



## Original Papers

# Flora of *Sinningia* (Gesneriaceae) in the state of Paraná, Brazil

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### Abstract

The genus *Sinningia* comprises about 80 species and can be recognized, among Gesneriaceae, by its herbaceous or sometimes subshrubby habit and tuberous, perennial structure at the base of the stem. This work is a taxonomic treatment of *Sinningia* in the state of Paraná. Descriptions, a dichotomous key, illustrations, and information about the distribution and phenological data on flowering and fruiting are provided. *Sinningia* is the largest genus of Gesneriaceae in the state of Paraná, where there are 18 species that occur mainly in rainforest, grasslands or *Cerrado* and are rupicolous, terrestrial, or epiphytic plants.

**Key words:** Atlantic Forest, *Cerrado*, Gesneriaceae, Gesnerioideae, Ligeriinae.

### Resumo

O gênero *Sinningia* compreende cerca de 80 espécies e é reconhecido, dentre as Gesneriaceae, pelo hábito herbáceo ou às vezes subarborescente, e uma estrutura tuberosa, perene na base do caule. Neste trabalho, apresentamos o tratamento taxonômico de *Sinningia* para o estado do Paraná, com descrições das espécies, chave dicotômica, distribuição, ilustrações e dados fenológicos de florescimento e frutificação. *Sinningia* é o maior gênero de Gesneriaceae no estado do Paraná, com 18 espécies ocorrendo principalmente em áreas de Floresta Ombrófila Densa e Mista, Campo ou Cerrado, como plantas rupícolas, terrestres, ou epifíticas.

**Palavras-chave:** Mata Atlântica, Cerrado, Gesneriaceae, Gesnerioideae, Ligeriinae.

### Introduction

The family Gesneriaceae has more than 150 genera and 3,500 species (Burt & Wiehler 1995; Chautems & Matsuoka 2003; Weber 2004; Weber *et al.* 2013). It occurs mostly in tropical regions, with centers of diversity in eastern Africa and northwestern South America, and there are a few species in subtropical and temperate regions of Asia, Europe, and South America (Weber 2004; Weber *et al.* 2013). In Brazil, there are 31 genera and 232 species, and the southeastern region of the country is a secondary center of diversity for the family (Araújo *et al.* 2022; Chautems 1991b; Chautems *et al.* 2022).

The genus *Sinningia* belongs to Ligeriinae (Gesneriaceae), which includes two other genera, *Vanhouttea* Lem. and *Paliavana* Vell. *ex* Vand. (Weber *et al.* 2013). *Sinningia* is the largest genus of Gesneriaceae in Brazil, with 78 species (Araújo *et al.* 2022; Chautems *et al.* 2022). It is distinguished from other genera mainly by the presence of a perennial tuberous stem that produces herbaceous aerial stems annually (Chautems 1990; Weber 2004). The genus as traditionally circumscribed is paraphyletic because *Vanhouttea* and *Paliavana* are nested within *Sinningia* (Weber 2004; Weber *et al.* 2013; Perret *et al.* 2003). Five strongly supported clades within *Sinningia* were

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informally referred to as the *Corytholoma* clade, *Sinningia* clade, *Vanhouttea* clade, *Thamnoligeria* clade, and *Dircaea* clade (Perret *et al.* 2003, 2007). A broader circumscription of *Sinningia* that includes *Vanhouttea* and *Paliavana*, reflecting phylogenetic relationships, will be addressed in a future updated classification (Chautems & Perret 2023).

*Sinningia* originated in the Atlantic Forest in southeastern Brazil, a region that still hosts the highest diversity of Gesneriaceae in the country (Chautems 1988; Perret *et al.* 2006, 2007, 2013). A few species with wide distributions, such as *S. elatior* (Kunth) Chautems and *S. warmingii* (Hiern) Chautems, occur as far as Central America or reach northern Argentina in various vegetation types; they are mainly rupicolous plants on rocky outcrops (Weber 2004; Perret *et al.* 2007; Araújo *et al.* 2022). In the state of Paraná, seven genera and 39 species of Gesneriaceae have been recorded, of which *Sinningia* (18 spp.) is the most abundant, followed by *Nematanthus* Schrad. (6), *Codonanthe* Mansf. (3), and *Napeanthus* Gardn. (2; Hinoshita *et al.* 2018). This work provides descriptions, an identification key, and illustrations of the *Sinningia* species native to the state of Paraná.

## Material and Methods

The state of Paraná is in the South Region of Brazil and 199,315 km<sup>2</sup>. The climate is predominantly subtropical and falls into the following two climate categories defined by Maack (1981): Cfa, which occurs on the coast and in the northeast region of the state, with hot summers and an undefined dry season; and Cfb, which occurs in the central portion, with moderate summers, frequent frosts in winter, and an undefined dry season (IAPAR 1978). The following five phytogeographical units are recognized in Paraná: tropical rainforest, mixed rainforest, seasonal dry forest, savanna (*Cerrado*), and steppes or grasslands (Labiak 2014; Veloso *et al.* 1992).

About 200 specimens of *Sinningia* were analyzed from the following herbaria: ALCB, EFC, FUEL, FURB, G, HCF, JOI, K, MBM, MO, NY, PACA, R, RB, S, SPF, UFP, UPCB, US, WAG, WU, and Z (acronyms according to Thiers, continuously updated). For each species, we listed at least one specimen for each municipality of occurrence; multiple collections were listed for species with limited collections. The terminology for the genus and species descriptions is based on Chautems (1991a), Chautems & Matsuoka

(2003), Chautems *et al.* (2010), Beentje (2010), and Weber (2004). The conservation status of each species, when available, is based on the CNCFlora website (CNCFlora 2012), where each species was classified according to the IUCN threat categories (IUCN 2021). When information on the conservation status of a species was not available on the CNCFlora website, it was not included in the species comments.

## Results and Discussion

### *Sinningia* Nees

Herbs or subshrubs, terrestrial, epiphytic or rupicolous, with a tuberous perennial stem base, this rarely absent and replaced by a fleshy stem. Aerial stems erect or pendulous, without adventitious roots, usually annual, sometimes perennial. Leaves opposite, whorled or in a rosette, iso- or anisophyllous, chartaceous or membranaceous. Inflorescences axillary or terminal, cymose, sometimes in spikes, racemes or thyrses, or reduced to one flower; bracts absent or reduced when present; calyx with 5 lobes fused near the base, corolla zygomorphic, tubular, tubular-campanulate or infundibuliform, base usually swollen, with 2 larger dorsal protuberances or 5 equal protuberances, apex divided in 5 lobes that can be equal, subequal or unequal, with the 2 dorsal ones forming a galea, turning the corolla bilabiate; stamens 4, included or rarely exerted, staminode present, connective poorly developed, anthers coherent, forming a rectangle or a star-shaped disc, dehiscence longitudinal; nectary with 2–5 glands; ovary semi-inferior or superior, stigma stomatomorphic. Fruit a dry or rarely semi-fleshy capsule at dehiscence, seeds subglobose or elliptic, 0.5–0.9 mm.

The state of Paraná has 18 species of *Sinningia*. The Brazilian states with the greatest diversity of *Sinningia* species are those in the Southeast Region (Espírito Santo, Minas Gerais, São Paulo, and Rio de Janeiro), and Rio de Janeiro is most biodiverse, with 29 species (Araújo *et al.* 2022). In the South Region, the states of Paraná and Santa Catarina have the same number of species (18 spp.) and Rio Grande do Sul has 12 species (Ferreira *et al.* 2015). In Paraná, most *Sinningia* species occur in dense rainforest, in the eastern portion of the state. In these areas, many species are rupicolous and inhabit rocky outcrops, cliffs, or mountain tops. Other species grow in native grassland areas or even along roads and in other disturbed areas.

Among the species found in Paraná, *S. gerdtiana* Chautems, *S. hatschbachii* Chautems, and *S. lineata* (Hjelmq.) Chautems are Endangered (E) according to IUCN criteria, while *S. canescens* (Mart.) Wiehler and *S. curtiflora* (Malme) Chautems are Near Threatened (NT) based on these criteria (Chautems *et al.* 2010, 2013; CNCFlora 2012; IUCN 2021). *Sinningia leucotricha* (Hoehne) H.E.Moore has already been mentioned as locally rare, but it does not qualify as threatened, near threatened, or conservation dependent, based on IUCN categories (Chautems & Araújo 2009). Other

species, such as *S. cooperi* (Paxt.) Wiehler, *S. douglasii* (Lindl.) Chautems, *S. elatior* (Kunth) Chautems, *S. macropoda* (Sprague) H.E.Moore and *S. warmingii* (Hiern) Chautems, were treated at Least Concern (LC) based on these criteria (Chautems & Araújo 2009; Chautems *et al.* 2010; 2013). The remaining species are Data Deficient (DD) or Not Evaluated (NE): *S. aggregata* (Ker Gawl.) Wiehler, *S. allagophylla* (Mart.) Wiehler, *S. calcaria* (Dusén *ex* Malme) Chautems, *S. conspicua* (Seem.) G.Nicholson, *S. eumorpha* H.E.Moore, *S. mauroana* Chautems, and *S. sellovii* (Mart.) Wiehler (CNCFlora 2012).

### Key to the *Sinningia* species in the state of Paraná

1. Inflorescences in spikes.
  2. Petiole 8–30 mm long; bracts longer than the corolla .....7. *Sinningia curtiflora*
  - 2'. Petiole 3–5 mm long; bracts shorter than the corolla.....2. *Sinningia allagophylla*
- 1'. Inflorescences other types.
  3. Corolla yellow, white, or purple.
    4. Leaves in pseudo-rosettes; corolla white or purple.....10. *Sinningia eumorpha*
    - 4'. Leaves opposite, not arranged in pseudo-rosettes; corolla yellow or white with purple stripes.
      5. Stems erect, unbranched; corolla tubular-campanulate, yellow with dark yellow stripes .....5. *Sinningia conspicua*
      - 5'. Stems prostrate, branched; corolla infundibuliform, white with purple stripes ..... 11. *Sinningia gerdtiana*
  - 3'. Corolla orange, red, or pink.
    6. Corolla with unequal lobes, the superior lobes larger than the lateral and inferior lobes.
      7. Plants terrestrial, occurring mostly in swampy places; inflorescences in racemes; corolla reddish or orange.....9. *Sinningia elatior*
      - 7'. Plants rupicolous or epiphytic; inflorescences in cymes; corolla red.
        8. Inflorescences pendulous; all parts of the plant pilose..... 6. *Sinningia cooperii*
        - 8'. Inflorescences erect; all parts of the plant villous or wooly ..... 12. *Sinningia hatschbachii*
    - 6'. Corolla with equal or subequal lobes.
      9. Aerial stem 0.4–2 m long, woody at the base ..... 16. *Sinningia mauroana*
      - 9'. Aerial stem 0.1–0.7 m long, herbaceous.
        10. Leaves 4–6-whorled.
          11. Plants epiphytic, rarely rupicolous; leaves 6-whorled ..... 8. *Sinningia douglasii*
          - 11'. Plants rupicolous; leaves 4-whorled.
            12. Leaves pubescent..... 3. *Sinningia calcaria*
            - 12'. Leaves tomentose .....13. *Sinningia leucotricha*
        - 10'. Leaves opposite or 3-whorled.
          13. Leaves inserted along 1–4 nodes; calyx lobes linear or narrowly lanceolate; corolla with dots in the throat or on the lobes.
            14. Inflorescences sessile or with a peduncle shorter than 4 cm ..... 4. *Sinningia canescens*
            - 14'. Inflorescences with a peduncle longer than 7 cm.

15. Plants with 4–6 leaves; corolla lobes 0.3–0.5 cm long, throat lighter than the corolla and with 12 or more dark dots ..... 14. *Sinningia lineata*
- 15'. Plants with only one pair of leaves; corolla lobes 0.2–0.3 cm long, throat red with 12 or fewer dots ..... 15. *Sinningia macropoda*
- 13'. Leaves inserted along 5 or more nodes; calyx lobes lanceolate; corolla without dots.
16. Plants glandular-pubescent..... 1. *Sinningia aggregata*
- 16'. Plants pubescent, but with non-glandular trichomes.
17. Flowers with a pendulous pedicel; stamens exserted..... 17. *Sinningia sellowii*
- 17'. Flowers with an erect pedicel; stamens included or reaching the corolla opening .....  
..... 18. *Sinningia warmingii*

**1. *Sinningia aggregata*** (Ker Gawl.) Wiehler, Selbyana 1: 32. 1975. Figs. 1e; 2a

Rupicolous herbs, 26–80 cm tall, with erect stems arising from tubers. Aerial stem herbaceous, glandular-pubescent, annual, branched from the base, nodes 5-numerous. Leaves opposite or 3-whorled, isophyllous; petiole 0.4–1.6 cm long, green to reddish, glandular-pubescent; blade 3.2–11.3 × 1.7–5.6 cm, elliptic to ovate, discolor, glandular-pubescent, acute at base and apex, margin crenate, secondary veins in 5–15 pairs. Inflorescences in a terminal thyrse composed of axillary cymes, erect, with sessile cymes, rachis 5–48 cm long, flowers 2–11 per axil; pedicel 1.7–4.7 cm long, erect, green to reddish, glandular-pubescent; bracts 1.1–4.5 × 0.8–2.2 mm, shorter than flowers, elliptic; calyx lobes 0.7–0.9 × 0.2–0.4 cm, lanceolate, erect, margin entire, green to reddish near apex, glandular-pubescent; corolla 2.8–3.5 × 0.5–0.9 cm, tubular, swollen at base with 2 larger dorsal protuberances, tube gradually enlarged near the flower opening, orange to bright red, without darker dots, glandular-pubescent, lobes 0.2–0.4 × 0.2–0.5 cm, orange to bright red, round, erect, subequal, the lower lobe more developed, orange to bright red; stamens 2.1–2.8 cm long, included, reaching corolla opening, filaments yellow, anthers coherent, forming a rectangle; ovary 0.5–0.7 × 0.2–0.3 cm, ovoid, pubescent, yellowish white, style 1.2–2.7 cm long, yellowish, pubescent; nectary composed of 2 larger and 3 smaller dorsal glands. Capsule 0.8–1.5 × 0.4–0.7 cm, ovoid, pubescent, brown.

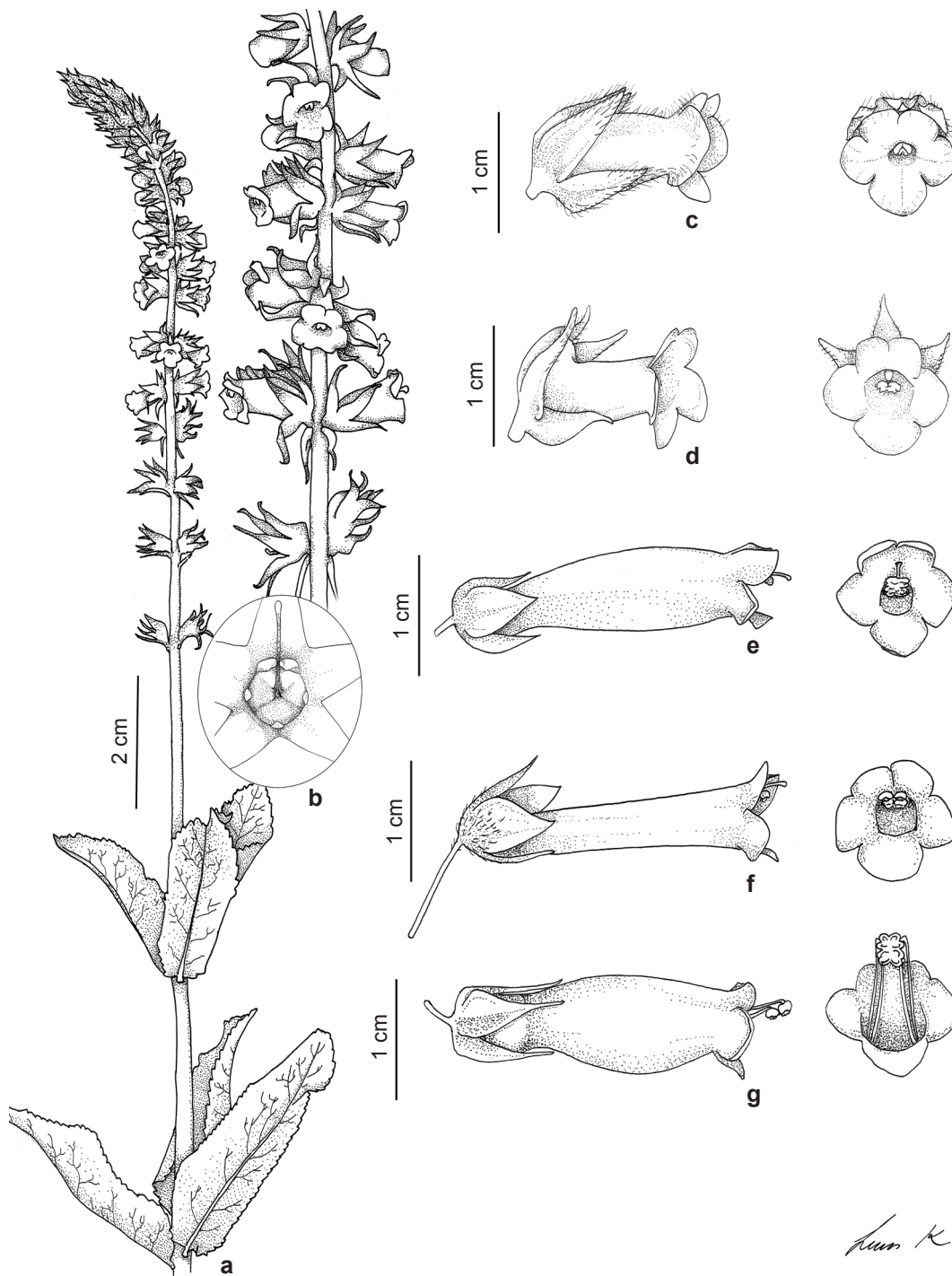
**Selected material:** Antonina, 16.VII.1991, fl., *G. Hatschbach 55630* (G, MBM). Bocaíúva do Sul, 28.IX.1958, fl., *G. Hatschbach 5061* (MBM, UPCB). Campina Grande do Sul, 17.IX.1996, fl., *J.M. Silva 1689* (G, MBM). Canta Galo, 14.XII.1992, fl., *A.C. Cervi 3873* (UPCB). Cerro Azul, 13.IX.2006, fl., *J.M. Silva 5036* (MBM). Guarapuava, 19.II.1971, fl., *G. Hatschbach 26350* (MBM, MO, US). Morretes,

15.XI.2000, fl., *A. Dunaiski-Jr 1631* (MBM). Ibaíti, 14.XI.2000, fl., *J. Carneiro 811* (MBM). Itapejara do Oeste, 22.XI.1990, fl., *G. Hatschbach 54843* (MBM). Pacas, 15.XII.1999, fl., *J.M. Silva 3127* (G, MBM, UPCB). Palmas, 4.XII.1971, fl. and fr., *G. Hatschbach 28201* (MBM). Paranaguá, 18.VII.1986, fl. and fr., *R.M. Brites* (UPCB, 32189). São João, 31.X.1914, *P.K.H. Dusén 15796* (S, holotype of *Corytholoma marchii* var. *minutiflora* Malme). Telêmaco Borba, fl., *E. Adenesky-Filho* (MBM 389641). Tibagi, 8.V.1953, fl. and fr., *G. Hatschbach 3170* (MBM, UPCB). Tomazina, 2.IX.1998, fl., *G. Hatschbach 68289* (MBM). Três Barras do Paraná, 17.X.1997, fl., *J.M. Silva 2128* (MBM, NY, US). Turvo, 17.II.2004, fl., *G. Hatschbach 76738* (G, MBM). Ventania, 8.VI.2005, fl., *D.A. Estevan 780* (MBM).

*Sinningia aggregata* occurs in Brazil and Paraguay (Chautems & Matsuoka 2003). In Brazil, it is in the states of Tocantins, Goiás, Mato Grosso, Mato Grosso do Sul, Minas Gerais, Rio de Janeiro, São Paulo, Paraná, and Santa Catarina (Araújo *et al.* 2022). In Paraná, it is found in tropical rainforest, mixed rainforest, and grasslands. It flowers all year round and bears fruits in May, July, and December. The species is easily recognized by the presence of glandular trichomes that cover the entire plant and produce an odoriferous scent.

**2. *Sinningia allagophylla*** (Mart.) Wiehler, Selbyana 1: 32. 1975. Figs. 1a-c; 2b

Terrestrial herbs, 33–74 cm tall, with erect stems arising from tubers. Aerial stem herbaceous, villous, annual, unbranched, nodes 6–12. Leaves opposite or 3-whorled, isophyllous; petiole 0.25–0.78 cm long, green to reddish, villous; blade 2.3–10.2 × 0.7–3.3 cm, elliptic-lanceolate, discolor, pubescent, acute to obtuse at base, obtuse at apex, margin crenate, secondary veins in 5–7 pairs. Inflorescences in dense terminal spikes, erect, rachis 8.1–28 cm long, flowers 1–2 per axil, inflorescences becoming lax at maturity;



**Figure 1** – a-c. *Sinningia allagophylla* – a. habit and inflorescence; b. nectaries; c. side and front view of a flower. d. *S. curtiflora* – side and front view of a flower. e. *S. aggregata* – side and front view of a flower. f. *S. warmingii* – side and front view of a flower. g. *S. sellovii* – side and front view of a flower. (a. Lozano 1835; b-c. Hatschbach 25599; d. Hinoshita 58; e. Cervi 3044; f. Hatschbach 79222; g. Hatschbach 20551).

pedicel 0.2–0.5 cm long, erect, green to reddish green, pubescent; bracts 0.6–0.8 × 0.1–0.2 cm, shorter than flowers, elliptic; calyx lobes 0.5–1 × 0.3–0.4 cm, lanceolate, erect, margin entire, green, yellowish or reddish, pubescent; corolla 1.1–1.5 × 0.3–0.5 cm, tubular, base without marked protuberances, tube widening near the flower opening, yellow, orange or reddish, without darker dots, pubescent; lobes 0.2–0.3 × 0.2–0.4 cm, round, erect, subequal, the lower lobe more developed than the rest, yellow, orange or reddish; stamens 0.7–1.4 cm long, included, filaments white to yellow, anthers coherent, forming a rectangle; ovary 0.2–0.4 × 0.2–0.3 cm, elliptic, pubescent, yellowish white, style 0.4–0.5 cm long, yellowish, pubescent; nectary composed of 2 larger dorsal and 3 smaller ventral glands. Capsule 0.7–0.4 × 0.4–0.6 cm, ovoid, pubescent, green.

**Selected material:** Arapoti, 23.X.1961, fl., *G. Hatschbach 8577* (MBM, UPCB). Araucária, XI.1957, fl., *C. Stellfeld 516* (UPCB). Campina Grande do Sul 9.XI.2008, fl., *N.L. de Souza 76* (FURB, MBM). Campo Largo, 6.XI.2001, fl. and fr., *R. Goldenberg 525* (UPCB). Colombo, 14.XII.1983, fl. and fr., *A. Bidá 173* (UPCB). Curitiba, 28.X.1989, fl., *E. Melo 139* (UPCB). Jaguariáiva, 15.XI.1992, fl., *A.C. Cervi 3854* (UPCB). Lapa, 14.XII.1959, fl. and fr., *R. Braga 169* (UPCB). Palmas, 15.XI.1998, fl., *G. Hatschbach 68707* (G, MBM, UPCB). Palmeira, 26.XI.2003, fl. and fr., *A.C. Cervi 8569* (UPCB). Piraquara, 30.X.2013, fl., *E.D. Lozano 1591* (MBM). Ponta Grossa, 9.X.2012, fl., *J.M. Silva 8207* (MBM); 12.XI.1997, fl., *A.C. Cervi 6419* (UPCB). Quatro Barras, 1.XI.2009, fl., *A.L.C. Miranda 320* (MBM). Serra do São Luiz do Purunã, 22.I.2014, fl., *J. Cordeiro 5155* (MBM).

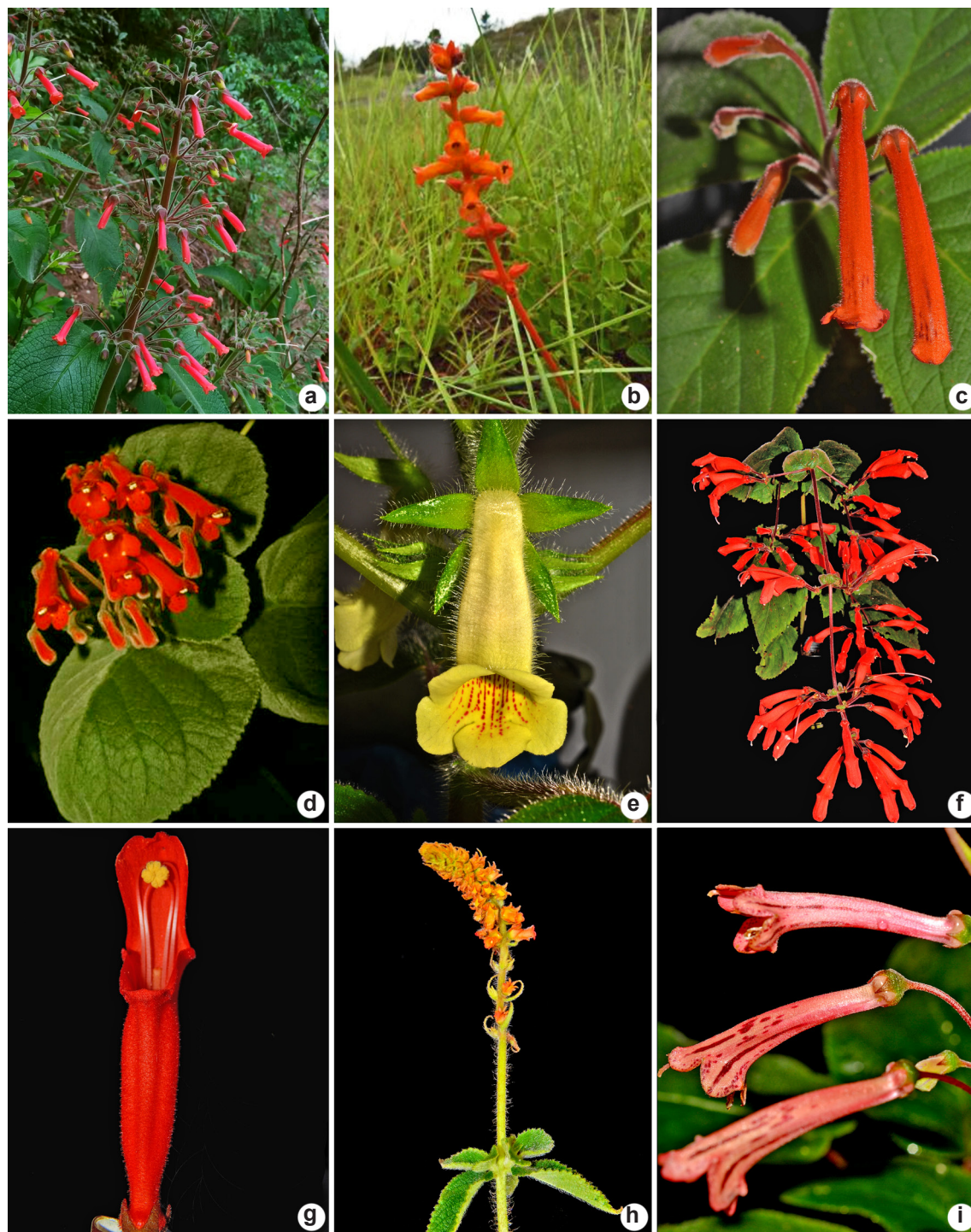
*Sinningia allagophylla* occurs in Brazil, Argentina, and Paraguay (Chautems & Matsuoka 2003). In Brazil, it occurs in the states of Goiás, Mato Grosso do Sul, Minas Gerais, Rio de Janeiro, São Paulo, Paraná, Santa Catarina and Rio Grande do Sul, as well as the Distrito Federal (Araújo *et al.* 2022). In Paraná, it is found mainly in mixed rainforest, grasslands, and *Cerrado*. This species is abundant and common in grasslands and degraded areas. It has a broad range of corolla colors (yellow or orange to red). It flowers and bears fruits from October to January. It is recognized by the flowers in spikes and differs from *S. curtiflora* by the shorter stems (33–74 vs. 65–111 cm), shorter petioles (0.25–0.78 vs. 0.5–3.5 cm), longer corollas (1.1–1.5 vs. 0.8–1.2 cm), and flowers longer than the bracts (vs. flowers shorter than the bracts in *S. curtiflora*).

### 3. *Sinningia calcaria* (Dusén *ex* Malme) Chautems, Candollea 45: 381. 1990. Figs. 2c; 3i

Rupicolous herbs, 11–29 cm tall, with erect stems arising from tubers. Aerial stem herbaceous, pubescent, annual, unbranched, with only one node. Leaves 4-whorled, anisophyllous; petiole 0.2–1.2 cm long, green to reddish, pubescent; blade 3.9–19.7 × 2.3–12.5 cm, elliptic to ovate, green and reddish on the main veins, pubescent, acute to obtuse at base, acute at apex, margin serrate, secondary veins in 7–11 pairs. Inflorescences in axillary cymes, erect, sessile or peduncle 0.4–2.2 cm long, flowers 1–8 per axil; pedicel 1.8–3.5 cm long, erect, green to reddish green, pubescent; bracts absent; calyx lobes 0.5–0.8 × 0.1–0.2 cm, linear-lanceolate to triangular, adpressed, reddish green, pubescent, margin entire; corolla 2.7–3.8 × 0.6–0.8 cm, tubular, swollen at base with 5 equal protuberances, tube gradually enlarged near the flower opening, orange-red and sometimes with darker spots, pubescent, lobes 0.2–0.4 × 0.2–0.6 cm, round, erect, subequal, the lower lobe more developed, orange-red; stamens 2.5–3.6 cm long, included or exerted, filaments white to yellow, anthers coherent, forming a rectangle; ovary 0.4–0.5 × 0.2–0.3 cm, ovoid, pubescent, yellow, style 1.7–2.5 cm long, pinkish, pubescent; nectary composed of 2 dorsal glands. Fruit not observed.

**Selected material:** Adrianópolis, 22.VIII.2000, fl., *J.M. Silva 3184* (G, MBM). Almirante Tamandaré, Trancheira, *P.K.H. Dusén 8711* (S, holotype). Bocaiúva do Sul, 29.XII.1975, fl., *R. Kummrow 1011* (MBM); 24.X.1943, fl., *G. Hatschbach 15* (MBM, SP). Castro, 14.VIII.1973, fl. and fr., *G. Hatschbach 32308* (MBM). Cerro Azul, 4.X.1973, fl., *G. Hatschbach 32650* (MBM); 21.VII.1970, fl. and fr., *G. Hatschbach 24509* (MBM); 5.X.1977, fl., *G. Hatschbach 40338* (MBM, NY, US). Cerro Azul, 23.VI.1992, fl., *G. Hatschbach 57098* (G, MBM). Doutor Ulysses, 26.XI.1998, fl., *A.C. Cervi et al. AC-481* (G, MBM). Matinhos, *L. Camargo 83* (MBM, holotype of *Rechsteineria aggregata* f. *littoralis* Hoehne). Rio Branco do Sul, 13.IX.1996, fl., *G. Tiepolo 682* (MBM). Tunas do Paraná, 20.VIII.1998, fl., *J.M. Silva 2416* (MBM). Ypiranga, *P.K.H. Dusén 6818* (S, holotype of *Corytholoma oligantha* Malme).

*Sinningia calcaria* is endemic to Brazil and occurs in the states of São Paulo and Paraná (Araújo *et al.* 2022). In Paraná, it is found in mixed rainforest and grasslands, on limestone outcrops in humid places. It blooms from June to December. It is recognized by the verticillate phyllotaxy (4-whorled leaves per node) and red-orange flowers with red spots on the throat.



**Figure 2** – a. *Sinningia aggregata*. b. *S. allagophylla*. c. *S. calcaria*. d. *S. canescens*. e. *S. conspicua*. f. *S. cooperii* (habit). g. *S. cooperii* (flower). h. *S. curtiflora*. i. *S. douglasii*. (Photos: a. Mathias E. Engels; the others from the authors).

**4. *Sinningia canescens* (Mart.) Wiehler, Selbyana 1: 32. 1975.** Figs. 2d; 3j

Rupicolous herbs, 18–52 cm tall, with erect stems arising from tubers. Aerial stem herbaceous, sericeous, annual, unbranched, nodes 2–3. Leaves opposite, isophyllous; petiole 0.3–1.5 cm long, green to reddish, villous; blade 3.9–19.7 × 2.3–12.5 cm, orbicular to obovate, green, canescent, acute, obtuse or cordate at base, obtuse at apex, margin serrate, secondary veins in 4–9 pairs. Inflorescences in axillary cymes, erect, sessile or peduncle 1.5–4 cm long, flowers 4–12 per axil; pedicel 1.6–3.8 cm long, erect, green to reddish green, villous; bracts 0.5–2.1 × 0.2–1.1 cm, shorter than flowers, leafy, orbicular; calyx lobes 0.7–1.1 × 0.1–0.2 cm, linear, adpressed, reddish green, villous, margin entire; corolla 2.5–2.9 × 0.5–0.7 cm, tubular, swollen at base with 5 equal protuberances, tube gradually enlarged near the flower opening, reddish, with 12 or more dark dots on throat and lobes, villous, lobes 0.2–0.4 × 0.2–0.4 cm, round, erect, subequal, lower lobe more developed than the rest, reddish; stamens 2.3–3 cm long, included, filaments white to yellow, anthers coherent, forming a rectangle; ovary 0.6–0.9 × 0.3–0.4 cm, conical, pubescent, reddish; style 1.7–2.5 cm long, reddish, pubescent; nectary composed of 2 dorsal glands. Capsule 0.8–1 × 0.5–0.8 cm, red to brown, pubescent.

**Selected material:** Balsa Nova, 16.V.2005, fl., *C. Kozera* 2277 (UPCB). Bocaíuva do Sul, 22.IX.2000, fl., *J.M. Silva* 3223 (G, MBM). Campo Largo, 28.II.1951, fl., *G. Tessmann* (MBM 75193). Castro, fl. and fr., *R. Maack* (MBM 75205). Jaguariáiva, 14.X.2006, fl., *E. Barbosa* 1695 (G, MBM, UP CB). Lapa, 17.X.1948, fl., *G. Hatschbach* 1036 (MBM). Palmeira, 20.IX.2011, fl., *J.M. Silva* 7836 (MBM). Ponta Grossa, 27.X.1995, fl. and fr., *O.S. Ribas* 897 (MBM, NY, SPF); XI.1928, *F.C. Hoehne* (SP 56346, holotype of *Reichsteineria canescens* var. *macrophylla* Hoehne). Prudentópolis, 19.X.1962, fl., *G. Hatschbach* 9319 (MBM). Tibagi, 12.IX.1997, fl., *F.N. Rodrigues* (UPCB 43431).

*Sinningia canescens* is endemic to Brazil and occurs in the states of São Paulo and Paraná (Araújo *et al.* 2022). In Paraná, it is found in *Cerrado* and grasslands, generally on rocky outcrops. Despite its broad occurrence, this species is suffering from environmental degradation due to agriculture and pastures (CNCFlora 2012). It was considered Near Threatened (NT) by the CNCFlora (2012), according to IUCN criteria (IUCN 2021). It flowers from September to May and bears fruits from November to May. It is recognized by the nearly opposite leaves with a canescent indumentum and reddish flowers with darker spots on the

throat. It differs from *S. leucotricha* by the leaves (opposite *vs.* whorled), indumentum (canescent *vs.* tomentose), and flower color (red *vs.* orange).

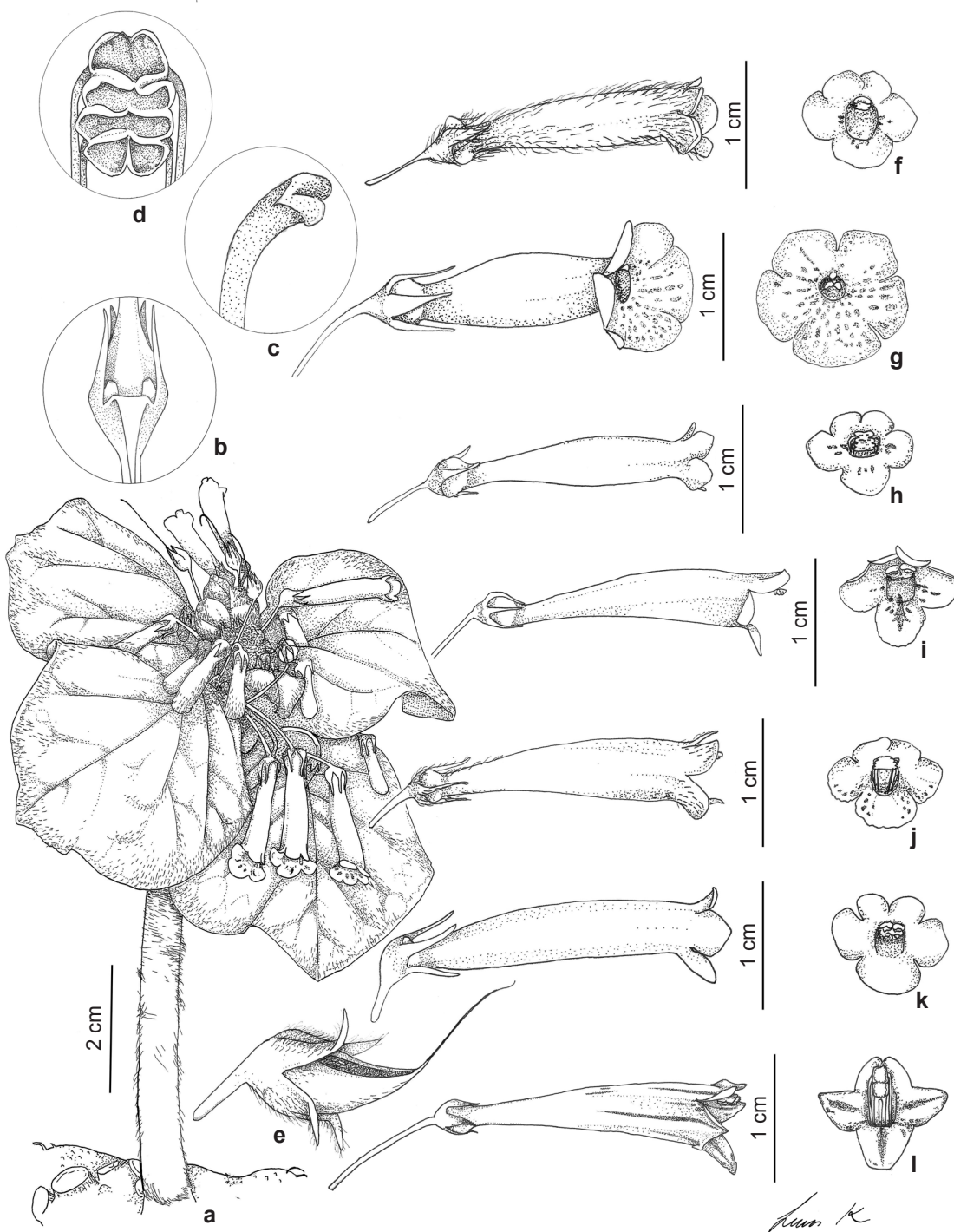
**5. *Sinningia conspicua* (Seem.) G.Nicholson, Ill. Dict. Gard. 3: 436. 1887.** Figs. 2e; 4a-e

Terrestrial or rupicolous herbs, 20–28 cm tall, with erect stems arising from tubers. Aerial stem herbaceous, pilose to villous, annual, unbranched, nodes 5–7. Leaves opposite, anisophyllous; petiole 0.9–10.5 cm long, green to reddish, pilose to villous; blade 6.8–16.1 × 3.7–11.6 cm, elliptic to ovate, green, pilose, acute, obtuse or cordate at base, acute to obtuse at apex, margin crenate, secondary veins in 6–8 pairs. Inflorescence in axillary cymes, erect, sessile, flowers 1–2 per axil; pedicel 6.6–9.4 cm long, erect, green to reddish green, pilose to villous; bracts absent; calyx lobes 1–1.8 × 0.3–0.5 cm, triangular to lanceolate, patent, margin entire, green, pilose; corolla 3.8–4.7 × 1.5–1.8 cm, tubular-campanulate, base swollen dorsally, without marked protuberances, gibbous for most of the tube, opening facing downwards, yellow with dark yellow stripes on throat, pilose, lobes 0.5–1.1 × 0.6–1.2 cm, round, erect, unequal, the lower lobe more developed, yellow; stamens 1.5–2.1 cm long, included, filaments white to yellow, anthers coherent, forming a rectangle; ovary 6.2–9 × 4.9–6.1 mm, conical, hairy, green, style 1.7–1.9 cm long, yellowish, pubescent; nectary composed of 2 dorsal glands. Fruit not observed.

**Selected material:** Doutor Ulysses, 19.IV.2008, fl., *E. Barbosa* 1242 (MBM). Iretama, 13.I.201983, fl., *G. Hatschbach* 46004 (BR, CEPEC, MBM, MO, US, Z). Jaguariáiva, 29.I.1915, *P.K.H. Dusen* 16543 (S, holotype de *Sinningia caulina* Malme).

*Sinningia conspicua* is endemic to Brazil and occurs in the states of Minas Gerais, Paraná, Santa Catarina, and São Paulo (Araújo *et al.* 2022). In Paraná, it is found in mixed rainforest and grasslands, on cliffs and humid rocky outcrops. This species is rare and has a disjunct distribution, but the lack of information about its real area of occurrence and populations led to it being assessed as Data Deficient (DD) by the CNCFlora (2012), according to IUCN criteria (IUCN 2021). This species blooms from January to July. It is recognized by its yellowish, tubular-campanulate corolla, with several dark stripes on the throat, and a strong scent. This species can be distinguished from *S. eumorpha* by the opposite leaves (*vs.* pseudo-rosette in *S. eumorpha*) and yellow, fragrant corollas (*vs.* lilac corollas without a fragrance in *S. eumorpha*).





**Figure 3** – a-f. *Sinningia leucotricha* – a. habit; b. nectaries; c. nectaries; d. stigma; e. fruit; f. side and front view of a flower. g. *S. lineata* – side and front view of a flower. h. *S. macropoda* – side and front view of a flower. i. *S. calcaria* – side and front view of a flower. j. *S. canescens* – side and front view of a flower. k. *S. mauroana* – side and front view of a flower; l. *S. douglasii* – side and front view of a flower. (a-f. Hinoshita 41; g. Engels 7812; h. Hatschbach 68805; i. Silva 7836; j. Silva 7836; k. Goldenberg 2221; l. Santos 155).

**6. *Sinningia cooperi*** (Paxt.) Wiehler, Selbyana 1: 32. 1975. Figs. 2f-g; 5a-e

Epiphytic or rupicolous herbs, 28–58 cm tall, with erect stems arising from tubers. Aerial stem herbaceous, pilose, annual, unbranched, nodes 4–7. Leaves opposite, isophyllous; petiole 0.8–3.7 cm long, green to reddish, pilose; blade 4.4–13.7 × 2.5–11 cm, ovate, green, glandular-pilose, cordate at base, acute at apex, margin serrate, secondary veins in 5–9 pairs. Inflorescences in a terminal thyrse composed of axillary cymes, pendulous, rachis 7–32.5 cm long, cymes sessile or peduncle 0.5–2.2 cm long, flowers 1–6 per axil; pedicel 0.7–3 cm long, green to reddish green, pilose; bracts 0.8–2.2 × 0.7–1.8 cm, shorter than flowers, cordiform; calyx lobes 0.4–0.9 × 0.1–0.2 cm, linear to narrowly lanceolate, adpressed, margin entire, reddish green, pilose; corolla 3.4–6.7 × 0.7–1.3 cm, tubular, elongate, swollen at base with 5 equal protuberances, tube gradually widening near the flower opening, intense red and sometimes with a purple spot at the opening, on the lower lip, pilose; lobes 0.8–2.2 × 0.6–0.9 cm, round, erect, unequal, the two upper lobes very developed, forming a galea, the lower lobes inconspicuous, reddish; stamens 3.6–5.2 cm long, included under the galea, filaments white to yellow, anthers coherent, forming a star-shaped disc; ovary 7.1–9.1 × 3–3.9 mm, conical, pubescent, reddish green, style 3.7–4.2 cm long, reddish, pubescent; nectary composed of 2 dorsal glands. Capsule 1.5–1.7 × 0.7–0.9 cm, reddish green, pubescent.

**Selected material:** Campina Grande do Sul, 5.IV.1958, fl., *G. Tessmann* (MBM 40078); 4.II.1985, fl. and fr., *P.I. Oliveira 865* (MBM). Guaratuba, 5.III.1999, fl., *E.P. Santos 763* (UPCB). Morretes, 27.II.1965, fl., *G. Hatschbach 12400* (MBM). Paranaguá, 5.IV.1948, fl., *G. Tessmann* (MBM 320997). Piraquara, 21.IV.1971, fl., *L.T. Dombrowski 5178* (MBM). Quatro Barras, 30.I.1996, fl., *G. Gatti 20* (EFC, UPCB); Morro do Anhangava, 14.II.1994, fl., *C.V. Roderjan 960* (MBM).

*Sinningia cooperi* is endemic to Brazil and occurs in the states of Espírito Santo, Rio de Janeiro, São Paulo, Paraná, and Santa Catarina (Araújo *et al.* 2022). In Paraná, it is found in tropical rainforest and is abundant at high altitudes, where it is epiphytic or rupicolous. This species has a large area of occurrence and was considered as Least Concern (LC) by the CNCFlora (2012), according to IUCN criteria (IUCN 2021). It flowers from January to April and bears fruits in April. It is recognized by the pendulous inflorescences, with several red

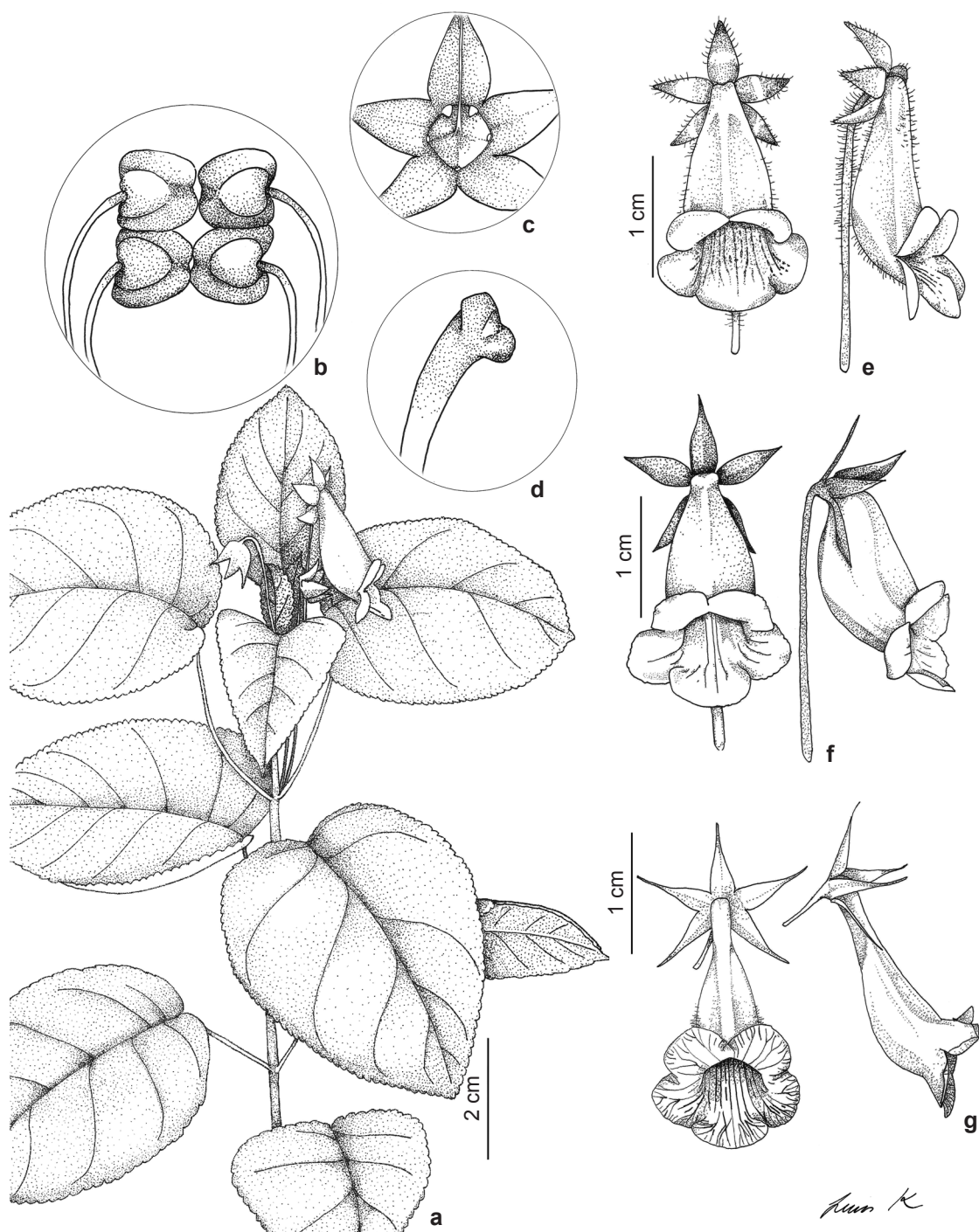
flowers and a corolla with a well-developed galea. It can be distinguished from *S. hatschbachii* by the pendulous inflorescences (*vs.* erect), smaller sepals (0.4–0.9 × 0.1–0.2 cm *vs.* 0.9–1.5 × 0.3–0.5 cm in *S. hatschbachii*), and pilose indumentum on the sepals (*vs.* wooly in *S. hatschbachii*).

**7. *Sinningia curtiflora*** (Malme) Chautems, Candollea 45: 382. 1990. Figs. 1d; 2h

Terrestrial herbs, 65–111 cm tall, with tubers buried at base of the stem. Aerial stem herbaceous, villous, annual, unbranched, nodes 6–12. Leaves opposite or 3-whorled, slightly anisophyllous; petiole 0.5–3.5 cm long, green to reddish, villous; blade 4.2–13.3 × 1.3–4.3 cm, ovate to elliptic, green, villous, acute to obtuse at base, acute to obtuse at apex, margin crenate, secondary veins in 6–10 pairs. Inflorescences in terminal spikes, erect, rachis 14–62 cm long, flowers 1–6 per axil; flowers sessile or pedicel 1–4 mm long, erect, green to reddish green, villous, inflorescences not becoming lax at maturity; bracts 0.8–1.8 × 0.2–0.3 cm, longer than flowers, linear-lanceolate; calyx lobes 4.5–9 × 2.2–3 mm, lanceolate, patent, margin entire, reddish green, pilose; corolla 0.8–1.2 × 0.3–0.4 cm, tubular, base somewhat gibbous dorsally, tube short, slightly widening near the flower opening, reddish or orange, pilose, lobes 1.1–2 × 1.2–1.9 mm, round, erect, unequal, the lower lobes larger, reddish or orange; stamens 6–8.2 mm long, included, filaments white to yellow, anthers coherent, forming a rectangle; ovary 2.1–4.1 × 2.2–3.1 mm, conical, pubescent, reddish green, style 5.5–7 mm long, yellowish, pubescent; nectary composed of 2 larger dorsal glands and 3 smaller ventral glands. Capsule 0.8–1.1 × 0.4–0.8 cm, reddish green, pubescent.

**Selected material:** Curitiba, 24.I.1985, fl., *A. Gentry 49756* (MBM, MO, RBR, US). Morretes, 7.IV.1999, fl. and fr., *J. Carneiro 650* (MBM); 19.III.1916, fl. and fr., *P.K.H. Dusén 18096* (S, holotype of *Corytholoma curtiflorum*); 23.II.1947, fl., *G. Hatschbach 629* (MBM, SP). Piraquara, 12.II.1988, fl., *E.F. Paciornik* (MBM 210525); 9.I.2006, fl., *M. Reginato 664* (UPCB); Estrada da Graciosa, 14.IX.2016, fl. and fr., *L.K.R. Hinoshita 58* (UPCB). Quatro Barras, 8.III.1989, fl., *A. Chautems 332* (E, G, NY, UPCB, US, WU); 14.II.2010, fl., *R. Ristow 477* (MBM); 2.III.1989, fl. and fr., *A.C. Cervi 2617* (UPCB); 21.I.1999, fl., *J. Cordeiro 1499* (G, MBM, UFP); 11.II.1964, fl. and fr., *G. Hatschbach 10964* (MBM); 9.I.1969, fl. and fr., *G. Hatschbach 20692* (MBM).

**Additional examined material:** BRAZIL. SANTA CATARINA: Ponte Alta, 11.II.1996, fl., *O.S. Ribas 1215* (ALCB, G, MBM).



**Figura 4** – a-e. *Sinningia conspicua* – a. habit; b. anthers; c. anthers; d. nectaries; e. side and front view of a flower. f. *S. eumorpha* – side and front view of a flower. g. *S. gerdtiana* – side and front view of a flower. (a. Barbosa 1242; b-e. Hatschbach 46004; f. Michelin 1314; g. Hatschbach 33846).

*Sinningia curtiflora* is endemic to Brazil and occurs in the states of Paraná, Santa Catarina, and Rio Grande do Sul (Araújo *et al.* 2022). In Paraná, it is mainly found in rural areas, on roadsides, or in other disturbed areas. Despite the large area of occurrence, this species is suffering from a loss of habitat quality and is considered Near Threatened (NT) by the CNCFlora (2012), according to IUCN criteria (IUCN 2021). It flowers and bears fruits from September to April. It is recognized by the stem reaching more than 1 m tall, inflorescences in spikes, and inflorescence bracts larger than the flowers. It differs from *S. allagophylla* by the longer stem (11–65 cm *vs.* 65–111 cm), petiolate leaves (0.5–3.5 cm *vs.* 0.25–0.78 cm), and smaller flowers that are shorter than the bracts (corollas 0.8–1.2 cm *vs.* 1.1–1.5 cm).

**8. *Sinningia douglasii*** (Lindl.) Chautems, Candollea 45: 382. 1990. Figs. 2i; 3l

Epiphytic or rarely rupicolous herbs, 29–68 cm tall, with erect stems arising from tubers. Aerial stem herbaceous, pubescent, annual, unbranched, nodes 1–2. Leaves 6-whorled, anisophyllous; petiole 0.4–7.8 cm long, reddish green, pubescent; blade 4.3–21.8 × 2.1–11.3 cm, ovate to elliptic, green or vinous and veins prominent on the abaxial surface, pubescent, acute to obtuse at base, acute at apex, margin serrate, secondary veins in 6–10 pairs. Inflorescences in a terminal thyse composed of axillary cymes, erect, rachis 9.5–27 cm long, cymes sessile or peduncle 0.3–5.6 cm long, flowers 3–12 per axil; pedicel 0.8–6.2 cm long, erect to downwardly curved, green to reddish green, pubescent; bracts 0.8–2.2 × 0.7–1.8 cm, shorter than flowers, cordiform to lanceolate; calyx lobes 0.4–0.6 × 0.1–0.2 cm, linear, adpressed, margin entire, reddish green, pubescent; corolla 2.8–4.2 (–6.6) × 0.4–0.8 cm, tubular, swollen at base with 5 equal protuberances, tube gradually widening near the flower opening, pink with brown lines all over corolla, pubescent, lobes 0.2–0.8 × 0.3–0.7 cm, round, erect, subequal, the upper lobes more developed, pink and with brown lines; stamens 2.5–3.6 cm long, included, filaments white to yellow, anthers coherent, forming a rectangle; ovary 5–8 × 2.1–3 mm, conical, pubescent, reddish green; style 1.5–3.5 cm long, yellowish, pubescent; nectary composed of 2 dorsal glands. Fruit not observed.

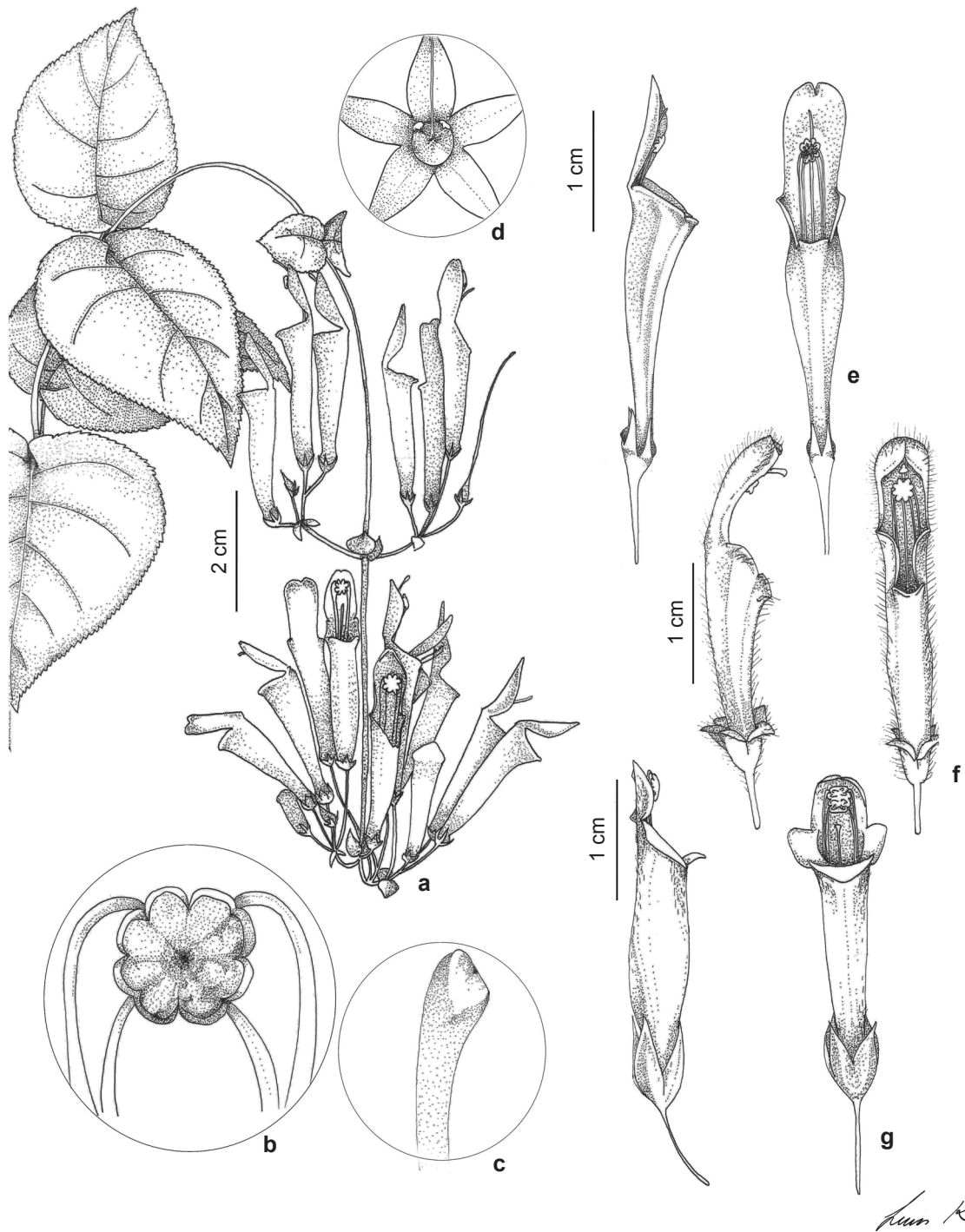
**Selected material:** Araucária, IV.2001, fl., *R. Kersten* 636 (UPCB). Balsa Nova, 28.X.1996, fl., *O.S. Ribas* 1551 (MBM). Campo Largo, 13.X.1996, fl., *G. Tiepolo*

547 (MBM). Candói, 27.X.2006, fl., *E. Barbosa* 1776 (MBM). Castro, 28.X.2016, fl., *J.M. Silva et al.* 9537 (MBM). Colombo, 18.III.2004, fl., *P.R.P. Andrade* (MBM 0298394). Curitiba, 15.X.2001, fl., *M. Borgo* 1299 (UPCB). Guaratuba, 20.X.2000, fl., *E.P. Santos* 927 (UPCB). Morretes, 17.XI.1980, fl., *L.T. Dombrowski* 12149 (M, MBM). Palmas, 27.X.2004, fl., *D. Liebsch* 905 (UPCB). Pinhais, 25.X.2009, fl., *R. Ristow* 295 (MBM). Piraquara, 8.XII.2001, fl., *P.H. Labiak* 2004 (MBM). Ponta Grossa, 12.X.1995, fl., *C.B. Poliquesi* 464 (MBM). Quatro Barras, 15.X.1995, fl., *G. Gatti* 5 (G, UPCB); Morro do Anhangava, 1.XI.1996, fl., *E.P. Santos* 155 (UPCB). Ortigueira, fl., 1.XI.2008, *M. Kaehler* 369 (UPCB). São Mateus do Sul, 28.X.1985, fl., *R.M. Brites* 148 (MBM, UPCB). Telêmaco Borba, 15.X.1997, fl., *A. Uhlmann* (MBM 0225135). Tijucas do Sul, 4.XII.2003, fl., *E. Barbosa* 826 (MBM).

*Sinningia douglasii* occurs in Brazil and northwestern Argentina, and it occurs in the states of Espírito Santo, Minas Gerais, Rio de Janeiro, São Paulo, Paraná, Santa Catarina, and Rio Grande do Sul (Araújo *et al.* 2022). In Paraná, it grows in seasonal dry forest and tropical and mixed rainforests, where it is a locally abundant epiphyte. Due to its large area of occurrence, this species was assessed as Least Concern (LC) by the CNCFlora (2012), according to IUCN criteria (IUCN 2021). It usually blooms from October to December, but there are a few recorded with flowers from March and April. It is recognized by the 6-whorled, petiolate leaves, pink flowers with darker spots on the throat, and epiphytic habit. It is similar to *S. calcarea* but differs in the habit (epiphytic *vs.* rupicolous), leaf phyllotaxy (6-whorled *vs.* 4-whorled), and pink corolla with brown striations (*vs.* orange-red).

**9. *Sinningia elatior*** (Kunth) Chautems, Candollea 45: 383. 1990. Fig. 5g

Terrestrial herbs, 67–103 cm tall, with erect stems arising from tubers. Aerial stem herbaceous, pubescent, annual, unbranched, nodes 4–9. Leaves opposite or 3-whorled, isophyllous; petiole 1.5–4.5 cm long, green to reddish, pubescent; blade 1.9–8.9 × 0.9–3.2 cm, ovate to elliptic, green, pubescent, obtuse at base, obtuse at apex, margin crenate, secondary veins in 4–10 pairs. Inflorescences in a terminal raceme, erect, rachis 15–56 cm long, sessile, flowers 1–3 per axil; pedicel 1.2–2.6 cm long, erect, green to reddish green, pubescent; bracts 0.8–1.8 × 0.3–0.8 cm, shorter than flowers, lanceolate to linear; calyx lobes 0.7–0.9 × 0.2–0.5 cm, lanceolate, adpressed, margin entire, green, pubescent; corolla 2.9–3.9 × 0.6–1 cm, tubular,



**Figure 5** – a-e. *Sinningia cooperii* – a. habit; b. anthers; c. stigma; d. nectaries; e. side and front view of a flower. f. *S. hatschbachii* – side and front view of a flower. g. *S. elatior* – side and front view of a flower. (a-e. Roderjan UPCB 22898; f. Hatschbach 2230; g. Hatschbach 18227).

swollen at base with 2 larger dorsal protuberances, tube gradually widening near the flower opening, reddish or orange, pubescent, lobes 0.2–0.9 × 0.6–0.9 cm, round to elliptic, erect, unequal, upper lobes forming a small galea, reddish or orange; stamens 2.8–3.9 cm long, included under the galea, filaments white to yellow, anthers coherent, forming a rectangle; ovary 6–9 × 2.1–4 cm, conical, pubescent, reddish green; style 1.9–3.5 cm long, yellowish, pubescent; nectary composed of 2 larger dorsal and 3 smaller ventral glands. Capsule 1–1.2 × 0.6–0.7 cm, brown, pubescent.

**Selected material:** Arapoti, 6.IV.1970, fl., *G. Hatschbach 24122* (MBM). Balsa Nova, 22.XII.2000, fl., *J. Carneiro 857* (MBM). Campina Grande do Sul, 4.II.2011, fl., *E. Barbosa 3027* (MBM). Castro, 9.I.1947, fl., *G. Hatschbach 580* (PACA, MBM). Contenda, 31.XII.1967, fl. and fr., *G. Hatschbach 18227* (UPCB, MBM). Curitiba, 23.II.1967, fl., *J. Lindeman* (MBM 0136783). Faxinal, 16.XI.1969, fl., *G. Hatschbach 22884* (MBM, NY). Guarapuava, 22.II.1982, fl., *R. Kummrow 1791* (MBM). Jaguariaíva, 28.XII.2000, fl., *M.K.F. Souza* (UPCB 43255). Lapa, 7.III.2002, fl., *O.S. Ribas 4541* (G, MBM). Mandirituba, 18.I.1971, fl. and fr., *G. Hatschbach 25975* (UPCB, MBM). Marmeleiro, 21.II.1971, fl., *G. Hatschbach 26411* (MBM, Z). Morretes, 29.I.2002, fl., *O.S. Ribas 4283* (MBM). Palmeira, 26.XI.2003, fl., *A.C. Cervi 8568* (UPCB). Piraquara, 10.II.2012, fl., *E. Barbosa 3369* (MBM). Ponta Grossa, 6.XI.2008, fl., *B.O. Andrade 160* (MBM). Quatro Barras, 21.I.1999, fl., *J. Cordeiro 1492* (G, MBM, MO, UFP). São José dos Pinhais, 30.XI.1978, fl., *G. Hatschbach 41882* (MBM, UPCB). Sengés, 13.XII.1958, fl., *G. Hatschbach 5281* (UPCB). Tibagi, 29.I.1959, fl., *G. Hatschbach 5466* (MBM). Tijucas do Sul, 11.I.1983, fl., *Y.S. Kuniyoshi 4597* (MBM).

*Sinningia elatior* is widely distributed in South America and occurs from Venezuela to Argentina (Chautems 1990). In Brazil, it is found in the states of Amazonas, Pará, Tocantins, Bahia, Piauí, Goiás, Mato Grosso, Mato Grosso do Sul, Minas Gerais, Espírito Santo, São Paulo, Paraná, Santa Catarina and Rio Grande do Sul, as well as the Distrito Federal (Araújo *et al.* 2022). In Paraná, it is found in grasslands and *Cerrado*, frequently on roadsides and in swampy places. Because of the large area of occurrence, this species was assessed as Least Concern (LC) by the CNCFlora (2012), according to IUCN criteria (IUCN 2021). It flowers from November to February, and sometimes in March or April, and bears fruits from September to November. It is recognized by the 3-whorled leaves, corolla posture at 90° relative to the axis of the inflorescence, and small galea formed by the unequal corolla lobes.

**10. *Sinningia eumorpha*** H.E. Moore, *Gentes Herbarum* 8: 390. 1954. Figs. 4f; 6a

Terrestrial or rupicolous herbs, 15–30 cm tall, with erect stems arising from tubers. Aerial stem herbaceous, pubescent, annual, unbranched. Leaves in a pseudo-rosette, anisophyllous; petiole 1.3–5.8 cm long, green, pubescent; blade 5.65–12.5 × 3.8–13.1 cm, ovate to elliptic, green, pubescent, cordate at base, obtuse at apex, margin crenate, secondary veins in 5–8 pairs. Inflorescence reduced to one axillary flower; pedicel 7.4–13.3 cm long, erect, green, pubescent; bracts absent; calyx lobes 0.8–1.2 × 0.2–0.3 cm, narrowly lanceolate, patent, margin entire, green with reddish apex, pubescent; corolla 3.7–5.2 × 1.3–1.7 cm, tubular-campanulate, base slightly swollen dorsally, gibbous over most of the tube, opening downwards, white or lilac, throat marked with violet and striped with dark purple, pubescent, lobes 0.8–1.1 × 0.8–1.1 cm, round, erect, unequal, the lower lobes more developed, white or lilac; stamens 1.8–2.3 cm long, included, filaments white to yellow, anthers coherent, forming a rectangle; ovary 0.5–0.6 × 0.2–0.4 cm, conical, pubescent, green; style 0.7–1.3 cm long, yellowish, pubescent; nectary composed of 2 dorsal glands. Fruit not observed.

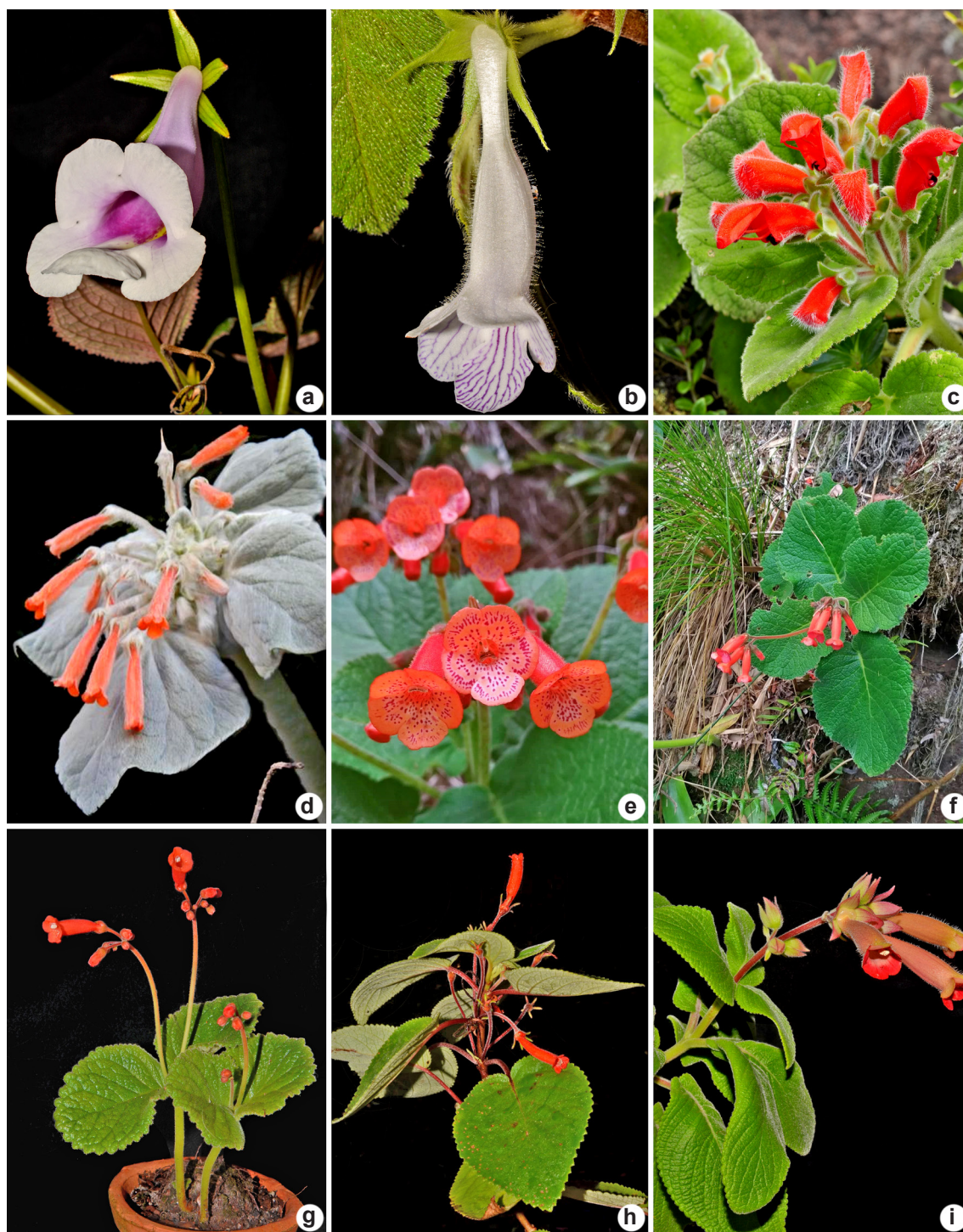
**Selected material:** Jacarezinho, 30.III.1974, fl., *R. Kummrow 531* (MBM). Telêmaco Borba, 19.III.2012, fl., *C. Michelin 1397* (MBM). Ribeirão do Pinhal, 11.I.2001, fl., *J. Carneiro 1037* (MBM).

**Additional examined material:** BRAZIL. SÃO PAULO: Botucatu, I.1899, fl., *G. Edwall 4348* (SP).

*Sinningia eumorpha* is endemic to Brazil and occurs in the states of São Paulo and Paraná (Araújo *et al.* 2022). In Paraná, it is found mainly in mixed rainforest. It is a rare plant that grows in shady and humid places. It blooms between January and March. It can be recognized by the leaves arranged in a pseudo-rosette and white or lilac corollas that are internally striped with purple. It is often cultivated as an ornamental and used in several hybrid crossings (Chautems 1990; Clayberg 1996).

**11. *Sinningia gerdiana*** Chautems, *Candollea* 65: 248. 2010. Figs. 4g; 6b

Rupicolous herbs, 25–40 cm tall, tuber absent. Aerial stem fleshy, perennial, branched, prostrate, pubescent, nodes numerous. Leaves opposite, anisophyllous; petiole 1.2–3.5 cm long, green, pubescent; blade 3.2–10 × 2–4.2 cm, ovate to elliptic, adaxial surface green, abaxial surface reddish, pubescent on both surfaces, acute to obtuse at base, acute at apex, margin serrate, secondary



**Figure 6** – a. *Sinningia eumorpha*. b. *S. gerdiana*. c. *S. hatschbachii*. d. *S. leucotricha*. e. *S. lineata* (flower). f. *S. lineata* (habit). g. *S. macropoda*. h. *S. mauroana*. i. *S. warmingii*. (Photos: c. Marcelo Brotto; e-f. Mathias E. Engels; the others from the authors).

veins in 5–6 pairs. Inflorescence reduced to one axillary flower; pedicel 0.5–1.5 cm long, erect, green, villous; bracts absent; calyx lobes 1–1.2 × 0.3–0.5 cm, lanceolate, patent, margin entire, green, pubescent; corolla 4.2–4.5 × 0.8–1.2 cm, infundibuliform base with practically no protuberances, gibbous, white, villous, throat striated with purple, lobes 0.5–0.7 × 0.8–1.2 cm, round, erect, unequal, white and with purple stripes, the lower lobe better developed; stamens 1.8–2.5 cm long, included, filaments white to yellow, anthers coherent, forming a rectangle; ovary 4.1–6.2 × 2–3.2 mm, conical, pubescent, greenish white, style 1.8–2.8 cm long, white, pubescent; nectary composed of 5 equal glands. Capsule globose, 8–10 × 8–9.2 mm, still somewhat fleshy at dehiscence, opening on one side only until the base of the hypanthium.

**Selected material:** Cerro Azul, 20.III.1974, fl., *G. Hatschbach* 33846 (MBM, holotype); 26.XI.1998, *G. Hatschbach* 71920 (MBM, paratype).

**Additional examined material:** BRAZIL. SÃO PAULO: Barra do Turvo, 27.II.2004, fl., *E. Barbosa* 884 (G, MBM); 22.II.2009, fl., *O.S. Ribas* 8083 (MBM); Parque Estadual de Jacupiranga, Núcleo do Cedro, 30.III.2005, fl., *M. Carboni* 202 (SPSF).

*Sinningia gerdiana* is endemic to Brazil and only known from along the border of the states of São Paulo and Paraná (Araújo *et al.* 2022). In Paraná, it grows in tropical rainforest, usually near riverbanks. This species has a small area of occurrence where there are no protective measures (Chautems 2010); therefore, it was assessed as Endangered (E) according to IUCN criteria (IUCN 2021). It blooms in February and March. It is differentiated from other congeners by the absence of a tuber and presence of a perennial stem that is branched, with secondary growth at the base. It is also distinguished by the presence of an infundibuliform, white corolla with the lobes and throat with purple stripes.

**12. *Sinningia hatschbachii*** Chautems, Candollea 52: 165. 1997. Figs. 5f; 6c

Rupicolous herbs, 30–40 cm tall, with erect stems arising from tubers. Aerial stem herbaceous, villous to woolly, annual, unbranched, nodes 3–5. Leaves opposite, anisophyllous; petiole 0.8–4.5 cm long, green to reddish, villous to woolly; blade 5.5–15.2 × 4.5–10.9 cm, ovate to elliptic, green, villous, acute at apex, cordate at base, margin serrate, secondary veins in 5–6 pairs. Inflorescences in axillary cymes, erect, cymes sessile, flowers 1–5

per axil; pedicel 1.2–2.6 cm long, erect, green to reddish green, villous; bracts absent; calyx lobes 0.9–1.5 × 0.3–0.5 cm, lanceolate, reflexed, margin entire, green, villous; corolla 4.8–5.4 × 0.9–1.1 cm, tubular, swollen at base with 5 equal protuberances, tube gradually widening near the flower opening, red, woolly, lobes 1.6–2.1 × 0.4–0.7 cm, round to elliptic, erect, unequal, upper lobes more developed, forming a galea, reddish or orange; stamens 3.7–4.9 cm long, included, filaments white, anthers coherent, forming a star-shaped disc; ovary 0.8–0.9 × 0.3–0.4 cm, conical, villous, reddish green, style 4.1–4.5 cm long, reddish, pubescent; nectary composed of 2 dorsal glands. Fruit not observed.

**Selected material:** Antonina, 12.I.1998, fl., *O.S. Ribas* 2230 (MBM). Morretes, 10.I.2003, fl., *E. Barbosa* 727 (MBM); 26.II.1950, fl., *G. Hatschbach* 1866 (MBM, SP, US holotype and isotypes); 20.II.1950, fl., *G. Hatschbach* 1900 (MBM, paratype); 27.II.1970, fl., *G. Hatschbach* 23939 (MBM, NY, UC, WAG, paratypes).

*Sinningia hatschbachii* is endemic to Brazil and occurs in the states of São Paulo, Paraná, and Santa Catarina (Araújo *et al.* 2022). In Paraná, it is found in tropical rainforest, mainly at high elevations. Due to its small extent of occurrence and rarity in nature, it was assessed as Endangered (EN) by the CNCFlora (2012), according to IUCN criteria (IUCN 2021). It blooms in January and February. It is recognized by a woolly indumentum covering the leaves, calyx with lanceolate and reflexed lobes, and red corolla with a well-developed galea that is covered by a woolly indumentum.

In Paraná, *S. hatschbachii* can hybridize with *S. cooperi* under natural conditions. This was observed in *O.S. Ribas* 2208 (MBM), from the municipality of Tijucas do Sul. This plant has intermediate characteristics between the two parental taxa but with a more congested inflorescence, pubescent leaves, and reddish trichomes.

**13. *Sinningia leucotricha*** (Hoehne) H.E. Moore, Baileya 19: 39. 1973. Figs. 3a–f; 6d

Rupicolous herbs, 15–40 cm tall, with erect stems arising from tubers. Aerial stem herbaceous, tomentose, annual, unbranched, nodes 1–2. Leaves apparently 4-whorled, anisophyllous; petiole 0.3–0.6 cm long, green, tomentose; blade 2.5–15 × 1.3–11.9 cm, ovate to elliptic, tomentose, silver-green, acute to obtuse at base, acute to obtuse at apex, margin serrate, secondary veins in 4–10



pairs. Inflorescences in axillary cymes, erect, subsessile or peduncle 0.5–0.8 cm long, flowers 1–10; pedicel 1.3–3.2 cm long, erect, green, tomentose; bracts absent; calyx lobes 0.5–0.9 × 0.1–0.2 cm, linear, adpressed, margin entire, green to reddish, tomentose; corolla 2.3–3.2 × 0.4–0.8 cm, tubular, swollen at base with 5 equal protuberances, tube gradually widening near the flower opening, reddish or orange, with dark dots near corolla opening, villous, lobes 1.6–2.8 × 0.2–0.4 cm, round, erect, subequal, lower lobe more developed, reddish or orange; stamens 2.2–3.4 cm long, included, filaments white, anthers coherent, forming a rectangle; ovary 0.7–1.2 × 0.2–0.4 cm, conical, pubescent, reddish green, style 1.4–2.9 cm long, reddish, pubescent; nectary composed of 2 dorsal glands. Capsule 1.2–1.5 × 0.5–0.7 cm, ovoid, pubescent, brown.

**Selected material:** Curitiba (cultivated), 28.VIII.2015, fl. and fr., *L.K.R. Hinoshita 41* (UPCB). Londrina, Salto Apucarazinho, 3.IX.1953, *T. Motosima* (SP 56347, holotype). Ortigueira, 16.XI.2011, fl., *V. Ariati 664* (MBM); 23.XI.2011, fl., *W.S. Costa 1* (MBM); 19.VIII.2012, fl., *C. Michelin 1543* (UPCB). Prudentópolis, 13.XI.2018, fl., *M.E. Engels 6394* (MBM). Sapopema, 27.IV.1997, fl., *C. Medri et al.* 447 (FUEL). Telêmaco Borba 23.IX.2012, fl., *T. Bochorny 113* (MBM).

**Additional examined material:** BRAZIL. SANTA CATARINA: José Boiteux, Reserva Indígena, 19.IX.1999, fl., *L. Cristofolini* (FURB 1888).

*Sinningia leucotricha* is endemic to Brazil and occurs in the states of Paraná and Santa Catarina, but it is rarely found in the latter. It was recognized as a rare Brazilian plant, due to the restricted number of records in the wild and because of its commercialization, which probably relies on illegal collecting in the wild (Chautems & Araujo 2009). It is found mainly in the *Cerrado* and grasslands, mostly on rocky outcrops. It blooms from August to April. It can be recognized by the congested, 4-whorled leaves, silvery tomentose indumentum, and orange flowers with darker spots on the throat.

**14. *Sinningia lineata*** (Hjelmq.) Chautems, *Candollea* 45: 385. 1990. Figs. 3g; 6e-f

Rupicolous herbs, 25–60 cm tall, with erect stems arising from tubers. Aerial stem herbaceous, pubescent, annual, unbranched, nodes 2(–3), internodes short. Leaves opposite, slightly anisophyllous; petiole 1.2–6.5 cm long, green, pubescent; blade 9.2–24 × 7.5–23.1 cm, elliptic to orbicular, green on both sides, pubescent,

cordate at base, acute to obtuse at apex, margin crenate or irregularly serrate, secondary veins in 5–7 pairs. Inflorescence in axillary cymes, erect, peduncle 7.3–15 cm long, flowers 9–15; pedicel 0.5–2.6 cm long, cylindrical, erect in relation to the branch, green, pubescent; bracts 5.2–9 × 0.1–0.2 cm, generally shorter than flowers, narrowly lanceolate, green, pubescent; calyx lobes 6.1–9.2 × 2.1–4.4 mm, fused near the base, narrowly lanceolate, erect, margin entire, green, pubescent; corolla 2.3–3.5 × 0.6–0.8 cm, tubular, elongate, widening at base and near opening, reddish with throat much paler, with more than 12 red dots on throat and lobes, pubescent, lobes 3.1–5.1 × 5.1–6.1 mm, round, patent, subequal, lower lobes slightly larger than upper ones, reddish and with darker red dots; stamens 2.5–2.8 cm long, anthers coherent, forming a rectangle, included, filaments white to yellow; ovary, 5.2–6.4 × 3–4 mm, conical, pubescent, yellow, style 2.2–2.5 cm long, yellowish, pubescent; nectary formed by 2 separate dorsal glands. Fruit not observed.

**Examined material:** Coronel Domingos Soares, 15.X.2019, fl., *M.E. Engels 7812* (MBM, RB).

**Additional examined material:** BRAZIL. RIO GRANDE DO SUL: Barracão, 9.VI.2000, fl., *J. Spanholi* (MBM 251163). Lacerdópolis, 17.IX.1994, fl., *G. Hatschbach 61088* (MBM). Vacaria, 21.X.2004, fl., *G. Hatschbach 78338* (MBM).

*Sinningia lineata* is endemic to Brazil and occurs in the states of Paraná, Santa Catarina, and Rio Grande do Sul (Araújo *et al.* 2022). *Engels 7812* is the first record of this species from Paraná. With only one record so far, this species is rare in the state. The species is found on rocky outcrops in tropical rainforest. Due to its small extent of occurrence, and because it inhabits regions affected by the construction of a dam, this species was assessed as Endangered (EN) by the CNCFlora (2012), according to IUCN criteria (IUCN 2021). It blooms from June to November. *Sinningia macropoda* and *S. lineata* are similar but can be differentiated by the leaves arranged on two or more nodes in *S. lineata* (*vs.* one node), longer petioles in *S. lineata* (1.2–6.5 cm *vs.* 0.2–0.9 cm), and corolla with a pale red throat in *S. lineata* (*vs.* red).

**15. *Sinningia macropoda*** (Sprague) H.E. Moore, *Baileya* 19: 39. 1973. Figs. 3h; 6g

Rupicolous herbs, 16–30 cm tall, with erect stems arising from tubers. Aerial stem herbaceous, pubescent, annual, unbranched, nodes 1(–2).

Leaves opposite, iso- or anisophyllous; petiole 0.2–0.9 cm long, green, pubescent; blade 4.2–13.2 × 5.7–16.3 cm, orbicular, green, pubescent, cordate at base, obtuse at apex, margin serrate, secondary veins in 4–7 pairs. Inflorescences in axillary cymes, erect, peduncle 7.4–17.4 cm long, flowers 3–10; pedicel 0.5–2.1 cm long, erect, green, pubescent; bracts absent; calyx lobes 0.5–0.7 × 0.1–0.2 cm, narrowly lanceolate, adpressed, margin entire, reddish green, pubescent; corolla 1.8–2.9 × 0.5–0.7 cm, tubular, swollen at base with 5 equal protuberances, tube gradually widening near the flower opening, reddish, with small darker dots on the throat, pubescent, lobes 0.2–0.3 × 0.2–0.4 cm, round, erect, subequal, lower lobes more developed, reddish; stamens 2.1–2.5 cm long, included, filaments yellow, anthers coherent, forming a rectangle; ovary 0.4–0.8 × 0.2–0.3 cm, conical, pubescent, reddish green, style 1.31–2.1 cm long, reddish, pubescent; nectary composed of 2 larger dorsal and 3 smaller ventral glands. Fruit not observed.

**Selected material:** Campo Largo, 2.II.1957, fl., *G. Hatschbach* 625 (MBM, SP). Lapa, 17.X.1948, fl., *G. Hatschbach* 1035 (MBM, US). Londrina, V.1985, *M.F. Carneiro* (FUEL 785). Palmeira, 7.XI.2004, fl., *M.G. Caxambu* 601 (HCF, MBM). Ortigueira, 6.VII.1996, fl., *J. Carneiro* 317 (MBM). Ponta Grossa, 10.X.1999, fl., *R. Ziller* 1912 (EFC). Serrinha, 14.X.1909, fl., P.K.H. Dusén 8538 (LD, isotype of *Corytholoma cyclophyllum* Dusén ex Laurent).

*Sinningia macropoda* occurs in Brazil and Paraguay (Chautems & Matsuoka 2003). In Brazil, it is found in Minas Gerais, São Paulo, Paraná, and Santa Catarina (Araújo *et al.* 2022). In Paraná, it grows mainly in mixed rainforest and grasslands, on outcrops or rocky walls, often around waterfalls. Due to its large area of occurrence and abundance, *S. macropoda* was assessed as Least Concern (LC) by the CNCFlora (2012), according to IUCN criteria (IUCN 2021). It flowers from July to March and bears fruits from September to March. It is easily identified by the one or rarely two pairs of large and orbicular leaves, inflorescence with a peduncle more than 7 cm long, and pedicellate flowers with red corollas and a relatively dark throat (or throat not lighter than the corolla tube).

**16. *Sinningia mauroana*** Chautems, Gesneriana 1: 9. 1995. Figs. 3k; 6h

Terrestrial or rupicolous herbs, 0.4–2 m tall, tuber absent. Aerial stem pubescent, woody at base, perennial, unbranched or branched from the base,

nodes at least 5. Leaves opposite, isophyllous; petiole 1.3–6.6 cm long, green with reddish base, pubescent; blade 4.6–11.2 × 2.1–7.2 cm, ovate to elliptic, green, pubescent to sericeous with a silvery look, especially on the adaxial surface, obtuse to cordate at base, acute at apex, margin serrate, secondary veins in 5–7 pairs. Inflorescence in axillary cymes, erect, sessile, flowers 1 to 3 per axil; pedicel 4.2–7.6 cm long, erect, green to reddish green, pubescent; bracts absent; calyx lobes 0.6–1.2 × 0.1–0.2 cm, linear, reflexed, margin entire, reddish green, pubescent; corolla 2.7–4 × 0.7–0.9 cm, tubular, swollen at base with 5 equal protuberances, tube gradually widening near the flower opening, orange-red, pubescent, lobes 0.2–0.5 × 0.3–0.5 cm, round, erect, subequal, lower lobes more developed, orange-red; stamens 2.8–3.8 cm long, included or reaching the opening of the corolla, filaments white to yellow, anthers coherent, forming a rectangle; ovary semi-inferior, 0.6–0.9 × 0.2–0.4 cm, conical, pubescent, reddish; style 1.8–2.6 cm long, reddish, pubescent; nectary composed of 2 dorsal glands. Capsule 1.3–1.4 × 0.4–0.5 cm, ovoid, pilose, reddish brown.

**Selected material:** Antonina, 7.III.2013, fl., *J. Cordeiro* 4732 (MBM); 19.VI.2015, fl. and fr., *R. Goldenberg* 2221 (UPCB). Guaraqueçaba, 15.X.1983, *G. Hatschbach* 59775 (MBM). Rio Branco do Sul, 13.IX.2006, fl., *J.M. Silva* 5013 (MBM).

*Sinningia mauroana* is endemic to Brazil and occurs in the states of Rio de Janeiro, São Paulo, and Paraná (Araújo *et al.* 2022). In Paraná, it is found in tropical and mixed rainforest, in shaded and humid areas. It usually flowers from September to March (rarely in June) and bears fruits from October to March. This species can be recognized by the perennial woody stem at the base, axillary flowers, and red or orange corolla.

**17. *Sinningia sellovii*** (Mart.) Wiehler, Selbyana 5: 72. 1978. Fig. 1g

Rupicolous herbs, 30–90 cm tall, with erect stems arising from tubers. Aerial stem herbaceous, pubescent, with non-glandular trichomes, annual, branched from the base, nodes 5-numerous. Leaves opposite or 3-whorled, isophyllous; petiole 0.2–0.8 cm long, green, pubescent; blade 3.2–13.4 × 1.2–8.7 cm, ovate to elliptic, green, pubescent, acute to obtuse at base, acute to obtuse at apex, margin crenate, secondary veins in 5–12 pairs. Inflorescences in terminal cymes, erect, sessile, rachis 9.5–46 cm long, flowers 1–4 per axil; pedicel 0.8–3.5 cm long, pendulous, green

to reddish green, pubescent; bracts 0.8–1.7 × 0.4–0.8 cm, shorter than flowers, lanceolate; calyx lobes 0.5–0.9 × 0.2–0.8 cm, lanceolate, adpressed, margin entire, green, sometimes with reddish apex, pubescent; corolla 1.3–3.1 × 0.6–1 cm, tubular, swollen at base with 2 larger dorsal protuberances, tube enlarged in middle of corolla, constricted near the flower opening, pinkish, without darker dots, pubescent, lobes 0.2–0.5 × 0.2–0.5 cm, yellowish in bud, pinkish at maturity, round to elliptic, erect, subequal; stamens 1.2–3.3 cm long, exerted, filaments white to yellow, anthers coherent, forming a rectangle; ovary 0.4–0.5 × 0.3–0.4 cm, conical, pubescent, reddish green, style 1.2–1.8 cm long, reddish, pubescent; nectary composed of 2 larger dorsal and 3 smaller ventral glands. Capsule 0.7–1.2 × 0.5–0.7 cm, turbinate, brown, glabrous. **Selected material:** Capitão Leônidas Marques, 10.IV.2004, fl., *O.S. Ribas 6263* (RB, UPCB). Céu Azul, 19.III.2004, fl., *O.S. Ribas 6059* (MBM). Dois Vizinhos, 8.XII.2001, fl., *P.H. Labiak 2027* (MBM); 11.I.1953, *B. Rambo* (PACA 53633, holotype of *Rechsteineria ramboi* Hoehne). Foz do Iguaçu, 3.V.1957, fl., *G. Hatschbach 3799* (MBM). Guaíra, 14.XI.1979, fl., *Buttura 327* (MBM). Londrina, 17.XI.1969, fl., *G. Hatschbach 22899* (UPCB). Prudentópolis, 18.XI.2009, fl., *O. Kuchler 11* (MBM). São Jorge do Oeste, fl., *G. Hatschbach 20551* (MBM). Telêmaco Borba, 29.X.2012, fl. and fr., *C. Michelon 1577* (MBM).

*Sinningia sellovii* occurs in Brazil, Bolivia, Paraguay, Argentina, and Uruguay (Wiehler 1978). In Brazil, it is found in Mato Grosso do Sul, Paraná, Santa Catarina, and Rio Grande do Sul (Araújo *et al.* 2022). In Paraná, it is rare and grows in open places, such as grasslands, *Cerrado*, and disturbed areas. It flowers and bears fruits from October to May. It is recognized by the pink and pendulous flowers. This species is morphologically similar to *S. warmingii*, and it is differentiated by the pendulous flowers (*vs.* erect in *S. warmingii*) and the pinkish corolla (*vs.* reddish or dark pink).

**18. *Sinningia warmingii*** (Hiern) Chautems, *Candollea* 45: 386. 1990. Figs. 1f; 6i

Terrestrial or rupicolous herbs, 25–86 cm tall, with erect stems arising from tubers. Aerial stem herbaceous, pubescent, with non-glandular trichomes, annual, branched from the base and often with new shoots in the upper axils, nodes numerous. Leaves opposite or rarely 3-whorled, isophyllous; petiole 0.6–4.8 cm long, green to reddish green, pubescent; blade 2.7–14.6 × 0.9–4.5 cm, ovate to elliptic, green, pubescent, acute at base, acute to obtuse at base, margin crenate,

secondary veins in 7–11 pairs. Inflorescences in a terminal thyrse composed of axillary cymes, erect, each cyme sessile, rachis 8.5–15 cm long, flowers 1–4 per axil; pedicel 1.1–1.9 cm long, erect, green to reddish green, pubescent; bracts 0.5–2.1 × 0.2–0.5 cm, shorter than flowers, elliptic; calyx lobes 0.7–1.2 × 0.3–0.5 cm, lanceolate, adpressed, margin entire, green, villous; corolla 2.3–4.2 × 0.6–0.9 cm, tubular, swollen at base with 2 larger dorsal protuberances, reddish or dark pink, pubescent, lobes 0.2–0.4 × 0.2–0.4 cm, round, erect, subequal, reddish or orange; stamens 2.3–3.9 cm long, included or reaching the corolla opening, filaments yellowish, anthers coherent, forming a rectangle; ovary semi-inferior, 0.4–0.5 × 0.2–0.3 cm, conical, pubescent, reddish green, style 0.7–3.3 cm long, yellowish, pubescent; nectary composed of 2 well-developed dorsal glands and 3 smaller ventral ones. Capsule 0.7–1.2 × 0.6–0.7 cm, conical, brown, pubescent.

**Selected material:** Guaraqueçaba, 12.II.2002, fl., *J. Carneiro 1310* (MBM). Londrina, 17.XI.1969, fl., *G. Hatschbach 22893* (F, HBR, K, MBM, MO, NY).

**Additional examined material:** BRAZIL. RIO GRANDE DO SUL: Torres, 26.I.1973, fl. and fr., *G. Hatschbach 31177* (G, MBM). SANTA CATARINA: Lauro Müller, 16.III.2005, fl., *G. Hatschbach 79222* (G, MBM). Orleans, 13.XI.2001, fl., *G. Hatschbach 72683* (G, MBM); 17.II.2010, fl., *M. Verdi. 4014* (FURB, MBM).

*Sinningia warmingii* occurs from Argentina to Peru. In Brazil, it is found in Goiás, Mato Grosso do Sul, Minas Gerais, Rio de Janeiro, São Paulo, Paraná, Santa Catarina, and Rio Grande do Sul (Araújo *et al.* 2022). In Paraná, it grows on roadsides and in open places. Due to its large area of occurrence, *S. warmingii* was assessed as Least Concern (LC) by the CNCFlora (2012), according to IUCN criteria (IUCN 2021). It flowers and bears fruits from October to February. This species is closely related to *S. aggregata*, from which it differs by the branching stem with frequent axillary buds in the upper leaves (*vs.* branched from the base), non-glandular indumentum (*vs.* glandular), and dull colored corolla (*vs.* bright red).

## Acknowledgements

The authors thank CAPES, for the master's scholarship granted to the first author; and CNPQ, for the Research Productivity scholarship granted to the fourth author. We are grateful to the curators at the ALCB, EFC, FUEL, FURB, G, HCF, JOI, K, MBM, MO, NY, PACA, R, RB, S, SPF, UFP,

UPCB, US, WAG, WU, and Z herbaria, for sending images of specimens or making their collections available.

### Data availability statement

In accordance with Open Science communication practices, the authors inform that all data are available within the manuscript.

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Area Editor: Dr. Marcelo Trovó

Received on October 02, 2023. Accepted on January 17, 2024.



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