

NOTES ON THE GENUS *SARCORHACHIS* Trel, (PIPERACEAE)

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In 1927 Trelease (Contr. U.S. Nat. Herb. 26, 2: 16) established the genus *Sarcorhachis*, based upon *Piper incurvum* Sieber ex C. DC. of the West Indies. He differentiated it from the genus *Piper* mainly by its axillary spikes arising from the same side of the leaf axil instead of opposite the leaf insertion, as in the genus *Piper*. From the genus *Pothomorphe* Miq. it was distinguished by having the spikes solitary in the leaf axils instead of borne several on a common peduncle. In Trelease and Yuncker's *The Piperaceae of Northern South America* (Vol. 1: 5. 1950), *Sarcorhachis* is moreover differentiated from *Trianaeopiper* by having four instead of three stigmas, by the scandent habit, and by the fruit partly immersed in and coalescent with the somewhat fleshy rachis at maturity, whereas in *Trianaeopiper* the fruit and rachis are scarcely coalescent.

Relatively few species of the genus *Sarcorhachis* are known. Although various scandent taxa have been described, they have been placed mainly in the genus *Piper* proper. One species of *Sarcorhachis*, *S. incurva* (Sieb.) Trel., is known from the West Indian islands of Martinique and Guadeloupe. Two taxa, *S. anomala* Trel. and *S. naranjoana* (C.DC.) Trel., have been described from Costa Rica and

Panamá, but are conspecific, while three other taxa, *S. obtusa* (Miq.) Trel., *S. schwackei* Yunck., and *S. sydownii* Trel. & Yunck., are known from southern Brazil, northern Ecuador, and southwestern Colombia.

In 1945 the genus was first collected in Venezuela from the eastern sector of the Coastal Cordillera in the states of Anzoátegui and Monagas by the author, but, due to the sterile condition of the collections, it was not possible to assign the material to any given taxon. In 1959 Dr. Leandro Aristeguieta of the Instituto Botánico of the Ministerio de Agricultura y Cría of Caracas, sent additional sterile material for identification to Dr. Yuncker, who assigned it tentatively to *S. Sydownii*. Eventually the author in 1966 collected the first fertile material in Venezuela, which indicates that it can be differentiated specifically from the other known taxa and is described below in the present work.

A study of the various taxa pertaining to *Sarcorhachis* indicates that they are closely related to one another and are separated mainly by slight differences. Moreover, a study of the fertile material collected in Venezuela tends to break down some of the presumed generic criteria by which *Sarcorhachis* is separated. For example, the spikes in *Sarcorhachis* are described as being axillary as well as solitary. However, in the Costa Rican *S. anomala*, and the Brazilian *S. obtusa*, the spikes are sometimes terminal. In *S. Sydownii* of Ecuador and Colombia they are both axillary and terminal, and on some of the fertile branches of the Venezuelan taxon, as well as of *S. sydownii*, the spikes may occur in pairs instead of being solitary. Paired peduncled spikes arising from a single axil have also been seen on a portion of a fertile branch of the specimen of *Duss 2565-C* of *Sarcorhachis incurva* of the West Indies. Moreover, the character of having four stigmas assigned to *Sarcorhachis*, breaks down in the Venezuelan material, in which the spikes have mainly five, rarely four, stigmas, as well as in some collections of *S. naranjoana*. Since some of the generic characters originally used by Trel. have been found to break down, doubt is thereby cast upon the taxonomic validity of the genus. The need for intensive collecting of fertile material throughout the range of the genus is evident. More numerous collections made in the future should clarify our present poor state of knowledge, not only as to the specific delimitations, but serve as well to mediate judgment and conclusions on the generic status of *Sarcorhachis*.

The principal character which serves to maintain *Sarcorhachis* in a category generically apart from both *Piper* and *Ottonia* is that of having the spikes arise in the actual axils of the leaves instead of leaf-opposed as in *Piper*. Furthermore, the solitary or paired spikes of *Sarcorhachis* differentiate it from *Pothomorphe*, in which the spikes are several on a common peduncle, while the possession of four or five stigmas serves to separate it from *Trianaopiper*, which has only three stigmas. Despite the statement by Trelease and Yuncker of "spikes solitary, axillary" in their generic description of *Sarcorhachis* (*The Piperaceae of Northern South America*, p. 421), nevertheless in their description of *S. sydowii* it is stated "spikes solitary in the upper leaf axils or terminal and subtended by a much reduced leaf", as shown by a specimen of *Cuatrecasas 16850* from Colombia with both terminal and axillary inflorescences.

In view of the above exceptions, it becomes necessary to emend the generic description of *Sarcorhachis* to allow for the characters found at variance with the original description.

Sarcorhachis Trelease, *emendato* Steyermark.

Spicae solitariae vel binae in axillis foliorum insertae, plerumque axillares vel interdum terminales haud oppositifoliae. Stigmata quatuor vel quinque.

Type species. *S. incurva* (Sieber) Trelease.

Key to the Species of Sarcorhachis

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| 1. Leaf apex rounded or obtuse. | 2. <i>S. Obtusa</i> |
| 1. Leaf apex acute to acuminate. | |
| 2. Spikes terminal only. | 6. <i>S. naranjoana</i> . |
| 2. Spikes usually axillary, sometimes terminal. | |
| 3. Leaves broadly ovate or elliptic-ovate, manifestly longer than broad. | 1. <i>S. convallariodorum</i> . |
| 3. Leaves suborbicular to suborbicular-ovate, about as broad as long or only slightly longer than broad. | |

4. Rachis ridge glabrate or nearly so; stigmas usually 5, rarely 4. 3. *S. venezuelana*.
4. Rachis ridge more or less densely puberulent; stigmas usually 4, rarely 5.
5. Innermost (uppermost) nerves of leaf blades arising 15-30 mm. above base of blade; petiole vaginate-winged from 10-15 mm. up midrib from base of blade; leaf blades 9-18 x 8-15 cm. 4. *S. sydowii*.
5. Innermost (uppermost) nerves of leaf blades arising 2-15 mm. above base of blade; petiole vaginate-winged from 2-10 mm. up midrib from base of blade; leaf blades 7-12 x 5-10.5 cm.
6. Leaf blades of flowering branches mainly cordate or subcordate, the sinus often closed or the inner base of the lobes overlapping; petiole vaginate from 7-10 mm. up midrib from base of blade. 5. *S. incurva*.
6. Leaf blades of flowering branches mainly truncate or subtruncate or even subcuneate, if slightly subcordulate then the sinus quite open and lobes not overlapping; petiole vaginate from 2-7 mm. up midrib from base of blade, sometimes showing only as a short spur or appendage. 6. *S. naranjoana*.

1. ***Sarcorhachis convallariodorum*** (C. De Candolle) Steyermark, *comb. nov.*
Piper convallariodorum C.DC. Bull. Herb. Boiss. II.1: 356. 1901.
Sarcorhachis schwackei Yunck. Inst. Bot. S. Paulo, Bol. no. 3: 133, fig. 116. 1966.

Type. Serra Ouro Preto in locis umbrosis ad rivulos, alt 1050 m, Brazil, *Schwacke 10227*.

Distribution. Southern Brazil. The type collection of *Sarcorhachis schwackei* was obtained in the state of Paraná, Brazil, from matas nos morros, Antonina, Dec., 1879, C.A. W. *Schwacke II.18*.

I can find no real differences whereby *Sarcorhachis schwackei* can be differentiated from *Piper convallariodorum*.

2. ***Sarcorhachis obtusa*** (Miquel) Trelease, Contr. U.S. Nat. Herb. 26: 118. 1929.

Artanthe (?) *obtus*a Miq. Syst. Pip. 416. 1844.

Piper fluminense C.DC. in DC. Prodr. 16,1: 308. 1869.

Type. Southern Brazil, *Sellow*.

Distribution. Known only from southern Brazil.

2a. ***Sarcorhachis obtusa var cordata*** Yuncker. Inst. Bot. S. Paulo, Bol. no. 3: 134, *fig 117*. 1966.

Type. Jacarei, Paraná, Brazil, 14 Aug. 1914, *Jönsson 862-A*.

Distribution. Known only from the state of Paraná, Brazil, where also collected on Cerro Azul, Turvo, *Hatschbach 6743*.

3. ***Sarcorhachis venezuelana*** Steyermark, *sp. nov.*

Planta primum repens tandem volubilis omnino glabra; foliis petiolatis, petiolis 2-6.5 cm. longis secus costam mediam laminae 0.5-1.6 cm. vaginatis; laminis subcoriaceis vel firme membranaceis suborbiculari-ovatis vel ovatis apice abrupte breviter acuminatis vel longiacuminatis, interdum acutis, basi subtruncatis vel paullo cordulatis vel manifeste cordatis 9-14.5 x 7-13 cm., lobis paullo inaequalibus uno latere brevioribus vel basi angustioribus, sinu lato aperto, subtus glandulosopunctatis, nervis lateralibus 9-11 intimis in partem infimam 1-2 cm. confluentibus; inflorescentiis solitariis vel duobus axillaribus 4.5 x 0.3-0.5 cm., rachidis crista glabra vel fere glabra, depressionibus sub anthesi conferte puberulentibus; pedunculo 1-2.5 cm. longo infra medium bracteato; bracteis sub inflorescentia ovato-oblongis apiculatis 8-10 x 5 mm.; bracteis sub floribus suborbiculari-subpeltatis, marginibus fimbriatis; stigmatibus quinque raro quattuor sessilibus oblongo-vermiformibus rotundatis.

Type. Selva siempre verde a lo largo del Río San Gián, al sur de Borburata, arriba de la Planta Eléctrica, entre Los Tanques y La Toma, Estado Carabobo, Venezuela, alt. 750 m., 27-28 Marzo 1966,

leaves subcoriaceous, silvery below; spikes pendent in flower, 4-5 mm. diam.; *Julian A. & Cora Steyermark 95152* (holotype VEN, isotype US).

Distribution. Coastal Cordillera and eastern Andes of Venezuela. Paratypes: D.F.: virgin wet forest on slopes along old road between "Portachuelo" and "Peñita" (Petaquire) and Carayaca, between Colonia Tovar-Junquito road and Hacienda El Limón, 6-8 mi. below junction of Junquito-Colonia Tovar road, alt. 1300-1500 m., 12 Oct. 1965, *Steyermark 94398*; same data as above, 24 June 1966, *Steyermark & Neuling 95929*. Anzoátegui: along Río Zumbador and Tributary near base of Piedra Blanca, northeast of Bergantín, alt. 800-1000 m., 1-2 Marzo 1945, *Steyermark 61301*. Monagas: South-facing forested slopes above limestone bluffs, northeast of Guácharo, alt. 1300-1400 m., 11 April 1945, *Steyermark 61997*. Sucre: Cerro de Humo, Península de Paria, laderas de bosque húmedo nublado que miran al sur, entre la Laguna y Roma, noroeste de Irapa, alt. 900-1060 m., 4 Marzo 1966, *Steyermark 95007*. Lara: selva arriba de Sanare, alt. 1500 m., Agosto 1959, *Aristeguieta 3949*; selva nublada en la Fila de Las Goteras, arriba de las cabeceras del Río Claro, al sur de Río Claro, Distrito Iribarren, alt. 1500-1550 m., 11 Agosto 1970, *Steyermark, Delascio, G.C.K. & E. Dunsterville 103686*; laderas pendientes mirando al sureste en la quebrada de La Toma, en La Loma Redonda, al sur de Terepaima, 25 kms. al sur de Cabudare, alt. 1100-1200 m., 4 de Agosto 1970, *Steyermark, Delascio, G.C.K. & E. Dunsterville 103357*. Trujillo: selva nublada, alrededores de un pantano grande entre Boconó y El Batatal, alt. 1800 m., 5 Sept. 1966, *Steyermark & Rabe 97369*.

This species is distinguished by the glabrate ridge of the rachis, the usually five stigmas, and the frequent occurrence of two spikes in the leaf axils. This taxon is not to be confused with *Piper venezuelense* C.DC. Journ. Bot. 4: 216. 1866, of the genus *Piper* proper.

4. ***Sarcorhachis sydowii*** Trel. in Fedde Repert. 48: 16. 1940.

Type. Prope Mindo, prov. Pichincha, Ecuador, alt. 1000-1200 m., 6 Nov. 1937, *H. Sydow 317*.

Distribution: Ecuador and Colombia, COLOMBIA. El Valle: Río Calima (región del Chocó), entre La Trojita y Guadualito, alt. 0-5 m., 11 Marzo 1944, *Cuatrecasas 16850*. ECUADOR. Prov. Pichincha: 20 km. W of Santo Domingo de los Colorados, alt. 303 m., 29 Oct. 1961, *Cazalet & Pennington 5181*; vicinity of Santo Domingo de los Colorados, near Hacienda Gloria María, 18 May 1955, *Asplund 16400*.

- 4a. ***Sarcorhachis sydowii*** var. ***hirsuta*** Yunck. Ann. Bot. Gard. 53: 380. 1966.

Type. Road from Loja to Zamora, km. 40-45, Zamora, Ecuador, alt. 1400-1600 m., 20 Nov. 1961, *Dodson & Thien 1423* (holotype MO, isotype DPU).

Distribution: known only from type locality.

5. ***Sarcorhachis incurva*** (Sieb.) Trel. Contr. U.S. Nat. Herb. 26,2: 15. 1927.

Piper incurvum Sieb. ex C.DC. Prodr. 16,1: 294. 1869.

Sarcorhachis incurva var. *stehlei* Trel. ex Stehlé, Bull. Soc. Bot. France 83: 627. 1936, *nomen*; Bull. Agric. Martinique 9: 132. pl. 2. 1940.

Sarcorhachis incurva var. *Treleasii* Stehlé, Bull. Agric. Martinique 9: 143. 1940.

Sarcorhachis incurva var. *typica* Stehlé, Bull. Agric. Martinique 9: 142. 1940.

Type. Martinique, *Sieber 254*.

Distribution. Porto Rico (cultivated), Martinique and Guadeloupe. PORTO RICO: Planted, Trujillo, 27 Feb. 1925, Britton & Boyton

8497. MARTINIQUE: Bois intérieurs de la fontaine Absalon, Sept. 1900, *Duss 4477*; grand bois des Pitons au Carlet der Lorrain, alt. 350-900 m., *Duss 1333, 4477*; St. Josepha a la Madaille, alt. 430 m., 30 Sept. 1940, *M. & H. Stehlé 4628*; Marne-Rouge, Ajoupa Bonillon, Petons du Carbet, bord du Lorrain, 1877, *Duss 9, 1333*; Peton de Chamflor, Feb. 1870, *Hahn 1303*; 1861, *Belanger 971*; 11 Dec. 1942, *H. & M. Stehlé 6018*; alt. 580 m., 7 Mar. 1946, *H. & M. Stehlé 6620*. GUADELOUPE: Chemin du Parnasse près Bains-Jaunes, alt. 680 m., 1 Mar. 1937, *Stehlé 1628*; 8 Feb. 1937, *Stehlé 1328*; same locality, alt. 800 m., 6 Aug. 1936, *Stehlé 995*; Cascade Vauchelet, 18 Sept. 1939, *Questel 4139*; St. Claude, 12 July 1941, *Questel 4942*; Chemin de Malanga, alt. 650 m., 1 Jan. 1937, *Stehlé 1677* (type of *Sarcorhachis incurva* var. *Treleasei* Stehlé); Camp Jacob (Vauchelet), Bassin-Bleu, 1892, *Père Duss 2565 C*; forêt des Bains Jaunes, alt. 1000 m., 5 Sept. 1944, *Stehlé, Quentiz, & Bena 5632*.

The specimen of *Père Duss 2565 C* shows two peduncles arising from one of the nodes on one part of the stem. I have not been able to separate the varieties *stehlei* or *treleasei* from typical *S. incurva*, nor the material referred to as *Piper incurvum* α *majus* C.D.C. (Prodr. 16,1: 294. 1869) from "in sylvis Guyanae (Rich. in h. Francovil.)".

6. ***Sarcorhachis naranjoana*** (C.D.C.) Trel. Contr. U.S. Nat. Herb. 26: 17. 1927.

Piper naranjoanum C.D.C. Linnaea 37: 363. 1872.

Sarcorhachis anomala Trel. Contr. U.S. Nat. Herb. 26: 118. 1929.

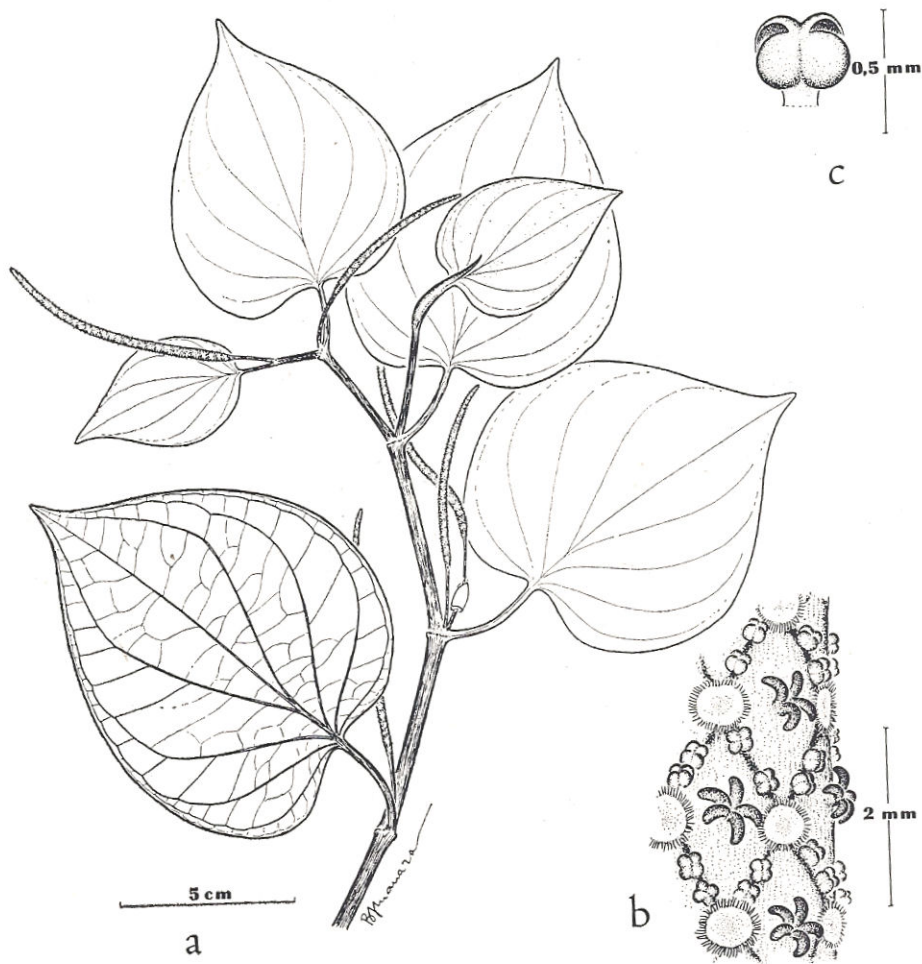
Piper terminalispicum Standl. Field Mus. Publ. Bot. 18: 365. 1937.

Type. Naranjo, Costa Rica, *Oersted 878*.

Distribution: Costa Rica and Panamá. COSTA RICA, Prov. Cartago: moist forest, El Muñeco, on the Río Navarro, alt. 1400-1500 m., 6-7 Mar. 1926, *Standley & Juvenal Valerio 50957*; Río Grande de Orosi, Tapantí, alt. 1200 m., 19 Jan. 1964, *Jimenez 1604*. Prov. San

José: vicinity of El General, alt. 1130 m., Feb. 1936, *Skutch 2593*;
La Hondura, alt. 1300-1700 m., 2-4 Mar. 1924, *Standley 37909* (type of
Sarcorhachis anomala Trel.). Prov. Guanacaste: moist forest, Quebra-
da Serena, Southeast of Tilarán, alt. 700 m., 27 Jan. 1926, *Standley*
& *Juvenal Valerio 46172*. Cacao plantation, plains of Santa Clara,
Río Hondo, alt. 100 m., 8 May 1903, *Cook & Doyle 616*. North slope of
central cordillera, Vara Blanca de Sarapiquí, alt. 1500-1750 m., July-
Sept. 1937, *Skutch 3151*. Buissons a Las Vueltas, Tucurrique, alt.
635 m., Nov. 1898, *Tonduz 12790*. PANAMA. along the Sambú River,
southern Darien, above tide limit, Feb. 1912, *Pittier 5562*.

The sterile leaves of some collections, as in *Standley & Valerio 46172* and *50957*, are of a large size equaling those of the Colombian and Ecuadorian *S. sidonii* and of the Venezuelan *S. venezuelana*. The stigmas are mainly four, but in the *Cook & Doyle 616* collection are sometimes five. This species is doubtfully distinct from *S. incurva*. The character of the terminal position of the spike, used as the chief criterion for separating *S. anomala* from *S. naranjocana*, breaks down, as shown by an examination of material of *S. naranjoana*.



Sarcorhachis venezuelensis Steyerm.

a. Hábito; b. Sección de la inflorescencia, mostrando las brácteas y cuatro flores con estigmas y estambres. c. Dehiscencia de la antera.

