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Life on the Wire—Plant Growth on Power Lines in the Americas

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Abstract: There are a number of rather anecdotal reports of plant growth on power cables in the Americas, but until now there has been no systematic attempt to gauge the geographical extension of this phenomenon nor a documentation of the diversity of species found there. Using observations from the participatory science data platform iNaturalist and the scientific literature, we document almost 700 occurrences of more than 40 species of vascular plants and three lichen species on power cables with a geographical distribution over 7000 km from the southern United States to northern Argentina. Based on these observations we discuss the ecological conditions of plant growth on power cables in terms of climate; elevational distribution; and the morphological, physiological, and life history traits that allow the observed set of species to thrive on this anthropic structure.

Keywords: anthropic habitats (urban ecology); bird nests; Bromeliaceae; crassulacean acid metabolism; dispersal; epiphytes; facilitation; lichens; Orchidaceae

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Citation: Zotz, G.; Cascante-Marín, A. Life on the Wire—Plant Growth on Power Lines in the Americas. *Diversity* **2024**, *16*, 573. https://doi.org/10.3390/d16090573

Academic Editor: Mario A. Pagnotta

Received: 12 August 2024
Revised: 10 September 2024
Accepted: 11 September 2024
Published: 12 September 2024

1. Introduction

Vascular epiphytes are plants that grow on other plants, typically trees, for their entire lives, and can be distinguished from co-occurring mistletoes by their non-parasitic nature [1]. The opportunistic character of the relationship of epiphytes with their host is aptly reflected by the fact that many of them frequently establish on artificial structures that are produced by humans, such as walls, fences, or power lines. In particular, the sight of plant growth on power cables and telephone wires has fascinated biologists for decades and is a common anecdote in books about epiphytes and, in particular, epiphytic bromeliads [1–5] (Figure 1).

The electric companies that own the infrastructure that distributes electricity within human settlements are less enthusiastic, because a dense plant cover causes a suite of problems [6], namely it affects preventive checks for defects by maintenance teams; makes the visual inspection of conductors difficult; may cause deterioration in the aluminum conductor; reduces its lifespan, possibly caused by decreasing heat dissipation, which leads to elevated temperatures; and increases the likelihood of breakage. Bromeliads that grow on jumpers close to poles may even cause a lethal risk to humans by conducting electricity to the associated structure.

These two perspectives are also reflected in the published literature with a focus on this phenomenon. On the one hand, ecologists analyzed, e.g., the nutrient concentrations of these plants and compared them to epiphytic conspecifics on natural substrates [7] or quantified annual growth rates in the two "habitats"—tree vs. power cable [8]—while others studied plants on power cables as a component of plant biodiversity in urban settings, e.g., [9]. On the other hand, studies were initiated to quantify the occurrence of plants on power lines to document the magnitude of the perceived problem or were designed to find means to lower the rate of new colonization and to make recommendations for the removal of already-established plants [10,11]. Still, the detailed data reported in the latter studies are also interesting information for the ecologist.

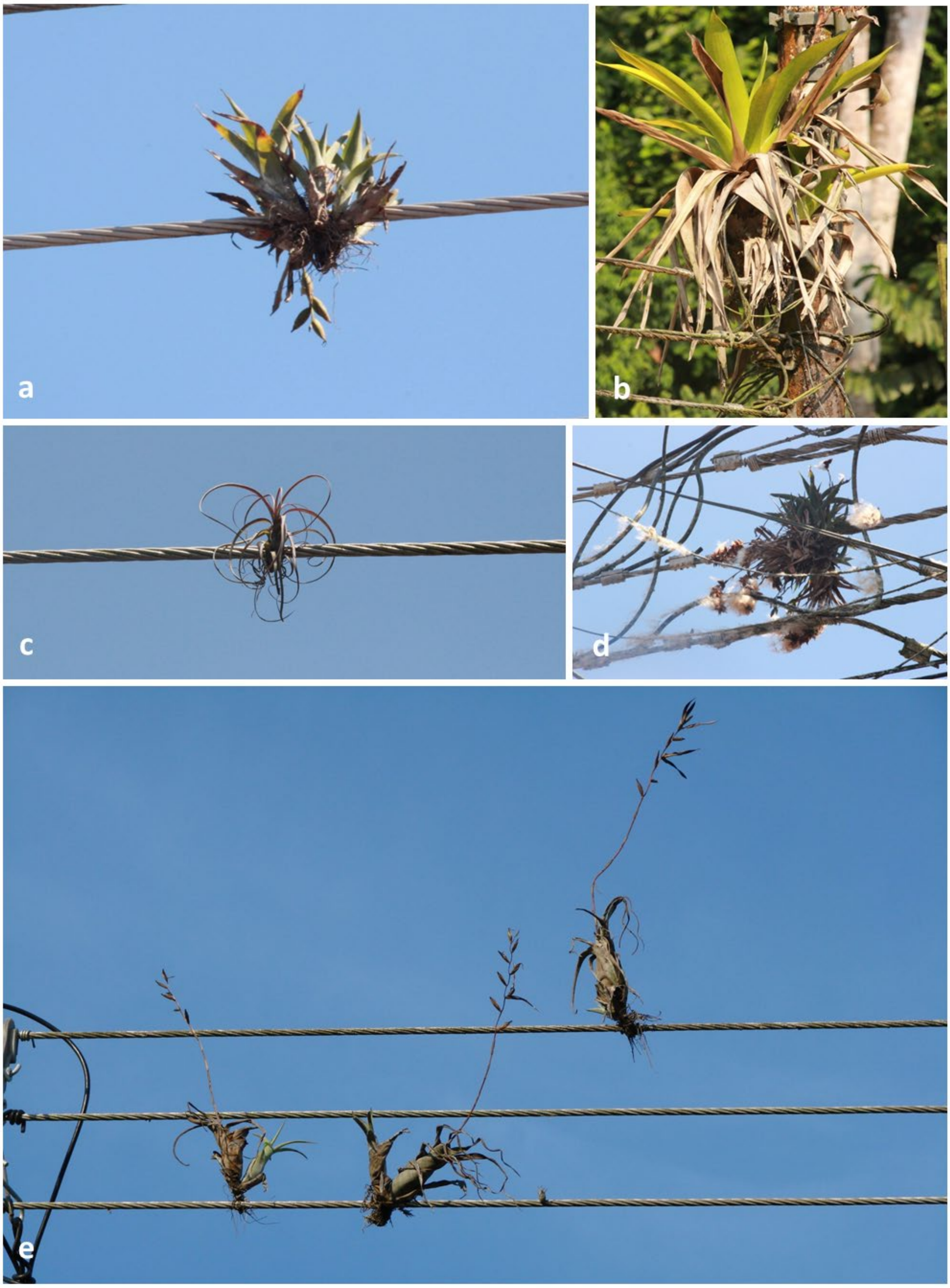


Figure 1. Plants on power lines and associated structures. (**a**) *Catopsis nutans* with infructescence in the city center of Cartago (Costa Rica), (**b**) a large *Werauhia sanguinolenta* plant with infructescence, (**c**) immature *Tillandsia balbisiana* (Golfito, Costa Rica), (**d**) a clump of *Catopsis nutans* plants with dehiscing capsules releasing numerous seeds (Cartago, Costa Rica), and (**e**) several fruiting *Tillandsia flexuosa* individuals near Pedasí (Panama).

There are different types of electrical network cables in the Americas. The greatest infestation occurs on bare cables, which are composed of up to 19 individual wires [10]. The resulting spaces between these wires facilitate the fixation of both the seed coma of bromeliads and the roots of growing plants. In contrast, cables covered by a thermosetting polymer compound that is resistant to weather, ultraviolet radiation, and mechanical abrasion are much less suited for attachment and, indeed, are found to be less affected [6]. When bromeliad abundance on cables and poles is high, other network structures, e.g., insulators, transformers, or consumer cables, may also be colonized.

The phenomenon of plants on power cables is currently only known from the Americas, but published reports cover a wide geographical range from the southern United States [12,13], Mexico [14], Trinidad and Tobago [15], and Panama [8] to Argentina [7] and Brazil [6,16]. Until now, there has not been any systematic attempt to gauge the geographical extension of this phenomenon in more detail nor to document the diversity of species that are found on electric cables and telephone wires.

Given the scarce data basis in the published literature, this goal could only be achieved by using information from the participatory science data platform iNaturalist [17] complemented by many observations of our own, which were also uploaded, as the main data source. The use of this platform as a research tool has been discussed in detail in several recent publications [18–20]; all conclude that—with appropriate quality checks—iNaturalist data meet the required standard to be useful for plant research. More specifically, we reviewed more than 100,000 observations of bromeliads and found about 700 observations of plants on electrical cables or telephone wires. The existing literature already suggested that *Tillandsia recurvata* would be by far the most common species, which at least partly reflects the fact that its north–south distribution is almost as extensive as that of the entire family Bromeliaceae [13]. The overall diversity of species found on these anthropic structures, however, was expected to be much larger than previously acknowledged. The current report confirms this notion: we show that more than 40 species can be found there.

2. Material and Methods

The most important source of information used in this study is iNaturalist. Specifically, we reviewed all observations of the bromeliad genera *Aechmea*, *Billbergia*, *Catopsis*, *Glomeropitcairnia*, *Guzmania*, *Racinea*, *Tillandsia*, *Vriesea*, and *Werauhia* that had been reported between 1 January 2014 and 31 May 2024. By far the largest number were available for the genus *Tillandsia* with >100,000 observations, and the lowest number were available for *Glomeropitcairnia* with c. 40. We also conducted searches with the keywords "power line", "power cable", and "línea eléctrica" in iNaturalist, none of which yielded additional observations. Although we only searched systematically for bromeliads, there were some observations in iNaturalist that referred to other taxa growing on power cables, and we also used our own observations and information from the scientific literature. This exercise resulted in 715 observations of plants on power cables and a few cases of related structures like poles and jumpers. We carefully reviewed each of these to confirm or correct the suggested species name. In the large majority of cases (630 individuals = 88% of all observations), the quality of the photograph(s), the presence of reproductive structures, and the general knowledge of geographic distributions allowed for an unambiguous species identification. For other observations, the poor quality of the pictures and the lack of reproductive structures in combination with the potential co-occurrence of species with similar morphology allowed only for the identification at the genus level, although often it was possible to narrow it down to only two possible species. These totaled 80 observations. In a third group (five cases), not even the genus could be determined with confidence.

The type of analysis then determined whether these groups were subsequently included or excluded. For example, to depict the full geographical extension of the occurrence of plants on power lines, all observations were included, while for more fine-scaled analyses at the species level, only group 1 was considered. However, to avoid duplicate observations of the same species at any location within a 1 km grid, we thinned the initial dataset using a custom script that resulted in a dataset in which there was no record of a conspecific within 1.4 km. This procedure led to the removal of 68 observations, mostly of *T. recurvata*.

The full dataset this report is based on (Supplementary Table S1) is the list of all 647 observations that show a plant or lichen growing on a power cable complemented with information from the literature. Only observations that are georeferenced were considered. Thus, we could visualize the geographic distribution of plant growth on power cables and analyze elevational pattern and climatic conditions. Lichens were not included in that analysis because of the scarcity of observations. Specifically, for each observation, we estimated the elevation, the annual mean temperature (MAT), and the annual precipitation (MAP) using the USGS GMTED 2010 elevation dataset (https://www.usgs.gov/coastal-changes-and-impacts/gmted2010, accessed on 7 June 2024), and the CHELSA V.1.2 climate dataset [21]. To obtain a reference of the distribution of elevation, temperature, and annual precipitation in the Americas from 35° N to 31° S (i.e., the range of latitudes of occurrences of the observations in iNaturalist), we laid a 50 km grid over the entire landmass and estimated the elevation, MAP, and MAT for each grid point. Then, we produced three histograms, which compared the distributions of elevation and climatic conditions of the Americas with those of the actual observations.

In another analysis, we assessed the occurrence of crassulacean acid metabolism (CAM) in the observed species with literature data, considering $\delta^{13}C$ values higher (i.e., less negative) than −20‰ as an unambiguous indication of CAM [22]. For bromeliads, we used the study by Crayn et al. [23], and for orchids we used studies by Silvera et al. [24], Torres-Morales et al. [25], and Zotz and Ziegler [22] as references. There is a single observation of an unidentified species of *Clusia* on a power line in Trinidad. Seven species have been described for the genus for this Caribbean island [26], five of which have been tested for CAM activity; all cases were positive [26].

3. Results

The 647 observations in iNaturalist and the literature document growth on power cables of at least 44 species of vascular plants and 3 species of lichens (Table 1). A total list of observations is given in Table S1. Bromeliads were by far the most successful taxon, particularly from the genus *Tillandsia*, but there were also rare cases of other taxonomic groups. A particularly interesting observation was made in Trinidad. There, a large *Clusia* sp. shrub had established itself on a clump of bromeliads. The woody *Clusia* was of considerable size and mass as to visually pull down the power cable, with long dangling aerial roots. An unidentified polypody fern also emerged from the same clump, and birds had built a nest in it. There were at least two other cases of such apparent facilitation, in which plants were not directly attached to the cable, but rooted in the root mass of a larger bromeliad—one orchid of the genus *Encyclia* in Mexico and a *Brassavola* in Panama (Figure S1).

Table 1. List of species found growing on power lines. Given are taxon names (following World Flora Online, http://www.worldfloraonline.org, accessed on 7 May 2024, family, number of observations, and photosynthetic pathway. A full list of sources is available in Table S1. When it was not possible to identify an observation with certainty to genus or species, respectively, family names or genus names are given. Whether or not these represent additional species is impossible to tell.

Taxon	Family	# obs	C3/CAM
Aechmea organensis	Bromeliaceae	1	CAM
Brassavola nodosa	Orchidaceae	1	CAM
Bromeliaceae	Bromeliaceae	4	
Catopsis sp.	Bromeliaceae	2	C3
Catopsis berteroniana	Bromeliaceae	5	C3
Catopsis nutans	Bromeliaceae	5	C3
Catopsis sessiliflora	Bromeliaceae	1	C3
Cladonia cf. *uleana*	Cladoniaceae	1	C3
Clusia sp.	Clusiaceae	1	CAM ?

Table 1. *Cont.*

Taxon	Family	# obs	C3/CAM
Encyclia cf. *meliosma*	Orchidaceae	1	CAM ?
Polypodiaceae	Polypodiaceae	1	C3
Racinaea multiflora	Bromeliaceae	3	C3
Teloschistes flavicans	Teloschistaceae	1	C3
Tillandsia sp.	Bromeliaceae	43	CAM ?
Tillandsia aeranthos	Bromeliaceae	8	CAM
Tillandsia balbisiana	Bromeliaceae	28	CAM
Tillandsia bandensis	Bromeliaceae	1	CAM
Tillandsia caliginosa	Bromeliaceae	8	CAM
Tillandsia capillaris	Bromeliaceae	44	CAM
Tillandsia caput-medusae	Bromeliaceae	7	CAM
Tillandsia concolor/fasciculata	Bromeliaceae	1	CAM
Tillandsia disticha	Bromeliaceae	3	CAM
Tillandsia duratii	Bromeliaceae	5	CAM
Tillandsia elongata	Bromeliaceae	2	CAM
Tillandsia exserta	Bromeliaceae	1	CAM
Tillandsia fasciculata	Bromeliaceae	9	CAM
Tillandsia flexuosa	Bromeliaceae	7	CAM
Tillandsia geminiflora	Bromeliaceae	1	CAM
Tillandsia juncea	Bromeliaceae	1	CAM
Tillandsia latifolia var. *divaricata*	Bromeliaceae	3	CAM
Tillandsia makoyana	Bromeliaceae	1	CAM
Tillandsia pedicellata	Bromeliaceae	2	CAM
Tillandsia pohliana	Bromeliaceae	1	CAM
Tillandsia polystachia	Bromeliaceae	5	CAM
Tillandsia recurvata	Bromeliaceae	352	CAM
Tillandsia recurvata/bandensis	Bromeliaceae	1	CAM
Tillandsia recurvata/capillaris	Bromeliaceae	28	CAM
Tillandsia recurvifolia	Bromeliaceae	1	CAM
Tillandsia reichenbachii	Bromeliaceae	3	CAM
Tillandsia schiedeana	Bromeliaceae	12	CAM
Tillandsia schiedeana/recurvata	Bromeliaceae	1	CAM
Tillandsia straminea	Bromeliaceae	2	CAM
Tillandsia streptocarpa	Bromeliaceae	6	CAM
Tillandsia stricta	Bromeliaceae	3	CAM
Tillandsia tehuacana	Bromeliaceae	1	CAM
Tillandsia tenuifolia	Bromeliaceae	1	CAM
Tillandsia tricholepis	Bromeliaceae	3	CAM
Tillandsia usneoides	Bromeliaceae	13	CAM
Tillandsia utriculata	Bromeliaceae	2	CAM
Tillandsia virescens	Bromeliaceae	5	CAM
Tillandsia/Racinaea	Bromeliaceae	1	CAM
Usnea cf. *barbata*	Usneaceae	1	C3
Vriesea incurvata	Bromeliaceae	1	C3
Vriesea sp.	Bromeliaceae	1	C3
Werauhia sanguinolenta	Bromeliaceae	1	C3

Overall, *Tillandsia recurvata* was by far the most abundant species. This species alone accounted for 352 (=54%) of all observations, being followed by *T. capillaris* with 44 records (=6%). Most of the remaining species were congenerics—more than 30 additional *Tillandsia* species were observed on power lines, while the genera *Aechmea*, *Catopsis*, *Werauhia*, and *Vriesea* accounted for only 1–3 species each with relatively few observations.

Geographically, observations spanned a latitudinal range of c. 7300 km from 35° N to 31° S. The longitudinal range was even larger with c. 11,000 km from 36° W to 155° W, but this was simply due to observations of one species that had been introduced to Hawaii—*Tillandsia polystachia*—where it has escaped from cultivation and is now found on native trees as well as on power lines.

Figure 2 visualizes the geographical distribution of the 644 observations of vascular plants on power lines in the Americas, while Figure 3 compares the elevational distribution and major climatic variables (MAT = mean annual temperature; MAP = mean annual precipitation) of the 644 growing sites with the overall elevation and climate of the Americas. The relatively low proportion of plants on power lines at lowland sites (Figure 3a) is at least partly explainable by their complete absence in Amazonia. A peak at intermediate elevations (1500–2000 m asl.; Figure 3a) coincides with relatively low temperatures (16–20 °C; Figure 3c), while a peak in the MAP of 500–1000 mm (Figure 3c) emphasizes an association with relatively dry sites.

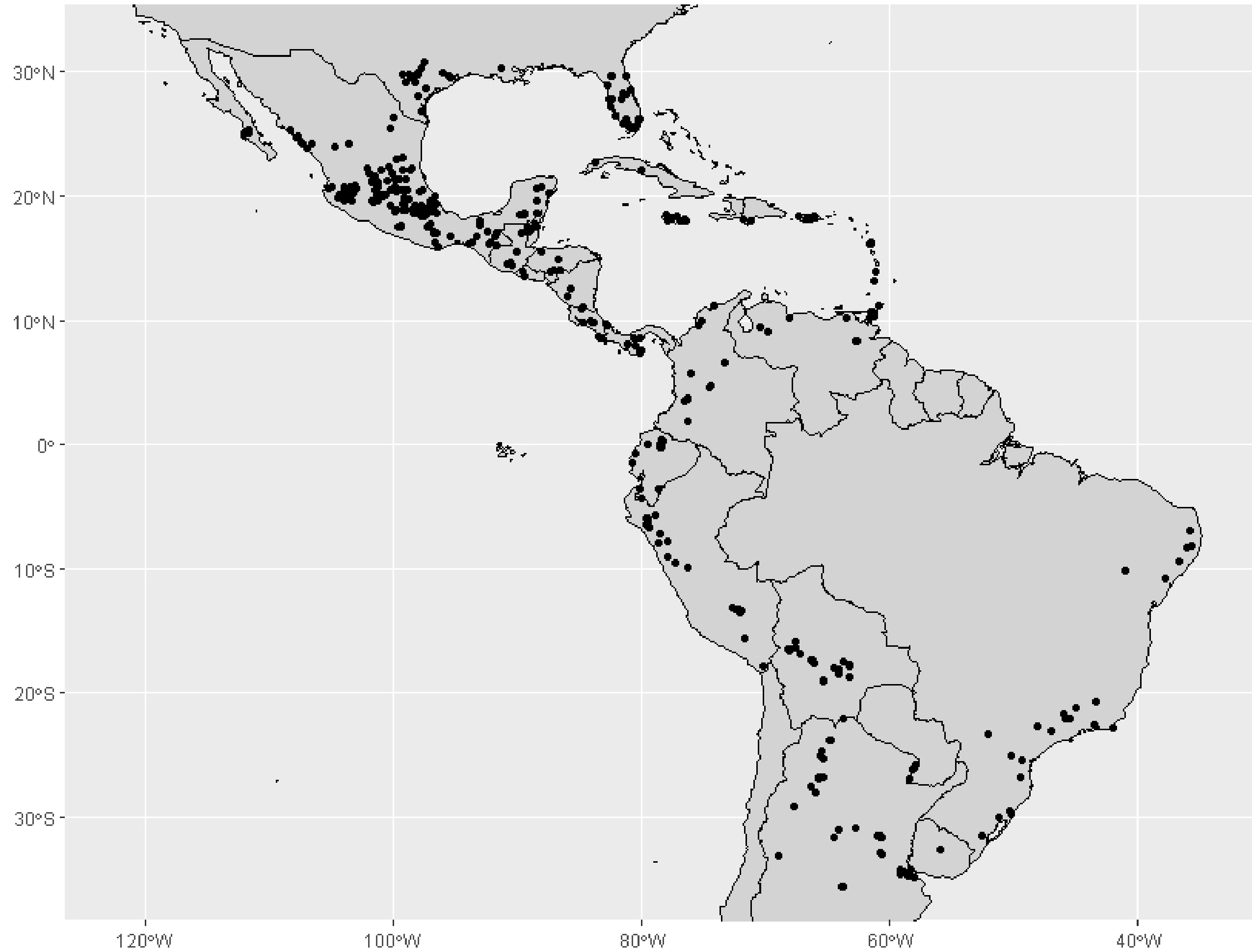


Figure 2. Geographical distribution of plants and lichens on power lines in the Americas. Each dot represents one observation, although in a number of cases, dots may totally or partially overlap if there are (i) more than one species per location or (ii) conspecifics were so close that at the scale of this map a distinction is impossible. For a full list, see Table S1. An observation from Hawaii of an introduced species (*Tillandsia polystachia*) is not shown.

Figure 4 shows the geographical distribution of the five species with the largest number of records. Clearly, *Tillandsia recurvata* was not only the most common and abundant species, but also the one with a very large geographical and elevational range—it was found from sea level to c. 4000 m asl. However, a wide geographical range is not a sufficient explanation for the success of that species, because *T. usneoides* has an even wider distribution, but its documented occurrence on power lines is quite limited. The other three more common species all have much more restricted distributions in general.

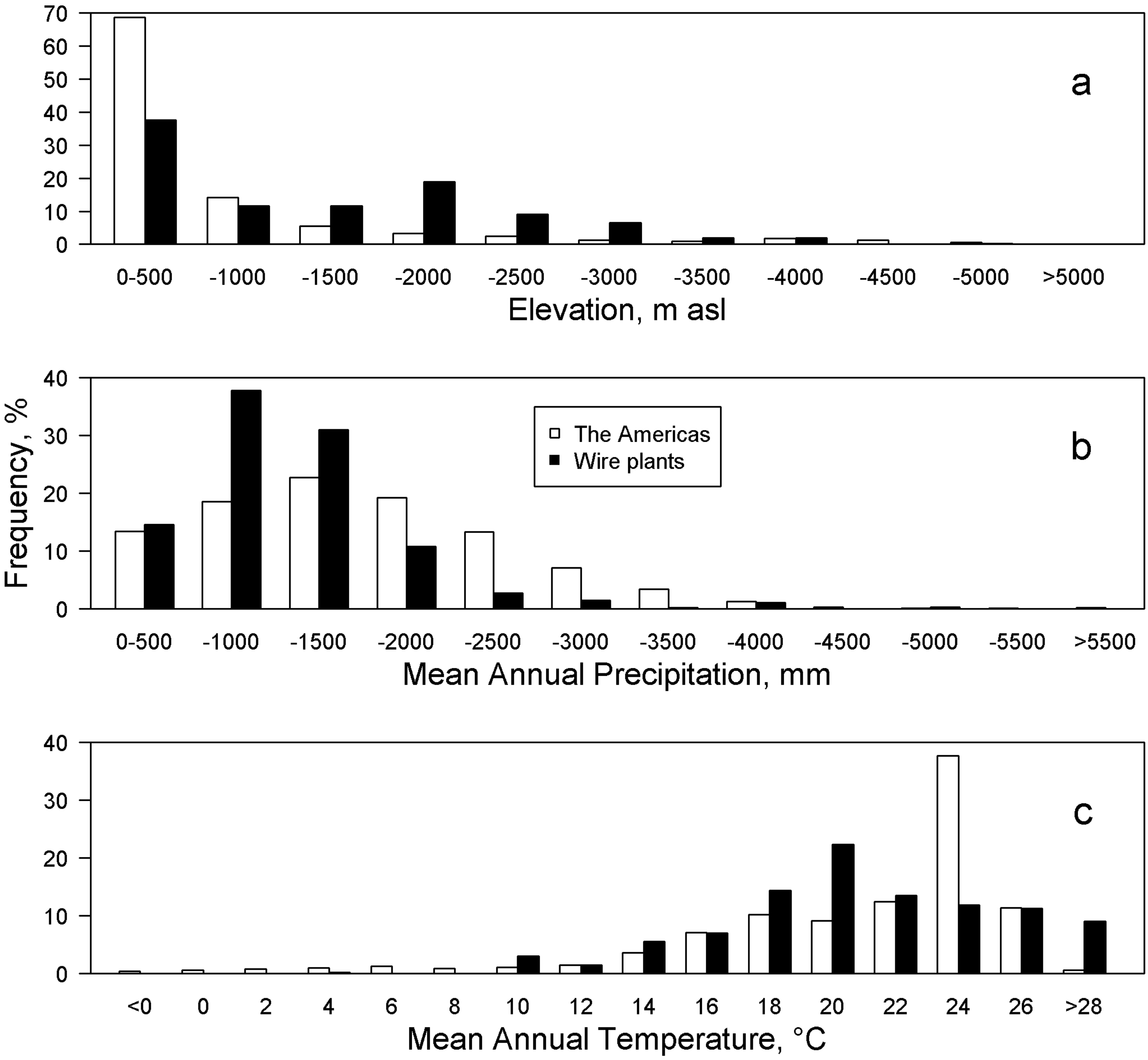
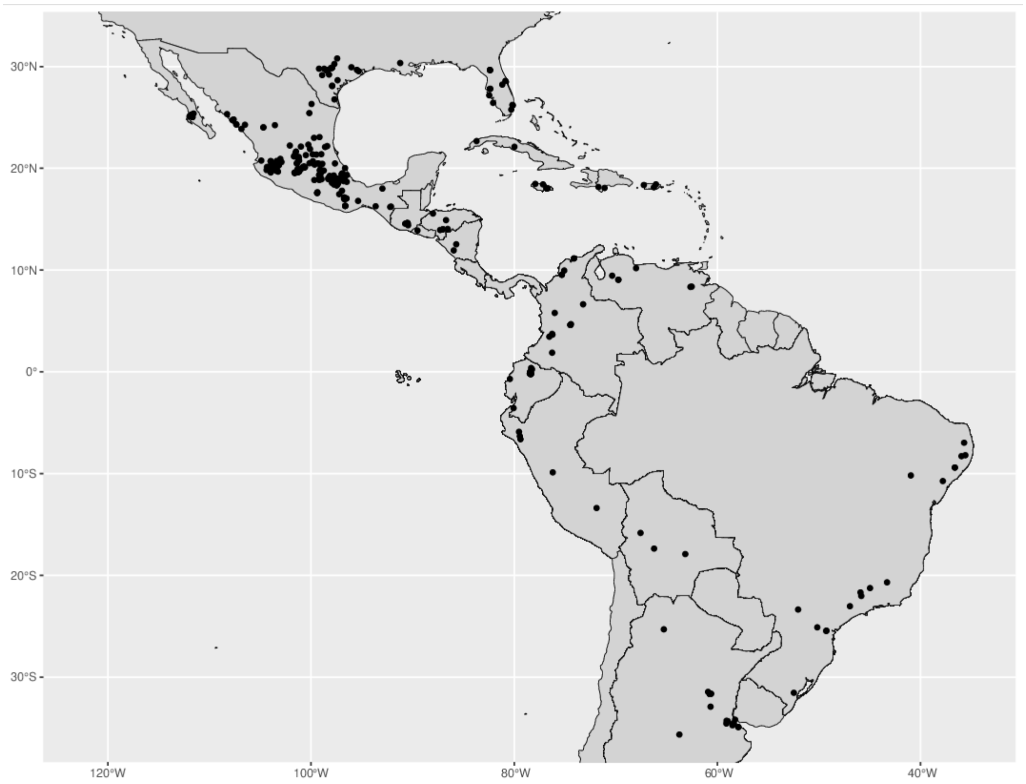


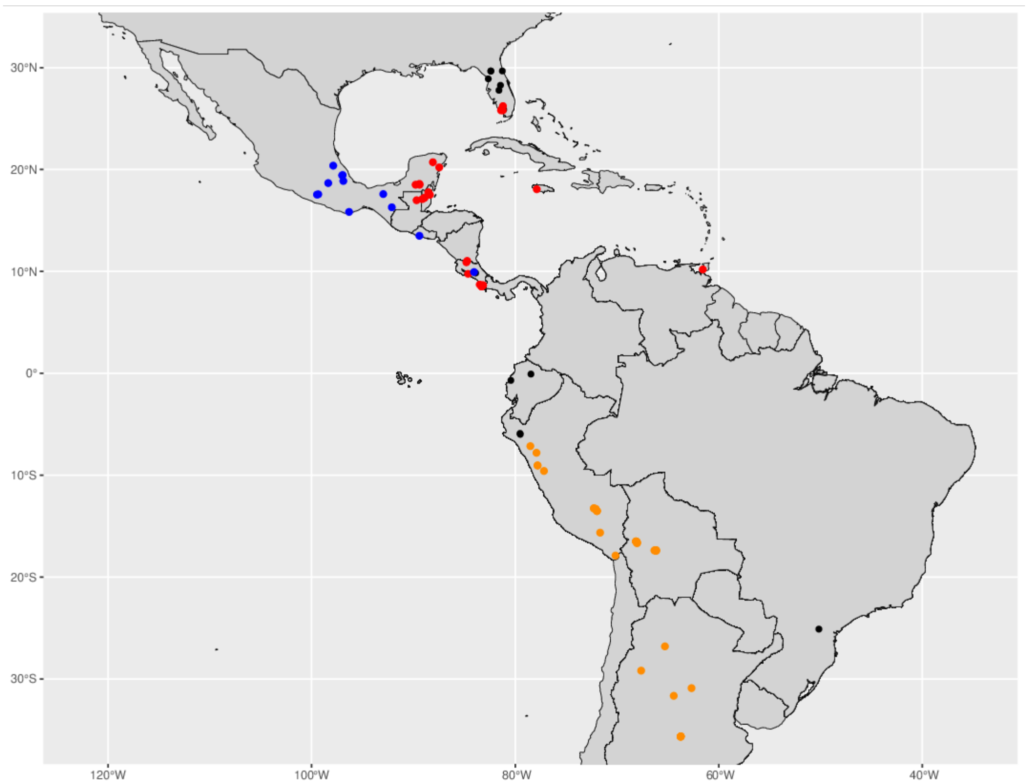
Figure 3. Modeled elevations and climatic conditions of the observation sites (black bars) and the Americas in the study area of 35° N to 31° S (white bars). Plot (**a**) gives elevational information, plot (**b**) mean annual precipitation (MAP), and plot (**c**). annual mean temperature (MAT).

The vast majority of all individual plants that were found on power lines were reproducing, as evidenced by current flowers and fruits or remnants of old infructescences. Among bromeliads, 85% of all observed plants reproduced in the current or previous year, while in *T. recurvata*, this percentage was slightly higher with 92%. The two orchids were both non-reproductive.

The average maximum size of the bromeliad species found in this study is 70 cm based on literature data [27] (range 16–200 cm, including the inflorescence). All of the more frequent species are much smaller than this (e.g., *Tillandsia recurvata* at 23 cm and *T. capillaris* at 16 cm), and the scarcity of larger species is arguably due to mechanical problems. Such problems are suggested by several observations of the few larger individuals, whereby a large *Tillandsia elongata* was hanging upside down in an observation from Trinidad, and several large individuals of *T. utriculata* or *T. polystachia* were also lopsided.



(**a**)



(**b**)

Figure 4. Geographical distribution of the five most common species. Each dot represents one occurrence record. For a full list, see Table S1. (**a**) *Tillandsia recurvata* (black). (**b**) *T. balbisiana* (red), *T. capillaris* (orange), *T. schiedeana* (blue), and *T. usneoides* (black).

The large majority of individuals and species of vascular plants found on power lines use CAM. All of the *Tillandsia* species, which account for almost 95% of all observations, and the single *Aechmea* species, use this water-conserving photosynthetic pathway. Still, CAM is not a requisite for growth on power lines, as evidenced by the remaining bromeliads of the genera *Catopsis*, *Vriesea*, and *Werauhia*, which are all C_3. Unambiguous information of the two orchids is available for *Brassavola nodosa* [22], while evidence for the photosynthetic pathway of *Encyclia* cf. *meliosma* is only circumstantial—all tested species of this genus are CAM [24,25]. With the same reasoning, the unidentified *Clusia* found in Trinidad is also likely to use CAM [26].

4. Discussion

An astonishing number of vascular plant species occur quite frequently on power lines, and there are also a few lichens. All of the vascular plant species are typically categorized as epiphytes [28], i.e., plants that live non-parasitically on a living host. Their use of a human-made structure highlights the opportunistic nature of epiphytic growth in general. Although reproducing vigorously at this artificial growing site, the only study that investigated growth and survival on power lines, with *T. flexuosa* in Panama, suggests that the conditions there are more demanding than in tree crowns [8]. These demanding conditions are also reflected in the high proportion of CAM plants (Table 1).

Plants on power lines can be observed in large portions of tropical and subtropical America (Figure 2) with a conspicuous gap in Amazonia. It was instructive to compare the climatic conditions of observation sites and the total of the study area—plants on power lines are clearly disproportionately found on the drier end of the spectrum of climatic conditions of the Americas (Figure 3).

Holst [13] claimed that bromeliads are the only plants that can maintain a perch on wires. This statement clearly needs a slight correction. Our analysis shows that there are quite a few other taxa that use this artificial structure, although bromeliads, particularly *Tillandsia* species, are indeed by far the most common occupants. Apart from the problem of successful dispersal, the presence of orchids poses another interesting question regarding early establishment. Orchids typically need a symbiotic fungus for germination [29]. The two observations of orchids on power lines, both of which show an association with an already established bromeliad, suggest that these fungi may find suitable conditions there.

Another statement of Holst [13] needs a qualifying comment as well. Although atmospherics and, to a lesser extent, small tank-forming species of the genera *Tillandsia* and *Catopsis* indeed dominate on power cables, there are also a number of larger species like *T. elongata* or *T. fasciculata*. Particularly noteworthy is a large and reproducing individual of *Werauhia sanguinolenta*, observed in Golfito, Costa Rica. Circumstances were quite particular, though, because this large tank bromeliad was growing adjacent to a pole, which was probably crucially important to allow the plant to stay upright. The recurring observations of larger, tilted plants is indicative of an obvious mechanical problem of larger plants. These plants need a functional tank, and hanging upside down after losing grip is probably lethal; however, a study with *Catopsis sessiliflora* found that moderate tilt affects tank function relatively little [30].

The remarkable dominance of tillandsioid bromeliads begs the question whether there is a specific set of characteristics that explains the success on power lines. We suggest that it is a combination of traits from diaspores with anchoring structures, small vegetative size, pronounced drought tolerance, a breeding system characterized by autogamy or apomixis, and clonal reproduction. First, upon arrival, seeds should be able to remain attached to the cables. The characteristic plumose appendage or coma of bromeliad seeds with hooked hairs allows anchorage both in small cracks of the phorophyte bark [31] or between individual wires of power lines. The stoloniferous and hanging *T. usneoides* is exceptional; it mainly spreads through fragments carried by wind or birds [32]. Orchids (the most important group of epiphytes but apparently rarely found on power lines) have tiny seeds devoid of anchoring structures, which perhaps represents a critical impediment to their establishment on power lines. The same is true for the even smaller spores of epiphytic ferns.

The physical attachment to small-diameter power lines is facilitated by small size—as evidenced by *Tillandsia recurvata* and *T. capillaris*, which are often colonizing twigs [3]; however, for larger and tank-forming plants, it is a particular challenge. As stated earlier, the abovementioned observation of a large *Werauhia sanguinolenta* is only a seeming contradiction to this statement.

Most of the successful bromeliads on power lines are so-called atmospherics [3], i.e., small species with dense foliar trichomes that provide, e.g., photoprotection in these exposed growing sites [33], and allow for the fast uptake of water and nutrients over the entire surface of the plant [3]. Mineral nutrient acquisition from the atmosphere and rain is high, as well as of heavy metals and other chemical pollutants that also indicate the ability of some common species on power lines such as *Tillandsia recurvata* [11,16,34], *T. capillaris* [7], or *T. usneoides* [35] to tolerate the levels of contamination of many urban areas. Another typical feature is CAM, although this is not without exception—a number of observations show that C_3 plants like *Werauhia sanguinolenta* or *Catopsis* spp. may also be able to thrive on power lines.

Data on the breeding system are only available for a handful of the species found in this study, but the limited evidence points in the direction of autogamy. Studies using genetic approaches [36], experimental pollination [37], and/or microscopy [38] reveal autogamy or cleistogamy in the two most common species (*Tillandsia recurvata* and *T. capillaris*). However, autogamy is not a strict prerequisite, since obligate outbreeders like *T. aëranthos* [37] and *T. caput-medusae* [39] are also found on power lines.

A final point is clonal reproduction. The prolific asexual production of new ramets is characteristic for the most common species. Both *T. recurvata* and *T. capillaris* were frequently forming compact aggregations of ramets around the power cables. In *T. usneoides*, spreading by new offshoots is by far the dominant means of reproduction, while sexual reproduction is extremely rare in that species.

How are these plants dispersed to power cables in the first place? Leal et al. [6] suggested that populations of epiphytic bromeliads from nature reserves close to urban settlements or on trees in the city itself are the initial seed source. As stated above, once established on power lines, the large majority of species seems to reproduce vigorously, allowing for the further colonization of power lines in the immediate vicinity. Frequent observations of bird nests, e.g., of Great Kiskadees (*Pitangus sulphuratus*) and other Tyrannidae positioned between poles and power lines (Zotz, unpubl. obs.; Figure S2), suggest another possibility. Numerous bird species use parts of or entire *Tillandsia* plants to build their nest and cover the bottom of their nests with *Tillandsia* seed down [40–43]. Thus, birds may play an active role in bringing *Tillandsia* plants and seeds to the immediate vicinity of power lines.

This study documented a surprising diversity of plants and a few lichens on power lines in the Americas, but we are aware of numerous caveats. We focused on bromeliads, which inevitably produced a taxonomic bias. Then, neither the used iNaturalist data nor the data from publications were collected in a systematic manner for a geographical analysis. Thus, one should be cautious when interpreting differences in the regional numbers of observations as evidence for actual differences in the frequency of plants on power cables. Moreover, the density of individuals in any given observation varied substantially, which was not quantified nor included in the analysis. Finally, we did not account for local differences in the number of active contributors to iNaturalist nor for differences in the regional density of power cables. However, we are confident that the larger picture at the continental scale (Figures 2–4) is correct. Take, e.g., the big gap in occurrence in Amazonia for which we suggest two possible reasons—(1) the species that dominate on power cables, particularly *Tillandsia recurvata*, do not occur there, as bromeliads in general are not very common in that region [44] and (2) power lines are not very common there either.

While acknowledging the limitations of iNaturalist data to reliably detect geographic patterns, exposing the currently available data base as we do has benefits by directing future searches. For example, since it is rather unlikely that there are really no plants on power lines in Uruguay, Paraguay, or the Guyanas, this publication will hopefully motivate contributors to document observations in these countries. Moreover, overhead power lines are not only common in the Americas, but also in other regions of the world, e.g., in Japan, but we are not aware of any reports of plants or lichens using them as substrate. The occupancy of power lines is clearly not idiosyncratic to biogeographically restricted bromeliads. Thus, we hope that our paper motivates others to report cases of, e.g., more orchid or lichen species not only from the Americas, but from anywhere else on the globe. Finally, our study should also be seen as an important contribution to the growing literature on plants in urban settings [9,45–47]. In a world with increasing dominance of *Homo sapiens*, many plants take advantage opportunistically of structural resources such as fences, walls, roofs, or power lines, but the study of this phenomenon is far from complete.

Supplementary Materials: The following supporting information can be downloaded at: https://www.mdpi.com/article/10.3390/d16090573/s1, Figure S1: *Brassavola nodosa*, Figure S2: Nest of a Great Kiskadee; Table S1: List of observations.

Author Contributions: Conceptualization, G.Z.; methodology, G.Z. and A.C.-M.; validation, G.Z. and A.C.-M.; formal analysis, G.Z.; data curation, G.Z. and A.C.-M.; writing—original draft preparation, G.Z.; writing—review and editing, G.Z. and A.C.-M.; visualization, G.Z. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Institutional Review Board Statement: Not applicable.

Data Availability Statement: The original contributions presented in the study are included in the article and Supplementary Materials.

Acknowledgments: We thank the many contributors to iNaturalist whose observations were the main basis of this study. Thanks also to Robert Lücking, Berlin, for the identification of *Telochistes flavicans*; Stefan Wester, Kaltenkirchen, for unearthing almost 20-yr-old pictures of *Brassavola nodosa*; and Bruce Holst, Sarasota, for adding observations to iNaturalist. Jessica Tay's (Oldenburg), Patrick Weigelt´s, and Holger Kreft´s (both Göttingen) help with the maps is also appreciated.

Conflicts of Interest: The authors declare no conflicts of interest.

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