zagreb.

U ovom članku sastavljeni su popisi vrsta iz potporodice Tillandsioideae (porodica Bromeliaceae) uzgajanih u Botaničkom vrtu zagrebačkog Prirodoslovno-matematičkoga fakulteta između 1892. i 2021. godine. Uređena je sinonimka i nomenklatura te istraženo podrijetlo biljnog materijala. Rezultati pokazuju da su tijekom 129 godina kroz zbirke Botaničkoga vrta prošle najmanje 82 svojte iz četiri roda potporodice Tillandsioideae (3 iz roda *Catopsis*, 6 iz roda *Guzmania*, 63 iz roda *Tillandsia* i 10 iz roda *Vriesea*). Od ukupno 9 rodova koji pripadaju potporodici Tillandsioideae danas uzgajamo 73 svojte iz 4 roda: 3 svojte iz roda *Catopsis*, 5 svojti iz roda *Guzmania*, 57 iz roda *Tillandsia* i 8 svojti iz roda *Vriesea*.

Ključne riječi: Botanički vrt PMF-a u Zagrebu, povijesne zbirke biljaka, *Tillandsia*, *Catopsis*, *Guzmania*, *Vriesea*

INTRODUCTION

The comprehensive investigation of plant collections in the Botanical Garden of the Faculty of Science, University of Zagreb (in further text "Botanical Garden" or "the Garden") initiated in 2012 is continuing with inventories of wild and cultivated taxa from 9 genera (*Alcantarea* (E. Morren ex Mez) Harms, *Catopsis* Griseb., *Glomero-pitcairnia* (Mez) Mez, *Guzmania* Ruiz & Pav., *Mezobromelia* L. B. Sm., *Racinaea* M. A. Spencer & L. B. Sm., *Tillandsia* L., *Vriesea* Lindl., *Werauhia* J. R. Grant) of the subfamily Tillandsioideae (family Bromeliaceae), following the principles established in the previous papers of this series (KOVAČIĆ, 2015; SANDEV *et al.*, 2018; KOVAČIĆ, 2019; STAMENKOVIĆ & KOVAČIĆ, 2020).

The bromeliad family is divided into three subfamilies: the Pitcairnioideae, the Bromelioideae and the Tillandsioideae. Tillandsioideae comprise approximately 50% of all known bromeliads, about 1520 species (GOUDA & BUTCHER, 2020). Furthermore, the IUCN *Red List of Threatened Species* holds 162 species in this subfamily in all genera but *Alcantarea*, *Catopsis* and *Glomeropitcairnia*. One way to distinguish between genera in Tillandsioideae and those of the other two subfamilies is that leaves in all species of Tillandsioideae are entire, they never have spines along the edges of the leaves (RAUH, 1979). Study of phylogenetic relationships in Tillandsioideae places *Catopsis* and *Glomeropitcairnia* within Tillandsioideae, but suggests monophyletic early divergences, perhaps before those lineages (*Guzmania*, *Mezobromelia*, *Tillandsia* and *Vriesea*) forming the subfamily core differentiated. Substantial isolation for *Catopsis* seems even more likely in the light of the seed structure, which differs from that of the other Tillandsioideae (PALACÍ, 2004). Upon capsule dehiscence, the seed hairs separate from each other to form the plumose appendage, long presumed to be adaptive for wind dispersal of the seed (MÜLLER, 1895; SZIDAT, 1922; BENZING, 1980). Persons handling Tillandsioideae seed soon learn how easily these hook-like structures on seeds adhere to rough-textured surfaces such as rock. All species in Tillandsioideae have an indumentum of radially symmetric scales. They are sparsely distributed in mesic *Tillandsia*, most *Vriesea* and all *Guzmania*, *Catopsis* and *Glomeropitcairnia* species. Trichomes are dense in xeric *Tillandsia* and a few in *Vriesea* species. Subfamily Tillandsioideae and its largest genus *Tillandsia* was named by Linnaeus in 1753 after the Swedish-born physician, doctor and botanist in Finland Elias Tillandz (1640 – 1693). It is an **epiphytic**, growing and rooting on a plant surface, primarily without additional substrate; **terrestrial**, growing on the ground and rooting into the substrate; saxicolous, growing on the ground and rooting into the shallow substrate accumulated between rocks or in crevices and **lithophytic**, growing and rooting on a bare rock surface, primarily without additional substrate. All Tillandsioideae, except for those that originate in the southern parts of the USA, come from Latin America. Although the majority of species flourish in mesic habitats some of the most popular species proliferate in xeric (dry or arid) environments. In our Garden's collections, all are sown, grown, overwintered and permanently planted indoors, sometimes during summer outdoors, protected against theft in glass showcases (Photo-tab. 1, 1a). Most of the samples in our collections were obtained through the *Index Seminum* network of inter-botanic-garden seed and plant exchange or received as gifts as living plants from private collections from our colleagues and visitors. Currently, there are 4 genera in the collection in Botanical Garden from 9 totally described in the Tillandsioideae subfamily. This article is based on species in these 4 genera: *Catopsis*, *Guzmania*, *Tillandsia* and *Vriesea*.

Genus *Catopsis*

The genus *Catopsis* was established in 1864 by German botanist and phytogeographer August Grisebach as being separate from *Tillandsia* (RAUH, 1979). The genus name is from the Greek "kata" (hanging down) and "opsis" (appearance). Members of the genus *Catopsis* are obligate epiphytic herbs, distributed throughout Central America, southern Mexico, the Caribbean, and northern South America. The genus has traditionally been placed in the subfamily Tillandsioideae (SMITH & DOWNS, 1977) based on the presence of simple, entire, neither thorny nor dentate leaves, superior ovary, capsular fruits, and seeds with a plumose appendage. The placement of *Catop-*

sis in Tillandsioideae is supported by cladistic analysis of chloroplast DNA sequences (Terry et al., 1997; Horres et al., 2000). Within Tillandsioideae, seed morphology has been a major feature in distinguishing *Catopsis* from related genera (SMITH & DOWNS, 1977). The appendage of numerous hairs or coma is said to be "apical" in the capsule. In most non-*Catopsis* members of Tillandsioideae (i.e., *Guzmania*, *Mezobromelia*, *Tillandsia*, *Vriesea*) the seed appendage is positioned toward the base of the capsule.

Nutrient stocks accessible to arboreal flora originate from the atmosphere and the soil. Availability to resident Bromeliaceae depends largely on the capacity of these plants, which varies among species, to utilize leachates, certain animal products or prey. Opportunities for the individual bromeliad may be limited, but some Bromeliaceae use a pitfall trap. Three species of bromeliads considered to be protocarnivorous: *Catopsis berteroniana* (Schult. & Schult. f.) Mez, *Brocchinia reducta* Baker and *B. hectioides* Mez. Protocarnivores are those plants that capture animals with less specialized foliage than the leaf traps in carnivorous plants. *Catopsis berteroniana* is a heliophilic plant that ranges from southern Florida to southeastern Brazil, reputedly depending more on animal than plant biomass for nutrients (FISH, 1976). Its shoots differ from those of most of the similar species by their more upright stature, yellow color, and the presence of a copious, friable, epicuticle. Wax-coated leaves are covered with white waxy powder. One possible function of this coating is to capture insects. Those that fall into the rosette are unable to climb the slippery leaves, but they can exit if the white powder is removed (WARD, 1979). Tanks contained relatively more animal remains and less litter than those of the other co-occurring phytotelm bromeliads located in similarly exposed microsites. Unlike *Brocchinia reducta*, which has been proven to produce at least one digestive enzyme and can therefore be considered carnivorous, there is little evidence to support the claims that the epiphytic *C. berteroniana* is carnivorous. It is able to attract and kill prey and the trichomes on the surface of the leaves can absorb nutrients, but so far no enzyme activity has been detected. It may be that this plant also relies on an internal food web for soft tissue digestion. (FRANK & O'MEARA, 1984; BENZING *et al.*, 1976).

Genus *Guzmania*

The genus *Guzmania* was established in the year 1802 by the Spanish botanists Hipólito Ruiz and José Antonio Pavón and was named after the Spanish pharmacist and naturalist Anastasio Guzman. Ruiz and Pavón use to work with Guzman's friend and botanist Juan Tafalla in Peru from 1785 to 1788. Tafalla must have suggested the name for this genus to Ruiz and Pavón, as it is unlikely that they ever met Guzmán (JØRGENSEN & LEÓN, 1999). Checked in July 2021 on the Gouda and Butcher List of Accepted Bromeliaceae Names there are 215 species in the genus *Guzmania*. Mostly epiphytic, some of the larger species can survive as terrestrials in their native habitat. The major growing habitat is in humid forests and can be found from sea level to mountain areas of 3000 m or more. Some species are found in Florida, but the most guzmanias growing habitat is in the highlands of Colombia and southwards to western Brazil. The genus *Guzmania* with its entire, spineless leaves make those plants desirable for growers and nurseries and play an important role as trade plants (Phototab. 1, 1f). For the plant fancier and flower fan, *Guzmania* is of special interest since many species possess beautifully colored flowers and bracts or decoratively marked leaves. By their nature they have softer leaves than the related Tillandsioideae and more attention to warmth, humidity and shade is required for them (RAUH, 1970).

Genus *Tillandsia*

The genus *Tillandsia* is a largest genus, not just in the subfamily Tillandsioideae but in the whole family Bromeliaceae, comprising 761 species (GOUDA & BUTCHER, 2021). Even today, more species are being discovered in remote corners of South America as dedicated researchers and enthusiasts seek them out. They are found throughout South America from Argentina to Venezuela and Colombia, in Central America from Panama to Mexico and the West Indies. They grow in tropical and subtropical regions, in cool mountain forests, in dry areas and in constant moist rain forests. They vary in size from a few centimetres (*Tillandsia bryoides* Griseb. ex Baker, *T. tricholepis* Baker) to about 4 meters in height (*T. grandis* Schltdl.) and may be found in all sorts of locations in the wild, from sea level to high altitudes, growing in sand, on rocks, cliff faces, tree trunks and branches, or on desert cacti. Those that grow in the hot, dry regions can have greyish, green or reddish foliage and are covered with a silvery scale. The soft, green-leaf species live high in tree tops in cool and humid rainforests or semi-open woods. Spanish moss (*Tillandsia usneoides* (L.) L., Photo-tab. 1, 3g) holds the record for the bromeliad with the greatest area colonized and longest range of dispersal, hence, not surprisingly, are the species with the most varied uses such as in medicinal utilities or fiber production. Scales or petal hairs are very important structures for genus recognition and as a key for the ecological and evolutionary features of the Bromeliaceae family (BENZING, 2000). Genus *Tillandsia*, in contrast to the closely related genus *Vriesea*, has no scales at the base of petals (RAUH, 1970).

The neotropical genus *Tillandsia* traditionally has been divided into six subgenera: *Allardtia* (A. Dietrich) Baker, *Anoplophytum* (Beer) Baker, *Diaphoranthema* (Beer) Baker, *Phytarrhiza* (Visiani) Baker, *Pseudalcantarea* Mez, and *Tillandsia* L. These groups are mainly distinguished by floral characters such as inserted versus exerted stamens, style length, and the shape of petals and leaves (SMITH & DOWNS, 1977). Several authors have recognized the need for the critical revision of these subgenera and finally BURFUSS *et al.* (2016) proposed a taxonomic revision at the tribal, subtribal, generic and partly subgeneric levels based on new or re-evaluated morphological and more variable DNA sequence data. According to them, the genus *Tillandsia* consists of seven subgenera (*Aerobia* Mez, *Anoplophytum*, *Diaphoranthema*, *Phytarrhiza*, *Pseudovriesea* Barfuss & W. Till, *Tillandsia*, *Viridantha* (Espejo) W. Till & Barfuss). The new subgenera, *Tillandsia* subg. *Pseudovriesea* and *T.* subg. *Viridantha* have been established, *T.* subg. *Aerobia* has been resurrected and *T.* subg. *Allardtia* has become a synonym of *T.* subg. *Tillandsia*.

IUCN *Red List of Threatened Species* holds 72 *Tillandsia* species from which we have 8 species in our collection. *T. umbellata* André is listed as endangered (EN), two are near threatened (NT), while the rest are listed as of low concern (LC) (Tab. 1).

Genus *Vriesea*

The genus *Vriesea* was established in 1843 by English botanist John Lindley and named in honor of Dutch professor of botany Willem Hendrik de Vriese. In their native habitat they extend from Central Mexico in the north to as far as Argentina, although they are mainly concentrated in Brazil. The number of known species cannot be stated exactly because of two main reasons: 1) new species are constantly being discovered; 2) research on living plants causes constant reassessment of the

taxonomy. Many tillandsias have to be assigned to the genus *Vriesea* because of the presence of scales at the base of the petals. Taxonomic discussion of the genus in recent decades has concentrated on the value of these appendages for distinguishing *Vriesea* and *Tillandsia* (SMITH & DOWNS, 1977). However, the use of this feature has been criticized by GRANT (1993) who proposed that 26 xerophytic taxa of *Vriesea* should be transferred to the genus *Tillandsia*. This point of view has not been widely accepted although phylogenetic analyses of Tillandsioideae by BARFUSS *et al.* (2005, 2016) partially corroborated the taxonomic changes proposed by Grant. Therefore, the greatest enigma concerns the actual number of species placed in *Vriesea* ranging from ca. 280 to 352 (GOMES-DA-SILVA *et al.*, 2012; GOVAERTS *et al.*, 2012). Some other authors like GAUDA & BUCHER (2021) made a list based on the database used for the 'Encyclopedia of Bromeliads' and it is updated on a daily basis. According to their list there are 231 *Vriesea* species today. The taxonomic delimitation of *Vriesea* is challenging because several diagnostic traits of the genus are shared with other genera in Tillandsioideae. The genus has no unique morphological features that distinguish it from other taxa. Earlier phylogenetic studies suggested a polyphyletic status for this genus, but taxon sampling was limited, and tests of congruence for morphological characters have not yet been performed. Taxonomic problems in *Vriesea* are genuinely complex, highlighting the requirement of phylogenetic analyses. Phylogenetic trees provide a basis for classification that reflects evolutionary relationships, but nevertheless some lineages have a complex evolutionary history (GOMES-DA-SILVA & SOUZA-CHIES, 2018). Their results allow them to provide a preliminary framework with which to revisit *Vriesea*. Their study represents the most comprehensive phylogenetic analysis with the synapomorphies and distinct geographical distribution of *Vriesea* to establish a newly proposed classification for the genus. Among the about 280 subspecies described in the genus *Vriesea* until 2012 (GOMES-DA-SILVA *et al.*, 2012) 42 taxa (39 species and three varieties) of xeric habit were excluded from *Vriesea* and included in *Tillandsia* species. The complete list of taxa for this lineage is given in Supporting Information Appendix S6 and *Vriesea* comprises 214 species (GOMES-DA-SILVA & SOUZA-CHIES, 2018).

MATERIAL AND METHOD

As explained in our previous papers (e.g., KOVAČIĆ, 2015), the main sources used for constructing the lists of individual plant groups growing in our Botanical Garden are the published records on the historic collections from the late 19th century, and our central database of plants, established in the late 1940s. The initial part of this study is based on the papers of HEINZ (1895–1896), who is imprecise in stating the details in the Garden inventory. After that, quite poor evidence on the genera in focus, there is a gap of more than 50 years during which the data on our collections are missing – until recent records were founded after WWII, and since then systematically gathered (details in KOVAČIĆ, 2015; BUDISAVLJEVIĆ & KOVAČIĆ, 2020). To make the inventory lists of Tillandsioideae as simple as possible, the data are arranged in one table consisting of the inventories from our card database (Tab. 1). Each entry is accompanied with data on the sample origin and date of acquisition, as well as the original notes from the database. Due to the immense synonymy, the table is designed according to the currently valid nomenclature of the *World Flora Online* (<http://www.worldfloraonline.org/>) database and compared with nomenclature of the *Plants of the World Online* (<http://www.plantsoftheworldonline.org>) launched in

March 2017 by the Royal Botanic Gardens, Kew. However, to preserve the historic plant names, column 6 (“Arrived as”) in the table contain the entries by which the specimens were originally recorded/arrived in our collection (Tab. 1).

RESULTS AND DISCUSSION

According to the earliest sources (HEINZ, 1895–1896), in the late 19th century only the family Bromeliaceae with genera *Tillandsia* and *Vriesea* are mentioned in our Botanical Garden, but without any details which species were planted or where they originated from.

Our post-WWII database provides much more information, although again some entries are rather meagre (Tab. 1).

Genus *Catopsis*

The genus *Catopsis* is not well represented in the Botanical Garden since the beginnings. This is a pity, as the plants, while not particularly striking, possess a quiet charm and simple elegance. Zero species in the collection were enlarged to 3 taxa of this attractive genus. The first plant species *Catopsis floribunda* L. B. Sm. was registered in our collection in 2018 and the taxon was given as present plant from the Botanical Garden in Vienna. Since then the Botanical Garden collection has acquired two more species from the genus *Catopsis* (Tab. 1). One sample arrived to the Garden via *Index Seminum* network, and another one was bought in a nursery. It is obvious that this is just start, but considering that there are just 21 registered species of genus *Catopsis* (accepted by the *World Flora Online*), the Botanical Garden has 14.3% of world species from this genus. Although some of the plant species that arrived in the Garden via the *Index Seminum* network listed as ‘pure species’ could have been hybrids or horticultural varieties, this could not happen with the genus *Catopsis*. This genus does not form any cultivars or hybrids, so even species that could be found in nurseries are ‘pure species’ (<https://registry.bsi.org/?genus=CATOPSIS>).

Genus *Guzmania*

Most of the samples in the genus *Guzmania* arrived in the Garden via the *Index Seminum* network, except one that was bought in a nursery as a living plant. As Tab. 1 shows, since WWII, according to the recent nomenclature, we have grown only 6 taxa of *Guzmania*, while one of them *G. fastuosa* (Andre) Mez. has even belonged to genus *Mezobromelia* since 1993 (GRANT, 1993). According to Derek Butcher at *Bromeliad Society International* (<https://www.bsi.org/new/key-to-the-genera-of-bromeliaceae/>) the only morphological differences between genus *Guzmania* and *Mezobromelia* is in petal bases bearing appendages (*Mezobromelia*) or being naked (*Guzmania*). Furthermore, recently, the circumscriptions for most of the Tillandsioideae (except *Catopsis* and *Glomeropitcairnia*) are not clear because morphological characters used for separation are of questionable diagnostic utility, e.g. spiral vs. distichous arrangement of the flowers, various connotations of the corolla tube and especially, presence vs. absence of petal appendages (BARFUSS *et al.*, 2005). In addition the transfer of species from *Guzmania* to *Mezobromelia* (UTLEY & LUTHER, 1991), from *Tillandsia* to *Guzmania* (RAUH, 1991), to *Mezobromelia* (WEBER & SMITH, 1983), and to *Racinaea* (GRANT, 1993; SPENCER & SMITH, 1993) etc., demonstrate the unreliability of the current morphologically based taxonomy. *Mezobromelia capituligera* (Griseb.) J. R. Grant (which arrived as

Guzmania fastuosa (André Mez) was last recorded in the collection in 1968, long before all these molecular researches started. From all of the above, it is hard to say if the Garden has ever had this specific species in its collection, which is why the genus *Mezobromelia* is not mentioned separately in this paper.

Genus *Tillandsia*

According to the old (SMITH & DOWNS, 1977) and recent nomenclature of taxa in subgenera (BARFUSS *et al.*, 2016) we grew and we are still growing at least some taxa from all established subgenera in the genus *Tillandsia* (for comparison see Tab. 2).

Post-WWII, or more precisely since 1970, when the first species in the genus *Tillandsia*, (*T. usneoides*; Photo-tab. 1, 3g) was registered in our Garden collection 63 different species and cultivars have been grown in our collection, while today we have 57 taxa. Ten of the specimens were grown (9 from seeds and one as a living plant) from samples taken in the wild (Tab. 1). Furthermore, recent research (BARFUSS *et al.*, 2016) has shown that six taxa from our collection are excluded from genus *Tillandsia* in other genus (Tab. 1) and some new species are discovered.

According to available data, the first bigger entry (seven species) in our collection was in 1973, introduced by dr. sc. Sala Ungar (manager of the Garden) from the Botanical Garden of Halle (Germany) as *plantae vivae*. Only one species (*T. tricolor* Schltdl. & Cham., which came wrongly named as *T. ionantha* Planch.; Photo-tab. 1., 2i) is still being grown in the garden collection today. It seems that wrong determination of tillandsias, followed by inadequately specific conditions for growing of each species resulted in a low survival rate. During the following decades the collection of tillandsias remained small in number of taxa and of specimens: essentially we grew only one taxon bought from nursery (still alive today) and a few ordered as *planta viva* via *Index Seminum* publications (none that survived longer than a few years). It seems that conditions for growing tillandsias were still not optimal (poor ventilation system in tropical greenhouse) from the 1990s, until in 2018 we decided to enlarge the number of taxa of this attractive genus and we found new place for growing this specific group of plant (Photo-tab. 1, 1abc).

More than 60 species and cultivars were ordered between 2018 and 2020 via *Index Seminum*-network or were mostly donated from tillandsia lovers and collectors. Some of the plants already flowered (Photo-tab. 1, 1dfgh, 2ahij, 3ah), some of them have just been put on the soil for germination and some new taxa will be added occasionally.

Morphological-ecological adaptations that could be subsequently used for taxonomic circumscriptions and breeding conditions are presented as lifestyle (habitat) in Tab. 2. These data with supplementary data of water, ventilation and light requirement (not shown in this paper) are key factors for successful breeding of this species.

Genus *Vriesea*

Since 1964, we can track most of the entries of specimens in our collection ordered via *Index Seminum*-network mostly as seeds (nine entries) and one as living plant (two from nursery). As seen in Tab. 1, during the investigated time we lost two species, *Vriesea amazonica* (Baker) Mez and *Vriesea imperialis* Carrière (Tab. 1). Furthermore, some authors made taxonomic changes in the genus *Vriesea* which resulted in its segregation into new genera (BARFUSS *et al.*, 2016). GOMEZ-DA SILVA & SOUZA-CHIES (2018) said that 'a good genus' should be monophyletic, stable and predictable, three prop-

Tab. 1. Species in the subfamily Tillandsioideae according to *The World Flora Online* grown in the Zagreb Botanical Garden of the Faculty of Science from 1951 to 2021.

Scientific name (Nomenclature acc. to World Flora Online)	Origin (botanical garden, city, nursery)	Year of obtaining	Last re-recorded	Origin of seeds/plant	Arrived as	Notes in the original inventory-card	Nomenclature acc. to Plants of the World Online – KEW	The IUCN Red List of Threatened Species 2019
<i>Catopsis floribunda</i> L. B. Sm.	Wien-WU	2018	2021		arrived as Planta Viva	gift from BG Wien	valid	
<i>Catopsis juncifolia</i> Mez & Wrecklé	Klagenfurt	2020	2021				valid	
<i>Catopsis morreniana</i> Mez	Nursery	2018	2021		arrived as Planta Viva		valid	
<i>Guzmania acorifolia</i> (Griseb.) Mez	Wien- WU	2020	2021				valid	
<i>Guzmania lingulata</i> (L.) Mez hort. (Photo-tab 1, 1f)	Nursery	2010	2021		arrived as Planta Viva		valid	
<i>Guzmania monostachia</i> (L.) Rusby ex Mez	Muenchen	2020	2021				valid	
<i>Guzmania mucronata</i> (Griseb.) Mez	Wien- WU	2020	2021				valid	
<i>Guzmania wittmackii</i> (André) André ex Mez	Muenchen	2020	2021				valid	
<i>Mezobromelia capituligera</i> (Griseb.) J. R. Grant	Lenjingrad	1958	1968		<i>Guzmania fastuosa</i> (André) Mez		<i>Cipuropis capituligera</i> (Griseb.) Christenh. & Byng	
<i>Tillandsia albertiana</i> Verv.	Linz	2019	2021				valid	
<i>Tillandsia anceps</i> Lodd.	Klagenfurt	2019	2021	French Guiana			<i>Wallisia anceps</i> (G. Lodd.) Barfuss & W. Till	
<i>Tillandsia andreaea</i> E. Morren ex André (Photo-tab 1, 2d)	Nursery (Germany)	2020	2021				valid	
<i>Tillandsia argentea</i> Griseb. (Photo-tab 1, 2b)	Linz	2019	2021				valid	
<i>Tillandsia baileyi</i> Rose ex Small	Klagenfurt	2019	2021	Mexico			valid	
<i>Tillandsia bartramii</i> Elliott	Muenchen	2020	2021				valid	
<i>Tillandsia bergeri</i> Mez (Photo-tab 1, 2f)	from private collection	2016	2021		arrived as Planta Viva	gift from Mr. Drago Greguričević collection	valid	
	from private collection	2021	2021		arrived as Planta Viva	gift from Mr. Bojan & Mrs. Emica Mesaroš collection	valid	
<i>Tillandsia bulbosa</i> Hook. (Photo-tab 1, 2g)	Halle	1973	1991		arrived as Planta Viva	brought by Dr Sala Ungar	valid	
	Linz	2019	2021		arrived as Planta Viva		valid	
	Ulm	2019	2021		arrived as Planta Viva		valid	

Scientific name (Nomenclature acc. to World Flora Online)	Origin (botanical garden, city, nursery)	Year of obtaining	Last recorded	Origin of seeds/plant	Arrived as	Notes in the original inventory-card	Nomenclature acc. to Plants of the World Online – KEW	The IUCN Red List of Threatened Species 2019
<i>Tillandsia buttle-marxii</i> Ehlers	from private collection	2019	2021		arrived as Planta Viva	gift from Mr. Ivan Džapo collection	invalid – name of plant species exist only in Tropicos and IPNI botanical data base	
<i>Tillandsia butzii</i> Mez	Halle	1973	1978		arrived as Planta Viva	brought by Dr Sala Ungar	valid	
	Berlin	2011	2019		arrived as Planta Viva			
	Gent	2019	2021					
	Muenchen	2020	2021					
<i>Tillandsia capillaris</i> Ruiz & Pav. (Photo-tab 1, 2a)	from private collection	2020	2021		arrived as Planta Viva	gift from Mr. I. Džapo collection	valid	Least Concern
	Linz	2019	2021		arrived as Planta Viva			
<i>T. capillaris</i> f. <i>cordobensis</i> (Hieron.) L. B. Sm.	Linz	2019	2021		arrived as Planta Viva		<i>Tillandsia virescens</i> Ruiz & Pav.	
<i>Tillandsia capillaris</i> f. <i>hieronymi</i> (Mez) L. B. Sm.	Berlin	2018	2019		arrived as Planta Viva		<i>T. capillaris</i> Ruiz & Pav.	
	Berlin	2019	2021		arrived as Planta Viva			
<i>Tillandsia capillaris</i> f. <i>virescens</i> (Hieron.) L. B. Sm.	from private collection	2020	2021		arrived as Planta Viva	gift from Mr. I. Džapo collection	valid	
<i>Tillandsia caput-medusae</i> E. Morren	Nursery	2019	2021		arrived as Planta Viva	Bought in nursery Flora		
	from private collection	2019	2021		arrived as Planta Viva	gift from Mr. Leon Božić & Mr. Tomislav Štrkalj collection	valid	
	Nursery (Germany)	2020	2021		arrived as Planta Viva			
<i>Tillandsia cardenasii</i> L. B. Sm.	Linz	2019	2021			name does not exist on World Flora Online	valid	Near Threatened
<i>Tillandsia chapalillaensis</i> Ehlers & Lautner	Wien	2020	2021	Mexico			valid	
<i>Tillandsia chapalillaensis</i> Ehlers & Lautner x ?	Wien	2020	2021	Mexico		unknown other parent <i>T. stricta</i> x <i>T. recurvifolia</i> ;		
<i>Tillandsia</i> 'Cotton Candy' (Photo-tab 1, 2c)	from private collection	2020	2021			gift from Mr. L. Božić & T. Štrkalj collection		

Scientific name (Nomenclature acc. to World Flora Online)	Origin (botanical garden, city, nursery)	Year of obtaining	Last recorded	Origin of seeds/plant	Arrived as	Notes in the original inventory-card	Nomenclature acc. to Plants of the World Online – KEW	The IUCN Red List of Threatened Species 2019
<i>Tillandsia crocata</i> (E. Morren) N. E. Br. (Photo-tab 1, 2h)	Linz	2019	2021		arrived as Planta Viva		valid	
<i>Tillandsia cyanea</i> Linden ex K. Koch	Nursery Halle	2003 1973	2021 1977		arrived as Planta Viva arrived as Planta Viva	arrived as Planta Viva brought by Dr. Sala Ungar	name with this authors does not exist	Near Threatened
<i>Tillandsia disticha</i> Kunth	Linz	2019	2021			gift from Mr. I. Džapo collection	valid	
<i>Tillandsia duratii</i> Vis. (Photo-tab 1, 3a)	from private collection	2019	2021		arrived as Planta Viva		valid	
<i>Tillandsia fendleri</i> Griseb. (Photo-tab 1, 1e)	Beč	2018	2021		arrived as Planta Viva		valid	Least Concern
<i>Tillandsia funkiana</i> Baker (Photo-tab 1, 3)	from private collection	2020	2021		arrived as Planta Viva	gift from Mr. I. Džapo collection	T. andreana E. Morren ex André	
<i>Tillandsia grandis</i> Schtdl.	Ulm	2019	2021				Pseudalcantarea grandis (Schtdl.) Pinzón & Barfuss	
<i>Tillandsia harrisi</i> Ehlers	Nursery	2019	2021		arrived as Planta Viva		valid	
<i>Tillandsia hildae</i> Rauh (Photo-tab 1, 1f)	from private collection	2020	2021		arrived as Planta Viva	gift from Mr. I. Džapo collection	valid	
<i>Tillandsia humilis</i> C. Presl (Photo-tab 1, 3c)	Linz	2019	2021		arrived as Planta Viva		valid	
<i>Tillandsia insularis</i> Mez	Muenchen	2020	2021		Racinaea insularis (Mez) M. A. Spencer & L. B. Sm.		Racinaea insularis (Mez) M. A. Spencer & L. B. Sm.	Least Concern
<i>Tillandsia ionantha</i> Planch. (Photo-tab 1, 2i)	unknown from private collection	unknown 2019	1984 2021		arrived as Planta Viva	gift from Mr. L. Božić & Mr. T. Štrkalj collection	valid	Least Concern
<i>Tillandsia ionantha</i> Planch. cult.	from private collection	2019	2021		arrived as Planta Viva	gift from Mr. L. Božić & Mr. T. Štrkalj collection		
<i>Tillandsia ixioides</i> Griseb. (Photo-tab 1, 3h)	from private collection	2020	2021		arrived as Planta Viva	gift from Mr. I. Džapo collection	valid	

Scientific name (Nomenclature acc. to World Flora Online)	Origin (botanical garden, city, nursery)	Year of obtaining	Last recorded	Origin of seeds/plant	Arrived as	Notes in the original inventory-card	Nomenclature acc. to Plants of the World Online – KEW	The IUCN Red List of Threatened Species 2019
<i>Tillandsia juncunda</i> A. Cast. (Photo-tab 1, 2f)	Linz	2019	2021		arrived as Planta Viva		valid	
<i>Tillandsia juncea</i> (Ruiz & Pav.) Poir.	Berlin from private collection	2017	2019		arrived as Planta Viva			
	Klagenfurt	2019	2021		arrived as Planta Viva		valid	
	Berlin	2019	2021	Mexico	arrived as Planta Viva			
<i>Tillandsia karwinskyana</i> Schult. & Schult. f.	Berlin	2019	2021		arrived as Planta Viva		valid	
<i>Tillandsia kirschmekii</i> Rauh (Photo-tab 1, 3d)	from private collection	2020	2021		arrived as Planta Viva	gift from Mr. I. Džapo collection	valid	
<i>Tillandsia laxissima</i> Mez	Wien	2020	2021	Mexico			<i>Barfussia laxissima</i> (Mez) Manzan. & W. Till	
<i>Tillandsia leiboldiana</i> Schltld.	Magdeburg	2020	2021				valid	
<i>Tillandsia loliacea</i> Mart. ex Schult. & Schult. f. (Photo-tab 1, 3e)	from private collection	2020	2021		arrived as Planta Viva	gift from Mr. I. Džapo collection	valid	
<i>Tillandsia malleomontii</i> Glaz. ex Mez	Berlin	2011	2011		arrived as Planta Viva		valid	
	Berlin	2018	2019		arrived as Planta Viva			
	Klagenfurt	2019	2021				valid	
	Klagenfurt	2020	2021				valid	
<i>Tillandsia paleacea</i> C. Presl (large forma)	from private collection	2020	2021		arrived as Planta Viva	gift from Mr. I. Džapo collection	valid	
<i>Tillandsia paleacea</i> C. Presl (small forma)	from private collection	2020	2021		arrived as Planta Viva	gift from Mr. I. Džapo collection	valid	
<i>Tillandsia permutata</i> A. Cast. x <i>Tillandsia retorta</i> Griseb. ex Baker	Wien-WU	2018	?					
<i>Tillandsia polystachia</i> (L.) L.	Klagenfurt	2019	2021	Mexico			valid	
	Klagenfurt	2020	2021	Mexico				
<i>Tillandsia pruinosa</i> Sw.	Linz	2020	2021			sample No 1	valid	
<i>Tillandsia remoides</i>	Halle	1973	1979		arrived as Planta Viva	incorrect name; brought by Dr Sala Ungar	species name does not exist	
<i>Tillandsia remota</i> Wittm.	Klagenfurt	2019	2021				valid	
<i>Tillandsia retorta</i> Griseb. ex Baker (Photo-tab 1, 3b)	from private collection	2020	2021		arrived as Planta Viva	gift from Mr. I. Džapo collection	valid	

Scientific name (Nomenclature acc. to World Flora Online)	Origin (botanical garden, city, nursery)	Year of obtaining	Last recorded	Origin of seeds/plant	Arrived as	Notes in the original inventory-card	Nomenclature acc. to Plants of the World Online – KEW	The IUCN Red List of Threatened Species 2019
Tillandsia schiedeana Steud.	Klagenfurt	2019	2021	Mexico				
	Rostock	2019	2021				valid	
	Stuttgart	2020	2021					
	Linz	2020	2021					
Tillandsia stellifera L. Hrom. (Photo-tab 1, 3f)	from private collection	2020	2021		arrived as Planta Viva	gift from Mr. I. Džapo collection	valid	
Tillandsia tectorum E. Morren cult. (Photo-tab 1, 2e)	Nursery (Germany)	2020	2021		arrived as Planta Viva; arrived as 'Snow' cultivar but this cult. doesn't exist on list of accepted cultivars			
	Linz	2019	2021		arrived as Planta Viva		valid	
Tillandsia tortilis Baker	Halle	1973	1978		arrived as Planta Viva	brought by Dr. Sala Ungar		
	Berlin	2018	2019		arrived as Planta Viva			
	Berlin	2019	2021		arrived as Planta Viva		valid	
	from private collection	2020	2021		arrived as Planta Viva	gift from Mr. I. Džapo collection		
	Linz	2019	2021		arrived as Planta Viva	arrived as Planta Viva		
Tillandsia tricolor Schltdl. & Cham. (Photo-tab 1, 1g)	from private collection	2019	2021		T. melanocrater;	gift from Mr. L. Božić & Mr. T. Štrkalj collection		
	Halle	1973	2021		T. ionantha; arrived as Planta Viva	brought by Dr. Sala Ungar	valid	
Tillandsia umbellata André	Wien-WU	2018	2021	Ecuador	arrived as Planta Viva	arrived as Planta Viva	Wallisia lindeniana (Regel) E. Morren	Endangered
	Szeged	1971	1978					
Tillandsia usneoides (L.) L. (Photo-tab 1, 3g)	Szeged	1973	1978					
	Szeged	1970	1977					
	Szeged	nn	1978					
	Rim	1991	2005		arrived as Planta Viva			
	Budapest	2017	2017		arrived as Planta Viva			
	Berlin	2018	2019		arrived as Planta Viva		valid	Least Concern
from private collection	2019	2021		arrived as Planta Viva	arrived as Planta Viva	gift from Mr. L. Božić & Mr. T. Štrkalj collection		

Scientific name (Nomenclature acc. to World Flora Online)	Origin (botanical garden, city, nursery)	Year of obtaining	Last recorded	Origin of seeds/ plant	Arrived as	Notes in the original inventory-card	Nomenclature acc. to Plants of the World Online – KEW	The IUCN Red List of Threatened Species 2019
<i>Tillandsia usneoides</i> (L.) L. 'Major'	Berlin	2018	2019		arrived as Planta Viva			
<i>Tillandsia usneoides</i> (L.) L. 'Minor'	Berlin	2018	2021		arrived as Planta Viva			
<i>Tillandsia velutina</i> Ehlers	from private collection	2020	2021		arrived as Planta Viva	gift from Ivan (ZOO) collection	valid	
<i>Tillandsia viridiflora</i> (Beer) Baker	Halle	1973	1988		arrived as Planta Viva	sold – can not be checked correctly; brought by Dr. Sala Ungar	<i>Pseudalcantarea viridiflora</i> (Beer) Pinzón & Barfuss	
<i>Tillandsia</i> sp.	Budapest	2017	2019		arrived as Planta Viva	unknown species		
<i>Vriesea amazonica</i> (Baker) Mez	unknown	2004	2005		<i>Werauhia gigantea</i> (Mart. ex Schult. & Schult. f.) J. R. Grant		<i>Werauhia gigantea</i> (Mart. ex Schult. & Schult. f.) J. R. Grant	
<i>Vriesea correia-arauji</i> E. Pereira & Penna	Wien	2020	2021				valid	
<i>Vriesea gigantea</i> Gaudich.	Magdeburg	2020	2021				valid	
<i>Vriesea imperialis</i> Carrière	Bruxelles	1965	1969				<i>Alcantarea imperialis</i> (Carrière) Harms	
<i>Vriesea incurvata</i> Gaudich.	Wien	2020	2021	Brazil			valid	
<i>Vriesea ospinae</i> H. E. Luther (Photo-tab 1, 1d)	Wien-WU	2018	2021		<i>Vriesea ospinae</i> var. <i>gruberi</i> H. Luther; arrived as <i>Planta Viva</i>		<i>Gouadea ospinae</i> var. <i>gruberi</i> (H. Luther) W. Till & Barfuss	
<i>Vriesea pabstii</i> McWill. & L. B. Sm.	Muenchen	2020	2021				valid	
<i>Vriesea racinae</i> L. B. Sm.	Wien	2020	2021	Brazil			valid	
<i>Vriesea saundersii</i> (Carrière) E. Morren	Bruxelles	1966	1966				valid	
	Berlin BHU	2020	2021				valid	
	Lada	1964	1991		arrived as <i>Planta Viva</i>		<i>Lutheria splendens</i> (Brongn.) Barfuss & W. Till	
	Nursery	2010	2021		arrived as <i>Planta Viva</i>			

Tab. 2. Accepted subgenus in genus *Tillandsia* in comparison to earlier classification and habitats of species in genus *Tillandsia* present in the Zagreb Botanical Garden of the Faculty of Science.

Scientific name (Nomenclature acc. to World Flora Online)	SMITH & DOWNS (1977)	BARFUSS <i>et al.</i> (2016)	Habitat
<i>Tillandsia andreana</i> E. Morren ex André	<i>Tillandsia</i>	<i>Tillandsia</i>	Epiphytic
<i>Tillandsia argentea</i> Griseb.	<i>Tillandsia</i>	<i>Tillandsia</i>	
<i>Tillandsia baileyi</i> Rose ex Small	<i>Tillandsia</i>	<i>Tillandsia</i>	
<i>Tillandsia bartramii</i> Elliott	<i>Tillandsia</i>	<i>Tillandsia</i>	
<i>Tillandsia bulbosa</i> Hook.	<i>Tillandsia</i>	<i>Tillandsia</i>	
<i>Tillandsia burle-marxii</i> Ehlers	Anoplophytum	Anoplophytum	
<i>Tillandsia butzii</i> Mez	<i>Tillandsia</i>	<i>Tillandsia</i>	
<i>Tillandsia capillaris</i> f. <i>hieronymi</i> (Mez) L. B. Sm.	Diaphoranthema	Diaphoranthema	
<i>Tillandsia capillaris</i> Ruiz & Pav.	Diaphoranthema	Diaphoranthema	
<i>Tillandsia caput-medusae</i> E. Morren	<i>Tillandsia</i>	<i>Tillandsia</i>	
<i>Tillandsia cardenasii</i> L. B. Sm.	Allardtia	Aerobia	
<i>Tillandsia chapalillaensis</i> Ehlers & Lautner	new species (Böker, A. (2013) <i>Tillandsia chapalillaensis</i> – eine neue, alte Art aus Nayarit, Mexiko, oder wie man Arten und Hybriden abgrenzt. Die Bromelie 2013(2): 70-73.)	<i>Tillandsia</i>	
<i>Tillandsia cyanea</i> Linden ex K. Koch	Phytarrhiza	Phytarrhiza	
<i>Tillandsia disticha</i> Kunth	Allardtia	<i>Tillandsia</i>	
<i>Tillandsia duratii</i> Vis.	Phytarrhiza	Phytarrhiza	
<i>Tillandsia grandis</i> Schltdl.	Pseudalcantarea	new genus Pseudalcantarea	
<i>Tillandsia insularis</i> Mez	Racinaea	new genus Racinaea	
<i>Tillandsia ixioides</i> Griseb.	Anoplophytum	Anoplophytum	
<i>Tillandsia jucunda</i> A. Cast.	Anoplophytum	Anoplophytum	
<i>Tillandsia leiboldiana</i> Schltdl.	Allardtia	<i>Tillandsia</i>	
<i>Tillandsia pacifica</i> Ehlers	new species (R. Ehlers (1991) <i>Tillandsia pacifica</i> R. Ehlers, spec. nov. Die Bromelie 1991(3): 62-5.)	<i>Tillandsia</i>	
<i>Tillandsia polystachia</i> (L.) L.	<i>Tillandsia</i>	<i>Tillandsia</i>	
<i>Tillandsia pruinosa</i> Sw.	<i>Tillandsia</i>	<i>Tillandsia</i>	
<i>Tillandsia remota</i> Wittm.	Allardtia	<i>Tillandsia</i>	
<i>Tillandsia retorta</i> Griseb. ex Baker	Diaphoranthema	Diaphoranthema	
<i>Tillandsia schiedeana</i> Steud.	<i>Tillandsia</i>	<i>Tillandsia</i>	
<i>Tillandsia tricholepis</i> Baker	Diaphoranthema	Diaphoranthema	
<i>Tillandsia tricolor</i> Schltdl. & Cham.	<i>Tillandsia</i>	<i>Tillandsia</i>	
<i>Tillandsia usneoides</i> (L.) L.	Diaphoranthema	Diaphoranthema	

Scientific name (Nomenclature acc. to World Flora Online)	SMITH & DOWNS (1977)	BARFUSS <i>et al.</i> (2016)	Habitat
<i>Tillandsia velutina</i> Ehlers	new species (R. Ehlers (1994) <i>Tillandsia velutina</i> , a New Species from Mexico and Guatemala. Journal of the Bromeliad Society 44(4): 153-155.)	<i>Tillandsia</i>	Epiphytic
<i>Tillandsia mallemonitii</i> Glaz. ex Mez	Phytarrhiza	Phytarrhiza	Epiphytic (rarely saxicolous)
<i>Tillandsia tortilis</i> Baker	<i>Tillandsia</i>	Viridantha	Epiphytic and lithophytic
<i>Tillandsia albertiana</i> Verv.	Anoplophytum	Anoplophytum	Saxicolous
<i>Tillandsia bergeri</i> Mez	Anoplophytum	Anoplophytum	
<i>Tillandsia crocata</i> (E. Morren) N. E. Br.	Phytarrhiza	Phytarrhiza	
<i>Tillandsia funkiana</i> Baker	<i>Tillandsia</i>	<i>Tillandsia</i>	
<i>Tillandsia harrisii</i> Ehlers	Phytarrhiza	Phytarrhiza	
<i>Tillandsia hildae</i> Rauh	<i>Tillandsia</i>	<i>Tillandsia</i>	
<i>Tillandsia humilis</i> C. Presl	Phytarrhiza	Phytarrhiza	
<i>Tillandsia karwinskyana</i> Schult. & Schult. f.	<i>Tillandsia</i>	<i>Tillandsia</i>	
<i>Tillandsia kirschnekii</i> Rauh	Phytarrhiza	Phytarrhiza	
<i>Tillandsia stellifera</i> L. Hrom.	Allardtia	Viridantha	
<i>Tillandsia umbellata</i> André	Phytarrhiza	new genus Wallisia	Saxicolous and epiphytic
<i>T. capillaris</i> f. <i>cordobensis</i> (Hieron.) L. B. Sm.	Diaphoranthema	Diaphoranthema	
<i>Tillandsia capillaris</i> f. <i>virescens</i> (Hieron.) L. B. Sm.	Diaphoranthema	Diaphoranthema	
<i>Tillandsia loliacea</i> Mart. ex Schult. & Schult. f.	Diaphoranthema	Diaphoranthema	
<i>Tillandsia tectorum</i> E. Morren 'Snow'	Allardtia	Viridantha	Saxicolous and epiphytic (dry areas) and desert sands
<i>Tillandsia paleacea</i> C. Presl	Phytarrhiza	Phytarrhiza	
<i>Tillandsia viridiflora</i> (Beer) Baker	Pseudalcantarea	new genus Pseudalcantarea	Terrestrial
<i>Tillandsia anceps</i> Lodd.	Phytarrhiza	new genus Wallisia	Terrestrial or epiphytic
<i>Tillandsia fendleri</i> Griseb.	Allardtia	<i>Tillandsia</i>	
<i>Tillandsia ionantha</i> Planch.	<i>Tillandsia</i>	<i>Tillandsia</i>	
<i>Tillandsia juncea</i> (Ruiz & Pav.) Poir.	<i>Tillandsia</i>	<i>Tillandsia</i>	
<i>Tillandsia laxissima</i> Mez	Phytarrhiza	new genus Barfussia	

erties that are not evident in *Vriesea*. The investigation on the patterns of phylogenetic relationships in the genera has been shown to be complex and indicates that genus is polyphyletic (BARFUSS *et al.*, 2016). In short, because of the low sampling of *Vriesea* species, the low number of informative characters, incorrect homology statements that lead to uncertainty in the proposed taxa attribution for *Vriesea* was judged to be premature (GOMEZ-DA SILVA & SOUZA-CHIES, 2018). In other words, in this paper we haven't changed taxonomy based on recent proposed taxonomic rearrangements because it seems that all studies just provide a preliminary framework to revisit *Vriesea* and the importance of further phylogenetic studies needs stressing.

CONCLUSION

Since the establishment of our Garden in 1889, we have grown at least 82 taxa from the Tillandsioideae subfamily (3 from *Catopsis*, 6 from *Guzmania*, 63 from *Tillandsia* and 10 from *Vriesea*) – species, cultivars and hybrids gained mostly via the *Index Seminum* network or received as gifts from collectors. Our current collection of Tillandsioideae holds 73 taxa, cultivars and hybrids – 3 from genus *Catopsis*, 5 from *Guzmania*, 57 from *Tillandsia* and 8 from *Vriesea*.

ACKNOWLEDGEMENTS

I wish to thank our donators, who have shared their plants and knowledge with us: Mr. Leon Božić and Mr. Tomislav Štrkalj (*Dnevna doza biljaka*, Zagreb, Croatia); Mr. Ivan Džapo (Zagreb, Croatia); Mrs. Emica and Mr. Bojan Mesaroš (Dubrovnik, Croatia) and Mr. Drago Greguričević (Arboretum *Variegata*, Samobor, Croatia).

Received August 2, 2021

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Phototable 1 (1, 2, 3).

Representatives of species of the subfamily Tillandsioideae grown in the Zagreb Botanical Garden of the Faculty of Science from 1951 to 2021.



a) Collection of genus *Tillandsia* in glass showcases



b) Collection of genus *Tillandsia* in greenhouse



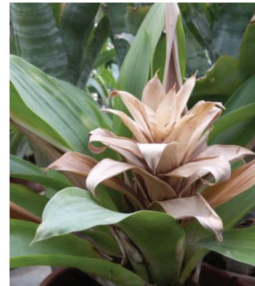
c) Collection of genus *Tillandsia* in greenhouse



d) *Vriesea ospinae* H.E.Luther



e) *Tillandsia fendleri* Griseb.



f) *Guzmania lingulata* (L.)
Mez hort.



g) *Tillandsia tricolor* Schldl. & Cham.



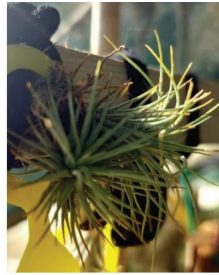
h) *Vriesea splendens*
(Brongn.) Lem.



i) *Tillandsia hildae* Rauh



a) *Tillandsia capillaris* Ruiz & Pav.



b) *Tillandsia argentea* Griseb.



c) *Tillandsia* 'Cotton Candy'



d) *Tillandsia andreana*
E. Morren ex André



e) *Tillandsia tectorum*
E. Morren cult.



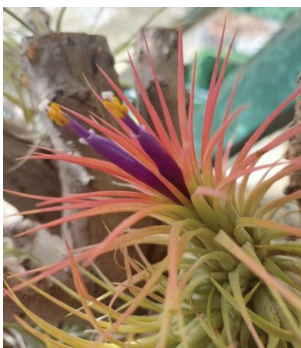
f) *Tillandsia bergeri* Mez



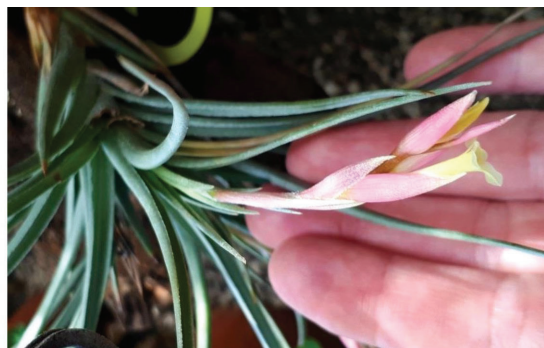
g) *Tillandsia bulbosa* Hook.



h) *Tillandsia crocata*
(E. Morren) N. E. Br.



i) *Tillandsia ionantha* Planch.



j) *Tillandsia jucunda* A. Cast.



a) *Tillandsia duratii* Vis.



b) *Tillandsia retorta*
Griseb. ex Baker



c) *Tillandsia humilis* C. Presl



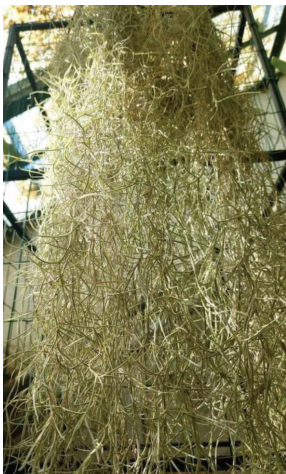
d) *Tillandsia kirschnekii* Rauh



e) *Tillandsia loliacea* Mart.
ex Schult. & Schult. f.



f) *Tillandsia stellifera* L. Hrom.



g) *Tillandsia usneoides* (L.) L.



h) *Tillandsia ixiooides* Griseb.



i) *Tillandsia funkiana* Baker

AUTHORSHIP:

All photographs in Photo-table 1 are originals in the collections of the Botanical Garden of the Faculty of Science (University of Zagreb), taken between 2019 and 2020 by Dr Dubravka Sandev, senior curator.