

# FIVE NEW RECORDS OF *SIDA* SECT. *MALACROIDEAE* (MALVACEAE, MALVOIDEAE) FROM CAATINGAS OF THE BRAZILIAN NORTHEASTERN REGION

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**Abstract.** This work has as objectives to report five new records in *Sida* section *Malacroideae* (Malvaceae) for Caatinga vegetation from the Brazilian northeastern: *Sida anomala*, *S. caulorrhiza*, *S. dureana*, *S. paradoxa*, and *S. simpsonii*. Data on geographic distribution and reproductive phenology as well as comments on morphological characters for species recognition are provided.

**Keywords:** Brazilian flora, distribution, Malvaceae, new records

**Resumo.** O objetivo deste trabalho é reportar cinco novos registros em *Sida* sect. *Malacroideae* (Malvaceae) para a vegetação de caatinga do Nordeste brasileiro: *Sida anomala* A.St.-Hil., *S. caulorrhiza* Krapov., *S. dureana* Krapov., *S. paradoxa* Rodrigo e *S. simpsonii* Krapov. Dados de distribuição geográfica e fenologia reprodutiva bem como comentários sobre os caracteres morfológicos para o reconhecimento das espécies são fornecidos.

**Palavras-chave:** Distribuição, flora brasileira, Malvaceae, novos registros

Malvaceae *sensu lato* are one of the largest families of angiosperms and currently contains all the representatives of the ancient families Bombacaceae, Tiliaceae, Sterculiaceae, and Malvaceae (*sensu stricto*) (APG IV). Currently, the family is represented by nine subfamilies, including Malvoideae Burnett, which encompasses approximately 110 genera and 1,730 species (Alverson, 1998; APG I, 1998; Bayer; Kubitzki, 2003).

Despite the large number of genera and species in this subfamily, *Sida* L. stands out for its taxonomic diversity combined with the wide worldwide distribution of its species. This genus has ca. 200 species and is distributed in Australia, Brazil, Colombia, Honduras, Mexico, and the United States of America (Fryxell, 1997; Krapovickas, 2003; Tropicos, 2021). Furthermore, *Sida* is found in all regions and phytogeographic domains in Brazil, with ca. 103 species

recorded (*Flora do Brasil*, 2020), and thus this country represents one of the main centers of diversity of the genus.

*Sida* is divided into 12 sections (Krapovickas and Esteves, 2003), among which *Sida* sect. *Malacroideae*, which is represented by 23 species in South America (Krapovickas 2007; 2012). The species of *Sida* sect. *Malacroideae* have as main morphological characteristics a herbaceous habit or rarely shrubby, stems that vary from erect, prostrate or decumbent; spatulate, lanceolate leaves; solitary flowers or flowers in inflorescences, calyx covered by stellate trichomes, glabrous stem tube or with simple or stellate trichomes and apiculate fruits, with stellate trichomes (Krapovickas, 2007).

The purpose of this article is to report five new records of *Sida* sect. *Malacroideae* (Malvaceae) from Brazilian northeastern.

## MATERIAL AND METHODS

The Northeastern region of Brazil has occupies an extension of 1.561.177.80 Km<sup>2</sup>, which corresponds to approximately 18.3% of its entire territory (IBGE, 2016) (Fig. 1). In this region, the predominant vegetation is Caatinga (Fig. 2), which occupies practically the entire northeast region of the country, with some areas in the state of Minas Gerais (Prado, 2003).

Monthly collections were carried out from November 2018 to November 2019 to obtain fertile specimens (with flowers and/or fruits) of the species of *Sida* sect. *Malacroideae* in Caatinga areas of Northeastern Brazil.

The samples obtained were pressed and, in parallel, flowers and fruits were stored in 70% alcohol. After pressing, the samples were placed to dry in an oven at 50°C for a period of 24 hours. The usual techniques for collection and

dried process in taxonomic studies were based on Hickey and King (2000). The specimens were incorporated into the Herbarium Manuel de Arruda Câmara (HACAM) of the State University of Paraíba, Campus I, Campina Grande, Paraíba State, Northeastern Brazil.

To carry out this study, the authors examined collections in Brazilian physical herbaria and foreign herbaria as well as material from their own collections. The new records were detected in the collections of the ALCB, ASE, EAC, HUEFS, JPB and MAC herbaria, and in materials obtained in the field in areas of Caatinga from Northeastern Brazil.

Five new records were found for the Caatingas of the Northeastern Brazil: *Sida anomala* A.St.-Hil., *S. caulorrhiza* Krapov., *S. dureana* Krapov., *S. paradoxa* Rodrigo, and *S. simpsonii* Krapov.

We thank FAPESQ (Fundação de Apoio à Pesquisa do Estado da Paraíba) for the MSc. fellowship to S.S. Figueiredo; CNPq (Conselho Nacional de Desenvolvimento Científico e Tecnológico) for a Productivity Research grant for J.I.M. Melo (PQ-2) Proc. N. 303860/2019-6; to LaBot (Laboratório de Botânica da Universidade Estadual da Paraíba-UEPB-Campus I) for the infrastructure available; Gilbevan Ramos for the preparation of the distribution map; PPGEC (Programa de Pós-Graduação em Ecologia e Conservação) for funding this study; the Transport sector of the Universidade Estadual da Paraíba (UEPB) for assisting the field expeditions.

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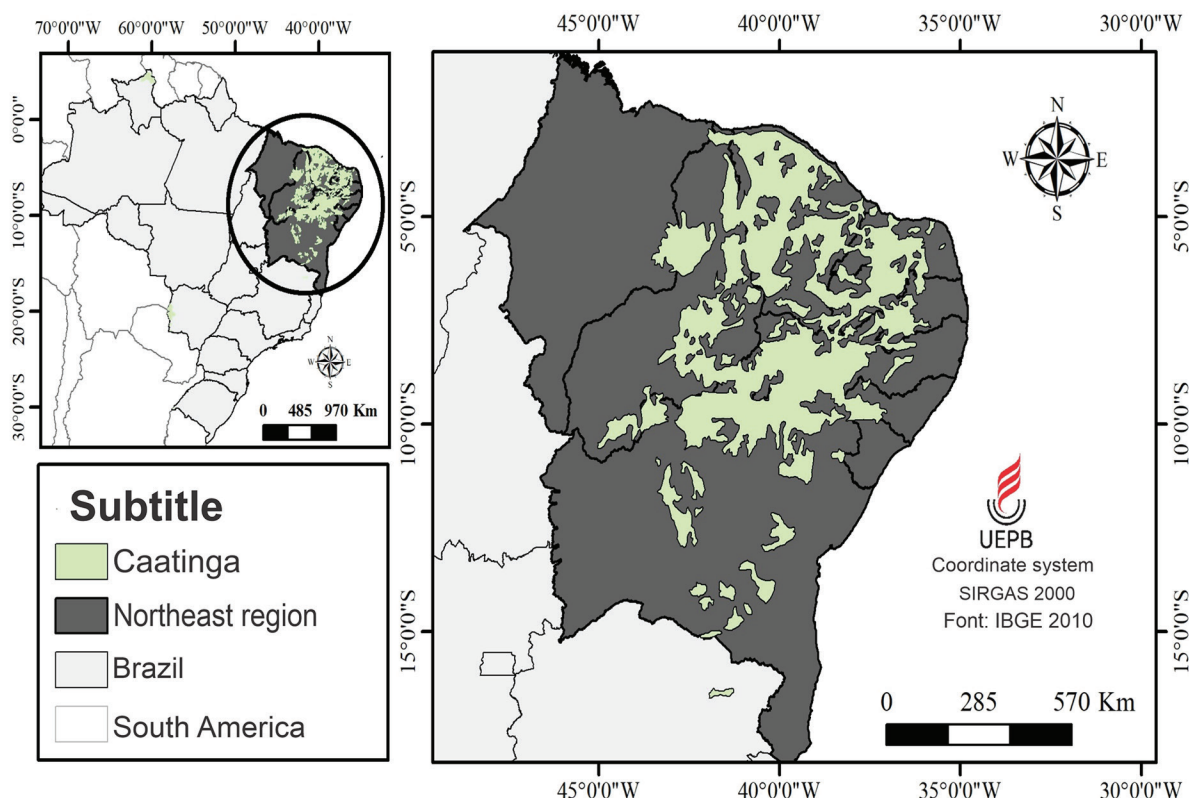


FIGURE 1. Study area, Caatinga of the Northeast region from Brazil. (Map by Gilbevan Ramos de Almeida).

1. *Sida anomala* A.St.-Hil., Flora Brasiliae Meridionalis (quarto ed.) 1(4): 140, pl. 33. 1825. (16 Nov 1825) (Fig. 3). TYPE: PARAGUAY, Paraguaria septentrionalis, *E. Hassler* 7508 (Holotype: BM [BM000545620], photograph).

**Distribution and habitat:** *S. anomala* is distributed in Bolivia, Brasil, Argentina and Uruguay (Krapovickas, 2007). In Brazil, the species was found in the Pampa and Pantanal phytogeographical domains, in this work, *S. anomala* is a new record for the Caatinga vegetation being recorded in the states of Alagoas and Paraíba.

**Phenology:** Flowering and fruiting in April, May, June and August.

**Additional specimens examined:** BRAZIL. Alagoas, Pão de Açúcar, 20 May 2007, fl., fr., *R. P. Lyra-Lemos, G. Araújo & L. Palmeira 10319* (MAC); Ibidem, 15 June 2000, fl., fr., *R. P. Lyra-Lemos 4782* (MAC). Ceará, without municipality, August 1988, fl., fr., *A. Fernandes s.n.* (15653 EAC). Paraíba, Cabaceiras, Sítio Bravo, 14 April 1992, fl., fr., *V. L. & C. F. Martins 91* (JPB).

This species can be easily recognized by the staminal tube with stellate and simple trichomes and the fruit with arista of radial stellate trichomes with 10-13 branches at the apex of the aristae.

2. *Sida caulorrhiza* Krapov., Bonplandia (Corrientes) 16 (3-4): 228-230, 10. 2007. (Fig. 4)

TYPE: BRAZIL, Goiás, Mun. Flores de Goiás, caminho para Rio dos macacos, *W. L. Werneck, C. L. Cristóbal & A. Krapovickas 930* (Holotype: CEN, not seen; Isotype: SP [SP001133], photograph).

**Distribution and habitat:** This species is distributed in Brazil and Paraguay (Krapovickas, 2007). In Brazil,

distributed only in the state of Goiás in the phytogeographic domain of the Cerrado. In this work, this species is a new record for Brazil and Caatinga vegetation being recorded in the states of Paraíba and Sergipe.

**Phenology:** Flowering and fruiting in March and May.

**Additional specimens examined:** BRAZIL. Paraíba, Piancó, 18 May 2019, fl., fr., *S. S. Figueiredo & M. L. Mamede 61* (HACAM). Sergipe, Tomar do Geru, Pastagem, 19 March 2014, fl., fr., *F. B. Gonçalves 14* (ASE).

This species can be recognized by the yellow corolla, staminal tube with simple trichomes, and fruit with glandular and pedicellate trichomes.

3. *Sida dureana* Krapov., Bonplandia (Corrientes) 16(3-4): 235, f. 13. 2007. (Fig. 5).

TYPE: PARAGUAY, Amambay, Col. San Antonio, *A. Schinini, J. Molero, R. Duré & M. Quintana 35556* (Holotype: CTES [CTES0013613], photograph).

**Distribution and habitat:** This species is distributed in Bolivia, Brazil, and Paraguay (Krapovickas, 2007). In Brazil, distributed only in the state of Mato Grosso do Sul in the phytogeographic domain of the Pantanal (Flora do Brasil, 2020). In this work, this species is a new record for Brazilian Northeastern and Caatinga vegetation being recorded in the states of Alagoas, Ceará, Paraíba and Piauí.

**Phenology:** Flowering and Fruiting in February, March, April, May, July, August and September.

**Additional specimens examined:** BRAZIL. Alagoas, Água Branca, Morro do Craunã, 09 August 2009, fl., *E. C. O. Chagas 4810* (MAC); Arapiraca, 20 July 1982, fl., fr., *R. P. Lyra & M. N. R. Staviski 585* (MAC). Ceará, Aiuaba, Estação Ecológica, Lagoa do Rosário, 22 March 1984, *E. Nunes s.n.*

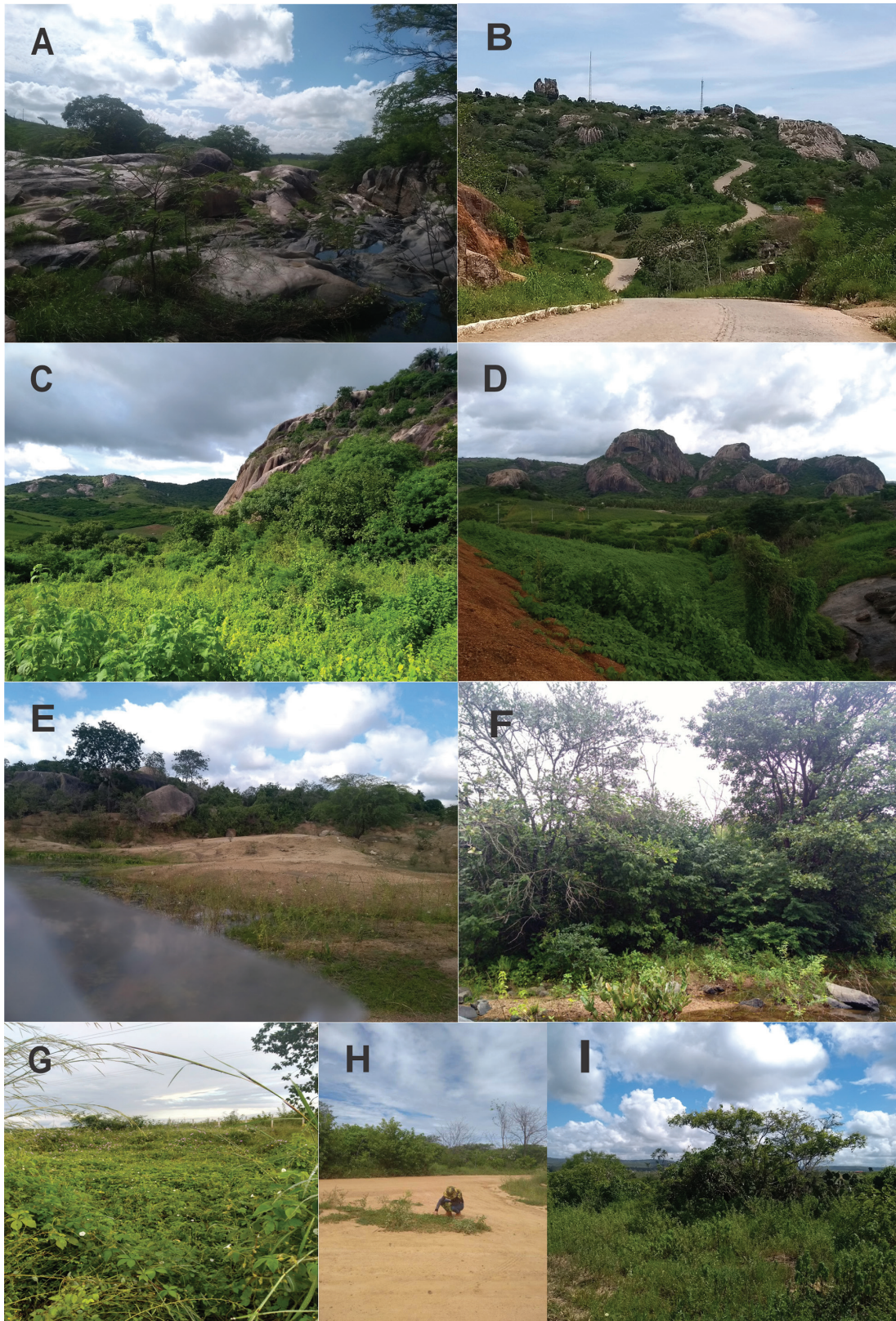


FIGURE 2. Environments of occurrence of the species of *Sida* sect. *Malacroideae* in Caatinga areas in Northeastern Brasil. **A**, Pedra de Ingá, municipality of Ingá/Paraíba State; **B**, Pedra de Santo Antônio, municipality of Fagundes/Paraíba State; **C**, rocky outcrop, municipality of Passa e Fica/Rio Grande do Norte State; **D**, Parque Estadual Pedra da Boca, municipality of Araruna/Paraíba State; **E**, Área de Proteção Ambiental (APA) do Cariri, municipality of Boa Vista/Paraíba State; **F**, trail, municipality of Conceição/Paraíba State; **G**, roadside, municipality of Piancó/Paraíba State; **H**, roadside, municipality of Sertânia/Pernambuco State; **I**, roadside, municipality of Arara/Paraíba State.

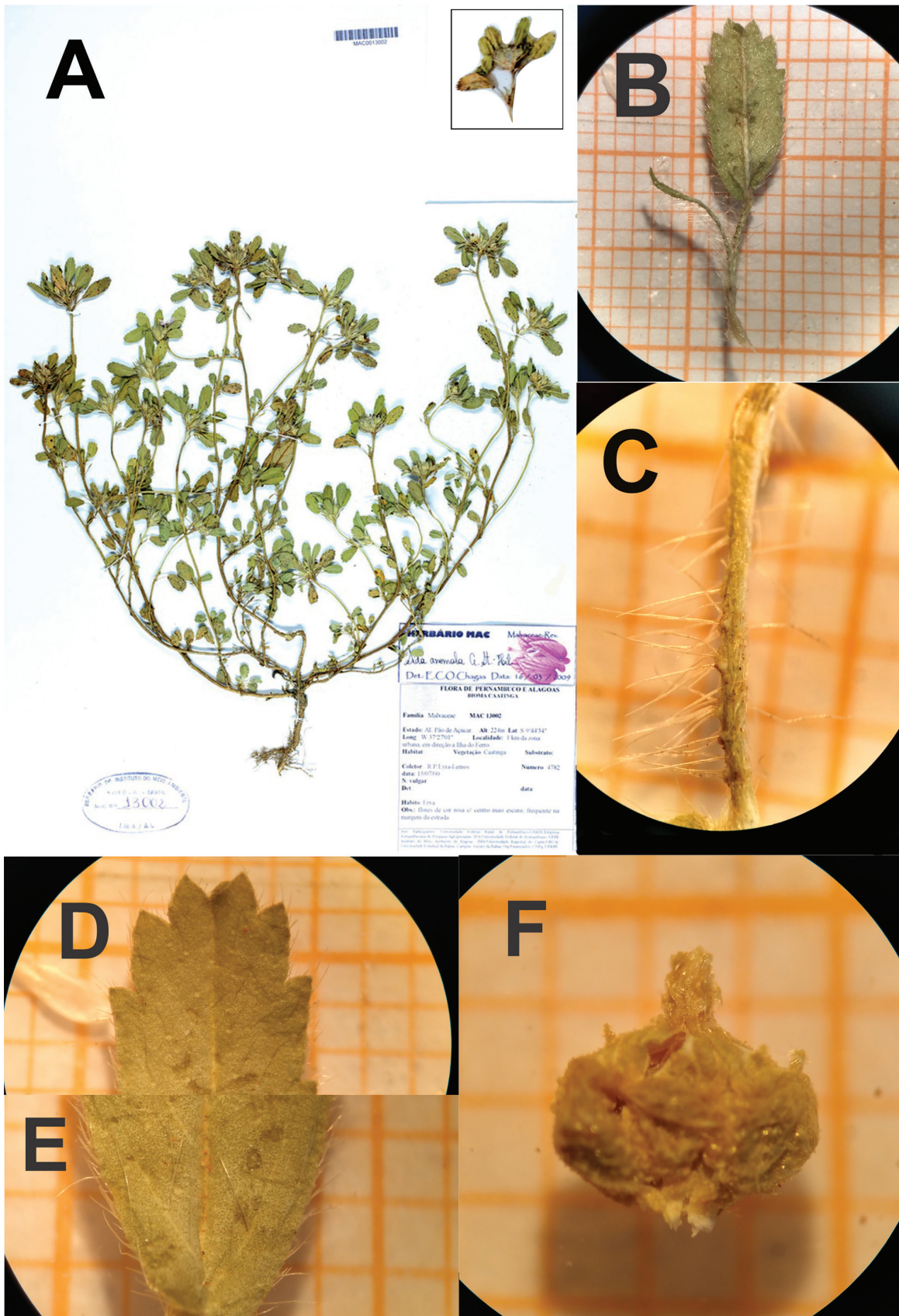


FIGURE 3. Specimen of *Sida anomala* belonging to the Herbarium MAC (Instituto do Meio Ambiente do Estado de Alagoas). **A**, reproductive branch; **B**, leaf blade, abaxial surface (starry trichomes); **C**, stipule (showing stellate and simple trichomes); **D**, apex of the leaf blade, adaxial surface with simple trichomes; **E**, leaf blade base, adaxial surface; **F**, fruit.

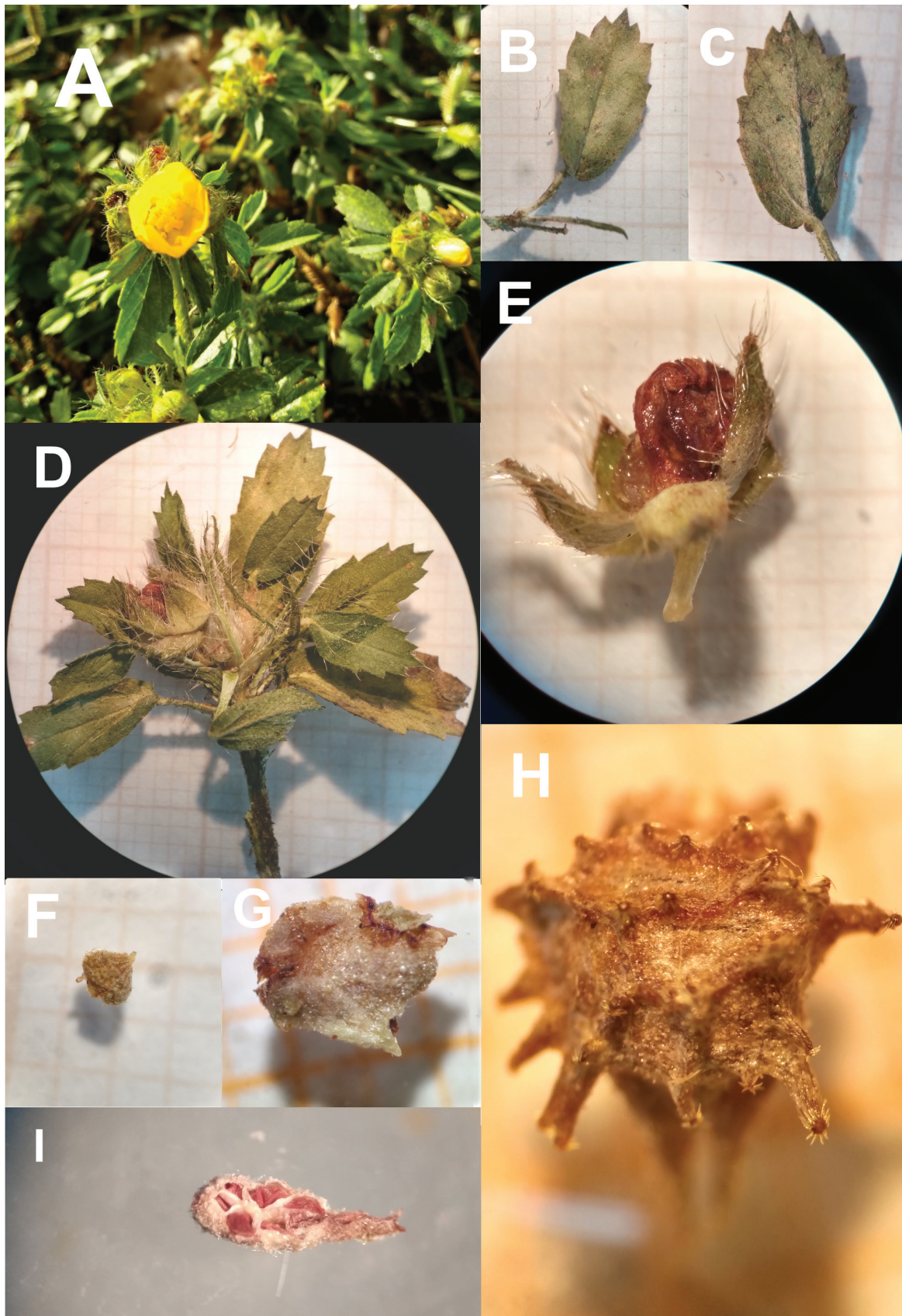


FIGURE 4. *S. caulorrhiza*. **A**, habit; **B**, leaf blade, adaxial surface (showing sparse starry trichomes); **C**, leaf blade, adaxial surface (showing starry trichomes); **D**, inflorescence; **E**, flower; **F**, ovary, **G**, fruit; **H**, fruit valve (showing aristae with stellate radial trichomes); **I**, ovary, in cross section.

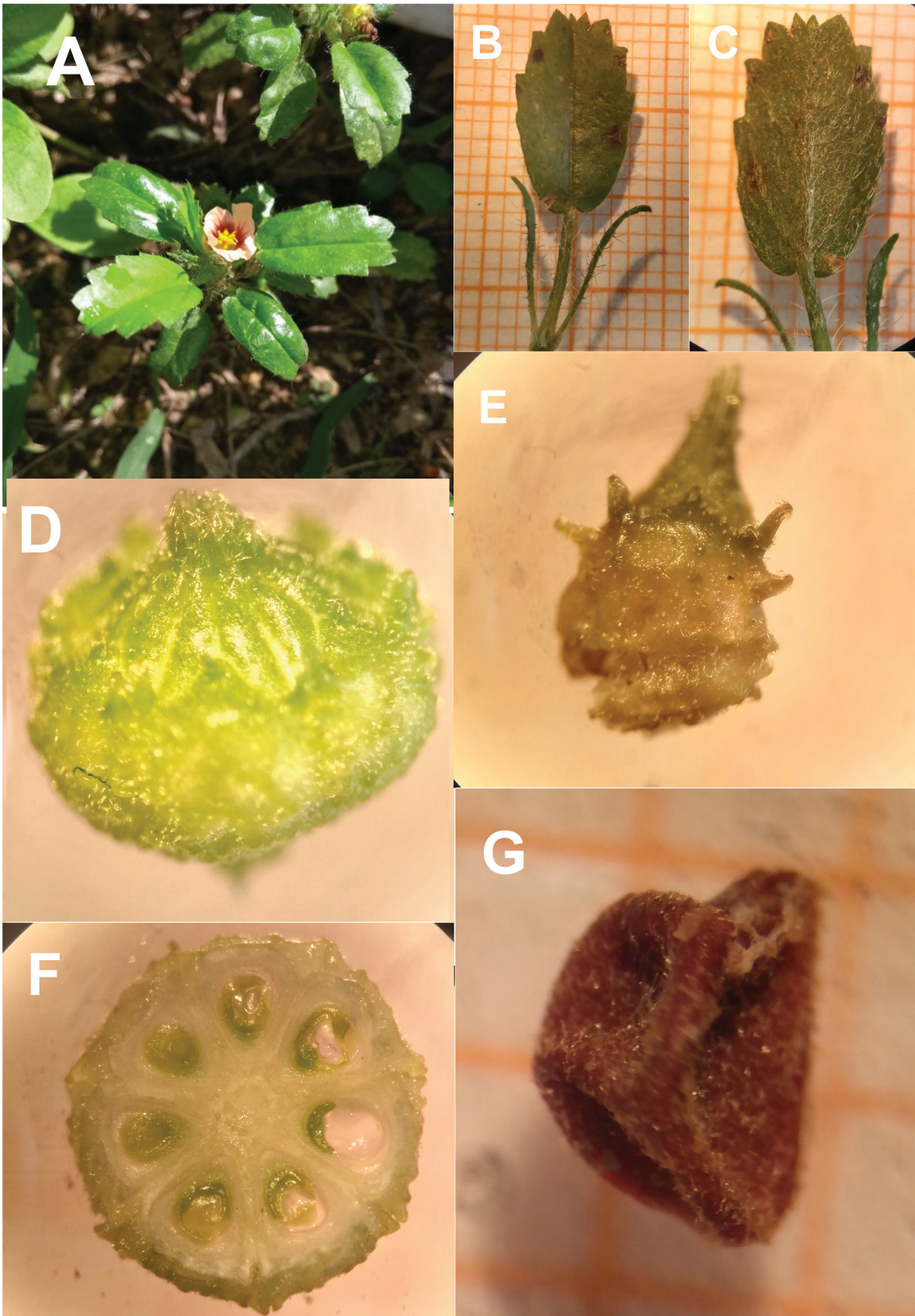


FIGURE 5. *S. dureana*. A, habit; B, leaf blade, adaxial surface (showing sparse ciliated trichomes); C, leaf blade, abaxial surface (showing starry trichomes); D, fruit; E, mericarp; F, fruit, in cross section; G, seed.

(EAC 12399); Fortaleza, *Campus* do Pici, 26 September 1980, *L. Z. Almeida s.n.* (EAC 2603); Parambu, Altamira, 19 March 2016, *M. R. K. G. Mota 06* (EAC); Santa Quitéria, Fazenda Itatiaia, 26 April 1984, fl., fr., *A. Fernandes s.n.* (EAC 12480); Senador Pompeu, Catolé, 29 August 1992, fl., fr., *E. B. Souza s.n.* (EAC 20121); Sobral, Distrito de Taparuaba, Unidade de Conservação Refúgio de Vida Silvestre da Andorinha (REVIS), 24 February 2017, fr., *E. B. Souza 4410* (EAC). Paraíba, Campina Grande, Universidade Estadual da Paraíba, *Campus* I, 18 March 2019, fl., fr., *S. S. Figueiredo 70* (HACAM). Piauí, Oeiras, Chapada Grande, 03 March 1983, fl., fr., *A. Fernandes s.n.* (EAC 11813).

This species can be recognized by the two aristas at the apex of the fruit, on the body of the fruit small aristas each one with 1 stellate trichomes at the apex, besides glandular trichomes short pedicellate, and in the lateral portion the arista are larger with 1 stellate radial trichome of 10–15 branches.

4. *Sida paradoxa* Rodrigo, Notas del Museo de la Plata, Botánica 2(14): 105, f. 1, 2. 1937.

TYPE: ARGENTINA, Corrientes, Arroyo las Garzas, *A.P. Rodrigo* 605 (Holotype: LP [LP004335]) photograph)

**Distribution and habitat:** *S. paradoxa* is distributed in Argentina and Brazil (Krapovickas, 2007). *S. paradoxa* is distributed in Argentina and Brazil. In Brazil is distributed only in the state of Rio Grande do Sul. In this work, this species is a new record for Pernambuco and Caatinga from Brazilian Northeastern being recorded in the state of Pernambuco.

**Phenology:** Flowering and fruiting in March.

**Additional Specimen examined:** BRASIL. Pernambuco, Ouricuri, terreno baldio, 23 March 1987, *J. L. S. Lima 359a* (ALCB, HUEFS).

This species can be recognized by the stems with stellate, 5–7 branched trichomes, the leaf blades glabrous on the adaxial surface but covered with stellate trichomes on the abaxial one, the corolla purple to lilac rose, and the glabrous staminal tube.

5. *Sida simpsonii* Krapov., Bonplandia (Corrientes) 16 (3–4): 246–248, f. 16, map. 2007. (Dec 2007).

TYPE: BRAZIL, Mato Grosso, Mun. S. Antônio do Levérger, *G. Hatschbach* 36090 (Holotype: CTES [CTES0013619], photograph).

**Distribution and habitat:** *S. simpsonii* is endemic from Brazil (Krapovickas, 2007), restricted to the state of Mato Grosso in the phytogeographic domain of the Pantanal (*Flora do Brasil*, 2020). This species is a new record for the Caatinga vegetation being recorded in the states of Ceará and Piauí.

**Phenology:** Flowering and fruiting in March, April, May, June and July.

**Additional specimens examined:** BRAZIL. Ceará, Aiuaba, Estação Ecológica, 30 April 1981, fr., *P. Martins s.n.* (EAC 10259); Ibidem, 24 April 2013, fl., fr., *M. I. B. Loiola 2034* (EAC); Ibidem, Lagoa do Rosílio, 11 April 1991, fl., fr., *M. A. Figueiredo 139* (EAC); Caucaia, Fazenda Invernada, 29 July 1989, fr., *M. A. Figueiredo s.n.* (EAC 16503); Crateús, Grajaú, 28 April 2007, fr., *L. P. Amaral-Neto 83* (EAC); Ibidem, Serra das Almas, 09 May 2002, fr., *F. S. Araújo 1514* (EAC); Graça, Sítio Santa Clara, 14 May 2017, fr., *F. F. Araújo 204* (EAC); Ibidem, 06 July 2016, fl., fr., *F. F. Araújo 38* (EAC); Irauçuba 06 June 2007, fl., fr., *C. D. S. Pessoa 62 and 72* (EAC); Ibidem, Fazenda Aroeira, 18 May 2002, fl., fr., *E. Trigueiro s.n.* (EAC 31638); Ibidem, Cacimba Salgada, 21 April 2001 fl., fr., *G. B. Oliveira s.n.* (EAC 31809); Quixadá, Fazenda Não Me Deixes, 15 April 2000, fl., fr., *R. C. Costa s.n.* (EAC 32026); Ibidem, 15 April 2000, fl., fr., *R. C. Costa s.n.* (EAC 32027); Pentecoste, Fazenda Experimental Vale do Curu, 07 April 2016, fr., *R. R. Miranda 127* (EAC); São Gonçalo do Amarante, Dunas do Pecém, 13 July 2004, fl., fr., *A. V. Vieira s.n.* (EAC 34219). Piauí, Alegre-Tianguá, 16 March 2011, fl., fr., *E. Silvestre s.n.* (EAC 50245).

This species can be recognized by the corolla with reddish pink petals and the staminal tube with simple trichomes.

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