

SCIENTIFIC PAPER

Ornamental and landscape potential of a bromeliad native to the Cerrado

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Abstract

Bromelia reversacantha Mez is an endemic species of the Cerrado Biome, for which there is no published data about its ornamental potentiality. The objective was to identify the ornamental and landscape potential of this bromeliad native from Cerrado. In September 2015, researchers specialized in the field of native plants evaluated the vegetative, reproductive and aesthetic characteristics of twenty plants of natural occurrence in the Biological Reserve Prof. José Ângelo Rizzo, in Mossâmedes, GO. In a scale of zero to ten, the bromeliad received an average score of 7.1 for the ornamental aspect, being 7.4; 7.3 and 6.6 respectively for the flowering plant, plant with fruits, and plant in the vegetative stage. The vigorous size, contrast, and color of the leaves and bracts, the showy inflorescence, the flowers, and fruits were shown as ornamental attributes. *Bromelia reversacantha* presents several characteristics favorable to its introduction in landscape projects, suggesting the use in gardens, or as living fences/borders and in pots; as well as in ornamentation in decorative arrangements with the use of inflorescences and fruit bunches.

Keywords: *Bromelia reversacantha* Mez, Bromeliaceae, landscaped, ornamental plasticity.

Resumo

Potencial ornamental e paisagístico de uma bromélia nativa do Cerrado

A *Bromelia reversacantha* Mez é uma espécie endêmica do Domínio Cerrado, para a qual não existem dados publicados sobre a sua potencialidade ornamental. Assim, objetivou-se identificar o potencial ornamental e paisagístico dessa bromélia nativa do Cerrado. Em setembro de 2015, pesquisadores especializados na área de plantas nativas avaliaram as características vegetativas, reprodutivas e estéticas de vinte plantas de ocorrência natural na Reserva Biológica Prof. José Ângelo Rizzo, em Mossâmedes, GO. Em escala de zero a dez, a bromélia recebeu nota média de 7,1 quanto ao aspecto ornamental, sendo de 7,4; 7,3 e 6,6 respectivamente para a planta florida, com frutos, e em estágio vegetativo. O porte vigoroso, o contraste e a coloração das folhas e brácteas, a inflorescência vistosa, as flores e frutos mostraram-se como atributos ornamentais. A *Bromelia reversacantha* apresenta várias características favoráveis à sua introdução em projetos paisagísticos, sugerindo o uso em jardins, ou ainda como cercas vivas/bordaduras e em vasos; assim como na ornamentação em arranjos decorativos com o uso das inflorescências e cachos de frutos.

Palavras-chave: *Bromelia reversacantha* Mez, Bromeliaceae, paisagismo, plasticidade ornamental.

Introduction

In different parts of the world, most of the ornamental plants cultivated are not native to these regions, which can result in negative effects both in natural environments and in crops (Heiden et al., 2006). Allied to this, is the standardization by the constant replication of the same species in each geographic region of the country (Lorenzi, 2013).

While landscaping with allochthonous species promotes the uniformity of landscapes, the use of native species may favor the preservation of local flora and highlight regional identities (Heiden et al., 2006). Due to the low maintenance

need, regionalism, biological diversity, and habitat for local wildlife, native plants play an important role in modern landscaping (Buckstrup and Bassuk, 1997).

Among the characteristics that fit the benefits resulting from its growing, highlights the reduction of time and financial resources destined to the implantation and maintenance of gardens. Considering also the reduction of the average size of green areas, the increasing use of gardens as active and recreational outdoor spaces, progressive costs of water, fertilizers and other chemicals, and the restriction or limitation of water for use in gardens, the use of native plants from the growing environment becomes even more promising (O'Brien, 1996).

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However, the strengthening of the proposal of an ecological or regional landscape is partly unfeasible, since the productive sector has not met the existing demand for use in landscape projects, and there is a lack of data on the supply and demand of ornamental plants native. From the native species, the prospection of new ornamental plants constitutes a great potential of production and commercialization both for the internal and external market (Heiden et al., 2006), expanding the product offering to the flower market (Tognon et al., 2016).

Thus, the need for research with an emphasis on the application of plant species becomes evident when considering the current scenario of the devastation of the native environment. In this sense, the use of native plants with ornamental potential can help in the valorization and conservation of biodiversity (Stumpf et al., 2009a). However, the first step in introducing a new plant to the growth is the establishment of a set of desirable ornamental features (O'Brien, 1996).

In the case of the bromeliads of the Cerrado, they can be considered as desirable ornamental characteristics, the varied designs and colors of the foliage and the beauty of the flowers, as indicated by Pereira (1982) for *Bromelia balansae*, native from Cerrado of the Federal District and, by Gavilanes et al. (1991) for *Ananas sativus* var. *microstachys*, a species found in Cerrado of Minas Gerais. For the species of this study, *Bromelia reversacantha*, endemic to Cerrado Rupestre in the State of Goiás (Forzza et al., 2009), there is no published data about its ornamental potentiality.

For decades, bromeliads have been appreciated as ornamental plants, especially in the USA, Europe, and Australia, where their growth is responsible by the important economy, absorbing, directly or indirectly, a large amount of labor (Paula and Silva, 2004). In this scenario, it is noteworthy that bromeliads have dozens of new species inserted in the ornamental plant trade annually (Pulido et al., 2018; Negrelle and Anacleto, 2019; Anacleto et al., 2019). In general, any plant can have ornamental use, if it fits the environment to be decorated and that meets the purpose of use, either in internal or external gardens (Tomblato, 2008).

In this context, this work was developed with the objective of identifying the ornamental and landscape characteristics of the native and endemic species of the Cerrado Biome, *Bromelia reversacantha* Mez.

Material and Methods

The plants were of natural occurrence in the Prof. José Ângelo Rizzo Biological Reserve, surrounded by the Serra Dourada State Park in Mossâmedes, GO, whose geographic coordinates were 16° 04' south latitude and 50° 11' west longitude and approximately 1.000 m altitude (Forzza et al., 2009).

The identification of the ornamental characteristics of bromeliad was carried out in its natural occurrence area, in September 2015, when plants were found in the vegetative stage, plants with open flowers and plants with mature

fruits. The evaluations were carried out in twenty randomly selected plants, including the three, mentioned stages, located in an area of 100 m². The plants were evaluated according to pre-established criteria, defined from the model of landscape evaluation proposed by Stumpf et al. (2009a), which was adapted for bromeliads, analyzing vegetative and reproductive characteristics, as well as other ornamental aspects.

The variables established were as follows:

- Plant height: determined with a tape measure, from the ground to the end of the highest leaf, preserved in its original position. When the presence of flower stalk or stalk with fruits, the height of this structure was also considered;
- Diameter of the leaf rosette: obtained with a tape measure, in the direction of the largest leaf, considering the original positions of the leaves, even when lying down;
- Developmental habit about the substrate: terrestrial, saxicolous, rupicolous or epiphytic (Givnish et al., 2011);
- Condition of luminosity in which the plant is found, full sun, half shade or shade;
- Plant layout: vertical, horizontal or balanced;
- Symmetry of the plant: symmetrical or asymmetric;
- Leaf edge: with thorns or smooth; whether with thorns: on the whole leaf or just at the base of the leaf; and as to the rigidity of the thorns: tender, not very rigid or very rigid;
- Presence or absence of "tank"; when present, size: small, medium or large;
- Ornamental values of plant structures (leaves, flowers, inflorescence, fruits, bunch of fruits): in descending order;
- Textures of structures of ornamental value (leaves, flowers, inflorescence, fruits, bunch of fruits): bright or opaque, smooth or rough, hairy or glabrous;
- Colors of structures of ornamental value (leaves, flowers, inflorescence, fruits, bunch of fruits): visually determined;
- Presence or absence of aroma; when present, in which structures: leaves, flowers/inflorescence or fruits/bunch of fruits; the sensation caused: pleasant or unpleasant; and the aroma intensity: weak, medium or strong;
- Position of the inflorescence: terminal or lateral; and the type of inflorescence: "bouquet" (internal), spiciform with erect rachis, "strobilus" or racemes;
- Flowering season and fruiting season;
- Ornamental potential of the fruits/bunch of fruits: yes or no; and the type of fruit: berry (fleshy) or capsule (dry);
- Indication of the plant for ornamental use: yes or no; if yes, in what way: in gardens, in pots, in arrangements, or otherwise; if for arrangements, which structure (s) can be used: leaves, flowers, inflorescence, fruits and bunches of fruit;
- Signs of insect attack: yes or no; if yes, in what structures: leaves, flowers and fruits; and incidence scores from zero to ten, by visual observation, considering zero for absence, and ten when insects totally attacked the plant;
- Disease signs/symptoms: yes or no; if yes, in what structures: leaves, flowers and fruits; and incidence scores from zero to ten, by visual observation, considering zero for absence, and ten when some disease totally impaired the plant;

• Beauty of the plant (ornamental/aesthetic/decorative aspects): notes from zero to ten, considering zero for the absence of ornamental features, and ten for maximum ornamental potential.

These variables were defined as representing aspects relevant to ornamentation, both considering the use in landscaping and considering the use as flowers and cut foliage, respectively based in Stumpf et al. (2009a) and Stumpf et al. (2007) with transformation. Except for the biometric variables, all the others were determined individually and sensorially (mostly visually) by four researchers specialized in the native plant area of the Cerrado.

The plants were evaluated at three different stages, when they were in vegetative stage, reproductive stage with inflorescence and in reproductive stage with fruits. The evaluators, subjectively and based on their previous

knowledge in the area, scored the species for each of its stages regarding its beauty. Sorting as: 0 – 4.9: low ornamental potential; 5.0 – 6.9: medium ornamental potential and; 7.0 – 10.0: high ornamental potential, based in Stumpf et al. (2007) with transformation.

Results and Discussion

The environment of growth in nature can indicate the future environment of growth of the plant, including the choice of the ideal substrate for its development. It was observed the *Bromelia reversacantha* developing directly in the soil and litter (Figure 1A). According to Paula and Silva (2004), this behavior is typical of terrestrial bromeliad, and the genus *Bromelia* has a preferably terrestrial habit and can be cultivated in soil-based substrates.



Figure 1. Details of *Bromelia reversacantha* plants in the Biological Reserve José Ângelo Rizzo, in Mossamedes-GO, 2015. A: Plant habit; B: Tipping of the outer leaves and plant disposition; C: Rigid spines and leaves in the form of canalicles; D: Inflorescence visited by butterfly; E: Flowers and bracts; F: Bunch of fruits.

Of the twenty individuals evaluated, six (30%) were in the vegetative stage (with leaves only), and fourteen (70%) in the reproductive stage, of which twelve (85.7%) were in flowering and two (14.3%) in fruiting; although the peak of flowering of the species occurs in June and July.

It was observed a lower plant height when in vegetative stage, with a variation from 0.35 m to 0.51 m ($x = 0.42$ m),

compared to the flowering stages (0.48 m to 0.69 m, $x = 0.58$ m) and fruiting (0.58 m to 0.74 m, $x = 0.66$ m) (Table 1). The difference in plant height between the vegetative and reproductive stages (flowering and fruiting) is due to the presence of flower stalk of the elongated type, which had from 0.24 m to 0.44 m length; although verified the occurrence of external leaf lodging at flowering time (Figure 1B).

Table 1. Plant height and diameter of the leaf rosette from *Bromelia reversacantha*, in their natural state. Mossâmedes-GO, 2015.

Number of plants / Phenological stage	Plant height (m)	Diameter of the rosette (m)
Vegetative stage		
1	0.40	0.80
2	0.42	0.93
3	0.35	0.84
4	0.38	0.91
5	0.51	0.84
6	0.43	1.04
Mean (\pm standard deviation)	0.42 (\pm 0.05)	0.89 (\pm 0.09)
Flowering plants		
1	0.60	1.08
2	0.53	0.82
3	0.49	0.78
4	0.48	0.88
5	0.49	0.78
6	0.69	1.03
7	0.57	0.99
8	0.60	1.03
9	0.56	1.10
10	0.63	0.71
11	0.65	1.00
12	0.69	1.15
Mean (\pm standard deviation)	0.58 (\pm 0.07)	0.95 (\pm 0.15)
Plants with fruits		
1	0.58	1.21
2	0.74	1.03
Mean (\pm standard deviation)	0.66 (\pm 0.11)	1.12 (\pm 0.13)
Overall mean (\pm overall standard deviation)	0.54 (\pm 0.11)	0.95 (\pm 0.14)

The plant had a mean rosette diameter of 0.95 m, ranging from 0.71 m to 1.21 m. This variation of 0.50 m in the diameter of the plants may be due to the tipping of the external leaves at the flowering. The rosette diameter, when compared to the plant height, results in a general horizontalized conformation; although the visual impression, in most cases, varies from vertical to balanced according to the evaluators. As 60% of the evaluated plants were flowering, and since the leaves are hidden and not very attractive due to the lodging in this stage, mixing with the litter and other lower elements around them, probably

the observed vertical conformation is due to the flashy color of the inflorescence, which predominates in the plant image at this phenological stage (Figure 1B).

The plant height, as well as the crown diameter, are essential characteristics to be considered in the landscaping and should be known when specifying the species for each environment, aiming its arrangement in spacings appropriate to the composition that is wanted, and at the same time, to the suitable development of the vegetable. According to Santos (2008), size is an excellent parameter for the classification of plants for use in landscaping.

In plants, the symmetry depends exclusively on the type of branching that forms the crown or foliage, and the direction of its growth. When branching starts from the main axis (racemic branching), the growth of this axis is continuous, and branching is limited (monopodial growth), probably the plant to be symmetrical. When branching starts from a short main axis with successive branches (cyme branching), the growth of this axis is limited, and the growth of the branches is unlimited (sympodial growth), the plant will have an asymmetric tendency (Leal and Biondi, 2006). Almost all the evaluated plants in this work were symmetrical, being a single individual asymmetric due to its sinuous flower stalk.

When there is sinuosity of the stem or flower stalk, this should not be taken as a negative aspect, since some ornamental pineapple genotypes (*Ananas comosus* var. *Ananassoides*) with sinuous flower stalk are already being studied, which are indicated for use in tropical flower arrangements, as a novelty for the floriculture sector.

The diversity of shades, designs, and forms of foliage is an important feature of bromeliads (Faria, 2005). The plant under study has leaves with serrated edge, according to the description made for this species by Smith and Downs (1979), with very rigid thorns, distributed from its base to the apex (Figure 1C).

It should be considered that through textures, pleasant sensations can be created for people who go to the gardens. The landscaper must pay attention to working with the textures when creating an environment, because those aggressive, found in the thorns, have greater weight than the delicate ones, besides bringing an intrinsic value, that of hurting those who come into direct contact with them (Lira Filho et al., 2002).

However, the presence of thorns may be a feature that, besides contributing to ornamentation, will allow the use as a guardian plant for the formation of living fences that, according to Paiva and Gavilanes (2004), can promote security, privacy, reduction noise and even pollution, delimitation of areas, or inhibition of passages. Still considering the texture, the leaves were classified by the evaluators as opaque, smooth and glabrous.

The leaves were usually green-purple in more than half of the evaluated plants (55%), regardless of their phenological condition, with varying shades of green and purple, according to each evaluator (Figures 1A-C). At the time of flowering, the central leaves and the bracts of various species of bromeliads become intense red. However, the color of the leaves varies between different species and according to different levels of luminosity in the environment, besides its total or partial coating, by peltate scale, to confer different shades, which makes them ornamental even when they are not flowery (Paula and Silva, 2004). Also, obtaining a different coloration of green on the leaves is a relevant feature, considering that it is a normally dominant color in the gardens, so that the plant can stand out even when it does not show flowering, aiding in the beautification of the environment throughout the year, which occurs with the bromeliad studied.

According to Paula and Silva (2004), bromeliads with rigid, compact, grayish or lively-colored leaves prefer the higher intensity of light. However, tender leaves and intense green adapt better to the environments of shade. In general, almost all species adapt to environments with about 50% solar luminosity. In this study, the occurrence of bromeliad was observed in both half-shade environments (55% of the evaluated plants) and in the full sun (40%). Only one plant was verified in the shade condition (5%). According to Paula and Silva (2004), there was a trend of more purple leaves in the full sun, while the greener leaves prevailed in the shaded environments (half shade and shade).

The rosette leaves of *B. reversacantha* plants did not form a true tank. According to Paula and Silva (2004), plants of the *Bromelia* genus, according to their ecology and nutrition strategy, have a proto tank, which are rudimentary tanks with the capacity to retain a small amount of water for a limited time. The leaves are shaped like “canaliculi” that direct the rainwater to the center of the rosette and the roots (Figure 1C).

Nowadays, this can be a positive feature, due to the connection of the water accumulated in the tank with the favoring of the multiplication of the dengue transmitting mosquito (*Aedes aegypti*). Although bromeliads are not the preferred reproduction habitat for this insect (Paula and Silva, 2004), it was observed reduction in the use of bromeliad species in landscaping, especially those with the tank, for this reason. However, according to Kiill et al. (2013), bromeliads play a key role in the survival of countless living beings, who depend on it for nourishment, being used as nurseries and drinking fountains. Besides its biological role, since its flowers provide nectar for bees, butterflies (Figure 1D) and hummingbirds, and the fruits serve as food for fauna.

Referring only to flowering plants, all evaluators considered the inflorescence to be the structure with the highest ornamental value, followed by the flowers alone and, finally, the leaves. In the species, the inflorescence is constituted by the arrangement of flowers and bracts grouped in a long axis. The terminal inflorescence of the “strobilus” type was considered pink color by the evaluators, and the scape was covered with white fuzz (Figure 1B-D). As for the texture, the evaluators classified the inflorescences as opaque, smooth and glabrous. For Faria (2005), the bracts (modified leaves) that protect the flowers are showy and more durable, maintaining for a long time the color and the vigor, which compensates for the ephemeral duration of the flowers.

Flowers of *B. reversacantha* were rosy-red (Figure 1E), considering variations of red and pink shades according to each evaluator. As for the texture, the flowers were also classified by the evaluators as opaque, smooth and glabrous. The color change along the seasons and phases of the plant’s life cycle makes it attractive for landscaping because they give movement to the garden (Lira Filho et al., 2002). It is also known that the flowers represent a robust visual appeal in the landscaping, being many species preferred by their blooms and by the time that they

remain flowered. According to Lira Filho et al. (2002), the color of the plant, besides being an aesthetic component, is important as regards the functional aspect. The coloring of the flowers serves to catch the attention of insects and hummingbirds that participate in their pollination.

Referring only to plants with fruits, three evaluators considered the fruits bunch to be the structure with the highest ornamental value, followed by the fruits alone and, finally, the leaves. Differently, only one evaluator considered the leaves as having the highest ornamental value, followed by the fruits bunch and, finally, the fruits alone. The bunch of fruits was light greenish-gray, while the fruits were greyish-green with whitish fuzz (Figure 1F), with shade variations according to each evaluator. According to the evaluators, both fruits bunch and fruits alone were classified as opaque, smooth and glabrous. All the evaluators considered that the bunch and the fruits are potentially ornamental.

The fruit of the species is a berry type, that according to Paula and Silva (2004), is a fleshy fruit, containing smooth seeds, without any appendix, surrounded by mucilaginous substance, is very appreciated by animals, especially birds, rodents and canids. Thus, it is observed that both the flowers and the fruits can attract birds, characteristics demanded in the landscaping, making the bromeliad more attractive.

The aroma is one of the characteristics used in the selection of ornamental plants by man. However, according to the evaluators, this plant does not exude any aroma that is perceptible by human smell, regardless of its stage.

As for the sanitary aspect of the twenty evaluated plants, only four showed signs of insect attack, always on the leaves, with an incidence score ranging from 1 to 4 ($x = 2.1$). In two of these plants, the attack was by larvae. Concerning the symptoms of diseases, in only five plants indications were found, also always in the leaves, with an incidence score ranging from 1 to 4 ($x = 1.6$). These results demonstrate that this species requires few phytosanitary treatments, which means one more attribute for its use in landscaping.

The decorative characteristics of a plant can be related to the color of the leaves and/or flowers, to the shape of the plant, shape, brightness, and size of the leaves, fruiting, color, and texture of the trunk, that is to those oriented towards visual communication elements of the plants (color, line, shape, and texture) (Lira Filho et al., 2002; Lorenzi, 2013). Thus, considering the plant in its totality, all the evaluators indicated it for ornamental use, three of them for use in gardens, pots and flower arrangements, and one of them only for use in gardens and pots. Some bromeliads are already used in gardens as living fences; especially Thus, considering the plant in its totality, all the evaluators indicated it for ornamental use, three of them

for use in gardens, pots and flower arrangements, and one of them only for use in gardens and pots. Some bromeliads are already used in gardens as living fences, especially *B. antiacantha*, *B. balansae* e *Ananas bracteatus* species (Paula and Silva, 2004).

When the possibility of use in arrangements, the inflorescence was the most indicated part of the plant, having been listed by three evaluators; followed by the leaves, indicated by two of them, and by the bunch of fruits also by two of them. Some species of bromeliads, *A. lucidus* and *A. ananassoides*, are cultivated as cut flowers for use in arrangements. This type of cultivation is being carried out in Brazil, aiming at export (Paula and Silva, 2004).

However, due to the deterioration of freshly harvested products, the storage life of these stems should be evaluated initially, since after cutting, they should be durable enough to reach the consumer with good condition although Kiill et al. (2013) consider that the high durability of the inflorescences of bromeliads species has been the reason for their high demand for the market of cut flowers, to compose flower arrangements. The authors indicate that the flower stalk and foliage of bromeliad *Neoglaziovia variegata* (Arruda) Mez, native to the Caatinga, due to their beauty and resistance, are promising elements of decoration. Its leaves last months after cutting without losing its characteristics. According to Stumpf et al. (2009b), besides the durability after cutting, characteristics of staining, size, shape, and texture should be considered, since they define the principles of floral composition.

The bromeliad of this study received a general score of 7.1 on the ornamental aspect (score adapted from Stumpf et al., 2007), with the scores of 7.4 and 7.3 for the flowering plant and with fruits, respectively, being better evaluated than the plant in the vegetative stage, with a score of 6.6 (Table 2). The exotic beauty and rusticity of bromeliads, expressed in a variety of colors and shapes, coupled with the fact that they can easily adapt to different environments, requiring little maintenance and space, make these plants widely used in landscaping (Kiill et al., 2013). They are already plants typically used in tropical gardens, for the diversity of colors and sizes, style in which all the exuberance of the flora of the tropical regions is present, with the predominance of the use of native species (Santos, 2008); as well as for use in rock gardens, being among the largest botanical groups of plants with species suitable for this purpose, such as *B. antiacantha* (Lorenzi, 2013). As reported by Stumpf et al. (2015), commercial cultivation and the use of native species in garden areas, as can be done with the bromeliads under study, are important conservation instruments for these species.

Table 2. Evaluation, by four evaluators, of the ornamental aspect of *Bromelia reversacantha*, in their natural state. Mossâmedes-GO, 2015.

Plants number / Phenological stage	Evaluator				Mean grade **
	1	2	3	4	
Plant in the vegetative stage					
1	6	7	8	7	7.0
2	7	5	8	6	6.5
3	5	6	7	6	6.0
4	6	6	7	5	6.0
5	7	6	8	6	6.8
6	8	8	7	7	7.5
Mean	6.5	6.3	7.5	6.2	6.6
Flowering plant					
1	8	7	8	7	7.5
2	7	7	7	8	7.3
3	7	7	7	8	7.3
4	6	7	8	7	7.0
5	6	8	8	7	7.3
6*	7	4	9	7	6.8
7	8	7	8	6	7.3
8	7	7	7	7	7.0
9	7	7	8	7	7.3
10	9	8	9	9	8.8
11	7	6	8	7	7.0
12	9	7	8	8	8.0
Mean	7.3	6.8	7.9	7.3	7.4
Plant with fruits					
1	6	7	6	8	6.8
2	8	7	8	8	7.8
Mean	7.0	7.0	7.0	8.0	7.3
<i>Overall mean</i>	<i>7.1</i>	<i>6.7</i>	<i>7.7</i>	<i>7.1</i>	<i>7.1</i>

* Plant with sinuous inflorescence stem; ** Scale from zero to ten.

It is noteworthy that the smaller size of the study species, giving it a greater possibility of use in landscaping, regardless of the size of the area, can be used in both smaller and larger gardens, allowing its wide use in gardens. However, the type of flowering to be used in composition with the plant should be considered, considering the presence of thorns in the leaves, allied to the lower leaves, which may hinder the management, especially when used in association with lawns, by the need for more pruning.

Certain plants, by their size, shape, color, and texture, have more attributes to be used alone in the garden. Others, however, need to be grouped in order to have esthetic value (Santos, 2008). The vigorous size, contrast, and coloring of the leaves and bracts, the

showy inflorescence, the flowers, and fruits, were shown as ornamental attributes. Thus, the *B. reversacantha* species can be used alone or in clusters in landscaping, and still as living fences.

Conclusions

The species *Bromelia reversacantha*, native and endemic to Cerrado rupestre in the Goiás State, presents several characteristics favorable to its introduction in landscaping projects, suggesting the use in gardens, alone or in massive, or as living fences/borders and in pots; as well as in ornamentation in decorative arrangements with the use of inflorescences and fruits bunch.

Author Contribution

M.R.Z. ID-0000-0002-4303-2075: Preparation of plant evaluation criteria; field analysis and data collection; article writing; critical review of the article; **M.W.S.** ID-0000-0002-8786-712X: Field analysis and data collection; critical review of the article; **S.T.S.** ID-0000-0001-6404-8271: Field analysis and data collection; critical review of the article; **L.L.P.** ID-0000-0001-9373-3868: Field analysis and data collection; critical review of the article.

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