The genus *Eleocharis* (Cyperaceae) in the restinga of Pará state, Brazil

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**Abstract**

This work reports eight *Eleocharis* species for the restinga of Pará state, Brazil: *E. bahiensis*, *E. endounifascis*, *E. geniculata*, *E. interstincta*, *E. minima*, *E. mutata*, *E. sellowiana*, and *E. urceolata*. Two species are new records for the state: *E. bahiensis*, and *E. urceolata*. An identification key, morphological descriptions, taxonomic comments, and illustrations of the species in the study area are provided.

**Key words**: Amazon, aquatic plants, Cyperoideae, sandy coast, taxonomy.

**Introduction**

*Eleocharis* R. Br. (Cyperaceae) comprises approximately 250 species distributed in tropical and subtropical regions of America (Goetghebeur 1998; González-Elizondo & Tena-Flores 2000). In Brazil it is the third largest genus of Cyperaceae, being represented by 82 species (BFG 2015). The morphology of *Eleocharis* is simple, with distinct intergeneric characteristics, such as reduced leaves, a tubular sheath, absence of the typical involucral bracts found in Cyperaceae, and an inflorescence reduced to a single spikelet (González-Elizondo & Peterson 1997). Identifying species of *Eleocharis* is often very difficult because of the small size of its diagnostic structures, such as glumes, achenes, and stylopodium (Svenson 1929; Faria 1998; Gil & Bove 2004).

There are some taxonomic treatments for *Eleocharis* in Brazil (notably, Faria 1998; Gil 2004; Trevisan 2005, 2009), regional checklists (e.g., Gil & Bove 2004, 2007), and new species were recently described (Trevisan & Boldrini 2010; Lima et al. 2014; Nunes et al. 2016b). For Pará state, there is no taxonomic work focusing exclusively on the genus.

*Eleocharis* species are aquatic or wetland plants that grow in moist or inundated soils, lagoons, lakes, marshes, on river margins, and in the sandy coastal vegetation (known in Brazil as restinga) (Faria 1998; Gil & Bove 2007). Abundant water and light are the main resources required for good development of the species (Gil & Bove 2004). According to Trevisan & Boldrini (2008), the species are ecologically important, mainly to the floristic composition and phytophysiognomy of flooded areas.

Brazil has approximately 8,500 km of coastline (Moraes 2007). Of this, 1,500 km are in the Amazon region, within the states of Amapá, Pará and Maranhão (Lacerda et al. 1984), where there is a mosaic of terrestrial and aquatic ecosystems of great environmental importance.
Among the various environments of the coastal region of the country, the restinga occupies around 5,000 km, which represents 79% of coastal Brazil (Lacerda et al. 1984; Araújo & Lacerda 1987). Along the Amazon coast, the restinga occurs discontinuously and occupies an estimated 1,000 km². Pará state contains 40% of the Amazonian restinga, which occurs in a coastal plain cut by peninsulas and bays (Amaral et al. 2008; Silva et al. 2010; Schneider et al. 2017).

According to the concept presented in the Brazilian law (CONAMA nº 303/2002 Resolution), restinga represents “sandy deposits, parallel to the coastline, produced by sedimentation processes, where different communities are found under marine influence”. These communities form a vegetation complex near the ocean that is mainly influenced by the soil (Silva 1999). The restinga vegetation is responsible for assuring balance in the ecosystems, as well as harboring species of economic, medicinal, food, and ornamental importance (Santos et al. 1999).

The objective of the present study was to better understand the taxonomy of Eleocharis species that occur in the restinga of Pará state, Amazon, Brazil. An identification key, morphological descriptions, taxonomic comments and illustrations of the studied species of Eleocharis are provided.

**Material and Methods**

Restinga in Pará state includes six distinct plant formations: halophile, creeping psammophile, herbaceous marshes, dune fields, open shrub formations, and restinga forest (Amaral et al. 2008). In Pará state, restinga is present in the municipalities of São Caetano de Odivelas, Curuça, Marapanim, Maracanã, Salinópolis, São João de Pirabas, Quatipurú, Tracuateua, Bragança, Augusto Corrêa and Viseu (Fig. 1). The climate is hot throughout the year, with an average annual temperature of 26 °C and minimum temperature above 18 °C (Silva et al. 2010).

Specimens from HBRA, IAN and MG herbaria, and images of specimens online at B, G, INPA, NY, P, RB and UB, were analyzed based on collections from the municipalities in Pará state where restinga is found (excluding the Marajó Island municipalities). Collected material was processed and deposited in MG.


The correct nomenclature of the species and their basionyms, as well as abbreviations of the original publications and authors, are based on The International Plant Names Index (<http://www.ipni.org/>) and Tropicos (<http://www.tropicos.org/Home.aspx>) sites. The terminology used to describe the species follows Nunes et al. (2016b).

**Results and Discussion**

A total of 144 specimens of Eleocharis from restinga in Pará state were analyzed. Eight species were confirmed, including two that are new records for the state.


Herbs, erect, caespitose or rhizomatous. Culms cylindrical, quadrangular, or slightly to evidently trigonous in cross section, septate or not. Leaves reduced to sheaths at the base of the culm (leaf blade absent), sheaths membranaceous or coriaceous. Inflorescence a single spikelet at culm apex; involucral bracts absent. Spikelets globose, ovoid, ellipsoidal or lanceoloid; sometimes dimorphic. Glumes persistent or deciduous, spiral, distichous or subdistichous; lower glumes fertile or sterile. Perianth bristles present, absent or rudimentary. Stamen 1–3. Stigma bifid or trifid. Achene biconvex or trigonous, smooth or reticulate, white to black; stylopodium confluent or not with the rest of the achene body (adapted from Svenson 1929; Gil & Bove 2007; Trevisan 2009).
Identification key to the species of *Eleocharis* in the restinga of Pará state

1. Plants robust, 39–98 × 0.2–0.6 cm; spikelets oblongoid or lanceoloid; glumes cartilaginous.
2. Culms solid, spongy, trigonous to obtusely trigonous in cross section; achenes with thickening at apex
   ........................................................................................................... 1.6. *Eleocharis mutata*
2’. Culms hollow, septate (septa very evident), cylindrical in cross section; achenes with a constriction at apex.
3. Culms with conspicuous central vascular bundle; glumes with truncate to rounded apex ....
   ........................................................................................................... 1.2. *Eleocharis endounifascis*
3’. Culms without conspicuous central vascular bundle; glumes with subacute to obtuse apex...
   ........................................................................................................... 1.4. *Eleocharis interstincta*
1’. Plants delicate, 1.2–38.5 × 0.02–0.11 cm; spikelets ovoid, ellipsoid or globose; glumes membranaceous
4. Styles bifid; achenes biconvex.
5. Sheaths without evident longitudinal ribs, apex oblique, cuspidate to apiculate, without hyaline appendix; achenes black, sometimes vinaceous
   ........................................................................................................... 1.3. *Eleocharis geniculata*
5’. Sheaths with 5 evident, longitudinal ribs, apex truncate, mucronate, with hyaline, rugose appendix; achenes dark brown to dark green .... 1.7. *Eleocharis sellowiana*
4’. Styles trifid; achenes trigonous.

Figure 1 – Location of the study area. Adapted from IBGE (2008).
6. Perennial herbs; culms quadrangular in cross section; glumes elliptical; lower glume continuous with the culm ................................................................. 1.5. *Eleocharis minima*

6'. Annual herbs; culms cylindrical in cross section; glumes oval-lanceolate or oblong; lower glume articulate with the culm

7. Glumes oval-lanceolate; stamens 2; achenes obovoid, longitudinally ribbed surface; stylopodium pyramidal ................................................................. 1.1. *Eleocharis bahiensis*

7'. Glumes oblong; stamen 1; achenes urceoloid, reticulate surface; stylopodium discoid .............. 1.8. *Eleocharis urceolata*


Fig. 2a-c

Annual herbs, caespitose, 2.7–13.2 cm long. Culms 2.5–12.7 × 0.03–0.08 cm, cylindrical in cross section, solid, spongy, conspicuous central vascular bundle absent, surface sulcate. Sheaths 0.5–3.5 cm long, membranaceous, without longitudinal ribs, apex acute to attenuate, aristate, with hyaline margins, apical hyaline appendix absent. Spikelets 2–5 × 1.5–3 mm, ovoid to ellipsoid, basal culmless spikelets absent; glumes spirally arranged, 1–1.9 × 1–1.5 mm, oval-lanceolate, membranaceous, sides stramineous, sometimes vinaceous with a prominent brown keel, margins hyaline, apex emarginate; lower glume sterile, articulate with the culm. Stamens 2. Styles 3. Perianth bristles absent. Achene 0.5–0.8 × 0.3–0.4 mm, trigonous, obovoid, greyish white, surface longitudinally ribbed, trabeculated between ribs, presence of a constriction between the achene body and stylopodium; stylopodium pyramidal, brown.


**Distribution and habitat**: Brazil (BFG 2015). This is the first record for the state of Pará. In Brazil, its also occurs in the Northeast (BA) region (BFG 2015). In the restinga of Pará state, this species is found in herbaceous marshes and dune fields.

**Comments**: *Eleocharis bahiensis* is characterized mainly by its glumes with a prominent brown keel, absence of perianth bristles, achenes that are trigonous, greyish white, with a longitudinally ribbed surface and trabeculae between the ribs, and conic stylopodium. It can be confused with *E. filiculmis* Kunth, a species not recorded for the study area, by the emarginate glumes and trigonous achenes; however, *E. bahiensis* possesses a sheath with an acute to attenuate, aristate apex and hyaline margins (vs. oblique to cuspitate apex and margins not hyaline), achene surface longitudinally ribbed with trabeculae between the ribs (vs. achene surface slightly ribbed and no trabeculae), and absence of perianth bristles (vs. perianth bristles present).


Fig. 2d-f

Perennial herbs, caespitose, 49–94 cm long. Culms 48–90 × 0.2–0.4 cm, cylindrical in cross section, hollow, transversely septate, conspicuous central vascular bundle present, surface not sulcate. Sheaths 2.5–15 cm long, membranaceous, without longitudinal ribs, apex obtuse to apiculate, without hyaline margins, apical hyaline appendix absent. Spikelets 10–40 × 4–5 mm, lanceoloid, basal culmless spikelets absent; glumes spirally arranged, 4–6 × 2–3.8 mm, subboval, cartilaginous, sides stramineous without a prominent keel, margins hyaline with one submarginal dark brown to black line, apex truncate to rounded; lower glume sterile, continuous with the culm. Stamens 3. Styles 3. Perianth bristles 7, white to stramineous, retrorsely scabrous. Achene 2–2.5 × 1–1.1 mm, biconvex, obovoid, light brown, surface with longitudinal rows of isodiametric cells, presence of a constriction between the achene body and stylopodium; stylopodium long-pyramidal, laterally compressed, dark brown to black.


**Distribution and habitat**: Venezuela, Guyana and Brazil (Hinchliff et al. 2010). In Brazil, this species occurs in the North (PA), Northeast (CE, PE, SE), Central-West (MS) and Southeast (RJ,
Figure 2 – a-c. *Eleocharis bahiensis* – a. sheath; b. spikelets; c. achene. d-f. *E. endounifascis* – d. sheath; e. spikelets; f. achene. g-i. *E. geniculata* – g. sheath; h. spikelets; i. achene. j-l. *E. interstincta* – j. sheath; k. spikelets; l. achene (a-c. J.F. Maciel-Silva et al. 3; d-f. J.F. Maciel-Silva et al. 7; g-i. M.N. Bastos et al. 638; j-l. S. Almeida et al. 325).
in the restinga of Pará state, this species was found in herbaceous marshes, permanent lakes, and streams formed from the accumulation of rain in open shrub formations.

Comments: Eleocharis endounifascis is mainly characterized by the hollow, separtate (septa evident externally) culm cylindrical in cross section, and cartilaginous glumes with a submarginal dark brown to black line. It can be confused with E. interstincta (Vahl) Roem. & Schult., primarily because of the hollow culm that has externally evident septa and is cylindrical in cross section, achene surface with longitudinal rows of isodiametric cells, and long-pyramidal stylopodium. However, E. endounifascis differs mainly by having a single, conspicuous central vascular bundle along the culm.

1.3. Eleocharis geniculata (L.) Roem. & Schult., Syst. Veg. 2: 150. 1817. Scirpus geniculatus L., Sp. PL 1: 48. 1753. Fig. 2g-i

Perennial herbs, caespitose, 3–38.5 cm long. Culms 2.7–37.5 × 0.08–0.11 cm, cylindrical in cross section, solid, spongy, conspicuous central vascular bundle absent, surface sulcate. Sheaths 0.5–10 cm long, membranaceous, without longitudinal ribs, apex oblique, cuspidate to apiculate, without hyaline margins, apical hyaline appendix absent. Spikelets 3–10 × 2.5–7.5 mm, globose to ovoid, basal culmless spikelets absent; glumes spirally arranged, 1–2.5 × 1–1.5 mm, globose to oval, membranaceous, sides and keel stramineous, keel not prominent, without hyaline margins, apex obtuse to rounded; lower glume sterile, articulate with culm. Stamens 2. Styles 2. Perianth bristles (5–) 7, sometimes rudimentary or absent, brown, margins retrorsely scabrous. Achene 0.9–1.1 × 0.4–0.8 mm, biconvex, obovoid, black, sometimes vinaceous achenes with a smooth surface, discoid stylopodium, and presence or absence of perianth bristles that can exceed the achene. The great morphological variation in relation to the size of the perianth bristles, and their presence or absence, has been cited by other authors (e.g., González-Elizondo 1994; Faria 1998; Trevisan & Boldrini 2008), and for the specimens we analyzed this character was also very variable. Eleocharis geniculata is similar to E. maculosa (Vahl) Roem. & Schult., a species not recorded for the study area, because of the ovoid spikelets, sterile lower glume, and biconvex, obovoid, black achenes. However, E. maculosa differs mainly by its sheath with a conspicuous apical hyaline and rugose appendix.

1.4. Eleocharis interstincta (Vahl) Roem. & Schult., Syst. Veg. 2: 149. 1817. Scirpus interstinctus Vahl, Enum. PL 2: 251. 1805. Fig. 2j-l

Perennial herbs, caespitose, 52–91 cm long. Culms 49.4–87.5 × 0.5–0.6 cm, cylindrical in cross section, hollow, transversely septate, conspicuous central vascular bundle absent, surface not sulcate. Sheaths 4–20 cm long, membranaceous, without longitudinal ribs, apex obtuse to acute, without hyaline margins, apical hyaline appendix absent. Spikelets 21–35 × 4–6 mm, oblengoid to lanceoloid, basal culmless spikelets absent; glumes spirally arranged, 5–6 × 2.5–3 mm, elliptic to oboval, cartilaginous, sides and keel stramineous, keel not prominent, margins hyaline, apex subacute to obtuse; lower glume sterile, continuous with the culm. Stamens 3. Styles 2–3. Perianth bristles 7, stramineous, margins retrorsely scabrous. Achene 2.4–3 × 1–2 mm, biconvex, obovoid, stramineous, surface with longitudinal rows of isodiametric cells, presence of a slight constriction between
the achene body and stylopodium; stylopodium triangular, brown.


**Distribution and habitat**: Africa, United States, Central America and South America (Colombia, Venezuela, Guyana, Suriname, Peru, Bolivia, Paraguay and Brazil) (Gil & Bove 2007; Trevisan & Boldrini 2008). In Brazil, this species occurs in all states (BFG 2015). In the restinga of Pará state, it is found in herbaceous marshes and inundated areas of open shrub formations.

**Comments**: *Eleocharis interstincta* is mainly characterized by the cylindrical culms with very evident septa, sheath with an acuminate apex, glumes with obtuse apex, and perianth bristles with retrorsely scabrous margins. It is similar to *E. endounifascis* (vide comments under *E. endounifascis*).

### 1.5. *Eleocharis minima* Kunth, Enum. Pl. 2: 139. 1837.

Perennial herbs, caespitose, 1.2–11 cm long. Culms 1–10.5 × 0.02–0.03 cm, quadrangular in cross section, solid, spongy, conspicuous central vascular bundle absent, surface sulcate. Sheaths 0.2–2.1 cm long, membranaceous, without longitudinal ribs, apex acute to obtuse, with hyaline margins, apical hyaline appendix absent. Spikelets 2.5–6 × 1–1.8 mm, ovoid to ellipsoid, basal culmless spikelets present; glumes distichously to spirally arranged, 1.2–2.1 × 0.7–1 mm, elliptic, membranaceous, sides stramineous, keel green and prominent, with hyaline margins, apex obtuse; lower glume sterile, continuous with the culm. Stamens 2–3. Styles 3. Perianth bristles rudimentary or absent, when rudimentary, white to light brown, margins smooth. Achene 0.7–0.9 × 0.3–0.5 mm, trigonous, ellipsoid to obovoid, white, yellowish to brownish, surface smooth, sometimes slightly verrucose, with evident cells, presence of a constriction between the achene body and stylopodium; stylopodium short-pyramidal, brown.


**Distribution and habitat**: United States, Central America and Brazil (Svenson 1929; Trevisan & Boldrini 2008). In Brazil, this species occurs in all states (BFG 2015). In the restinga of Pará state, it occurs in flooded areas of dune fields and streams formed by rainfall in open shrub formations.

**Comments**: *Eleocharis minima* is mainly characterized by the capillary culm, distichously to spirally glumes with stramineous sides, prominent, green keel, lower glume continuous with the culm, perianth bristles absent or rudimentary, and trigonous, white, yellowish to brownish achene with a short-pyramidal stylopodium. It can be confused with *E. nana* Kunth, a species not recorded for the study area, mainly due to the similarity in habit, capillary culm, obtuse sheath apex, and glumes subdistichously to spirally arranged. *Eleocharis minima* differs from *E. nana* mainly by having perianth bristles rudimentary or absent, smooth when rudimentary (vs. perianth bristles 5, retrorsely scabrous). It is the species with the highest number of misidentifications, which is possibly due to the morphological complexity found in the representatives of series *Tenuissimae* (C.B. Clarke) Svenson (González-Elizondo & Peterson 1997; Trevisan & Boldrini 2010; Roalson et al. 2010). Most of the specimens had basal culmless spikelets, which characterizes the species in series *Tenuissimae* subser. *Chaetariae* (C.B. Clarke) Svenson (Svenson 1929; González-Elizondo & Peterson 1997; Trevisan & Boldrini 2010; Nunes et al. 2016b).


Perennial herbs, caespitose, 39–98 cm long. Culms 36.5–93 × 0.2–0.55 cm, trigonous to obtusely trigonous in cross section, solid, spongy, conspicuous central vascular bundle absent, surface not sulcate. Sheaths 3.5–36 cm long, membranaceous, without longitudinal ribs, apex acuminate to caudate, with hyaline margins, apical hyaline appendix absent. Spikelets 21–57 × 4–5 mm, lanceoloid, basal culmless spikelets absent; glumes spirally arranged, 3.1–4.6 × 2.2–4.1 mm, oblong to obovate, cartilaginous, sides with vinaceous dots, keel stramineous, not prominent, margins hyaline, apex obtuse to rounded; lower glume sterile, continuous with culm. Stamens 3. Styles 3. Perianth bristles 6–7, light brown, margins...
Figure 3 — a-c. *Eleocharis minima* — a. sheath; b. spikelets; c. achene. d-f. *E. mutata* — d. sheath; e. spikelets; f. achene. g-i. *E. sellowiana* — g. sheath; h. spikelets; i. achene. j-l. *E. urceolata* — j. sheath; k. spikelets; l. achene (a-c. L.K.M. Rodrigues 25; d-f. U. Mehlig et al. 1703; g-i. M.N. Bastos et al. 1184; j-l. L.O. Santos et al. 290).
Perennial herbs, rhizomatous, 2–25 cm long. Culms 1.7–24.3 × 0.03–0.1 cm, cylindrical in cross section, solid, spongy, conspicuous central vascular bundle absent, surface sulcate. Achenes 0.5–2.5 cm long, membranaceous, with five, green, longitudinal ribs, apex truncate, mucronate, apical hyaline and rugose appendix present. Spikelets 3–7 × 1.4–3.5 mm, ovoid, sometimes ellipsoid, basal culmless spikelets absent; glumes spirally arranged, 1.4–2.5 × 1–1.3 mm, oblong to elliptic, membranaceous to nearly membranaceous, sides vinaceous with prominent greenish keel, margins hyaline, apex obtuse to rounded; lower glume sterile, articulate with culm. Stamens 2. Styles 2. Perianth bristles 7, brown to vinaceous, margins retrorsely scabrous. Achenes 1–1.1 × 0.4–0.8 mm, biconvex, widely elliptoid to obovoid, dark brown to dark green, surface smooth to reticulate, presence of a slight constriction between the achene body and stylopodium; stylopodium conic, light to dark brown.

specimen. In addition to the stylopodium, there is also variation in the size of the fruit. Despite the evident variation, the specimens analyzed were closer to the circumscription of *E. sellowiana* and were determined as this species.


Annual herbs, caespitose, 2–8.5 cm long. Culms 1.8–8.1 × 0.03–0.04 cm, cylindrical in cross section, solid, spongy, conspicuous central vascular bundle absent, surface sulcate. Sheaths 0.5–1 cm long, membranaceous, without longitudinal ribs, apex acute, margins hyaline, apical hyaline appendix absent. Spikelets 2.5–4 × 1–2 mm, ovoid, basal culmless spikelets present; glumes spirally arranged, ca. 1 × 0.5 mm, oblong, membranaceous, sides vinaceous with prominent greenish keel, margins hyaline, apex obtuse, sometimes emarginate; lower glume fertile, articulate with the culm. Stamen 1. Styles 3. Perianth bristles absent. Achene 0.4–0.6 × 0.3–0.4 mm, trigonous, urceoloid, white-greyish, surface reticulate, presence of a constriction between the achene body and stylopodium; stylopodium discoid, light brown.

**Examined material:** Bragança, Península de Ajuruteua, Salinas dos Roques (Jabuti), campo próximo à borda sul do bosque na 4ª ilha de terra firme, 13.V.2007, fl. and fr., L.O. Santos et al. 290 (HBRA, MG).

**Distribution and habitat:** Mexico, Nicaragua and Brazil (Svenson 1929; González-Elizondo 1994; BFG 2015). This is the first record of this species for the state of Pará. In Brazil, its also occurs in the Central-West (DF) and Southeast (SP) regions (BFG 2015). In the restinga of Pará state, it is found in flooded areas of open shrub formations.

**Comments:** *Eleocharis urceolata* is characterized by the sheath with an acute apex, glumes with vinaceous sides, with prominent greenish keel, margins hyaline, and urceoloid achene with reticulate surface and discoid stylopodium. It resembles *E. bahiensis* because of the trigonous achenes and glumes articulate with the culm; however, *E. urceolata* differs from *E. bahiensis* by the sheath with an acute apex (vs. aristate), oblong glumes (vs. oval-lanceolate) and urceoloid achenes (vs. obovoid).

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List of exsiccate
Almeida S 325 (1.4), 326 (1.6). Bastos MN 552 (1.6), 638 (1.3), 648 (1.3), 777 (1.1), 800 (1.3), 926 (1.3), 976 (1.2), 1103 (1.7), 1128 (1.3), 1184 (1.7), 1202 (1.6), 1203 (1.2), 1217 (1.5), 1597 (1.3), 1637 (1.5), 1639 (1.1), 1693 (1.6), 1799 (1.3). Calvacante P 450 (1.3), 950 (1.6). Carreira L 1448 (1.3). Costa Neto SV 2 (1.5), 20 (1.3). Davidse G 17839 (1.6). Egler WA 602 (1.3). Gil A 289 (1.3), 312 (1.2), 372 (1.6). Gurgel ESC 828 (1.3). Jangoux J 1202 (1.7). Lins A 908 (1.3), 909 (1.3). Lobato LCB 176 (1.6), 198 (1.3), 226 (1.6), 2546 (1.3). Maciel-Silva JF 3 (1.1), 4 (1.1), 5 (1.2), 6 (1.2), 7 (1.2), 8 (1.2). Mehlig U 18 (1.3), 24 (1.3), 70 (1.6), 78 (1.3), 206 (1.3), 328a (1.3), 328b (1.1), 336 (1.6), 342 (1.7), 361 (1.7), 366 (1.3), 510 (1.3), 795 (1.3), 996 (1.3), 1621 (1.5), 1636 (1.7), 1664 (1.7), 1674 (1.3), 1703 (1.6), 1707 (1.7). Menezes MPM 70 (1.3). Nascimento RESA 259 (1.6), 260 (1.3). Oliveira ES 144 (1.3), 170 (1.3), 174 (1.3). Oliveira J 954 (1.3). Oliveira L 261 (1.3), 368 (1.3), 513 (1.3). Rocha AES 279 (1.3), 308 (1.3), 831 (1.3). Rodrigues LKM 1 (1.6), 10 (1.6), 16 (1.3), 18 (1.3), 23 (1.3), 25 (1.5), 30 (1.3), 37 (1.7), 41 (1.3), 42 (1.3), 43 (1.2), 49 (1.7), 51 (1.3), 55 (1.6), 58 (1.6), 63 (1.3), 72 (1.6). Rodrigues W 5081 (1.4). Rosa WO 41 (1.3). Santos CCL 28 (1.6). Santos JUM 6B (1.3). Santos LO 29 (1.5), 290 (1.8), 332 (1.7), 347 (1.3), 349 (1.6), 392 (1.3). Silva MJ 220 (1.3). Silva RM 61 (1.3). Wanderley MGL 2660 (1.3), 2668 (1.6).