

Sansevieria vanillosa, a name for a long known species from Tanzania, and a short overview on the subcapitate species

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Dedicated to Horst † and Doris Pfennig

Abstract

In 1975, the German *Sansevieria* specialist Horst Pfennig made the collection *Pf 1192* in southeastern Tanzania, Lindi region, close to the sea. This collection is here described and published as a new species, *Sansevieria vanillosa*, based on protocols and a herbarium specimen of the late Horst Pfennig and own observations on a cultivated plant. To date, this collection was mostly assigned to *S. braunii*, another poorly known species from northwestern Tanzania, but remained unresolved. Both species share some characters such as the blotched and dashed leaf pattern, the subcapitate inflorescence, the inarticulate pedicels, the reddish flower and the vanilla-like odour of the flowers. However, there is a combination of traits that distinguish the new from all to date known species in the genus, including the length of the corolla tube, the reddish brown to orange brown colour of the inner rhizome cortex, and the leaves occurring single or in pairs and showing contrasting colours of upper and lower surface. *Sansevieria longiflora* and *S. longistyla* also possess subcapitate inflorescences, but differ in flower colour, flower position, pedicel articulation, and other traits. *Sansevieria vanillosa* is probably a forest dweller and seems to have a very small distribution area.

Introduction

It often proves difficult to assign plants of *Sansevieria* to known species. The reasons include the various appearances that individual plants show during their lifetime, the variability of species throughout large distribution areas, and the striking similarity which plants from different species (Scharf & Burkart 2021) may show. Additionally, there is no reliable modern identification key, with the best still being that by N.E. Brown (1915), although this is not easy to work with, and the species concept applied is considered outdated (Jankalski 2006) in a number of cases. Finally, there are still many undescribed species, although, since 1994 (Chahinian 1994, Jankalski 2007, Newton 2020), almost 40 have been described as new.

Horst Pfennig travelled to East Africa 15 times (Pfennig 2019) to collect genuine living *Sansevieria* material for cultivation. He did not reach his objective to publish a new monograph of the genus (Pfennig 1981b) to overcome the difficulties described above due to his early death (Newton 2005,

Polhill & Polhill 2016) in 1994. His fifth itinerary (Pfennig 1981a) included the coastal region of southern Tanzania. Close to Lindi town, a region which is also the origin of the type plant of *S. perrotii* (Warburg 1901), he found a large, stemless *Sansevieria* with strongly patterned flat leaves. He cultivated this plant in his greenhouse at Herford, Germany, under Pf 1192. At first, he supposed that it was *S. kirkii* var. *pulchra* (Baker 1887, Brown 1915) but later thought that it might be *S. braunii* (Engler & Krause 1910). Both names were documented on the label of Pf 1192 which he prepared for the Herbarium B and which was stored there under B 10 0482576 (Fig. 1). We believe, however, that Pf 1192 is a hitherto scientifically undescribed taxon, which is put forward here as a new species.



Fig. 1 - *Sansevieria vanillosa*, type specimen B 10 0482576.

Note the various lengths of the bracts in relation to the internodes.

Material and Methods

This description is largely based on trait protocols which Horst Pfennig recorded in May 1976, September 1979, and September 1985, on the plant he had collected N of Lindi, Tanzania, in September 1975 under *Pf 1192*. Data are available online at <http://www.sansevieria-pfennig.eu/7.html>. Additional observations and measurements, specifically of vegetative traits, were executed on a living plant of *Pf 1192* which has been cultivated in Potsdam Botanical Garden since April 2015, and on a dried inflorescence from *Pf 1192* which Horst Pfennig prepared in 1979 and stored in B under B 10 0482576. Own measurements were conducted with a folding rule and a digital hand calliper and are printed in italics below.

For comparison, traits of other species were taken from the literature. A small number of supplemental data was taken from living plants cultivated in Potsdam Botanical Garden and from the type specimen of *S. braunii* at EA.



Fig. 2 - *Sansevieria vanillosa*,

flowering plant *Pf 1192*, most probably September 1979. Presumably, the inflorescence to the right was prepared under B 10 0482576. Note the more or less horizontal position of the open flowers, not conserved in B 10 0482576.

(Photo: Horst Pfennig, printed courtesy of Doris Pfennig.)

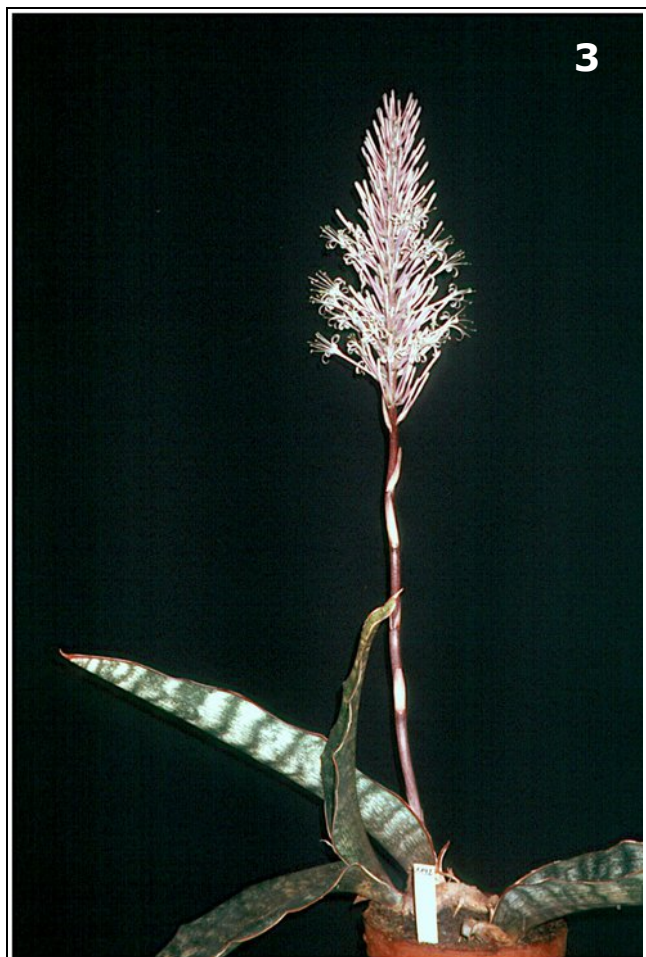


Fig. 3 - *Sansevieria vanillosa*,

flowering plant *Pf 1192*, date not clear. Note the reddish tone of the flowers, the purple peduncle and the strong banding of the leaf undersides.

(Photo: Horst Pfennig, printed courtesy of Doris Pfennig.)

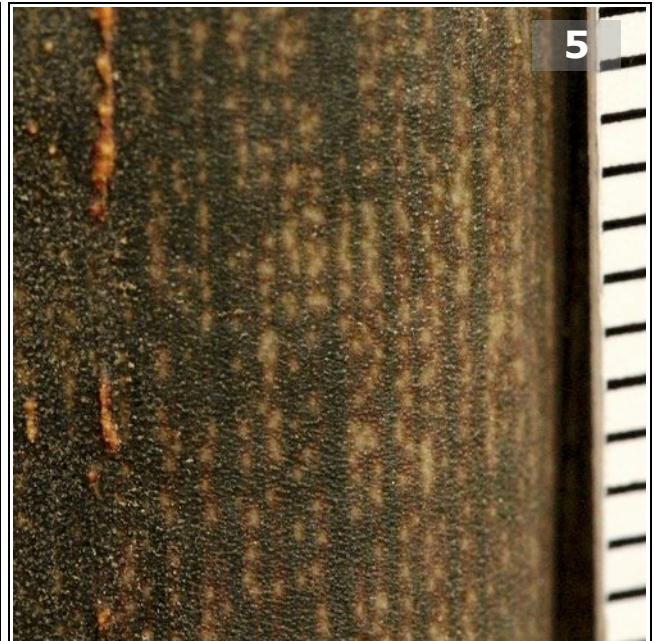
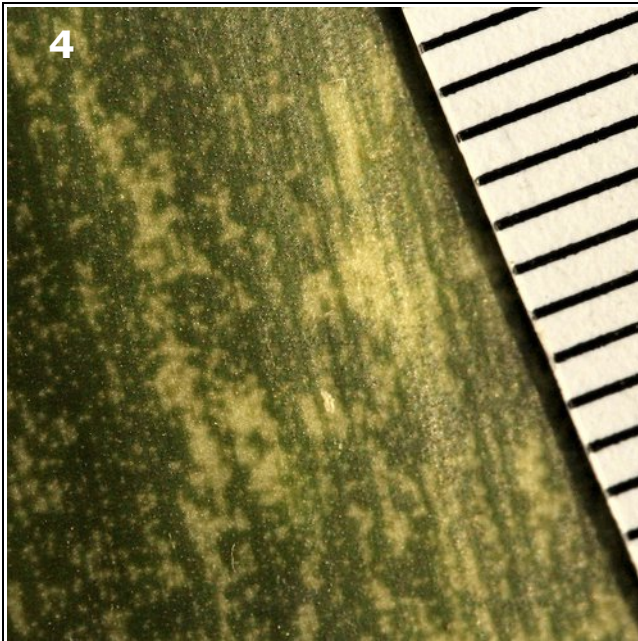


Fig. 4 - Leaf adaxial (upper) side, showing a detail of the dashed pattern and the tiny pointed pimples that are hardly recognisable by touch. 1 mm rule for scale.
(Photo: M. Burkart)

Fig. 5 - Leaf abaxial (lower) side, showing the finely rough surface. Note the difference in colour from the adaxial side (Fig. 4). Both pictures were taken at afternoon daylight in the public *Sansevieria* glasshouse in Potsdam Botanical Garden within one minute in March, 2021. 1 mm rule for scale.
(Photo: M. Burkart)

Fig. 6 - Young leaf of *S. vanillosa*, clearly showing the contrasting colours of leaf upper and lower surface.
(Photo: M. Burkart)

Fig. 7 - Approximate location of the collection site of *Pf 1192*, 5 km N of Lindi, Tanzania.
(Map from © OpenStreetMap contributors, download 15/3/2021 from openstreetmap.org, modified.)

Results



Discreteness

Pf 1192 has dense, subcapitate (elongate head-like) inflorescences. This is obvious from the photographs of the living plant in the Pfennig collection (Fig. 2 and 3), from the herbarium specimen B 10 0482576 prepared from it (Fig. 1) and also from the data recorded by Pfennig. There are several traits that differentiate between *Pf 1192* and the other known *Sansevieria* species with subcapitate inflorescences – *S. longiflora* (Sims 1826), *S. braunii* (Engler & Krause 1910) and *S. longistyla* (La Croix 2004) – which are collated in Tab. 1. Therefore, it is described here as a new species with the name *Sansevieria vanillosa*.

Biogeography and habitat

To date, *Sansevieria vanillosa* is doubtlessly known only from Pfennig's collection *Pf 1192*. It was collected at the coast of the Indian Ocean (Fig. 7), ca. 5 km North of the town of Lindi, at ca. S9°57' E39°43' (reconstructed according to the data of H. Pfennig). There it grew "on steep slope towards the sea in half shade to shade on brown, stony soil".

Taxonomic treatment

Sansevieria vanillosa M.BURKART & SCHARF, **sp. nov.**

Type

TANZANIA. Lindi region, c. 5 km N of Lindi town, on steep slope towards the sea a few meters above sea level, ca. S9°57', E39°43', 8 September 1975, Horst Pfennig *Pf 1192* (holotype: B 10 0482576, Fig. 1).

Diagnosis

Sansevieria vanillosa differs from all other species of *Sansevieria* in the following combination of traits: a dense, subcapitate inflorescence with flowers that do not shed after wilting, non-articulate pedicels, 5 to 8 bracts on the peduncle, flowers with tubes 34–46 mm long and lobes 24–30 mm long, reddish brown to orange brown colour of the rhizome inner cortex, and flat leaves that are mostly born single or in pairs on the rhizomes and that have a strong dark green and pale green mottling on the adaxial side with additional strong dark-green dashing, and a similar patterning on the abaxial side but in blackish and light grey instead of green tones.

Description

Rhizomatous perennial herbs, rhizome diameter up to 35 mm, rhizome inner cortex reddish brown or orange brown, light brown when young, heads ca. 5 cm below soil surface. Leaves flat, subterranean parts purple, up to 100 cm long and 15 cm wide, lamina 3–4 mm thick, very stiff, single or in pairs, rarely more, adaxial leaf side almost smooth to the touch but minutely verruculose with tiny pointed pimples 0.1–0.3 mm apart (Fig. 4), with dark green colour and pale green mottling or cross-banding pattern, additionally stippled with interrupted dark green lines, abaxial side with indistinct median ridge which is up to 7 mm thick, finely rough (Fig. 5), pattern very similar to adaxial side but blackish green and light grey green instead of green (Fig. 6), margin somewhat wavy, reddish brown with stramineous border. Inflorescence unbranched, subcapitate, sometimes appearing without a leaf (Fig. 2), 30–60 cm high, peduncle 5–12 mm in diameter, green to greyish green with dark purple dashes or purple hue, usually longer than the flowering part (Fig. 2 and 3), with (5)6–8 bracts that are mostly shorter but in the upper part longer than their internodes (Fig. 1), lanceolate, the upper ovoid-lanceolate, light brown, drying during flowering time, flowering part (4.5)14–31 cm long. Flowers in bundles of 2–4 but single in the upper part of the inflorescence, bracteoles greenish-whitish, ovoid-lanceolate, not fully dry at anthesis, 10–25 mm long, 4–6(10) mm wide. Flower pedicels 2–5 mm long, without articulation, therefore flowers do not shed after anthesis even if unfertilised. Flowers held more or less horizontally at anthesis (Fig. 2), white with light to strong purple hue outside, tube 34–46 mm long, lobes 24–30 mm long, revolute. Filaments as long as lobes or up to 3 mm longer, style 8–10 mm longer than lobes. Anthers 2–3 mm long, greenish to greenish yellow. Fruit and seed unknown.

Etymology

Vanillosa, “resembling vanilla”, was chosen as the species epitheton in reverence to Horst Pfennig, who was obviously the first collector of this species in Tanzania. He described the odour of their flowers as “smelling like vanilla”. A corresponding vernacular name is “Vanilla Snake Plant”.

Discussion

Discreteness

The subcapitate inflorescence makes *S. vanillosa* something special. Only three other known species have this type of inflorescence: *S. longiflora*, *S. braunii* and *S. longistyla*. The morphologically most similar species is *S. braunii*. *Sansevieria braunii* differs mainly by its clearly shorter and somewhat narrower leaves, stouter peduncles, floral tube twice as long and somewhat longer anthers from *S. vanillosa*. Despite this, the flowers of both species give off a scent of vanilla – this was mentioned by Engler & Krause (1910) in their description of *S. braunii* (“stark nach Vanille duftend”) and repeatedly documented by H. Pfennig in his protocols. In addition, the leaf pattern with dashing seems to be a common trait – Engler & Krause (1910) describe it as “*nervis longitudinalibus numerosis densis*”, i.e. “with numerous, dense longitudinal nerves”. This may be the reason why both, Pfennig (on the label in B) and also Butler (2009), linked *Pf 1192* with *S. braunii*. The description of Engler & Krause (1910) doesn’t mention conspicuously different coloured adaxial and abaxial leaf surfaces (according to them, the leaves are “coloured green” and “sparingly bearing white blotches or bands”), and consequently, this attractive contrasting

colouration of *S. vanillosa* seems to be an additional differentiating trait between these two species. Regrettably, another important character, the articulation of the pedicel, is not mentioned in Engler & Krause (1910). The fact that the inflorescences of the type specimens of *S. braunii* (EA) still keep all their flowers points towards inarticulate pedicels as in *S. vanillosa*.

Sansevieria longifolia and *S. longistyla* differ from *S. vanillosa* in further traits, including the position of the flowers. Open flowers of both *S. vanillosa* and (presumably) *S. braunii* are held more or less horizontal, whereas in *S. longistyla* (La Croix 2004 Fig. 1A) and *S. longiflora* (Budweg 2020) they are held diagonal to nearly vertical. For both these species, the flower colour is described as greenish white (La Croix 2004, Budweg 2020, Newton 2020), not reddish as in *S. braunii* and *S. vanillosa*. In addition, these two species have articulate pedicels, which is explicitly mentioned in La Croix (2004) and is visible in the figures in Budweg (2020) both on the living plants and on the herbarium specimens.

Further distinguishing characters between the species mentioned above are listed in Tab. 1.

Table 1:

Traits of species with subcapitate inflorescences, including the capitate species *S. kirkii* for comparison.

	<i>S. longiflora</i> var. <i>l.</i>	<i>S. longistyla</i>	<i>S. braunii</i>	<i>S. vanillosa</i>	<i>S. kirkii</i> var. <i>k.</i>
reference	Newton (2020)	La Croix (2004)	Engler & Krause (1910)	hoc loco	Newton (2020)
rhizome diameter [mm]	25	30	30 ²	35	
colour of rhizome inner cortex		orange	brownish-orange ²	brownish orange to reddish brown	brown ⁴
leaves	rosulate, spreading			spreading	erect or ascending-spreading
leaves per shoot	4–6	unknown	2 ²	1–2(3)	1–3
leaf length [mm]	300–1500	330	550–650	to 1000	750–2750
leaf width [mm]	40–90	73	70–110	to 150	60–90
adaxial leaf surface	smooth	slightly rough		smooth to the touch, minutely verruculose	satiny ⁹
abaxial leaf surface	smooth	slightly rough		finely rough	satiny ⁹
adaxial leaf main colour	dark green	dark bluish green	green	dark green	greyish green
abaxial leaf main colour				blackish green	greyish green ⁹
leaf pattern	spots scattered or in irregular transverse bands	mottled	sparse bands or blotches	mottled or transversely banded	mottled or transversely banded
pattern colour adaxial side	paler green	pale bluish-green	whitish	light green	light green
pattern colour abaxial side				light grey	
leaf border colour	red-brown or yellowish	prominent red	red	reddish brown and stramineous	reddish-brown
inflorescence total length [mm]	330–680	480–580	450	to 600	to 600

	<i>S. longiflora</i> var. <i>l.</i>	<i>S. longistyla</i>	<i>S. braunii</i>	<i>S. vanillosa</i>	<i>S. kirkii</i> var. <i>k.</i>
peduncle diameter [mm]			17 ⁷	5–12	
peduncle bracts		3–5		(5)6–8	
bracts length		shorter than internodes ¹		as long as internodes	
length flowering part [mm]	75–380	210–270	250–500 ⁷	(45)140–310	38–100
flowers per bundle	2–3	1–3		1–4	2 ⁴
bracteole length [mm]	13–26	9–10	20–30 ⁷	10–33	25–38
bracteole width [mm]		2–3		4–10	8.5–19
bracteole state at anthesis		papery		drying	fresh ⁴
odour			strongly vanillose	vanillose	
pedicel articulation	probably present	present	probably absent	absent	absent ⁴
pedicel total length [mm]	1.6–3.2	3–4	10 ⁵	2–5	6.4–10.5
corolla outer colour	greenish-white	greenish-white	flushed reddish	flushed purple	pale purplish or dull pink
corolla total length [mm]	114–140 ⁸	80–85	100–110	58–76	146–172 ⁸
tube length [mm]	89–102	50–65	80	34–46	114–127
lobe length [mm]	25–38	15–20		24–30	32–45
anther length [mm]	3–4.5 ⁶	5–6 ¹	3–4	2–3	
style length [mm]		100–110	up to 125	66–86 ³	
stigma exsertion [mm]		38–40			
direction of flowers at anthesis	erect to ascending ⁶	suberect		more or less horizontal	horizontal to vertical ⁴

Annotations:

1) taken from figure 1E in La Croix (2004); 2) from Newton (2020); 3) calculated from Pfennig's measurements; 4) own observation (var. *pulchra*); 5) from Newton in Butler (2009); 6) from Budweg (2020); 7) own measurements on the types (EA); 8) calculated from the figures given; 9) own observation (var. *kirkii*).

Biogeography and habitat, further collections

In 2020, very similar plants to *Pf 1192* were found by Barry Yinger a few kilometres North of the collecting locality of *Pf 1192*. These plants (*YS 0380*) had at least one infructescence. Since then, they have flowered on his *Sansevieria* farm in Tanzania (Yinger in litt.). Up to now, it was not possible to carry out a detailed examination of these plants. We take into consideration, however, that his collection *YS 0380* belongs to *S. vanillosa* too.

The collection of B. Yinger was made in a shady place, similar to *Pf 1192*. Therefore, *S. vanillosa* is probably a forest plant.

It is very likely that *S. vanillosa* occupies just a small distribution area in the southeastern coastal region in southern Tanzania. In contrast, the type of *S. braunii*, obviously its closest relative, came from western Tanzania (Ujiji at the Lake Tanganyika; this species was additionally cultivated in the Sigi Valley near Amani at the beginning of the 20th century [Engler & Krause 1910]). Nothing is known to us about similar findings in the wide gap in between the known localities of the two

species. *Sansevieria braunii* also seems to be very rare as it is not or very rarely present in living collections. Possibly, both species represent local endemic species of Tanzania with only very small distribution areas.

No *Sansevieria* with subcapitate inflorescence is mentioned in the “Flora of Tropical East Africa” (Mbugua 2007), although *S. braunii* is native to the Flora area and was already described in 1910. Also, neither the collection nor the herbarium specimen of *Pf 1192* are mentioned.

Acknowledgements

We have to thank Horst Pfennig † for his tireless, self-sacrificing collecting activity in eastern Africa as well as for drawing up the protocols of the characters of his collection *Pf 1192*. We also thank his widow Doris Pfennig and their grandson for the establishment of the Pfennig website with all trait protocols and diagnostic photos of her late husband. Moreover, Doris Pfennig entrusted all relevant documents of her husband to the first author, permitted the use of his photos and gave extensive support. We thank Peter A. Mansfeld for the extension of the submission deadline and the publication of this article, Maya Volck for the reconstruction of Horst Pfennig’s itineraries, and Tone Sophie Haugk for thoroughly checking this text. Christiane Benthin cultivates a living plant of *Pf 1192* in the Botanical Garden in Potsdam and hopes together with us for an inflorescence appearing soon, Christian Perseke helped a lot to find the elegant species epitheton, Robert Vogt friendly granted access to herbarium B and cared for the scan of the holotype, Matthias Schultz checked the specimens in herbarium HBG, although with negative results regarding the collection *Pf 1192*. Barry Yinger encouraged us to write up this contribution and gave friendly insights into his collections in Tanzania.

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