Abstract
Herein we present a taxonomic synopsis of Aechmea species from Alagoas, Pernambuco, Paraíba, Rio Grande do Norte and Ceará states. The lack of a taxonomic key for identification of species, the high rate of endemism and the recent novelties published within Aechmea from this region motivated this work. Samplings were conducted in areas of all states studied between 2010 and 2014. We identified 27 species in the study areas while two names were excluded from the species list compiled from the literature. The subgenus Aechmea was the most representative with 20 species. Of particular importance was the Gravisia complex, represented by ten of the 14 species that form this informal taxonomic group. Pernambuco and Alagoas were the most species-rich compared to the other states. For each species found in the study area, we present identification keys, comments on the taxonomic relationships, habitat information and geographical distribution.

Key words: Bromeliaceae, Poales, taxonomy, morphology.

Introduction
Aechmea Ruiz & Pavón comprises nearly 250 species distributed in eight subgenera and is one of the most representative genera of Bromelioidae (Forzza et al. 2014; Smith & Downs 1979). The species occur from Mexico to southern Brazil, Uruguay and northern Argentina (Butcher & Gouda cont. upd.; Forzza et al. 2014; Smith & Downs 1979). In the Atlantic Forest, 140 species have been cited (Martinelli et al. 2008; Forzza et al. 2014), which represents more than 50% of the species richness of Aechmea.

The relationships among lineages within Aechmea are still unclear (Givnish et al. 2014, 2011; Sass & Specht 2010; Schulte et al. 2009; Horres et al. 2007; Givnish et al. 2007; Schulte et al. 2005), reflecting the traditional difficulties in classifying and establishing a precise definition of the genus (Faria et al. 2010; Wendt 1997; Smith & Downs 1979). However, the delimitation proposed by Smith & Downs (1979) has been largely used in taxonomic studies (Butcher & Gouda cont. upd., Forzza et al. 2014; Aguirre-Santoro & Betancur 2008; Martinelli et al. 2008; Martins et al. 2007).

In the northern portion of the Atlantic Forest, Sousa & Wanderley (2000) recorded ten species of Aechmea for the state of Pernambuco and later, Leme & Siqueira-Filho (2006) found 23 species in the states of Pernambuco and Alagoas. Martinelli et al. (2008) recognized Pernambuco and Alagoas as a region with high diversity and endemism of Bromeliaceae within the Atlantic Forest which was confirmed by Maciel et al. (2015).

The Atlantic Forest fragments have not yet received enough attention concerning their diversity of bromeliads, especially in the Brazilian Northeast. These forest remnants exhibit a range of edaphic, geomorphological and altitudinal aspects (Ferraz & Rodal 2008). Sometimes these remnants can be found inserted in a semiarid matrix and are locally known as “brejos de altitude” (Thomas & Barbosa 2008). In this region, recent discoveries have expanded the geographical distribution of species (Magalhães et al. 2014) and new taxa have been described (Leme & Scharf 2011). Furthermore, recent advances in our knowledge of Aechmea phylogeny have indicated the role of biogeography on the systematics of the genus (Sass & Specht 2010), highlighting the importance of regional taxonomic studies.

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In this work, we studied Aechmea species from the northern part of the Atlantic Forest (Alagoas, Pernambuco, Paraíba, Rio Grande do Norte and Ceará states) and provide identification keys as well as geographcal and ecological information for the species.

**Material and Methods**

Field work was performed from December 2010 to July 2014 in montane, submontane and lowland Atlantic Forest fragments from Alagoas, Ceará, Paraíba, Pernambuco and Rio Grande do Norte states. We have included the “brejos de altitude” in our study area, although they are not recognized as part of the Atlantic Forest (Thomas & Barbosa 2008).

Voucher specimens were deposited at UFP herbarium and duplicates sent to RB and NY. Collections at ALCB, ASE, CEPEC, EAC, HRB, HUEFS, IAN, INPA, IPA, JPB, MAC, MBML, MIRR, MPEG, NY, PEUFR, RB, UFP, UFRN, UFRR, US and VIES were also analyzed. To confirm species identification, protologs and type specimens were consulted.

**Results and Discussion**

We registered 27 species of Aechmea in Alagoas (17 spp.), Pernambuco (20 spp.), Paraíba (12 spp.), Rio Grande do Norte (3 spp.) and Ceará (4 spp.) states. Species richness decreases from south to north, reflecting on a local scale the same pattern discussed by Martinelli et al. (2008) for the Atlantic Forest. No specimens were found to confirm the occurrence of A. marauensis Leme cited to Alagoas, Pernambuco and Paraíba (Forzza et al. 2014).

Aechmea conifera L.B. Smith was also excluded because the specimens cited by Sousa & Wanderley (2000) belong to A. serragrandensis Leme & J.A. Siqueira-Filho. Thus, A. conifera and A. marauensis are now restricted to Bahia.


The Gravisia species complex (Read & Luther 1991) is the richest informal taxonomic group in the study area with 10 of the 14 species recognized as belonging to this complex by Leme & Siqueira-Filho (2006) and Read & Luther (1991). The Aechmea lingulata complex is represented in the area by four species. This taxonomic complex combines 21 species distributed in the Caatinga and Atlantic Forest of Brazil and the Caribbean (Leme & Siqueira-Filho 2006).

**Key to the Species of Aechmea from the northern Atlantic Forest**

1. Leaf blade margins entire ................................................................................. 18. Aechmea marginalis
1’. Leaf blade margins dentate or serrulate

2. Leaf blades variegated ................................................................................ 2.
2’. Leaf blades green on both surfaces or adaxially green and abaxially vinaceous

3. Inflorescences simple

4. Floral bracts absent; inflorescence axis wholly exposed............ 22. Aechmea nudicaulis
4’. Floral bracts present; inflorescence axis completely hidden by bracts

5. Leaves shorter or nearly as long as the inflorescence, 20–60 cm long ...........

.......................... 3. Aechmea bromeliifolia var. bromeliifolia
5’. Leaves much longer than the inflorescence, 65–220 cm long

6. Inflorescences 11–15 cm long, fertile part 7.5 cm long ..........................

.......................... 14. Aechmea gustavoi
6’. Inflorescence 60–80 cm long, fertile part 11–25 cm long

7. Floral bracts with margins densely serrulate ............................................. 20. Aechmea multiflora
7’. Floral bracts with margins entire

8. Inflorescences glaucous; floral bracts 1.9–2.8 cm × 1–1.4 cm .........

.......................... 21. Aechmea muricata
8’. Inflorescences yellow; floral bracts 7–7.5 cm × 3.8–4.5 cm .........

.......................... 25. Aechmea serragrandensis

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3’. Inflorescences compound
9. Floral bracts ≥ 1 cm long
10. Inflorescence 10–12 branched
  11. Primary bracts as long as or longer than the basal branches, erect, suberect or reflexed
  12. Primary bracts suberect to erect; floral bracts 1.2–1.4 cm long; pedicels 4–5 mm long
      5. Aechmea catendensis
  12’. Primary bracts reflexed; floral bracts 1.5–2 cm long; pedicels 1–2.5 mm long
      9. Aechmea emmerichiae
  11’. Primary bracts distinctly shorter than the basal branches, divergent
  13. Leaf blade apex attenuate, acute; primary bracts ovate-lanceolate; floral bracts much shorter than the internodes
      10. Aechmea eurycorymbus
  13’. Leaf blade apex truncate, pungent; primary bracts ovate; floral bracts slightly longer than the internodes
      13. Aechmea guainumbiorum
10’. Inflorescence 4–8 branched
  14. Peduncle bracts green; branches spreading; rachis partly exposed, sepals yellow
      6. Aechmea cephaloides
  14’. Peduncle bracts red or orange; branches erect; rachis hidden, sepals orange
  15. Inflorescence orange; fertile part 19–25 cm long; peduncle bracts orange; primary bracts divergent with the branches
      1. Aechmea aquilega
  15’. Inflorescence yellow; fertile part 8–16 cm long; peduncle bracts red; primary bracts erect
  16. Fertile part of inflorescence 8 cm long; primary bracts yellow
      15. Aechmea lactifera
  16’. Fertile part of inflorescence 12–16 cm long; primary bracts red
      7. Aechmea chrysocoma
9’. Floral bracts < 1 cm long or absent
  17. Flowers pedicellate
  18. Peduncle bracts divergent, imbricate; primary bracts ovate, apex pungent
      8. Aechmea costantinii
  18’. Peduncle bracts erect, remote; primary bracts elliptic, apex acute
  19. Terrestrial or rupicolous; leaves 33–65 cm long; leaf blade laxly serrulate; inflorescence pinkish; primary bracts red; sepals elliptical
      16. Aechmea leptantha
  19’. Epiphytic; leaves 70–110 cm long; leaf blade laxly dentate; inflorescence red; primary bracts yellow; sepals oblong
      27. Aechmea werdermannii
17’. Flowers sessile
  20. Inflorescence branched only at basal portion, red; leaf blades adaxially green and abaxially vinaceous
      12. Aechmea fulgens
  20’. Inflorescence branched from base to apex, yellow, red, green or white; leaf blades green
  21. Flowering plant 20–50 cm tall, forming a tubular to narrowly funnelform rosette with 6–8 leaves; inflorescence 30–40 cm long, fertile part 5.5–16 cm long; branches 1.5–2 cm long
      19. Aechmea mertensii
  21’. Flowering plant 60–170 cm tall, forming a tubular, crateriform or infundibuliform rosette with 8–20 leaves; inflorescence 53–120 cm long, fertile part 15–70 cm long; branches 5–26 cm long
  22. Fertile part of inflorescence 50–70 cm long; with 80–100 branches
      4. Aechmea castelnavii
  22’. Fertile part of inflorescence 15–54 cm long; with 4–28 branches
  23. Primary bracts as long as the branches or exceeding them, pink or red
      26. Aechmea tomentosa
  23’. Primary bracts reduced or shorter than the axillary branches, green
  24. Blade prickles 1.5–3 mm long; inflorescence branches 15–26 cm long
      23. Aechmea patentissima
  24’. Blade prickles 0.5–2 mm long; inflorescence branches 5–12 cm long
25'. Inflorescence with 6–16 branches
   26. Leaf sheath 16–21 cm long; leaf blade 62–110 × 3.5–5 cm, margins laxly to subdensely serrulate; inflorescence green to red .............................................................. 11. Aechmea froesii
   26. Leaf sheath 11–13 cm long; leaf blade 39–70 × 8–10 cm, margins densely serrulate; inflorescence whitish .............................................................. 17. Aechmea maranguapensis

Aechmea Ruiz & Pavon
Terricolous, rupeicolous or epiphytic plants, short- or long-caulescent, forming a tubular, narrowly funnelform, funnelform, broadly funnelform, crateriform or utriculate rosette. Leaves much shorter than the inflorescence to much exceeding the inflorescence; sheaths broadly ovate to elliptical; blades lanceolate to ligulate, green on both surfaces, adaxially variegated or abaxially vinaceous, erect, arching or recurving, glabrous to densely lepidote, apex attenuate, rounded, truncate, obtuse or emarginate, acute to pungent, margins entire to densely serrulate, prickles antrorse, straight or retrorse. Inflorescences simple or compound, capitate, globose, ovoid, ellipsoid, subcylindrical or paniculate, brown, whitish, pinkish, yellow, green, vinaceous, orange, red or glaucous; peduncle bracts remotely to densely imbricate, orange, red, pink, brown, glaucous, green or castaneous; primary bracts erect to divergent with the branches or reflexed, remotely to densely-imbricate, linear-lanceolate to ovate, entire to serrulate, shorter than the secondary peduncle to exceeding the branches, yellow, red, green, pink or orange; erect, spreading or curved; rachis hidden to wholly exposed; floral bracts ample to absent, much shorter than the internodes to exceeding the internodes remotely to very densely imbricate, membranaceous, chartaceous, stiff-chartaceous, coriaceous or stiff-coriaceous, glabrous to very densely lepidote, orange, white, green, red, brown, pink, glaucous or yellow. Flowers contiguous to spreading to a right angle with the rachis, sessile to long-pedicellate; sepals obovate to ovate-lanceolate, membranaceous to coriaceous, apex rounded to pungent, glabrous to densely lepidote, pink, white, green, yellow, orange or lilac.

   Fig. 1a-c


Endemic to the state of Alagoas and known only from the type locality. It grows as an epiphyte in the lowland Atlantic Forest. Leme & Siqueira-Filho (2006) highlighted the heavily impacted conditions of its habitat in Alagoas, where the only known population is recorded and put it under risk of extinction. It can be differentiated from other species in this study by its variegated leaves, long caulescent growth form and fasciculated inflorescence. It is morphologically related to A. disjuncta (L.B. Sm.) Leme & J.A. Siqueira and cited under the complex A. fosteriana by Leme & Siqueira-Filho (2006).
3. Aechmea bromeliifolia var. bromeliifolia (Rudge) Baker in Bentham & Hooker f., Gen. Pl. 3(2): 664. 1883. Fig. 1d-e


It occurs from Central America to northwestern South America and Brazil (Faria et al. 2010). In the study area it is found in Ceará and Paraíba. It grows as an epiphytic or terrestrial plant in Cerrado, Caatinga, Atlantic and Amazonian Forests and in coastal sandy soils (Faria et al. 2010). It can be characterized by its leaves shorter or nearly as long as the inflorescence, which differentiates this species from A. subg. Chevaliera. Moreover A. bromeliifolia has densely lepidote floral bracts and white or brown inflorescences. It belongs to A. subg. Macrochordon (Baker) de Vrieese and two varieties are accepted by Faria et al. (2010): A. bromeliifolia var. albobracteata Philcox and A. bromeliifolia var. bromeliifolia, the latter is found in the study area based on its known geographical distribution and pink peduncle bracts.

4. Aechmea castelnauii Baker, Handb. Bromel. 39: 1889. Fig. 1f


This species occurs from Costa Rica to Bolivia and Brazil (Smith & Downs 1979), where it grows in the Atlantic and Amazonian Forests (Forzza et al. 2014; Smith & Downs 1979) as an epiphyte in open or shaded places. In the study area, it is recorded only from Ceará state. It has a very long pinkish inflorescence, with up to 80–100 branches. These characters are unique among other species in this study.

5. Aechmea catendensis J.A. Siqueira & Leme, Fragm. Mata Atlântica do Nordeste: 205. 2006. Fig. 1g


Endemic to the state of Pernambuco. It grows as a terrestrial plant in shaded Atlantic Forest (Leme & Siqueira-Filho 2006). Among the taxa of the Gravisia complex, it has a more massive inflorescence and larger rosettes. Its inflorescence is globose due to the very congested apical branches and the basal branches are petals with ascendant flowers. It also has crateriform rosettes and inflorescences shorter than the leaves.

6. Aechmea cephaloides J.A. Siqueira & Leme, Fragm. Mata Atlântica do Nordeste: 202. 2006. Fig. 1h


Endemic to the state of Pernambuco. It grows as a terrestrial plant in shaded Atlantic Forest (Leme & Siqueira-Filho 2006). Among the taxa of the Gravisia complex, it has a more massive inflorescence and larger rosettes. Its inflorescence is globose due to the very congested apical branches and the basal branches are petals with ascendant flowers. It also has crateriform rosettes and inflorescences shorter than the leaves.

7. Aechmea chrysocoma Baker, Handb. Bromel.: 44. 1889. Fig. 1i


Endemic to the northeastern São Francisco River area, where it occurs in Paraíba, Pernambuco and Alagoas states. It grows as an epiphytic or terrestrial plant in shaded places from the Atlantic Forest. It has a yellow inflorescence with a 12–16 cm long fertile part, red peduncle bracts and red and erect primary bracts. The name was revalidated by Leme & Siqueira-Filho (2006) and the species also belongs to the Gravisia complex. Originally, it was described by Baker (1889), then accepted as a variety under A. aquilega by Smith & Downs (1979) and finally as synonymous with A. aquilega by Read & Luther (1991). However, it is clear that the Gravisia complex requires new approaches for a better taxonomic delimitation of the taxa within this informal group.
8. *Aechmea costantinii* (Mez) L.B.Sm., Phytologia 19: 281. 1970. Fig. 1j


Endemic to the northeastern São Francisco River area. Epiphytic in shaded and open areas in submontane and montane Atlantic Forest from Paraíba, Pernambuco and Alagoas (Leme & Siqueira-Filho 2006). *Aechmea costantinii* is differentiated by the minute floral bracts and pungent primary bracts, yellow inflorescence and flowers, 4–4.5 cm long pedicels and densely lepidote sepals. Sousa & Wanderley (2000) cited *A. stelligera* to Pernambuco, which was later synonymized with *A. costantinii* (Leme & Siqueira-Filho 2006).

9. *Aechmea emmerichiae* Leme, Bradea 4(39): 309. 1987. Fig. 2a


Endemic to northeastern Brazil, where it occurs in Bahia and Paraíba. In the study area it occurs in Paraíba state (Leme & Siqueira-Filho 2006). It grows in rocky outcrops in montane areas of the Atlantic Forest. It is considered part of the Gravisia complex (Read & Luther 1991) and closely related to *A. eurycorymbus* and *A. aquilega*. It differs by its inflorescence with 10–12 branches, and flowers, 4–4.5 cm long, and primary bracts and floral bracts shorter than the internodes. Leme & Siqueira-Filho (2006) and Sousa & Wanderley (2000) also emphasized how unclear is the taxonomic limits between *A. eurycorymbus* and *A. werdermanii* are. The main morphological characters to differentiate both species are the length of the floral bracts (1.7–2.5 cm long in *A. eurycorymbus* vs. 0.6–0.8 cm long in *A. werdermanii*) and pollen morphology (finely reticulated exine and not dense walls vs. broadly reticulated exine and not dense walls) (Leme & Siqueira-Filho 2006).


Endemic to the northeastern São Francisco River area. It occurs in Paraíba, Pernambuco and Alagoas as a terrestrial plant in shaded places of the lowland Atlantic Forest. It is morphologically related to *A. emmerichiae* and *A. guianumbiorum*, but can be differentiated by its attenuate and acute leaf blade apices and floral bracts, laxly imbricate peduncle bracts, ovate-lanceolate primary bracts and floral bracts shorter than the internodes. Leme & Siqueira-Filho (2006) and Sousa & Wanderley (2000) also emphasized how unclear is the taxonomic limits between *A. eurycorymbus* and *A. werdermanii* are. The main morphological characters to differentiate both species are the length of the floral bracts (1.7–2.5 cm long in *A. eurycorymbus* vs. 0.6–0.8 cm long in *A. werdermanii*) and pollen morphology (finely reticulated exine and not dense walls vs. broadly reticulated exine and not dense walls) (Leme & Siqueira-Filho 2006).

11. *Aechmea froesii* (L.B.Sm.) Leme & J.A.Siqueira, Fragm. Mata Atlântica do Nordeste: 225. 2006. Fig. 2d


Endemic to northeastern Brazil, this species occurs from Pernambuco to Bahia along the Atlantic Forest. In the study area it occurs in Pernambuco and Alagoas. It grows as an epiphytic or terrestrial plant in open or shaded areas. It belongs to the *Aechmea lingulata* complex (Leme & Siqueira-Filho 2006) and can be differentiated from the others by its green to red inflorescences with 6–9(14) branches. It often has red inflorescences but this is variable within populations. Smith & Downs (1979) recognized it as a variety of *A. lingulata* while Sousa & Wanderley (2000) accepted no infraspecific taxa under *A. lingulata*. However, Leme & Siqueira-Filho (2006) proposed a new combination, which is followed here.


Endemic to the northeastern São Francisco River area, it occurs as a terrestrial and sometimes epiphytic plant in shaded places in the Atlantic Forest in Paraíba, Pernambuco and Alagoas states. Among the cauline species in this study, it can be differentiated by its green or adaxially green and abaxially vinaceous leaves, branched and red
inflorescence, sessile flowers and lilac sepals. Smith & Downs (1979) proposed two varieties based on the chromatic pattern of the leaves, which were recognized neither by Sousa & Wanderley (2000) nor Leme & Siqueira-Filho (2006).

13. *Aechmea guainumbiorum* J.A.Siqueira & Leme, Fragm. Mata Atlântica do Nordeste. 207. 2006. Fig. 2f


Endemic to the state of Pernambuco. Rupicolous in exposed rock outcrops in submontane Atlantic Forest at 500–700 m altitude. Closely related to *A. eurycorymbus*, from which it differs by its truncate and pungent leaf blade apex, the remote basal-most peduncle bracts and the imbricate uppermost peduncle bracts; ovate primary bracts and floral bracts slightly exceeding the internodes. According to Leme & Siqueira-Filho (2006), this species belongs to the Gravisia complex.

14. *Aechmea gustavoi* J.A.Siqueira & Leme, Selbyana 22(2): 147. 2001. Fig. 2g-h

**Specimens examined:** PERNAMBUCO: Jaqueira, Serra do Urubu, 08.IX.2000, *J.A. Siqueira-Filho 1091* (UFP-holotype); *ibidem*, 29.IV.2014, *J.R. Maciel et al. 1929* (UFP).

Endemic to northeastern Brazil and occurring in Bahia and Pernambuco, in submontane Atlantic Forest at 500 to 600 m altitude. In the study area it is restricted to Pernambuco. It is an epiphyte of canopy trees at 10 m above the ground and in shaded areas. It is very distinctive due to its capitate inflorescence and the short fertile portion fully inserted in the rosette. Leme & Siqueira-Filho (2006) related this inflorescence pattern to species of *Neoregelia* subg. *Protoregelia*, but morphological characters leave no doubt of its systematic position. Sousa (2004) and Leme & Siqueira-Filho (2006) indicated some more populations in the states of Pernambuco and Alagoas, however the species has not yet been collected in these areas.

15. *Aechmea lactifera* Leme & J.A.Siqueira, Fragm. Mata Atlântica do Nordeste. 199. 2006. Fig. 2i


Endemic to northeastern Brazil from Paraiba to Sergipe. In the study area it occurs in Paraiba, Pernambuco and Alagoas. Rupicolous in exposed rock outcrops in the Atlantic Forest and Caatinga. The combination of a pinkish, large and lax inflorescence with pedicellate flowers and red primary bracts is unique among the studied species. Leme & Siqueira-Filho (2006) placed this taxon under *Aechmea* (previously described as *Portea leptantha* Harms) based on morphological evidence, but recently Sass & Specht (2010) have confirmed its affinity to *Portea* species based on molecular evidence. Herein, we follow Forzza et al. (2014) and Leme & Siqueira-Filho (2006), who used morphological characters to place this species under *Aechmea*.

16. *Aechmea leptantha* (Harms) Leme & J.A.Siqueira, Fragm. Mata Atlântica do Nordeste: 213. 2006. Fig. 2j-k


Endemic to northeastern Brazil from Paraiba to Sergipe. In the study area it occurs in Paraiba, Pernambuco and Alagoas. Rupicolous in exposed rock outcrops in the Atlantic Forest and Caatinga. The combination of a pinkish, large and lax inflorescence with pedicellate flowers and red primary bracts is unique among the studied species. Leme & Siqueira-Filho (2006) placed this taxon under *Aechmea* (previously described as *Portea leptantha* Harms) based on morphological evidence, but recently Sass & Specht (2010) have confirmed its affinity to *Portea* species based on molecular evidence. Herein, we follow Forzza et al. (2014) and Leme & Siqueira-Filho (2006), who used morphological characters to place this species under *Aechmea*.

17. *Aechmea maranguapensis* Leme & Scharf, Bromelie 2011(2): 59. 2011. Fig. 3a


Endemic to the state of Ceará and growing as an epiphytic or rupicolous plant in Serra de Maranguape above 700 m alt. Leme & Scharf
(2011) related it to *A. pernambucensis* and *A. subbahianensis* Leme, Amorim & J.A. Siqueira. However, based on the studied specimens, it seems to be morphologically related to *A. froesi* in the *A. lingulata* complex due to its little-branched inflorescence. However, it can be differentiated by its lilac flowers that are purplish at the apex, white inflorescence, shorter sheaths, and shorter and wider leaf blade.

**Fig. 3b**  
**Specimen examined:** ALAGOAS: Ibataguara, II.2001, J.S. Medeiros & A. Frassy (HB-holotype).

Endemic to the state of Alagoas and restricted to a small area of lowland Atlantic Forest where grows as an epiphyte. It has a capitulate but branched yellow inflorescence and green bracts. However, the main character to recognize it is the entire leaf blade margin, uncommon among species from the area.

**19. Aechmea mertensii** (G. Mey.) Schult. & Schult. f. in Roemer & Schultes, Syst. Veg., ed. 15 bis 7(2): 1272. 1830.  
**Fig. 3c**  

It is cited from Colombia, Peru and Brazil (Smith & Downs 1979), where it occurs in the Amazon and Atlantic Forest. In the study area it is found from Paraíba to Alagoas, Pernambuco and Rio Grande do Norte (Magalhães et al. 2014). It grows in open and shaded areas as an epiphytic or terricolous plant in lowland Atlantic Forest. It is common in sandy soils along the coast in “restinga” vegetation. It can be characterized by its green and subcylindrical inflorescence. Leme & Siqueira-Filho (2006) and Sousa & Wanderley (2000) highlighted the heavy impact on and loss of natural populations in urban areas in the state of Pernambuco.

**Fig. 3d-e**  
**Selected specimens:** ALAGOAS: Corupipe, Ufrn Guaxuma, 31.X.2004, J.A. Siqueira-Filho et al. 1436 (UFP); Feliz Deserto, s.t., 4.XI.1979, D. Andrade-Lima 79-8772 (IPA); Maragogi, s.l., 11.X.1980, D. Andrade-Lima 80-8813 (IPA).

Endemic to Brazil, distributed from Alagoas to Bahia state. In the study area it was recorded only for Alagoas. It is a common species in lowland coastal forest (“restinga”) where it grows as a terrestrial plant in sandy soils and shaded places or as an epiphyte. It can be recognized by its massive, globose and red inflorescence with, densely serrulate, red floral bracts. The fruits are edible with a sweet flavor. Canela et al. (2003) pointed out that the inflorescence of *A. multiflora* elongates after anthesis, which differentiates it from *A. depressa* L.B. Sm. Leme & Siqueira (2001) described *A. frassyi* as related to *A. multiflora* but later the same authors synonymized it (Leme & Siqueira 2006).

**Fig. 3f-g**  

Endemic to the northeastern São Francisco River area, restricted to Alagoas, Pernambuco and Rio Grande do Norte (Magalhães et al. 2014). It grows in open and shaded areas as an epiphytic or terricolous plant in lowland Atlantic Forest. It is common in sandy soils along the coast in “restinga” vegetation. It can be characterized by its green and subcylindrical inflorescence. Leme & Siqueira-Filho (2006) and Sousa & Wanderley (2000) highlighted the heavy impact on and loss of natural populations in urban areas in the state of Pernambuco.

**Fig. 4a**  

Endemic to Brazil, distributed from Alagoas to Bahia state. In the study area it was recorded only for Alagoas. It is a common species in lowland coastal forest (“restinga”) where it grows as a terrestrial plant in sandy soils and shaded places or as an epiphyte. It can be recognized by its massive, globose and red inflorescence with, densely serrulate, red floral bracts. The fruits are edible with a sweet flavor. Canela et al. (2003) pointed out that the inflorescence of *A. multiflora* elongates after anthesis, which differentiates it from *A. depressa* L.B. Sm. Leme & Siqueira (2001) described *A. frassyi* as related to *A. multiflora* but later the same authors synonymized it (Leme & Siqueira 2006).
Figure 2 – Species of the Aechmea. a. A. emmerichiae – inflorescence. b-c. A. eurycorymbus – b. inflorescence; c. floral bract view. d. A. froesii – inflorescence. e. A. fulgens – fertile part of inflorescence. f. A. guainumbiorum – inflorescence. g-h. A. gustavoi – g. leaf; h. leaf margin detail. i. A. lactifera – i. fascicle of the inflorescence. j-k. A. leptantha – j. fertile part of inflorescence; k. flower.
Aechmea from northeastern Atlantic Forest

Aechmea nudicaulis occurs from Central America to Brazil (Wendt 1997) and A. nudicaulis var. nordestina is one of the varieties recognized. It is endemic to the montane and submontane northern Atlantic Forest and found in the states of Paraíba and Pernambuco (Leme & Siqueira-Filho 2006). The pale green peduncle bracts, sepals and inflorescence can be used to distinguish this variety (Smith & Downs 1979). In the study area it can be grouped with the plants with long caulescent growth form, but it has green leaves and a simple, pale green inflorescence with the axis fully exposed.


In the study area it occurs in Rio Grande do Norte, Paraíba, Pernambuco and Alagoas states, but has a wide distribution in the Atlantic Forest and can also been found in Bahia, Espirito Santo, and Rio de Janeiro. It is terrestrial or epiphytic in shaded or open places. It is related to A. pernambucensis but can be distinguished by the higher number of inflorescence branches. A. patentissima has a longer inflorescence and longer branches than A. pernambucensis. Leme & Siqueira-Filho (2006) restored A. patentissima to species status unlike Smith & Downs (1979) and Sousa & Wanderley (2000), who placed A. patentissima as a variety of A. lingulata. Leme & Siqueira-Filho (2006) included this species in the A. lingulata complex and related it to A. lingulatoides Leme & H. Luther.


Previously recorded just to the state of Alagoas, now the distribution of A. serragrandensis is expanded to Pernambuco. It grows as an epiphyte in shaded areas in the lowland and submontane Atlantic Forest. It is very distinctive due to its ovoid or ellipsoid inflorescence with yellow and entire floral bracts. The plants support a big rosette and massive inflorescences. Despite the poor morphological knowledge of A. conifera (Sousa 2004), Leme & Siqueira-Filho (2006) described A. serragrandensis by comparing it to A. conifera. The authors cited A. Lima 69-5589 as a paratype, which was used by Sousa (2004) to recognize A. conifera in the state of Alagoas. Thereby, we excluded recognition of the species A. conifera from the study area.


Endemic to the northeastern São Francisco River area. It occurs as a terrestrial plant in sandy soil of the lowland Atlantic Forest along the coast of the states of Alagoas and Pernambuco. It grows in shaded areas and is rarely found in open habitats. It has small floral bracts and sessile flowers. It is distinguished by being the only species in the area with cinereous inflorescences, entire and red peduncle bracts and primary bracts and sepals with a 0.5–0.8 mm long spine. Sousa & Wanderley (2000) and Leme & Siqueira-Filho (2006) used the peduncle and flower indument, primary bract
Figure 3 – Species of the Aechmea. a. A. maranguapensis – inflorescence. b. A. marginalis – part of the leaf blade. c. A. mertensii – habit. d-e. A. multiflora – d. habit; e. floral bract. f-g. A. muricata – f. fertile part of inflorescence; g. floral bract.
shape, branch arrangement and flower length to distinguish this taxon from *A. costantinii* (=*A. stelligera*) and *A. werdermannii*.

**Fig. 4h**  

Endemic to the northeastern São Francisco River area. Epiphytic in montane and submontane Atlantic Forest from Paraíba, Pernambuco and Alagoas. It grows in shaded places. The species is morphologically similar to *A. leptantha* and *A. eurycorymbus* but differs by its habit (epiphytic) with longer leaves (70–110 cm) and red inflorescences. Although it was not included by Read & Luther (1991) under the Gravisia complex, Leme & Siqueira-Filho (2006) suggested its relationship.

### Acknowledgments

We are indebted to the organizations that funded our field research, including CNPq (Brazil), the National Science Foundation (USA, DEB-0946618), Velux Stiftung (Switzerland), and the Beneficia Foundation (USA). We thank the curators of the consulted herbaria, Regina Carvalho for illustrations and Scott Heald for reviewing the English of the manuscript.

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