



## The tribe Senecioneae (Asteraceae) in Pernambuco, Brazil

### A tribo Senecioneae (Asteraceae) em Pernambuco, Brasil

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#### ABSTRACT

This work aimed to carry out a taxonomic study for the Senecioneae tribe in the state of Pernambuco. The study was based on analysis of herbarium collections and field observations. Two genera were recognized for the tribe Senecioneae: *Emilia* Cass. and *Erechtites* Rafin, and two species species for each genus: *Emilia fosbergii* Nicolson, *Emilia sonchifolia* (L.) DC., *Erechtites valerianifolius* (Wolf) DC., *Erechtites hieraciifolius* (L.) Raf. ex DC., beyond two varieties *Erechtites* var. *hieraciifolius* e *E.* var. *cacalioides* (Fisch. ex Spreng.) Less. ex Griseb. Representatives of *Emilia* are the most frequent and distributed, being present in all ecosystems in the state, from the “Zona da Mata” areas to the drier regions of the Caatinga. In the other hand, the species of *Erechtites* show a more restricted distribution, being recorded for “Zona da Mata” and “Brejos de Altitude”. In this work, descriptions, keys for identification, illustrations of species, phonological data, comments about morphological affinities and geographical distribution are provided.

#### RESUMO

Este trabalho teve como objetivo realizar um estudo taxonômico para a tribo Senecioneae no estado de Pernambuco. O estudo foi baseado na análise de coleções de herbário e em observações de campo. Foram reconhecidos para a tribo Senecioneae dois gêneros: *Emilia* Cass. e *Erechtites* Rafin, e seis táxons no total: *Emilia fosbergii* Nicolson, *Emilia sonchifolia* (L.) DC., *Erechtites valerianifolius* (Wolf) DC., *Erechtites hieraciifolius* (L.) Raf. ex DC., além de duas variedades *Erechtites* var. *hieraciifolius* e *E.* var. *cacalioides* (Fisch.exSpreng.) Less. ex Griseb. Os representantes de *Emilia* são os de maior frequência e distribuição, estando presentes em todos os ecossistemas do estado, desde as áreas da Zona da Mata até regiões mais secas da zona da Caatinga. Por outro lado, as espécies de *Erechtites* mostram distribuição mais restrita, sendo registradas para a Zona da Mata e em Brejos de Altitude. Neste trabalho são fornecidas descrições, chaves de identificação, ilustração das espécies, dados fenológicos e comentários sobre afinidades morfológicas e de distribuição geográfica.

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## Introduction

The Senecioneae Cass. tribe stands out in the Asteraceae family as the most diverse in terms of number of species, with around 3,500 distributed in 150 genera (Nordenstam et al. 2009). It has a cosmopolitan distribution (Bremer, 1994) and is characterized by having the most variable habits such as herbs, shrubs, lianas and trees (Bremer, 1994). The leaves may be alternate, rosette or distributed along the branches, sessile or petiolate, with entire margins or pinnatisect. Capitulescence is corymbiform, paniculiform or thyrsoïd, terminal or axillary or in solitary capitulum (Teles & Stehmann, 2016).

In Brazil, about 100 species have been recorded distributed in 12 genera: *Adenostyles* Cass., *Dendrophorbium* (Cuatrec.) C. Jeffrey, *Emilia* (Cass.) Cass., *Erechtites* Raf., *Euryops* (Cass.) Cass., *Graphistylis* B. Nord., *Gynura* Cass., *Hoehnephytum* Cabrera, *Jacobaea* Mill., *Pentacalia* Cass., *Pseudogynoxys* (Greenm.) Cabrera, *Senecio* L. (Teles et al. 2023).

Among the taxonomic studies involving the Senecioneae tribe, Cabrera's (1974, 1978, 2000) for Argentina stands out, where the author points out the occurrence of approximately 12 indigenous genera for the country, highlighting *Senecio*, which is widespread with around 270 species. Another important study, both from a floristic and taxonomic point of view, is that by Barkley (1975) for the flora of Panama. Taxonomic reviews for Brazil, especially for the Northeast region, involving the Senecioneae tribe are scarce, being found only that by Baker (1884) in the "Flora Brasiliensis", that by Barroso (1959) for the representatives occurring in the municipality of Rio de Janeiro, where six species distributed in three genera were studied, the review by Hind (2000) for Bahia, with emphasis on the genus *Senecio*, where new species were described.

Cabrera (1958) conducted an extensive review at genus level, covering only the species of *Senecio* occurring in Brazil, Uruguay and Paraguay. In addition to the taxonomic treatment, this author made comments on the ecology and geographical distribution of the species. It is also worth mentioning the checklist drawn up by Hind (1993) for the Senecioneae from Brazil.

Other specific works mention some representatives of the tribe in floristic surveys, such as that by Hind (1995) for the flora of Pico das Almas (Bahia); the floristic lists for the Cerrado by Mendonça et al. (1998); the list of Asteraceae from the Serra da Canastra National Park, by Nakajima & Semir (2000); that of Mendonça et al. (2000), in areas of the Cerrado/Caatinga ecotone, covering the states of Bahia and Minas Gerais; the survey of the Senecioneae tribe for the state of Pernambuco (Silva & Pereira, 2005); and also those headed by Teles & collaborators (2006; 2009; 2010; 2013), most of which refer to new species for the southeast region of Brazil, as well as new combinations and new records; and the work by

Teles & Stehmann (2016) for the state of Minas Gerais, where 41 spp were found in the Cerrado ecotone. The most recent work was carried out by Funez et al. 2021, on taxonomic notes on *Erechtites*, in which the authors solved typification and nomenclatural problems.

Based on the above, it can be seen that flora studies involving Senecioneae tribe for the state of Pernambuco are still lacking, highlighting the importance of this floristic survey and its morphological characterization. Therefore, a taxonomic study of the Senecioneae tribe for the state of Pernambuco is proposed here.

This is an unprecedented taxonomic treatment of the species of Senecioneae occurring in the state of Pernambuco, including identification keys, descriptions of the species, comments on taxonomic affinities, geographical distribution and habitat, phenological data and botanical illustrations.

## Material and Methods

For the taxonomic treatment, the representatives of the Senecioneae tribe deposited in the Herbarium IPA – Agronomic Institute of Pernambuco, which has a collection of approximately 3,200 exsiccates of the Asteraceae family, were initially surveyed. Several specimens deposited in the PEUFR, HST and UFP herbaria, acronyms according to Thiers, 2022 (continuously updated), were also analyzed. Field expeditions were also carried out in Pernambuco, covering areas of the Atlantic Forest, Caatinga and Brejos de Altitude. The collected material was processed according to the usual herborization procedures (Mori et al. 1989) and then incorporated into the IPA Herbarium.

In addition, specialized bibliographies such as floras and protologues on the Asteraceae family were accessed to identify the material and prepare the taxonomic treatment. The online collections of the Virtual Herbarium of Flora and Fungi-Reflora (BFG, 2020) and splink (<https://specieslink.net/search/>) were also accessed. Comments on distribution, habitat, phenological data and photographic plates have been added.

## Results and Discussion

This study revealed the occurrence of two genera belonging to the Senecioneae tribe in the state of Pernambuco: *Emilia* Cass. and *Erechtites* Rafin, both with two species - *Emilia fosbergii* Nicolson and *Emilia sonchifolia* (L.) DC.; *Erechtites hieraciifolius* (L.) Rafinex DC., with two varieties: *hieraciifolius* and *cacalioides* (Fisch.ex Spreng.) Less. ex Griseb. and, finally, *Erechtites valerianifolius* (Wolf) DC.

In the area under study, the species were found mainly in anthropized environments (degraded forest trails, pastures and urban areas), but there were also records in more preserved areas such as in the Reserva municipal de Bonito, in the Mata do Bituri in the city of Brejo da Madre de Deus and in the Chapada de São José in the city of Buique, for example.

This corroborates the literature, which points out that most of the Asteraceae species are considered ruderal (Bazante et al. 2022), i.e. they are common in fragmented landscapes.

The occurrence of Asteraceae in disturbed areas is of great importance to this family, as they act as sources of propagules, helping in the secondary succession of these areas (Heiden et al. 2007).

### **Senecioneae tribe**

**Senecioneae** Cass. Journ. Phys. 88: 196. 1819.

Herbs, sub-shrubs, shrubs, rarely vines or trees. Leaves usually alternate, sometimes opposite or rosulate. Involucres formed by a series of bracts, free or united, sometimes accompanied by an external calyx. Receptacle naked, rarely paleaceous, flat or convex. Flowers are isomorphic or dimorphic, red, lilac, yellow, orange or white; the marginal female flowers are usually ligulate, tubular or filiform; the central flowers are hermaphrodite or male, tubular. style-arm are flat or subcylindrical, apex truncate, lanceolate or triangular, with a crown of collector hairs. Anthers with appendiculate apex, rounded, acute, obtuse or caudate base. Cypsela generally cylindrical, costate. Pappus are abundant, capillary, rarely feathery or paleaceous.

*Identification key for the genera of the Tribe Senecioneae in the State of Pernambuco, Brazil*

- 1.** Involucre without calyculus; isomorphic flowers; style-arm truncate at apex..... ***Emilia***
- 1'.** Involucre with calyculus; dimorphic flowers; style-arm triangular at apex ..... ***Erechtites***

***Emilia*** Cass. Bull. Soc. Philom. 1817: 68. 1817.

Annual to perennial herb, erect to semi-erect, glabrous to pubescent. Leaves alternate, sessile, sagittate, spatulate to pinnately divided, glabrous to slightly pubescent. Involucre cylindric to campanulate; involucral bracts arranged in a single series, without calyculus. Receptacle flat, naked. Flowers numerous, isomorphic, hermaphrodite; corolla tubular, toothed, lilaceous or red in color; style-arm plane, apex truncated, with a crown of collector hairs; anthers with obtuse thecae at the base. Cipsela cylindrical to angular, costate, glabrous to pilose. Pappus formed by white capillary bristles.

The genus has about 23 species from Tropical Asia, Africa and Malaysia. Two species are adventitious in Tropical America (Cabrera, 1974). In Pernambuco, the following species are found: *Emilia sonchifolia* and *Emilia fosbergii*.

*Key for Emilia species*

1. Lower leaves spatulate; involucre bracts distinctly smaller than corolla; Red flowers..... ***Emilia fosbergii***

1'. Lower leaves pinatipartite; involucre bracts slightly smaller than the corolla; lilac flowers..... ***Emilia sonchifolia***

**1.1. *Emilia fosbergii*** Nicolson. Phytologia 32: 33-34. 1975. Fig. 1. A-C

Annual, erect herb, 0.6–0.9 m tall. Stem cylindrical, striate, slightly pubescent. Leaves alternate, sessile, membranaceous, with irregularly toothed margins, presenting glands at the apex of the teeth; lower leaves spatulate, 8–10 × 2.5–6 cm; upper leaves sagittate, 5–8 × 2–3 cm, with sparsely spaced trichomes on both sides. Inflorescence lax, with capitulum arranged in terminal corymbs; peduncle long, 3–9 cm long. Subcampanulate involucre, 0.7–1 × 0.4–0.5 cm; involucre bracts 7–12, arranged in a single series, linear, slightly pubescent at apex and smaller than flowers. Receptacle flat, naked, slightly pubescent on the outer portion. Flowers 50–80, isomorphic, hermaphrodite; corolla tubular, red in color, deeply 5-toothed, 0.6–1.1 cm long; style branches with truncated apex, surmounted by a crown of collector hairs; fillets inserted at the bottom of the corolla. Cypsela, 5 ribs, cylindrical, pilous, 0.1–0.4 cm long. White pappus, 0.4–0.75 cm long.

**Vernacular name:** Pincel.

**Taxonomic notes:** *Emilia fosbergii* is characterized by its tubular corolla with red flowers. It resembles *E. sonchifolia*, but has already been differentiated in the comments of this last species.

**Distribution and habitat:** ruderal herb, native to warm regions of Asia, Africa, Polynesia and America (Prusk, 1998; Kissmann & Groth, 1999). In Brazil, it is present in almost all regions, being predominant in the Cerrado region (Hind, 1995). It occurs throughout the state of Pernambuco, particularly in the more humid regions. Frequent in crop fields and near of houses.

**Phenological data:** flowers and fruit during all the year, mainly from June to October.

**Material examined:** Recife: Av. Caxangá, near the viaduct, 23.VIII.1984, F. Gallindo 84 (IPA 42021); Bonito: Reserva Municipal de Bonito, 12/09/1995 M. R. C. S. Melo *et al.* 180 (IPA 61094); Buíque: Chapada de São José, I.1997 R. Pereira *et al.* 66440 (IPA); Bonito: Fazenda Santo Elias, in direction to the city of Lajedo, above a large “lajedo”, 11.VI.1998, R. Pereira *et al.* 1511 (IPA 57164); Arcoverde: Serra das Varas, Estação Experimental do IPA, Community of Pintada, trail near the forest degrades, 29.VI.2005, R. Pereira *et al.* 68610 (IPA).

**1.2. *Emilia sonchifolia* (L.) DC.** Prodr. VI (5): 302. 1836. Fig. 1. D-F.

Annual herb, erect to semi-erect, 0.3–0.7 m tall. Stem cylindrical, slightly pubescent, with sparse hyaline trichomes. Leaves alternate, semi to amplexicaules, membranous, with irregularly toothed margins, presenting glands at the apex of the teeth; pinnate lower leaves, 5.5–11.5 × 1.5–4.5 cm, with sparse trichomes along the veins; upper leaves sagittate, 2.5–7.5 × 0.5–1.5 cm, with trichomes all over dorsal surface, mainly on young leaves. Inflorescence in capitulum arranged in terminal corymbs; long peduncle, 3–9 cm long. Involucre cylindrical to subcampanulate, 0.7–1.5 × 0.25–0.45 cm; involucral bracts 7–10, arranged in one single series, linear, slightly pubescent at the apex, slightly smaller than the flowers. Receptacle flat, naked, pubescent on the outer portion. Flowers 30–50, isomorphic, hermaphrodite; corolla tubular, lilaceous, 5-toothed, 0.3–0.9 cm long; style branches with truncated apex, surmounted by a crown of collector hairs; fillets inserted at the bottom of the corolla. Cypsela 5 ribs, cylindrical, pilous, 0.25–0.3 cm long. White pappus, a little smaller than the corolla, 0.7–0.8 cm long.

**Vernacular name:** Pincel, bela-emília.

**Taxonomic notes:** the species is characterized by sagittate upper leaves and pinnate lower leaves, and lilac flowers. It resembles *Emilia fosbergii* in its tubular corolla, but differs in the shape of its lower leaves (pinnate in *E. sonchifolia* vs. spatulate in *E. fosbergii*) and flower color (lilac vs. red in *E. fosbergii*).

**Distribution and habitat:** herb native to warm regions of Asia, Africa, Polynesia and America, widely distributed (Barley, 1975; Kissmann & Groth, 1999). In Brazil, it occurs in almost all regions, being predominant in coastal areas (Pereira, 1984). It is very common throughout the state of Pernambuco, where it has been observed as an invader of crop fields, and is also frequently found around the houses.

**Phenological data:** flowers and fruits all year long.

**Material examined:** Cabo de Santo Agostinho: Estação da COMPESA de Gurjaú, next to water treatment plant dam, 19.VIII.2002, M. F. Cavalcanti *et al.* 55 (IPA 63391); Campus of IPA, 19.III.2001, M. F. Cavalcanti (IPA 59691); Sede do IPA, no canteiro next to anexo do Bloco 8, Bongi, 20.V.2002 M. F. Cavalcanti 11 (IPA 63380); Maraiá: Engenho Curtume, 05.IX.1989, R. Pereira *et al.* 2009 (IPA 60519); Goiana: UEP de Itapirema, V.1986 R. Pereira 145 (IPA 49431).

**2. *Erechtites* Raf.** Fl. Ludovic. 65. 1871.

Annual to perennial herb. Branches glabrous to pubescent. Leaves sessile, semi to amplexicaules, lobed to pinnate, glabrous to pubescent, irregular margins, serrated to

serrated. Involucre cylindrical; involucre bracts arranged in one single series, accompanied by a calliculus; calliculus bracts uniseriate, arranged from the base of the receptacle to the peduncle. Receptacle flat, naked. Flowers numerous, dimorphic; the female margins, uni to pluriseriate, 4 to 5-toothed; the central hermaphrodites, tubular to subcampanulate, 5-toothed; style branches of hermaphrodite flowers truncated or sometimes with a short appendage, apex with a crown of collecting hairs; anthers with obtuse thecae at the base. Cypsela cylindrical, flank, glabrous to pilose. Pappus formed by simple hairs, white to pink in color.

The genus contains about five species, distributed on almost all continents except Africa, with three species reported from South America (Barley, 1975; Barroso et al., 1991). In Pernambuco, the presence of two species was verified, which show a more restricted distribution throughout the state, being recorded with greater frequency in the Zona da Mata and in areas of Brejos de Altitude. The genus is represented by *Erechtites hieraciifolius*, with two varieties: *hieraciifolius* and *cacalioides*; and by *Erechtites valerianifolius*. This last species occurs mainly in the municipalities of Bonito and Brejo da Madre de Deus.

*Key for Erechtites species*

1. Female marginal flowers, bi to multiseriate; white pappus..... ***Erechtites hieraciifolius***  
 1'. Female marginal flowers, uniseriate; lilac pappus..... ***Erechtites valerianifolius***

**2.1 *Erechtites hieraciifolius* (L.) Raf. ex DC. Prodr. VI(5): 294.1836.**

Annual, erect herb, 0.4–1.8 m tall. Stem cylindrical, canaliculate, glabrous to slightly pubescent. Leaves alternate, semi to amplexicaules, with irregularly serrated margins; the lower lobed-toothed to subpinnatesects, 9–20 × 3–5 cm; upper ones sagittate to lanceolate, 3–9 × 1–2 cm, glabrous to pubescent along the veins on the dorsal side. Inflorescence in capitulum arranged in corymbose panicles; peduncle 2–9 cm long. Involucre cylindrical, 0.6–1.5 × 0.3–0.7 cm; involucre bracts 11–18, arranged in a single series, linear-lanceolate, slightly pubescent at the apex, accompanied by a calycul at the base; calycul bracteoles 6–15, linear to oblong, ciliated or not, with single to multicellular trichomes, from 1/3 to 1/5 of the length of the bracts. Receptacle flat, naked. Flowers numerous, 30–140, dimorphic; marginal female, filiform, uni to multiseriate, 4 to 5-toothed, 0.5–11 cm long; central hermaphrodite, subcampanulate, short 5-toothed, 0.6–12.5 cm long. Cypsela 8–12, pilous, 0.2–0.35 cm long. White pappus.

**Vernacular name:** Serralha, lã-de-gato.

**Taxonomic notes:** *Erechtites hieraciifolius* is characterized by sagittal to lanceolate upper leaves, differing from *E. valerianifolius*, which has pinatissect upper leaves; female marginal

flowers, bi to multiseriate and white pappus vs. uniseriate female marginal flowers and lilac pappus in *E. valerianifolius*.

**Distribution and habitat:** ruderal herb, native to Central and South America. In Brazil, it occurs almost everywhere (Barkley, 1975; Pereira, 1984). In Pernambuco, it is distributed in the Zona da Mata of the state, preferably in humid and fertile soils, being very common as an invader of crop fields, in secondary forests, along roadsides and close to houses.

**Phenological data:** Flowers and fruits all year long.

*Key for varieties of Erechites hieraciifolius*

1. Calycul bracteoles equal to or greater than 1/4 of the length of the involucre bracts, all ciliated, with multicellular trichomes.....***E. var. cacalioides***
2. Smaller than 1/4 of the length of the involucre bracts, smooth to sparsely ciliated, with unicellular trichomes..... ***E. var. hieraciifolius***

**2.1.1 *Erechites hieraciifolius* var. *hieraciifolius* (L.) Raf. ex DC. Fig. 1. G-H.**

**Taxonomic notes:** The taxon is differentiated in the taxonomic comments of *E. var. cacalioides*.

**Material examined:** Cabo de Santo Agostinho: water treatment of COMPESA, forest on the right bank of the river, clearing close to the banana plantation, Gurjaú, 20.XII.1983 F. Gallindo et al. (IPA 43445); São Lourenço da Mata: edge of the way of Córrego da Bexiga, Tapera, 01.IX.1931, *B. Pickel*. (IPA 7170); São Lourenço da Mata: In “Depressão” of Cuieira, Tapera 24.II.1930, *B. Pickel* (IPA 7169); União dos Palmares: Engenho Cumaratuba, top of the mountain, Andrade-Lima et al. (IPA 25581).

**2.1.2 *Erechites hieraciifolius* var. *cacalioides* (Fisch.ex Spreng.) Griseb. Fig. 1. I-J.**

**Taxonomic notes:** *Erechites hieraciifolius* var. *cacalioides* differ from *E. var. hieraciifolius* by the calycul bracteoles that are equal to or greater than 1/4 the length of the involucre (*vs.* less than 1/4 *E. var. hieraciifolius*) and the presence of multicellular trichomes (*vs.* unicellular trichomes).

**Material examined:** Água Preta: Border with Alagoas, 2004, R. Pereira et al. 23 (IPA 66153); Bonito: Mata de Bonito, border of the road in direction to the forest, 08.XI.2003 M. F. Cavalcanti et al. 1575 (IPA 66253); Buíque: Chapada de São José, VI.1997 R. Pereira et al. 66439 (IPA); Exu: Serra da Gameleira, way to the city – Exu Post, about 6 km to get to the post, 06/08/1986 R. Pereira 325 (IPA 49121); Reserva Ecológica de Carnijó, Moreno – PE, 27.XI.2003, O. Cano et al. 277 (IPA 63313).



**2.2. *Erechtites valerianifolius* (Wolf) DC. Prodr. VI – 294. 1838. Fig. K-L**

Annual, erect herb, 0.3–1.10 m tall. Stem cylindrical, multistriated, glabrous to slightly pubescent. Leaves alternate, semi-amplexicaules, with irregularly serrated to toothed margins; the lower ones irregularly lobed to pinnatisectate, 6–12 × 2–3.5 cm; the upper ones pinnatisectate, 3–6 × 1.5–2.5 cm, slightly glabrous to pubescent along the veins on the dorsal surface. Inflorescence in dense capitulum, axillary or terminal, arranged in corymbose panicles; peduncle 5–25 cm long. Involucre cylindrical, 0.7–1.2 × 0.3–0.8 cm; involucre bracts 12–15, arranged in a single series, linear-lanceolate, glabrous to slightly pubescent at the apex, accompanied by a calycul at the base; calycul bracteoles 5–15, linear, slightly ciliated, 1/3 to 1/4 the length of the bracts. Receptacle flat, naked. Flowers numerous, ca. from 60, dimorphic; the female margins, filiform, uni to biseriate, 5-dentate, 0.5–0.9 cm long; the central ones hermaphrodite, subcampanulate, 5-dentate, 0.6–0.9 cm long. Cypsel cylindrical, 8–12 lateral, glabrous to sparsely pilose, 0.15–0.4 cm long. lilac pappus.

**Vernacular name:** Serralha, caruru-amargoso.

**Taxonomic notes:** The taxon is morphologically compared to *Erechtites hieracifolius* and differentiated in comments on the last species.

**Distribution and habitat:** Native herb of tropical America, occurring in Central and South America. In Brazil, it is found growing in almost all states, from north to south, especially in the Coastal Zone region (Pereira, 1984; Prusk, 1998). It is considered ruderal and occurs on the edges of forests in dense populations, where it is recorded mainly in the areas of Brejos de Altitude.

**Phenological data:** flowers and fruits all year long.

**Material examined:** Taquaritinga: Sítio at the roadside, after the tower of microwave, 17.VI.1997, C. Ferreira s.n (IPA 61983); Brejo da Madre de Deus: Mata do Bituri, 30.X.2000, L. M. Nascimento *et al.* 440 (IPA 61505); Bonito: Mata de Bonito, on the edge of the forest trail, in a shaded area, close to a banana grove, 08.XI.2003, M. F. Cavalcanti *et al.* 1400 (IPA 66250); Bonito: Mata de Bonito, 07.XI.2003 R. Pereira *et al.* 1570 (IPA 66251).

**Figure 1.**

*A-C. Emilia fosbergii*

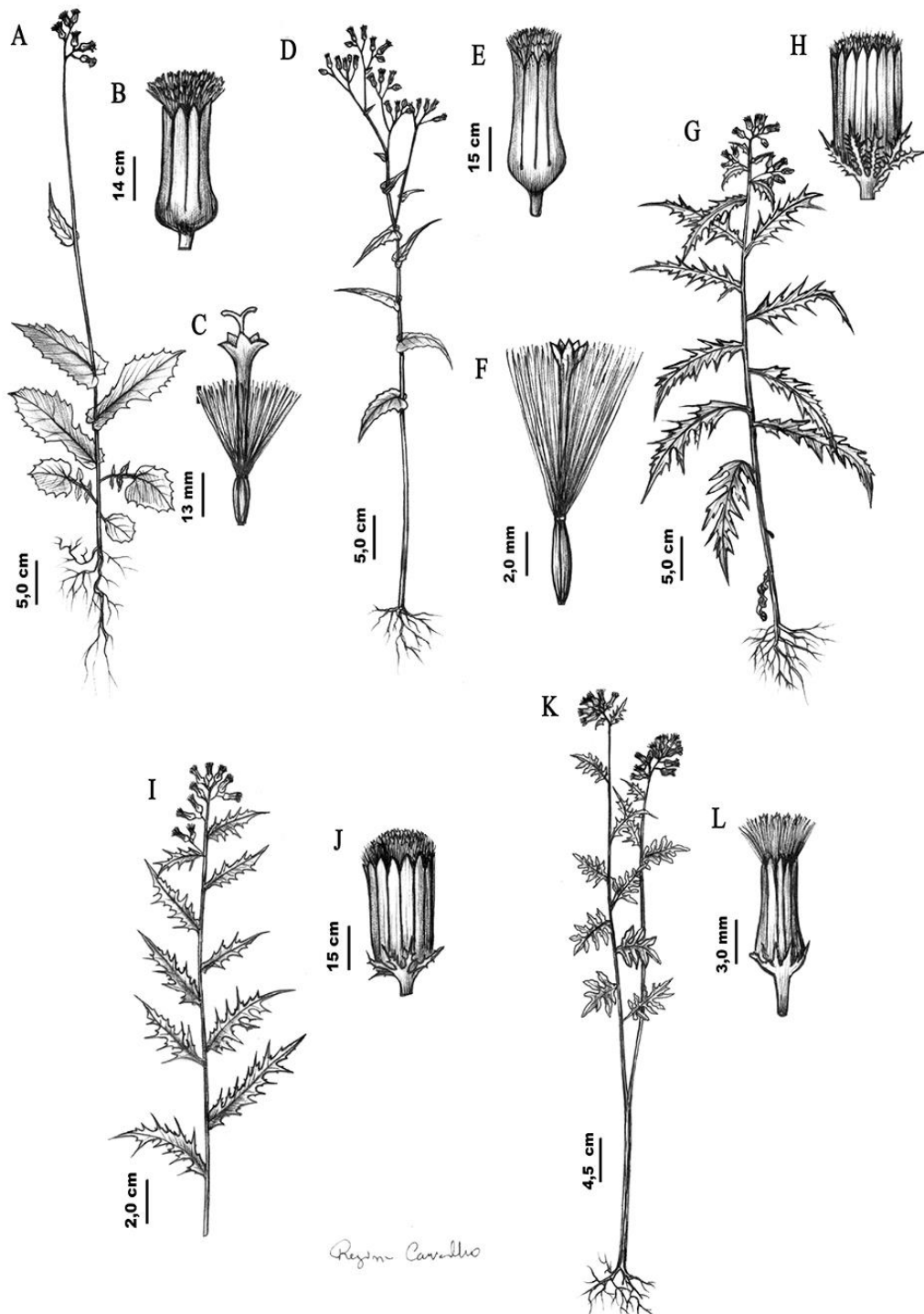


Figura 1. **A-C. *Emilia fosbergii***, A. Habit, B. Capitulum, C. Flower. **D-F. *Emilia sonchifolia***, D. Habit, E. Capitulum, G. Flower. **G. H. *Erechites hieraciifolius* var.**

**hieraciifolius**, G. Habit, H. Capitulum. **I- J. *Erechtites hieraciifolius* var. *cacalioides***. **K-L. *Erechtites valerianifolius***, K. Capitulum. L. Flower.

## Conclusion

The present work brought inedited results about the Senecioneae tribe for the state of Pernambuco through the identification, morphological characterization and differentiation between the species and their varieties. The species were considered ruderal and important for the secondary succession of fragmented areas.

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