

*SEL(049331)! **ZELAYA**: Cerro Livico, 7 km northeast of Siuna, forest slope; elev. 500 m. Climbing trunk of tree 28 April 1978, D. Neill 3670 *SEL(047695; sterile)! **COSTA RICA**: **GUANACASTE**: Flores amarillas. Enredadera subiendo tronco de árbol, en chaparral o bosque poco denso dentro de sabana cerrada. A 5 millas al sur de La Cruz, Liberia. Alt. 200 m, febrero 11, 1963, *A. Jiménez M.* 313 *F(1606969)! 550 m, *Calvo* 1136 F(1456238)! Parque Nacional Guanacaste, Estación Maritza, sendero a la cima del Volcán Orosí. Bosque primario y secundario, 10°57.6'N, 85°29.6'W, 600 m. Planta epífita, creciendo sobre un árbol a 5 m de altura y a la orilla de una quebrada. Frutos verdes. 2 julio 1989, *INBio* 132 INB! *CR(fruit)! **PUNTARENAS**: Cantón de Buenos Aires. Along the Río Ceibo, Ujarrás. 09°14'00" N, 83°18'00" W, 500 m. Thick stemmed vine; climbing high on trunk of tree in riparian forest. Lvs. succulent, deflexed. Just one young bud and one old, dry flower seen. 9 March 1993. *M. Grayum* 10237 INB! Esparza Macacona, margen derecha, quebrada La Turbina. Bejuco trepador, botones florales verde tenue, flor de corola amarilla, aromática, 15 enero 1987, *G. Herrera & E. Herrera* 466 MO(3594340)! **WITHOUT PRECISE LOCALITY**: "*Vanilla reichenbachii*", *Endres* 270 W(16231, 16175, 16176)! Sepals and petals greenish yellow. Lip orange yellow. Pie del Turrubares, 150 m, March 6, 1926 *A. Alfaro* 269 *AMES(31487, *31487)! In forest between Colonia & Las Huacas, May 25 1903, *O.F. Cook & C.B. Doyle* 742 *US(474659)! "Costa Rica", dried leaf from *M. Godefroy-L.*, Paris, 1895 K! **PANAMA**: **PANAMA**: Low places contiguous to City, Alt Sea level. Grows in damp places. Climbs trees up to 40-60. Flowers yellow, with orange throat. Flowers Feb-March. 1919, *C.W. Powell* 137 AMES(*23763; AMES 28290 is *V. phaeantha*)! Moist woods; large herbaceous vine, Río Paraíso, above East Paraíso, January 7, 1924, *P.C. Standley* 29919 *AMES(31437, sterile)! *US(1225393)! Vine on west shore, Barro Colorado Island, March 11, 1931, *C.L. Wilson* 119 *F(636191)! Barro Colorado Island, shores of Gatun Lake, South of Lab., Aug 28th 1929, *W.N. Bangham* 458 *AMES(71357, fruit)! Near Canal Zone, *C.V. Piper* s.n. *AMES(36948)! Low thick scrub along R. Tecumen, north of Chepo road, up to 30 m. March 10, 1935, *A.A. Hunter and P.H. Allen* 852 *AMES(42162)! *F(1329667)! *US(1976167)! Coastal thicket; large herbaceous vine; common, Punta Paitilla, January 12, 1924, *P.C. Standley* 30788 *US(1229496)! Parque Nacional Altos de Campana. Epífita con botones florales verdes. Fuera del parque, a 1 km de la oficina del parque. Sendero de interpretación, 1 km al este del campamento de los guardabosques de INRENARE. Bosque húmedo tropical premontano. Elevación entre 800 y 900 m. 8°40'N; 79°55'W. 23 de abril de 1993, *M.D. Correa, E. Montenegro & E. Hidalgo* 9460 PMA! Cerca de Cerro Azul, 14.8 km al N de la carretera Cd. de Panamá-Tocumen, camino Cerro Azul-Cerro Jefe, vegetación secundaria con *Terminalia* y *Byrsonima*, ca. 600 m s.n.m., trepadora, estéril,

toda la población con hojas elípticas, grandes y tallos gruesos, 4 junio 2001, *M. Soto* 9921, *G. Salazar, J. Linares y R. Gregg* PMA! in cult., at Smithsonian Tropical Research Institute in Balboa. Voucher: fragrance collection. 18 Mar 1979, *J.D. Ackerman* 1354 SEL(039338)! In Powell's garden; large vine, Balboa, Non., 1923-Jan., 1924, *P.C. Standley* 28570 *US(1225365; sterile)! **COCLE**: ca. 5 km al N de El Copé, entrada del Parque Nacional Omar Torrijos, vegetación secundaria abierta, derivada de bosque húmedo tropical premontano con *Vochysia*, ca. 700 m s.n.m. 2 junio 2001, *G. Salazar, J. Linares, M. Soto y R. Gregg* PMA!

REFERENCES: Hamer, Orch. Nicaragua, Ic. Pl. Trop. pl. 1195. 1984.

14. *Vanilla sarapiquensis* Soto Arenas, *sp. nov.*

TYPE: **COSTA RICA**: HEREDIA: Sarapiquí. Llanura de San Carlos. Sardinal. Bosques residuales y tacotales camino a Finca Dos Loas. 10°31'45"N, 84°05'32", 70 m. Bejuco herbáceo. Sépalos verde crema, labelo blanco, columna con la punta negra, 10 May 1995, holo. *J.F. Morales* 4082, *E. Lépez, V.H. Ramírez & A. Rojas* INB! iso. apparently at MO.

Vanillae costaricensis aemulens differt inflorescentiis bracteisque minoribus, floribus longioribus, labello suborbiculari, 3-lobato, callo duobus carinis incrassatis prominentibus in apicem confluentibus.

Hemiepiphytic vine, leafy. **Stems** 4 mm thick; internodes 6.5-7.8 cm long. Aerial **roots** flattened, ca. 2 mm wide. **Leaves** obscurely petiolate, the petiole canaliculate, ca. 7 mm long, 3.5 mm wide; blade elliptic, long acuminate, somewhat cuneate at base, membranaceous-chartaceous in dried condition, 15.9-19.5 x 4.8-7 cm. **Inflorescence** very different from the vegetative shoots, a 4-flowered raceme 5.5 cm long, internodes up to 1.5 cm long; peduncle ca. 26 mm, rachis ca. 2 mm thick. **Bracts** scale-like, ovate to lanceolate, acuminate, concave, 9 x 4 mm. **Flowers** successive, with rather spreading segments, showy, ca. 7 cm in diameter; tepals green-cream colored, lip white; of heavy substance. **Ovary** rather sigmoid, terete, somewhat thickened at base, smooth, inconspicuously sulcate, 42-53 mm long, 3-4 mm thick. **Dorsal sepal** rather spreading, convex, the margins reflexed, the apex slightly incurved, slightly undulate; elliptic, apex acute-subacute, extreme apex

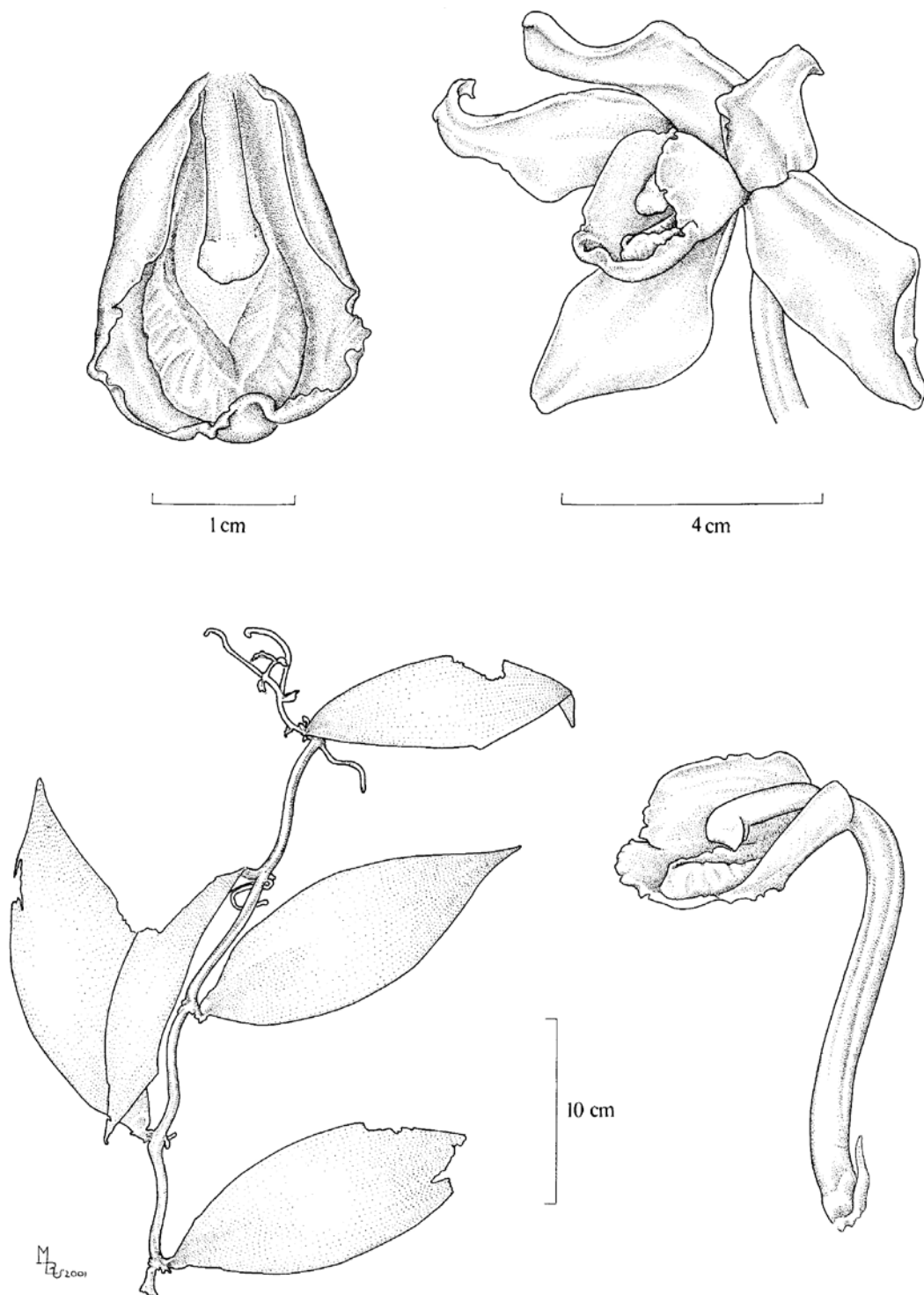


FIGURE 14. *Vanilla sarapiquensis* Soto Arenas, based on the type specimen, J.F. Morales 4082, Drawing by M. López.

conduplicate-subcalyptrate, rounded; base obtuse-rounded, ca. 10 veined, sparsely warty on the dorsal surface, 44 x 17 mm. **Lateral sepals** basally concave, convex at apex, the margins near the middle reflexed, the apex recurved, widely elliptic, obtuse, base obtuse-rounded, margins scarcely undulate, sparsely warty on the dorsal surface, 11-veined, 41 x 20 mm. **Petals** spreading, recurved at apex, slightly undulate on the upper margin, oblong-elliptic, oblique, subacute, base obtuse-rounded, 8-veined, smooth but axially sulcate on dorsal surface, 45 x 16 mm. **Lip** attached to the column 3 mm, ovate-suborbicular, obscurely trilobed in outline, constricted at 2/3; 32 x 28 mm, the base subcordate, slightly concave, with the lateral margins erect forming a throat around the column; midlobe concave, margins inflexed, incurved at apex, rounded, 8 x 16 mm; the lateral lobes semielliptic, the margins minutely pleated, 21 x 10 mm; **callus** arising above the middle, built up by a pair of broad, elevated apically confluent keels, the keels somewhat sulcate from the bottom to the crest, more elevated at distal part, widely triangular in cross-section on their distal part, 18 mm long, 5 mm wide. **Column** arcuate, semiterete, with a dilated apex, smooth, 21 x 4 mm. **Anther** protruding, semierect the distal part perpendicular to the column body; the anther separated from the surface of the lip. Fig. 14.

DISTRIBUTION: Known only from northern Costa Rica, in the Llanura de San Carlos; it is to be expected from adjacent Nicaragua.

ECOLOGY: Apparently in rainforest, at 70 m elevation. It was collected with flowers in May.

This species of the membranaceous group is known from a single collection from N Costa Rica. *Vanilla costaricensis*, is known from the same geographic area (Llanura de San Carlos), but *V. sarapiquensis* is distinct in its much shorter inflorescences with scale-like bracts (*V. costaricensis* has big bracts like those of *V. inodora*), larger flowers with much broader tepals, suborbicular, trilobed lip, and especially by the very different callus made up of two elevated, thick, sulcate keels, confluent in the apical part. In *V. costaricensis* the lip is subentire, ovate-flabellate, with the apex truncate or somewhat trilobed, but the lateral lobes at the apex are subequal or slightly longer than the mid lobe. In *V. costaricensis* the callus

is made up of a pair of flat, broad keels along the axial line, from the base to the beginning of the apical third, then separated in 3 low, erect, congested keels ending at the apex.

Vanilla mexicana has a distinctly trilobed lip, with the midlobe more protruding, 3-keeled, with the keels parallel. Also related is *V. martinezii* with much larger flowers, straight sepals, more rugose, basal keels, although the short inflorescence, with reduced bracts is similar.

15. *Vanilla trigonocarpa* Hoehne, Arq. Bot. Estado Sao Paulo, nov. ser. 1(6): 126, t. 139. 1944.

TYPE: BRAZIL:PARA: Matas de terra firme, Belém do Pará, flores em 23-11-1926 e frutos em 7-10-1926, A. Ducke s.n., holo., HEPF(19445)!

Vanilla pauciflora Dressler, Orquideología 13(3): 229-232. pl. 1979.

TYPE: PANAMA: Prov. Panamá, carretera El Llano-Cartí, 10-15 km al norte de El Llano; 3 marzo 1976; sépalos verde pálido, pétalos crema verdoso, labelo blanco, lámina café-amarillo, fragante, R.L. Dressler 5290, holo. US(not seen).

Hemiepiphytic vine, leafy, up to at least 8 m high. **Stems** somewhat fleshy, 7-10 mm thick; internodes 4.8-7.5 cm long. Adventitious attaching roots dorsiventrally compressed, at least up to 6 cm long, ca. 4 mm wide; adventitious free roots subterete, ca. 3 cm long, 2 mm wide. **Leaves** petiolate, the petiole 1.5-2.5 cm long; blade elliptic or elliptic-oblong to obovate, long acuminate, leathery, relatively thin, 15-30 x 5.5-7 cm. **Inflorescence** usually on the lower part of the stem, a 1-2(-4) flowered raceme, 13-15 mm long. **Bracts** lanceolate, 15-20 mm long. **Flowers** with spreading segments, sepals pale green, petals greenish cream, lip cream, the blade yellow-brown with a white margin, the throat with yellow-brown veins. **Ovary** ca. 4 cm long. **Dorsal sepal** lanceolate, obtuse, subclawed, the claw ca. 40 mm long, 8 mm wide, 11-11.5 x 1.6-1.8 cm. **Lateral sepals** elliptic, subclawed, the claw ca. 40 mm long, 8 mm wide; 10.5-11 x 1.8-2 cm. **Petals** narrowly oblanceolate, obtuse, with a prominent rib on the outer surface, 10.8-11 x 1.6-1.8 cm. **Lip** attached to the column along the margins of the basal half (ca. 6.5-7 cm long), when flattened 11.5 x 5.5 cm; unguiculate,