

A REVISION OF THE GENUS *STYLOSANTHES**

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HISTORY OF THE GENUS

The genus *Stylosanthes* was established in 1788 by O. Swartz¹ with two species, *S. procumbens* (= *S. hamata* (L.) Taub.) and *S. viscosa*. Previous to the founding of the genus, most present-day species of *Stylosanthes* had been referred to other genera. Linnaeus² in 1753 had described *Trifolium biflorum* (= *S. biflora* (L.) BSP.) and in 1759³ *Hedysarum hamatum* β (= *S. viscosa* Sw.); in 1775 Aublet⁴ had named *Trifolium guianense* (= *S. guyanensis* (Aubl.) Sw.).

Preceding the advent of the binomial system, a few polynomials had been applied to modern species of *Stylosanthes*. Apparently the first mention of a species now known to belong to the genus was in 1696 when Sir Hans Sloane⁵ listed *Anonis non spinosa, minor, glabra, procumbens, flore lutea* as occurring in Jamaica. This is *S. hamata* (L.) Taub. In 1737 Burmann⁶ recorded *Trifolium procumbens zeylanicum hirsutum* (= *S. fruticosa* (Retz.) Mohlenbrock).

Willdenow, in the fourth edition of 'Species Plantarum',⁷ listed five species of *Stylosanthes*. G. Don⁸ in 1832 listed thirteen species. Of these, however, only seven have proved to be distinct, and three of these were recorded without usage of the earliest epithet applicable.

The first study of *Stylosanthes* was a synopsis by Vogel⁹ in 1838. He divided the genus into two sections, EUSTYLOSANTHES and STYPOSANTHES, based on the absence or presence, respectively, of an axis rudiment (an aborted secondary axis associated with each flower). An unfortunate situation has arisen, however, since Vogel designated *S. procumbens* Sw. (= *S. hamata* (L.) Taub.) of § STYPOSANTHES to be the type species. According to present nomenclatorial rules, the section or subgenus including the type species must repeat the generic name, hence Vogel's § STYPOSANTHES must be changed to § STYLOSANTHES; his § EUSTYLOSANTHES here is renamed § ASTYLOSANTHES. In his section including species without axis rudiments, Vogel recorded eight species, three of them new, while in the other section, seven species are listed including four new ones. All seven of Vogel's new

¹ Swartz, O. Prod. Veg. Ind. Occ. 108. 1788.

² Linnaeus, C. Sp. Pl. 773. 1753.

³ Linnaeus, C. Syst. Nat. 10:1170. 1759.

⁴ Aublet, F. Pl. Guian. 776. 1775.

⁵ Sloane, H. Cat. Pl. 1696.

⁶ Burmann, J. Thes. Zeyl. 1737.

⁷ Willdenow, C. Sp. Pl. 3:1166. 1800.

⁸ Don, G. Gen. Syst. 2:281. 1832.

⁹ Vogel, in Linnaea 12: 68. 1838.

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species are recognized in this study as valid, with only one of the entire fifteen listed by him placed in synonymy.

Between 1838 and 1890, six species were ascribed to *Stylosanthes* by various authors, but all apply to species previously named.

A more detailed revision was provided by Taubert¹⁰ in 1890, including morphology, generic relationships, and geographical distribution in addition to keys and descriptions for the species. He retained Vogel's division of the genus into two sections and recognized 22 species, four of which he himself proposed. Fifteen of these are maintained in this study, although the specific concept has changed somewhat. It is apparent that Taubert was handicapped by the limited number of specimens available for his study.

Little was added to the genus until 1919 when Hassler¹¹ enumerated the species of Paraguay and added fourteen subspecies, varieties, and forms to *S. guyanensis* and *S. montevidensis*.

Blake described thirteen species between 1920 and 1926, Harms¹² added one in 1923, Macbride¹³ one in 1943, and Standley and Williams¹⁴ one in 1950. In 1943, Herter¹⁵ split the genus into two genera, *Stylosanthes* and *Astyposanthes*, equivalent to Vogel's sections and in which rank I prefer to treat them. In the present study, 25 species are recognized, three described for the first time.

GENERIC RELATIONSHIPS

Stylosanthes belongs to the tribe Hedysareae of the papilionaceous Leguminosae characterized by monadelphous stamens and a lomentum. The alternation of subbasifixed and versatile anthers and the absence of stipels suggest its relationship with three other genera, *Zornia*, *Arachis*, and *Chapmannia*. The quartet is grouped in the subtribe Stylosanthinae.

Stylosanthes shows a close affinity with *Zornia* because of the large bracts subtending each flower and the often spicate inflorescence. The leaflets of *Zornia*, however, are paripinnate, the ovules are numerous, and bracteoles are lacking. *Arachis* is closely allied to *Stylosanthes* since both genera have similar stipules and 2-3 ovules per carpel, but they differ in that bracteoles are lacking and the loment matures underground in *Arachis*. The monotypic *Chapmannia* from Florida bears imparipinnate leaves, but differs in that it possesses minute stipules, numerous ovules per carpel, and lacks bracteoles.

MORPHOLOGY

Species of *Stylosanthes* usually are herbaceous or suffruticose perennials, some attaining a height of 1.5 meters. Some species are prostrate and spreading (*S. viscosa*, some specimens of *S. hamata*), others upright and ascending. The roots usually are thick and mostly straight, with few secondary roots.

¹⁰ Taub. in Verh. Bot. Brand. 32:1-32. 1890.

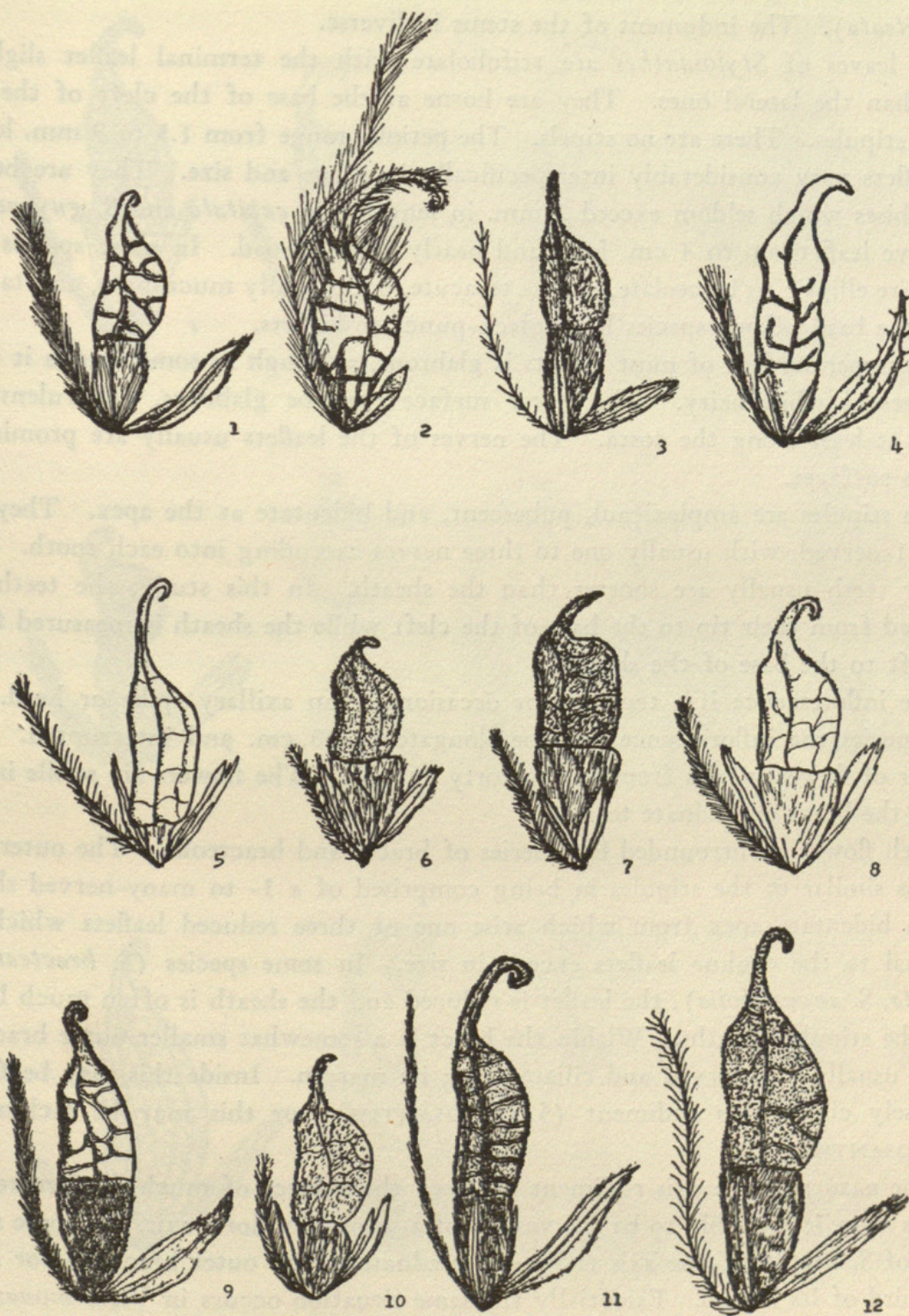
¹¹ Hassl. in Fedde, Rep. Sp. Nov. 16:221-223. 1919.

¹² Harms, in Fedde, loc. cit. 19:69. 1923.

¹³ Macbr. in Field Mus. Publ. Bot. 13³:411. 1943.

¹⁴ Standl. & L. Wms. in Ceiba 1:145. 1950.

¹⁵ Hert. in Rev. Sudamer. Bot. 7:209. 1943.

Fig. 1. Lomenta of *Stylosanthes*

1. *Stylosanthes capitata*, Williams & Assis 5834; 2. *S. bracteata*, Jørgensen 4877; 3. *S. calcicola*, Small 6537 (TYPE); 4. *S. mexicana*, Schaffner 579 (TYPE); 5. *S. erecta*, Robertson 32; 6. *S. scabra*, Martius 1124; 7. *S. scabra*, Pickel 2556; 8. *S. tuberculata*, Shafer 2463; 9. *S. sympodialis*, Weberbauer 5936; 10. *S. fruticosa*, Mearns 1956; 11. *S. subsericea*, Standley 12110; 12. *S. macrocarpa*, Pringle 6721 (TYPE). All figures $\times 3\frac{1}{2}$.

The stems are generally diffusely branched and woody at the base, rarely simple (*S. bracteata*). The indument of the stems is diverse.

The leaves of *Stylosanthes* are trifoliolate with the terminal leaflet slightly larger than the lateral ones. They are borne at the base of the cleft of the bidentate stipules. There are no stipels. The petioles range from 1.5 to 9 mm. long. The leaflets vary considerably interspecifically in shape and size. They are borne on rachises which seldom exceed 2 mm. in length. *S. capitata* and *S. guyanensis* may have leaflets up to 4 cm. long and nearly 2 cm. broad. In most species the leaflets are elliptic to lanceolate, obtuse to acute, occasionally mucronate, and tapering to the base. Some species have black-punctate leaflets.

The upper surface of most leaflets is glabrous, although in some species it may be appressed white-hairy. The lower surface may be glabrous, puberulent, or bristly, at least along the costa. The nerves of the leaflets usually are prominent on both surfaces.

The stipules are amplexicaul, pubescent, and bidentate at the apex. They are 3- to 11-nerved, with usually one to three nerves extending into each tooth. The stipular teeth usually are shorter than the sheath. In this study, the teeth are measured from their tip to the base of the cleft while the sheath is measured from the cleft to the base of the sheath.

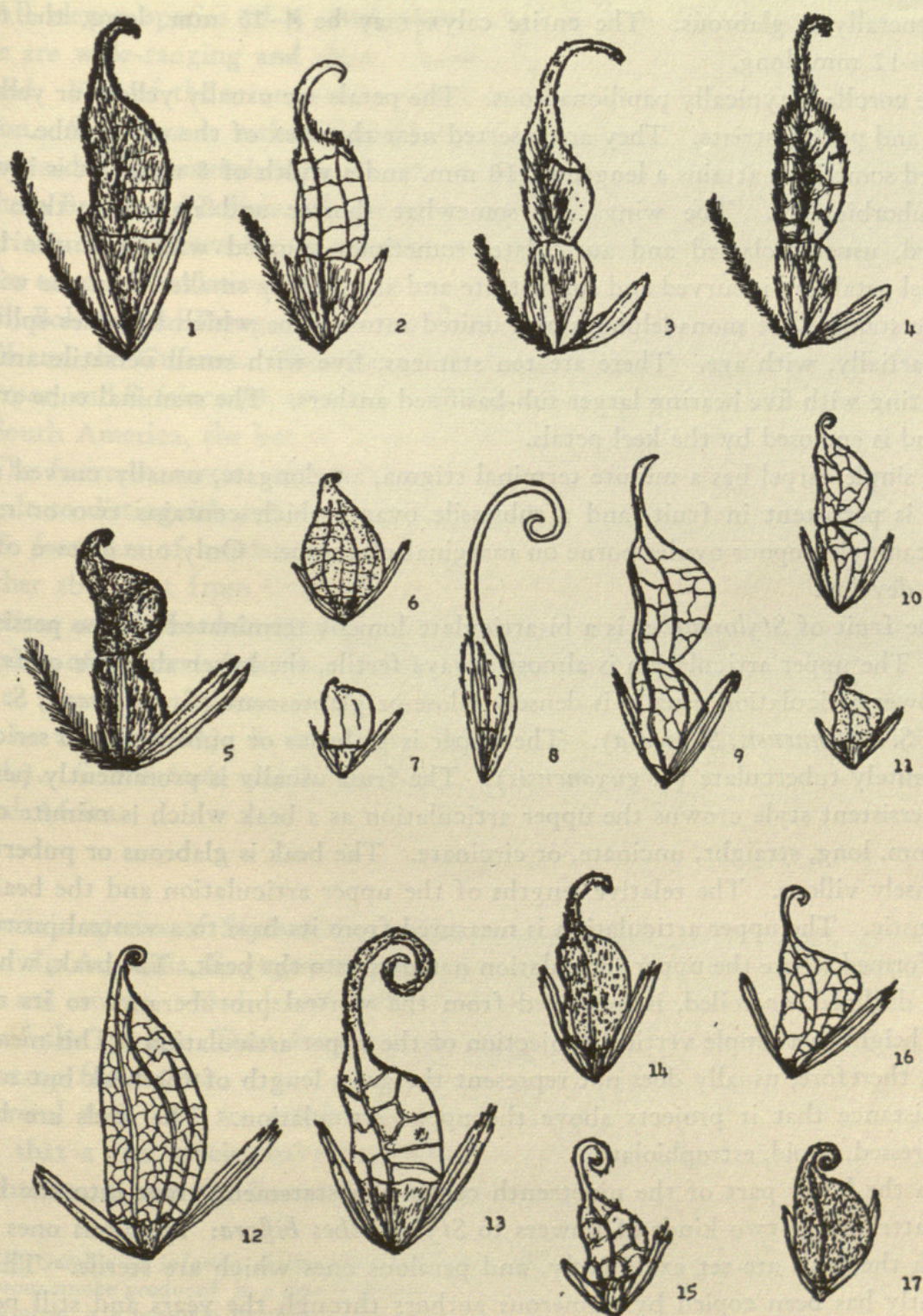
The inflorescence is a terminal or occasionally an axillary spike or head. In some species the inflorescence may be elongate to 20 cm. and interrupted. The number of flowers varies from one to forty or more. The flowers are sessile in the axil of the bract and adnate to it.

Each flower is surrounded by a series of bracts and bracteoles. The outermost bract is similar to the stipules in being comprised of a 3- to many-nerved sheath with a bidentate apex from which arise one or three reduced leaflets which are identical to the cauline leaflets except in size. In some species (*S. bracteata*, *S. capitata*, *S. angustifolia*), the leaflet is reduced and the sheath is often much larger than the stipular sheaths. Within the bract is a somewhat smaller outer bracteole which usually is 3-nerved and ciliate along its margin. Inside this may be found a densely ciliate axis rudiment (§ *STYLOSANTHES*) or this may be lacking (§ *ASTYPOSANTHES*).

The nature of the axis rudiment has been the subject of much conjecture, but studies show it probably to be the vestige of a secondary floral axis. In some specimens of *S. bracteata*, the axis rudiment is adnate to the outer bracteole for about one-third of its length. Essentially the same situation occurs in *Vicia monanthos*, according to Svenson.¹⁶ Within the axis rudiment are one (§ *ASTYPOSANTHES*) or two (§ *STYLOSANTHES*) inner bracteoles which often are deeply cleft and usually long-ciliate near the apex.

The calyx is comprised of an elongated tube expanded into five lobes at the apex. The lobes usually are unequal, with one larger than the others or rarely with two larger. Usually the four smaller lobes are connate. The largest lobe usually

¹⁶ Sven. Am. Jour. Bot. 33:394-498. 1946.

Fig. 2. Loments of *Stylosanthes*

1. *S. nervosa*, Weberbauer 6215 (TYPE); 2. *S. hamata*, Ricksecker 47; 3. *S. hamata*, Blake 7792; 4. *S. hamata*, Leonard 8797; 5. *S. sericeiceps*, Jahn 678 (TYPE); 6. *S. biflora*, Fisher s. n.; 7. *S. guyanensis*, Martius 1123; 8. *S. angustifolia*, Burchell 9004; 9. *S. leiocarpa*, Herter 89069; 10. *S. cayennensis*, Broadway 972 (TYPE); 11. *S. viscosa*, Miers 2963; 12. *S. macrosoma*, Hassler 7606; 13. *S. humilis*, Orcutt 4447; 14. *S. figueroae*, Figueroa 897 (TYPE); 15. *S. humilis*, Palmer 25; 16. *S. hippocampoides*, Herter 85562; 17. *S. montevidensis*, Venturi 9957. All figures $\times 3\frac{1}{2}$.

is acute, the others obtuse or subacute. They may be puberulent or glabrous. The tube generally is glabrous. The entire calyx may be 4–15 mm. long, the tube being 3–12 mm. long.

The corolla is typically papilionaceous. The petals are usually yellow or yellow-orange and purple-striate. They are inserted near the apex of the calyx tube. The standard sometimes attains a length of 10 mm. and a width of 8 mm. It is invariably suborbiculate. The wings are somewhat shorter and narrower than the standard, usually clawed and auriculate, sometimes spurred within at the base. The keel petals are incurved and subrostrate and are slightly smaller than the wings.

The stamens are monadelphous and united into a tube which becomes split, at least partially, with age. There are ten stamens, five with small versatile anthers alternating with five bearing larger sub-basifixed anthers. The staminal tube arches into and is enclosed by the keel petals.

The single carpel has a minute terminal stigma, an elongate, usually curved style which is persistent in fruit, and a subsessile ovary which contains two or rarely three campylotropous ovules borne on marginal placentae. Only one or two of the ovules develop.

The fruit of *Stylosanthes* is a bi-articulate loment terminated by the persistent style. The upper articulation is almost always fertile, the lower abortive or fertile. The lower articulation usually is densely pilose or glabrescent (*S. mexicana*, *S. leio-carpa*, *S. cayennensis*, *S. erecta*). The upper is glabrous or puberulent to sericeous or minutely tuberculate (*S. guyanensis*). The fruit usually is prominently nerved. The persistent style crowns the upper articulation as a beak which is minute or up to 8 mm. long, straight, uncinat, or circinate. The beak is glabrous or puberulent to densely villous. The relative lengths of the upper articulation and the beak are diagnostic. The upper articulation is measured from its base to a ventral protuberance formed where the upper articulation narrows into the beak. The beak, whether erect, declined, or coiled, is measured from the ventral protuberance to its maximum height as a simple vertical projection of the upper articulation. This measurement, therefore, usually does not represent the gross length of the beak but merely the distance that it projects above the upper articulation. The seeds are black, compressed, ovoid, estrophiolate.

In the latter part of the nineteenth century, a statement crept into the literature attributing two kinds of flowers to *Stylosanthes biflora*: apetalous ones from which the seeds are set exclusively, and petalous ones which are sterile. This apparently has been copied by numerous authors through the years and still persists in some of our more recent manuals. No evidence of apetalous flowers occurring in *S. biflora* was found in this study.

GEOGRAPHY OF THE GENUS

The genus *Stylosanthes* is indigenous to savannas and similar areas in the eastern United States, Central America, the Antilles, South America to northern Argentina, the Galapagos Islands, central and southern Africa, Madagascar, and southern

India and Ceylon. In addition, *S. humilis* is adventive in Malaysia and Australia.

All eleven species of § ASTYPOSANTHES occur in the Western Hemisphere. Some are wide-ranging and show considerable variability, although most are well defined. Five of the seven widely distributed species of *Stylosanthes* belong in this section. *S. biflora* is rather abundant over the eastern United States. The very widespread *S. guyanensis* with its two subspecies occurs from Central America to southern Brazil and Bolivia. *S. viscosa* occurs from Baja California through Central America and northern South America and the Caribbean basin. *S. montevidensis* and its close local relatives, *S. hippocampoides* and *S. macrosoma*, center in southern Brazil, Bolivia, and Paraguay. *S. angustifolia* occurs rather frequently in northern Brazil and the Guianas. The other three species of this section, *S. cayennensis*, *S. figueroae*, and *S. leiocarpha*, are local, the first two being restricted to extreme northern South America, the last to Uruguay, Paraguay, and southeastern Brazil.

The fourteen species of § STYLOSANTHES, on the other hand, are exceedingly difficult to distinguish and are mostly restricted. Only *S. hamata* of the Antilles and *S. fruticosa* of southern Africa, India, and Ceylon are widespread. *S. scabra* is rather abundant from Colombia to Minas Geraes, Brazil. *S. macrocarpa* and *S. subsericea* are confined to Central America and *S. calcicola* to Florida, the Antilles, and parts of Central America. From Colombia and Venezuela to Peru and Ecuador are found *S. mexicana* (also in Mexico and Bolivia), *S. nervosa*, *S. tuberculata* (also in the Antilles), *S. sericeiceps*, and *S. sympodialis* (also in the Galapagos Islands). *S. bracteata* and *S. capitata* center in Brazil. *S. erecta* occurs in east-central Africa.

USES

Certain species of *Stylosanthes* (*S. fruticosa*, in particular) are used as fodder crops. In Australia, *S. guyanensis* ssp. *guyanensis* has been planted in an effort to check soil erosion. Nodules of nitrogen-fixing bacteria are present on the roots of most of the species. Data for some specimens indicate *Stylosanthes* to be a good cover crop for coffee.

Several folk uses are attributed to certain members of the genus. Taubert noted that a few species have been used as diuretics. Hutchinson and Dalziel¹⁷ attribute many uses for *S. erecta* by native Africans:

In Gambia an infusion of the plant is taken internally for colds, etc. In N. Nigeria the odorous smoke produced in a pipe is blown on to arrow wounds as an antidote to their poison. The plant is a common ingredient in superstitious herbal practice, e.g., the root worn as a charm or prepared as a wash is a preventive of injury by sharp weapons (Hausa *maganin k'arfe*, literally "medicine against metal"). Other plants with hard roots are similarly employed (e.g., *Uraria picta*). It is an ingredient in aphrodisiac prescriptions. A decoction of the root, or leaf used as a daily bath for an infant will enable him to walk very early. The plant, smoked like tobacco, and also made into a decoction, is a charm against injury by a blow by a cudgel, and will cause the weapon to break.

¹⁷ Appendix to Fl. W. Trop. Afr. p. 262. 1937.

ACKNOWLEDGMENTS

The author is grateful to Dr. Robert E. Woodson, Jr., who supervised the study and who meticulously criticized the manuscript; to Dr. Edgar Anderson and the staff of the Missouri Botanical Garden for the courtesies extended to him; and to his many friends and colleagues who utilized the keys and descriptions and added numerous invaluable comments.

SYSTEMATIC TREATMENT

STYLOSANTHES Sw. Prod. Veg. Ind. Occ. 108. 1788. (T: *S. hamata* (L.) BSP.)

Astyposanthes Hert. in Rev. Sudamer. Bot. 7:209. 1943.

Herbs, rarely subshrubs. Leaves pinnately 3-foliolate; stipules amplexicaul, divided at the apex into two teeth, adnate to the base of the petioles; stipels none. Inflorescence spicate, terminal or axillary, 1- to several-flowered; flowers yellow or orange with purple stripes; calyx 5-lobed and with a long tube; corolla 5-merous, papilionaceous; stamens 10, the filaments united into a tube which splits with age, with 5 versatile anthers alternating with 5 sub-basifixed anthers; fruit a 1- to 2-articulated loment; seeds ovoid, light brown to black, smooth, lustrous.

The herbaria in which the cited specimens are deposited and their abbreviations are as follows: Chicago Natural History Museum (F), Gray Herbarium (GH), Missouri Botanical Garden (MO), New York Botanical Garden (NY), and the United States National Herbarium (US).

KEY TO THE SPECIES

Sect. I. STYLOSANTHES. Each flower, or at least the lower flowers, subtended by an axis rudiment; inner bracteoles 2 (1 in *S. sericeiceps*).

- A. Bracts 13–25 mm. broad, with 13–23 conspicuous and usually broad, colored nerves.
- B. Fertile articulations of the loment often 2, the upper glabrous, the beak less than one-third as long as the upper articulation, glabrous or with a very few short stiff hairs; nerves of the bracteal sheath about 15; stems usually with scattered bristles. Brazil, Venezuela.....1. *S. capitata*
- BB. Fertile articulations of the loment 1, pilose, the beak only slightly shorter than the upper articulation, pilose; nerves of the bracteal sheath about 21; stems pilosulous to villous. Brazil, Paraguay.....2. *S. bracteata*
- AA. Bracts at most 10 mm. broad, with fewer than 15 nerves which are inconspicuous.
- C. Beak of the loment straight or only slightly curved; leaflets glabrous on both surfaces (rarely with marginal cilia); teeth of the upper stipules mostly longer than the sheath. Florida, Central America, Mexico, Bahamas, Cuba.....3. *S. calcicola*
- CC. Beak of the loment uncinat or coiled; leaflets usually pubescent, at least on the lower surface (occasionally glabrous in *S. erecta* of Africa and *S. hamata* of the West Indies); sheath of the upper stipules mostly longer than the teeth.
- D. Loment completely glabrous or with some pubescence on the beak only or occasionally on the nerves in *S. mexicana*.
- E. Stems sericeous or bristly; leaflets sparsely but conspicuously bristly-ciliate; loment often green, with both articulations usually fertile; inflorescence obovoid. Mexico, Venezuela, Bolivia.....4. *S. mexicana*
- EE. Stems glabrous or puberulent above; leaflets without bristly cilia; loment brown, with only one articulation usually fertile; inflorescence often narrow. West Africa.....5. *S. erecta*
- DD. Loment pubescent on the body and usually on the beak.
- F. Stem and bracts bearing tuberculate-based hairs (sometimes merely with tubercles); lower surface of leaflets usually villous with interspersed tuberculate bristles; beak

of the loment shorter than the upper articulation (sometimes equaling it in *S. macrocarpa* and *S. nervosa*).

G. Beak of the loment half to one-third the length of the upper articulation.

H. Bracts shortly scabrous-hispid; inflorescence usually nearly as broad as long; beak of the loment short-hairy.

I. Leaflets often punctate beneath, obtuse; stem bearing short dark setae, the whole aspect of the plant dingy brown; fertile articulation usually 1, pubescent throughout. Brazil, Ecuador, Venezuela, Colombia, Bolivia.

.....6. *S. scabra*

II. Leaflets not punctate beneath, acute; stem setose or puberulent to densely pilose, not dingy brown; fertile articulations often 2, pilosulous only on the ribs. Bahamas, Cuba, Colombia, Venezuela, Peru.....7. *S. tuberculata*

HH. Bracts villous or with long tuberculate bristles; inflorescence often 2-3 times longer than broad; beak of the loment usually rufous-pilose.

J. Bracts softly villous and rarely with tuberculate bristles; inflorescence 2-3 times longer than broad; loment 1.0-1.5 mm. broad, the beak rufous-pilose. Ecuador, Peru, Galapagos Islands.....8. *S. sympodialis*

JJ. Bracts with tuberculate bristles; inflorescence about as broad as long; loment 1.5-2.5 mm. broad, the beak puberulent. Africa, Ceylon, India.

.....9. *S. fruticosa*

GG. Beak nearly equaling to exceeding the upper articulation.

K. Beak of the loment strongly coiled; bracteal sheath and often the stem sericeous and with interspersed tuberculate bristles. Honduras, Mexico.....

.....10. *S. subsericea*

KK. Beak of the loment curved to strongly uncinat; bracteal sheath and stem with tuberculate bristles but not sericeous.

L. Upper articulation and beak combined about 8 mm. long, the beak about equaling the upper articulation; plants to 0.2 m. tall. Mexico.....11. *S. macrocarpa*

LL. Upper articulation and beak combined 5.0-7.5 mm. long, the beak sometimes slightly shorter than the upper articulation; plants to 1 m. tall.

M. Fertile articulations mostly 2; bracteal sheath usually bearing long tuberculate-based bristles; leaflets elliptic, obtuse to subacute, usually puberulent. Africa, Ceylon, India.....9. *S. fruticosa*

MM. Fertile articulation usually 1; bracteal sheath short-hispid to densely ciliate; leaflets usually oblanceolate, acute to acuminate, glabrous or occasionally hispid beneath. Venezuela, Peru, Bolivia, Argentina.

.....12. *S. nervosa*

FF. Stem and bracts pilose, villous, or nearly glabrous, lacking tuberculate bristles; lower surface of leaflets pilose or appressed-villous or glabrous, never with tuberculate bristles; beak of the loment equaling or exceeding the upper articulation (except *S. sericeiceps*).

N. Beak of the loment equaling or exceeding the upper articulation; pubescence of the bracteal sheath whitish; stem usually not pubescent throughout. Florida, Bahamas, Cuba, Central America, Colombia, Venezuela.....13. *S. hamata*

NN. Beak of the loment about one-half as long as the upper articulation; pubescence of the bracteal sheath tan or rufous; stem often pubescent throughout.

O. Loment pubescent throughout; leaflets glabrous above, 15-25 mm. long; bracteal sheaths tan-pilose. Venezuela.....14. *S. sericeiceps*

OO. Loment pubescent above, glabrous below; leaflets minutely pubescent above, 20-40 mm. long; bracteal sheaths rufous-pilose. Peru, Ecuador, Galapagos Islands.....8. *S. sympodialis*

Sect. II. ASTYPOSANTHES. Flowers not subtended by an axis rudiment; inner bracteole 1.

A. Beak of the loment minute, at most about one-fifth as long as the upper articulation, the fertile articulation 1.

B. Fertile articulation shortly hairy throughout or rarely glabrous, terete, 2.5-5.0 mm. long. Eastern United States.....15. *S. biflora*

BB. Fertile articulation minutely tuberculate near the apex or rarely with a few scattered appressed white hairs, flattened, 1.5-3.0 mm. long. Bahamas, Central America, Mexico, South America.....16. *S. guyanensis*

AA. Beak of the loment from one-fourth as long to exceeding the upper articulation, the fertile articulations 1-2.

- C. Leaflets 0.5–2.0 mm. broad; inflorescence very narrow and elongate; beak of the loment strongly uncinat, often 2–3 times as long as the pubescent upper articulation. Brazil, Guianas.....17. *S. angustifolia*
- CC. Leaflets 2–6 mm. broad; inflorescence usually capituliform, globose to ovoid or obovoid; beak of the loment various but not strongly uncinat.
- D. Loment glabrous (occasionally pubescent only on the beak).
- E. Loment with 2 fertile articulations, the beak straight or uncinat; bracteal leaflets stalked.
- F. Beak straight or nearly so, about equaling the upper articulation, together about 5–6 mm. long; bracts, leaflets, and stems densely short-bristly. Brazil, Uruguay, Paraguay.....18. *S. leiocarpa*
- FF. Beak uncinat, one-third as long as the upper articulation, together 3.0–3.5 mm. long; bracts and sometimes the leaflets and the stems with scattered long bristles, often glabrous. French Guiana.....19. *S. cayennensis*
- EE. Loment with 1 fertile articulation, the beak strongly uncinat to coiled; bracteal leaflets sessile or subsessile.
- G. Loment conspicuously reticulate-nerved, about as broad as long (excluding the beak); inflorescence 4- to 8-flowered. Uruguay, Argentina.....20. *S. hippocampoides*
- GG. Loment obscurely nerved, about twice as long as broad (excluding the beak); inflorescence 2- to 4-flowered. Paraguay.....21. *S. macrosoma*
- DD. Loment pubescent (if nearly glabrous, the stem viscid).
- H. Beak shorter than or nearly equaling the upper articulation; stem often viscid.
- I. Stems with viscid hairs or short-hispid; leaflets usually punctate beneath; fertile articulations 1–2.
- J. Fertile articulations usually 2, the upper decidedly widest above the middle, the beak coiled, about one-third the length of the upper articulation. Bahamas, Cuba, Central America, Mexico, South America.....22. *S. viscosa*
- JJ. Fertile articulation usually 1, broadest at or below the middle, the beak nearly straight or slightly uncinat, one-half to nearly equaling the upper articulation. Colombia.....23. *S. figueroae*
- II. Stems without viscid hairs; leaflets not punctate; fertile articulation 1. Brazil, Paraguay, Uruguay, Bolivia, Argentina, Colombia.....24. *S. montevidensis*
- HH. Beak nearly 2–4 times longer than the upper articulation; stems not viscid. Central America, Mexico, Bahamas, Cuba, Colombia, Venezuela, Brazil.....25. *S. humilis*

Section I. STYLOSANTHES

Section *STYPOSANTHES* Vog. in *Linnaea* 12:68. 1838. (T: *S. hamata* (L.) Taub.)

Each flower, or at least the lower, subtended by an axis rudiment; inner bracteoles 2.

Styposanthès hamata (L.) Taub., as type of the genus, automatically becomes the type of § *STYLOSANTHES*.

1. *STYLOSANTHES CAPITATA* Vog. in *Linnaea* 12:70. 1838, ex char.

Stems erect, branched, to 1 m. tall, subligneous near the base, decumbent or ascending, densely and shortly white-hairy and also with some scattered bristles, the pubescence generally more dense below each node. Leaflets oblong to elliptic, to 30 mm. long and 15 mm. broad, usually about 15 mm. long and 5 mm. broad, acute and mucronulate at the apex, densely villous on both surfaces, with 7–9 pairs of conspicuous veins; petioles 3–6 mm. long, densely villous, the rhachis 1.0–3.5 mm. long; sheath of the stipules 7–9 mm. long, densely villous, longer than the subulate teeth, several-nerved. Spikes thick, capituliform, about two-thirds as broad as high, to 35 mm. long, many-flowered, on peduncles usually 5–7

cm. long, occasionally 2–3 cm. long; bracts with a single very reduced leaflet; sheath often purplish, 8–12 mm. broad, conspicuously 11- to 17-nerved, copiously soft-pubescent; outer bracteole 1, to 3 mm. long, ciliate; axis rudiment 5–7 mm. long in fruit, very long-ciliate; inner bracteoles 2, 2.0–2.5 mm. long and much narrower than the outer, densely ciliate at the apex. Calyx tube 4–6 mm. long, the mostly acute and sparsely ciliate lobes about 2.5 mm. long. Standard obovate, 5–7 mm. long; wings obovate, 4–5 mm. long, auriculate at the base; keel petals 3–4 mm. long, falcate and auriculate. Loment to 2.5 mm. broad, reticulate-nerved; both articulations usually fertile (either sometimes abortive), the upper about 3.5 mm. long and glabrous, the lower somewhat shorter and glabrous or sparsely pubescent; beak uncinat, about 1 mm. long, glabrous or with very few short stiff hairs on the inner face.

Taubert in his diagnosis of *S. capitata* states that the legume is uni-articulate, the lower joint being abortive. However, specimens of this species may bear two fertile articulations. The original description of *S. capitata* which contains no mention of the fruit apparently is based on an incomplete specimen, for Vogel comments: "*Vidi specimen unum incompletum*".

All species of *Stylosanthes* except *S. capitata*, *S. bracteata*, and *S. angustifolia* possess 1–3 leaflets between the teeth of the bracteal sheaths. In these three, a small laminal extension of the midvein of the sheath usually is all that is present.

Specimens from Venezuela and the Piauí state of Brazil are more coarse and have the general vegetative appearance of *S. scabra*. The nature of the inflorescence and loment clearly distinguishes *S. capitata* from *S. scabra*.

Grows in fields, forests, or waste ground and is known only from Brazil and Venezuela. It grows at altitudes of about 1000 meters. Vogel does not specifically cite any specimens but merely states that *S. capitata* has been collected in Brazil by Sellow between Victoria and Bahia (fig. 3).

BRAZIL: MARANHÃO: Rio Tocantins, Pires & Black 1994 (NY). MINAS GERAES: Belo Horizonte, de Oliveira s. n. (US), Williams & Assis 5646, 5863 (GH), 5834 (GH, MO, NY); Morro das Pedras, Williams & Assis 6475 (GH); Pampulha, Williams 5644 (NY). PIAUÍ: Oeiras, Gardner 2093 (GH, NY); exact locality unknown, Lützelburg 112 (NY).

VENEZUELA: ANZOÁTEQUI: near Mapira, Lasser 775 (US). BOLÍVAR: Ciudad Bolívar, Bailey 1434 (GH, NY, US).

2. STYLOSANTHES BRACTEATA Vog. in Linnaea 12:70. 1838. (T: Sellow 4734!)

Stems herbaceous, very slender, erect, simple or occasionally branched, to 2 dm. tall, pilosulous to villous throughout. Leaflets lanceolate to elliptic, acute to obtuse and mucronulate at the apex, to 25 mm. long and 4 mm. broad, usually much narrower, pilose on both surfaces, with 5–7 pairs of veins prominent beneath; petioles 1–2 mm. long, pilosulous, the rhachis about 0.5 mm. long; sheath of the stipules 5–8 mm. long, pilosulous or villous as the stem, 17- to 21-nerved, the teeth lance-subulate, 4.5–7.0 mm. long. Spikes capitate, 8- to several-flowered, to 30 mm. long; bracts unifoliate, pilose and ciliate, 10–15 mm. wide, the sheaths



Fig. 3

8.0–9.5 mm. long and with 15–21 prominent purplish nerves, the teeth 2.0–3.5 mm. long, the sessile leaflet to 5.5 mm. long; outer bracteole 1, 3.0–3.5 mm. long, bifid and ciliate near the apex; axis rudiment 7–9 mm. long in fruit, very densely pilose; inner bracteoles 2, 2–3 mm. long, ciliate. Calyx tube 8.0–8.5 mm. long, the lobes 2.0–2.5 mm. long and ciliate. Standard obovate, 4.5–6.0 mm. long; wings 3.5–4.5 mm. long, auriculate at the base; keel petals 3–5 mm. long, auriculate. Loment to 2 mm. wide, reticulate-nerved; lower articulation abortive, upper articulation 3–4 mm. long, densely pilose; beak strongly uncinat, 3.0–3.5 mm. long, pilose.

The presence of the copiously and softly hairy broad bracts makes *S. bracteata* readily distinguishable from other species of the genus. This species is the most slender *Stylosanthes* and, when in fruit, possesses the longest axis rudiment. In some specimens, the axis rudiment is adnate to the outer bracteole for about one-third of its length.

In dry regions in Paraguay and southwestern Brazil at altitudes around 800 meters; may also occur in northeastern Argentina. Burkart¹⁸ comments that specimens referable to *S. bracteata* collected by Spegazzini (2194 and 2195) may be from Argentina, although the labels signify only "Norte de la provincia de Corrientes" (fig. 3).

BRAZIL: MATO GROSSO: Capão Bonito, Archer & Gebrt 105 (US). MINAS GERAES: Ituiutabá, Macedo 479 (US), 1241 (MO); Uberaba, Regnell s. n. (US). PARANÁ: between Lagos and Desiro, Dusén 15684 (GH); Tibagu, Reiss s. n. (F); Villa Velha, Ponta Grossa, Hoebne 23369 (GH, NY). WITHOUT PRECISE LOCALITY: Rio Vardo, Riedel s. n. (NY); Sellow 4734 (GH, F).

PARAGUAY: Estancia Primera, Jörgensen 4877 (US, MO); between Río Apa and Río Aquidaban-mi, Fiebrig 5208 (GH, US); Tapiracuay River, Hassler 4363 (GH, NY); exact locality unknown, Hassler 8510 (NY).

3. *STYLOSANTHES CALCICOLA* Small, Man. Southeast. Fl. U. S. 730. 1932. (T: Small, Mosier, & Small 6537!)

Stems erect, to 0.5 m. tall, branched from near the base, minutely pubescent along one side, or sometimes glabrous, rarely pubescent throughout. Leaflets lanceolate to ovate, acute or acuminate at the apex, to 15 mm. long, glabrous or ciliate on margins near the base, with 3–5 pairs of conspicuous veins; petioles 2–4 mm. long, glabrous or puberulent, the rhachis 0.2–1.0 mm. long; sheath of the stipules glabrous or puberulent, with about 7 conspicuous nerves extending into the usually somewhat longer teeth. Spikes narrowly oblong or ovoid, 0.5–1.5 cm. long, crowded, 2- to several-flowered; bracts unifoliate, the sheath equaling to twice as long as the teeth, averaging 4 mm. wide, ciliate and often bristly on the back, 5- to 7-nerved; outer bracteole 1, about 3 mm. long, ciliate at the apex; axis rudiment 6.0–7.5 mm. long in fruit, sparsely pilose; inner bracteoles 2, 2.0–2.5 mm. long, ciliate at the apex. Calyx tube 3–4 mm. long, about 1 mm. longer than the acute lobes. Standard obovate, 4.5–6.0 mm. long; wings 4–5 mm. long, auriculate; keel petals falcate, 3.5–4.5 mm. long. Loment 1.5–2.0 mm. broad, conspicuously nerved; both articulations usually fertile, the upper 2.5–3.0 mm. long, densely and shortly white-hairy or sometimes glabrate, the lower 2.0–2.5 mm. long, puberulent or sericeous; beak straight or only slightly curved, 1.5–2.5 mm. long, from half as long to equaling the upper articulation, with short white hairs or glabrous.

Stylosanthes calcicola is distinguished from all other species of the section by its straight beak and its general lack of pubescence.

Small described *S. calcicola* in 1932 from a collection made in Dade County, Florida, in 1915. All the Florida specimens were collected in pinelands in hammocks. In addition to Florida, the species is indigenous to Mexico (Yucatan), Guatemala, and Cuba. Apparently the first collection of this species was made from Yucatan by Gaumer (908) in 1895 or 1896. Although there are minor differences between the Florida and Yucatan specimens, the characters of the loment

¹⁸ Darwiniana 3:327. 1939.

and the general lack of pubescence throughout the entire plant seem to indicate that these populations belong to the same species. The specimens from Florida are mostly low, much-branched plants (tall and unbranched in *Cornman 2132*) with densely pubescent lomenta while those from Yucatan and Cuba are considerably taller and generally possess pubescent lomenta. The leaflets of the Florida specimens are shorter.

Stylosanthes calcicola resembles *S. hamata* with respect to leaflet morphology, habit, and the densely pubescent lomenta. It is an apparent calciphile with a tolerance for rather warm, arid climates.

UNITED STATES: FLORIDA: Dade Co.: pinelands near Murden Hammock, *Small, Mosier & Small 6438* (MO); pinelands near Ross-Costello Hammock, *Small, Mosier & Small 6537* (US). Monroe Co.: Big Pine Key, *Cornman 2132* (MO).

GUATEMALA: HUEHUETENANGO: between Nentón and Las Palmas, *Steyermark 51654* (F).

MEXICO: YUCATAN: Chichancanab, *Gaumer 2044* (GH, US, MO, F); Izamal, *Gaumer 992* (GH, US, F); San Anselmo, *Gaumer 1955* (GH, NY, MO, F), *Gaumer 1956* (GH, US, MO, F), *Gaumer 908* (MO, US, F); Progreso, *Flores 1* (F).

BAHAMAS: NEW PROVIDENCE ISLAND: West Bay, *Degener 18984* (GH, NY).

CUBA: CAMAGÜEY: Ganado, Cayo Sabinal, *Shafer 863* (NY, F).

4. *STYLOSANTHES MEXICANA* Taub. in Verh. Bot. Brand. 32:21. 1890. (T: *Schaffner 579*!)

Stylosanthes bangii Taub. ex Rusby, in Mem. Torr. Bot. Club 4:206. 1895. (T: *Bang 936*!)

Stem ascending to spreading, subliguous near the base, to 3 dm. tall, usually much branched from near the base, densely covered with appressed white hairs, often with scattered bristles at least on the lower half of the stem. Leaflets broadly lanceolate to obovate, obtuse to subacute, glabrous or nearly so above, usually sparsely bristly-ciliate, occasionally with some tuberculate-based bristles on the lower surface, with 3-4 pairs of conspicuous veins; terminal leaflet to 16 mm. long and 4 mm. broad, the lateral leaflets somewhat smaller; petioles 3-6 mm. long, shortly white-hairy to nearly glabrous, the rachis to 2 mm. long; sheath of the stipules equaling or exceeding the teeth, somewhat veiny, pubescent like the stem. Spikes dense, more or less oblongoid, to 15 mm. long, several-flowered; outer bracts trifoliate, the inner unifoliate, the sheath with short white hairs or sometimes with tuberculate-based bristles, 7- to 9-nerved, 3.5-5.0 mm. long, the teeth 0.5-1.0 mm. shorter than the sheath; outer bracteole 1, oblong-lanceolate, ciliate, bifid, 3.5-4.5 mm. long; axis rudiment to 6 mm. long in fruit, long white-ciliate; inner bracteoles 2, ciliate, 2-3 mm. long. Calyx tube to 6 mm. long, the obtuse lobes about 2-3 mm. long, usually glabrous, sometimes ciliate. Standard suborbiculate, 4.5-6.0 mm. long; wings nearly equaling the standard in length, subauriculate at the base; keel petals falcate, 3.0-4.5 mm. long. Loment 6-7 mm. long, 1.5-3.5 mm. broad, reticulate-nerved; both articulations usually fertile, the upper 3-5 mm. long, glabrous or with some appressed pilosity on the nerves when immature, the

lower somewhat shorter, glabrescent, occasionally abortive; beak recurved-uncinate or sometimes with a half-coil, 2.5–3.0 mm. long, usually about equaling the upper articulation in length, glabrous or sparsely hairy.

Stylosanthes mexicana shows much variation in leaflet shape and pubescence. While most specimens possess some tuberculate hairs in addition to simple pili, *Leavenworth 135* from Nuevo León, and *Purpus 4925* from San Luis Potosí, Mexico, lack these bristles. The leaflets of *Purpus 4925* are obtuse instead of acute.

On valley floors dissected by arroyos and alluvial fans, in wooded gorges, and savannas at altitudes from 800 to 2500 meters (fig. 3).

At first glance, the geographic distribution of *S. mexicana* seems to be very peculiar. This species is known from a few states in central Mexico and from Caracas, Venezuela, and the chacos of Bolivia, widely disjunct areas. This situation, however, occurs in several species of flowering plants, striking examples being *Larrea divaricata* (Zygophyllaceae), *Atamisquea emarginata* (Capparidaceae), and *Koeberlinia spinosa* (Koeberliniaceae). This last species is known from the Mexican states of Tamaulipas, Nuevo León, and San Luis Potosí and again from a small area in the western chacos of Bolivia.

In searching for an explanation of this seemingly unusual distribution, Johnston¹⁹ observes that both the areas in Mexico and Bolivia are extensive regions which are characterized by low atmospheric humidity and rainfall usually less than twenty inches annually, and in which the climatic and edaphic conditions are rather similar. The plants which occur in these areas belong principally to genera of a xerophytic nature. Johnston points to the presence in the deserts of North America of floristic elements which apparently are a part of a flora now well represented in South America. He believes we are dealing "with a very old American desert flora formerly shared by both continents. In South America it is now relatively well preserved but in North America it lingers in a few recognizable remnants."

It is obvious that at the present time the extensive unbroken belt of wet tropical forest between the Mexican and Bolivian stations presents "effective barriers to the exchange of elements." Johnston postulates that "during dry, warm epochs, an exchange might have been effected along relatively arid coastal strips similar to . . . those now present in western Central America, Ecuador, and Peru."

The species from Bolivia, known as *S. bangii*, is indistinguishable from *S. mexicana* and is considered synonymous.

MEXICO: COAHUILA: Palm Canyon, *Marsh 969* (F). HIDALGO: near El Salto, *Pringle 11969* (GH, US, F). NUEVO LEÓN: Diente Canyon, near Monterrey, *Mueller & Mueller 325* (F); Monterrey, *Pringle 2253* (GH, F); Villa de Santiago, *Leavenworth 135* (MO). OAXACA: Mitla, *Smith 101* (US). QUERÉTARO: San Juan del Río, *Rose, Painter & Rose 9528* (US). SAN LUIS POTOSÍ: Mina de San Rafael, *Purpus 4928* (GH, NY, MO, F); San Miguelito, *Schaffner 800* (GH, NY), *579* (US, F). TAMAULIPAS: Buena Vista Hacienda, *Wootton s. n.* (US); Cerro de la Tamaulipeca, *Bartlett 10608* (F), *10612* (GH, F); near Miquihuana, *Stanford, Retherford & Northcraft 793* (GH, NY, MO); vicinity of La Victoria, *Palmer 490* (GH, NY, US); exact locality unknown, *Viereck 300* (US).

BOLIVIA: COCHABAMBA: Bolivian Plateau, *Bang 963* (GH, NY, MO, US, F).

¹⁹ Jour. Arn. Arb. 21:356–363. 1940.

VENEZUELA: DISTRITO FEDERAL: Caracas, *Pittier 9679* (GH, US, NY); lower Catiza, near Caracas, *Pittier 7319* (GH, US).

5. *STYLOSANTHES ERECTA* Beauv. Fl. Owar. 2:28. 1807, ex char.

Stylosanthes guineensis Schum. in Schum. & Thonn. Beskr. Guin. Pl. 357. 1828, ex char.
Ononis coriifolia Reichb. ex Guil., Perr. & Rich. Pl. Senegam. 204. 1830, nom. nud. in
 synon.

Stylosanthes guineensis G. Don, Gen. Syst. 2:281. 1832, ex char.

Stylosanthes erecta var. *guineensis* Vog. in Linnaea 12:68. 1838, ex char.

Stylosanthes erecta var. *acuminata* Welw. ex Baker, in Oliver, Fl. Trop. Afr. 2:156. 1871,
 ex char. (T: *Welwitsch 2127*.)

Stems suffrutescent, suberect, 0.3–1.5 m. tall, much branched, puberulent above, glabrous below, rarely with bristles. Leaflets oblanceolate, mucronulate, narrowed at both ends, glabrous, often punctate beneath, usually with 2–5 pairs of conspicuous veins; terminal leaflet to 25 mm. long and 5.5 mm. broad, the lateral ones to 13 mm. long and 4.5 mm. broad; petioles 4–6 mm. long, glabrous or puberulent, the rhachis about 1.5 mm. long; sheath of the stipules 4.0–7.5 mm. long, glabrous, puberulent, ciliate, or bristly, 5- to many-nerved, the teeth 3.5–5.0 mm. long. Spikes oblongoid to narrowly elongate and sometimes interrupted, 4- to 12-flowered; bracts usually unifoliate, the leaflet averaging 6 mm. long, the sheath 4–6 mm. long, 4.0–5.5 mm. broad, ciliate along the margins and often bristly on the back, 5- to 7-nerved, the teeth 2.5–4.5 mm. long; outer bracteole 1, 3–6 mm. long, ciliate at the apex; axis rudiment 3.5–6.5 mm. long, ciliate; inner bracteoles 2, 2.0–3.5 mm. long. Calyx tube 4.0–5.5 mm. long, the lobes about 2 mm. long. Standard suborbiculate, 4.0–6.5 mm. long; wings 4–5 mm. long, auriculate, clawed; keel petals falcate, 3.5–4.5 mm. long. Loment 1.5–2.0 mm. wide, reticulate and with one longitudinal nerve per face; only the upper articulation usually fertile, 3.5–4.5 mm. long, glabrous or nearly so; beak uncinat, glabrous or short-hairy on the inner face, 1.5–2.5 mm. long, less than half as long as the upper articulation.

Stylosanthes erecta is distinguished by its loment which are mostly uni-articulate and glabrous or nearly so, although the illustration which accompanies Beauvais' original description depicts a bi-articulate loment.

The shape and pubescence of the leaflets are quite variable and have given rise to two named varieties regarding which there has been considerable confusion. Taubert cites *Welwitsch 2127* under var. *guineensis*, but this specimen is the type for var. *acuminata*. Var. *guineensis* is usually applied to those specimens which have bristly stems. Although including var. *guineensis* in his 'Leguminosae of Tropical Africa', Baker²⁰ states that it is hardly varietally distinct from *S. erecta*. Since there is no line of demarcation with reference to degree of pubescence among the specimens, it does not seem wise to retain either variety.

The inflorescence is usually much longer than broad, often becoming interrupted, although some specimens have more ovoid and compact heads. The leaflets in some specimens are punctate beneath.

²⁰ Legum. Trop. Afr. 320. 1926.

In addition to the localities listed, the species is reported to occur in Sierra Leone, Angola, and Gaboon. The habitats include dry gravelly hills, sea sands, sandy pastures, and sandy thickets along rivers.

BELGIAN CONGO: Leopoldville, from Boma to Shinkakasa, *Claessens s. n.* (GH).

FRENCH WEST AFRICA: IVORY COAST: Grand Drewin, *Roberty 13710* (MO). SENE-GAL: exact locality unknown, *Sieber 37* (MO, NY).

GOLD COAST: Keta, *Darko 584* (MO); "Pram and Pram", *Robertson 32* (MO).

LIBERIA: exact locality unknown, *Cook 137, 145* (US).

NIGERIA: Lagos (Apapa), *Bels 43* (MO); exact locality unknown, *Vogel s. n.* (GH).

6. *STYLOSANTHES SCABRA* Vog. in *Linnaea* 12:69. 1838, ex char.

Stylosanthes diarthra Blake, in *Proc. Biol. Soc. Wash.* 33:49. 1920. (T: *Jahn 169!*)

Stylosanthes gloiodes Blake, loc. cit. 45. 1920. (T: *Townsend A 57!*)

Stylosanthes plicata Blake, loc. cit. 46. 1920. (T: *Kuntze s. n.!*)

Stems suffruticose, ascending to suberect, much branched, to 1.5 m. tall, densely and shortly hairy and often setosulous, sometimes viscid, rarely glabrescent. Leaflets elliptic to oblong-lanceolate, obtuse, mucronate, densely and shortly hairy above and below, sometimes glabrescent, with a few scattered setae, with 4–5 pairs of usually conspicuous veins; terminal leaflet to 15 mm. long, 5 mm. broad, the lateral ones to 12 mm. long and 4.5 mm. broad, often punctate beneath; petioles 2.5–6.0 mm. long, canaliculate above, scabrous with dense short hairs, the rhachis 1.0–3.5 mm. long; sheath and teeth of the stipules variable in length, the sheath usually 1.5–5.0 mm. longer than the teeth, short-hispid, 7- to 9-nerved. Spikes short, crowded, oblongoid, several-flowered; bracts unifoliate, the leaflet about 4 mm. long, hispid, the sheath 3.5–6.5 mm. long, 3.0–4.5 mm. broad, densely hispid, about 7-nerved, the teeth 2.5–4.5 mm. long and somewhat shorter than the sheath; outer bracteole 1, lanceolate, 2.0–4.5 mm. long, bifid and ciliate at the apex; axis rudiment 4–5 mm. long, ciliate; inner bracteoles 2, 2–4 mm. long, ciliate at the apex. Calyx tube 3.0–6.5 mm. long, the more or less acute lobes 1.5–3.5 mm. long. Standard broadly obovate to suborbiculate, to 7 mm. long and 6 mm. broad; wings clawed, auriculate, spurred within at the base, 4–5 mm. long; keel petals auriculate, 3.5–4.5 mm. long. Loment about 2.5 mm. broad, reticulate-nerved; upper articulation 2–4 mm. long, shortly hairy, the lower 2–3 mm. long, evenly pilose throughout; beak unciniate, shortly hairy, 1–2 mm. long, one-half to one-third as long as the upper articulation.

The species has a wide range but is apparently most abundant in the Minas Geraes area of Brazil. It is attributed to Peru by Bentham²¹ (fig. 4).

Stylosanthes scabra of § *STYLOSANTHES* is the viscid counterpart of *Stylosanthes viscosa* of § *ASTYPOSANTHES*.

BOLIVIA: LA PAZ: Larecaja, *Mandon 698* (GH).

BRAZIL: BAÍA: exact locality unknown, *Salzmann s. n.* (MO). MATO GROSSO: exact locality unknown, *Kuntze s. n.* (NY, US). MINAS GERAES: Ituiutaba, *Macedo 2226* (MO); Santa Luzia, *Williams & Assis 201* (GH, MO), *Barreto 5773* (F); Serro, *Williams*

²¹ In *Mart. Fl. Bras.* 15²:1. 1859.

♂ *Assis* 6850 (GH, US). PARAÍBA: exact locality unknown, *de Moraes* 887 (NY). PERNAMBUCO: Tapera, *Pickel* 2556 (GH, US, NY, F), 2481 (GH, US, NY); Tiama, *Millsbaugh* 67 (F); exact locality unknown, *Gardner* 973 (GH, NY, US, F). RIO GRANDE DO SUL: Jacuí, *Teodoro* 1783 (GH). SÃO PAULO: Campinas, *Santoro* 638 (US); Avenida Barão Itapura, Campinas, *Santoro* 380 (US); San José do Barreiro, *Hoehne* & *Gehrt* 17665 (GH). WITHOUT PRECISE LOCALITY: São João Bapt., *Pohl* 567 (NY).

COLOMBIA: CUNDINAMARCA: Aguadita, *Ricardo* s.n. (US). HUILA: between Hobo and Gigante, *Arbeláez* & *Cuatrecasas* 8328 (US, F). EL VALLE: Cali, *Bermúdez* 20 (US), *Killip* & *Cuatrecasas* 38410 (US); Carretera al Mar, west of Cali, *Killip* & *Lehmann* V 39798 (US); Cisneros, Dagua Valley, *Killip* 11431 (US, GH, NY); north of Palestina, *Garcia* 6328 (US); Trés Cruces, *Bermúdez* & *Barkley* 17C869 (NY, US).

ECUADOR: Cariamanga, *Townsend* A 57 (US).

VENEZUELA: MÉRIDA: Sierra de Nevada de Mérida, *Jahn* 108 (US); above Los Gonzalez, *Steyermark* 56234 (F). TRUJILLO: Valera, *Jahn* 169 (US); Nagua, *Warming* 101 (US).

7. *STYLOSANTHES TUBERCVLATA* Blake, in *Proc. Biol. Soc. Wash.* 33:48. 1920. (T: *Britton* 3336!)

Stems suffruticose to 5 dm. tall, erect, branched, evenly and densely pilose and with dense short tuberculate-based hairs. Leaflets elliptic to oblong-lanceolate, acute and often mucronulate at the apex, the margins bristly-ciliate, both surfaces more or less appressed-pilose and often tuberculate-hispid at least below, with 4-6 pairs of prominent lateral nerves; terminal leaflet 10-20 mm. long, 3-5 mm. broad, the lateral ones somewhat smaller; petioles 2-4 mm. long, hispid-setose, the rhachis about 1 mm. long; sheath of the stipules 5-7 mm. long, pubescent and hispidulous as the stem, the subulate teeth 2-3 mm. long. Spikes narrowly oblongoid, 6-15 mm. long, 6- to 10-flowered; bracts unifoliate, the leaflet pilosulous and densely tuberculate-hispid, the sheath 3.5-5.0 mm. long, hispidulous, the teeth slightly shorter; outer bracteole 1, 3-4 mm. long, bifid or entire, obtuse, ciliate or glabrous; axis rudiment 3-4 mm. long in fruit, pilose; inner bracteoles 2, 2-3 mm. long, narrow, ciliate or glabrous. Calyx tube 4-5 mm. long, glabrous, the obtuse lobes 2.5-3.0 mm. long, ciliate or glabrous. Standard 4-5 mm. long, 3-4 mm. broad; wings somewhat auriculate at the base, short-spurred within, 4-5 mm. long; keel petals falcate, 3.0-4.5 mm. long. Loment reticulate-nerved, about 2.5 mm. broad; upper articulation of the loment fertile, 3-4 mm. long, usually sparsely or occasionally densely pilosulous on the ribs, the lower articulation fertile or abortive; beak slightly uncinatc, shortly hairy, at least near the base, 1.5-2.0 mm. long.

In savannas and on open banks at altitudes from 400 to 1800 meters (fig. 4).

BAHAMAS: NEW PROVIDENCE ISLAND: Southwest Landing, *Britton* 3336 (US).

CUBA: CAMAGÜEY: Pueblo Romano, Cayo Romano, *Shafer* 2463 (US, NY, F).

COLOMBIA: ANTIOQUIA: Medellín, *Archer* 1002 (GH, US). CAUCA: La Paila, *Holton* 22 (NY). HUILA: Quebrada de Angeles to Río Cabrera, *Rusby* & *Pennell* 325 (NY); Gigante, Ancón, *Plata* 72 (US). NORTE DE SANTANDER: Río Zulia, *Nicifaro* s.n., 2412 (US). EL VALLE: Cali, *Fosberg* 22001 (US); Dagua, *Killip* 5431 (NY, GH, US); Jamundi, *Bermúdez* 24 (US). WITHOUT PRECISE LOCALITY: Tocoima, *Arbeláez* 2237 (US).

PERU: HUANCANELICA: Tayacaja, below Colcabamba, valley of the Mantaro, *Weberbauer* 6451 (GH, US, F).

VENEZUELA: DISTRITO FEDERAL: around Caracas, *Pittier* 9754 (NY, US, GH). WITHOUT PRECISE LOCALITY: Avila, *Vogl* 661 (F).

8. *STYLOSANTHES SYMPODIALIS* Taub. in Verh. Bot. Brand. 32:19. 1890. (T: Spruce 6373, photo!)

Stylosanthes psammophila Harms in Fedde, Rep. Sp. Nov. 19:69. 1923. (T: Weberbauer 5936!)

Stems erect, to 4.5 dm. tall, branched from near the base, shortly villous above, glabrate below, rarely with short bristles. Leaflets narrowly lanceolate to elliptic, acute at the tip, the larger ones to 40 mm. long and 5.5 mm. broad, evenly villous on both surfaces, usually with long marginal cilia, with 4–6 pairs of moderately conspicuous veins; petioles to 10 mm. long, usually much shorter, pilose, the rhachis about 2 mm. long; sheath of the stipules covered with soft short often rufous hairs, rarely with a few bristles. Spikes few-flowered; outer bracts usually trifoliate, the inner unifoliate, the sheath about 2 mm. longer than the teeth, densely covered with soft often rufous hairs, rarely with tuberculate bristles, 5- to 7-nerved; outer bracteole 1, 2.5–3.0 mm. long, pilose near the apex; axis rudiment to 7 mm. long, with long rufous hairs; inner bracteoles 2, 2.0–2.5 mm. long, pilose near the apex. Calyx tube 3–5 mm. long, the acute, ciliate lobes 1–2 mm. long. Standard about 4.5 mm. long, suborbiculate; wings 3–4 mm. long, auriculate at the base; keel petals 3–4 mm. long, auriculate. Loment strongly reticulate-nerved, to 2 mm. broad; both articulations of the loment usually fertile, the upper about 3 mm. long, glabrous below, with tawny hairs above, the lower nearly as long, densely pilose; beak 2.0–2.5 mm. long, usually slightly shorter than the upper articulation, uncinatate or almost with a complete coil, densely covered with short hairs.

Occurs in sandy soils on the Galapagos Islands and in Peru and Ecuador. The specimens from the Galapagos Islands have leaflets 5–15 mm. long which sometimes bear short erect hairs along with the rufous pilosity on the bracteal sheaths. The continental specimens have longer and more narrow leaflets (to 40 mm. long) and usually possess only appressed pubescence on the bracteal sheaths. These latter specimens have been determined by some as *S. psammophila*.

In his monograph of *Stylosanthes*, Taubert describes under *S. scabra* an unnamed variety from the Galapagos Islands, stating "*var. caulibus villosopubescentibus, non scabris.*" These specimens belong to *S. sympodialis*.

ECUADOR: GALAPAGOS ISLANDS: Abingdon Island, Snodgrass & Heller 836 (GH); Albemarle Island, Tagus Cove, Stewart 1695 (MO, GH, US, NY), Snodgrass & Heller 171 (GH), Howell 9599 (GH); Bindloe Island, Snodgrass & Heller 767 (GH), Baur 90 (GH); Charles Island, Snodgrass & Heller 450 (GH), Stewart 1697 (MO, GH, US, NY), Baur 92 (GH), Post Office Bay, Howell 8815 (GH, US), Black Beach, Svenson 151 (GH, F); James Island, Rorud 144 (GH); Jervis Island, Baur 89 (GH); North Indefatigable Island, Snodgrass & Heller 673 (GH); Santa Cruz Island, Rorud 145 (GH); South Seymour Island, Howell 9948 (US). GUAYAS: Playas, Asplund 5086 (US); Punta Carnero, Svenson 11301 (NY); Salinas, Svenson 11400 (US, GH); Punta Centinella, Svenson 11258 (NY); Salinas, La Puntilla, Asplund 5610 (US); Salinas, Asplund 5650 (US). PIURA: exact locality unknown, Eggers 14798 (US). WITHOUT PRECISE LOCALITY: Espinosa 517, 590 (US).

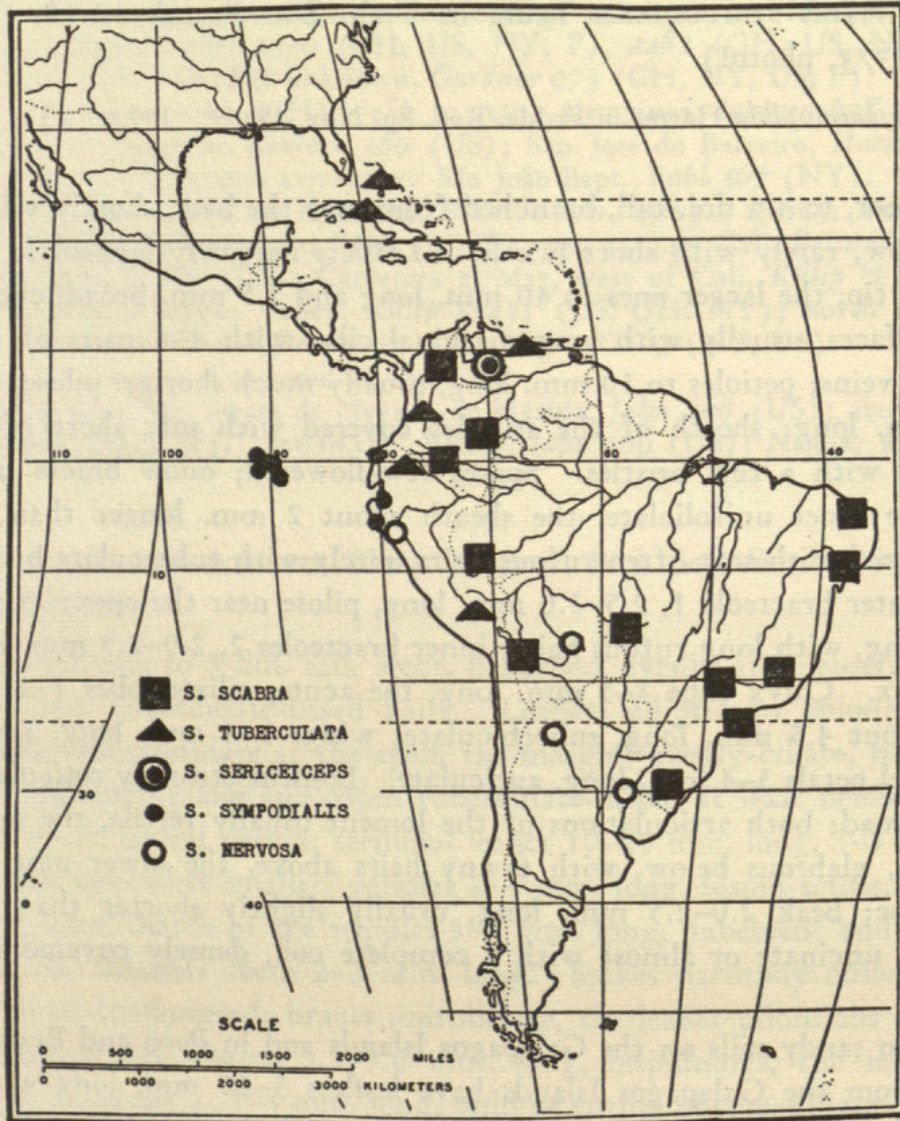


Fig. 4

PERU: PIURA: Parinas Valley, *Haught* 134 (US, NY); Negritos, *Haught* F 44 (NY, F); between Piura and Nomala, *Weberbauer* 5936 (GH, US). TUMBES: Zarumilla, *Ferreira* 5960 (US).

9. *STYLOSANTHES fruticosa* (Retz.) Mohlenbrock, comb. nov.

Hedysarum hamatum acc. Burm. f. Fl. Ind. 167. 1768, non L.

Arachis fruticosa Retz. Obs. Fasc. 5:26. 1791, ex char.

Stylosanthes mucronata Willd. Sp. Pl. 3:1166. 1800, ex char.

Stylosanthes bojeri Vog. in Linnaea 12: 68. 1838, ex char.

Stylosanthes aprica Span. in Linnaea 15:192. 1841, ex char. (T: *Burke & Zeyher* 404.)

Stylosanthes setosa Harv. in Harv. & Sond. Fl. Cap. 2:227. 1862, ex char.

Stylosanthes flavicans Baker in Oliv. Fl. Trop. Afr. 2:156. 1871. (T: *Kotschy* 425!)

Stem suffrutescent, about 5 dm. tall, much branched, erect or spreading, sometimes prostrate, shortly white-hairy above, occasionally with scattered short bristles, these sometimes yellow, often puberulent or glabrescent below. Leaflets acute,

rarely obtuse at the tip, glabrous or puberulent to densely short-hairy, often with scattered short setae on the margins and midvein beneath, with 3–4 pairs of conspicuous nerves, or with the veins rarely obscure; terminal leaflet to 17 mm. long (rarely to 25 mm. long) and 3.0–4.5 mm. broad (rarely to 8 mm. broad), the lateral to 16 mm. long and 3.0–4.5 mm. broad; petioles 4–7 mm. long, hispidulous or shortly bristly, sometimes puberulent, the rhachis 1.0–2.5 mm. long; sheath of the stipules 4.5–10.0 mm. long, densely and shortly hairy and usually with scattered bristles, or sometimes only with bristles, with 5–7 pairs of conspicuous nerves, the subulate teeth 3–6 mm. long, never longer than the sheath. Spikes ovate, dense, 4- to 10-flowered; bracts mostly unifoliate, the leaflet(s) often plicate, the sheath tuberculate-bristly to merely long-ciliate around the margins, 3.0–6.5 mm. long, 2.5–5.5 mm. broad, about 7-nerved, the teeth averaging 3–5 mm. long, often nearly equaling the sheath; outer bracteole 1, 4–6 mm. long, ciliate at the apex; axis rudiment 3–5 mm. long, ciliate; inner bracteoles 2, 2.5–4.5 mm. long, ciliate at the apex. Calyx tube 4.5–6.5 mm. long, the lobes 2–4 mm. long, ciliate. Standard suborbiculate, 4.5–7.0 mm. long; wings 4–5 mm. long, auriculate at the base; keel petals 4–5 mm. long, auriculate. Loment 1.5–2.5 mm. broad, reticulate; both articulations usually fertile, or the lower sometimes abortive; lower articulation, when fertile, 2.5–4.0 mm. long and as long as or slightly longer than the upper, pilose; beak somewhat uncinatate or scarcely coiled, 1.5–3.0 mm. long, shortly hairy.

The specimens of *Stylosanthes* from Africa and adjacent areas which belong to § STYLOSANTHES seem to be treated best as belonging to two highly variable species: *S. erecta* from West Tropical Africa, and *S. fruticosa* from South Africa, Madagascar, India, and Ceylon. The former has loment which are glabrous or nearly so, while *S. fruticosa* possesses pubescent loment.

Stylosanthes fruticosa is extremely diverse in its morphology, and a large number of variants have been described. In this study, the only course that seemed practical was to consider all these variants as belonging to one exceedingly broad species. The basis for the deluge of species seems to be mostly the pubescence of the stems, leaves, bracts, and stipules. In all of these, however, the loment characters remain essentially uniform. Thus *S. aprica* described from Timor, *S. bojeri* from Zanzibar, *S. flavicans* from Sudan, and *S. setosa* from the Cape are being treated as *S. fruticosa*. *S. sundaica* of Malaysia, considered by most recent authors as a synonym for *S. fruticosa*, is really a synonym for a species in § ASTYPOSANTHES

Specimens collected in Kordofan by Pappi (364) and by Kotschy (425) are the basis for Baker's *S. flavicans*. These specimens are flavescent when dried and somewhat viscid and apparently represent an extreme in the *S. fruticosa* complex. Many of the bristly specimens of *S. fruticosa* are at least subviscid, however, and no dividing line may be drawn to separate the specimens. Specimens called *S. bojeri* are very bristly and are sordid upon drying. This again seems to represent only an extreme, and intergradations of all degrees of pubescence may be found.

Apparently the first mention of this species in the literature was in 1737 when

Burm²² recorded the polynomial '*Trifolium procumbens zeylanicum hirsutum*.' In 1768 Burmann f.²³ noted that *Hedysarum hamatum* occurred in Ceylon and Jamaica. It is evident that he included under this binomial at least two species, the present *S. hamata* (L.) Taub. from Jamaica which Linnaeus called *Hedysarum hamatum* a in 1759 and *S. fruticosa* from Ceylon. In 1791 Retzius²⁴ named *Arachis fruticosa* from Ceylon and included under it Linnaeus' *Hedysarum hamatum* a. Nine years later, Willdenow²⁵ described *S. mucronata* and listed *Arachis fruticosa* as a synonym. Therefore it appears that the first legitimate epithet to be applied to this species is *fruticosa*.

KENYA: trail from Nyeri to Wambugu, Mearns 1956 (NY, US); 14 miles from Mombassa, vicinity of Changamwe, Mearns 2230 (US).

MOZAMBIQUE: Lourenço Marques, Howard 56 (US), Barle 82 (US), Curtis 80 (GH); Lourenço Marques, Marracuene, Quintas 6 (MO); Delagoa Bay, Kuntze s. n. (NY); Maputo, Sousa 3960 (MO).

NIGERIA: on the Niger, Baiki s. n. (GH); exact locality unknown, Barter 3428 (GH).

SOUTHERN RHODESIA: Matapos, Plowes 1426 (MO); Nyamandhlovu, Plowes 1603 (MO); Umtali, Chase 3231 (NY).

SUDAN: KORDOFAN: Nile Land, Kotschy 425 (GH).

TANGANYIKA: Ugogo, Dodoma, Peter 44443, 44463 (MO); Nzega, 50 miles north of Tabora, Carnochan 10 (GH); near Manyoni, north of Kilimatinbe, Carnochan 338 (GH); Dar-es-Salaam, Kuntze s. n. (NY).

UNION OF SOUTH AFRICA: TRANSVAAL: Barberton, Thorncroft 1913 (NY); near Crocodile Poont, Dyer & Verdoorn 3426 (NY); Pretoria, Mogg 14785 (US). ZULULAND: Somkele, Wood 9291 (US).

CEYLON: exact locality unknown, Thwaites 1451 (GH, NY).

EAST INDIES: exact locality unknown, Wight 814 (NY).

INDIA: Mysore and Carnatic, Thompson s. n. (GH); Salem, Hosur, Yeshoda 415 (NY).

10. *STYLOSANTHES SUBSERICEA* Blake, in Proc. Biol. Soc. Wash. 33:50. 1920. (T: *Purpus* 7152!)

Stylosanthes scoparia Standl. & L. Wms. in Ceiba 1:145. 1950. (T: Williams & Molina 11261!)

Stems suffruticose, usually erect, slender to robust, to 1 m. tall, often much branched, long-pilose and usually sericeous throughout, occasionally with a few bristles near the inflorescence, sometimes glabrescent. Leaves crowded, the leaflets lanceolate, acuminate, the terminal to 20 mm. long and 4.5 mm. broad, the lateral to 15 mm. long and 3.5 mm. broad, shortly white-hairy on both surfaces with occasional bristles below, with 3-5 pairs of conspicuous veins often forming a submarginal nerve; petioles 5-7 mm. long, densely white-hairy, the rhachis 1.5-2.0 mm. long, pubescent as the petioles; sheath of the stipules 5-9 mm. long, sericeous with occasional scattered tuberculate-based bristles, 9- to many-nerved, the teeth lance-subulate, 6.0-7.5 mm. long. Spikes narrow, oblongoid, 4- to 10-flowered, 12-20 mm. long, on peduncles 0.5-4.0 mm. long; bracts unifoliate, often short-

²² Burmann, Thes. Zeyl. 1737.

²³ Burmann f., Fl. Ind. 167. 1768.

²⁴ Retz. Obs. Bot. Fasc. 5:26. 1791.

²⁵ Willd. Sp. Pl. 3:1166. 1800.

bristly on the back, 4.0–5.5 mm. wide, the sheath 4.0–5.5 mm. long and 7- to 9-nerved, the teeth 3.5–5.0 mm. long; outer bracteole 1, 4–7 mm. long, pilose nearly throughout; axis rudiment about 6 mm. long in fruit, long-ciliate; inner bracteoles 2, 3–4 mm. long, ciliate. Calyx tube 6–8 mm. long, the lobes 3–5 mm. long, the upper two lobes obtuse and long-pilose, the lateral ones similar but somewhat shorter, the lowest acute, pilose. Standard suborbiculate, 5–8 mm. long; wings mostly obovate and with a short claw, auriculate, shortly spurred, 4–6 mm. long; keel petals 3.5–5.0 mm. long, spurred within at the base. Loment about 2.5 mm. wide, conspicuously reticulate; both articulations usually fertile, the lower 3–4 mm. long and densely long-pilose, the upper 3.5–4.0 mm. long, sometimes slightly exceeding, sometimes slightly shorter than the lower, covered with long white hairs; beak 2.5–5.0 (–7.0) mm. long, white-hairy, with a distinct coil.

Stylosanthes subsericea is the woodiest member of the genus and sometimes attains a height of one meter. The circinate beak of the pubescent loment nearly equals or surpasses the upper articulation in length. The lower leaves fall early, leaving the stem bearing only the persistent subulate stipules near the base.

All the Honduran specimens previously have gone under the binomial *S. scoparia*. However, the great similarity of floral structure and vegetative characters of the Honduran plants with *S. subsericea* of Mexico indicates these two epithets to refer to the same species. The Mexican plants lack tuberculate bristles on the lower surface of the leaflets.

The species is very local and is known only through a few collections from Honduras and Oaxaca, Mexico, where it grows in regions of dry rocky hillsides and dry ravines, usually with pines and oaks, at elevations between 600–850 meters.

HONDURAS: COMAYAGUA: vicinity of Comayagua, *Standley & Chacon* 5866 (F), 5400 (F). MORAZÁN: Río Yeguaré, near El Zamorano, *Standley & Molina* 4631 (F); Quebrada de Santa Clara, near Río Yeguaré, *Standley & Williams* 1598 (F); above El Zamorano, between Jicarito and El Pedregal, *Standley* 12260 (F); along Río Yeguaré, east of El Zamorano, *Standley* 14593 (F); San Francisco, *Williams & Molina* 13220 (F); Tatumbla, *Rodríguez* 509 (F); Santa Inés, *Rodríguez* 478 (F); Río Yeguaré, *Rodríguez* 973 (F); Las Mesas, *Standley* 21222 (F); Quebrada de Santa Clara, *Standley & Williams* 1563 (F); above El Jicarito, *Standley* 21112 (F); Río Yeguaré valley, Santa Clara Creek, *Williams & Molina* 11261 (GH, F); near Las Mesas, *Standley* 28654 (US); Río Yeguaré, between Tatascán and Maraíta, *Molina* 4079 (US); Camino Viejo between Suyapa and Tegucigalpa, *Standley* 14213 (US, F); near Río Yeguaré, below El Zamorano, *Standley* 12110 (MO, F); Río Capa Rosa, El Zamorano, *Rodríguez* 3662 (US, F); Quebrada de Santa Clara, near Río Yeguaré, *Standley & Williams* 1634 (US, F); along Río Yeguaré, east of El Zamorano, *Standley* 1077 (US, F). EL PARAÍSO: Quebrada de Dantas, on road between Las Mesas and Yuscarán, *Standley* 14983 (MO, F); vicinity of Güinope, *Standley, Williams, Molina & Padilla* 2077 (F); south of Güinope, *Standley* 14862 (F); Río Yeguaré, *Molina* 1681 (F); Caleras, *Williams & Molina* 14133 (F).

MEXICO: OAXACA: Cerro de Picacho, *Purpus* 7152 (GH, NY, US, MO, F); near Oaxaca, *Rose & Hough* 4584 (US).



Fig. 5

11. *STYLOSANTHES MACROCARPA* Blake, in Proc. Biol. Soc. Wash. 33:47. 1920. (T: *Pringle 6721!*)

Stems herbaceous throughout, much branched from the base, spreading or ascending, to 20 cm. tall, densely covered with mostly appressed-ascending pili, with short tuberculate bristles beneath each node. Leaflets elliptic, subacute, mucronate, light green, glabrous above, sparsely bristly on the midvein beneath and along the margins, with 3-4 pairs of conspicuous veins; terminal leaflet to 13 mm. long and 3.5 mm. broad; petioles 3-5 mm. long, sparsely pilose and often shortly bristly, the rhachis 1.0-2.5 mm. long; sheath of the stipules about equaling the teeth, 3-4 mm. long, pubescent like the stem. Spikes ovoid, to 15 mm. long, 5- to 10-flowered; outer bracts trifoliolate, the inner unifoliolate, the sheath pilose and bristly, 6-8

mm. long, about twice as long as the teeth, 7-nerved; outer bracteole 1, oblong, about 4.5 mm. long, ciliate near the apex; axis rudiment to 8 mm. long in fruit, long-hairy; inner bracteoles 2, 2.5–3.0 mm. long. Calyx tube 5–6 mm. long, the obtuse lobes 2–3 mm. long. Standard obovate, not clawed, about 6 mm. long; wings auriculate below and shortly appendaged within; keel petals falcate. Loment 6.0–8.5 mm. long, 3.0–3.5 mm. broad, reticulate; usually only the upper articulation fertile, 4.0–4.5 mm. long, evenly appressed-pilosulous, the lower abortive or occasionally fertile, densely pilose; beak strongly uncinat, evenly appressed-pilosulous, 3.5–4.0 mm. long, usually equaling the superior articulation.

Stylosanthes macrocarpa, known only from hills near Oaxaca, Mexico, closely resembles *S. mexicana* but differs in fruit morphology. The loment of *S. macrocarpa* is evenly appressed-pilosulous throughout while that of *S. mexicana* is glabrous or puberulent only along the nerves.

The flowers examined show two inner bracteoles although Blake,²⁶ in his original description, states the number of "bractlets" (= inner bracteoles) to be 1, a character not in keeping with the other members of § STYLOSANTHES. One of the large sub-basifixed anthers in some of the flowers is about twice as large as the other four. This seems to be only a sporadic anomaly.

MEXICO: OAXACA: near Oaxaca, *Pringle 5782* (GH); Monte Albán, *Pringle 372* (GH).

12. STYLOSANTHES NERVOSA Macbr. Field Mus. Publ. Bot. 13³:411. 1943. (T: *Weberbauer 6215*!)

Stems suffrutescent, to 1 m. tall, erect, branched, usually villous with interspersed tuberculate-based hairs, at least when young. Leaflets oblong-lanceolate, acute to acuminate, glabrous or nearly so above, puberulent beneath with occasional tuberculate hairs (at least on the costa), with 4–6 pairs of conspicuous nerves, the terminal leaflet to 20 mm. long and 3 mm. broad, the lateral somewhat smaller; petioles 2–4 mm. long, pilose with occasional tuberculate hairs, rarely glabrous, the rhachis about 1 mm. long; sheath of the stipules about 7 mm. long, usually equaled by the subulate teeth, pilose, glabrate, with 5–7 nerves. Spikes narrowly oblong-lanceolate, 2- to 8-flowered; bracts unifoliate, the leaflet ciliate, the sheath 5–7 mm. long, with numerous tuberculate hairs, densely ciliate, 5- to 7-nerved, the teeth usually 3–5 mm. long, sometimes bearing tubercles; outer bracteole 1, 4–5 (–7) mm. long, ciliate at the apex; axis rudiment 3–4 mm. long, ciliate; inner bracteoles 2, 3–4 mm. long, ciliate at the apex. Calyx tube about 7 mm. long, the lobes 3 mm. long, the upper 4 obtuse, ciliate or glabrous. Standard 5–6 mm. long; wings somewhat auriculate at the base, shortly spurred within; keel petals 3.5–5.0 mm. long, falcate. Loment about 2 mm. broad, reticulate; only the upper articulation usually fertile, about 3.5 mm. long, evenly pilose throughout; beak about 2.5 mm. long, pilose, strongly uncinat but usually not completely coiled.

²⁶ In Proc. Biol. Soc. Wash. 33:47. 1920.

Infrequent over a broad range, known only from a few stations in Venezuela, Peru, Bolivia, and northern Argentina (fig. 4).

ARGENTINA: CORRIENTES: exact locality unknown, *Ibarrola* 2310 (US). SALTA: La Merced, *Venturi* 5136 (GH, US).

BOLIVIA: SANTA CRUZ: Buena Vista, *Steinbach* 5397 (NY, GH).

PERU: CAJAMARCA: Jaen, near mouth of Chinchipe River, *Weberbauer* 6215 (NY, GH, US, F).

VENEZUELA: Serranias de Terepaima, *Saer* 631 (F).

13. *STYLOSANTHES HAMATA* (L.) Taub. Verh. Bot. Brand. 32:22. 1890.

Hedysarum hamatum a L. Syst. Nat. 10:1170. 1759, ex char.

Stylosanthes procumbens Sw. Prod. Veg. Ind. Occ. 108. 1788, ex char.

Stylosanthes humilis Rich. ex Hemsl. in synonym., Biol. Centr. Am. Bot. 1:272. 1882, ex char.

Stylosanthes eriocarpha Blake, Contrib. U. S. Nat. Herb. 24:4. 1922. (T: *Blake* 7792!)

Stems ascending, spreading, prostrate, or matted, to 1 m. tall, often much branched, usually with a line of fine pubescence on one side of the stem, sometimes glabrous near the base or rarely throughout, or occasionally sericeous throughout. Leaflets lanceolate to elliptic, obtuse to subacute, to 20 mm. long and 6 mm. broad, glabrous or shortly pilose above and below, with 3–6 pairs of conspicuous veins; petioles 2–6 mm. long, puberulent or pilose, the rhachis 0.5–2.5 mm. long; sheath of the stipules shortly hairy, sericeous, or glabrous, 3- to 11-nerved, usually exceeding or occasionally surpassed in length by the teeth. Spikes rather small, ovoid to oblongoid, few- to 15-flowered; outer bracts trifoliolate, inner usually unifoliolate, very variable in pubescence of the sheath, mostly only ciliate, the sheath 5- to 7-nerved; outer bracteole 1, 2.5–5.0 mm. long, ciliate at the apex; axis rudiment 2–7 mm. long; inner bracteoles 2, 2.5–3.5 mm. long, ciliate at the apex. Calyx tube 4.0–7.5 mm. long, at least twice as long as the more or less acute and ciliate lobes. Standard 4–5 mm. long, suborbiculate; wings 3.5–4.5 mm. long, clawed and auriculate; keel petals 3.0–4.5 mm. long, falcate. Loment about 2 mm. broad, reticulate; both articulations usually fertile, the upper 2–4 mm. long, glabrous or puberulent in localized areas, or densely and evenly sericeous, the lower, when fertile, somewhat shorter, pilose or glabrescent; beak equaling to exceeding the upper articulation, glabrous or with short pubescence, uncinat.

Stylosanthes hamata is readily distinguished by a series of characters which includes a more or less puberulent bi-articulate loment with a beak slightly exceeding the upper articulation and a general lack of tuberculate bristles.

This species appears to be related most nearly to *S. fruticosa* of Africa and, indeed, the two were not separated by such early authors as Burmann f. and Retzius. *Stylosanthes fruticosa* usually possesses tuberculate bristles and evenly pilosulous loment. *Stylosanthes hamata* is similar to *S. sympodialis* but in the latter the beak of the loment is shorter than the upper articulation.

The spikes are usually 2- to 5-flowered, but some specimens from the Antilles have large dense spikes which may bear as many as 15 flowers. The habit of this species may be erect to ascending, or prostrate and matted. This difference seems

to be correlated with altitude; the specimens from elevations between 100 and 900 meters tend to be upright while those near sea level seem to be matted. These latter have been known as *S. procumbens*.

The range of *S. hamata* is broad and includes Florida, eastern Mexico and Central America, the Antilles, Colombia, and Venezuela, often becoming a pest in gardens in Jamaica, Cuba, and neighboring islands.

UNITED STATES: FLORIDA: Dade Co.: *Moldenke* 778 (MO).

BAHAMAS: ANDROS ISLAND: Spaniard Creek, *Small & Carter* 8882 (F, NY, GH, US); Mastic Point, *Brace* 7097 (NY, F); road to Little Creek, *Brace* 5245 (NY). CAICOS ISLANDS: South Caicos, *Wilson* 7637 (GH, NY, F); Jacksonville, *Millsbaugh & Millsbaugh* 9100 (NY, F). CROOKED ISLAND: Marine View Hill, *Brace* 4635 (NY, F); Land-rail Point, *Brace* 4678 (NY, F). ELEUTHERA ISLAND: Current, *Coker* 339 (NY). GRAND BAHAMA ISLAND: Eight Mile Rocks, *Britton & Millsbaugh* 2454 (GH, NY, US, F). GRAND TURK ISLAND: The Wells, *Millsbaugh & Millsbaugh* 9342 (NY, US, F); Waterloo, *Millsbaugh & Millsbaugh* 9034 (F). GREAT RAGGED ISLAND: exact locality unknown, *Wilson* 7821 (GH, NY, F). NEW PROVIDENCE ISLAND: Nassau, *Hitchcock s. n.* (MO, F); Clifton Point, *Degener* 18985 (GH, NY, MO); Nassau, *Northrop & Northrop* 37 (GH, NY, F), *Curtiss* 9, 118 (GH, US, NY, MO, F), *Coker* 541 (NY), near Fort Fincastle, *Wright* 86 (GH, NY, F), off Soldier's Road, *Wright* 223 (GH, NY), road to Lake Cunningham, *Britton* 93 (NY), west of Bay Street Road, *Millsbaugh* 2172 (F); exact locality unknown, *Brace* 444 (F). RUM CAY: Port Nelson, *Brace* 3934 (NY, F). SAN SALVADOR ISLAND: exact locality unknown, *Wilson* 7359 (NY, F).

CUBA: CAMAGÜEY: Pueblo Romano, Cayo Romano, *Shafer* 2499 (NY). HABANA: Habana, *Palmer & Riley* 821 (US), *Babs* 460 (NY); Regla, *Shafer* 104; Playa de Cojimar, *Hitchcock s. n.* (F); Marianão, *Piper* 6089 (US). ORIENTE: Santiago, Morro Hill, *Millsbaugh* 1077 (US, F), *Howard* 5788 (GH, US, NY, MO); Guantánamo Bay, *Britton* 1941 (US, NY); Holguin to Cacocum, *Shafer* 1551 (US, NY); Santiago, *Havard* 105 (NY); Santiago, Morro Castle, *Havard* 82 (NY); Santiago, *Underwood & Earle* 1682 (NY). WITHOUT PRECISE LOCALITY: Tricornia, *Hitchcock s. n.* (F).

DOMINICAN REPUBLIC: BARAHONA: Los Patos, *Abbott* 1767 (US); Barahona, *Howard & Howard* 8413 (GH, NY), *Fuertes* 211 (GH, MO, NY, US, F), *von Türckheim* 2804 (NY). SAN JUAN: near San Juan de la Maguana, *Howard & Howard* 8795 (GH); El Cercado, Juan Santiago, Hondo, *Howard & Howard* 9293 (NY). SANTIAGO: Santiago, *Jiménez* 473 (US). SANTO DOMINGO: Monción, banks of Río Mao, *Valeur* 802 (US); Guayubin, *Abbott* 937a (US), 942 (US); near Puerto Liberador, Manzanillo Bay, *Howard & Howard* 9659 (NY); Monción, *Valeur* 248 (NY, US, MO, F); Ciudad Trujillo, *Allard* 14350 (US), 13087 (US, F), 13114 (US), 13107 (US), 13313 (US), 13725 (US, MO), 14007 (US), 14281 (US); Azua, *Rose, Fitch & Russell* 4028 (US, NY). WITHOUT PRECISE LOCALITY: Moca, *Ekman* NH 11270 (US); Haina, *Faris* 38 (US, NY); Llanos de Rafael, *Eggers* 1920 (NY, US); Constanza, *von Türckheim* 2529 (NY).

GRAND CAYMAN: South Sound, *Kings* GC 69 (MO); Bodden Bay road, *Millsbaugh* 1335 (F).

HAITI: ARTIBONITE: vicinity of Ennery, *Leonard* 8798 (GH, US, NY, MO), 8797 (F), 9463 (US); Gros Morne, *Leonard* 9858 (US); St. Marc, *Leonard* 2863 (US), 2881 (US). GONAIVES: Gonaives to La Hotte Rochée on road to Terre Neuve, *Nash & Taylor* 1545 (NY). GONAVE ISLAND: Étroit, *Leonard* 3401 (GH, US). MIREBALAIS: exact locality unknown, *Cook, Scofield & Doyle* 81 (US). DU NORD: St. Michel de l'Atalaye, *Leonard* 7037 (US); Plaisance to Marmelade, *Nash* 678 (NY). NORD-OUEST: Jean-Rabel, *Leonard & Leonard* 12925 (US); Port-de-Paix, *Leonard & Leonard* 11001 (GH, US); vicinity of Bombardopolis, *Leonard & Leonard* 13448 (NY, US). SUD: west of Jérémie, *Holdridge* 928 (US). LA VALLÉE: Tortuga Island, *Leonard & Leonard* 11224 (US, MO), 15583 (US). WITHOUT PRECISE LOCALITY: Plaine Centrale, Pavane-Papaye, *Ekman* H6013 (US); La Cumbre, *Raunkaier* 1137 (US).

JAMAICA: Sherwood Forest, *Orcutt* 3137 (MO); Port Morant, *Hitchcock* s. n. (MO); Kingston, *Hitchcock* s. n. (MO); near Port Antonio, *Fredholm* 3054 (US, NY); Trelawny, Jackson Town, *Hunnewell* 19781 (GH); Waterloo Road, *Campbell* 6019 (NY); vicinity of Mandeville, *Brown* 107 (NY).

LESSER ANTILLES: ANEGADA: exact locality unknown, *Britton & Fishlock* 1007 (US, NY, F). ANGUILLA: exact locality unknown, *Boldingh* 5536 (NY). ANTIGUA: St. Johns, *Shafer* 36 (NY); exact locality unknown, *Hutson* s. n. (US). BARBADOS: Waterford, St. Michael, *Dash* 281 (US, NY, F); Codrington, *Borrell* 281 (US); Hastings, *Waby* 62 (US). BONAIRE: exact locality unknown, *Boldingh* 7246 (NY). CURAÇAO: Santa Cruz, *Britton & Shafer* 3013 (NY). GRENADA: Richmond Hill, *Broadway* s. n. (US, NY). GUADELOUPE: Pointe-à-Pitre, *Hammarlund* 18 (NY); exact locality unknown, *Questel* 1459 (US). INAGUA: Salt Pond Hill, *Fairchild* 2599 (US); Matthew Town, *Nash & Taylor* 1069 (NY, F). MONA: exact locality unknown, *Stevens* 6224 (NY), 6344 (NY). ST. BARTHÉLEMY: Gustavia, *Questel* 116 (NY), 217 (NY); exact locality unknown, *Forsström* s. n. (F). ST. CROIX: Corn Hill, *Ricksecker* 216 (GH, MO, NY, US, F); Judith's Ferry, *Thompson* 482 (GH, NY); Bassin, *Ricksecker* 47 (US, MO, F). ST. JAN: Bethania to Rosenberg, *Shafer* 232 (US, NY). ST. KITTS: near Basseterre, *Britton & Cowell* 729 (US, NY). ST. THOMAS: Svenson's Bay, *Britton* 280 (NY); Paradise Bay, *Britton & Britton* 208 (US, NY). TORTOLA: Sea Cow Bay, *Britton & Shafer* 667 (GH, NY). VIRGIN GORDA: exact locality unknown, *Fishlock* 163 (GH, NY).

LITTLE CAYMAN: South Side, Blossom Point, *Kings* LC 75 (MO).

PUERTO RICO: Quebradillas, *Stevenson* 5887 (US); Guanica, *Sintenis* 3756 (NY, US); Yauco, *Underwood & Griggs* 658 (US, NY); Guayama, Pozuelo, *Goll* 531 (US); Cayey, south of Caguas, *Heller & Heller* 328 (US, NY, F); Bayamon, *Sintenis* 1092 (US, MO, NY); Condado, *Britton, Britton & Brown* 5764 (US, NY).

GUATEMALA: IZABAL: trail from Los Amates to Izabal, *Blake* 7792 (GH, US); Puerto Barrios, *Standley* 25126 (NY, US).

PANAMA: COCLÉ: Penonomé, *Shafer* 36 (NY).

COLOMBIA: ATLÁNTICO: Salgar, around Puerto Colombia, *de Kattab, Molina & Barkley* Ato25 (US), Ato48 (US); Barranquilla, *Elias* 927 (US); Puerto Colombia, *Dugand* 4008 (US). BOLÍVAR: La Popa, *Killip & Smith* 14067 (NY, GH, US, F); Cartegena, *Molina & Barkley* Boo48 (US). CUNDINAMARCA: east of Apulo, *Killip, Dugand & Jaramillo* 38164 (US). MAGDALENA: exact locality unknown, *Castañeda* 252 (MO). TOLIMA: Curvas de Gualanday, *Arbeláez & Cuatrecasas* 6506 (US).

VENEZUELA: FALCÓN: Adicora, Paraguaná, *Tomayo* 750 (US), 977 (US, F). NUEVA ESPARTA: Island of Margarita, *Miller & Johnston* 68 (GH, NY, US, MO, F).

14. *STYLOSANTHES SERICEICEPS* Blake, in *Contrib. U. S. Nat. Herb.* 20:524. 1924. (T: *Jahn* 678!)

Stems suffruticose, erect, to 0.5 m. tall, densely covered with shortly appressed silvery hairs, glabrescent below. Leaflets lanceolate, to 25 mm. long and 5 mm. broad, acuminate, mucronate, usually glabrous above, minutely pubescent beneath and along the margins, with 4-7 pairs of prominent veins; petioles to 6 mm. long, sericeous, the rhachis to 2.5 mm. long; sheath of the stipules about as long as the teeth, densely short-hairy, with 3 veins crowded near the center. Spikes oblongoid or obovoid, about 15 mm. long, crowded, several-flowered; outer bracts often trifoliate, inner unifoliate, the sheath 5-7 mm. long, about equaling the teeth, densely covered with long tawny hairs, 5-nerved; outer bracteole 1, bifid, ciliate, about 4 mm. long; axis rudiment to 4 mm. long, densely pilose; inner bracteole 1, about equal in length to the outer but narrower. Calyx tube to 7 mm. long, the more or less pilose lobes obtuse or acute, about 3 mm. long. Standard to 8 mm. long, suborbiculate; wings 4.5-6.5 mm. long, auriculate; keel petals 4.5-6.0 mm. long, falcate. Loment 1.5-2.0 mm. broad, reticulate; both articulations fertile or

the lower sometimes abortive, the upper 2.5–3.0 mm. long, evenly clothed with short silvery hairs, the lower, when fertile, nearly 4 mm. long, pilose; beak 1.5–2.0 mm. long, nearly half as long as the upper articulation, strongly uncinat, densely white-hairy.

Stylosanthes sericeiceps apparently marks the transition between § STYLOSANTHES and § ASTYPOSANTHES in that only the lowest 2–3 flowers in each spike possess an axis rudiment and that each flower, in addition, is subtended by only one inner bracteole, the latter character one which is found throughout § ASTYPOSANTHES. The absence of the axis rudiment in upper flowers has been noted for some specimens in other species of § STYLOSANTHES (*S. hamata* and *S. subsericea*), but this is the only species in which this is combined with the absence of one of the inner bracteoles.

Stylosanthes sympodialis closely resembles *S. sericeiceps*, differing from it in the rufous villosity of the bracteal sheaths and in the unevenly pubescent loment.

There are no data as to the habitat of this species, except that it grows at altitudes between 400 and 1000 meters. It is known only from Venezuela.

VENEZUELA: MÉRIDA: Lagunillas, *Jahn* 678 (US, GH, NY); between Estangues and Pointe Real, *Pittier* 12842 (NY, US).

Section II. ASTYPOSANTHES (Herter) Mohlenbrock, stat. nov.

Sect. *Eustylosanthes* Vog. in *Linnaea* 12:63. 1838.

Astyposanthes Herter, in *Rev. Sudamer Bot.* 7:209. 1943.

None of the flowers subtended by an axis rudiment; inner bracteole 1.

In the absence of previous typification, *Stylosanthes humilis* HBK. is designated as the type for § ASTYPOSANTHES.

15. STYLOSANTHES BIFLORA (L.) BSP. Prelim. Cat. N. Y. Pl. 118. 1883.

Trifolium biflorum L. Sp. Pl. 773. 1753, ex char.

Arachis aprica Walt. Fl. Carol. 183. 1788, ex char.

Stylosanthes elatior Sw. in Svenska Vet. Akad. Handl. 11:296. 1789, ex char.

Stylosanthes hispida Michx. Fl. Bor. Am. 2:75. 1803, ex char.

Stylosanthes hispida var. *hispidissima* Michx. loc. cit. 1803, ex char.

Stylosanthes hispida var. *nudiuscula* Michx. loc. cit. 1803, ex char.

Stylosanthes hispida a *erecta* Pursh, Fl. Am. Sept. 2:480. 1814, ex char.

Stylosanthes hispida β *procumbens* Pursh, loc. cit. 1814, ex char.

Stylosanthes elatior β *hispidissima* Torr. & Gray, Fl. N. Am. 1:354. 1838, ex char. (T: *Michaux s. n.*)

Stylosanthes biflora a *elatior* O. Ktze. Rev. Gen. 1:209. 1891, ex char.

Stylosanthes biflora β *guianensis* O. Ktze. loc. cit. 1891, ex char.

Stylosanthes riparia Kearney, in Bull. Torr. Bot. Club 24:565. 1897. (T: *Kearney* 674!)

Stylosanthes biflora var. *hispidissima* Poll. & Ball, in Proc. Biol. Soc. Wash. 13:134. 1900, ex char.

Stylosanthes biflora var. *hispidissima* Mohr, in Contrib. U. S. Nat. Herb. 6:570. 1901, ex char.

Stylosanthes floridana Blake, in Proc. Biol. Soc. Wash. 33:51. 1920. (T: *Sudworth s. n.*!)

Stylosanthes riparia var. *setifera* Fern. in Rhodora 40: 438. 1938. (T: *Fernald & Long* 8321!)

Stylosanthes riparia f. *ochroleuca* Fern. loc. cit. 1938. (T: *Fernald & Long* 8732!)

Stems herbaceous to subligneous at the base, to 6 dm. tall, erect or spreading, much branched or rarely sparsely branched, glabrous to puberulent to densely hispid, the bristles sometimes yellowish. Leaflets ovate to elliptic to lanceolate, obtuse to acute at the tip, glabrous on both surfaces and occasionally with spinulose teeth on the margins, sometimes punctate beneath, with 3–6 pairs of nerves; terminal leaflet to 40 mm. long and 10 mm. broad, usually much smaller, the lateral ones slightly smaller than the terminal; petioles 1–3 mm. long, glabrous to puberulent to hispidulous, the rhachis 0.5–1.5 mm. long; sheath of the stipules 3–10 mm. long, glabrous to puberulent to densely hispid, with numerous nerves, the subulate teeth 3–8 mm. long, often setose. Spikes small, 1- to 8-flowered; bracts mostly unifoliate or the outer sometimes trifoliate, the sheath puberulent to densely hispid, rarely glabrous, 3.0–6.5 mm. long, 2.5–5.5 mm. broad, mostly 5- to 9-nerved, the teeth usually somewhat shorter; outer bracteole 1, lanceolate, 2–3 mm. long, glabrous to ciliate at the apex; axis rudiment none; inner bracteole 1, 1.0–2.5 mm. long, glabrous to ciliate at the apex. Calyx tube 2.5–5.0 mm. long, glabrous, the more or less acute lobes 2–4 mm. long, glabrous to puberulent. Standard suborbiculate, 4.5–7.0 mm. long, to 5.5 mm. broad; wings 3.5–4.5 mm. long, auriculate, spurred within at the base; keel petals denticulate to entire at the apex, auriculate, spurred within at the base. Loment 2.5–3.0 mm. broad, strongly reticulate with vertical nerves; only the upper articulation of the loment fertile, 2.5–5.0 mm. long, obovoid, plump, puberulent throughout; beak 0.5–1.0 mm. long, coiled.

The *Stylosanthes biflora* complex is defined as including populations not only of *S. biflora* but also *S. riparia* and *S. floridana* of other authors. The members of this complex are relatively constant with respect to loment characters but are diverse in leaflet shape, pubescence, and to some extent habit. However, some variation may occur in shape of the loment with some articulations more inflated than others, or in degree of reticulation. Loments are generally puberulent although they may become glabrous with age. Degree of maturity affects such characters of the loment so that in some specimens, the entire range of variability may be observed.

Most authors refer specimens with acute leaflets and without bristles on the stem to *S. biflora* (L.) BSP., and those with acute leaflets and bristles on the stem and bracteal sheaths to *S. biflora* var. *hispidissima* (Michx.) Pollard & Ball. Specimens with obtuse leaflets and which may be either non-bristly or bristly are regarded mostly as *S. riparia* Kearney or its variety *setifera* Fern., respectively. Specimens from the extreme southeastern United States which lack bristles completely are known sometimes as *S. floridana* Blake. A sharp line of demarcation among these variants is, however, difficult to determine, a fact which has been noted previously by some workers (Isely²⁷).

Supposedly the best criterion to separate *S. riparia* from *S. biflora* is the position of the beak on the upper articulation of the loment. In *S. riparia*, the beak is said to

²⁷ Iowa State Coll. Jour. Sci. 30:113. 1955.

be oriented terminally on the loment rather than at one side as in *S. biflora*. However, in most specimens identified as *S. riparia*, the beaks appear lateral. Isely attributes the differences between fruits to "artifacts of observation" since "the degree to which the beak is or is not symmetrically placed may depend on the angle from which it is viewed".

Other varieties or species which have been segregated from *S. biflora* seem only to represent extremes.

UNITED STATES:

ALABAMA: DeKalb Co.: *Ruth* 338 (MO). Lee Co.: *Baker* s. n. (MO). Marshall Co.: *Hubricht* B 1667 (MO). Mobile Co.: *Graves* 961 (MO).

ARKANSAS: Baxter Co.: *E. J. Palmer* 5961 (MO). Clark Co.: *Demaree* 17794 (MO). Craighead Co.: *Demaree* 3495 (MO). Cross Co.: *Demaree* 19618 (MO). Dallas Co.: *Demaree* 23350 (MO), 23340 (MO). Drew Co.: *Demaree* 18016 (MO). Franklin Co.: *Demaree* 17788 (MO). Hot Springs Co.: *Demaree* 17463 (MO). Jefferson Co.: *Demaree* 19460 (MO). Johnson Co.: *Demaree* 19966 (MO). Lincoln Co.: *Demaree* 19156 (MO). Logan Co.: *Demaree* 17682 (MO). Miller Co.: *Heller & Heller* 4126 (MO). Prairie Co.: *Demaree* 22303 (MO). Pulaski Co.: *Demaree* 17293 (MO). Saline Co.: *Demaree* 21195 (MO). Sharp Co.: *Emig* 168 (MO). Union Co.: *Demaree* 19421 (MO). Yell Co.: *Demaree* 21270 (MO).

DELAWARE: Newcastle Co.: *Commons* s. n. (MO). Sussex Co.: *Churchill* s. n. (MO).

FLORIDA: Duval Co.: *Curtiss* 6418 (MO). Escambia Co.: *Brinker* 473 (MO). Hillsborough Co.: *Ferguson* s. n. (MO). Jefferson Co.: *Hitchcock* s. n. (MO). Lake Co.: *Nash* 1309 (MO). Marion Co.: *Woodson & Schery* 97 (MO). Volusia Co.: *Hood* s. n. (MO).

GEORGIA: Bulloch Co.: *Harper* 946 (MO). Cobb Co.: *Duncan* 8646 (MO). DeKalb Co.: *Miller, Perry, Boyd & Myers* 531 (MO). Gwinnett Co.: *Allard* 129 (MO). Madison Co.: *Duncan* 11588 (MO). Oconee Co.: *Small* s. n. (MO). Stephens Co.: *Duncan* 11737 (MO). Union Co.: *Duncan* 7835 (MO). Whitfield Co.: *Harper* 393 (MO).

ILLINOIS: Jackson Co.: *Mohlenbrock* 5058 (MO).

KANSAS: Cowley Co.: *White* 134 (MO). Montgomery Co.: *Rydberg & Imler* 454 (MO).

KENTUCKY: McCreary Co.: *Wherry & Pennell* 13873 (MO). Whitley Co.: *Wherry & Pennell* 13843 (MO).

LOUISIANA: Rapides Parish: *Ball* 621 (MO).

MARYLAND: Montgomery Co.: *Painter* 1084 (MO).

MISSOURI: Barry Co.: *Bush* 3265 (MO). Benton Co.: *Steyermark* 24436 (MO), 24436a (MO). Butler Co.: *Steyermark* 11489 (MO). Callaway Co.: *Steyermark* 26175 (MO). Camden Co.: *Steyermark* 20655 (MO). Cole Co.: *Steyermark* 14981 (MO). Crawford Co.: *Steyermark* 15373 (MO). Dade Co.: *Steyermark* 5653 (MO). Dent Co.: *Kellogg* 995 (MO). Douglas Co.: *Steyermark* 15373 (MO). Dunklin Co.: *Bush* 6271 (MO). Franklin Co.: *Craig* s. n. (MO). Greene Co.: *Dewart* 72 (MO). Henry Co.: *Steyermark* 15948 (MO). Hickory Co.: *Steyermark* 24488 (MO). Howell Co.: *Blankinship* s. n. (MO). Iron Co.: *Pammel* s. n. (MO). Jasper Co.: *Palmer* 461 (MO). Jefferson Co.: *Steyermark* 1366 (MO). Lincoln Co.: *Steyermark* 8130 (MO). McDonald Co.: *Palmer* 6a (MO). Maries Co.: *Steyermark* 15303 (MO). Marion Co.: *Davis* 7866 (MO). Oregon Co.: *Palmer & Steyermark* 41740 (MO). Pike Co.: *Steyermark* 25893 (MO). Polk Co.: *Steyermark* 23987 (MO). Ralls Co.: *Steyermark* 25865 (MO). Reynolds Co.: *Steyermark* 14201 (MO). Ripley Co.: *Mackenzie* 327 (MO). St. Louis Co.: *Drushel* 4311 (MO). Shannon Co.: *Bush* s. n. (MO). Stoddard Co.: *Steyermark* 20763 (MO). Stone Co.: *Steyermark* 22699 (MO). Taney Co.: *Palmer* 5888 (MO). Vernon Co.: *Drouet* 130 (MO). Wayne Co.: *Steyermark* 11217 (MO). Webster Co.: *Steyermark* 23897 (MO). Wright Co.: *Bush* s. n. (MO).

NEW JERSEY: Burlington Co.: *Meredith s. n.* (MO). Camden Co.: *Martindale s. n.* (MO). Gloucester Co.: *Parker 12430* (MO). Hunterdon Co.: *Fisher s. n.* (MO). Middlesex Co.: *Mackenzie 2871* (MO). Ocean Co.: *Churchill s. n.* (MO). Salem Co.: *Meredith s. n.* (MO).

NORTH CAROLINA: Cherokee Co.: *Fox 4034* (MO). Cumberland Co.: *Fox & Godfrey 2600* (MO). Edgecombe Co.: *Fox 4080* (MO). Harnett Co.: *Fox & Godfrey 2559* (MO). Henderson Co.: *Davis 9030* (MO). Hoke Co.: *Schallert s. n.* (MO). Orange Co.: *Wilson 28* (MO). Rowan Co.: *Heller 14005* (MO). Swain Co.: *Beardslee & Kofoed s. n.* (MO). Wayne Co.: *Fox, Godfrey & Boyce 4325* (MO).

OKLAHOMA: Caddo Co.: *Goodman 2342* (MO). Choctaw Co.: *Houghton 4025* (MO). Comanche Co.: *Stevens 1411* (MO). Johnston Co.: *Palmer 6438* (MO), *6438a* (MO). McCurtain Co.: *Houghton 3788* (MO). Payne Co.: *Stratton 188* (MO). Woods Co.: *White 277* (MO).

PENNSYLVANIA: Bedford Co.: *Berkheimer 3458* (MO). Lancaster Co.: *Eisenhower s. n.* (MO). Montgomery Co.: *Redfield 1524* (MO). Philadelphia Co.: *Eby s. n.* (MO). Schuylkill Co.: *Collector Unknown* (MO). York Co.: *Glatfelter s. n.* (MO).

SOUTH CAROLINA: Aiken Co.: *Eggert s. n.* (MO). Anderson Co.: *Davis 8441* (MO). Dillon Co.: *Godfrey SC49040* (MO). Georgetown Co.: *Godfrey 146* (MO). Laurens Co.: *Davis s. n.* (MO). Oconee Co.: *Duncan 11255* (MO). Pickens Co.: *Rodgers 385* (MO).

TENNESSEE: Cocke Co.: *Kearney 675* (MO); *Kearney 674* (MO).

TEXAS: Bowie Co.: *Eggert s. n.* (MO). Brazos Co.: *Palmer 11750* (MO). Dallas Co.: *Reverchon 193* (MO). Harris Co.: *Boon 185* (MO). Lee Co.: *Eggert s. n.* (MO). Nacogdoches Co.: *Parks RX2287* (MO). Parker Co.: *Tracy 8025* (MO). Travis Co.: *Buckley s. n.* (MO). Waller Co.: *Hall 153* (MO).

VIRGINIA: Smyth Co.: *Small s. n.* (MO).

WEST VIRGINIA: Jackson Co.: *Berkley 816* (MO). Lincoln Co.: *Berkley 899* (MO). Summers Co.: *Fox 2481* (MO).

16. *STYLOSANTHES GUYANENSIS* (Aubl.) Sw. Svenska Vet. Akad. Handl. 11:296. 1789.

Stems herbaceous or mostly suffrutescent, erect or rarely scandent, to 1 m. tall, glabrous to puberulent to pilose or often hispid or setose, the setae often purplish. Leaflets green to purple, lanceolate to elliptic to nearly ovate, acute or occasionally obtuse at the apex, glabrous to puberulent to tuberculate-bristly, particularly on the margins and the costa beneath, sometimes spinulose-toothed, with 2–7 pairs of nerves, the terminal usually 5–30 mm. long and 2–10 mm. broad (rarely to 45 mm. long and 20 mm. broad), the lateral ones slightly smaller than the terminal; petioles 1–10 mm. long, sometimes canaliculate above, glabrous to puberulent to setose, the rhachis 0.5–1.5 mm. long; sheath of the stipules glabrous to pilose to setose, 2–15 mm. long, 3- to many-nerved, the subulate teeth 2–10 mm. long. Spikes small, narrow, and 2-flowered to large, globose, and about 40-flowered; bracts mostly unifoliate, the leaflet sometimes much reduced and often spinulose-toothed, the sheaths green to purple, glabrous to puberulent to bristly, 3–7 mm. long, 3- to 9-nerved; outer bracteole 1, lanceolate or ovate, 2.5–3.0 mm. long, acuminate, glabrous to pilose, occasionally purplish at the apex; axis rudiment none; inner bracteole 1, 2–3 mm. long, acuminate, glabrous to pilose, colored like the outer bracteole. Calyx tube 4–8 mm. long, glabrous to sparsely pubescent, the

lobes 3–5 mm. long, obtuse to acute, ciliate or sometimes pilose. Standard 4–8 mm. long, 3–5 mm. broad, suborbiculate; wings 3.5–5.0 mm. long, auriculate, spurred within at the base; keel petals 3.5–5.0 mm. long, falcate. Loment 1.5–2.5 mm. broad, reticulate; only the upper articulation fertile, glabrous to minutely short-pubescent near the apex, or occasionally with sessile glands near the apex, ovoid, plump, 2–3 mm. long; beak minute, 0.1–0.5 mm. long, strongly inflexed.

KEY TO THE SUBSPECIES

- a. Leaflets green, usually 10–60 mm. long, sometimes tuberculate-bristly but not spinulose-toothed; internodes usually much greater than 1.5 cm. long; inflorescence mostly 5- to 40-flowered. Central America, South America.....16a. *S. guyanensis* ssp. *guyanensis*
- aa. Leaflets purplish, 4–12 mm. long, densely and shortly tuberculate-bristly on the margin and the costa, appearing short-serrate; internodes 0.5–1.5 cm. long; inflorescence 1- to 4-flowered. Mexico.....16b. *S. guyanensis* ssp. *dissitiflora*

Stylosanthes guyanensis is a most variable species. The leaflets range from small and lanceolate to large and elliptic. The indument of the stem is diverse. The spikes are large and to 40-flowered to small and 1- to 2-flowered. Numerous subspecies, varieties, and forms have been proposed, but intergradations occur between almost all. Except for subspecies *dissitiflora*, there is no strong geographical correlation with any of the variants. A great number of the most southern specimens are 40-flowered and bristly and the northern specimens 5- to 20-flowered and more or less viscid, but this is far from constant.

Great confusion as to the proper name for this species has arisen. Aublet described *Trifolium guyanense* as having pubescent loment and illustrated it thus. The type photograph, however, appears to coincide with many of the specimens examined in this study with glabrous or puberulent loment. Those considering Aublet's *T. guyanense* as inapplicable to present known specimens employ the binomial *S. gracilis* for this broad species.

Numerous other morphological extremes have been proposed: *S. hispidula* Rich. with densely hispid stems; *S. surinamensis* Miq. with rather narrow leaflets; *S. ruellioides* Benth. with densely pubescent stems and broad leaflets; *S. longiseta* Micheli with the stems bearing long bristles; and *S. pobliana* Taub. with acuminate leaflets. *Stylosanthes ingrata* Blake from Vaca Falls, British Honduras, is without fruit but seems to be *S. guyanensis* ssp. *guyanensis*.

Stylosanthes guyanensis ssp. *guyanensis* occurs from Central America through South America into northern Argentina, also in the Antilles. It has been planted in Australia in an effort to impede soil erosion. *Stylosanthes guyanensis* ssp. *dissitiflora* is limited to a small area in southwestern Mexico. It occurs at altitudes between 3500 and 5000 feet.

16a. *STYLOSANTHES GUYANENSIS* ssp. *GUYANENSIS*

- Trifolium guyanense* Aubl., Pl. Guian. 776. 1775, ex char. (T: *Aublet s. n.*, photo!)
- Stylosanthes hispida* Rich., Act. Soc. Hist. Nat. Par. 2:112. 1792, ex char.
- Stylosanthes gracilis* HBK., Nov. Gen. et Sp. 6:507. 1823, ex char.
- Stylosanthes surinamensis* Miq., in Linnaea 18:567. 1844, ex char.
- Stylosanthes ruellioides* Benth., in Mart. Fl. Bras. 15¹:90. 1859, ex char.
- Stylosanthes guyanensis* β *subviscosa* Benth. loc. cit. 92. 1859, ex char.
- Stylosanthes longiseta* Micheli, in Mem. Soc. Phys. Genève 28:7. 1883, ex char.
- Stylosanthes pobliana* Taub. in Verh. Bot. Brand. 32:29. 1890. (T: *Pobl 1997!*)
- Stylosanthes guyanensis* var. *pubescens* Pilger, in Engl. Bot. Jahrb. 30:160. 1901, ex char. (T: Pilger 286).
- Stylosanthes juncea* f. *intermedia* Chod. & Hass. in Bull. Herb. Boiss. ser. 2, 4:884. 1904. (T: Hassler 3781).
- Stylosanthes montevidensis* var. *longiseta* (Micheli) Chod. & Hass. loc. cit. 885. 1904. (T: Hassler 4573).
- Stylosanthes guyanensis* var. *genuina* Hass. in Fedde, Rep. Sp. Nov. 16:220. 1919. (T: Hassler 7781!)
- Stylosanthes guyanensis* var. *genuina* f. *esetosa* Hass. in Fedde, loc. cit. 221. 1919. (T: Hassler 2834!)
- Stylosanthes guyanensis* var. *intermedia* (Vog.) Hass. in Fedde, loc. cit. 1919.
- Stylosanthes guyanensis* var. *intermedia* ssp. *anomala* Hass. in Fedde, loc. cit. 1919, ex char.
- Stylosanthes guyanensis* var. *subviscosa* f. *viscosissima* Hass. in Fedde, loc. cit. 1919. (T: Hassler 6454!)
- Stylosanthes guyanensis* var. *longiseta* (Micheli) Hass. in Fedde, loc. cit. 222. 1919.
- Stylosanthes guyanensis* var. *marginata* Hass. in Fedde, loc. cit. 223. 1919. (T: Hassler 9938!)
- Stylosanthes ingrata* Blake, in Proc. Biol. Soc. Wash. 39:51. 1928. (T: *Record s. n.*!)
- Stylosanthes gracilis* var. *vulgaris* Burkart, in Darwiniana 3:247. 1939, ex char.
- Stylosanthes gracilis* var. *subviscosa* (Benth.) Burkart, loc. cit. 248. 1939.

BRITISH WEST INDIES: TRINIDAD: St. Joseph savanna, Britton, Hazen & Broadway 976 (GH, US, NY).

BRITISH HONDURAS: BELIZE: Belize, Bartlett 11250 (US, NY). CAYO: Mt. Pine Ridge, Bartlett 11706 (US, GH); Vaca Falls, *Record s. n.* (US). STANN CREEK: Stann Creek, Schipp 486 (MO, GH, NY, F); Stann Creek, *Gentle 1883* (MO, GH, NY, F). TOLEDO: Swasey Branch, Monkey River, *Gentle 3898* (GH, F, US, NY, MO).

COSTA RICA: CARTAGO: Juan Viñas, Rowlee & Stork 839 (NY, US). Cartago, Léon 186 (F). HEREDIA: Santa Barbara, Pittier 1656 (US). SAN JOSÉ: Santiago, Brenes 14326 (GH, US); San José, Tonduz 2169 (US, GH); El General, Skutch 2462 (NY, US); San Pedro de la Calabaza, Tonduz 10919 (US); Santa María, Standley 41595 (US); between Aserri and Tarbaca, Standley 34031 (US). WITHOUT PRECISE LOCALITY: Boruca, Tonduz 4707 (US); Río Colorado, Valerio 278 (F).

EL SALVADOR: LA LIBERTAD: between Finca Germania and Finca San Antonio, near Comasagua, Carlson 250 (F). SAN SALVADOR: from San Martín to Laguna de Ilopango, Standley 22523 (US, NY); exact locality unknown, Calderón 1133 (US, NY), 1287 (GH, US, NY); Standley 19398 (NY, GH, US), Velasco 8963, 8995 (US). SANTA ANA: vicinity of Metapan, Standley & Padilla 3098 (F), 3261 (F). SAN VICENTE: San Vicente, Standley 21318 (US, GH, NY).

GUATEMALA: ALTA VERAPAZ: Coban, Standley 70111 (NY, F); Coban, von Türckheim 84 (US). CHIMALTENANGO: Alameda, Johnston 346 (F); from Chimaltenango to San Martín Jilotepeque, Standley 57982 (GH, NY, F); San Martín Jilotepeque, Standley 64402 (NY, F); San Juan-Malagua, Johnston 1555 (F). CHIQUIMULA: El Rincón, Standley 74734 (F). ESCUINTLA: along Río Guacalate, Standley 89369 (F), 58200 (F); Finca El Zapote, Muenschner 12417 (F); near Escuintla, Standley 63577 (GH, F). GUATEMALA: Finca Breña, between Guatemala and Fiscal, Standley 59690 (F); near Finca La Aurora, Aguilar 18 (F); Chilloní, Rojas 47 (US); exact locality unknown, Salas 529

(US). HUEHUETENANGO: along Río Cuilco, between Cuilco and San Juan, *Steyermark* 50838 (F); Río Pucal, *Standley* 65833 (F); east of San Rafael Pétzal, *Standley* 83051 (F), 83076 (F); 14 miles south of Huehuetenango, *Standley* 82398 (F). IZABAL: between Los Amates and Izabal, *Kellermann* 7556 (NY, F), 7257 (NY, F); between Milla and Cristina, *Steyermark* 38355 (F), 38653 (F); Gualán, *Blake* 7691 (US); Cristina, *Blake* 7585 (US); Quiriguá, *Standley* 24223 (GH, US); near Quiriguá, *Standley* 72470 (F). JALAPA: vicinity of Jalapa, *Standley* 76661 (F); northeast of Jalapa, *Standley* 76803 (F). JUTIAPA: vicinity of Jutiapa, *Standley* 75042, 75511 (F). QUEZALTENANGO: Colomba, *Skutch* 2048 (US, GH, F). QUICHÉ: between Cotzal and San Francisco, *Sharp* 45169 (F); exact locality unknown, *Aguilar* 1490 (F). RETALHULEU: near Retalhuleu, *Standley* 88622 (F). SACATEPÉQUEZ: Barranco Hondo, *Standley* 60232 (GH, F); Santa María de Jesús, *Standley* 59401 (GH, NY, F); Ciudad Vieja, *Tejada* 273 (US); near Antigua, *Standley* 61723 (F). SANTA ROSA: southeast of Barberena, *Standley* 77879 (F); Buena Vista, *Heyde & Lux* 3752 (F); La Vega, *Heyde & Lux* 4457 (US, GH). SUCHITEPÉQUEZ: Finca Las Nubes, *Steyermark* 35442 (F); Tinca Mocá, *Skutch* 1463 (GH). ZACAPA: Sierra de las Minas, *Steyermark* 29647 (F).

HONDURAS: CHOLUTECA: vicinity of San Marcos de Colón, *Standley* 15706 (US). COMAYAGUA: Siguatepeque, *Standley* 56264 (US, F); vicinity of Comayagua, *Standley & Chacón* 5972 (F); El Achote, near Siguatepeque, *Standley* 56148 (F). COPÁN: Hacienda Espiritu Sancto, *Blake s. n.* (US). MORAZÁN: El Zamorano, *Molina* 61 (F, US); San Antonio del Oriente, *Rodríguez* 668 (F), 687 (F); Piedra Parada, *Standley* 11937 (F); near Joya Grande, *Standley & Molina* 4466 (F); Guaimaca, *Molina* 2906 (F). OLANCHO: from Catacamas to Loma Pelona, *Standley* 18283 (F). EL PARAÍSO: Quebrada de Dantas, *Standley, Williams & Molina* 1260 (F); Yuscarán, *Molina* 1694 (F); west of Güinope, *Merrill & Williams* 15713 (F); Manzaragua Road, *Williams & Molina* 11484 (MO, GH, F); Ofo de Agua, *Williams & Molina* 12027 (GH, F); Güinope, *Rodríguez* 1678 (F). SANTA BÁRBARA: Los Dragos, *Standley & Lindelie* 7405 (F).

MEXICO: CHIAPAS: exact locality unknown, *Doyle* 144 (US). JALAPA: Hacienda de la Laguna, *Schiede* 631 (NY). JALISCO: San Sebastian, *Nelson* 4075 (US, GH). OAXACA: Jalapa, *Pringle* 9174 (GH). PUEBLA: Metlatoyuca, *Goldman* 57 (GH, US). VERACRUZ: Minatitlan, *Mell s. n.* (NY); Zacuapan, *Purpus* 1888 (NY, MO, US, GH, F); Orizaba, *Botteri* 152 (GH). WITHOUT PRECISE LOCALITY: Lodiogo, *Palmer* 1900 (NY, GH, US, F); Monte Cristo, *Matuda* 1958 (US, NY, GH); Vallecitos, Montes de Oca, *Hinton* 11456 (US).

NICARAGUA: GRANADA: near Granada, *Grant* 756 (GH). JINOTEGA: San Rafael del Norte, *Miller & Griscom* 66 (US); southwest of Jinotega, *Standley* 9534 (F), 10082 (F), 10094 (F).

PANAMA: CANAL ZONE: Sosa Hill, Balboa, *Standley* 26443 (US); between Fort Clayton and Corozal, *Standley* 29159 (US); Summit, *Standley* 30068 (US); along Las Cruces Trail, *Hunter & Allen* 753 (GH, MO); Río Puente, *Dodge, Steyermark & Allen* 16835 (GH); Empire to Mandinga, *Piper* 5129 (US). CHIRIQUÍ: Volcancitos, *Terry* 1264 (GH, US, MO, F); COCLÉ: Penonomé, *Williams* 167 (US, NY), 148 (US, NY); Natá, *Allen* 838 (GH, US, MO, NY). PANAMÁ: Sabanaz, *Standley* 25837 (US); Taboga Island, *Standley* 28013 (US); between Matías Hernández and Juan Díaz, *Standley* 32077 (US); Chêpo, *Hunter & Allen* 75 (MO, GH); Pacora, *Bro. Maurice* 790 (US).

ARGENTINA: CÓRDOBA: Sierra Chicas, Estancia la Reducción, *Burkart* 7397 (F). CORRIENTES: Estancia, Santa Teresa, *Pedersen* 79 (US). MISSIONES: Santa Ana, *Rodríguez* 756 (MO); Posadas, *Ekman* 1742 (NY); San Ignacio, *Ekman* 1740 (US).

BOLIVIA: LA PAZ: Guanai-Tipuani, *Bang* 1459 (MO, US, GH, NY, F); Nord Yungas, Coripata, *Büchtien* 8101 (US, NY); Tipuani, *Büchtien* 5423 (US, GH, MO, NY, F); South Yungas, San Bartolomé, near Calisaya, *Krukoff* 10536 (US, MO, NY, F); Tampa, *Büchtien* 1787 (US); La Joya, *Tate* 1031 (NY); Mapiri, *Tate* 466 (NY), 471 (NY); near La Paz, *Rusby* 1008 (NY); Guanai, *Rusby* 2324 (NY). SANTA CRUZ: Velasco, *Kuntze s. n.* (NY, US, F); Sará, Buena Vista, *Steinbach* 6916 (GH, NY, F, MO); San José, *Williams* 384 (US). WITHOUT PRECISE LOCALITY: Eskia, *White* 612 (NY).

BRAZIL: BAÍA: Mucugé, Serra Sincorá, *Froes* 20128 (NY). CEARÁ: Lagoa Porangaba, Fortaleza, *Drouet* 2726 (GH, US, F). DISTRITO FEDERAL: Praia de Sernambetiba, L. B. *Smith* 6359 (US). GOIÁS: Corgo do Jaraguá, *Pohl* 949 (NY); Quexada, *Maceil* 2132 (MO). MINAS GERAES: São Sebastião do Paraíso, *Vidal* 3659 (GH); Caldas, *Regnell* III428 (US); Uberaba, *Regnell* 430 (US); Ilheos, *Moricand* s. n. (GH); Viçosa, *Mexia* 4523 (NY, GH, US, MO, F); near Lagôa Pampulha, *Williams & Assis* 6084 (GH); Estação de Barreiro, *Williams & Assis* 7122 (GH); Belo Horizonte, *Williams & Assis* 5832 (GH, US); Bento Pires, *Williams & Moreira* 5219 (GH); Tijuco, *Riedel* 1316 (US); Canga, *Magalhaes* 1760 (US); Engenho Nogueira, *Magalhaes* 3168 (US); Santa Luzia, Chapeu de Sol, *Archer & Barreto* 5015 (US); Jaboticatubas, L. B. *Smith* 7078 (US); Diamantina, *Archer* 4084 (US); Serra do Taquaril, *Barreto* 5771 (F); Ituiutaba, *Macedo* 1670 (US). PARÁ: Vigia, Campina do Palha, *Pires* 4083 (NY); Gurupá, *Ducke* 16182 (US); Colares, *Poeppig* 2930 (NY); Belém, *Baldwin* 4557 (US). PARAÍBA: Areia, de *Moraes* 885 (NY). PARANÁ: Villa Velha, *Dusén* 14781 (GH, F); Morungaba, *Dusén* 16568 (GH); Tibagy, *Reiss* 75a (NY, F); Jaguaraiava, *Dusén* 16381 (GH), 16596 (MO). PERNAMBUCO: Tapera, *Pickel* 2403 (US). RIO DE JANEIRO: Cabo Frio, *Rose & Russell* 20693 (US); Tijuca, *Riedel* 1256 (US). SÃO PAULO: Butantan, *Hoebne* 137 (NY, GH); Iparanga, *Luederwaldt* 13323 (NY); Capivari, *Riedel* 1316 (US). WITHOUT PRECISE LOCALITY: Serra do Cipo, Conceicao, *Barreto* 8994 (F); Rio Claro and Poracutu, *Pohl* 2107 (NY); Socaja, *Mikan* s. n. (NY); Corrego Padre, *Pohl* 1997 (NY, F).

BRITISH GUIANA: Pirara, *Schomburgk* 381 (US); basin of Rupununi River, near mouth of Charwair Creek, A. C. *Smith* 2376 (MO, NY, US, F); Orealla savanna, *Berbice*, *Irwin* 330 (US); exact locality unknown, *Schomburgk* 240 (US).

COLOMBIA: ANTIOQUÍA: Hayo Rico, *Corres & Barkley* 18A200 (US); Medellín, *Archer* 644 (US); Bello, *Archer* 436 (US); San Antonio, Bro. *Daniel* 530 (US, F); Fredonia, Bro. *Tomas* 957 (US); El Prado, Bro. *Tomas* 1009 (US); El Carmen, Bro. *Daniel* 2310 (US). BOGOTÁ: Caqueza, *Traina* 4327 (US). BOYACÁ: Mt. Chepon, *Lawrence* 332 (NY, GH, F). CAUCA: Popayán, *Lehmann* 2855 (US); El Tambo, von *Sneidern* 1414 (NY, US); Albán, San José, *Arbeláez* 2382 (US); Valle del Cauca, *Traina* 4323 (NY); La Paila, *Holton* 955 (NY); Cuatro Esquinas, *Pennell & Killip* 6352 (US, NY). CUNDINAMARCA: La Esperanza, *Cuatrecasas* 2472 (US); San Francisco, *Garcia-Barriga* 10981 (US); Estación Santana, *Dugand & Jaramillo* 3831 (US, NY); Sasaima, Bro. *Ricardo* s. n. (US); Quetame, *André* 1113 (F); Soncha, *André* 1474 (F). HUILA: east of Neiva, *Rusby & Pennell* 1111 (NY); San Agustín, Bro. *Daniel* 4127 (US, F). MAGDALENA: Pueblo Bello, Valle Dupar, Bro. *Angel* 673 (US); Santa Marta, Jordan, H. H. *Smith* 58 (US, NY, GH, F); Jagua, *Allen* 688 (MO). META: Cabuyaro, *Sprague* s. n. (US); Las Lagartija, southwest of Uribe, *Fosberg* 19414 (US); Villavicencio, Bro. *Apollinaire* s. n. (US); El Mico airstrip, *Philipson, Idrobo & Fernandez* 1310 (US). NORTE DE SANTANDER: del Sarare, Río Cubucón, *Cuatrecasas* 18608 (US, F). SANTANDER: Río Casanare, Esmeralda, Los Llanos, *Cuatrecasas* 3824a (F). TOLIMA: Libano, *Pennell* 3351 (NY); west of San Lorenzo, *Pennell* 3491 (NY, US, GH); Mariquita, *Pennell* 3673 (US, NY, GH). EL VALLE: Samaria, on Río Timba, near Timba, *Fosberg* 20518 (NY, US); Las Neives, west of Cali, *Killip, Cuatrecasas & Dryander* 39200 (US, F); Pavas, *Pennell* 5505 (NY, GH), 5532 (GH, US); Dagua, *Arbeláez* 3015 (US); east of Zarzal, *Pennell, Killip & Hazen* 8461 (GH, NY, US); Santa Rosa, *Pennell & Killip* 6073 (US, NY); Río Cali, Pichindé, *Duque* 1650 (US); Cerro de Tres Cumbres, *Bermúdez & Barkley* 17C845 (US); Cartago, Cuchilla de Santa Bárbara, *Cuatrecasas* 22966 (US); El Forge, near Buenaventura, *Killip & Cuatrecasas* 38938 (US, F). VAUPÉS: Río Guaviare, San José del Guaviare, *Cuatrecasas* 7653a (US). WITHOUT PRECISE LOCALITY: no location given, *Mutis* 2345 (US), 2976 (US), 4683 (US).

ECUADOR: exact locality unknown, *Espinosa* 590 (US).

FRENCH GUIANA: vicinity of Cayenne, *Broadway* 709 (NY); west of Cayenne, *Cowan & Maguire* 38013 (NY); exact locality unknown, *Bentham* 20 (NY).

PARAGUAY: AMAMBAY: Sierra de Amambay, *Hassler* 12043 (NY, F). CAAGUAZA: Yhú, *Hassler* 9532 (NY, GH). CENTRAL: Cerros de Tobatí, *Hassler* 6454 (GH, NY). LA CORDILLERA: Cordillera de Altos, *Fiebrig* 405 (GH). SAN PEDRO: San Estanislão,

Hassler 6014 (GH, NY), *5996* (NY, GH), *7030* (NY, GH), *7081* (NY). WITHOUT PRECISE LOCALITY: Centurion, *Fiebrig 4397* (GH, US); Santa Elisa, *Hassler 2834* (MO, GH); Berghang, San Luis, *Fiebrig 4453-4413* (GH).

PERU: AYACUCHO: Aino, *Killip & Smith 22605* (NY, US). CUZCO: San Pedro, *Vargas 2576* (GH); Valle de Santa Ana, *Herrera 3614* (F). JUNÍN: Chanchosmayo Valley, *Schunke 1410, 1412, 1518* (F). SAN MARTÍN: near Moyobamba, *Klug 3638* (NY, GH, US, MO, F); Tarapoto, *Woytkowski 35097* (MO, F). TUMBES: La Palma, *Anderson 948* (US).

SURINAM: Republiek, *Kuyper 18* (US); Coppename River, *Volksberg, Pulle 279* (MO).

VENEZUELA: ANZOÁTEQUI: Los Caños, *Pittier 14472* (US); Río Cani, *Garroni 62* (US). BOLÍVAR: Gran Sabana, Hato Santo Teresa, *Tomayo 3202* (US); between Ciudad Bolívar and El Cristo, *Killip 37217* (US); Caño Piña, *Cardona 614* (US). COPEDES: San Carlos, *Rudd 331* (US). DISTRITO FEDERAL: Turmerito, *Killip 37138* (US, NY); Caracas, *Bailey & Bailey 97* (US); El Limón, *Williams 10540* (F). MÉRIDA: Tovar, *Fendler 297* (GH, MO); Montes de Zepa, *Lossen 314* (US). MONAGAS: between Caripe and San Agustín, *Steyermark, 61783* (MO, F). TRUJILLO: Carretera Trujillo-Boconó, *Tomayo 1846* (US); Escuque, *Pittier 13150* (NY, MO, US). ZULIA: Mene Grande, *Pittier 10588* (US). WITHOUT PRECISE LOCALITY: Tobay, *Gebriger 358* (MO); Entrada, *Warming 100* (US).

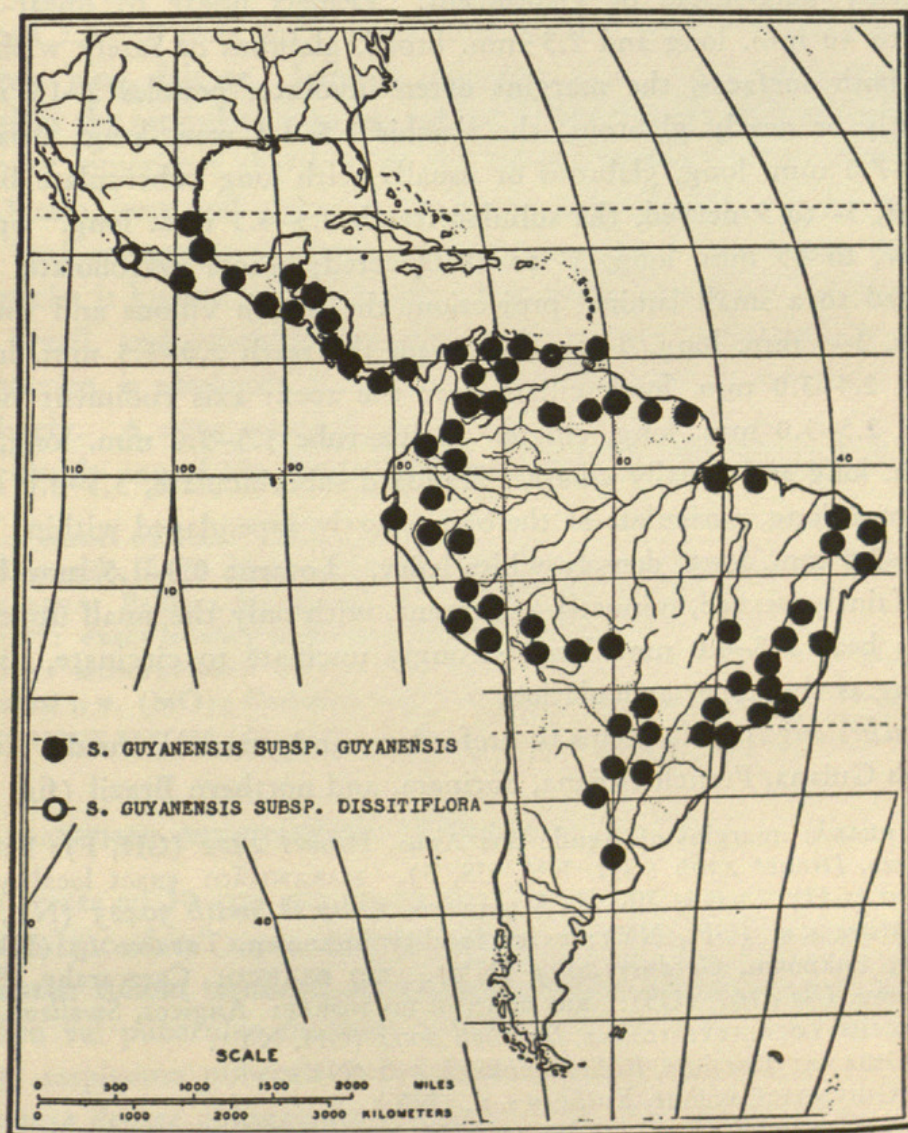


Fig. 6

- 16b. *STYLOSANTHES GUYANENSIS* ssp. *dissitiflora* (Robins. & Seat.) Mohlenbrock, stat. nov.

Stylosanthes dissitiflora Robins. & Seat. in Proc. Am. Acad. 28:105. 1893. (T: ^{Pringle} ~~Robinson~~ & ~~Seaton~~ 5172!)

Stylosanthes purpurata Blake, in Proc. Biol. Soc. Wash. 33:52. 1920. (T: Rose 2942!)

Stylosanthes eciliata Blake, in Univ. Calif. Publ. Bot. 10:409. 1924. (T: Purpus 9246!)

MEXICO: JALISCO: near Guadalajara, Rose & Painter 7478 (US, GH); southwest of Autlán, McVaugh 14222 (US); near Etzatlán, Rose & Painter 7543 (US, NY); Río Blanco near Guadalajara, Pringle 11433 (US, GH); near Guadalajara, Pringle 5172 (GH).

17. *STYLOSANTHES ANGUSTIFOLIA* Vog. in Linnaea 12:63. 1838, ex char. (T: Sellow s. n.)

Stylosanthes angustissima Klotzsch, in Schomburgk, Faun. Fl. Brit. Guin. 1200. 1840, ex char.

Astyposanthes angustifolia (Vog.) Herter, in Rev. Sudamer. Bot. 7:209. 1943.

Stems usually woody below, erect, much branched from the base, to 1 m. tall, slender, densely long-hispid or glabrescent. Leaflets linear to linear-lanceolate, acuminate, to 40 mm. long and 2.5 mm. broad, glabrous or rarely with scattered bristles on both surfaces, the margins often involute; petioles 2–16 mm. long, shortly bristly or nearly glabrous, the rhachis 1.5–3.5 mm. long; sheath of the stipules 3.5–7.0 mm. long, glabrous or usually with long tuberculate bristles and often villous, 5- to 9-nerved, the subulate teeth 2.5–4.5 mm. long. Spikes elongate, narrow, to 45 mm. long, 3- to 20-flowered; bracts unifoliate, the leaflet often reduced to a small laminal projection, the sheath villous and usually with long bristles, 3–4 mm. long, 9- to 11-nerved, the teeth 2.0–3.5 mm. long; outer bracteole 1, 2.5–3.0 mm. long, ciliate near the apex; axis rudiment none; inner bracteole 1, 2.5–3.0 mm. long, ciliate. Calyx tube 3.5–5.0 mm. long, the lobes 1.5–2.5 mm. long and usually ciliate. Standard suborbiculate, 3.5–4.0 mm. long; wings 3–4 mm. long, auriculate at the base, shortly appendaged within; keel petals falcate, 1.5–2.5 mm. long, densely white hairy. Loment 0.8–1.5 mm. broad, 2–3 mm. long, faintly nerved, minutely pubescent, with only the small upper articulation fertile; beak 2.5–4.0 mm. long, strongly uncinatate to circinate, usually over twice as long as the upper articulation.

Stylosanthes angustifolia seems to prefer low sandy areas in woods. It is known from British Guiana, French Guiana, Surinam, and northern Brazil (fig. 7).

BRAZIL: CEARÁ: margins of Açude Boa Agua, Drouet 2422 (GH, F); Bairro do Tanape, Fortaleza, Drouet 2366 (GH, NY, US, F). MARANHÃO: exact locality unknown, Gardner 6000 (GH). PARÁ: Ilha do Mosqueiro, Killip & Smith 30423 (NY, US); near Santarem, Spruce s. n. (GH, NY); exact locality unknown, Tavares 13 (NY). PIAUÍ: exact locality unknown, Gardner 2094 (NY). RIO BRANCO: Caracarahy, Froes 23664 (NY); Surumu, Ule 8161 (US). RIO GRANDE DO NORTE: Angicos, Swallen 4715 (US). WITHOUT PRECISE LOCALITY: tropics, Burchell 9004 (GH, NY).

BRITISH GUIANA: Roraima, R. Schomburgk 536 (NY).

FRENCH GUIANA: Cayenne, Rothery s. n. (NY).

SURINAM: Wayombo River, Linder 97 (GH, NY); Joden, Kegel 1113A (NY); Saron, Kegel 1113B (NY); Sectie Oest, Pulle 139 (US, MO); near Zanderij Island, Archer 2813 (US); exact locality unknown, Hostmann 1018 (NY, MO).

18. *STYLOSANTHES LEIOCARPA* Vog. in *Linnaea* 12:64. 1838. (T: *Sellow 4235!*)

Astyposanthes leiocarpa (Vog.) Herter, in *Rev. Sudamer. Bot.* 7:209. 1943.

Stems herbaceous to somewhat woody at the base, simple to much branched, ascending to suberect, nearly 0.5 m. tall, often viscid, densely and shortly bristly to glabrous near the base. Leaflets usually oblong, mucronulate at the apex, the terminal to 15 mm. long and 3 mm. broad, the lateral to 12 mm. long and 3 mm. broad, with short tuberculate-based bristles on both surfaces, with 2–4 pairs of very obscure veins not forming any submarginal nerve; petioles 3.5–4.5 mm. long, hispidulous, the rhachis 1.5–2.0 mm. long; stipular sheaths 4–6 mm. long, with 9–11 distinct veins, long-bristly, the subulate teeth 5–6 mm. long. Spikes 2.5–4.0 mm. long, 8- to 10-flowered; bracts unifoliolate, the leaflet hispid to short-bristly, the sheaths bristly, 3.5–4.5 mm. long with 7, rarely 9–11 veins, the teeth 2.5–3.5 mm. long; outer bracteole 1, 2.5–3.0 mm. long, ciliate near the tip; axis rudiment none; inner bracteole 1, 2.0–2.5 mm. long and ciliate. Calyx tube 2.5–3.0 mm. long, the lobes 2.0–2.5 mm. long and ciliate. Standard suborbiculate, 4–6 mm. long; wings 3.5–5.0 mm. long, auriculate, spurred within at the base; keel petals 3.5–4.5 mm. long, falcate. Loment reticulate with 1 or 2 additional longitudinal nerves besides the reticulate venation, about 2 mm. broad; both articulations fertile, or the upper sometimes abortive, or the lower abortive; upper articulation when fertile 2–3 mm. long and glabrous, the lower, when fertile, 1.5–3.5 mm. long and glabrous; beak somewhat uncinuate or nearly straight, 2.0–2.5 mm. long, glabrous.

The species is known only through a few collections from Uruguay, Paraguay, southern Brazil, and southern Colombia. A specimen collected by Arsène from Morelia, Mexico, is obviously *S. leiocarpa*, but this extreme extension of the range seems unlikely. A note penciled on the sheet by S. F. Blake in 1924 states that this is "probably one of the sheets distributed by Otto Weigel and is badly mixed."

BRAZIL: MINAS GERAES: Osorio, Morro Grande, *Rambo SI747* (US). RIO GRANDE DO SUL: São Leopoldo, *Leite 1909* (GH); São João do Monte Negro, *Bornmüller 657* (GH). SANTA CATARINA: Palhoca Massiambú, *Reitz & Klein 653* (US).

PARAGUAY: exact locality unknown, *Hassler 7575* (NY).

URUGUAY: MONTEVIDEO: Pooitos/Carrasco, *Herter 7669I* (GH, NY, MO, F); Montevideo, *Baratini s. n.* (MO); Carrasco, *Osten 6498* (US). SAN JOSÉ: Barra, *Herter 89069* (MO). WITHOUT PRECISE LOCALITY: Cabo Santa Maria, *Rosengurtt B247I* (NY).

19. *STYLOSANTHES cayennensis* Mohlenbrock, sp. nov.

Herba erecta ad 30 cm. alta caulibus parce ramosis glabris vel puberulis. Foliola elliptico-lanceolata supra glabra subtus punctulata puberula setosa nervis 4–6-gemmatis; foliolo terminali ad 12 mm. longo 3.5 mm. lato; petiolo 2–4 mm. longo glabro vel puberulo; rhachide 1–2 mm. longa; stipulae striatae vagina 3–6 mm. longa saepissime puberula processibus subulato-mucronatis setosis 3–5 mm. longis. Spicae densae oblongoideae floribus 3–10; bracteis plerumque unifoliolatis stipuliformibus vagina puberula vel setosa 3–6 mm. longa nervis 5; bracteola exteri-

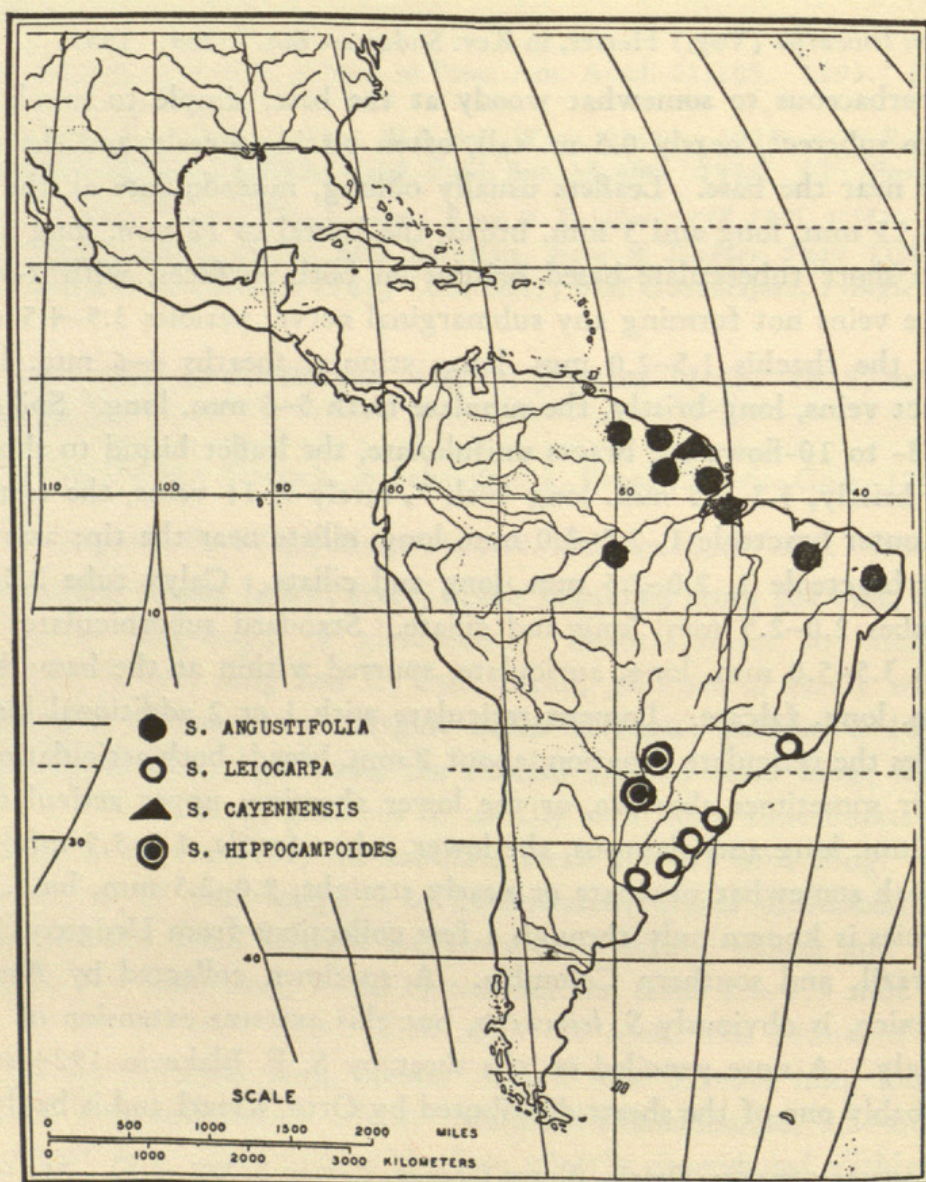


Fig. 7

ore 1, 2.5–3.0 mm. longa apice ciliata; axis rudimento nullo; bracteola interiore 1, 2.5–3.0 mm. longa apice ciliata. Calycis tubus 3.5–5.0 mm. longus glaber lobis 1.5–2.5 mm. longis. Corolla lutea; vexillo suborbiculato 4–5 mm. longo; alis falcatis 3.5–4.0 mm. longis; carina falcata 3.5–4.0 mm. longa. Lomentum 1.5–2.0 mm. latum reticulatum, articulo superiore 2 mm. longo glabro vel raro puberulo, articulo inferiore 1.5–2.0 mm. longo glabro, rostro circa 1 mm. longo valde uncinato vel circinato glabro.

Known only from wet habitats in the vicinity of Cayenne, French Guiana. It is related to *S. guyanensis* because of the glabrous lomentis and the short strongly uncinuate beak but differs in its bi-articulate lomentis.

FRENCH GUIANA: vicinity of Cayenne, *Broadway* 231 (US, NY, GH), 672 (NY, GH), 972 (GH, HOLOTYPE).

20. *STYLOSANTHES hippocampoides* Mohlenbrock, sp. nov.

Herba erecta ad 60 cm. alta caulibus parce ramosis setosis. Foliola lineari-lanceolata supra setosula subtus setosa nervis 3-4-gemmatis; foliolo terminali ad 15 mm. longo 2.5 mm. lato; foliolis lateralibus ad 15 mm. longis 2 mm. latis; petiolo 2-4 mm. longo puberulo vel setosulo; rhachide circa 1 mm. longa; stipulae striatae vagina 3-8 mm. longa glabra vel setosula processibus subulatis mucronatis setosis 3-5 mm. longis. Spicae densae ovatae floribus 2-6; bracteis plerumque unifoliolatis stipuliformibus vagina setosa 3-6 mm. longa; bracteola exterior 1, 2-3 mm. longa apice ciliata; axis rudimento nullo; bracteola interior 1, 2.0-2.5 mm. longa, apice ciliata. Calycis tubus 3.0-5.5 mm. longus glaber lobis 1.5-3.0 mm. longis. Corolla lutea; vexillo suborbiculato 3.5-5.5 mm. longo; alis falcatis 3-4 mm. longis; carina falcata 3.0-3.5 mm. longa. Lomentum circa 2 mm. latum valde reticulatum, articulo superiore 2.5-3.0 mm. longo glabro, articulo inferiore abortivo, rostro 2 mm. longo uncinato glabro.

Stylosanthes hippocampoides closely resembles *S. montevidensis* and *S. macrosoma*. *Stylosanthes hippocampoides* has conspicuously reticulate, glabrous loment about as broad as long and a 4- to 8-flowered inflorescence; *Stylosanthes macrosoma* has obscurely nerved, glabrous loment about twice as long as broad and a 2- to 6-flowered inflorescence; *Stylosanthes montevidensis* has a reticulate-nerved, pubescent loment about as broad as long and a 4- to 40-flowered inflorescence. The specific epithet is derived from the loment which superficially is shaped like the sea-horse (*Hippocampus*).

The species is infrequent in Uruguay and northern Argentina. Some specimens were included by Burkart in his *S. gracilis* var. *rostrata*. The presence of a distinct beak on the loment clearly distinguishes this species from *S. gracilis* of Burkart.

ARGENTINA: CÓRDOBA: Unquillo, *Cabrera s. n.* (F); Sierra Chica, *Kurtz s. n.* (NY); Sierra Achala, *Kurtz 8303* (NY, HOLOTYPE); Potrera de Loza, *Galander s. n.* (NY). CORRIENTES: Ituzaingo, Puerte Loreto, *Schuranz s. n.* (US); exact locality unknown, *Burkart 6743* (GH). MISIONES: Concepción, *Clos 2023* (GH).

URUGUAY: COLÓNIA: Riachuelo, *Herter 15562* (GH, US, NY, MO, F); exact locality unknown, *Clos 3231* (GH).

21. *STYLOSANTHES MACROSOMA* Blake, in Proc. Biol. Soc. Wash. 33:52. 1920. (T: *Morong 255!*)

Stylosanthes montevidensis f. *arenosa* Hass. in Fedde, Rep. Sp. Nov. 16:223. 1919, ex char.

Stems ligneous near the base, erect, branched, to 2 dm. tall, with soft white pubescence and some scattered tuberculate bristles. Leaflets narrowly elliptic, mucronate, acute, nearly glabrous above but with scattered bristles beneath, with 3-4 pairs of conspicuous veins forming a submarginal nerve; terminal leaflet to 14 mm. long and 2.5 mm. broad; petioles 3-5 mm. long, with scattered short bristles, the rhachis 1 mm. long or less; sheath of the stipules 4.5-5.5 mm. long, with scattered bristles, 11- to 15-nerved, the subulate teeth 3-4 mm. long. Spikes oblongoid to ovoid, 2- to 4-flowered; bracts unifoliolate, the leaflet 4-7 mm. long,

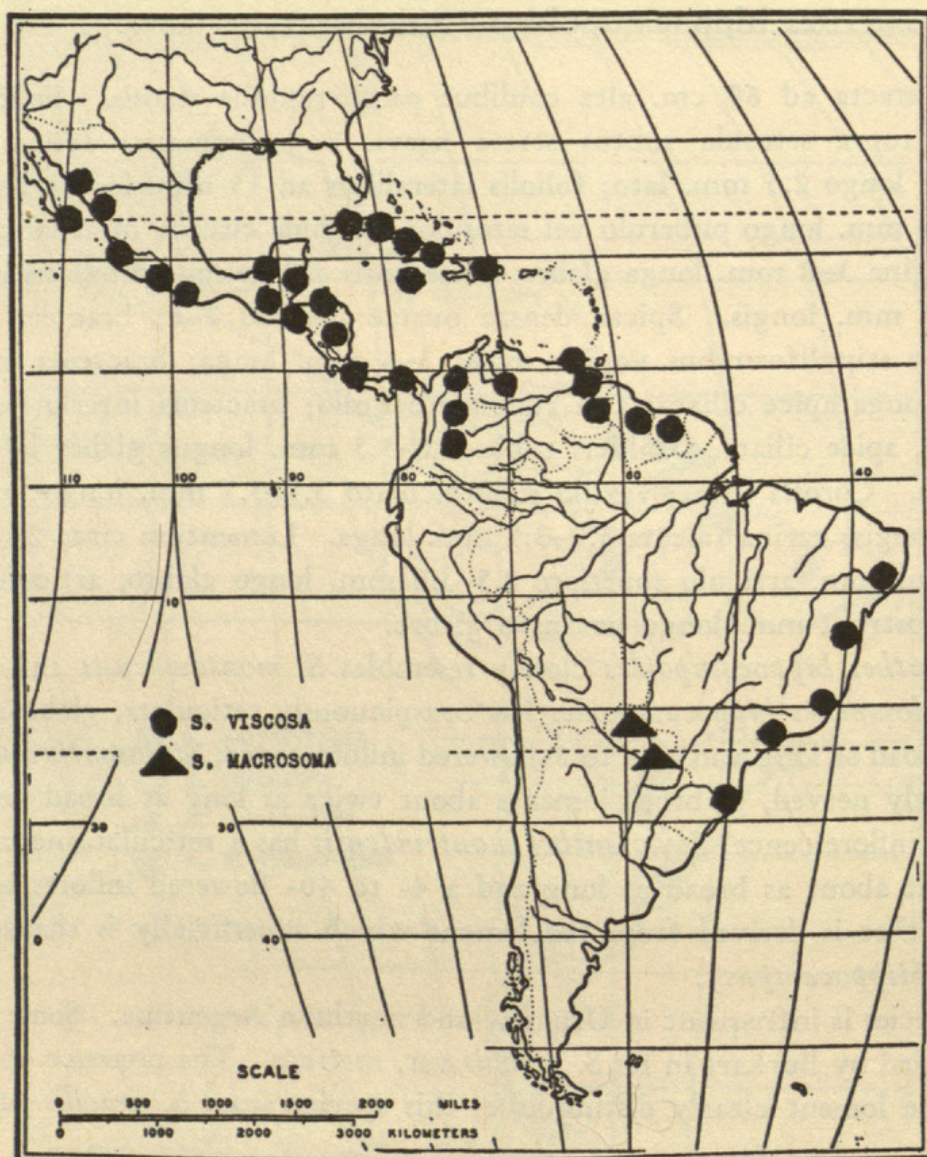


Fig. 8

the sheath 2.5–3.5 mm. long, 4.0 mm. broad, with scattered bristles and about 9 nerves, the teeth 3.5–4.0 mm. long; outer bracteole 3.0–3.5 mm. long, ciliate at the apex; axis rudiment none; inner bracteole 1, 1.0–2.5 mm. long, ciliate at the apex. Calyx tube 2.5–3.5 mm. long, the lobes 2–3 mm. long and ciliate. Standard suborbiculate, 4–5 mm. long; wings 3.5–4.5 mm. long, obovate, auriculate at the base and shortly appendaged within; keel petals 3–4 mm. long, subrostrate. Loment 2.0–2.5 mm. broad, weakly nerved; only the upper articulation of the loment fertile, 3.5–5.0 mm. long, glabrous except for some short hairs on the margin near the summit; beak strongly uncinuate to nearly coiled, 1.5–2.5 mm. long, less than half as long as the upper articulation.

The type was distributed as *S. guyanensis* although Morong noted on the collection label that it was not quite like other specimens of *S. guyanensis* which he had collected. Hassler named this species as a form of *S. montevidensis*.

PARAGUAY: ASUNCIÓN: exact locality unknown, Morong 255 (US, MO, GH, NY).
WITHOUT PRECISE LOCALITY: Hassler 7606 (GH, NY).

22. *STYLOSANTHES VISCOSA* Sw. in Prod. Veg. Ind. Occ. 108. 1788, ex char.

Hedysarum hamatum β L. Syst. Nat. 10:1170. 1759, ex char.

Stylosanthes glutinosa HBK. Nov. Gen. et Sp. 6:507. 1823, ex char.

Stylosanthes viscosa β *acutifolia* Benth. in Mart. Fl. Bras. 15¹:91. 1859, ex char.

Stylosanthes viscosa f. *typica* Hass. in Fedde, Rep. Sp. Nov. 16:220. 1919, ex char.

Stylosanthes prostrata M. E. Jones, in Contrib. West. Bot. 15:135. 1929. (T: Jones 24002!)

Stems ascending and spreading or prostrate and matted, much branched, to 1 m. long, densely pubescent with short viscid hairs. Leaflets to 25 mm. long, 5 mm. broad, usually much smaller, acute or obtuse, punctate beneath, shortly hairy or hispidulous, with 2–4 pairs of conspicuous veins; petioles 2.5–5.0 mm. long, hispidulous, viscid, the rhachis 1–2 mm. long; sheath of the stipules 3.5–5.5 mm. long, 1–2 mm. longer than the teeth, hispidulous and viscid on the back, 3- to 5-nerved. Spikes small, crowded, ovoid, 2- to 5-flowered; outer bracts usually trifoliolate, inner unifoliolate, the sheath equaling or slightly exceeding the teeth, hispidulous and viscid on the back, 5- to 7-nerved; outer bracteole 1, 2.5–3.0 mm. long, ciliate at the apex; axis rudiment none; inner bracteole 1, 2.5–3.0 mm. long, ciliate at the apex. Calyx tube 3–7 mm. long, glabrous to puberulent. Standard suborbiculate, 4–7 mm. long; wings 4–5 mm. long, auriculate, spurred within at the base; keel petals 3–4 mm. long, falcate. Loment to 2.5 mm. broad; only the upper articulation of the loment fertile, 2–4 mm. long, shortly hairy, reticulate-nerved; beak short, less than half as long as the upper articulation, usually about one-third to one-fourth as long, shortly hairy, strongly uncinat, often coiled.

Most specimens possess subacute or obtuse leaflets 5–15 mm. long. Some have acuminate leaflets 15–25 mm. long, and these have been segregated as var. *acutifolia*. This variation occurs throughout the entire range of the species, however, although most of the specimens with longer leaflets are found in the southern part of the range.

Stylosanthes prostrata of Baja California is merely a heavily viscid, prostrate form of *S. viscosa*.

Stylosanthes viscosa has been reported several times as an adventive along the western coast of Africa.

CUBA: CAMAGÜEY: Camagüey to Santa Ana, Britton 1960 (NY, US); south of Sierra Cubitas, Shafer 505 (NY). HABANA: Guanabacoa, Baker 2930 (NY); Gran Sierra, Clemente 2078 (NY); Loma de las Yatas, Ekman 574 (US); Loma de la Jata, Wilson & León 11643 (NY, US); exact locality unknown, Taber 1930 (NY). LAS VILLAS: Santa Clara, vicinity of Sancti Spiritus, Shafer 12120 (GH, NY, MO, US, F); 12 km. east of Cascajal, Howard 5578 (GH), 85534 (GH, NY); Cienfuegos, Combs 407 (GH, US, NY, MO, F); La Magdalena, Cayamas, Baker 2503 (NY, US); Manacas, Jack 8713 (NY). ORIENTE: El Cobre, Britton, Cowell & Shafer 12866 (NY, MO, US); Guantanamo Bay, Britton 1960 (NY, US); exact locality unknown, Wright 122 (GH, NY, MO). WITHOUT PRECISE LOCALITY: Linden s. n. (NY).

DOMINICAN REPUBLIC: SANTIAGO: El Rubio, Jimenez 1058 (US). SANTO DOMINGO: Monte Cristi, Ekman 12633 (US).

JAMAICA: Two-Mile-Wood, St. Catherine, Harris 12406 (GH, NY, MO, US, F); Lititz savana, Harris 12899 (GH, NY, MO, US, F); Abbey Green, Orcutt 2869 (US); Kingston, Hansen 1897 (NY); Spring Hill, Portland, Harris 6630 (NY, US, F).

EL SALVADOR: near Chalchuapa, *Calderón* 1008 (US, GH).

GUATEMALA: JALAPA: between Monjos and Jalapa, *Steyermark* 32209 (F). JUTIAPA: Cerro Colorado, *Standley* 76183 (F).

HONDURAS: COMAYAGUA: vicinity of Comayagua, *Standley & Chacón* 5385, 5403 (F); Siguatopeque, *Standley* 5627S (F, US). EL CAYO: exact locality unknown, *Gentle* 2245 (GH, F). MORAZÁN: Las Mesas, *Swallen* 10793 (US); west of Chaquito, near Río Yeguare, *Standley* 22948 (US); San Antonio, *Rodríguez* 667 (F). EL PARAÍSO: Quebrada de Dantas, *Standley, Williams & Molina* 1289 (F); Yuscarán, *Molina* 1658 (F).

MEXICO: BAJA CALIFORNIA: San José del Cabo, *Jones* 24002 (GH, NY, MO, US, F), 27236 (GH, US); Todos Santos, *Jones* 24769 (MO, NY, F); Cape San Lucas, *Rose* 16364 (NY, US). CHIAPAS: Hacienda Monserrate, *Purpus* 9126 (US); between Tapaná, Oaxaca, and Tomala, *Nelson* 2945 (US), 2950 (US). COLIMA: east side of Manzanillo Bay, *Ferris* 6199 (US). GUERRERO: 4 miles north of Acapulco, *Barkley, Rowell & Westlund* 30 (F); Acapulco, *Palmer* 10 (GH, MO). JALISCO: San Sebastian, northeast of Hacienda del Cura, *Mexia* 1373 (GH, MO). SINALOA: Río Florido, *Debesa* 1525 (US); Santa Lucia Concordia, *Debesa* 1632 (US). SONORA: Alamos, *Rose, Standley & Russell* 12693 (GH, US, F); Alamos, Río Puerte, *Gentry* 2934 (GH, MO, US, F). TABASCO: Achotal, Balancán, *Matuda* 3041 (F, NY), 3047 (NY, F). ZACATECAS: near San Juan Capistrano, *Rose* 2467 (GH, US).

NICARAGUA: Volcán El Viejo, *Oersted* 4740 (F).

PANAMA: PANAMÁ: vicinity of San Carlos, *Allen* 1143 (GH, US, MO, NY).

BOLIVIA: COCHABAMBA: Ayopaya, Sailopata, *Cardena* 3186 (F). WITHOUT PRECISE LOCALITY: São Yungas, *Büchti* 210 (US); Urupana, *White* 942 (NY).

BRAZIL: BAÍA: Mt. Peludo, *Curran* 391 (GH, US, F); Machado Portela, *Rose & Russell* 19956 (US); Ilha de Itaparica, *Pires* 3421 (NY); Busca Vida, *Bondar* 2598 (F). DISTRITO FEDERAL: Ipanema, *Barreto* 5600 (F). MINAS GERAES: Lassance, Pirapora, *Cochran s. n.* (US); Tejuco, *Vauthier* 163 (GH); Ilheos, *Riedel* 211-212 (GH, US). PERNAMBUCO: Prazeres, *Pickel* 980 (GH, US, NY); Tapera, *Pickel* 186 (F). RIO DE JANEIRO: near Rio de Janeiro, *Burchell* 4109 (GH), 1174 (GH, NY); Copacabana, *Glaziou* 5817 (NY). SANTA CATARINA: Laguna, *Reitz & Klein* 4677 (US). SÃO PAULO: Campiña, *Krug & Zagatto* 2191 (US); Butantan, *Gehrt* 25239 (NY).

BRITISH GUIANA: Berbice (or Demerara) Co., *Abraham* 89 (NY); exact locality unknown, *Schomburgk* 178 (US, NY).

COLOMBIA: CUNDINAMARCA: Melgar, *Pennell* 3608 (GH, US, NY, F). HUILA: east of Neiva, *Rusby & Pennell* 1083 (GH, US, NY), 1042 (NY). MAGDALENA: Rincón Hondo, *Allen* 405 (MO). SANTANDER: Lebrija, *Molina* 376 (US). TOLIMA: Doima, *Haught* 2444 (MO, US, F, NY); Honda, *Pennell* 3608 (GH, US, NY, MO).

PARAGUAY: LA CORDILLERA: Ypacaray, *Hassler* 11576 (GH, US, NY, MO). WITHOUT PRECISE LOCALITY: between Río Apa and Río Aquidaban-mí, *Fiebrig* 4384-4082 (GH, US).

SURINAM: Zanderij Island, *Maguire & Stabel* 23733 (NY, US, F); Sectie Oest, *Stabel & Gonggrüp* 523 (US); Corantijn River, *Rombouts* 166 (NY).

VENEZUELA: BOLÍVAR: Island of Margarita, Pt. Mosquito, *Johnston* 249 (GH); between Ciudad Bolívar and El Cristo, *Killip* 37234 (US); between Upata and Río Caroní, *Steyermark* 57563 (MO, F). NUEVA ESPARTA: Cocke Island, *Johnston* 6 (US, GH). TRUJILLO: Loma de Moron, near Valera, *Pittier* 10721 (GH, US, NY).

23. *STYLOSANTHES figueroae* Mohlenbrock, sp. nov.

Herba humistrata vel suberecta basi ramosissima ad 20 cm. longa caulibus glabris vel puberulis. Foliola elliptico-ovata puberula nervis 3-5-gemmatis; foliolo terminali ad 10 mm. longo 5 mm. lato; foliolis lateralibus ad 10 mm. longis; petiolo 1-3 mm. longo glabro vel puberulo; rhachide 0.5-1.5 mm. longa; stipulae striatae vagina 3-7 mm. longa glabra vel puberula processibus subulatis mucronatis 3-5 mm. longis. Spicae parvae oblongoideae floribus 2-7; bracteis plerumque uni-

foliolatis stipuliformibus vagina puberula 3–6 mm. longa nervis 3–7; bracteola exteriore 1, 2.5–4.0 mm. longa apice ciliata; axis rudimento nullo; bracteola interiore 1, 2.0–3.5 mm. longa apice ciliata. Calycis tubus 3.5–5.5 mm. longus glaber lobis 1.5–2.5 mm. longis. Corolla lutea; vexillo suborbiculato 4.0–5.5 mm. longo; alis falcatis 3.5–4.5 mm. longis; carina 3.5–4.5 mm. longa. Lomentum pubescens circa 2 mm. latum reticulatum; articulo superiore 2.5–3.0 mm. longo puberulo; articulo inferiore abortivo; rostro 2.0–2.5 mm. longo uncinato puberulo.

Stylosanthes figueroae is distinguished from other members of its section by the pubescent loment with only one fertile articulation. It most nearly resembles *S. humilis* from which it differs in having the beak of the loment one-half to two-thirds the length of the upper articulation, rather than two to six times as long.

This species is known only from the vicinity of Cali, Colombia.

COLOMBIA: CAUCA: Cali, *Figueroa* 897 (US, HOLOTYPE); Cauca, *Triana s. n.* (NY).

24. *STYLOSANTHES MONTEVIDENSIS* Vog. in *Linnaea* 12:67. 1838. (T: *Sellow s. n.*!)

Stylosanthes juncea Micheli, in Mem. Soc. Phys. Genève 28:7. 1883, ex char.

Stylosanthes juncea var. *setosa* Chod. & Hass. in Bull. Herb. Boiss., ser. 2, 4:884. 1904, ex char.

Stylosanthes montevidensis var. *juncea* (Mich.) Hass. in Fedde, Rep. Sp. Nov. 16:223. 1919.

Stylosanthes montevidensis f. *glabrata* Hass. in Fedde, loc. cit. 1919. (T: *Hassler 2709*!)

Stylosanthes montevidensis f. *setosa* Hass. in Fedde, loc. cit. 1919, ex char.

Stylosanthes montevidensis f. *typica* Hass. in Fedde, loc. cit. 1919, ex char.

Stylosanthes linearis Blake, in Jour. Wash. Acad. Sci. 14:287. 1924. (T: *Jørgensen 2693*!)

Stylosanthes gracilis var. *rostrata* Burkart, in Darwiniana 3:251. 1939, ex char.

Stylosanthes montevidensis var. *beterophylla* Burk. loc. cit. 260. 1939, ex char. (T: *Dusen s. n.*)

Astyposanthes montevidensis (Vog.) Herter, in Rev. Sudamer. Bot. 7:210. 1943.

Stems usually erect, to 1 m. tall, slender to robust, simple or often sparsely branched, glabrous to puberulent above or rarely throughout, usually with scattered long bristles. Leaflets lanceolate to linear, acute and mucronulate, glabrous to shortly hairy or occasionally with bristles along the costa beneath, with 2–4 pairs of conspicuous veins forming a submarginal nerve; terminal leaflet to 4 cm. long and 3 mm. broad, the lateral ones to 3 cm. long and 2.5 mm. broad; petioles 2.5–7.0 mm. long, glabrous, hispidulous, or short-bristly, the rhachis about 1 mm. long; sheath of the stipules 5–11 mm. long, sparsely bristly or densely short-hairy or rarely glabrous and with 13–21 often conspicuous nerves, the subulate teeth 3.0–7.5 mm. long, averaging about 4 mm. shorter than the sheath. Spikes globose, very small and few-flowered to large and over 40-flowered; bracts unifoliate, the leaflet 2–5 mm. long, the sheath 2.5–4.5 mm. long, 2.5–5.0 mm. broad, ciliate along the margins or occasionally with a few bristles near the apex, usually 7-nerved, the teeth 1–4 mm. long; outer bracteole 1, 3–4 mm. long, ciliate at the apex; axis rudiment none; inner bracteole 1, 2–3 mm. long, often bifid, ciliate at the apex. Calyx tube 2–5 mm. long, the lobes 2–3 mm. long. Standard suborbiculate, 4.0–6.5 mm. long; wings 3.5–5.0 mm. long, auriculate at the base; keel petals 3.5–4.5

mm. long, falcate. Loment 2–3 mm. broad, reticulate-nerved; only the upper articulation fertile, 3.0–5.5 mm. long, densely short hairy, at least near the apex; beak strongly uncinat, densely short hairy, 1.5–2.5 mm. long, one-half to one-third as long as the upper articulation.

The variability of the species is attested to by the many varieties and forms which have been proposed. Many of these are based on tenuous characters, and there is no line of demarcation separating any of them. Micheli proposed *S. juncea* as a new species on the basis of the stem usually 4 mm. or more in diameter as opposed to 2 mm. for *S. montevidensis*. Hassler divided the *S. montevidensis* complex into two forms of "typical" *S. montevidensis* and two forms of var. *juncea*, recognizing the latter as a variety, even though stating that it was merely a robust form.

Blake described *S. linearis* in § STYLOSANTHES because of the presence of an axis rudiment 0.3–0.8 mm. long. This character was not discovered in the present study of the type. Blake also noted the presence of 2 bractlets (= inner bracteoles), but there is actually only 1 deeply bifid inner bracteole.

The size of the inflorescence is exceedingly variable, specimens at one extreme having spikes 2- to 5-flowered while those at the other extreme have spikes over 40-flowered.

Stylosanthes montevidensis is recognized from other members of its section by the one fertile pubescent articulation with the circinate beak about one-half as long as the articulation.

A specimen collected by Calderón from El Salvador in all probability is adventive although the species does extend from Argentina to Colombia.

EL SALVADOR: near Chalchuapa, *Calderón 1051* (NY, US).

ARGENTINA: CHACO: Resistencia, *Margarita Belen, Aguilar 1163* (MO); Las Palmas, *Jørgensen 2693* (GH, US, MO). CÓRDOBA: Sierra Chico, *Lossen 173* (GH, MO, F). CORRIENTES: San Martín, La Cruz, *Ibarrola 1770* (US); Estancia, Santa Teresa, *Pedersen 111* (US); Empedrado, *Pedersen 908* (US). CRUZ ALTA: Campi Alegre, *Schreiter 4078* (F). JUJUY: Capital, Quebrada de Chañi, *Schreiter 11083* (GH). MISIONES: Candelaria, Garupa, *Bertoni 2382* (F); Apóstoles, *Clos 1911* (GH). SALTA: Guachipas, Alemania, *Venturi 9957* (GH, US, MO). SANTA FÉ: Reconquista F.C.S.F., *Burkart 5883* (GH). TUCUMÁN: Burruyaco, *Venturi 2616* (GH, US) Las Cejas, *Venturi 2117* (US); Campa Alegria, *Venturi s. n.* (US). WITHOUT PRECISE LOCALITY: Cafí, Cancillo, *Venturi 5992* (US); La Granja, *Ekman 1743* (NY, US, MO).

BOLIVIA: LA PAZ: La Paz, *Bang s. n.* (US). SANTA CRUZ: Sara, Buena Vista, *Steinbach 6922* (GH, MO, F), *5243* (GH), *3219* (F), *6614* (F).

BRAZIL: PARANÁ: Serrinka, *Dusén 16261* (GH), *13718* (NY, US). RIO GRANDE DO SUL: Porto Alegre, *Malme 726* (F). SANTA CATARINA: Sombrio, *Collector Unknown C1397* (GH). SÃO PAULO: Capital, *Pickel 5499* (US). WITHOUT PRECISE LOCALITY: Turnig, *Dusén 9147* (US).

COLOMBIA: META: San Martín, *Dryander 3038* (US).

PARAGUAY: CENTRAL: Caballero, *Morong 399* (NY, US, MO). PRESIDENTE HAYES: Santa Elisa, *Hassler 2709* (GH, MO). WITHOUT PRECISE LOCALITY: Estancia Primera, *Jørgensen 4817* (NY, US, MO, F); Coro de Altos, *Hassler 1798* (NY), *1799* (NY).

URUGUAY: CANALONES: Atlantida, *Rosengurtt B2830* (NY). CERRO LARGO: Río Negro, Palleros, *Rosengurtt B79* (NY). COLÓNIA: Arroyo de Pintos, Artilleros, near Puerto Platero, *Bartlett 21194* (GH). CONCEPCIÓN: Quinta del Colegio, *Lorentz s. n.* (US). SALTO: San Antonio, *Osten 5375* (US); San Antonio, *Rosengurtt B1070* (GH, F).

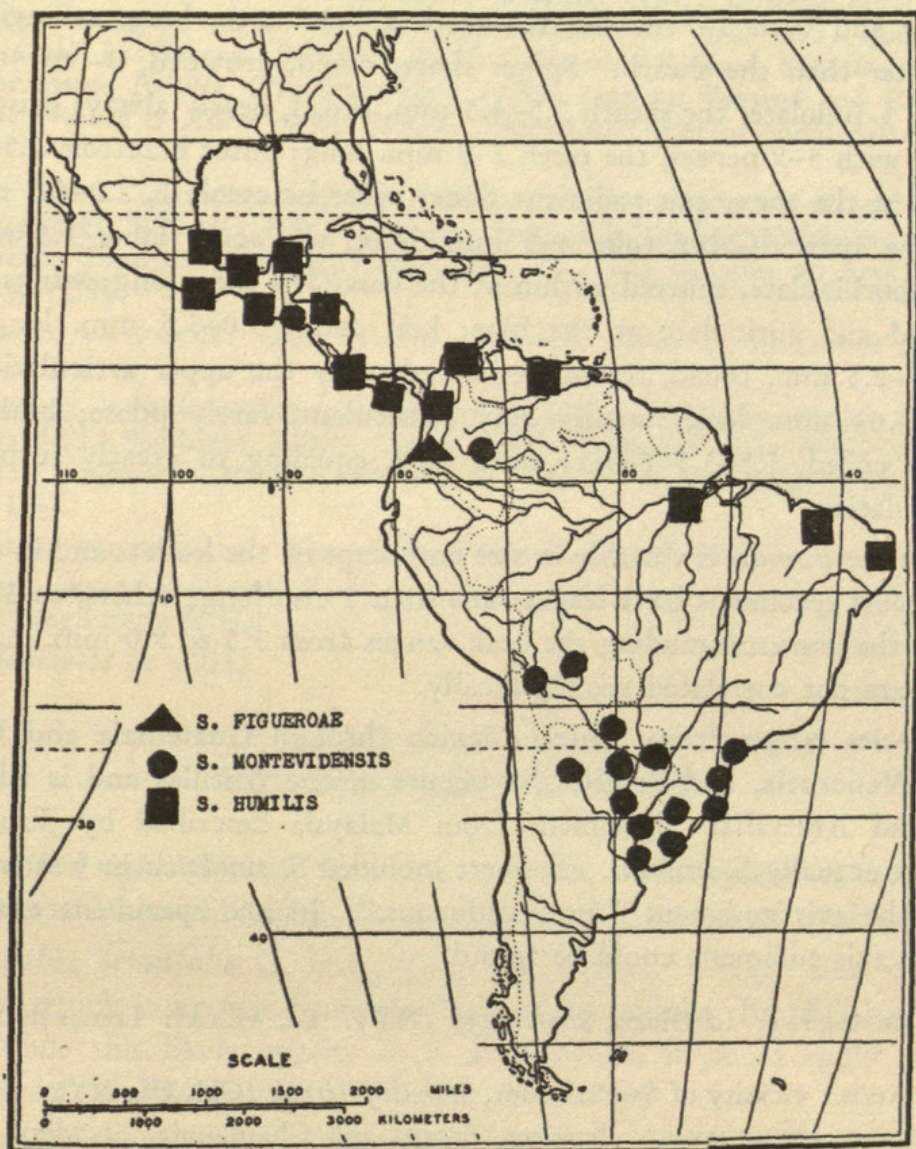


Fig. 9

25. *STYLOSANTHES HUMILIS* HBK. Nov. Gen. et Sp. 6:506. 1823, ex char.

Stylosanthes sundaica Taub. in Verh. Bot. Brand. 32:21. 1890, ex char.

Astyposanthes humilis (HBK.) Herter, in Rev. Sudamer. Bot. 7:209. 1943.

Stems usually ascending or sometimes prostrate, herbaceous to subligneous at the base, to 0.5 m. tall, branched, usually with short white hairs along one side of the stem, often with scattered short bristles, rarely nearly glabrous except near the base, the pubescence usually more dense immediately beneath each node. Leaflets lanceolate or sometimes elliptic, often mucronate, acute, short bristly-ciliate to nearly glabrous, with 3–4 pairs or usually conspicuous veins; terminal leaflet to 15 mm. long (rarely to 30 mm. long) and 3.5 mm. broad, the lateral ones to 11.5 mm. long and 3.0 mm. broad; petioles 2.5–5.0 mm. long, shortly hairy and often with scattered bristles, the rhachis 1–2 mm. long; sheath of the stipules 3–5 mm. long,

short-bristly and with 5–7 nerves, the teeth 2.5–3.5 mm. long, averaging about 1 mm. shorter than the sheath. Spikes short, ovoid, crowded, 3- to 4-flowered; bracts 1- to 3-foliate, the sheath 2.5–4.5 mm. broad, nearly always bristly, rarely only ciliate, with 5–9 nerves, the teeth 2–3 mm. long; outer bracteole 2.5–3.0 mm. long, ciliate at the apex; axis rudiment none; inner bracteole 1, 2.0–2.5 mm. long, ciliate at the apex. Calyx tube 4–5 mm. long, the acute lobes 1.5 mm. long. Standard suborbiculate, spurred within at the base, 3–4 mm. long; wings 3–4 mm. long, clawed and auriculate at the base; keel petals 3.0–3.5 mm. long, falcate. Loment 1.5–2.5 mm. broad, reticulate-nerved; only the upper articulation fertile, 1.5–2.5 (–4.0) mm. long, usually only puberulent, rarely pilose; beak strongly uncinatate to coiled, 1.5–3.5 (–5.5) mm. long, equaling to greatly surpassing the upper articulation.

Stylosanthes humilis is variable in size and shape of the leaflets and in size of the loments. Most specimens have leaflets less than 1 cm. long; others, to 3 cm. long. The size of the loment including the beak ranges from 3.5 to 9.0 mm. long. These differences are not correlated geographically.

The species ranges from central Mexico through Guatemala and Panama to Colombia, Venezuela, and Brazil; also occurs in the Antilles and is adventive in Malaysia and Australia. Specimens from Malaysia described by Taubert as *S. sundaica* are actually *S. humilis*. Taubert included *S. sundaica* in § STYLOSANTHES but with the axis rudiment "most caducous." In the specimens examined, no trace of an axis rudiment could be found.

CUBA: CAMAGÜEY: La Gloria, *Shafer* 239 (NY). LAS VILLAS: Lomas de Bañao, *Luna* 730 (NY).

EL SALVADOR: vicinity of San Salvador, *Standley* 19399 (GH, US, NY).

GUATEMALA: CHIQUIMULA: between Zacapa and Chiquimula, *Standley* 73693 (F); near Chiquimula, *Standley* 73862 (F); north of Quezaltepeque, *Steyermark* 31372 (US, F). ESCUINTLA: Río Guacalate, *Standley* 58237 (NY, F). GUATEMALA: near Guatemala and Fiscal, *Standley* 59788 (F). JALAPA: vicinity of Jalapa, *Standley* 76411 (F). JUTIAPA: between Jutiapa and Plan de Urrutia, *Standley* 75455, 74910, 75652 (F); between Agua Blanca and Amatillo, *Steyermark* 30457 (F), 30450 (F). QUICHÉ: exact locality unknown, *Aguilar* 1407 (F). SANTA ROSA: plains of Llano Entero, southeast of Chiquimulilla, *Standley* 78796 (F); south of Guezacapan, *Standley* 79431 (F); near Cuilapa, *Standley* 77942 (F); Chupadero, *Heyde & Lux* 4162 (GH, US). ZACAPA: vicinity of Zacapa, *Standley* 74588, 73589 (F); between La Fragna and Estanzuela, *Steyermark* 29126 (F).

HONDURAS: MORAZÁN: Río Yeguaré, *Williams & Molina* 16967 (GH, US, F); Agua Amarilla, *Williams & Molina* 11027 (F); El Zamorano, *Rodríguez* 1257, 2163 (F). EL PARAÍSO: exact locality unknown, *Standley* 13600 (NY, US, F). YORO: near Progreso, *Standley* 55048 (US, F).

MEXICO: CHIAPAS: Jalisco, *Purpus* 9138 (US). COLIMA: Colima, *Palmer* 108 (US). GUERRERO: Cutzamala, Cayuca, *Hinton* 6985 (NY, US, F); Acapulco, *Palmer* 25 (GH, US, NY, MO, F). JALISCO: Tecoman, *Orcutt* 4447 (MO, GH, F); Barranca de Portillo, *Barnes & Land* 240 (GH, US, F). MÉXICO: Temascaltepec, Tejupilco, *Hinton* 1932 (US), 1931 (GH), 4767 (GH, US). MICHOACÁN: Apatzingán, Aguililla, *Hinton* 5289 (US, GH, NY). OAXACA: San Gerónimo, *Mell* 2117 (NY). VERA CRUZ: Acasonica, *Purpus* 8894 (GH, US, MO); Zacuapán, *Purpus* 2331 (GH, US, NY, MO, F); Minatitlán, *J. G. Smith* 408 (MO).

PANAMA: CANAL ZONE: Corozal, *Standley* 27403 (US); between Fort Clayton and Corozal, *Standley* 29191 (US). COCLÉ: Aguadulce, *Pittier* 4837 (US), 4983 (GH, NY, US). PANAMÁ: Las Sabanas, *Standley* 41178 (US); near Panamá, *Standley* 26794, 27730 (US); near Punta Paitilla, *Standley* 26293 (US); between Panamá and Chêpo, *Dodge, Hunter, Steyermark & Allen* 16700 (MO). VERAGUAS: west of Soná, *Allen* 1054 (GH, US, MO).

BRAZIL: BAÍA: (data not legible) (MO). CEARÁ: Acude São Bento, Maranguape, *Drouet* 2194 (GH, NY, MO, US, F). PARÁ: Boim, Rio Tapajoz, *Kuhlmann* 18223 (US). PERNAMBUCO: Tapera, *Pickel* 3036 (GH, US, F). RIO GRANDE DO NORTE: Angicos, *Swallen* 4737 (US).

COLOMBIA: ANTIOQUIA: exact locality unknown, *Gutierrez, Klevens & Barkley* 1463 (US).

VENEZUELA: GUARÍCO: between La Encrucijada and Misión Abajo, *Pittier* 14925 (US); Mesa de El Sombrero, *Pittier* 12489 (MO). MÉRIDA: near Tovar, *Fendler* 1793 (GH, MO). TRUJILLO: Dividine, *Pittier* 10823 (US). ZULIA: Maracaibo, *Pittier* 10698 (NY, GH, US).

AUSTRALIA: QUEENSLAND: Townsville, *White* 8818 (NY, US).

MALAYSIA: BALI: Tedjazolla, *deVoogd* 2061 (GH). NOESA PENIDA: Sampelan near Tanglad, *deVoogd* 2397 (GH).

JAVA: *Horsfield* 91 (GH).

EXCLUDED OR DUBIOUS SPECIES

Stylosanthes rigida Spreng. Syst. 3:310. 1826. This species is described by a single phrase which could well apply to a number of species of *Stylosanthes*.

Stylosanthes tenuifolia G. Don, Gen. Syst. 2:281. 1832. Don distinguishes this species, which is known from the "Isle of Maranham, Brazil," by its narrow leaflets. While this likely applies to *S. angustifolia*, it could apply to narrow-leaflet forms of *S. guyanensis*.

Stylosanthes suborbiculata Chiov. Ann. di Bot. 13:381. 1915. The type for this species (*Paoli* 239), collected in 1913 in Somaliland, has not been seen and is therefore excluded from the systematic treatment. Chiovenda describes it as without an axis rudiment which distinguishes it from all other African species of *Stylosanthes* except *S. viscosa* which is adventive along the western coast of Africa. A photograph of *S. suborbiculata* may be found in Result. Sc. Miss. Stefan.-Paoli Somal. Ital. t. 8 (1916) but this is of little value in determining the exact status of the species.

Stylosanthes rupestris Stuck. ex Seckt, Rev. Univ. Nac. Córdoba 17³⁻⁴:145. 1930. This is a *nomen nudum* with only the location given by the author—Sierra (Malaguena), Argentina.

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Italicized numbers refer to collectors' numbers, *s. n.* (*sine numero*) to unnumbered collections; parenthetical numerals refer to the numbers assigned to the species in this monograph.

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