

2-7-2010

# Taxonomic Revision of *Passiflora* section *Xerogona* (Raf.) Killip (Passifloraceae)

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**UNIVERSITY OF MISSOURI -ST. LOUIS**  
**Department of Biology**

**Taxonomic Revision of *Passiflora* Section *Xerogona* (Raf.) Killip  
(Passifloraceae)**

**Tatiana Erika Boza Espinoza**

**A thesis presented to the Graduate School of the University of  
Missouri -St. Louis in partial fulfillment of the requirements for the  
degree of Masters of Science**

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**Summer, 2010**

**Saint Louis, Missouri**

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## ACKNOWLEDGEMENTS

I would like to thank Ph.D. Peter Stevens, for all his time, patience, and suggestions. I would also like to thank Ph.D. Peter M. Jørgensen and Ph.D. John M. MacDougal, for their support, encouragement, suggestions and for the invaluable comments that helped me get a better understanding of this group.

I am grateful to the Project “Untangling the passionflower vines: phylogeny, species diversification, and character evolution in *Passiflora* subg. *Decaloba* (Passifloraceae)” for providing financial support for my graduate studies and for my fieldwork. I also thank the Missouri Botanical Garden for their support to graduate students. I am also grateful to my professors for their guidance throughout my graduate studies. Peter Stevens, Amy Zanne, Bette Loiselle, and Mick Richardson.

I would also like to thank Kristen Porter-Utley, and Shawn E. Krosnick, for their assistance. I thank Ph.D. Jim Solomon, curator at the Missouri Botanical Garden, for his help with the loans and facilitating the collections at MO, and to the curators of the others herbaria, F, G, GH, K, MICH, NY, P, PH, and US among many others for providing material on loan. I also want to thank people from the Missouri Botanical Garden: Carmen Ulloa, Mary MacNamara, Andrea Voyer, and Ana Spencer for their invaluable help.

I want to express my special thanks to Alba Arbelaez, Juan Carlos Penagos, Carolina Romero, Dilys Vela, Rosa Ortiz-Gentry, John Pruski, Vania Torrez, Saul Hoyos and David Kenfack and other people who were incredibly academically and socially helpful during the last two years.

Finally, I would like to thank my parents to whom I dedicate this work.



## ABSTRACT

*Passiflora* subgenus *Decaloba* section *Xerogona* is a group of herbaceous vines found in subtropical and tropical regions of America. The 15 species, including two subspecies, recognized here are primarily distributed in Central America, with a few also found in South America. The species of the section are recognized by their very unusual dehiscent capsular fruit, absence of bracts and laminar nectaries and their transversely grooved seeds. The section contains two problematic species complexes; *P. capsularis* and *P. rubra*. The morphological variation among and within these two complex species are examined in this study using Principal Component Analysis (PCA) based on correlation matrices of morphological characters. The variation of these two complexes was studied throughout their distributional range. Within the *P. capsularis* complex only one species has been recognized. However, two species were recognized within the *P. rubra* complex based mainly on floral characters: *P. cisnana* and *P. rubra*. A key, detailed descriptions, distribution maps, and photographs are included in the revision. The distribution and ecology of the 15 species recognized are also discussed.

Key words: *Passiflora*, section *Xerogona*, Principal Component Analysis

## INTRODUCTION

*Passiflora* is a large genus of more than 557 species of vines and lianas, it is primarily distributed in the New World tropical, subtropical, and occasionally temperate areas, but there are also about 25 species in India, Southeast Asia, Oceania, and Australia. It is most diverse in the tropical regions of America where it is found in a variety of habitats from deserts and floodplains to Andean slopes up to the lower limits of the *puna* and *páramo*, in forest margins up to 3800 m in the high Andes, but the populations there are generally small (Holm-Nielsen et al., 1988).

Vegetatively, *Passiflora* displays a wide range of leaf shapes and great variation in the types of extrafloral nectaries present on leaves, bracts, and petioles. *Passiflora* has a complex floral structure and is characterized by several unique floral features. The most distinctive characteristic is the corona of showy filaments, which plays a very important role in the pollination of most of the species. The innermost series of the corona, the operculum, is often basally connate and frequently membranous. The limen is a disk shaped organ at the base of the androgynophore, which comes into contact with the operculum and together they regulate access to the nectar ring; at the floor of the floral tube. The limen is absent in some species. The androgynophore is elongate, and the ovary is located at the point where the stamens diverge from the androgynophore. Variation in these floral and vegetative features forms the basis of a complex taxonomic subdivision of *Passiflora* into subgenera, sections and series (Killip, 1938; Muschner et al., 2003; Feuillet and MacDougal, 2004).

*Passiflora* comprises five subgenera, *Astrophea*, *Decaloba*, *Deidamioides*, *Tetrapathea*, and *Passiflora* (Feuillet and MacDougal, 2003). Subgenus *Astrophea* includes approximately 57 South American woody lianas, and a few trees and shrubs, some with cauliflorous inflorescences. The flowers are white to pink or purple, or red to orange and usually have thick yellow coronal filaments and an obvious floral tube formed by the fused calyx and corolla. The flowers are mostly bee or hummingbird pollinated (Krosnick, 2006). Subgenus *Deidamioides* is relatively small with only 13 species; it is distinguished by having a whitish to yellow corona with two or four rows of filaments and whitish or greenish white flowers with a broad floral tube. The flowers may be

pollinated by bees (Krosnick, 2006). Subgenus *Passiflora* is the largest subgenus with 251 species of vines or lianas with large colorful flowers often with complicated corona or sometimes with a long floral tube with very reduced corona; the floral bracts are usually conspicuous. There are various floral morphologies within subgenus *Passiflora*. Pendulous red or pink colored flowers are pollinated by hummingbirds, upright red flowers with coronal filaments arranged to form a narrow tube are also pollinated by hummingbirds, and dish-shaped white flowers are pollinated by bats, however, most species are pollinated by bees (Ulmer and MacDougal, 2004). Subgenus *Tetrapathea*, which has been recently included within genus *Passiflora* based on phylogenetic analyses (Krosnick and Freudenstein, 2005), contains only 3 species, restricted to New Zealand; it is characterized by having flowers with four to five stamens and two or three carpels, and is completely dioecious (De Wilde, 1971, Krosnick & Freudenstein, 2005 ). Finally, the second largest subgenus, *Decaloba*, with more than 233 species, includes herbaceous climbers and lianas with great morphological, biogeographical, and ecological diversity. The most remarkable morphological variation is in leaf shape: the leaf blades may look like swallowtails, shields, sausages, duck feet, boomerangs, kitten heads, coins, and half moons, and there is also variation in variegation and the arrangement of extrafloral nectaries on the petioles or laminae. Flowers range from green small and less than 1 cm diam., whitish and ca. 2.3 cm diam., to red with a long androgynophore ca 2.9 cm. The majority of species are pollinated by bees and wasps, but there are some species adapted to hummingbird pollination (Ulmer and MacDougal, 2004) and at least one species is known to be pollinated by bats: *P. penduliflora* (Kay, 2001).

Feuillet and MacDougal (2003) proposed that subgenus *Decaloba* be divided into eight supersections, *Pterosperma*, *Hahniopathanthus*, *Disemma*, *Multiflora*, *Auriculata*, *Cieca*, *Bryonioides*, and *Decaloba*, seven of which grow in the New World and one, *Disemma*, in the Old World. Supersection *Decaloba* is the largest group in the subgenus with about 120 species. The leaves are mostly 2-lobed by the reduction of the central lobe of a 3-lobed lamina. The laminar nectaries appear as ocellae between the main veins, but there are no petiolar nectary glands. Two sections are recognized within supersection *Decaloba*: section *Decaloba* consisting of approximately 106 species, and section *Xerogona*, which includes about 15 species that are characterized by a very unusual

dehiscent capsular fruit. The fruits of all other passifloras are berries (Ulmer and MacDougal, 2004). Killip (1938) placed *Xerogona* as a section within subgenus *Plectostemma* (supersection *Decaloba* of Feuillet and MacDougal, 2003) in a classification based primarily on floral morphology.

My study focuses on species of section *Xerogona*. They are distributed primarily in Central America, with a few also found in South America. The most important morphological features distinguishing section *Xerogona* are the absence of bracts and laminar nectaries, dehiscent fusiform fruit, and the transversely grooved seeds (Killip, 1938; Ulmer and MacDougal, 2004).

Within *Xerogona* the Central American species are relatively well defined, while, the most difficult portions of section *Xerogona* are two species complexes in South America and in the Caribbean Islands. These are traditionally named *Passiflora capsularis* L. and *Passiflora rubra* L., and within each there is much morphological variation; furthermore, it is often difficult to distinguish between the two complexes. The three most important features that have been used to differentiate between the two complexes are the indumentum of the ovary, the shape of the fruit (Killip, 1938; Holm-Nielsen et al., 1988), and the color of the corona (Killip, 1938; Ulmer and MacDougal, 2004).

## **Objectives**

The main goal of this study is to update our knowledge of the species of *Xerogona*. The particular objectives of this study are:

- To elucidate the number of taxa within section *Xerogona*.
- To evaluate which are the most useful characters to identify these taxa.
- To provide a key to differentiate the species recognized.
- To describe all species within section *Xerogona* in a monographic format.

## MATERIALS AND METHODS

### Morphological Data Set

This study is based primarily on the examination of the external morphology of over 1400 dried collections from more than 70 herbaria, supplemented with observations from plants preserved in FAA, photographs, and living plants in the field. Specimens of the *P. rubra* complex were collected during field work in Peru and Bolivia.

All of the herbarium specimens representing section *Xerogona* were carefully observed, and those spanning the morphological variation and geographical range of each species were chosen for measurement. Characters were measured from corresponding positions on mature, reproductive plants in order to minimize variation due to developmental differences. Given that this study is developed under the Project “Untangling the passionflower vines: phylogeny, species diversification, and character evolution in *Passiflora* subg. *Decaloba* (Passifloraceae)”, the characters used were selected from the morphological character dataset used by the entire project. A total of 66 morphological characters were measured or observed on the selected plant specimens. All measurements were taken from herbarium material using a caliper and dissecting microscope (Nikon SMZ-1). Because the species of *Passiflora* exhibit much morphological variation even in a single plant I recorded the maximum and minimum measurements of each character for each specimen.

Characters chosen for measurements were based in part on those that have been previously used to differentiate species within genus *Passiflora* and within section *Xerogona*. Particular emphasis was placed on leaf shape, flower structure including, corona morphology, and details of operculum, limen, androgynophore, floral nectary, fruit shape, and seeds. All the characters measured are listed in Table 1. All the measurements were made in mm except for the qualitative characters.

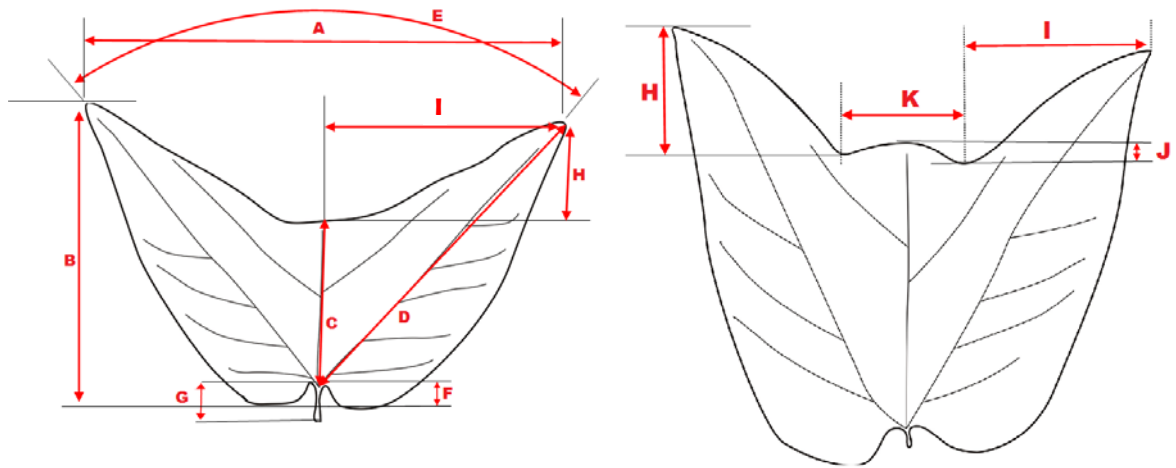
Foliar characters measured are shown in Fig.1:

- length and width of the blade
- number of lobes (unlobed leaves occur in *Passiflora cobanensis*, 2-lobed in *P. rovirosae* and *P. goniosperma*, and 3-lobed leaves are rarely present in *P. capsularis* and *P. citrina*).

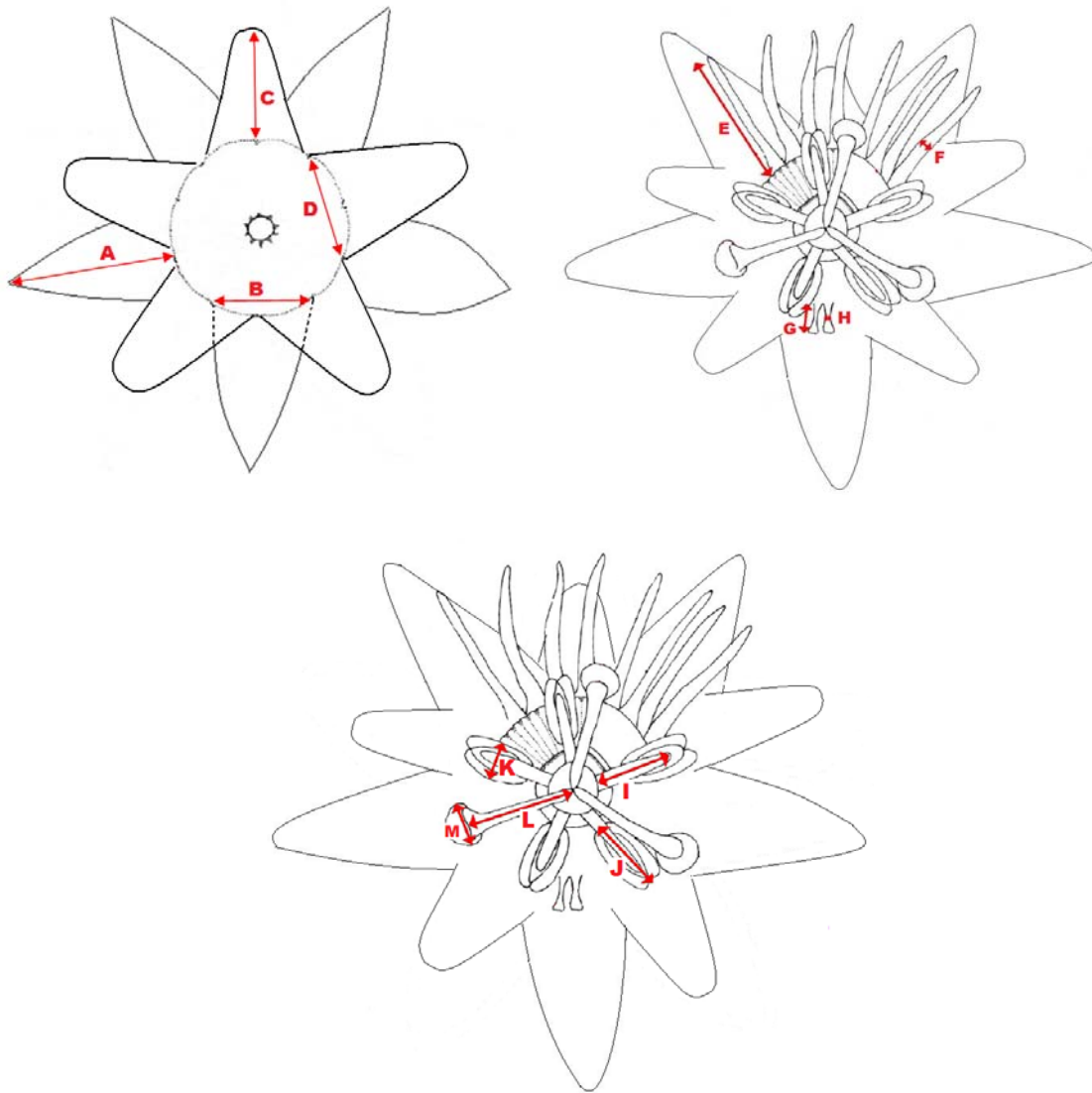
- length and width of the deepest lobe
- the angle between the lateral veins (the angle between lateral lobes has been used to differentiate species within *Passiflora* (Escobar, 1980; MacDougal 1994, Porter-Utley 2003; Milward-de-Acevedo 2004)
- length of lateral and central veins

Floral characters were observed on herbarium specimens rehydrated by placing flowers in warm water. The flowers of species of section *Xerogona* range from about 1.5 cm in diam., in *P. tenella* and *P. pusilla*, to about 4 cm in diam. in *P. costaricensis* and *P. rovirosae*. The floral characters that I measured are shown on Fig. 2 and 3. These characters include

- length and width of the sepals and petals
- length of corona filaments
- height of the operculum
- length and width of anthers
- style length

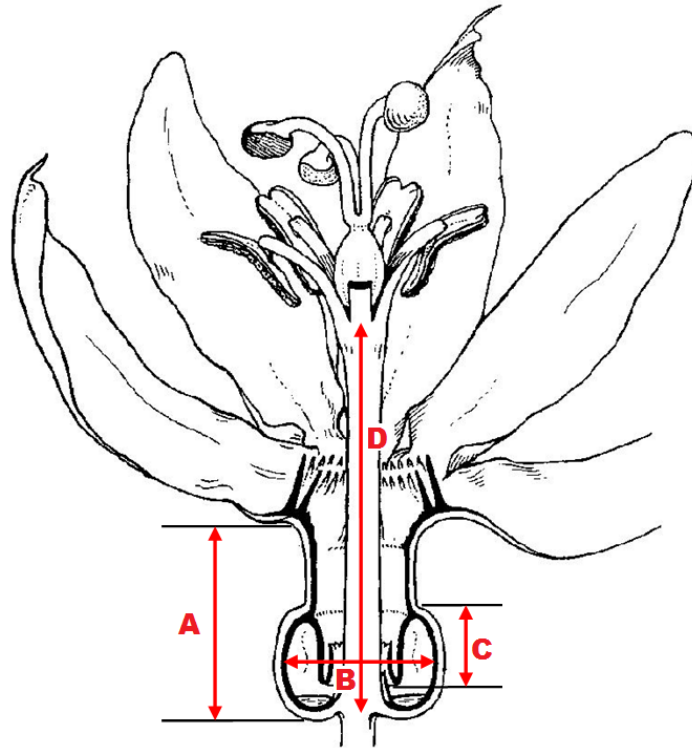


**Figure 1.** Outline of leaves of *P. rubra* showing measurements taken. A. Width of blade. B. Length of blade. C. Length of central vein. D. Length of lateral vein. E. Angle between primary lateral veins. F. Distance from point of petiolar insertion to the base of basal lobe. G. Length of petiole. H. Length of lateral lobe. I. Width of lateral lobe. J. Length of central lobe. K. Width of central lobe.



**Figure 2.** Frontal views of subg. *Decaloba* flower demonstrating measurements taken. A. Length of sepal. B. Width of sepal. C. Length of petal. D. Width of petal. E. Length of outer coronal filament. F. Width of outer coronal filament always at midpoint. G. Length of inner coronal filament. H. Width of inner coronal filament. I. Length of stamina filament. J. Length of anther. K. Width of anther. L. Length of style. M. Width of stigma.





**Figure 3.** View of *P. manicata* showing measurements taken of floral tube in some species of section *Xerogona*. A. Length of floral tube. B. Width of floral tube. C. Operculum height. D. Angrogynophore length (modified from Jørgensen et al., 1984).

**Table 1.** List of quantitative and qualitative characters recorded.

<b>Organ</b>	<b>Quantitative Characters</b>	<b>Code in PCA</b>	<b>Organ</b>	<b>Quantitative Characters</b>	<b>Code in PCA</b>
<b>Leaf</b>	Stipule length *	StL	<b>Flower</b>	Anther width *	AW
	Stipule width *	StW		Style length *	StyL
	Petiole length *	PeL		Style width	
	Blade lateral lobe length *	BLLbL	Stigma width		
	Blade lateral lobe width *	BLLbW	Fruit length*	FL	
	Blade central lobe length		<b>Fruit</b>	Fruit width *	FW
	Blade central lobe width			Seed length *	SeL
	Blade central vein length *	BCVL	<b>Seed</b>	Seed width *	SeW
	Blade lateral vein length *	BLVL		Seed groove number	
	Blade lateral veins angle *	BLVA	<b>Qualitative Characters</b>		
	Blade length outline *	BLO	<b>Stem</b>	Stem shape	
	Blade width *	BW		<b>Leaf</b>	Stipule shape
	Blade basal lobe length *	BBLbL	Stipule apex		
	Blade trichome length abaxial		Stipule abaxial indumentum		
	Blade trichome length adaxial		Stipule adaxial indumentum		
Number of blade lobes		Blade shape outline			
<b>Flower</b>	Peduncle length		Blade base		
	Inflorescence flower number		Blade abaxial indumentum		
	Floral tube diameter		Blade adaxial indumentum		
	Floral tube length		Blade indumentum type abaxial		
	Flower diameter		Blade indumentum type adaxial		
	Sepal length *	SL	Blade surface		
	Sepal width *	SW	Petiole indumentum		
	Petal length *	PL	<b>Flower</b>	Sepal shape	
	Petal width *	PW		Sepal apex	
	Corona outer row length *	CORL		Petal shape	
	Corona outer row width			Petal apex	
	Corona inner row length			Corona filaments color	
	Corona inner row width			Ovary shape	
	Corona row number			Ovary indumentum *	OvI
	Corona filament number			Ovary indumentum type	
Androgynophore length*	AGL	<b>Fruit</b>		Fruit shape	
Operculum height *	OH			<b>Seed</b>	Seed shape
Anther length *	AL				

(\* characters used in PCA Analyses).

## Principal Component Analysis (PCA)

Within *Xerogona* the Central American species are relatively well defined and easy to distinguish. They present no taxonomic or morphological problem (see taxonomic treatment). However, *Passiflora capsularis*, *P. rubra*, and *P. cervii* are difficult to distinguish and morphologically very variable. So in order to find distinguishing characters and reach a better understanding of their morphological variation PCAs were carried out on the *P. capsularis* and *P. rubra* complexes and including the closely related *P. cervii*.

Principal Components Analysis (PCA) is a useful statistical method to evaluate morphological variation. It has been used to circumscribe taxa of plants such as Bromeliaceae (Gardner, 1983), Passifloraceae (Porter-Utley, 2003; Ocampo, 2007), Fabaceae (Castro et al., 2005), Arecaceae (Henderson, 2004; Henderson 2006), and Calceolariaceae (Puppo, 2008), among others. The data used in the PCA analyses were the mean values of measurements from each specimen.

A total of 66 morphological characters were recorded. However, only 24 quantitative and one qualitative characters were used (Table 1). The qualitative characters were not included in the analyses because they are not really appropriate for the method used (Sneath and Sokal, 1963, 1973; Quinn and Keough, 2002; Jolliffe, 2002; Gotelli and Ellison, 2004).

Only 131 collections provided complete data for the analyses of *P. capsularis*, *P. cervii*, and *P. rubra* (Appendix 1); *P. cervii* is represented by only a few collections, perhaps reflecting its restricted distribution in the southern region of Brazil. The material included, when possible, specimens from the entire distributional range and specimens that reflect the variation within species as gauged by eye. Data was stored in TROPICOS® and from there a matrix was built using the variables listed in Table 1.

Data analyses were carried out using the computer program SPSS 17.0 for Windows. The one sample Kolmogorov-Smirnov test was performed to test the normality of the data. Outliers were checked with box plots.

Only those axes corresponding to components with eigenvalues greater than 1.0 were extracted and the individuals were projected on the first three PCA components. Specimens that lacked much data were deleted from the analyses.

More than 15 sets of analyses were made; but only the most relevant are included here. These were separated into two sets (Table 2). The first included all the data of *P. capsularis* and *P. rubra* complexes, and *P. cervii*. The second included the specimens of the *P. rubra* complex and *P. cervii*. The specimens used for the various analyses are listed in Appendix 1. *Passiflora capsularis* and *P. rubra* were recognized by Killip (1938), while *P. cervii* is a new species published by Milward de Acevedo (2008).

**Table 2.** List of the different PCAs carried out including the number of specimens and characters available for analysis.

<b>Analyses</b>	<b>No. specimens</b>	<b>No. characters</b>
<b>1</b> i. All species, all characters	15	26
ii. All species, only vegetative characters	113	11
iii. All species, only floral characters	43	11
iv. All species, vegetative and floral	42	20
v. All species, vegetative and fruit	58	15
<b>2</b> i. <i>P. rubra</i> complex/ <i>P. cervii</i> , all characters	12	26
ii. <i>P. rubra</i> complex/ <i>P. cervii</i> , only vegetative	72	11
iii. <i>P. rubra</i> complex/ <i>P. cervii</i> , only floral	38	11
iv. <i>P. rubra</i> complex/ <i>P. cervii</i> , vegetative and floral	37	22

Since there is little overlap between flowering and fruiting periods only approximately 12% of the specimens (15 out 131) could be scored for all characters. Analyses of foliar characters (113 specimens), floral characters (39 specimens), floral + foliar characters (42 specimens), and foliar + fruit characters (58 specimens) were carried out separately. The second group of analyses focused on the *P. rubra* complex and *P. cervii*. Only 12 specimens were scored for all characters, 72 for foliar characters, 38 for floral characters, and 37 for foliar + floral characters. The results from the PCAs are represented as bivariate scatter plots. The ellipses drawn indicate the groupings of the specimens.

## RESULTS

### Analysis 1 – All species

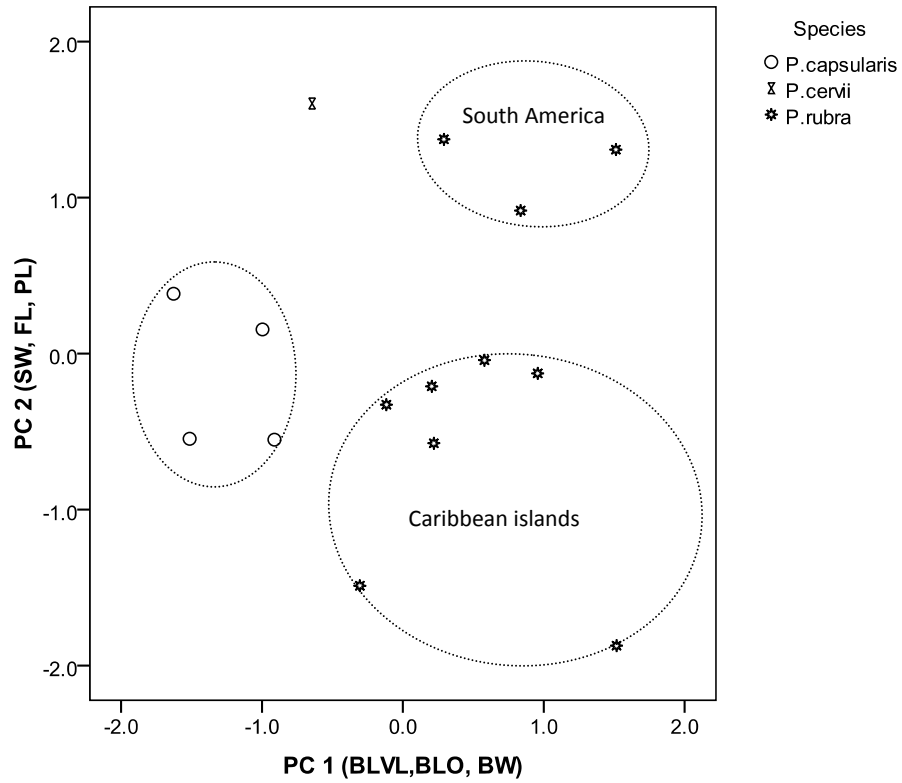
#### i. All characters

This first analysis included specimens that represent all the different morphologies within the species complexes and included specimens from all parts of their distributional range. The PCA including all specimens with all characters suggest that there are two main groups (Fig. 4). These main groups separate clearly the two species recognized by Killip (1938) *Passiflora capsularis* and *P. rubra*. Within the *P. rubra* complex two subgroups were distinguished, one from South America and the other from the Caribbean Islands. *P. cervii* is placed close to the South American group of *P. rubra*.

The first three components explained approximately only 28, 18, and 12% respectively of the variance (Table 3). Characters that influence the variance of the first component were blade lateral vein length (BLVL), blade length outline (BLO), and blade width (BW). Sepal width (SW), fruit length (FL), and petal length (PL) explained most of the variation in the second component, while petal length (PL), petal width (PW), and blade lateral vein angle (BLVA) loaded heavily on the third component (Table 4).

Several scatter plots were made using different combinations of the components on the axes (not shown). Since they all were similar, only one is shown here: the bivariate scatter plot of component 1 vs. component 2 (Fig. 4).

**Figure 4.** Bivariate scatter plot of the first two components of the analysis of all species – all characters.



**Table 3.** Principal Components loadings from the analysis of all species - all characters

Component	Initial Eigenvalues		
	Total	% of Variance	Cumulative %
1	7.281	28.004	28.004
2	4.554	17.517	45.522
3	3.032	11.662	57.183
4	2.632	10.123	67.307
5	1.932	7.431	74.738
6	1.627	6.259	80.998
7	1.228	4.725	85.722
8	1.023	3.935	89.657

Table 4. List of characters loadings of the first three components in the analysis of all species - all characters

	Component		
	1	2	3
Blade lateral vein length	.916	.114	.041
Blade length outline	.892	.282	.092
Blade width	.818	-.353	.382
Blade lateral lobe width	.788	-.371	.261
Blade central vein length	.722	.531	-.091
Blade basal lobe length	.709	.299	-.007
Petiole length	.678	-.290	.198
Stipule width	.645	-.202	.004
Stipule length	.539	.501	-.208
Seed length	.527	-.187	-.596
Fruit width	.497	.400	-.450
Petal width	.389	.475	.587
Anther length	.315	-.377	.436
Sepal width	.305	.470	.130
Seed width	.170	-.331	-.640
Anther width	.026	-.526	-.069
Corona outer row length	-.069	.327	-.061
Petal length	-.080	.534	.603
Blade lateral lobe length	-.142	-.502	.372
Blade lateral veins angle	-.155	-.625	.491
Androgynophore length	-.163	-.394	-.425
Sepal length	-.288	.717	.224
Fruit length	-.340	.633	-.317
Operculum height	-.344	.018	.175
Style length	-.419	.391	.248
Ovary indumentum	-.834	.153	.149

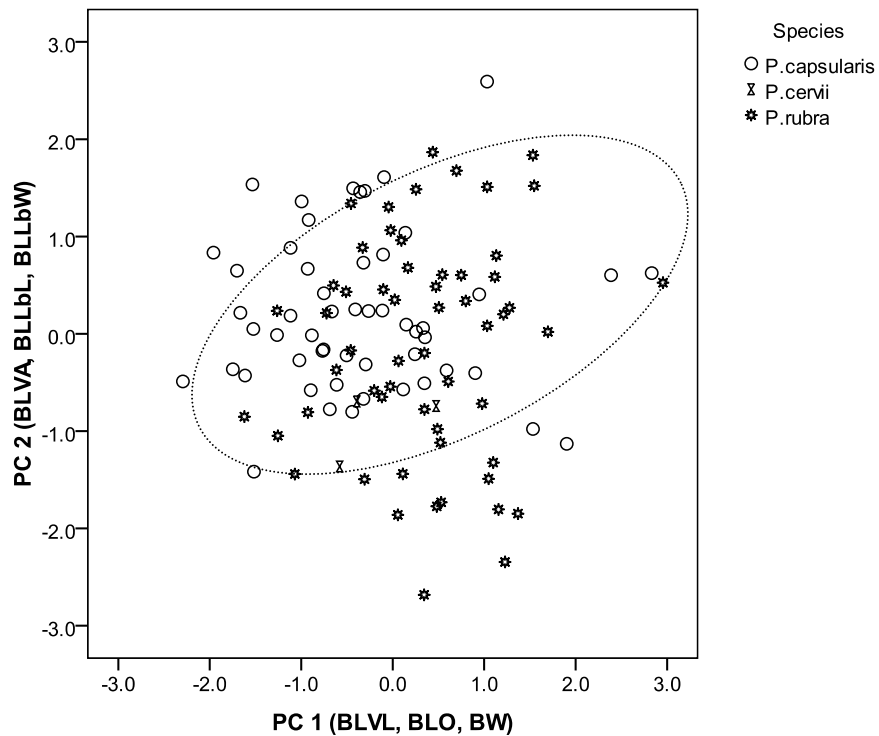
## ii. Only vegetative characters

To see whether vegetative characters alone can differentiate between *P. capsularis*, *P. rubra*, and *P. cervii* I analyzed only foliar characters. The two first components explained approximately 48 and 18% respectively of the total variance (Table 5). As in the analysis 1, the characters that explain the first component were blade lateral vein length (BLVL), blade length outline (BLO), and blade width (BW). For the second component, the characters that explains most of the variation were blade lateral veins angle (BLVA), and blade lateral lobe length and width (BLLbL, BLLbW) (Table 6).

In the scatter plot, *P. capsularis* and *P. rubra* are not clearly separated, the species overlapping considerably. In the morphological space in the center of the overlap area

where the ellipse is drawing are specimens of *P. capsularis* from Central America and *P. rubra* from the Caribbean islands and *P. cervii* from Brazil. (This shows the vegetative similarities between the three). The specimens of both species in this area of the graph have 2-lobed leaves, while outside of the ellipse the specimens of both species are from South America and have 3-lobed leaves. *P. cervii* appeared towards the periphery of the overlapping space (Fig. 5). Clearly, leaf morphology is extremely variable, even within one individual, and cannot be used by itself to distinguish the species.

**Figure 5.** Bivariate scatter plot of the first two components of the analysis of all species – vegetative characters only.





**Table 5.** Principal Component loadings from the analysis of all species – vegetative characters only.

Component	Initial Eigenvalues		
	Total	% of Variance	Cumulative %
1	5.312	48.290	48.290
2	1.938	17.619	65.909
3	1.485	13.498	79.406

**Table 6.** List of character loadings of the first three components from the analysis of all species –vegetative characters only.

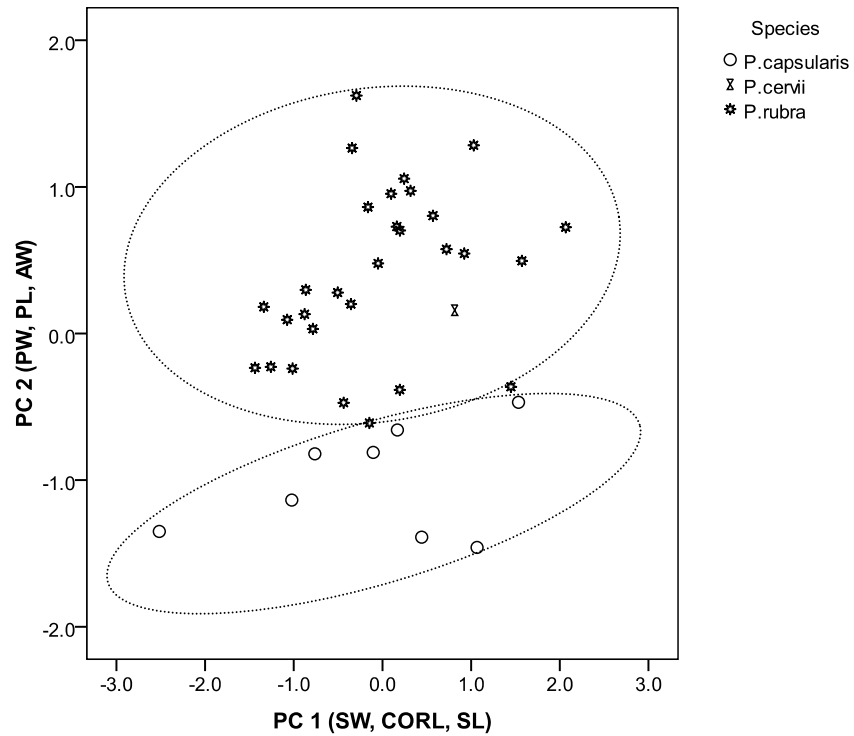
	Component		
	1	2	3
Blade lateral vein length	.928	-.078	-.282
Blade length outline	.897	-.281	-.280
Blade width	.876	.391	.052
Blade basal lobe length	.803	-.040	.334
Blade lateral lobe length	.802	.391	.018
Blade central vein length	.687	-.657	-.098
Petiole length	.644	.142	-.401
Stipule width	.572	-.165	.587
Stipule length	.495	-.257	.561
Blade lateral lobe length	.345	.567	-.433
Blade lateral veins angle	.106	.825	.442

### iii. Only floral characters

In this PCA I included the 35 specimens with floral characters. The two first components explained approximately 24 and 20% of the variance respectively (Table 7). Characters that loaded heavily on the first component were sepal width (SW), corona outer row number (CORL), and sepal length (SL). For the second component, the characters responsible for the variation were petal width (PW), petal length (PL), and anther width (AW) (Table 8).

The scatter plot of the variation in floral characters (Fig. 6) shows two coherent but only weakly distinct groups, *P. capsularis*, and *P. rubra*, with almost no overlap. *Passiflora cervii* is placed within the morphological space occupied by *P. rubra*.

**Figure 6.** Bivariate scatter plot of the components of the analysis of all species – floral characters only.



**Table 7.** Principal Component loadings from the analysis of all species – floral characters only.

Component	Initial Eigenvalues		
	Total	% of Variance	Cumulative %
1	2.635	23.953	23.953
2	2.148	19.530	43.483
3	1.458	13.258	56.742
4	1.258	11.432	68.174
5	1.010	9.185	77.359

**Table 8.** List of character loadings from the analysis of all species – floral characters only.

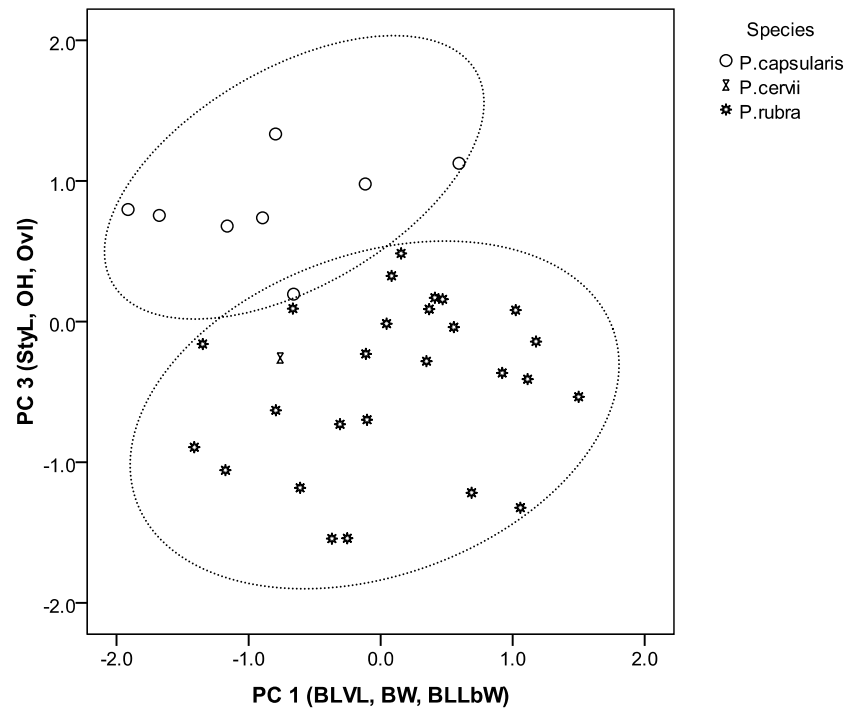
	Component		
	1	2	3
Sepal length	.629	-.171	.098
Sepal width	.764	-.147	.029
Petal length	.208	.610	.568
Petal width	.262	.615	.580
Corona outer row number	.681	-.194	-.287
Androgynophore length	.417	-.122	-.314
Operculum height	.602	-.460	.077
Anther length	.478	.527	-.251
Anther width	.496	.538	-.183
Ovary indumentum	-.023	-.489	.444
Style length	.263	-.526	.555

#### iv. Vegetative and floral characters

The PCA of vegetative and floral characters together showed the same general pattern as the previous analysis. The first, second, and third components explained 27, 13, and 11% of the total variance respectively (Table 9). As in the analyses i and ii, the characters that loaded heavily on the first component were blade lateral vein length (BLVL), blade width (BW), and blade lateral lobe width (BLLbW). The second component was represented by a combination of vegetative and floral characters, while the third component was mainly explained by floral characters such as style length (StyL), operculum height (OH), and ovary indumentum (OvI) (Table 10).

The scatter plot of the variation in vegetative + floral characters (Fig. 7) displayed two groups. As with the analysis of floral characters alone, there was very little overlap between the *P. capsularis* and *P. rubra* complexes. Finally, as in some previous analyses, *P. cervii* appeared within the *P. rubra* complex.

**Figure 7.** Bivariate scatter plot of the 1<sup>st</sup> and 3<sup>rd</sup> components of the analysis of all species – vegetative and floral characters.



**Table 9.** Principal Component loadings from the analysis of all species – vegetative and floral characters.

Component	Initial Eigenvalues		
	Total	% of Variance	Cumulative %
1	5.960	27.092	27.092
2	2.931	13.322	40.414
3	2.477	11.260	51.674
4	2.325	10.569	62.243
5	1.563	7.104	69.347
6	1.264	5.744	75.091

**Table 10.** List of character loadings of the first three components from the analysis of all species – vegetative and floral characters'

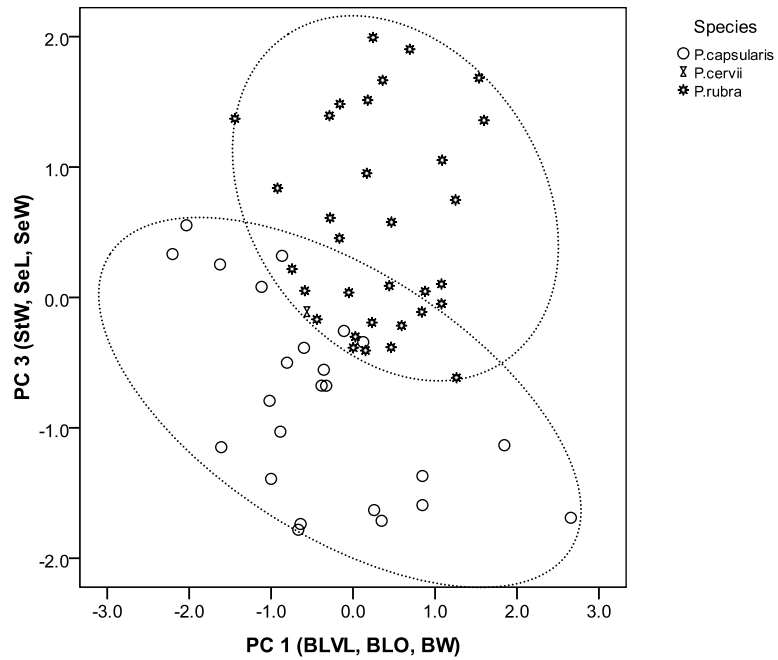
	Component		
	1	2	3
Stipule length	.624	.164	.053
Stipule width	.726	.115	.182
Petiole length	.641	-.177	-.331
Blade central vein length	.538	.570	-.388
Blade lateral lobe length	.327	-.522	.385
Blade lateral lobe width	.857	-.163	.175
Blade lateral vein length	.882	.078	-.006
Blade lateral veins angle	.287	-.556	.300
Blade length outline	.828	.166	-.168
Blade basal lobe length	.820	.002	-.003
Blade width	.865	-.315	.136
Sepal length	-.254	.729	.210
Sepal width	.385	.597	.461
Petal length	-.179	.359	-.589
Petal width	.183	.269	-.404
Corona outer row length	.010	.566	.403
Androgynophore length	-.162	.125	.393
Operculum height	.021	.392	.568
Anther length	.096	.195	-.090
Anther width	.068	.310	-.108
Ovary indumentum	-.463	-.182	.398
Style length	.030	.219	.530

#### v. Vegetative and fruit/seed characters

The PCA of vegetative, fruit, and seed characters showed similar patterns to those in the previous analyses. The first, second, and third components explained 37, 16 and 15% respectively of the total variance (Table 11). As in the previous analyses, the characters that loaded heavily on the first component were leaf characters such as blade lateral vein length (BLVL), blade length outline (BLO), and blade width (BW). The second component was also represented by leaf characters, while the third component was explained mainly by a combination of leaf and fruit characters such as stipule width (StW), seed length (SeL), and seed width (SeW) (Table 12).

A scatter plot of the variation in vegetative plus fruit and seed characters (Fig. 8) displayed an overlapping area between *P. capsularis* and the *P. rubra* complex. Similar to the analysis of vegetative characters *P. cervii* was placed in the overlapping area.

**Figure 8.** Bivariate scatter plot of the components of the analysis of all species – vegetative and fruit characters.



**Table 11.** Principal Component loadings from the analysis of all species – vegetative and fruit character).

Component	Initial Eigenvalues		
	Total	% of Variance	Cumulative %
1	5.461	36.404	36.404
2	2.437	16.249	52.653
3	2.176	14.504	67.157
4	1.336	8.905	76.062

**Table 12.** List of character loadings of the first three components from the analysis of all species – vegetative and fruit characters

	Component		
	1	2	3
Blade lateral vein length	0.931	-0.045	-0.272
Blade length outline	0.916	-0.221	-0.203
Blade width	0.835	0.428	-0.152
Blade basal lobe length	0.779	0.069	0.306
Blade central vein length	0.771	-0.494	0.089
Blade lateral lobe width	0.715	0.525	-0.137
Petal length	0.627	0.128	-0.415
Stipule width	0.570	-0.014	0.532
Stipule length	0.522	-0.206	0.431
Fruit width	0.418	-0.300	0.442
Seed length	0.310	0.348	0.489
Blade lateral lobe length	0.223	0.415	-0.701
Fruit length	0.102	-0.560	-0.360
Seed width	-0.091	0.468	0.457
Blade lateral veins angle	-0.120	0.839	0.108

### **Analysis 2: *Passiflora rubra* complex – *P. cervii***

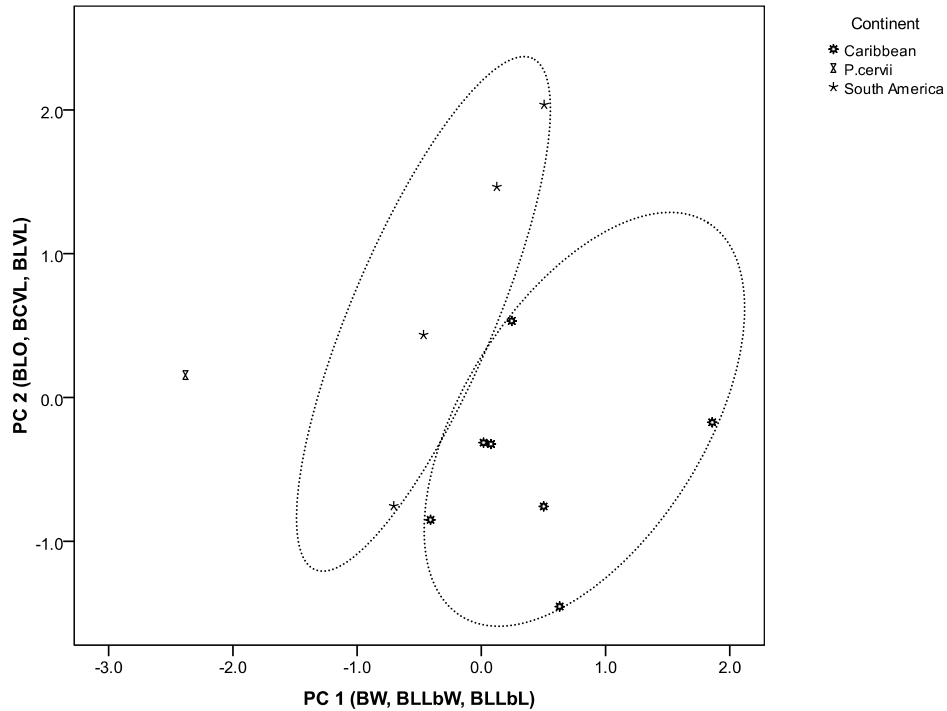
The *P. rubra* complex is a group of species that have been variously circumscribed by previous authors (Velloso, 1827; Lindley, 1830; Roemer, 1846; Harms 1894). Because *P. cervii* came out several times with *P. rubra* in the preceding analyses, it was also included in these analyses.

#### **i. All characters**

A PCA results in the recognition of two coherent not sharply separated groups within *P. rubra*, and the single specimen of *P. cervii* appears separately from these two groups (see Fig. 9). All Caribbean specimens represent one group and the other consists of only the South American specimens. The first three components accounted for 22, 20, and 18% respectively of the total variance (see Table 13). The characters that explained most of the variations for the first component were blade width (BW), blade lateral lobe width (BLLbW), and blade lateral lobe length (BLLbL). The second component was explained by leaf characters such as blade length outline (BLO), blade central vein length (BCVL),

and blade lateral vein length (BLVL)(see Table 14). *Passiflora cervii* is separate because it has very broad 3 lobed leaves. The South American specimens have 2 or 3 lobed leaves and the Caribbean specimens have 2 lobed leaves. These two groups are adjacent (Fig. 9) probably because they share the character of having 2 lobed leaves.

**Figure 9.** Bivariate scatter plot of the components of the analysis of the analysis of *P. rubra* and *P. cervii* – all characters.



**Table 13.** Principal Component loadings from the analysis of *P. rubra* and *P. cervii* – all characters.

Component	Initial Eigenvalues		
	Total	% of Variance	Cumulative %
1	5.722	22.009	22.009
2	5.122	19.701	41.710
3	4.687	18.027	59.737
4	3.296	12.675	72.412
5	1.853	7.127	79.539
6	1.686	6.486	86.024
7	1.227	4.718	90.742



**Table 14.** List of character loadings of the first three components in the analysis of *P. rubra* and *P.cervii* – all characters

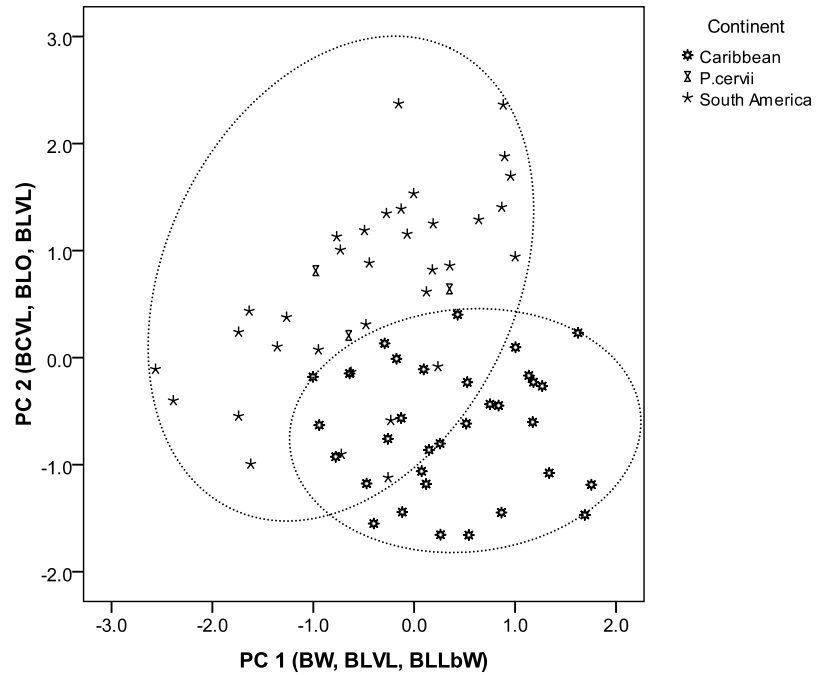
	Component		
	1	2	3
Stipule length	-.063	.620	.007
Stipule width	.452	-.247	.329
Petiole length	.519	.173	-.363
Blade central vein length	-.225	.880	.134
Blade lateral lobe length	.636	-.171	-.465
Blade lateral lobe width	.721	.114	-.285
Blade lateral vein length	.592	.738	-.155
Blade lateral veins angle	.454	-.461	-.384
Blade length outline	.385	.891	-.163
Blade basal lobe length	.142	.721	.059
Blade width	.785	.219	-.483
Sepal length	-.680	.262	.179
Sepal width	-.335	.234	.341
Petal length	-.656	.271	-.413
Petal width	-.387	.402	-.224
Corona outer row length	-.229	.280	.333
Operculum height	-.502	.145	-.691
Androgynophore length	.046	-.653	.633
Anther length	.101	-.232	-.176
Anther width	-.033	-.661	-.139
Ovary indumentum	-.750	.049	-.524
Style length	-.560	-.185	.431
Fruit length	-.043	.293	.852
Fruit width	.198	.456	.606
Seed length	.569	.052	.683
Seed width	.463	.053	.519

**ii. Only vegetative characters**

In the PCA that use exclusively vegetative characters there is substantial overlap between Caribbean and South American specimens of *P. rubra*; *P. cervii* again appeared along with South American specimens of *P. rubra* (Fig. 10). The first component accounted for 41% of the variance while the second and third components accounted for 24% and 10% respectively of the variance (Table 15). Characters that load on the first component were blade width (BW), blade lateral vein length (BLVL), and blade lateral lobe width (BLLbW). The second component was explained by blade central vein length

(BCVL), blade length outline (BLO), and blade lateral vein length (BLVL) (see Table 16).

**Figure 10.** Bivariate scatter plot of the 1<sup>st</sup> and 2<sup>nd</sup> components of the first analysis of vegetative characters only of *P. rubra* and *P. cervii*.



**Table 15.** Principal Component's loadings from the analysis of *P. rubra* and *P. cervii* – vegetative characters only.

Component	Initial Eigenvalues		
	Total	% of Variance	Cumulative %
1	4.538	41.252	41.252
2	2.652	24.110	65.362
3	1.078	9.799	75.160

**Table 16.** List of character loadings from the first three components of the analysis of *P. rubra* and *P. cervii* – vegetative characters only

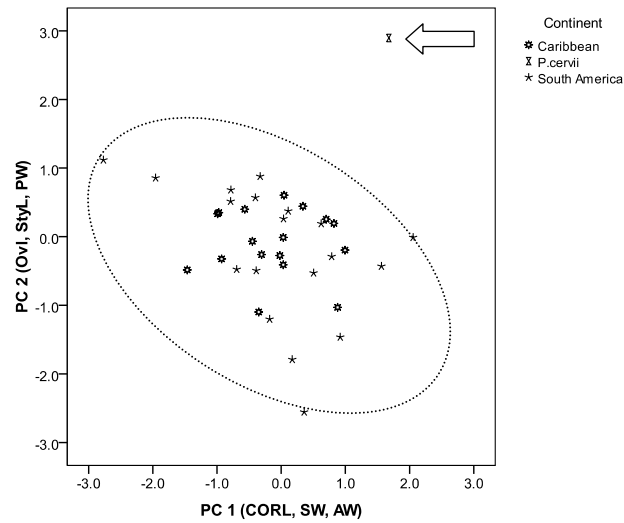
	Component		
	1	2	3
Stipule length	.476	.330	.419
Stipule width	.118	-.095	.803
Petiole length	.511	-.209	-.283
Blade central vein length	.330	.903	-.028
Blade lateral lobe length	.649	-.466	-.147
Blade lateral lobe width	.819	-.435	-.108
Blade lateral vein length	.857	.377	-.139
Blade lateral veins angle	.390	-.806	.160
Blade length outline	.762	.606	-.129
Blade basal lobe length	.738	.155	.287
Blade width	.908	-.290	-.015

iii. **Only floral characters**

The PCA that use exclusively floral characters explained approximately 32 and 15% of the variance respectively in the first two components (Table 17). Characters that loaded heavily on the first component were corona outer row length (CORL), sepal width (SW), and anther width (AW). For the second component, the characters responsible for the variation were ovary indumentum (OvI), style length (StyL) and petal width (PW) (Table 18).

The scatter plot of the variation in floral characters shows no grouping within *P. rubra*, however, *P. cervii* is quite separate. It is characterized by having puberulous ovary while South American and Caribbean specimens of *P. rubra* have hirsute ovaries (Fig. 11).

**Figure 11.** Bivariate scatter plot of the 1<sup>st</sup> and 2<sup>nd</sup> components of analysis of *P. rubra* and *P. cervii* (arrow) – Only floral characters.



**Table 17.** Principal Component loadings from the analysis of *P. rubra* and *P. cervii* – only floral characters

Component	Initial Eigenvalues		
	Total	% of Variance	Cumulative %
1	3.465	31.501	31.501
2	1.656	15.055	46.556
3	1.445	13.137	59.693
4	1.098	9.978	69.671

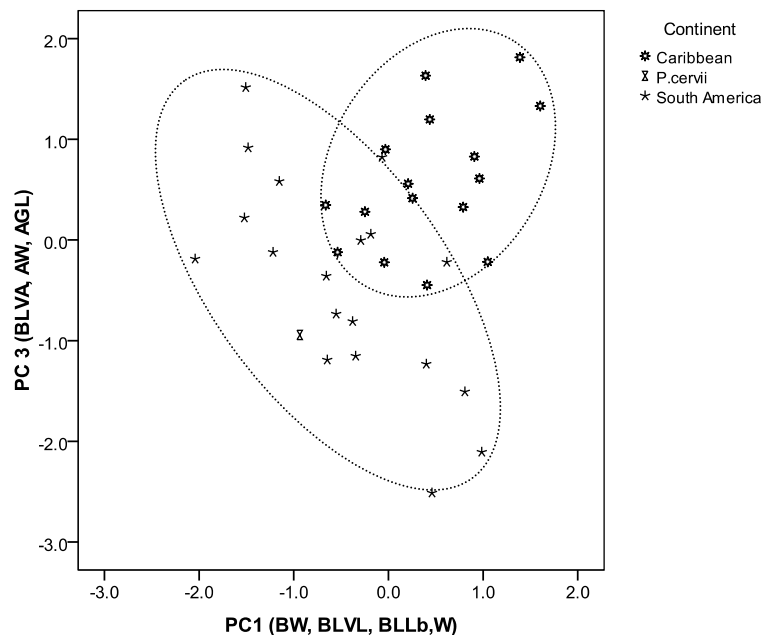
**Table 18.** List of character loadings from the first three components of the analysis of *P. rubra* and *P. cervii* – only floral characters

	Component		
	1	2	3
Petal length	0.711	-0.008	0.349
Sepal length	0.705	-0.085	0.303
Corona outer row length	0.661	-0.360	-0.122
Sepal width	0.633	0.343	-0.556
Aanther width	0.629	-0.356	0.115
Petal width	0.577	0.437	-0.439
Operculum height	0.514	0.295	0.420
Anther length	0.512	-0.451	0.047
Style length	0.422	0.469	-0.325
Androgynophore length	0.336	-0.583	-0.322
Ovary indumentum	0.279	0.483	0.560

#### iv. Vegetative and floral characters

The PCA of vegetative + floral characters largely showed the same pattern as the previous analysis. The first, second, and third components explained 27, 16, and 13% respectively of the total variance (Table 17). The characters explaining most of the variation in the first component were blade width (BW), blade lateral vein length (BLVL), blade lateral lobe width (BLLbW). The second component was explained by sepal width (SW), petal width (PW), and sepal length (SL). While blade lateral vein angle (BLVA), anther width (AW), and androgynophore length (AGL) explained most of the variation in the third component (Table 18). Given that there is no clear differentiation in sepal and petal lengths, the second component was not used in the scatter plot. Specimens again cluster in two overlapping groups, but now *P. cervii* is again within the group of South American specimens (see Fig. 11).

**Figure 12.** Bivariate scatter plot of the 1<sup>st</sup> and 3<sup>rd</sup> components of analysis of *P. rubra* and *P. cervii* – vegetative characters + flower.



**Table 19.** Principal Component loadings from the analysis of *P. rubra* and *P. cervii* – vegetative characters + flower

Component	Initial Eigenvalues		
	Total	% of Variance	Cumulative %
1	5.842	26.556	26.556
2	3.558	16.172	42.727
3	2.901	13.188	55.915
4	1.836	8.347	64.262
5	1.484	6.745	71.007
6	1.022	4.647	75.654

**Table 20.** List of character loadings of the first three components from the analysis of *P. rubra* and *P. cervii* – vegetative characters + flower

	Component		
	1	2	3
Stipule length	0.621	0.389	-0.336
Stipule width	0.225	-0.378	-0.084
Petiole length	0.672	-0.119	0.180
Blace central vein length	0.306	0.427	-0.696
Blade lateral lobe length	0.691	-0.153	0.300
Blade lateral lobe width	0.855	0.045	0.361
Blade lateral vein length	0.886	0.230	-0.214
Blade lateral veins angle	0.492	-0.099	0.689
Blade length outline	0.786	0.286	-0.412
Blade basal lobe length	0.758	0.242	-0.005
Blade width	0.909	0.091	0.315
Sepal length	-0.386	0.634	-0.062
Sepal width	-0.074	0.669	0.057
Petal length	-0.495	0.559	0.074
Petal width	-0.072	0.665	-0.118
Corona outer row length	-0.207	0.542	0.288
Operculum height	0.088	0.468	0.121
Androgynophore length	-0.350	0.022	0.610
Anther length	-0.056	0.337	0.557
Anther width	-0.043	0.496	0.651
Ovary indumentum	-0.158	0.324	-0.159
Style length	0.006	0.499	0.014

## DISCUSSION

### 1. Principal Component Analyses of the species complexes

The PCA analyses of the quantitative morphological characters for *P. capsularis* and *P. rubra* complexes support the delimitations in the earlier taxonomic treatment of Killip (1938) and Holm-Nielsen et al. (1988). However, it was not until an analysis of the floral characters alone was undertaken that *P. capsularis* and *P. rubra* became phenetically separable. Floral characters such as indumentum of the ovary (Killip, 1938; Holm-Nielsen et al., 1988) and the color of the corona (Killip, 1938; Ulmer and MacDougal, 2004) had been used before as the most important features to differentiate between the two complexes; the analysis of floral characters here provides more characters to differentiate the two. Characters such as sepal and outer corona filament morphologies loaded heavily on the variance of the first component in the analyses 1.i, and 1.iii (see Table 4, 8; and Figs. 4, 6). Petal length and width, anther width, style length, operculum height, and ovary indumentum explained most of the variation of the second component in the analyses 1.iii, and 1.iv (see Table 8, 10; and Figs. 6, 7). However, these taxa can also be distinguished mainly by the shape of the fruit (Killip, 1938; Holm-Nielsen et al., 1988) not included in the analyses, which in *P. capsularis* is fusiform or broadly fusiform, slightly to sharply hexagonal, and glabrous, while in *P. rubra* it is obovoid, rounded or abruptly acute at apex, sub-6-angled, and hirsute. The size of seeds and the sculptural designs of the sclerotesta present good taxonomic characteristics in species of *Passiflora* (Killip, 1938; Tillet, 1988; MacDougal, 1994; Deginani, 2001; Ulmer and MacDougal, 2004; Pérez-Cortez, 2007; Estrada and Rodriguez, 2009), and *P. capsularis* and *P. rubra* are no exceptions. The seeds of both are almost of the same size and are transversely sulcate, but there are differences in shape. The seeds of *P. capsularis* have a large projection at the apex which is oriented to one side and the base is acute, while *P. rubra* lacks the projection.

In addition, *P. capsularis* and *P. rubra* have slight differences in leaf shape and flower morphology. *P. capsularis* has very broadly obovate to depressed obovate leaves that almost always have two lobes. *P. rubra* has also very broadly obovate (South American specimens) to depressed obovate leaves (Caribbean specimens) that have two

or three lobes. However, these quantitative data overlap in morphological space (Fig. 5), and the two species are very similar morphologically. Differences in the sizes of the various parts of the plant may reflect the environmental conditions of the areas where the plants of these very widespread species grow (Raunkier, 1934). Therefore, qualitative characters may be more informative about the differentiation between species. PCAs analyses were based on quantitative data only, and there are clearly no discrete breaks among and between the two complexes. Killip (1938) and Holm-Nielsen et al. (1988) noted that the fruit characters were very useful in distinguishing *P. capsularis* from *P. rubra*. However, fruit characters such as fruit length and width, which might be useful, were it not (Fig. 8) for the fact that there are relatively few specimens with ripe fruits.

However, inclusion of qualitative characters such as presence, density and type of hairs in the abaxial or adaxial blade surface, number of lamina lobes, number of corona rows, and presence, density and type of hairs on the ovary strongly supported the recognition of differences between *P. capsularis* and *P. rubra*. Thus, although *P. capsularis* and *P. rubra* are poorly separated in the majority of PCA analyses, I decided to keep them as separate species because of differences in the ovary indumentum, color of the corona filaments, differences in size of floral characters (Fig. 6), and differences in fruit and seed morphologies (Table 21).

Recently, a new species of section *Xerogona* from Brazil, *P. cervii*, was described by Milward de Acevedo (2008). This species resembles *P. capsularis* and *P. rubra* but can be differentiated from these by leaf shape, filamentous corona, and oblate-spheroid pollen grains (Table 21). *Passiflora cervii* was recognized to be sympatric with *P. capsularis* and allopatric with *P. rubra* (Milward de Acevedo, 2008). Indeed, there are some specimens of *P. capsularis* from the south and southeast of Brazil that share the same geographic area with *P. cervii*. On the other hand, the geographical distribution of *P. rubra* in Brazil is restricted to a very small area located in the Northeastern part of the country, where *P. cervii* is not found. I have seen only three specimens of *P. cervii*, one from Minas Gerais: Vicosá, which is the type locality (*Mexia* 5402), one from Parana (Rio Branco do Sul; *Oliveira* 691) and the other from Rio Grande do Sul (Montenegro; (*Sehnem* 2430). These specimens represent almost the complete known geographical range of *P. cervii*.



*P. cervii* in the all character analysis 1.i (Fig. 4), appears isolated from both complexes (*P. capsularis*, and *P. rubra*). However, in analysis 1.ii (Fig. 5), using only vegetative characters the specimens of *P. cervii* appear in the morphological space where both complexes overlap, all three species having similar leaf morphology. The same pattern occurs when vegetative plus fruit characters are analyzed 1.v (Fig. 8). The fruit of *P. cervii* can be ovoid as in *P. rubra* or it can be fusiform as in *P. capsularis*, and glabrous as in *P. capsularis*, so fruit characters do not distinguish these species. Similarly, when vegetative and floral characters or only floral characters are used the specimens of *P. cervii* appear within the morphological space occupied by *P. rubra* (Fig. 6 and Fig. 7). *Passiflora cervii* is characterized by having densely villous hairs on both surfaces of the 3-lobed leaf blade, a single series of corona filaments, and ovary with puberulous indumentum, while *P. rubra* has very densely hirsute hairs on both surfaces of the 2 or 3-lobed leaf blade, 1 or 2 series of corona filaments, and ovary with densely and long hirsute indumentum. Nevertheless, *P. cervii*, *P. capsularis*, and *P. rubra* are morphologically similar when only quantitative data are considered.

In analysis 2, where *P. rubra* from South America and the Caribbean and *P. cervii* are compared, and when all characters are used two adjacent groups can be distinguished within the *P. rubra* complex and *P. cervii* appears to be separated from both. A group of *P. rubra* of specimens from the Caribbean islands and another group of South American specimens (Figs 4, 9) are weakly separated in morphological space. The two are mainly distinguished by leaf characters such as blade width (BW), blade lateral lobe length width (BLLbW), blade lateral lobe length (BLLbL), blade length outline (BLO), blade central vein length (BCVL), and blade lateral vein length (BLVL) (see Fig. 9). When only vegetative characters (leaves) are used, the two groups overlap somewhat in morphological space (see Fig. 10) with *P. cervii* in the space occupied by South American morphological space of *P. rubra*. The group of South American specimens has almost always very broadly obovate leaves with 2 or 3 lobes, with the exception of few specimens from the Southwest of Colombia (Silverstone-Sopkin 2573, 6184) and in the Northwest of Peru (Ule 6546) that have depressed obovate leaves with 2 lobes. Caribbean specimens have broadly obovate to depressed obovate leaves that always have 2 lobes; *P. cervii* shares morphological space with *P. rubra* because of the 3-lobed leaves they have in common. The characters that explain most of the variation are blade width (BW), blade

lateral vein length (BLVL), blade lateral lobe width (BLLbW), blade central vein length (BCVL), and blade length outline (BLO. When only floral characters are included there are no groupings within the *P. rubra* complex because variation in these quantitative characters is limited.

When vegetative and floral characters are both included the pattern does not change from when only vegetative characters are used; there are still two overlapping groups (see Fig. 11). Here the characters that account for most of the total variance are leaf characters in the first component of the variation and leaf and floral characters in the second and third component. The pattern of variation becomes clear when qualitative floral characters are taken into account. Characters such as sepal and petal apices and color of the outer corona along with corona row number that were not included in the analysis can help to differentiate South American specimens from the Caribbean specimens (see Table 21).

There are some differences in the qualitative variation of sepals and petals. South American specimens are characterized by having sepals with an acute apex, petals about half as long as the sepals and petals with a slightly praemorse to obtuse or retuse apex; while the Caribbean group is characterized by having sepals with an acuminate apex, petals only slightly shorter than sepals and with an acute apex. There are differences in the number of rows of corona filaments and their length. The South American specimens have almost always two rows of corona filaments (except in Lasser 1552, Venezuela and Knapp 2838, Guyana) and the length of the outer row of filaments is intermediate between that of the sepals and petals. The Caribbean specimens have a corona with only one or two rows of filaments, and the outer row is almost always shorter than both the sepals and petals. The corona filaments also differs in these two groups: they are purplish or red at the base, and cream to white higher up in South America, while they are purple or pink dotted their entire length in Caribbean specimens. The ovary shape is also different between these two groups, being ellipsoid in the South American group and ovoid to round in the Caribbean group (see Table 21). *Passiflora cervii* is quite separate from both groups. The most important qualitative character separating *P. cervii* from the *P. rubra* complex is the ovary indumentum which is merely puberulous in *P. cervii* while it is densely hirsute in the *P. rubra* complex (see Table 21).

## 2. Section *Xerogona*

Reduction has taken place in section *Xerogona* and several organs have been lost (bracts, petiolar, and laminar glands) reducing the number of characters available to distinguish species elsewhere in the genus.

The section *Xerogona* is characterized by capsular fruit which dehiscence in an unusual way. In capsular fruits the pericarp usually dehisces along regular lines and splits into as many valves as there are carpels to expose the seeds. In section *Xerogona*, the capsule splits into as many angles as there are in the capsule and expose the seed along every other capsule valve. Although I have observed this unusual fruit dehiscence in photographs of *P. capsularis* (Plate 1C), *P. escobariana* (Plate 8C), and on living plants of *P. cisnana* in the field (Plate 2C), it needs further observations in the other species of the section.

The seeds in section *Xerogona* are transversely sulcate with the ridges between the grooves often smooth and shiny. However, there are some variations in the seed sclerotesta morphology. The seeds of *P. goniosperma* are strongly compressed laterally with narrow ridges; the grooves are reduced to a row of teeth along this narrow ridge (Plate 9D). Seeds also may have slightly rugulose ridges as in *Passiflora sanguinolenta* (Plate 14 C) or have strongly rugulose ridges as in *P. tenella* (Plate 15 C).

Within section *Xerogona* the morphologically most different species, *P. tenella*, is a small and poorly known herb from dry coastal Ecuador and Peru. *Passiflora tenella* rarely reaches 0.9 m tall and is apparently annual. Its fruit does not appear to be a capsule and the seeds have strongly rugulose ridges unlike other members of *Xerogona*, but the shape of the leaves and the absence of floral bracts and laminar nectaries suggest affiliation with this section and a preliminary DNA analysis place the species as sister to the rest of the section (Porter-Utley com. pers).

Within section *Xerogona* there are some species that may look morphologically similar but these species differ in some morphological features and also in their geographical distribution.

*Passiflora citrina* is similar to *P. sanguinolenta* having flowers with floral tubes almost the same shape and size, but they differ in color, the flowers of *P. citrina* being light to bright yellow while the flowers of *P. sanguinolenta* are red to reddish violet.

They also differ in geographical distribution. *Passiflora citrina* is found in Mexico, Nicaragua, and Costa Rica, while *P. sanguinolenta* is endemic to Ecuador.

*Passiflora cobanensis*, *P. konzattiana*, and *P. goniosperma* all have flowers with short outer corona filaments that are purplish at the base and yellow at the apex. However, *P. cobanensis* can be differentiated from the other two by having unlobed leaves. *Passiflora konzattiana* differs from *P. goniosperma* by having seeds with transverse grooves and smooth ridges while *P. goniosperma* has strongly compressed seeds with grooves reduced to a row of teeth.

*Passiflora rovirosae* is often confused by its similarity to *P. costaricensis*. However, *P. rovirosae* differs from *P. costaricensis* in its short indumentum and 5-angulate not 3-angulate stems.

*Passiflora cobanensis* was previously circumscribed by Killip in 1938 as two different species *P. cobanensis* and *P. brevipes*. MacDougal in 2004 recognized only a single species, *P. cobanensis*. Within *P. cobanensis* two variants can be recognized as subspecies *P. cobanensis* ssp. *cobanensis* and *P. cobanensis* ssp. *brevipes*. These two subspecies have been recognized based on differences in stem, leaf, corona filaments, and ovary characters. The former is characterized by having 4 to 5-angulate stems, thinner leaves that are slightly reticulate and sparsely pubescent beneath, linear-clavate outer corona filaments, and glabrous to puberulous ovary. The later is characterized by 3-angulate stems, thicker leaves conspicuously reticulate beneath with nerves and veins elevated and densely pubescent, filiform outer corona filaments, and a tomentose ovary.

## CONCLUSION

*Passiflora* subgenus *Decaloba* (DC.) Rchb. section *Xerogona* consists of 15 species and 2 subspecies of small to medium sized climbing vines that have unusual dehiscent capsular fruits, absence of bracts and laminar nectaries, and smooth grooved seeds. The species are primarily distributed in Central America with 9 species while 3 species are found in South America. Two taxa are found in both Central America and South America, *P. capsularis* and *P. costaricensis*. *Passiflora cispnana* is widespread in South America and *P. rubra* widespread in the Caribbean islands.

*Passiflora cobanensis* was separated into two subspecies, *P. cobanensis* ssp. *cobanensis* growing in mesic to wet uplands in Chiapas; and *P. cobanensis* ssp. *brevipes* in hotter lowland and seasonally drier areas. The separation of this species in two subspecies is based on differences on stem, leaf, corona filaments and ovary characters.

The morphological pattern of variation shown by all specimens assigned to the *P. capsularis* and *P. rubra* species complexes showed that those complexes are actually made up of four separate groups (Fig. 4 and Fig. 6). The *P. capsularis* complex forms a single group, while the *P. rubra* complex can be separated into two groups (Fig. 4 and Fig. 9), *P. cervii* can also be distinguished from these complexes. These other two taxa can be distinguished mainly by qualitative features as shown in Table 21, as well as by geography; one is from the Caribbean islands and the other is from South America. The type and original description of *P. rubra* was based on material from the Caribbean Islands consequently the Caribbean group will keep the species name of *P. rubra* L, and the South America group will take the name *P. cispnana* Harms as that is the oldest available name.

Table 21. Summary of distinctive qualitative characters separating species in the *P. capsularis*/*P. rubra* complexes

Character	<i>P. capsularis</i>	<i>P. cervii</i>	<i>P. cisanana</i>	<i>P. rubra</i>
Leaf shape	broadly obovate to depressed obovate	very broadly obovate	very broadly obovate	broadly obovate to depressed obovate
Leaf lobe number	almost always 2-lobed	3-lobed	2 or 3-lobed.	2-lobed
Leaf indumentum (abaxial)	densely hirsute	densely villous	densely hirtellous	densely hirsute
Leaf indumentum (adaxial)	sparsely hirsute	sparsely villous	densely hirsute	sparsely hirsute
Peduncles	solitary	solitary	solitary, very rarely in pairs	solitary or in pairs
Sepal apex	acute	acuminate	acute	acuminate
Petal length	about half as long as the sepals	shorter than sepals	about half as long as the sepals	shorter than sepals
Petal apex	slightly praemorse or retuse	acute	slightly praemorse to obtuse or retuse	acute
Corona rows number	1 rarely 2 (Colombia, Brazil, Argentina, and Haiti)	1	2, except in Venezuela (Lasser 1552) and Guyana (Knapp 2838).	1 or 2
Corona filament shape	filiform	ligulate	filiform	filiform
Corona filament length (in contrast to sepals and petals)	almost always shorter than sepals and petals	shorter than sepals and petals	shorter than sepals and petals or in between	between sepals and petals or as long as the petals
Color of the corona	pure white very rarely with pink base.	unknown	purplish, pink or red at base, cream to white above	purple or pink dots the entire length
Ovary shape	narrowly ovoid to fusiform-ellipsoid	ellipsoidal to ovoid	ellipsoidal	ovoid to round
Ovary indumentum	glabrous to minutely puberulous	hispid to puberulous	densely hirsute	densely hirsute
Pollen grains	prolate-spheroid, 12-colporate	oblate-spheroid, 12 colporate	prolate-spheroid, 12-colporate	prolate-spheroid, 12-colporate
Fruit shape	fusiform or broadly fusiform, slightly to sharply hexagonal, glabrous.	ovoid or fusiform, glabrous	ellipsoidal to obovoid or abruptly acute at apex, 6-angled, hirsute	rounded to ovoid 6-ribbed, pubescent
Seed shape	with a large projection in the apex oriented to one side of the seed.	ellipsoidal, 5 or 6-sulcate	lacks the projection	with a small projection in the apex oriented to one side of the seed

## Taxonomic Treatment

The species concept used for this study is the general lineage concept of De Quieroz (1998) “...., a species lineage is composed of a series of ancestral and descendant species”, “Species are more inclusive population level lineages...” therefore, a species is a segment of an evolutionary lineage at the population level. The species criterion I used is that of phenetic similarity. So species are “...the smallest populations permanently separated from each other by distinct discontinuity in the series of biotypes...” (Davis & Heywood, 1973), and those discontinuities may reflect geographical, ecological and/or reproductive isolation.

The taxonomic revision of section *Xerogona* is based on morphological observations. It includes a description of the section, an identification key, the descriptions of the taxa themselves, notes on their distribution, ecology and phenology, and distribution maps of each species. The descriptions of the taxa are based on mature reproductive herbarium specimens and photographs. The descriptive terms used follow those in Hickey & King (2000) and Stearn (2004) and colors in the description refer to those of fresh material and photographs. Since maximums and minimums of each character (in parenthesis) were measured quantitative data are expressed as follows: the first number is the smallest measurement then the average of the minimum followed by the average of the maximum and then largest measurement (e.g. Stipules (2.8--4.4--5.0(--8.1) × (0.3--0.6--0.7(--0.8) mm). All measurements are expressed in mm except for leaf length and width which is expressed in cm. Width measurements, were taken at the widest point of the structure involved. Exceptions of the descriptions are cited in parenthesis.

Every effort was made to use foliar characters in the key, since leaves are almost always diagnostic if careful measurements are taken (MacDougal, 1994), and few collectors make detailed descriptions of the flowers (Jørgensen et al. 1984). Distribution maps were produced in ArcView GIS Version 9.5. The latitudes and longitudes concerning 15 species were gathered from TROPICOS ® and georeferenced when coordinates were not directly available in order to construct the distributional maps.

*Passiflora* subgenus *Decaloba* (DC.) Rchb. section *Xerogona* (Raf.) Killip. Publ. Field Mus. Nat. Hist., Bot. Ser. 19: 26 1938. *Xerogona* Raf. Fl. Tellur. 4: 103 1836. [1938].

**TYPE:** *Xerogona biloba* Raf., nom. illeg. (based on *Passiflora capsularis* L.)

Small to medium sized climbing perennial vines (herbaceous annual vine). Stems slightly striate to 3--5-angular. Stipules linear to linear-triangular; petioles eglandular; lamina with entire margin, abaxially puberulous to pubescent, adaxially puberulous to hirsute (glabrous); 2--3-lobed (unlobed), the lateral lobes acuminate to rounded, base cordate to round, laminar nectaries absent. Peduncles articulate with the distal part (the 'floral stipe'). Bracts absent (a single linear bract less than 4 mm long at the apex of the peduncles). Flowers with a shallow dish shaped floral cup (floral tube); sepals linear or narrowly triangular, not corniculate, white, pale greenish yellow, or red, often conspicuously 3-veined; petals linear to narrowly elliptic, white, pale greenish to greenish yellow, yellow, or red, sometimes tinged with pink or purple at the base; corona filaments in 1 or 2 series; the outer white, greenish with yellow apex, reddish purple with yellow apex, or white with pink or purple at the base; inner filaments capillary or absent; operculum membranous-plicate; nectar ring annular; limen annular, close to androgynophore. Carpels 3; ovary ellipsoid, ovoid, obovoid or fusiform, minutely puberulous to densely pubescent; stigma capitate. Fruit fusiform, ellipsoid, or obovoid, 6-angular to 6-keeled, reddish, purplish red, red and white, (greenish), dehiscent; arils white; seeds transversely sulcate, the ridges smooth (rugulose, with two longitudinal row of teeth per face or reduced to a row of teeth along the ridge), black. Chromosome number:  $n = 6$ . Germination type is epigeal.



### Key to the Species of *Passiflora* Section *Xerogona*

- 1a. Lamina unlobed, narrowly obovate to very broadly obovate.  
**5. *P. cobanensis***
- 1b. Lamina 2-lobed or 3-lobed (the central lobe, if present, reduced).
- 2a. Plant smaller than 0.9 m; lamina 1--5 × 2--8 cm, depressed obovate.  
Corona filaments in 2 series.
- 3a. Lamina densely pubescent, lateral lobes apex obtuse to round.  
Corona inner filaments white. Ovary tomentose. Seeds with two longitudinal rows of 5--6 teeth per face. Mexico, Nicaragua, and Costa Rica.  
**10. *P. pusilla***
- 3b. Laminas sparsely pubescent, lateral lobes apex acute. Corona inner filaments violet tinged. Ovary glabrous. Seeds with 4--5 transverse sulci which are strongly rugulose. Ecuador and Peru.  
**14. *P. tenella***
- 2b. Plant 1--7 m or more; lamina 2--16 × 2--13 cm, narrowly to very broadly obovate or depressed obovate. Corona filaments in 1 or 2 series.
- 4a. Floral tube present. Androgynophore 15--29 mm long.
- 5a. Stems 5-angular. Lamina broadly obovate. Floral tube light to bright yellow, corona filaments in 1 rarely 2 series.  
Honduras, Guatemala, and El Salvador.  
**4. *P. citrina***
- 5b. Stems 3-angular. Lamina depressed obovate. Floral tube red or reddish violet, corona filaments consistently in 2 series. Ecuador and Peru.  
**15. *P. sanguinolenta***
- 4b. Floral tube absent. Androgynophore 2--10 mm long.
- 6a. Androgynophore 2--4 mm long. Outer corona filaments purplish at the base and yellow at the apex, 2--10 mm long.

7a. Lamina 2(--3)-lobed, depressed obovoid. Seeds not compressed laterally with smooth grooves.

**6. *P. conzattiana***

7b. Lamina 2-lobed, very broadly obovate. Seeds compressed laterally with a narrow longitudinal ridge and grooves reduced to a row of teeth along ridge.

**9. *P. goniosperma***

6b. Androgynophore 4--10 mm long. Outer corona filaments white, white with pink or purple base or white with yellow tips, 5--20 mm long.

8a. Stems 5-angular. Corona filaments in 2 series.

9a. Petioles 11--14 mm long. Laminas 2(--3)-lobed, the angle between the lateral lobes veins 41--50°. Peduncles 18--42 mm long usually solitary. Floral stipe 2--5 mm long (to 5--9 mm in fruit). Stigma 0.5--1.6 mm diam. Plant pubescent throughout.

**11. *P. quinquangularis***

9b. Petioles 21--26 mm long. Laminas 2-lobed, the angle between the lateral lobes veins 27--33°. Peduncles 5--25 mm long usually in pairs. Floral stipe 5--11 mm long (to 5--19 mm in fruit). Stigma 1.1--2.8 mm diam. Plant puberulous throughout.

**12. *P. rovirosae***

8b. Stems 3- or 3(--5)-angular. Corona filaments in 1 or 2 series.

10a. Vine 4--12 m long. Laminas 7--16 cm long, the angle between the lateral lobes veins 28--59°. Fruit ellipsoid or fusiform.

11a. Stems sharply 3-angulate. Plant densely tomentose throughout with trichomes 0.5--2.0 mm long. Lamina 2-lobed. Floral stipe 2--7 mm long (to 4--11 mm in fruit). Operculum usually finely pubescent, yellowish green. Androgynophore 4--8 mm long.

*7. P. costaricensis*

11b. Stems 4--5-angulate. Plant puberulous throughout with trichomes 0.1--0.6 mm long. Lamina 2(--3)-lobed. Floral stipe 2--3 mm long (to ca. 4 mm in fruit). Operculum glabrous, light purple. Androgynophore 7--8 mm long.

*8. P. escobariana*

10b. Vine 2--4(--8) m long. Lamina 2--10 cm long, the angle between the lateral veins 32--108°. Fruit ovoid, obovoid, globose or broadly fusiform.

12a. Ovary glabrous to minutely puberulous.

13a. Floral stipe 2--5 mm long (to 2--15 mm in fruit). Sepals with acute apex. Petals about half as long as the sepals, with slightly praemorse or retuse apex. Lamina 2(--3)-lobed. Central America to South America

1. *P. capsularis*

13b. Floral stipe 3--4 mm long (to ca. 8 mm in fruit). Sepals with acuminate apex. Petals slightly shorter than the sepals, with acute apex. Lamina 3-lobed. Southeast of Brazil

2. *P. cervii*

12b. Ovary densely hirsute.

14a. Lamina 2--3-lobed. Floral stipe 1--7 mm long (1--8 mm in fruit). Sepals with acute apex. Petals about half as long as the sepals, with slightly praemorsus to obtuse or retuse apex. Corona filaments in 2 very rarely 1 series, outer filaments shorter than sepals and petals, purplish or red at the base, cream to white above. Ovary ellipsoid. South America.

4. *Passiflora cissnana*

14b. Lamina 2-lobed. Floral stipe 1--4 mm long (1--3 mm in fruit). Sepals with acuminate apex. Petals slightly shorter than sepals with acute apex. Corona filaments in 1 or 2 series, outer filaments between sepals and petals in

length, with purple or pink  
dots along the entire length.

Ovary ovoid to globose.

Caribbean Islands

**13.** *P. rubra*

1. **Passiflora capsularis** L. Sp. Pl. 2:957(1753)

*Granadilla capsularis* (L.) Medik., Malvenfam. 96. 1787. – *Xerogona biloba* Raf., Fl. Tellur. 4:103(1838), nom. illeg. – *Decaloba capsularis* (L.) M. Roem., Fam. Nat. Syn. Monogr. 2:154(1846). – TYPE: An illustration, the engraving on the title page of Jacques Barrelier. Pl. Gal. Hisp. Ital. Obs. Icon. Æneis Exhib. Titul., Fig. 1. (lectotype designated here).

*Passiflora pubescens* Kunth in Humb., Bonpl. & Kunth, Nov. Gen. Sp. 2:132(1818). – *Cieca pubescens* (Kunth) M. Roem., Fam. Nat. Syn. Monogr. 2:141(1846). – TYPE: Venezuela, Aragua, between Maracay and Nueva Valencia, *Humboldt & Bonpland s. n.* (holotype, P).

*Passiflora bilobata* Vell. Fl. Flumin. Icon 9: pl. 78. 1827. – *Decaloba bilobata* M. Roem., Fam. Nat. Syn. Monogr. 2:154(1846), nom superfl. – TYPE: the cited plate.

*Passiflora capsularis* var. *acutiloba* DC., Prodr. 3:325(1828). – TYPE: Brazil, collector unknown *s.n.* (holotype, G).

*Passiflora piligera* Gardner, London J. Bot. 1:173(1842). – *Decaloba piligera* (Gardn.) M. Roem., Fam. Nat. Syn. Monogr. 2:161(1846). – TYPE: Brazil, foot of Galvia Mountain, *Gardner 49* (holotype, BM not seen; isotypes, K not seen).

*Passiflora paraguayensis* Chodat, Bull. Herb. Boissier 7 (9, app. I):74(1899). – TYPE: Paraguay, Itagua, *Hassler 1419* (holotype, G not seen).

*Passiflora hassleriana* Chodat, Bull. Herb. Boissier 7 (app. I):74(1899). – TYPE: Paraguay, Tacuaral, *Hassler 1202* (holotype, G not seen; isotypes, K not seen, P).

*Passiflora hassleriana* var. *grandiflora* Chodat & Hassl., Bull. Herb. Boissier 2(4):62(1903). – TYPE: Paraguay, Rio Apa, *Hassler 7913* (holotype, G; isotypes, BM not seen, GH, K not seen, MO, P).

*Passiflora hassleriana* var. *paraguariensis* Chodat & Hassl., Bull. Herb. Boissier 2(4):62(1904). – TYPE: Paraguay, Chololo, Rio Apa, *Hassler 6684* (holotype, G not seen).

Vine 2--4(--8) m, sparsely pubescent to glabrescent; stems 3--5 angular, striate, pubescent when young while older parts glabrescent. Stipules (1.9--3.7--4.5(--7.4) × (0.1--0.3--0.4(--0.7) mm, linear to linear triangular, more or less falcate, very sparsely pubescent abaxially; petiole (7--15--21(--53) mm long; lamina (2.4--5.0--6.7(--10.8) ×

(2.5--5.4--6.7(--11.8) cm, very broadly obovate to depressed obovate, base cordate, densely hirsute abaxially with trichomes 0.1--1.1 mm long, sparsely hirsute adaxially with trichomes 0.2--1.1 mm long; 2(--3)-lobed, the lateral lobes acuminate to acute (the central lobe reduced or rounded, cusp-like); the angle between the lateral veins (37--56--66(--102)°. Peduncles (12--27--34(--62) mm long, slender, solitary (in pairs); floral stipe 1.5--5 mm long; flowers (19--31--35(--48) mm diam., greenish white or pale yellow-green; sepals (10.9--14.7--16.3(--21.9) × (1.6--2.7--3.4(--4.7) mm, narrowly triangular, sparsely hirsutulous pubescent, apex acute, pale green to white (base pink); petals (4.5--8.4--9.8(--14.6) × (0.9--1.7--2.0(--2.9) mm, linear to narrowly triangular; about half as long as the sepals, apex slightly praemorse, white; corona filaments in 1 (2) series, filaments of outer series 30--32, (6.3--9.2--10.3(14.4) mm long, pure white (base pink); (filaments of the inner series (1.3--2.7--2.9(--3.0) mm long; operculum (0.6--1.3--1.5(--2.2) mm; limen erect; androgynophore 4.6--8.6 mm long, green; stamens with filaments (4.3--4.6--5.3(--5.6) mm long; anthers (1.9--3.0--3.2(--3.6) × (0.6--1.1--1.3(--1.8) mm; ovary 3--5 × 2--3 mm, ovoid to fusiform-ellipsoid, glabrous to minutely puberulous; styles (1.6--3.1--3.8(--5.1) × 0.2--0.3 mm; stigma (0.7--0.9--1.2(--1.4) mm diam. Fruit (32--45--50(--76) × (9--14--15(--37) mm, fusiform to broadly fusiform with more abruptly tapering apex, slightly to sharply hexagonal, glabrous, reddish brown, dark purplish red or red (white or cream between the ridges); stipe 2.0--15.0 mm long; seeds (1.3--2.7--3.0(--3.9) × (1.1--1.6--1.8(--2.1) mm, transversely sulcate with 6--9 sulci, and with a large projection in the apex oriented to one side (Plate 1D).

**Local Names:** “*Calzoncillo*” (Salvador); “*maracuja branco miudo*”(Brazil).

**Distribution and Ecology:** From Mexico to Panama; Colombia, Venezuela, French Guiana, Ecuador, central Brazil to Paraguay, Bolivia, and the Greater Antilles (Cuba, Dominican Republic, Haiti and Jamaica) in moist, wet, rain and cloud forests from 50 to 2600 m altitude mainly in secondary forest edges, secondary open areas and roadsides.

**Phenology:** Flowers observed from May to December. Fruits documented from April to July and from December to January.

**Selected specimens examined:** ARGENTINA. **Corrientes:** Depto. San Ignacio, Salto Tabay, 15 Feb 1980, *A. Schinini 19878* (CTES); **Misiones:** Santa Ana, 27°23'00"S 055°35'00"W, 06 Dec 1945, *J. Montes 1539* (WIS); Puerto Tguozu, 05 March 1945, *R. B. Hayward s.n.* (LIL); Puerto Beinbeuq, 15 March 1945, *R. B. Hayward s.n.* (LIL); Victoria-Ruta 12, 17 Nov 1949, *E. Schwind 2421* (L, WIS); Cainguás, Mineral, 14 March 1958, *J. E. Montes 27637* (F, NY); Puerto Rico, 26°48'S 055°01'W, 14 Feb 1955, *J. E. Montes 14753* (F, NY); Candelaria, Loreto, 28 April 1947, *J. E. Montes 375* (BAB); Santa Ana, 27°23'S 055°35'W, 27 Jan 1976, *M. C. Romanczuk 486* (BAB, SI); General Manuel Belgrano, De Bernardo de Irigoyen a El Dorado, ruta prov. 17, 34 km de Bdo. de Irigoyen, 26°22'S 053°53'W, 01 March 1995, *F. O. Zuloaga et al. 5095* (MO, SI); Refugio de vida silvestre Urugua-í, FVSA, camino de entrada a la casa y sendero hacia Arroyo Sauer, 25°58'S 054°07'W, 15 Nov 2000, *M. E. Múlgura et al. 2712* (MO, SI); Salto Tupá, sobre arroyo Rodador, frente entrada del INTA, 26°02'S 053°45'W, 15 Dec 1997, *M. E. Múlgura et al. 1909* (MO, SI); Guaraní, Sector CIFOR, 26°54'59"S 054°12'18"W, 12 Feb 2002, *H. A. Keller & F. Robledo 1611* (CTES); Predio del Refugio Moconá Naturaleza y Aventura, alrededores del Salto Horacio Foester, 27°08'S 053°55'W, 07 March 2002, *M. E. Múlgura et al. 3091* (MO, SI); Ruta Prov. 2, Reserva Ecológica Provincial, 23 km de El Soberbio camino al Parque Provincial Moconá, 27°10'S 054°06'W, 12 Feb 1996, *O. Morrone et al. 692* (MO, SI); Iguazú. Parque Nac. Iguazú, Isla San Martín, 25°41'S 054°46'W, 04 March 1995, *F. O. Zuloaga et al. 5240* (MO, SI); Arroyo Mlocay, 05 Feb 1947, *T. Meyer 11814* (CTES); Cataratas del Iguazu, 15 March 1944, *T. Meyer 5912* (GH); San Pedro, Parque Provincial Cruce Caballero, picada saliendo de la casa del Guardaparque, 26°31'S 053°59'W, 15 Apr 1996, *F. O. Zuloaga et al. 5560* (MO, SI); Parque Provincial Moconá, 27°08'S 053°53'W, *J. Daviña, et al. 206* (CTES, G); Ruta 20, a 30 km del cruce con la ruta 17 hacia B. de Irigoyen, 26°21'S 055°53'W, 14 Dec 1997, *M. E. Múlgura et al. 1851* (MO, SI). BOLIVIA. **Santa Cruz:** Chiquitos, Santiago de Chiquitos, Serranía de Santiago, camino a la cueva y altura el arco, 18°40'S 059°15'W, 13 Nov 1997, *F. Mamani & A. Jardim 1281* (MO, USZ); Nuflo de Chavez, Las Trancas, Lomerio cerca las parcelas de Bolfor, 16°32'45"S 061°50'21"W, 30 Marzo 1995, *A. Jardim 1924* (F, MO, NY, USZ); Lomerio, 12 km al N de la comunidad Las Trancas, area de estudio del proyecto "BOLFOR", Las Trancas-95,



16°31'13"S 061°50'47"W, 02 March 1995, *F. Mamani* 584 (LPB, MO, NY, USZ).

BRAZIL. S. Salvador, Montenegro, Sarmentum indumeto, 30 March 1949, *A. Sehnem* 3747 (B); RGS, Butterberg, P. Montenegro, 22 May 1950, *B. Rambo* 47127 (B); RGS Alto Feliz p. Caí, 09 3 1933, *B. Rambo* 249 (B); RGS, Est. Silvicultura, Sta Maria, 10 Apr 1956, *Camargo* 60359 (B); Formosa Do Sul, Margem da Estrada para Jordaninho, *G. F. Árbocz* 1063 (F); N. Friburgo, e silva prea Collegio, Nov 53, *P. Capell s.n.* (MA); Rio Canoas, Itajaí: Caminho do mato, 18 Jan 1953, *P. R. Reitz* 5164 (US); Estrada Dona Francisca, Joinvile, 01 March 1958, *P. R. Reitz & Klein* 6549 (US); **Bahia**: Ca. 12 km na estrada de Ribeirão do Largo para Nova Brasilia, 15°31'20"S 040°41'11"W, 15 Aug. 2001, *A. M. V. de Carvalho* 6921 (NY); Municipio de Ilhéus, Área do CEPEC (Centro de Pesquisas do Cacau), Km 22 da Rodovia Ilhéus Itabuna (BR 415), 27 Aug 1986, *J. L. Hage et al.* 2142 (G); 5.3 km from Almadina on road to Ibatupã then left 7.9 km on road to Serra dos Sete Paus, 14°44'11"S 039°41'57"W, 4 Apr 1997, *W. W. Thomas et al.* 11447 (NY); **Espírito Santo**: Clay banks, Serra do Caparaó, 20°21'S 041°51'W, 30 Apr 1925 – 4 May 1925, *A. Chase* 9631 (GH, MO, US); **Goiás**: Between Goiabeira and Annapolis, 16°25'14"S 049°00'40"W, 23 March 1930, *A. Chase* 11517 (GH, US); **Mato Grosso do Sul**: Aquidauana, 20°26'02"S 055°45'05"W, 26 Feb 1930, *A. Chase* 11060 (GH, MICH, US); **Minas Gerais**: 1876, *A. F. Regnell s.n.* (US); Lavras. Vertical red clay, 21°14'43"S 044°59'59"W, 10 March 1925, *A. Chase* 8801 (GH, US); Juiz de Fora, 21°45'40"S 043°21'23"W, 24 Feb 1925, *A. Chase* 8618 (GH, US); Outskirts of Realeza, junction of BR-116 and BR-262, 20°10'S 042°10'W, 18 Jan 1985, *A. Gentry et al.* 49696 (MO); Lavras, 25 Jan 1939, *E. P. Heringer* 136 (SPF); Cerrado ca. 20 Km E. of Diamantina, 15 March 1970, *H. S. Irwin* 27581 (NY); Lagoa Santa, 19°37'38"S 043°53'23"W, Nov - Dec 1867, *J. E. B. Warming* 1159 (C); 19°37'38"S 043°53'23"W, 18 Nov 1864, *J. E. B. Warming* 1161 (C); *J. E. B. Warming s.n.* (C, NY, WU); *J. E. B. Warming s.n.* (C); *L. E. Gilbert* 9052 (TEX); cidade de Caldas, Serra da Cidade, 1 March 1869, *S. E. Henschen* 639 (UPS); Fazenda da Chicaca, Municipio of Santa Luzia, 13 Dec 1945, *V. Assis* 191 (GH); Viçosa. State Agricultural School, Viçosa, 18 Dec 1958, *S. I. Howard* 2276 (NY, TEX); **Paraná**: Serra do mar, Viaduto dos Padres, 15 Apr 1982, *A. C. Cervi* 1974 (CTES); Salto Iguassú, 11 Jan 1953, *B. Rambo* 53616 (B); Capoeira, 08 Dec 1982, *G. Hatschbach* 45793 (BR, G); 18 Feb 1960, *G. Hatschbach* 6821 (L, US);

Mato Preto (mun. Cerro Azul) Orla da mata, 6 Dec 1983, *G. Hatschbach* 47634 (MO); Passinho (mun. Laranjeiras do Sul), 09 Apr 1975, *G. Hatschbach* 36609 (GH, HBG, MO, US); Astorga, 29 Jan 1950, *Imaguire*, *N* 1838 (US); Vicinity of Rio Branco do Sul, 30 Apr 1967, *J. C. Lindeman & J. H. de Haas* 5230 (NY, U, US); Rio Piedade (Mun. Cerro Azul) Beira da estrada, 24 Apr 1997, *J. M. Silva & C. Garcia* 1944 (C, G, HBG, MO); Vêu de Noiva (mun. Morretes), 15 Jan 1986, *J. M. Silva & J. Cordeiro* 51 (C, CAS); Falls of Iguacu, 25°42'00"S 054°26'00"W, 10 Feb 1965 - 11 Feb 1965, *L. B. Smith* 15012 (GH, US); Estrada da Ribeira, Serra do Santana (Mun. Bocaiúva do sul), 23 Dec 1997, *O. S. Ribas* 2227 (C, G, HBG); 06 Jan 1915, *P. Dusén* 16291 (GH, US); Estrada Doña Francisca, Joinville, 01 March 1958, *P. R. Reitz & R. M. Klein* 16785 (B, GH, L, NY, US); Jul 1968, *R. Braga* 1524 (GH, US); Beira de estrada, *R. Reitz* 12078 (GH, US); Curitiba. Morro Grande (mun. Cerro Azul), 19 Feb 1981, *G. Hatschbach* 43615 **Rio de Janeiro:** Road from Teresopolis to Além Paraíba, 38 km from Além Paraíba, 22°05'S 042°48'W, 18 Jan 1985, *A. Gentry et al.* 49704 (MO); *B. Luschnath s.n.* (OXF); Brasilia, *C. Martius s.n.* (M); Rio De Janeiro, 22°54'10"S 043°12'27"W, March 1892 - May 1892, *L. Riedel & B. Luschnath* 718 (NY, US); Therezopolis, 12 March 1924, *L. H. Bailey & E. Z. Bailey* 1287 (BH); Tijuca, Dec 1913, *P. Dusén s.n.* (GH); Brasilia, 20 Nov 1909, *Ph. V. Lützelburg* 25 (M); 1842, *Riedel s.n.* (NY); **Rio Grande do Sul:** Excolonia Santo Angelo, 28°17'57"S 054°15'47"W, 9 Feb 1893, *C. A. M. Lindman* 1141 (GH, MO, S, UPS, US); 30 Dec 1958, *P. R. Reitz* 6116 (US); **Santa Catarina:** Piratuba, Cascata do Monje, 27°24'39"S 051°46'16"W, 27 Jan 1992, *A. Krapovickas* 43996 (F, GH); Tijuca [Tijucas], 27°14'29"S 048°38'01"W, *A. F. M. Glaziou* 3990 (C, P); Apr 89, *E. Ule s.n.* (HBG); 27°11'37"S 051°29'41"W, 8.Jun 1911, *P. Dusén* 11893 (G, GH, MO, S, US); Capoeira, 16 Feb. 1956, *R. Reitz* 2679 (B, NY); Capoeira, 7 Jan. 1956, *R. Reitz & R. M. Klein* 2335 (B, NY, US); **São Paulo:** Judaiá, E. Experimental IAC, Banco de Germoplasma, 11 Nov 1996, *Bernacci* 2178 (F); Capital Vila Cerqueira Cesar, 18 Feb 1931, *F. C. Hoehne s.n.* (SPF); Mairiporã: 24.7 km south along road from Nazaré Paulista, 4.3 km S of village of Tapera Grande, Near entrance of "Fazenda Central", 23°19'S 046°35'W, 12 Apr 1960, *G. Eiten & L. T. Eiten* 1844 (GH, NY, US); Município de Socorro-SP, bairro dos Domingues, próximo ao sítio Beija-Flor, 07 March 2000, *M. Groppo* 388 (K, SPF); Município de Socorro-SP, bairro dos Domingues, sitio Beija-flor.,

04 Feb 2000, *M. Groppo* 363 (F, SPF); *G. Perdonnet* 264 (G); Atibaia. Serra de Itapetininga, estrada para a Pedra Grande, 16 Dec 2003, *M. A. Farinaccio et al.* 582 (SPF); Aguas da Prata, 21°52'S 047°20'W, 21 March 1994, *A. B. Martins* 31409 (SPF); Municipio de Itararé, cerca de 28 Km de Itararé em Direção à pedreira São Judas cerca de 1 km da estrada Itararé - Bonsucesso de Itararé 2a parada, 12 Feb 1995, *P. H. Miyagi et al.* 412 (SPF); Municipio de Aguas da parta, ca 500 m do Distrito de São Roque da Fartura brejo na beira da estrada para Vargem Grande do Sul, 21°51'S 046°45'W, 11 Jan 1994, *V. C. Souza et al.* 5001 (SPF); Pr. Jaraguá, 03 March 1942, *W. Hoehne* 11057 (IAC). CARIBBEAN. **Cuba:** San Juan Mts, Sigüanea, El Junco, 01 -- 20 July 1950, *R.A. Howard et al.* 163 (GH); Cienfuegos, Belmonte, Soledad, Cienfuegos, 22°07'19"N 081°21'43"W, 18 Sep 1927, *J. G. Jack* 6316 (F, US); **Haiti:** Vicinity of Ennery, Department de L'Artibonite, 19°29'N 072°29'W, 03 Feb 1926, *E. C. Leonard* 9465 (F, GH, US); **Jamaica:** Hanover, 11 Jul 1975, *L. L. Clarkson & W. J. Kress* 75-282 (DUKE). COLOMBIA. Las Delicias N.W. of Restrepo Valle, 02 Aug 1962, *Bridgeman* 212 (K, US); Thickets, 05 May 1939, *E. P. Killip* 35528 (GH, US); **Antioquia:** Hatillo, 06°25'N 075°24'W, 23 May 1936, *Daniel* 941 (US); Salamina, *F. C. Lehmann* 4723 (B, F, K, MO, US); Cerca a Villa Arteaga, 19 Apr 1948, *F. Sierra & F. A. Barkley* 18C634 (B, US); Cañasgordas, 9 Jul 1983, *J. Santa & J. Brand* 773 (MO, NY); Mpio. de Amalfi, road to Medellín, 1 km N of road to Anorí, 06°50'N 075°09'W, 15 Feb 1989, *J. M. MacDougal et al.* 4065 (GH, MO, US); Cordillera Central Antioquia, en los alrededores de Medellin, 1946, *R. Perdomo* 10 (GH, US); Nariño, carretera a Termas "Espíritu Santo", 05°34'N 075°03'W, 14 Sep 1994, *R. Fonnegra et al.* 5181 (GH, HUA, LL, MO, U, US); San Luis, Cañón del Río Claro, sector norte, margen izquierda, 05°53'N 074°39'W, 16 Jun 1984, *A. Cogollo* 1839 (JAUM, MO); Santa Bárbara, 05°48'51"N 075°35'30"W - 05°51'37"N 075°33'37"W, 21 Sep 1922, *F. W. Pennell* 10895 (GH, US); 5 Km suroeste de Santa Barbara, 24 Dec 1976, *L. K. Albert de Escobar & U. Lucia* 390 (LL); Zaragoza, Quebrada Coguií, 2 km antes de la desembocadura del Río Mata en el Río Porce, 18 March 1989, *F. J. Roldan & R. Fonnegra* G. 2704 (MO, NY); **Caldas:** entre La Felisa y Filadelfia, 9 Jul 82, *L. K. Albert de Escobar & J. Brand* 2058 (MA); 5 km de San Pelegrino, Carretera a Arauca, 26 Dec 1976, *L. K. Albert de Escobar* 417 (TEX, U); **Chocó:** Riosucio, Serranias de la margen izquierda del río Cacarica, a poca distancia de

su desembocadura en el río Atrato, 3 Jul 1957, *R. Romero 6347* (F, GH, MO, NY);

**Cundinamarca:** Top of canyon wall at edge of potrero, 08 May 1944, *E. P. Killip & A. Dugand 38368* (GH, US); Hacienda Saldaña, Municipio Caparrapi, 10 Jun 39, *H. García-Barriga 7729* (GH, MA, US); Santandercito, Oct 1953, *L. Uribe 2511* (MA); Highway above Tocaima, 13 Apr 1949, *O. Haught 6396* (US); La Esperanza, 05°10'N 074°41'W, 11 Apr 1935, *W. A. Archer 3284* (GH, NA, US); **La Guajira:** Chingolita, 3 leguas al Este de Carraipia, 24 Nov 1953, *R. Romero 4404* (NY); **Magdalena:** "Cincinnati," lower slopes of Mount San Lorenzo, near Santa Marta, 01°06'40"N 074°05'33"W, *W. E. Seifriz 15* (GH, US); Santa Marta, banks of River Don Diego, 12 May 1898, *H. H. Smith 2780* (NY); **Risaralda:** Belen de Umbria, Caldas. Belén, 05°12'13"N 075°52'14"W, 15 Sep 1922, *F. W. Pennell 10613* (GH, US); **Santander:** Río Suratá valley, between El Jaboncillo and Suratá, 07°19'38"N 073°01'00"W - 07°22'39"N 072°58'36"W, 02 Feb 1927, *E. P. Killip & A. C. Smith 19044* (GH, NY, US); Jan 1880, *Kalbreyer s.n.* (HBG); San Juan Valley (Camp IV), 06°30'N 074°14'W, Jun 1935, *O. Haught 1768* (GH, US); Bucaramanga, Bucaramanga, 07°07'51"N 073°06'33"W, 16 Feb 1927, *E. P. Killip & A. C. Smith 19340* (GH, US); Charta, Charta, 07°17'03"N 072°58'11"W, 01 - 11 Feb 1927, *E. P. Killip & A. C. Smith 19037* (GH, NY, US); Surata, Surata, 07°22'10"N 072°59'14"W, 04 - 10 Jan 1927, *E. P. Killip & A. C. Smith 16477* (A, GH, NY, US);

**Tolima:** El Libano, cafetales y alrededores, 17 July 1947, *H. García-Barriga 12230* (GH, US); Fresno región de "Cerro Azul" hacienda de "El Diamante", 04 Dec 1939, *H. García-Barriga 08265* (US); Libano, 04°55'27"N 074°57'28"W, 26 Dec 1917 – 29 Dec 1917, *F. W. Pennell 3424* (GH, MO, NY, US); **Valle del Cauca:** Piedra de Moler, 04°42'27"N 075°51'04"W, 01 March 1876, *E. André 2418* (K); Cisneros, Clay banks, 04°49'21"N 076°47'20"W, 10 May 1922, *E. P. Killip 5371* (GH, US); Near Palmira, 03°31'58"N 076°13'47"W, 26 - 30 May 1922, *F. W. Pennell & E. P. Killip 6167* (GH, NY, US); Dagua, 21 Sep 1922, *E. P. Killip 11443* (GH, NY, US); Zarzal, Hacienda El Medio (Carretera Panamericana entre La Palle y Zarzal, parte plana del Valle del Río Cauca), 24 May 1987, *F. A. Silverstone-Sopkin & N. Paz 3189* (MO); Hacienda El Medio (Carretera Panamericana entre La Paila y Zarzal, parte plana del Valle del Río Cauca), 29 May 1988, *P. Silverstone-Sopkin et al. 4044* (MO). COSTA RICA. *H. Pittier 8921* (BR); environs de San José, 09°55'48"N 084°04'48"W, Jun 1902, *Pittier 16675* (CR); **Alajuela:**

23 Sep 1976, *V. J. Dryer* 763 (F); Zarcero, Guadalupe, 10°10'48"N 084°24'36"W, 23 Jan 1940, *A. Smith* 2293 (NA, US); Region of Zarcero, 10°10'48"N 084°23'24"W, 18 Nov 1937, *A. Smith* A587 (EAP, F); **Cartago:** El Guarco, ca. 13.4 km south of San Isidro de Tejar in the lower slopes of Talamancas ca. 14 km south of the intersection of the Cartago-San José road on the Carretera Interamericana (km post 29), 09°46'12"N 083°59'24"W, 21 Jul 1980, *J. M. MacDougal* 685 (DUKE); **Guanacaste:** Abangares. Upper San Gerardo Valley, 5 km N Monteverde, Atlantic slope, Continental divide, 10°21'N 084°48'W, 12 Oct 1989, *W. Haber & W. Zuchowski* 9536 (MO); **Heredia:** Vicinity of Bajo La Hondura, along road between Paracito and the Río Claro, 10°03'36"N 083°58'48"W, 14 Jan 1978, *T. B. Croat* 44486 (MO); **Limón:** Pococi, P. N. Braulio Carrillo, cuenca del Sarapiquí, margen del Río Sucio, 10°08'55"N 083°56'55"W, 23 Sep 1999, *A. Rodriguez et al.* 5186 (MO); **Puntarenas:** 10°20'N 084°50'W, 24 Dec. 1985, *W. A. Haber* 3884 (MO); Monteverde, upper San Luis River valley below Monteverde on Pacific slope. 10°20'N, 84°50'W, 10°20'N 084°50'W, 17 Dec. 1985, *W. A. Haber ex E. Bello* 3932 (DUKE, MO); 10°20'N 084°50'W, 10 Dec. 1985, *W. A. Haber ex E. Bello* 3697 (MO); Puntarenas, Monteverde, camino hacia la R. B. de Monteverde, 10°20'00"N 084°49'30"W, 21 Oct 2000, *A. Estrada* 2437 (F); **San José:** 09°32'24"N 083°55'48"W, Apr 1932, *M. Valerio* 178 (BR, CR, F); La Palma, 10°03'00"N 083°58'48"W, Aug 1898, *Tonduz* 7426 (US); Vazquez de Coronado, P. N. Braulio Carrillo, Cuenca del Sarapiquí 2 Km antes de la Estación Quebrada González, riberas del Río Sucio, 10°09'00"N 083°57'00"W, 05 Aug 1999, *A. Rodríguez G. & V. H. Ramírez* 5110 (G); La Palma area, northeast of San Jeronimo, above the La Hondura valley, 10°01'48"N 084°00'00"W, 4 Feb 1977, *W. Burger & G. Visconti* 10231 (F); Steep wet slopes below La Palma, along Río Claro (upper Río La Hondura) along the trail to Guapiles, 10°01'48"N 083°58'48"W, 01 Jan 1967, *W. C. Burger* 4152 (F). ECUADOR. **El Oro:** Road Piñas - Santa Rosa, above El Placer, 03°37'S 079°49'W, 15 Nov 1977, *G. Harling et al.* 15568 (AAU, GB); Road Piñas - Santa Rosa, above El Placer, 03°37'S 079°49'W, 14 Nov 1977, *G. Harling et al.* 15514 (GB); **Loja:** Alamor - Cazaderos Road. El Limo, 03°39'S 080°09'W, 03 Apr 1980, *G. Harling & L. Andersson* 17839 (AAU, GB); **Los Ríos:** Río Palenque Biological Station, 00°35'S 079°22'W, 11 Feb 1973, *Dodson et al.* 5240 (GH, RPSC, SEL, US); **Pichincha:** 20 Km W of Santo Domingo de los Colorados, 00°14'38"S 079°19'26"W, 01

Nov 1961, *P. C. D. Cazale & T. D. Pennington 5240* (B, K, NY, UC); GUATEMALA. **Chiquimula:** Along Río Tacó, between Chiquimula and Montaña Barriol, 3-15 mi NW of Chiquimula, 14°49'50"N 089°34'01"W, 26 Oct 1939, *J. A. Steyermark 30630* (F); **Jalapa:** Mountains about Chahuite, NW of Jalapa, 14°40'26"N 090°02'48"W, 16 Nov 1940, *P. C. Standley 77481a* (F); **Santa Rosa:** Cuajiniquilapa, 14°16'38"N 090°17'55"W, Sep 1893, *E. T. Heyde & E. Lux 6142B* (GH, US); Guachipilín, 14°09'37"N 090°01'25"W, Sep 1893, *E. T. Heyde & E. Lux 6141* (B, G, GH, US); **Sololá:** Finca Santo Thomas Pachuj (zwischen Patulul und Lucas Toliman), 14°36'35"N 091°06'09"W, 20 Apr 1998, *H. Forther 10251* (MSB); HONDURAS. **Lempira:** Faldas Montaña Puca entre Guatán y Cuábanos, 25 Sep 1963, *A. Molina 12920* (EAP, F); MEXICO. **Oaxaca:** Near border of Oaxaca and Veracruz, Highway 185, km 129 heading north, 28 Jul 1971, *A. C. Gibson & L. C. Gibson 2446* (RSA); NICARAGUA. **Jinotega:** El Recreo, 4 km al norte de Santa Gertrudis, 13°13'N 085°53'W, 8 Apr 1981, *P. P. Moreno & J. C. Sandino 7907* (MO); PANAMA. **Chiriquí:** Watershed for the Fortuna project Dam under construction, Southeast of AOKI camp, 08°45'N 082°16'W, 07 Jun 1980, *J. P. Folsom et al. 8183* (TEX); Filo del Cerro Fortuna, S. del campamento de Fortuna, sitio de presa, 08°45'N 082°15'W, 28 Sep 1976, *M. D. Correa et al. 2966* (MO, PMA); 12 km N of Los Planes de Hornito, IRHE Fortuna Hydroelectric Project, 08°43'N 082°14'W, 17 Jun 1982, *S. Knapp & M. Vodicka 5500* (MO); **Coclé:** Cerro Pilón, El Valle, 08°38'16"N 080°06'18"W, 4 Jan 1968, *J. A. Duke & B. R. Lallathin 15023* (MO); Along the trail from Continental Divide near the sawmill above El Copé to Río Blanco del Norte, 08°41'00"N 080°35'54"W - 08°43'00"N 080°36'24"W, 20 Feb 1982, *S. Knapp et al. 3667* (MO); **Veraguas:** past Escuela Agrícola on road to Calovebora; 81°07'W, 8°32'N, elev. 1200 m., 08°32'N 081°07'W, 9 Sep 1982, *C. Hamilton et al. 1260* (MO); Forests above Primero Brazo del Río Santa Maria, N of Escuela Agicola Alto de Piedra, just W of Santa Fé, 08°34'N 081°07'W, 4 Jun 1982, *S. Knapp & R. Dressler 5383* (MO); Santa Fe, Primer Brazo del Río Ulabá, 08°33'N 081°07'W, 06 Jul 1996, *J. E. Aranda et al. 2805* (PMA, SCZ). PARAGUAY. Rio de La Plata, 1854, *E. Palmer s.n.* (US); 1853 - 1856, *E. Palmer s.n.* (US); Dto Cantera, Colonia Alborada, 23 Nov 1948, *J. E. Montes 3279* (K); Rio Apa and Rio Aquidaban, *K. Fiebrig 4108* (B, E, G, K); Chemin, C.F.A.P., Pto Stroessner, Km 12, 28 Dec 1984, *L. C. Stutz de O. 2107* (NY); San Bernardino, 02 Mar 1946, *T. Rojas*

13269 (CAS, LIL); San Lorenzo del Campo Grande; Orslasde montes Laurelty, 19 Nov 1941, *T. Rojas 9367* (LIL); **Alto Paraná:** Estancia Río Bonito, 25°37'55"S 054°48'17"W, 27 Feb 1996, *E. M. Zardini & L. Guerrero 44619* (AS, MO); Viv. Ftal Itaipú, Orilla de bosque., 8 Mach 1979, Itaipú Binacional *Unknown 208* (MO); Escuela Técnica Forestal, Puerto Presidente Stroessner, km 12, 28 Jan 1982, *J. Fdez Casas & J. Molero 5663* (MA, MO, NY); Rio Alta Parana., Oct 1909, *K. Fiebrig 6027* (B, BM, E, G, GH, P, US); Escuela Tecnica Forestal Km 12 Pto. Pres. Straoessner, 04 Dec 1978, *M. Bernardi 18893* (NY); **Amambay:** Estancia Carmen de la Sierra, 19 Mar 91, *N. Soria 4379* (MA, MO); **Caaguazú:** Villa Rica [Sierra de Villa Rica], 25°36'S 055°58'W, *P. Jörgensen 3792* (C, CAS, DLY, F, GH, MO, NY, PH, US); **Caazapá:** National Park Caaguazú, 26°05'49"S 055°28'58"W, 25 Nov 1997, *E. M. Zardini & A. Benítez 47522* (AS, MO, NY); **Central:** Par Centralis: Regio lacus Ypacaray; "Cordillera de Altos" per Lieden, 25°17'S 057°20'W, Feb 1913, *E. Hassler 11531* (B, BM, C, E, F, G, GH, K, L, MO, NY, US, WIS); Estero del Ypoá, Tacuara, 4 km NW of Cerro Pé. Cerrado, 25°38'S 057°28'W, 28 Oct 1992, *E. Zardini & L. Guerrero 33371* (AS, MO, US); Tavarory, 2.5 km from administration on the direction to Arroyo Abai, 25°30'S 057°30'W, 16 Dec 1991, *E. Zardini & T. Tilleria 29427* (AS, MO); 1 km W from entrance to Tavarory, Savanna, 25°30'S 057°30'W, 25 March 1992, *E. M. Zardini & L. Guerrero 31572* (AS, CAS, MO); 2.5 km W from entrance to Tavavory, 25°30'S 057°30'W, 18 May 1992, *E. M. Zardini & T. Tillería 31763* (AS, BH, CU, MO); Itá Enramada., 14 Nov 1978, *M. M. Arbo et al. 1677* (CTES); 11 Jan 1959, *T. M. Pedersen 5264* (C, GH, US); San Lorenzo, 25°20'S 057°32'W, 24 Dec 1936, *W. A. Archer 4761* (NA); **Concepción:** Estancia Santa Maria de la Sierra, 22°43'48"S 057°27'07"W, 15 Oct 1994, *E. M. Zardini & L. Guerrero 41577* (AS, MO); Estancia Primavera-Vallemi, 22°24'07"S 057°37'33"W, 3 Nov 2001, *E. M. Zardini & L. Guerrero 57260* (MO); Estancia Primavera-Valle Mí, 22°23'46"S 057°37'29"W, 6 Nov 2001, *E. M. Zardini & L. Guerrero 57542* (MO); Parque Nacional "San Luis de la Sierra", 22°40'21"S 057°20'29"W, 15 Sep 1994, *E. M. Zardini & M. Vera 40947* (AS, MO); **Cordillera:** San Bernardino, Costa del Lago Ipacaray, 14 Oct 1973, *C. L. Quarín et al. 1561* (CTES); Tobatí "Ybytú Silla" mesa Southern area, 25°12'S 057°07'W, 10 Jun 1991, *E. Zardini & R. Velázquez 27278* (FCQ, MO); Between Emboscada and Nueva Colombia, 25°07'S 057°19'W, 01 Jun 1993, *E. M. Zardini & L.*

*Guerrero 35902* (AS, MO); **Guairá:** Cordillera de Ybytyruzú, Road to Cantera Jhú, 3 kms S of route to Coronel Oviedo, 25°48'S 056°20'W, 20 Sep 1989, *E. Zardini & R. Velásquez 14513* (FCQ, MO); Cumbre del Cerro Acati, a orillas del camino, 25°55'S 056°15'W, 30 March 1989, *I. Basualdo 002421* (MO, TEX); Cumbre del Cerro Acati, 25°55'S 056°15'W, 30 March 1989, *M. Ortiz 001185* (MO); Ybyturuzú, en la cumbre del Cerro Acatí, 25°55'S 056°15'W, 29 March 1989, *N. Soria 3491* (FCQ, MO); **Itapúa:** Estancia Parabel, 15 Apr 1989, *S. Keel 1900* (MO); **Paraguarí:** National Park Ybycu'i, 5 km N of administration, 26°03'S 056°50'W, 25 Nov 1991, *E. M. Zardini & P. Aquino 29016* (MO, PY); National Park Ybycu'í, 26°01'S 056°46'W, 12 March 1992, *E. M. Zardini & L. Guerrero 31039* (F, MO, NY, PY); Macizo Acahay, 25°54'S 057°09'W, 5 Jan 1989, *E. M. Zardini & C. Velásquez 9235* (MO, PY); Cordillera de Altos, 25°30'S 057°09'W, 12 Nov 1902, *K. Fiebrig 426a* (B, E, F, G, L); Cordillera de Altos, 25°30'S 057°09'W, 1902, *K. Fiebrig 194* (B, E, G); **San Pedro:** Alto Paraguay, Primavera, 31 Aug 1960, *A. L. Woolston 1206* (C, GH, U, US). VENEZUELA. 1879, *Ernst s.n.* (B); **Falcon:** Parque Nacional Cueva de la Quebrada el Toro, 20 Jan 1980, *G. L. Sobel & J. J. Strudwick 2064* (NY); **Miranda:** La Mocca [La Moca], 10°22'N 066°36'W, 07 Aug 1891, *B. Eggers 13530* (C).

*Decaloba smithii* M. Roem. was considered by Killip (1938) to be a synonym of *P. capsularis* L. Indeed, Roemer (1846) described *D. smithii* as a replacement of the earlier name, *P. capsularis* sensu Smith, described by John Smith in 1819. Smith's description seems to fit *P. capsularis* except when he mentions – “There are two glands at the base of the leaf”; *P. capsularis* L. lacks glands on the leaf. Smith's description may apply to several other species such as *P. tuberosa* (MacDougal, comm. pers.). I have therefore eliminated *Decaloba smithii* of the synonymy of *P. capsularis*.

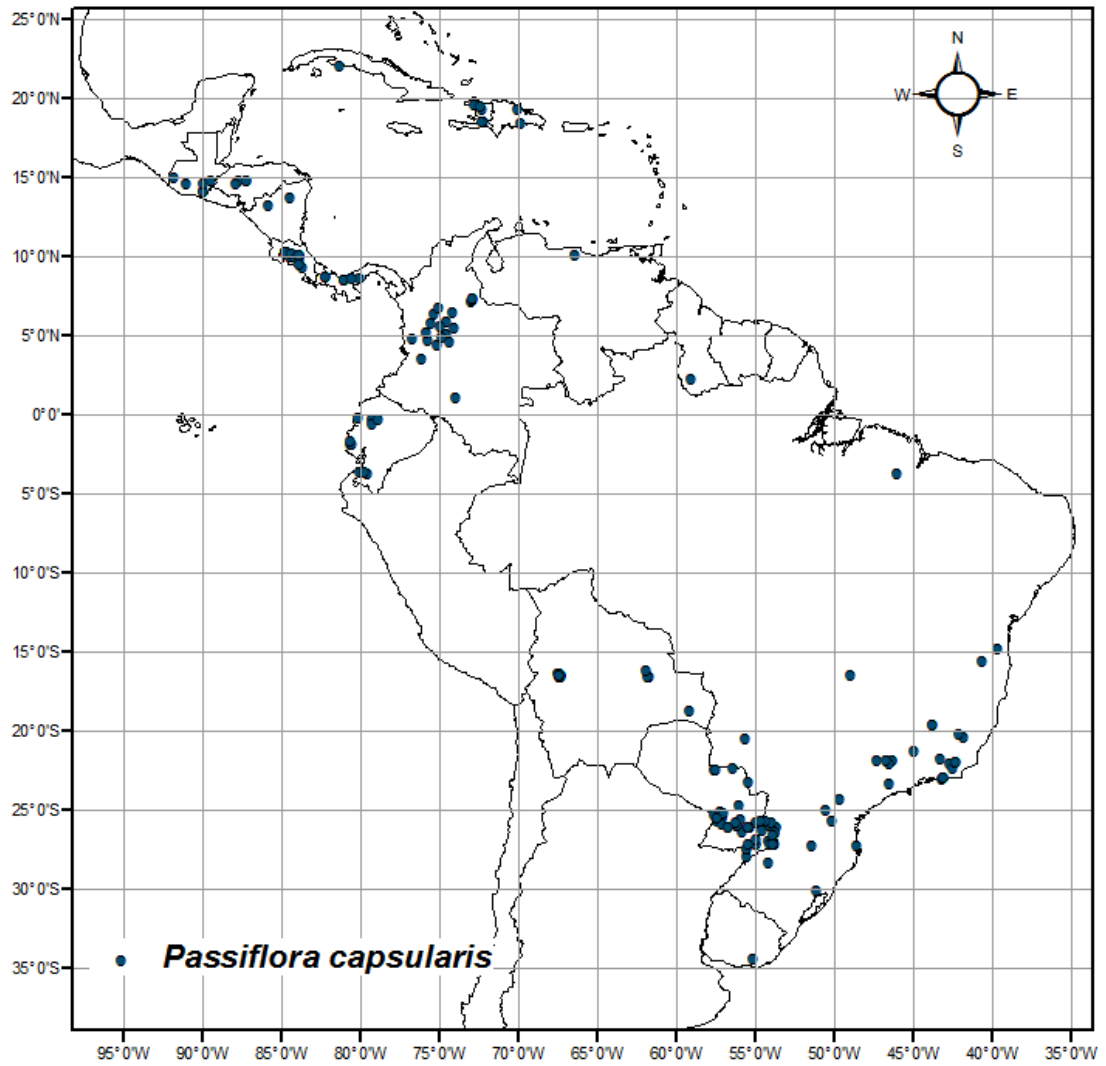
*Passiflora capsularis* and *P. rubra* have often been confused by early authors because it is difficult to distinguish the two in the absence of flowers and fruits. The first description by Plumier (1703) of *P. rubra* is actually an attempt to clarify the distinction between the two species.

*Passiflora capsularis* is characterized by having solitary flowers, sepals with acute apices, petals with slightly praemorse apices and about half as long as the sepals,



while *P. rubra* have solitary flowers or in pairs, sepals with acuminate apices, petals with acute apices and a bit short than the sepals. The corona filaments of *P. capsularis* are in 1 rarely 2 series, the outer filaments are almost always shorter than sepals and petals, pure white (but in a dried state this difference is not perceptible); in *P. rubra* having 2 series of corona filaments is more common, the outer series of filaments is between the sepals and petals in length, with purple or pink dots along their entire length. The ovary in *P. capsularis* is narrowly ovoid to fusiform-ellipsoid, glabrous to minutely puberulous, whereas in *P. rubra* it is ovoid to round, densely pubescent with white to brown trichomes; the fruits are fusiform, or slightly to sharply hexagonal, and glabrous in *P. capsularis*, while in *P. rubra* they are ovoid to rounded, and hirsute. The seeds of *P. capsularis* differ from those of *P. rubra* by having a longer projection 0.7--1.0mm in the apex oriented to one side. *Passiflora rubra* have a shorter projection, only 0.3--0.5 mm long.

*Passiflora capsularis* and *P. cissana* are very similar when only vegetative characters are considered. However, these species can be distinguishing when floral characters are used. *Passiflora capsularis* is characterized by having the outer corona filaments pure white, while in *P. cissana* the outer corona filaments are purplish, pink to red at the base and cream to white above. The ovary in *P. capsularis* is narrowly ovoid to fusiform-ellipsoid and glabrous to minutely puberulous, whereas in *P. cissana* it is ellipsoid and densely hirsute. Fruit shape also differ: it is fusiform or broadly fusiform, sharply hexagonal, and glabrous in *P. capsularis*, and ellipsoid to obovoid to abruptly acute at apex and hirsute in *P. cissana*. The seeds of *P. capsularis* differ from those of *P. cissana* by having a large projection in the apex oriented to one side while *P. cissana* seeds are acute at the apex and lack the distinct projection.



**Figure 13.** Distribution of *Passiflora capsularis* L.



**Plate1.** *Passiflora capsularis* L. A. Flower. B. Plant (*Hernández 5581*). C. Dehiscent fruit (*MacDougal 1520*). D. Arils (*MacDougal 1520*). E. Seed (*Burger 10231*).  
Photos: A. Ochoa, J; B. Hernández, A.; C, D. MacDougal, J. M.; E. Boza T. E.

2. **Passiflora cervii** Milward de Azevedo, Brittonia 60(4): 310-312 (2008).

TYPE: Brazil. Minas Gerais: Viçosa, *unknown s.n.* (holotype, VIC not seen).

Vine moderately to densely villous throughout. Stem 3-angular, striate. Stipules (4.6--4.9--5.6(--6.1) × (0.3--0.4(--0.5) mm, narrowly triangular, very sparsely pubescent abaxially; petiole (9--12--18(--23) mm long; lamina (5.0--5.7--6.5(--7.4) × (4.9--5.2--5.8(--6.1) cm, very broadly obovate, base cordate, densely villous abaxially with trichomes 0.4--0.5 mm long, densely villous adaxially with trichomes 0.3--0.5 mm long, 3-lobed, the lateral lobes acute to obtuse, the central lobe, reduced and obtuse; the angle between the lateral veins (45--48--56(--58)°. Peduncles (23--27--49(--67) mm long, slender, solitary; floral stipe 3.1--3.6 mm long; flowers (26--27--29(--31) mm diam.; white; sepals (12.7--15.6--17.3(--19.8) × (1.9--2.6--3.4(--4.3) mm, narrowly triangular, apex acuminate, sparsely hirsute pubescent outside; petals (8.6--10.2--11.0(--13.6) × (1.2--2.1--2.3(--2.6) mm, linear to narrowly triangular, apex acute, shorter than sepals; corona filaments in 1 series, filaments of outer series 30--32, (8.3--9.6--10.8(11.7) mm long, shorter than the sepals and petals; operculum (1.9--2.0--2.3(--2.6) mm; limen cupulate; androgynophore 5.8--8.1 mm long; stamens with filaments 4.4--5.1(--5.5) mm; anthers 3.2--3.7(--3.9) × (1.2--1.4--1.5) mm; ovary 3.1--4.5 × 1.7 mm, ellipsoidal to ovoid, minutely puberulous; styles (3.3--3.5--4.1(--4.6) mm; stigma 1.0--1.1 mm diam. Fruit ca. 44 × 15 mm, ovoid to fusiform, color unknown; stipe ca. 8.1 mm long; seeds 1.8--2.5 × 1.2--1.5 mm, transversely sulcate with 5--6 sulci, rounded at the base.

**Local Names:** “*maracujazinho*” (Santa Catarina - Brazil).

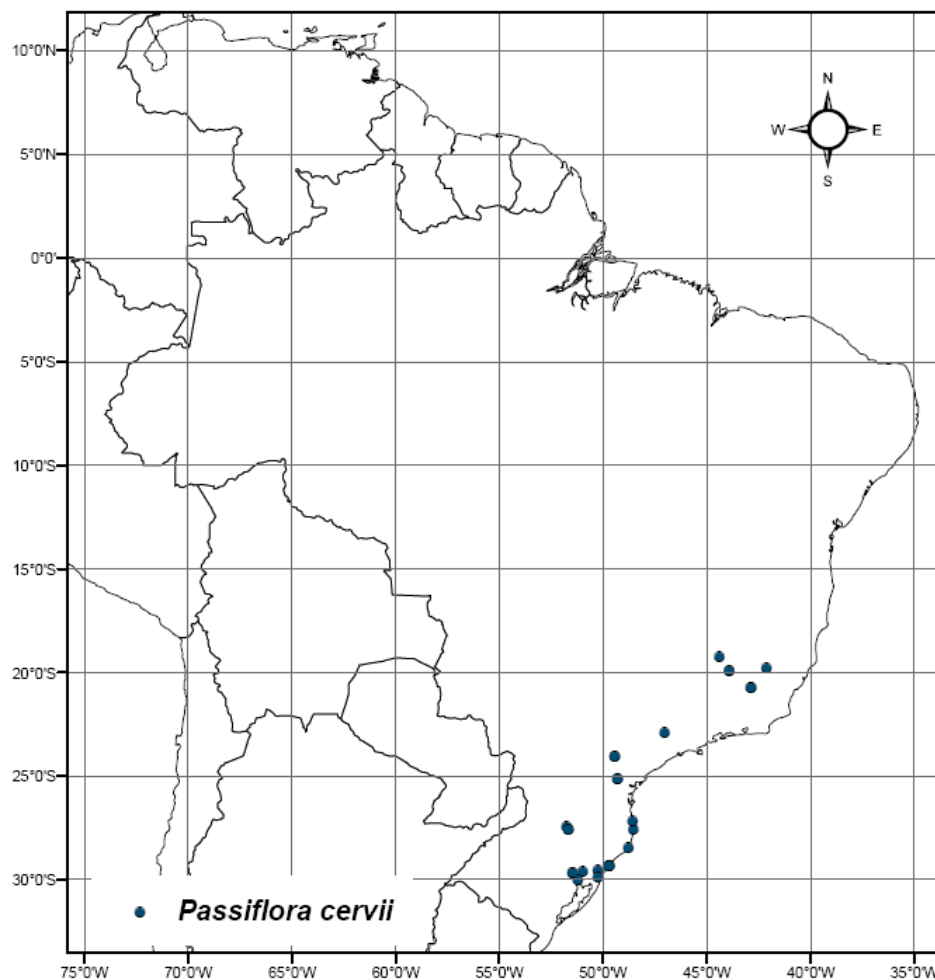
**Distribution and Ecology:** Restricted to the south east of Brazil in the states of Minas Gerais, São Paulo, Paraná, Santa Catarina, and Rio Grande do Sul in both montane rain forest and coastal forest.

**Phenology:** Flowers observed in October to April. Fruits documented from February to June and from October to December.

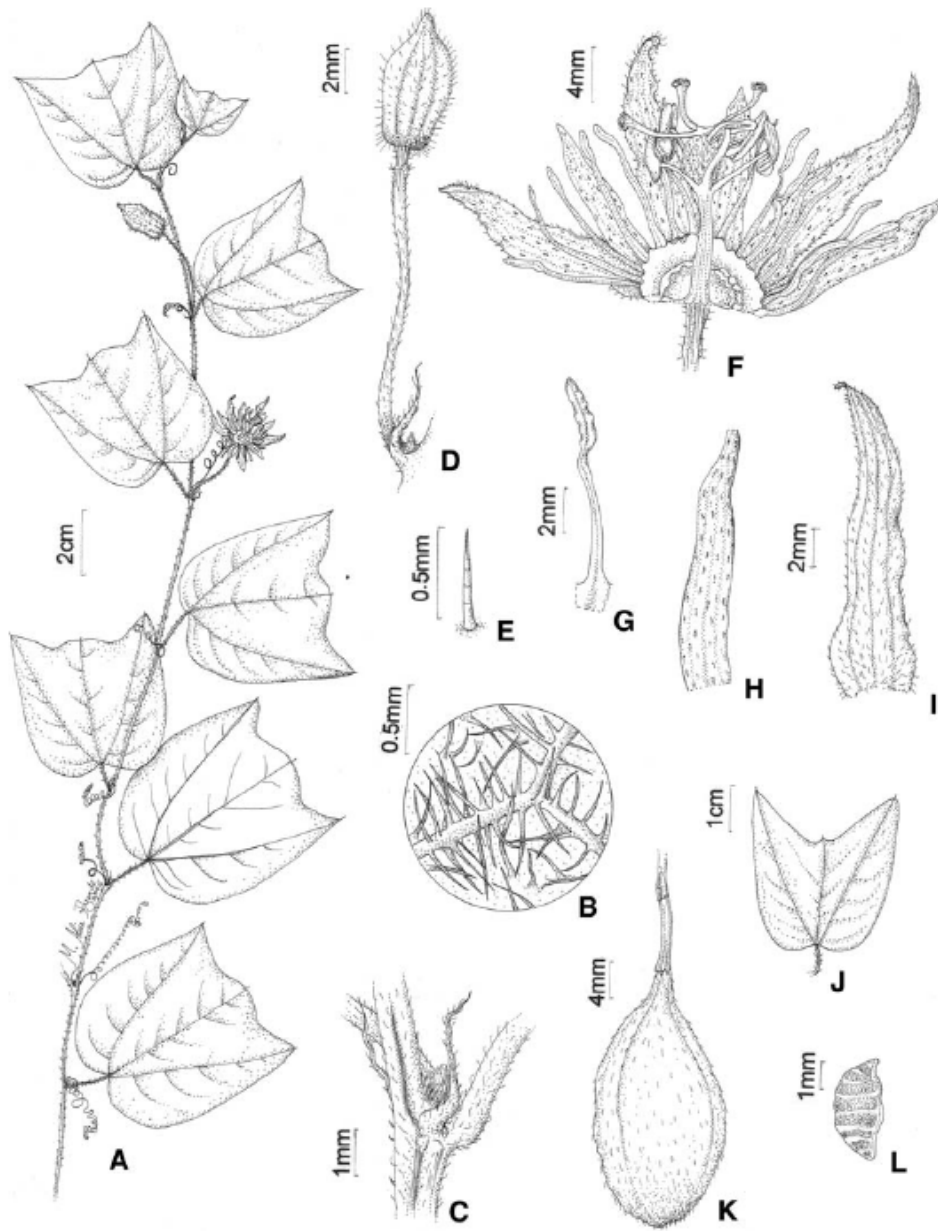
**Selected specimens examined:** BRAZIL. **Minas Gerais:** Vicosa. Road to Barroso. Fazenda de Aguada, 20°45'20"S 042°52'02"W, 11 Dec 1930, Y. *Mexía* 5402 (CAS, G,

GH, MO, NY, S, US); **Paraná:** Lavarinha (mun. Rio Branco do Sul) Paraná, 25°11'24"S 049°18'51"W, 25 Nov 1982, *P. I. Oliveira 691* (HBG, NY, SP); **Rio Grande do Sul:** S. Salvador, Montenegro, R.G.S., 29°41'59"S 051°28'46"W, 04 Jan 1949, *A. Sehnem 2430* (CAS).

*Passiflora cervii* is very closely related to *P. capsularis* and *P. rubra*. The most important character to distinguish the three is the ovary, which is glabrous or minutely puberulous in *P. capsularis*, puberulous to hispid in *P. cervii*, and densely white to brown hirsute in *P. rubra*. *Passiflora cervii* can be distinguished also by its very broadly obovate leaves, ligulate corona filaments, oblate-spheroid pollen grains, and by its distribution (Milward-de-Azevedo, 2004).



**Figure 14** Distribution of *Passiflora cervii* Milward de Azevedo



**Figure 15.** *Passiflora cervii*. **A.** Habit. **B.** Detail of abaxial surface of leaf. **C.** Stipule. **D.** Bud. **E.** Pluricellular trichome. **F.** Detail of flower. **G.** Filaments of corona. **H.** Petal. **I.** Sepal. **J.** Leaf. **K.** Fruit. **L.** Seed. (Drawing taken from Milward de Azevedo, 2008).

3. **Passiflora cisnana** Harms, Bot. Jahrb. 18 (Beibl. 46): 5 (1894).

TYPE: Ecuador: Loja, near El Cisne, 1200--1500 m. *Lehmann 4833* (holotype, B, destroyed; isotype, K; photo, F, MO, NY).

*Passiflora lunata* Vell. Fl. Flumin. Icon. 9: pl. 80. 1827. – *Decaloba semilunaris* M. Roem., Fam. Nat. Syn. Monogr. 2:154 (1846), nom superfl. – TYPE: the cited plate.

Vine 2--4 m long, densely and softly pubescent. Stems 3--4-angular. Stipules (2.2--4.4--5.0(--7.8) × (0.3--0.5--0.7(--1.0) mm, linear to linear triangular, more or less falcate, very sparsely pubescent abaxially, petiole (5--14--20(--33) mm long; lamina (3.1--5.5--6.6(--9.1) × (2.7--5.4--6.5(--9.5) cm, very broadly obovate; base deeply cordate, densely hirtellous abaxially with trichomes 0.2--0.9 mm long, densely hirsute adaxially with trichomes 0.4--1.1 mm long, 2--3-lobed, the lateral lobes acuminate to acute, (the central lobe, obtuse or rounded); the angle between the lateral veins (32--51--58(--76)°. Peduncles (4--16--21(--46) mm long, slender, solitary very rare in pairs; floral stipe 1.0--6.5 mm long; flowers 43--45 mm diam., greenish white or pale yellow-green; sepals (10.3--16.7--18.2(--24.4) × (2.2--3.0--3.6(--5.8) mm, narrowly triangular, sparsely hirsutulous pubescent outside, apex acute, white (base pink); petals (5.1--10.3--11.7(--15.3) × (1.2--1.9--2.2(--4.4) mm, linear to narrowly triangular; about half as long as the sepals, apex slightly praemorse to obtuse or retuse, white; corona filaments in 2 (1) series, filaments of outer series 32--38, (5.4--10.1--11.1(--15.8) mm long, filiform, purplish, pink or red at base, cream to white above, (filaments of the inner series (1.2--1.8--2.0(--2.5) mm long); operculum (0.9--1.3--1.5(--2.2) mm; limen erect; androgynophore 5.1--9.9 mm long, green; stamens with filaments (2.7--3.8--4.2(--4.8) mm long; anthers (2.2--3.3--3.6(--5.3) × (0.8--1.2--1.3(--1.7) mm; ovary 2.1--4.0 × 1.1--3.0 mm, ellipsoid, densely brownish hirsute hairs; styles (1.9--2.9--3.3(--4.6) × 0.2--0.3 mm; stigma (0.6--0.9--1.1(--1.6) mm diam. Fruit (21--36--44(--63) × (7--14--19(--39) mm, obovoid, rounded or abruptly acute at apex, slightly hexagonal, hirsute, reddish brown, dark purplish red or red (white or cream between the ridges); stipe 1.4--7.5 mm long; seeds (1.9--2.8--3.1(--3.7) × (1.3--1.6--1.8(--2.0) mm, transversely sulcate with 6--7 sulci, apex without projection.

**Local Names:** “mazomanchachi” Cusco, Peru.

**Distribution and Ecology:** From Colombia, Venezuela, Guyana, Suriname, French Guiana, and northeastern Brazil to Bolivia, Peru and Ecuador, in surrounding lowland Amazonian rain forest, from 150 to 3000 m altitude.

**Phenology:** Flowers observed in January, February and from September to November. Fruits observed in January and from March to July and December.

**Selected specimens examined:** BOLIVIA. 1895, *M. Bang* 2836 (B, BM, CTES, F, G, GH, K, MICH, MIN, MO, NY, PH, S, US, W); **Chuquisaca:** Hernando Siles, Suroeste del poblado de Monteagudo, serranías bajas, colinados, bastante antropizados, 19°35'22"S 064°05'19"W, 19 Dec 2006, *J. A. Peñaranda et al.* 315 (HSB, MO); Hillside right of and entering from the Toma de Agua del Rio Limon, municipally protected area, Monteagudo, 19°45'S 063°57'W, 24 Jan 2001, *K. Wendelberger et al.* 397 (MO); Piedemonte Serranía Los Milagros, camino Guayabillar-Cañon Largo, 20°19'21"S 064°02'00"W, 27 Dec 2005, *M. Serrano et al.* 7030 (HSB, MO); Luis Calvo. Abra del Incahuasi en el límite entre Chuquisaca y Santa Cruz, 19°48'52"S 063°43'10"W, 15 Feb 2006, *A. Lliully et al.* 628 (HSB, MO, TEX); Ticucha, Aproximadamente a 12 km al NO de la comunidad de Tichucha, en el alto Inao, 19°34'S 063°54'W, 14 Apr 2003, *J. Gutierrez et al.* 331 (MO, NY); Sud Cinti, Orocote, ca 3 horas en caballo al NW de la comunidad de Orocote entre los rios Limonal y Cochayo, 20°47'S 064°21'W, 29 Apr 2005, *R. Lozano et al.* 1177 (MO, NY); Tomina, Las Casas, aprox. a 3 km de la comunidad Las Casas, en el sector de Pampillos, 19°19'42"S 064°06'58"W, 19 Apr 2005, *J. Gutiérrez et al.* 1219 (LPB, MO, NY); Las Casas, aprox. a 50 min de la comunidad de las Casas, trayecto a Llantoj, 19°18'48"S 064°06'58"W, 14 Dec 2004, *J. Gutiérrez et al.* 1042 (JPB, LPB, MO, NY); Llantoj, aprox a 1 hr bajando de Abra Santa cruz trayecto a Llantoj, 19°18'57"S 064°05'15"W, 14 Dec 2004, *J. Gutierrez et al.* 1089 (MO, NY); Monteagudo, 64km hacia Sucre, 19°30'S 064°10'W, 08 March 1981, *St. G. Beck* 6367 (LPB, M, MO); **La Paz:** Caranavi, road from La Paz to Caranavi, 15°59'56"S 067°35'02"W, 22 Jul 2009, *T. E. Boza & J. Uzquiano* 2109 (MO); Carretera entre La Paz hacia Chulumani, 03 May 1979, *L. K. Albert de Escobar* 1302 (QCA, TEX); Abel Iturrealde, Rio Tuichi, 14°18'S 068°35'W, 3 Nov 1997, *D. Lara* 290 (MO); Franz Tamayo,



15 km rio arriba de la Hacienda Ubito, 14°24'S 068°27'W, 13 Jul 1993, *M. Kessler 3964* (LPB); Parque Nacional Madidi, Noroeste de Apolo, 14°33'39"S 068°41'24"W, 05 March 2005, *L. Cayola 1550* (BOLV, CTES, HSB, LPB, MO, NY); Loayza, between Miguillas and the summit of the road leading to La Plazuela., 16°28'S 067°22'W, 30 Dec 1989, *L. J. Dorr et al. 6923* (LPB, MO, NY); Muñecas, Camata, 1,4 km al NW del pueblo, 15°14'46"S 068°45'31"W, 15 May 2006, *A. Fuentes et al. 10631* (BOLV, LPB, MA, MEXU, MO, NY, USZ); Nor Yungas, 19 km NE of Chuspipata, 16°13'S 067°46'W, 21 Jan 1984, *A. Gentry & J. Solomon 44392* (LPB, MO, NY); Milluguaya in Nor Yungas, 16°21'37"S 067°35'51"W, Dec 1917, *O. Buchtien 636* (E, GH, HBG, NA, NY, US); Polo-Polo by Coroico, 16°11'20"S 067°43'37"W, Oct - Nov 1912, *O. Buchtien 3852* (GH, US); Polopolo by Coroico in Nor Yungas, 16°11'00"S 067°44'00"W, Oct 1912, *O. Buchtien 3872* (GH, US); Camino Coroico-Trinidad (9km pasando hospital de Coroico), 16°08'S 067°42'W, 05 Jan 1992, *J. P. Schmitt et al. 371* (LPB, MO); Caranavi, ca. 8 km E of Caranavi on road to Alto Beni, 20 Feb 1999, *J. R. I. Wood & D. Mondaca 14553* (K, LPB); 3.4 km from Yolosa on the road to Coroico, 16°13'S 067°44'W, 15 Feb 1980, *J. C. Solomon 4835* (MO); Coroico, near Hotel Prefectural, 16°11'S 067°43'W, 22 March 1984, *J. C. Solomon et al. 12065* (LPB, MO); Road from Coroico to Santa Barbara, 16°10'S 067°43'W, 23 Nov 2003, *M. Delanoy 146* (MO); 16°10'S 067°43'W, 23 Nov 2003, *M. Delanoy 147* (MO); 16°12'S 067°40'W, 23 Nov 2003, *M. Delanoy 176* (MO); 16°12'S 067°40'W, 23 Nov 2003, *M. Delanoy 181* (MO); Valle del rio Unduavi, 16°44'S 067°24'W, 30 Nov 1987, *R. Seidel & E. Vargas 1183* (LPB); 4,5 km S de Coroico, 16°13'S 067°45'W, 5 Dec 1989, *St. G. Beck 17220* (K, LPB, MO, SI, TEX, US, USZ); Caranavi, 35km hacia Coroico, 16°03'S 067°41'W, 10 March 1987, *St. G. Beck 13515* (LPB, TEX); Proximidades al camino de desvio hacia el valle de Huarinillas, 16°12'S 067°47'W, 05 Dec 1998, *St. G. Beck 24604* (LPB); Sud Yungas, Chulumani, entre Chulumani e Irupana, pasado Chímasi, por El puente sobre el río Solacama, 16°25'24"S 067°29'19"W, 26 Sep 1996, *F. Muñoz Garmendia & J. P. Pivel Rainieri 3055* (MA, MO); Zona cafetera entre Coroico y Yolosa, 2.4 km arriba de Yolosa, 16°12'S 067°45'W, 06 Oct 1984, *L. Albert de Escobar & J. C. Solomon 4824* (F, LPB, MA, MO, QCA, TEX); Road from Yuni Grande to Huancallo, Irupana, 16°26'S 067°27'W, 20 Dec 2003, *M. Delanoy 316* (MO); 16°26'S 067°26'W, 20 Dec 2003, *M. Delanoy 315* (MO); Road

from the old electric plant, near the river, to Irupana, 16°28'S 067°26'W, 19 Dec 2003, *M. Delanoy 312* (MO); 16°26'S 067°28'W, 19 Dec 2003, *M. Delanoy 310* (MO); 16°28'S 067°28'W, 19 Dec 2003, *M. Delanoy 307* (MO); Road from Uyuca to Duraznuni, Irupana, 16°28'S 067°25'W, 18 Dec 2003, *M. Delanoy 304* (MO); 16°28'S 067°23'W, 18 Dec 2003, *M. Delanoy 302* (MO); 16°28'S 067°23'W, 18 Dec 2003, *M. Delanoy 299* (MO); 16°28'S 067°23'W, 18 Dec 2003, *M. Delanoy 293* (MO); 16°28'S 067°23'W, 18 Dec 2003, *M. Delanoy 290* (LPB, MO); Road between Porotoco and Siquiljara, Irupana, 16°30'S 067°26'W, 17 Dec 2003, *M. Delanoy 287* (MO); 16°30'S 067°26'W, 17 Dec 2003, *M. Delanoy 285* (MO); 16°30'S 067°25'W, 17 Dec 2003, *M. Delanoy 281* (MO); Road between Rio Blanco and Huancane, Chulumani, 16°19'S 067°32'W, 07 Dec 2003, *M. Delanoy 207* (MO); 16°21'S 067°31'W, 07 Dec 2003, *M. Delanoy 209* (MO); Ocobaya-Chulumani, 16°25'S 067°29'W, 08 Dec 2003, *M. Delanoy 212* (MO); 16°25'S 067°29'W, 08 Dec 2003, *M. Delanoy 214* (MO); 16°25'S 067°29'W, 08 Dec 2003, *M. Delanoy 216* (MO); Between Las Lomas and San Antonio, Chulumani, 16°23'S 067°31'W, 09 Dec 2003, *M. Delanoy 220* (MO); 16°21'S 067°31'W, 09 Dec 2003, *M. Delanoy 227* (MO); Chulumani-Chimasi, 16°23'S 067°31'W, 10 Dec 2003, *M. Delanoy 236* (MO); 16°23'S 067°31'W, 10 Dec 2003, *M. Delanoy 240* (MO); Ocobaya--Chicaloma, 16°25'S 067°29'W, 11 Dec 2003, *M. Delanoy 244* (MO); Road between Irupana and Yuni Grande, 16°28'S 067°26'W, 15 Dec 2003, *M. Delanoy 247* (MO); 16°28'S 067°26'W, 15 Dec 2003, *M. Delanoy 249* (MO); 16°28'S 067°26'W, 15 Dec 2003, *M. Delanoy 254* (MO); 16°26'S 067°26'W, 15 Dec 2003, *M. Delanoy 258* (MO); Road from La Florida to Santa Rosa, Yanacachi., 16°21'S 067°45'W, 17 Jan 2004, *M. Delanoy 403* (MO); Road from Chaco to La Florida, Yanacachi, 16°21'S 067°45'W, 18 Jan 2004, *M. Delanoy 418* (MO); Road between Cruz Loma and Coroico, 16°10'S 067°42'W, 10 Apr 2003, *M. Delanoy 7* (MO); Road between Cruz Loma and Coroico, 16°10'S 067°42'W, 10 Apr 2003, *M. Delanoy 8* (MO); Road between Yolosa and Coroico, 16°12'S 067°43'W, 23 Apr 2003, *M. Delanoy 15* (MO); Chicaloma, 16°27'S 067°29'W, 6 Feb 1996, *St. G. Beck 22650* (LPB, MO); A 36km camino Puente Villa-Chulumani, 16°22'S 067°34'W, 01 Apr 1994, *St. G. Beck 21352* (LPB, MO); Chulumani 107 km hacia el NNE, pasando Asunta, Alto Charia sobre rio San Jose, afluente del río Boopi, 16°04'S 067°12'W, 07 Aug 1983, *St. G. Beck 8553* (HUA, LPB, US); Lomachica

1,5 km rumbo a Ocobaya, 16°27'S 067°27'W, 20 Nov 1994, *St. G. Beck* 22281 (LPB, MO, NY); Colaya, Ranch Tiempaya, Dec. 14, 1935, *Y. Mexía* 4303 (GH, MO); **Santa Cruz:** Buenavista, 17°35'30"S 063°44'57"W, 13 Jun 1928, *J. Steinbach* 8045 (E, G, GH, MO, NY, PH); Japacani, March 1961, *M. Cárdenas* 5914 (US); Andres Ibanez, monumento Natural Espejillos, sobre el camino de las cabañas hacia la comunidad de Agua dulce, 17°54'07"S 063°25'56"W, 22 Jan 2008, *A. Molina* 457 (MO); Cantón Ayacucho, Parque Natural Espejillos, quebrada Espejillos, O de San José (oeste del Río Piray), 17°54'S 063°26'W, 8 Apr 2001, *A. L. Arbeláez et al.* 621 (MO, NY); Área Privada Natural Protegida Arubai de Don German Coimbra Sainz, 17°42'04"S 063°23'47"W, 05 Nov 2006, *L. Arroyo et al.* 3767 (MO, USZ); La Guardia, 5 km al S, 17°30'S 063°24'W, 08 Jan 1998, *St. G. Beck* 23428 (LPB, MO); Chiquitos, Serranía Sunsas, campamento principal de Bocamina, 17°20'S 060°45'W, 09 Nov 1997, *F. Mamani & A. Jardim* 1131 (G, LPB, MO, USZ); Cordillera, Cuevo adentro la sierra cerca la planchada de Chevron, 20°26'S 063°30'W, 29 Dec 1994, *A. Jardim & N. Rosas-Hurtado* 1555 (MO, USZ); Incahuasi–Prov. Cordillera–Pto. Sta. Cruz, Feb 1951, *M. Cárdenas* 4733 (US); Florida, tramo de 10 km en el circuito del sendero ecoturístico en construcción, quebrada El Cañadon, 18°14'22"S 063°40'46"W, 17 May 2005, *I. G. Vargas et al.* 7172 (MO, USZ); 2 km (air) NW of center of Bermejo, around Laguna Volcán, 18°07'S 063°39'W, 24 Dec 1994, *M. Nee* 46142 (LPB, NY); Ichilo, 15 km SSE of Buena Vista, Estancia San Rafael de Amboro, 17°35'S 063°36'W, 19 May 1991, *A. Gentry* 74109 (LPB, MO, USZ); 5km WSW of El Hondo, "Potrerillo", W of Quebrada La Concha, 17°40'S 063°29'W, 13 Feb 1994, *M. Nee & I. Vargas* 44925 (LPB, MO, NY, US, USZ); Nuflo de Chavez. Concepción 75 km hacia San Ignacio, comunidad Palmarito, 16 Apr 2001, *St. Beck* 25771 (LPB); Sarah, Bosques de Buenavista, 17°27'S 063°40'W, 31 March 1917, *J. Steinbach* 3295 (G, K, US). BRAZIL. **Ceará:** Maranguapé, serra de Maranguaé., 23 Jan 1968, *Z. A. Trinta et al.* 1270 (CTES); Maranguape, Pirapora, near Maranguape, 10 Jul 1944, *H. C. Cutler* 8129 (US); **Maranhão:** Alzilândia, Rio Pindare, 03°45'S 046°05'W, 11 Dec 1978, *J. I. Jangoux & R. P. Bahia* 342 (NY, US); **Minas Gerais:** Caldas, Rio Pardo, 19 Feb 1870, *A. F. Regnell* 639 (MO, UPS); Fazenda Serra Azul, 302 km E of Macarani-Bandeiras road on farm ca. 12 km N of Bandeiras (at Fazenda Canada), 15°49'31"S 040°31'21"W, 30 Jan 2004, *W. W. Thomas et al.* 13689 (NY); **Pernambuco:**

Tapera, 07°52'S 037°52'W, *B. J. Pickel* 2625 (US); **Rio de Janeiro:** Rio de Janeiro, 22°54'S 043°12'W, *J. F. Widgren* 117 (S, UPS). COLOMBIA. 11 Oct 1982, *A. Escobar* 2504 (NY); Río Digua Valley, between La Elsa and Río Blanco, 02 Aug 1939 - 05 Aug 1939, *E. P. Killip* 34774 (US); Hacienda El Medio (carretera Panamericana entre La Paila y Zarzal, parte plana Valle del Río Cauca), 04°19'09"N 076°04'22"W - 04°23'54"N 076°04'38"W, 17 Nov 1986, *P. Silverstone-Sopkin et al.* 2573 (MO); Carretera vieja de Cali a Buenaventura, *S. Hoyos* 231 (MA); **Antioquia:** 15 Sep 1883, *F. C. Lehmann* 3140 (G); Mpio. del Jardín, road between Jardín and Los Andes, 6.0 km from centro of Jardín, 05°36'N 079°49'W, 31 Jan 1989, *J. M. MacDougal & F. J. Roldán* 3621 (MO, US); Entre San Luis y el Rio Samaná, 2 km abajo de San Luis, sitio El azuceno, 1 km arriba de la quebrada la sirena, 21 March 1982, *L. K. Albert de Escobar et al.* 1953 (QCA); San Carlos, 11.5 km de San Carlos hacia El Jordán, 11 Nov 1989, *L. K. Albert de Escobar & F. J. Roldán* 8817 (TEX); **Caldas:** Pereira, Jan 1946, *B. Tomás* 2444 (US); San Jose, Cauca Valley, 05°28'51"N 075°41'08"W, 03 Sep 1922, *F. W. Pennell* 10240 (PH, US); Cordillera Central, rocky cliff, along Rio Campoalegro, San Francisco, 05°03'17"N 075°41'59"W, 31 Aug 1922, *F. W. Pennell* 10183 (GH, NY, US); **Cauca:** Rio Ojar, *F. C. Lehmann* 3364 (G, K); 17 Jun 1883, *F. C. Lehmann* 22894 (G); **Cundinamarca:** Sasaima, vereda de Apocentos, 10 Jul 1960 - 12 Jul 1960, *H. García-Barriga* 17279 (US); al SE, 27 Jun 1960, *A. L. Uribe* 3471 (NY); Cachipay, 05°16'N 074°34'W, 17 Apr 1935, *W. A. Archer* 3309 (NA, US); Nocaima, Hacienda Tobia, 15 Feb 1942 - 20 Feb 1942, *H. García-Barriga* 10593 (US); San Bernardo, 23 June 1940, *J. Cuatrecasas* 9630 (US); **Magdalena:** Alto Rio Frio Cabeceras del Rio Congo, Ciudad Antigua, 10°59'N 074°04'W, 26 Jul 1989, *S. Madriñán & C. E. Barbosa* 518 (GH); **Putumayo:** Municipio Mocoa, corregimiento de San Antonio, vereda Alto Campucana, finca La Mariposa, 01°12'N 076°38'W, 20 Apr 1994 - 21 Apr. 1994, *J. Betancur et al.* 4986 (COL, MO); **Quindío:** Salento, 04°38'15"N 075°34'13"W, 31 Jul 1922, *F. W. Pennell* 9084 (US); Genova, Vereda El Dorado, 04°03'N 076°25'W, 6 Oct 1988, *G. Arbelaez S et al.* 2760 (MO); **Tolima:** Libano, 17 Jul 1947, *H. García-Barriga* 12233 (US); **Valle del Cauca:** Restrepo, 03°49'32"N 076°31'31"W, 16 Sep 1922, *E. P. Killip* 11257 (US); Finca El Porvenir, vereda El Guacimo, a 6 km del pueblo de Toro por carretera a San Pacho ( San Francisco), 03°18'N 076°14'W, 9 Feb 1990, *P. Silverstone-Sopkin et al.* 5830 (MO);

Cartago, Alto del Dinde, entre Cartago y Alcalá, 16 Nov 1946, *J. Cuatrecasas* 22892 (F, US); Dagua, carretera vieja de Cali a Buenaventura, vereda la Elsa., 03°34'47"N 076°46'54"W, 13 Jun 1983, *S. Hoyos & J. Santa* 230 (WIS); El Cerrito, Hacienda El Milagro y hacienda adyacente, a 4 km al sur del pueblo del Cerrito, parte plana del Valle de Rio Cauca, 03°38'22"N 076°17'40"W, 24 Jun 1991, *P. Silverstone-Sopkin & J. E. Giraldo Gensini* 6184 (MO); Palmira, Hacienda El Guachal, vereda de Caucaseco, ca. 1 km, adelante del puente del comercio de la ciudad de Cali, se desvia a la derecha, 03°26'14"N 076°31'21"W, 11 May, 1988, *J. E. Ramos & N. Paz* 922 (MO); Restrepo, vereda Río Bravo, quebrada La Cristalina, El Pital, 04°00'N 076°00'W, 4 March 1986, *W. Devia* 1118 (MO); Sevilla. 22 Jun 1941, *G. Soto Herrera* 923 (US); Via Sevilla-La Raquelita, a orilla de la quebrada la Raquelita, 04°00'N 076°00'W, 31 Jul 1985, *W. Devia* 1069 (MO); Versailles, Versailles [Versalles], 04°34'39"N 076°12'11"W, 05 Jul 1920, *Dawe* 839 (K, NY, US); Zarzal, Zarzal, 04°23'54"N 076°04'38"W, 22 Jul 1922, *F. W. Pennell et al.* 8541 (GH, US). ECUADOR. **Azuay:** Vicinity of Cumbe, 03°05'S 079°01'W, 25 Sep 1918, *J. N. Rose et al.* 22984 (US); **Bolívar:** San Miguel, 01°42'S 079°02'W, 04 Nov 1924, *F. L. Stevens* 202 (US); Road Babahoyo – Guaranda, above Balzapamba, 01°48'S 079°10'W, 21 Apr 1980, *L. B. Holm-Nielsen et al.* 23065 (AAU, QCA); Guaranda, recorrido entre el recinto Chazo Juan hasta el km 3 del sendero a la Chorrera de Moras, 01°23'36"S 079°08'59"W, 18 Feb 2005, *H. Vargas* 5029 (MO, QCNE); **Cañar:** Río Patul, Manta Real near Hacienda Aurora, Cañar Azuay border, 02°32'S 079°30'W, 23 Aug 1995, *D. D. Kapan* 121 (TEX); Valley of Río Cañar, Near Abadel, 02°29'18"S 079°06'20"W, *Prieto CP-36* (NY); **Chimborazo:** Huigra, 02°17'S 078°59'W, 04 - 27 Jul 1923, *A. S. Hitchcock* 20747 (GH, NY, US); Huigra, mostly on the Hacienda de Licay, 02°17'S 078°59'W, 21 Aug 1918, *J. N. Rose & G. Rose* 22275 (GH, NY, US); Hda. "La Carmela", estrivaciones de la Cord. Occ., Sibambe, 02°15'S 078°54'W, 16 Aug 1943, *M. Acosta-Solis* 5325 (F); Cañon of the río Chanchan near Huigra, 02°18'10"S 078°59'19"W, 07 - 14 May 1945, *W. H. Camp E-3014* (F, G, GH, K, MO, NY, P, S, UC, US); Alausí, Parroquia Huigra, sector Illin., 02°20'45"S 079°02'53"W, 26 May 2006, *C. E. Cerón et al.* 57436 (MO); Hacienda de Licay, near Rio Chanchan, hill behind (North) of Huigra on old road from Guayaquil to Riobamba, trail starting from railroad track ca. 1 km to east of town, 02°15'S 078°55'W, 26 May

1989, *J. F. Smith 2046* (QCA, WIS); **Cotopaxi:** Tenefuerste, Río Pilalo, km, 52-53, Quevedo-Latacunga, 00°59'N 079°04'W, 12 Jun 1983, *C. H. Dodson et al. 13941* (MO); Finca El Copal, Río Pilaton, above El Tingo, Latacunga-Quevedo Hwy., 2 Nov 1992, *D. D. Kapan 27* (TEX); Finca El Copal Río Pilalo, El Tingo, 10 Jul 1993, *D. D. Kapan 72* (TEX); **El Oro :** Rio Pejeyacu, below Pejeyacu 5.15 km above main Pasaje-Uzhcurumi rd., on rd. to Chilla, 03°21'S 079°36'W, 08 Nov 1992, *D. D. Kapan 41* (TEX); Between Paccha and Muluncay, 12 March 1993, *G. Harling 27061* (GB); 7 millas este Saracay, 03°36'34"S 079°53'01"W, 15 Apr - 15 May 1979, *L. K. Albert de Escobar 1357* (QCA); Arenillas, Zaracay, road from Arenillas to Piñas, 03°37'54"S 079°52'15"W, 14 Feb 1976, *T. C. Plowman 5448* (F, GH); Piñas, Parroquia El Placer, Reserva Ecológica Buenaventura, propiedad de la Fundación Jocotoco, 03°39'05"S 079°47'42"W, 7 Apr 2005, *H. Vargas et al. 5299* (MO, QCNE); Portovelo, along trail between Portovelo and Río Cabra, passing Minas Nuevas, Huertas and arriving at Cachicarán, 03°43'S 079°37'W - 03°34'S 079°38'W, 23 Aug 1943, *J. A. Steyermark 54091* (F, US); **Esmeraldas:** 50 km north of Pedernales along new coastal highway, 3 km north of Río Cojimíes crossing, 00°19'N 079°55'W, 19 Dec 1998, *D. Neill et al. 11699* (MO); **Guayas:** Cord. Chongón-Colonche, 01°48'S 080°42'W, 23 Jan 1997, *C. Bonifaz & C. Cornejo 3544* (MO); Summit of Cerro Azul above Casas Viejas, 22 km NW of Guayaquil on road to Salinas, 02°09'S 079°59'W, 25 Sep 1981, *C. H. Dodson & P. M. Dodson 11528* (MO); Teresita, 31 Oct 1924, *F. L. Stevens 198* (US); Barraganetal, 02°11'S 079°18'W, 17 Nov 1924, *F. L. Stevens 328* (US); Guayaquil, 12 km. from Guayaquil, 18 Feb 1962, *A. J. Gilmartin 583* (GH, US); Bosque Protector Cerro Blanco, Guayaquil, Carretera a Salinas, Km 15, 02°10'S 079°58'W, 21 Jan 1992 - 25 Jan 1992, *D. Rubio & G. Tipaz 2364* (MO); Cerro Azul, carretera a Salinas, Km 13, 02°10'S 078°50'W, 07 May 1992, *G. Tipaz et al. 864* (MO); Bosque Protector Cerro Blanco, carretera Guayaquil to Salinas, Km 15, 02°10'S 080°08'W, Jan 1994, *T. Núñez & A. Hernández 202* (MO, QCNE); **Imbabura:** Railroad line from Lita to 2 km above, 00°50'N 078°28'W, 01 Sep 1982, *W. G. D'Arcy 14859* (MO); **Loja:** Catamayo valley, road Loja to La Toma, km 12 W of pass, 04°00'S 079°18'W, 23 March 1998, *B. Øllgaard & P. Lozano 2955* (AAU, QCA); NE slopes of Cerro Mataperro, 3 km SW of San Pedro, 10 km WNW of Catamayo, 03°57'18"S 079°26'33"W, 10 Feb 1945, *F. R. Fosberg & M. A. Giler 22943* (US); Mountains of

Villonaco, road Loja to Catamayo, 03°59'47"S 079°18'32"W, 18 March 1972, *G. Harling 11273* (GB); Road Cariamanga Yambaca-El Toldo-Chaco, km 10-20, 04°21'S 079°34'W - 04°24'S 079°31'W, 17 Feb 1993, *G. Harling & B. Ståhl 26458* (GB, MO); Vilcabamba to Yangana, 04°18'S 079°13'W, 15 Apr 1974, *G. Harling & L. Andersson 13622* (AAU, GB); Vilcabamba to Yangana Road, km 12 - 15, 04°20'41"S 079°11'17"W, 21 Apr 1980, *G. Harling & L. Andersson 18480* (AAU, GB); Celica to Alamor Road, ca. 3 km W of Celica, 18 Feb 1985, *G. Harling & L. Andersson 22173* (GB); Road Loja to Catacocha, ca. 25 km S Las Chinchas, 09 Nov 1977, *G. Harling et al. 15242* (GB); Road Loja to Catacocha, ca. 10 km S of Las Chinchas, 03°59'46"S 079°31'05"W, 07 Nov 1977, *G. Harling et al. 15148* (GB); Km 8 from Sozoranga along track to Reserva Natural El Tundo, propiedad de fundacion ARCOIRIS, ca. km 2-3 above and past reserve, 04°19'S 079°49'W, 20 Aug 1967, *G. P. Lewis et al. 3499* (E, K, MO); Loja-Catamayo, km 7 at Villonaco, 24 along track to Cera and Chantaco and onwards to La Toma, 03°53'S 079°19'W, 9 March 1997, *G. P. Lewis & B. B. Klitgaard 3077* (MO, QCA); San Pedro de Vilcabamba, 04°15'S 079°15'W, 16 Jul 1986, *J. M. MacDougal 1944* (DUKE, MO); Udushi roadside, 03°28'S 079°24'W, 11 Oct 2000, *J. E. Madsen et al. 7412* (AAU, MO, NY); Loja-Portovelo road, 03°59'S 079°12'W - 03°43'S 079°37'W, 03 - 06 Oct 1918, *J. N. Rose et al. 23343* (GH, NY, US); W of Vilcabamba, 04°17'S 079°13'W, 26 Nov 1981, *Madsen 36736* (AAU, QCA); Road Velacruz-Catacocha, ca. Km 6., 04°00'S 079°35'W, 11 Mar 1989, *E. Øllgaard & Eriksen 90965* (AAU, MO, QCA); El Empalme-Celica, approx. 5 km from Celica, 04°07'S 079°55'W, 11 Apr 1994, *P. M. Jørgensen et al. 55* (GB, MO, NY, QCA, US); Entre San Pedro y Chinchas (unos 55 km O de Loja), 01 March 1947, *R. Espinosa 1316* (US); Malacatus, 19 Dec 1946, *R. Espinosa 1119* (US); San Pedro (unos 50 km O de Loja), 09 Feb 1947, *R. Espinosa E1281* (US); Km 21 on road La Toma to Catacocha, 03°58'S 079°30'W, 17 Feb 1988, *S. Læggaard 70192* (AAU, QCA); ca. 7 Km E of Catamayo on road to Loja, 03°59'52"S 079°19'18"W, 06 Feb 1984, *S. Knapp & J. Malet 6261* (BH, CU, QCA, QCNE, US); Celica, Zapotillo road, ca. 4 km below Pozul, 03°59'46"S 079°31'05"W, 22 Feb 1985, *G. Harling & L. Andersson 22410* (GB, QCA); road from Celica to Alamor, northern and shorter route, passing through Mercadillo, Km 8.75 from Plaza Central in Celica, 03°58'S 080°10'W, 17 May 1989, *J. F. Smith 1964* (GB, MO, QCA, WIS); El Empalme-Celica, roadside, 04°08'S 079°55'W,

25 Feb 1988, *P. M. Jørgensen 65134* (AAU, CU, GB, MO, NY, QCA, U, UPS); Loja, La Argelia, 04°02'01"S 079°11'50"W, 20 Dec 1945, *M. Acosta-Solis 11383* (F); **Los Ríos:** Río Palenque Field Station, halfway between Quevedo and Santo Domingo de los Colorados, 00°35'00"S 079°22'00"W, 26 Feb 1974, *A. Gentry 10211* (MO); Hacienda Clementina, Cerro Samana, La Torre, 01°39'S 079°20'W, 27 May 2002, *B. Ståhl & X. Cornejo 5954* (GB); Centro Científico Río Palenque, Km 47, carretera Santo Domingo de los Colorados-Quevedo, 11 Jan 1987, *X. Buitrón & R. Valencia 129* (QCA); Rios-Represa Daule Peripa, Pto. Palmar ( Río Daule), 02°10'S 079°51'W, 1 Jun 1985, *C. B. B. 179* (MO); Río Palenque, 00°35'00"S 079°22'00"W, 7 Feb 1979, *C. H. Dodson et al. 7635* (MO); **Manabí:** San Sebastian, Machalilla National Park, ridgetop moist forest, 01°36'S 080°42'W, 21 Jan 1991, *A. Gentry et al. 72606* (MO); Recreo, 00°29'S 080°27'W, 21 Jan 1897, *Eggers 15584* (F, L); Cantón Pedernales, cerro Pata de Pájaro a 10 km al este de Pedernales, a 3 km del rancho de la Familia Arroyo, 00°01'N 079°57'W, 8 March 1997, *H. Vargas et al. 1239* (MO, QCNE); Central part of Parque Nacional Machalilla, 01°37'S 080°40'W, 09 May 1985, *S. Lægaard 54292* (MO, QCA); Jipijapa, Parroquia Machalilla, Parque Nacional Machalilla, San Sebastian, entre la Guacharaca y Quimise, 01°30'S 080°34'W, 24 Sep 1991, *C. E. Cerón et al. 16559* (MO); **Morona-Santiago:** Campamento La Playa, road construction camp, 23 km SE of San Juan Bosco, 03°21'S 078°28'W, 28 Jan 1981, *A. H. Gentry et al. 30934* (MO); El Centro Shuar Kankaim, 02°20'S 077°41'W, 7 Nov 1985, *D. Shiki RBAE261* (NY); **Pichincha:** Dos Rios, km 90, old road via Chiriboga, Quito-Santo Domingo, 7 Apr 1984, *C. Dodson et al. 14156* (MO); Km 96-94 old road Quito-Santo Domingo, 21 March 1980, *C. H. Dodson & A. H. Gentry 9714* (MO); Maquipucuna Reserve, vicinity of Nanegal 6.7 km NE of Nanegalito-Nanegal Road (turnoff ca. 3 km S of Nanegal), 19 km N of Nanegalito, along main trail to the summit, 00°07'12"N 078°37'56"W - 00°06'42"N 078°37'49"W, 11 Mar 2006, *T. B. Croat et al. 95712* (MO); Carretera Quito-Aloag-Sto. Domingo de los Colorados, km 94, a 10 km al S de la carretera, estribaciones occidentales del Volcán El Corazón. Hacienda " La Esperie", 00°21'S 078°51'W, 08 Jun 1986, *V. Zak 1057* (MO, QCA); Quito. Antiguo carreto Quito-San Juan- El Empalme, 10 Jan 1987, *A. Freire 533* (QCA); **Tungurahua:** *L. K. Albert de Escobar 92-6* (TEX); **Zamora-Chinchipec:** Palanda to Zumba, Km 6.2, 15 Jul 1994, *C. Jiggins 37* (QCA); Palanda to Zumba Km 28,



15 Jul 1994, *C. Jiggins* 38 (QCA); Northern side of Rio Palanda at crossing with Zumba road, 04°38'S 079°08'W, 30 Jan 1985, *G. Harling & L. Andersson* 21284 (AAU, GB, MO, NY, QCA); Zamora, 1 km S of Zamora, 04°04'41"S 078°57'08"W, 17 Dec 1975, *M. T. Madison* 2466 (GH). GUYANA. Region: U. Takutu-U, Essequibo, NW Kanuku Mtns, 12 km ESE Nappi village in foothills, 03°23'N 059°29'W, 12 Feb 1993, *B. Hoffman* 3728a (U, US); Region: Cuyuni-Mazaruni, Paruima to Konuktipu (Rain mountain) trail, 05°48'N 061°03'W, 11 Feb 1996, *D. Clarke* 1106 (US); **Rupununi:** Ureisha Mountain above Tipuru Village, Summit of mountain is a 5 hour stiff walk from the village, Southern edge of Pakaraima Mountains, 04°10'N 059°15'W, 5 Jan 1982, *S. Knapp & J. Mallet* 2838 (MO). HAWAIIAN ISL. Kopeka Cave, "Pokutelute", 14 March 1984, *W. A. Whistler* 5290 (K). PERU. **Amazonas:** Bagua, campamento El Milagro, just across Rio Utcubamba from Bagua Chica, at Km 228; and along river to north of camp, 25 - 28 Feb 1967, *S. S. Tillett* 672-154 (GH, US); Chachapoyas, carretera Chachapoyas - Bagua la grande - Olmos, 31 km NE de Olmos, 18 Jul 1979, *L. K. Albert de Escobar & P. E. Berry* 1526 (TEX); Road Chachapoyas to Mendoza, 13 Km east of Chachapoyas, 05 Jun 1998, *M. Weigend et al.* 98/392 (M); road Leymebamba to Chachapoyas, River valley at uniformly, 5 Jun 1998, *M. Weigend et al.* 98/382 (F, M, MO, USM); road Balsas to Chachapoyas, middle western Calla-calla slopes descending from pass, 06°23'37"S 077°53'41"W, 2 Jun 1998, *M. Weigend et al.* 98/335 (F, M, MO); **Ayacucho:** Huanta, Aina [Ayna], between Huanta and Rio Apurimac, 12°36'25"S 073°49'58"W - 12°35'14"S 073°49'14"W, 07 - 17 May 1929, *E. P. Killip & A. C. Smith* 22800 (F, NY, US); **Cajamarca:** La Palma, 10 km NW de Chirinos, 05°25'S 078°53'W, 5 Feb 1988, *A. Gentry et al.* 61192 (MO); Dist; Catache, Upper Río Zaña Valley, ca. 1 km above Monte Seco on road to El Chorro, 16 March 1986 - 18 March 1986, *M. O. Dillon et al.* 4340 (MO); Cajamarca, Km 131 on Hwy from near Pacasmayo to Cajamarca, 07°13'S 078°15'W, 04 Jan 1983, *W. D. Stevens* 22048 (MO); Contumaza, 09 March 1995, *A. Sagástegui A. & S. Leiva G.* 15531 (F, MO, QCA, TEX); Andaloy (San Benito - Yetón), 07°26'S 078°56'W, 28 Mar 1985, *A. Sagástegui A. et al.* 12545 (F, MO); 13 km above Cascas on road to Contumazá, 07°25'S 078°50'W, 6 Feb 1987, *B. A. Stein et al.* 4023 (MO); Entre Cascas y Contumazá, 13 Jul 1979, *L. K. Albert de Escobar & P. E. Berry* 1489 (TEX); On road from Contumaza to Cascas, 07°24'32"S 078°47'06"W, 12 Jun

2009, *T. E. Boza & G. Rodriguez* 2078 (MO); Hualgayoc, Monte Seco, Aug 1949, *J. Soukup* 3878 (US); Monte Seco, Aug 1939, *J. Soukup* 3879 (US); Jaén, Dist. Santa Rosa, 3 km al N del pueblo de Santa Rosa, 05°25'09"S 078°34'12"W, 24 March 2006, *E. Ortiz & J. Mateo* 1208 (AMAZ, HUT, MO, MOL, USM); San Ignacio, La Coipa, Localidad Vista Florida, 05°26'10"S 078°56'00"W, 18 Jun 1997, *J. Campos & Z. García* 4042 (MO); San José de Lourdes, Estrella del Oriente, 04°58'00"S 078°59'05"W, 07 Jan 1998, *J. Campos et al.* 4813 (MO); San José de Lourdes, 05°00'S 078°04'W, 24 Apr 1999, *R. Vásquez & J. Campos* 26184 (MO); Arriba de San Francisco (ca. a el Chaupe), 05°01'08"S 078°59'32"W, 05 Jan 1995, *S. Leiva G. & P. Lezama A.* 1614 (F, M, MO, NY, QCA, TEX); Santa Cruz, ca. 3 km. (por aire), 06°31'S 079°04'W, 6 Jun 1987, *J. Santisteban C. & J. Guevara B.* 140 (F, MO, NY); La Florida above Montesecco, 05 May 3, *M. Weigend et al.* 7557 (B); **Cusco:** Valle del Río Vilcanota, Amaybamba-Quillabamba, 10 March 1928, *C. Bues* 2129a (US); Echarate, 12°50'S 072°39'W, Nov 1928, *C. Bues s.n.* (US); Dist. Echarate, Piedra Blanca, 12°44'S 072°33'W, 20 Aug 2003, *E. Suclli & J. Farfán* 1178 (AMAZ, CUZ, HUT, MO, MOL, USM); Uchumayo, 12°56'59"S 072°40'20"W, *F. L. Herrera & Garmendia (Bues s.n.)* 2129a (US); Dist. Echarate, Sajiruyoc - Belenpata, 12°49'S 072°34'W, 25 Sep 2003, *G. Calatayud* 1983 (CUZ, MO, USM); Cocalpampa, Chaullay, Maranura, Quillabamba, La Convención, Quintalpata +/- 150 km NW from Cusco on the road from Cusco to Kiteni, 12°49'S 072°47'W - 13°17'S 072°43'W, 29-30 Dec 1986, *P. Núñez et al.* 6804 (MO); Calca, Dist. Yanatile, Estrella, 12°26'50"S 072°30'05"W, 19 Oct 2005, *E. Suclli et al.* 2439 (CUZ, MO); Dist. Lares, Colca, borde de carretera, 12°51'44"S 072°07'36"W, 19 Feb 2004, *L. Valenzuela et al.* 2701 (CUZ, F, HUT, MO, USM); Dist. Quebrada, Combapata, 12°38'25"S 072°20'25"W, 25 Jan 2003, *L. Valenzuela et al.* 1356 (CUZ, MO); La Convención, Dist. Echarati, Localidad Papelpata, 12°27'S 072°21'W, 12 May 2005, *G. Calatayud et al.* 2974 (CUZ, MO); Dist. Echarate, Kiteni, Agua Dulce, 15°38'33"S 073°04'07"W, 17 Nov 2005, *I. Huamantupa et al.* 7205 (CUZ, MO, USM); Dist. Maranura, Maranura, 12°54'47"S 072°09'54"W, 22 March 2004, *L. Valenzuela et al.* 3118 (CUZ, MO); Dist. Santa Ana, Bosque del Chuyapi, 12°56'46"S 072°46'40"W, 22 Jul 2006, *L. Valenzuela et al.* 7351 (CUZ, MO); Quillabamba, Salaspampa, 12°49'S 072°47'W, 29 Oct 1986, *P. Núñez & S. Walsh* 6368 (MO); 139 km de Cusco en

Quellomayo, subiendo hacia la "ceja", entre Santa Teresa y Chaullay, 13°08'S 072°36'W, 1-3 Jan 1988, *P. Núñez V. & F. Motocanchi* 8773 (MO); Sahuayaco, Rio Chalpimayo, 25 Jan 1975, *T. C. Plowman & E. Wade* 4871 (GH, K); Dist. Huayopata, Cachapampa, 13°11'07"S 072°37'40"W, Apr 2004, *W. L. Galiano et al.* 6085 (CUZ, MO, USM); Distrito de Santa Teresa, 13°11'23"S 072°36'40"W, 07 Jan 2009, *T. E. Boza & P. O. Chambi* 2042 (MO); 13°11'38"S 072°36'43"W, 07 Jan 2009, *T. E. Boza & P. O. Chambi* 2044 (MO); 13°09'47"S 072°36'18"W, 07 Jan 2009, *T. E. Boza & P. O. Chambi* 2045 (MO); 13°09'45"S 072°36'16"W, 07 Jan 2009, *T. E. Boza & P. O. Chambi* 2046 (MO);

**Huanuco:** Huacachi, Estacion near Muna, 09°40'15"S 075°48'41"W, 20 May - 01 Jun 1923, *J. F. Macbride* 4162 (F, US); Vicinity of Tingo María, along road from bridge over río Chinchao south of Tingo María to Fundo San Juan, 18 Jun 1961, *M. E. Mathias & D. Taylor* 5319 (F, US); Huanuco, Trocha entre Carpish y Pati, 09°42'S 076°05'W, 15 Jan 1987, *C. Díaz S. & M. S. Baldeón* 2255 (MO, QCA); Puente Durand, north of Huanuco, Valley of Chinchao Rio, 3 Nov 1938, *H. E. Stork & O. B. Horton* 9577 (F, G, NA); Dtto. Chincháo, Chincháo, 09°38'S 076°04'W, 02 Aug 1964, *J. D. Dwyer* 6215 (MO); Leoncio Prado, road from Tingo Maria to Aguaytía before the actual Abra Divisoria, 09°12'S 075°49'W, 25 March 2001, *K. Weigend et al.* 5329 (M, NY);

**Junin:** Valley of Río Tulumayo, ca. 10 km S of San Ramón, 11°15'S 075°20'W, 5 Jun 1983, *A. Gentry et al.* 41532 (MO); Rio Colorado, near junction with Rio Chanchamayo, 10°58'S 075°22'W, 7 Feb 1983, *A. Gentry et al.* 40137 (MO); Puente-Paucartambo to La Merced, Chanchamayo Valley, 11°20'S 075°20'W, 30 Jan 1983, *A. Gentry et al.* 39822 (MO); La Merced, 11°02'09"S 075°19'24"W, 29 May - 04 Jun 1929, *E. P. Killip & A. C. Smith* 23432 (NY, US); Río Paucartambo Valley, near Perene Bridge, 11°02'09"S 075°19'24"W, 19 Jun 1929, *E. P. Killip & A. C. Smith* 25371 (US); La Merced, 11°02'09"S 075°19'24"W, 29 May - 04 Jun 1929, *E. P. Killip & A. C. Smith* 23400 (F, GH, MA, NY, US); La Merced, 11°03'S 075°19'W, 6 Nov 1962, *J. Schunke* 6230 (F, MO); Along road between San Ramón and Oxapampa, 6 km beyond (north of) turnoff for road to Satipo, 10°53'30"S 075°18'00"W, 1 Apr 1984, *T. B. Croat* 57723 (MO); Chanchamayo, Cann of Río Colorado, 10 km N of La Merced, 10°59'S 075°20'W, 3 March 1991, *A. Gentry & C. Díaz* 73297 (MO); La Merced-Villa Rica road, between Puente Paucartambo and Río Colorado, 10°54'S 075°17'W, 6 Jan 1984, *D. N. Smith et al.*

5614 (MO, TEX); Along Rio Colorado, N bank W of Puente Colorado, 12 Km N of La Merced, 22 March 1984, *S. Knapp et al.* 6344 (BH, CU, US); Junin, Pichis Trail, Yapas, 28 - 29 Jun 1929, *E. P. Killip & A. C. Smith* 25441 (NY, US); ca. 18-24 Km N. of San Ramon on road to Oxapampa, 20 Dec 1978, *M. O. Dillon & B. L. Turner* 1443 (F); Tarma, road from Tarma to San Ramon, 11°10'11"S 075°20'00"W, 21 May 1981, *G. A. Sullivan et al. & D. D. Soejarto* 1072 (MO); Entre la Merced y San Ramon, 11°03'S 075°19'W - 11°08'S 075°20'W, 20 Oct 1963, *P. Tovar* 4371 (MO); **La Libertad:** Otuzco, Arriba de Huaranchal, 07°41'S 078°27'W, 6 Jun 1958, *A. Lopez M.* 1341 (MO); Huaranchal, Dpto. La Libertad, 06 June 1958, *A. López et al.* 2639 (RSA, US); **Lambayeque:** Lambayeque, El Lloque, Penachi, 19 Oct 1985, *S. Llatas Q.* 1451 (F); **Pasco:** Road from La Merced to Oxapampa, 11°03'S 075°19'W - 10°34'S 075°24'W, 28 Feb 1982, *A. H. Gentry & D. Smith* 35785 (MO); Oxapampa, trail between Yanahuanca and Chumalli along Río Pozuzo, 10°31'00"S 076°29'55"W - 10°08'00"S 076°40'00"W, 15-16 March 1984, *D. N. Smith et al.* 6322 (MO, US); Oxapampa, 12 km SE of town Road over shoulder of Cerro Pajonal to Villa Rica, 05 Feb - 02 Apr 1997, *M. Weigend & N. Dostert* 97/55 (MSB); Oxapampa, along trail between Pozuzo and Yanahuanca, along Rio Pozuzo, 10°05'00"S 075°28'00"W, 17 March 1984, *S. Knapp* 6333 (BH, CU, NY, US); Limestone cliffs along Rio Pozuzo on trail between Yanahuanca and Chumalli, 10°03'S 075°25'W, 15 March 1984, *S. Knapp* 6330 (BH, CU, K, US); Rio Tres Aguas, Km 34.5 on Oxapampa- Puente Paucartambi road, 10°45'S 075°37'W, 12 March 1984, *S. Knapp & J. Mallet* 6323 (BH, CU, US); **Piura:** Huancabamba, Distrito Canchaque - "Chorro blanco", 05°22'S 079°36'W, 18 Apr 1987, *C. Díaz S. & M. S. Baldeón* 2451 (F, MO, NY, QCA); Canchaque, entre "Chorro Blanco" y "War War", 05°22'23"S 079°36'01"W, 18 Jan 1989, *C. Díaz et al.* 3197 (MO); below Chorro Blanco, 5 km n. of Canchaque, 05 Apr 1939, *H. E. Stork* 11416 (GH, K, NA); Road Chulucanas- Huancabamba, Canchaque, 11 km above village on road to Huancabamba, 05°23'24"S 079°34'15"W, 16 May 1998, *M. Weigend & N. Dostert* 98/185 (M, MO); **San Martín:** Tarapoto, 06°30'05"S 076°21'56"W, Nov 1902, *E. Ule* 6546 (B, G, HBG, L); Chanchamayo, 20 Oct 1863, *I. Batilló* 2187 (F); San Roque, Jan - Feb 1930, *L. Williams* 7088 (US); Lamas, Distrito Alonso de Alvarado, San Juan de Pacaizapa, km 72, carretera Tarapoto Moyobamba, 06°31'58"S 076°22'09"W, 12,18,20,23 Jun 1977, *J. Schunke-V.*

9709 (F, G, MO, NY, U); San Martín, Jan 1930 - Feb 1930, *L. Williams* 2088 (F);

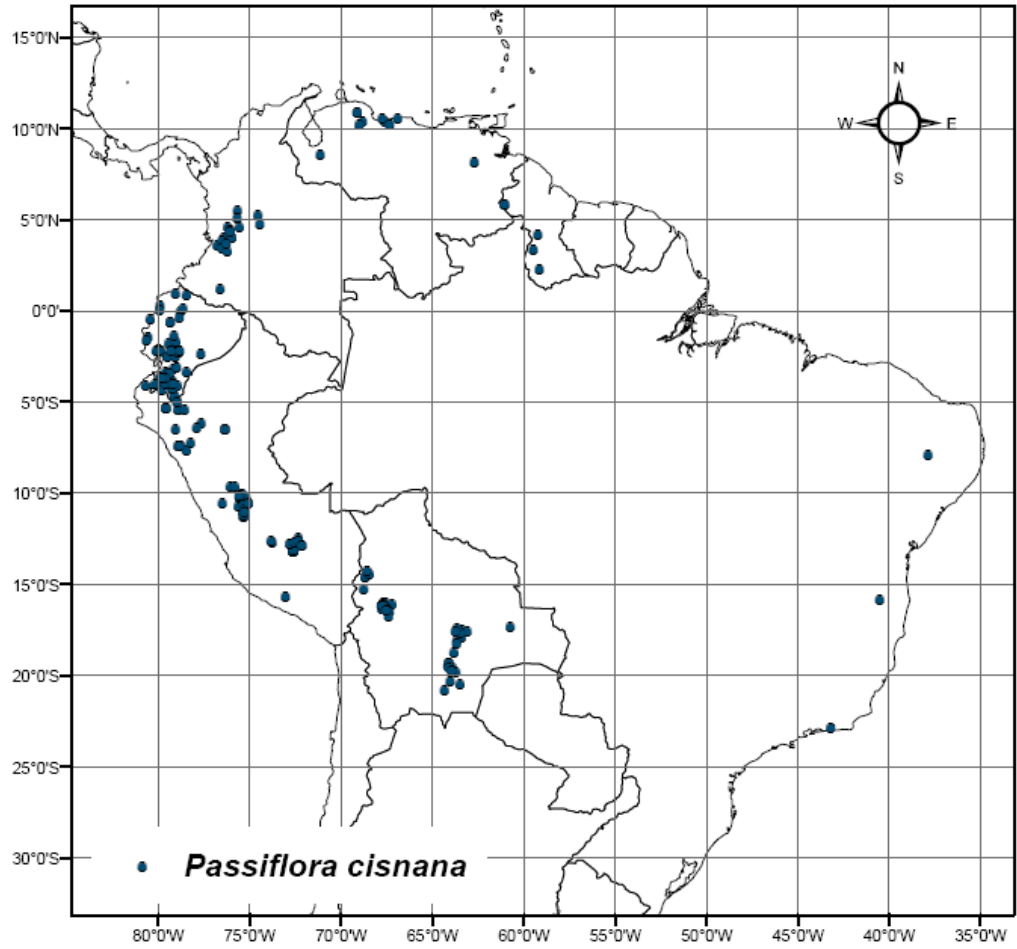
**Tumbes:** Tumbes, Mts. E of Hacienda Chicama, 04°08'13"S 080°41'43"W, 19 - 24 Feb 1927, *A. Weberbauer* 7653 (F, G, US). VENEZUELA. Selva nublada a lo largo de la carretera entre Buenos Aires y Guamales parte occidental de la Sierra de Aroa, Dto. Urachiche, al norte Urachiche, 10°14'N 069°01'W, 18 Aug. 1977, *J. A. Steyermark et al.* 114090 (MO, NY); Onside of path in savanna, 25 May 1938, *L. Williams* 10121 (F, G, MICH); Alrededores de Sta. Elena de Uairen, 25 Apr 1946, *T. Lasser* 1552 (NY);

**Aragua:** En la regresiva de la vuelta del Diablo, Vía Choroni, 31 Oct 1971, *C. E. Benitez de Rojas* 1173 (F, MY, U); Between El Postachuelo & Ocumare, 10°30'N 067°46'W, 20 Jan 1924, *H. Pittier* 11387 (US); Parque Nacional H. Pittier, along ascent from Maracay to summit of Alto Choroni, 10°21'10"N 067°35'37"W - 10°14'49"N 067°35'45"W, 8 Feb, 1973, *T. B. Croat* 21459 (MO); **Bolivar:** Distrito Piar, La Camilera, 40 mts al Oeste del El Manteco, Jul 1978, *F. Delascio C. & R. L. Liesner* 7050 (MO); Municipio Caroni, Cercanias de Lechozal, entre CD. Guyana y El Pao, 08°07'00"N 062°43'00"W, 30 Jul 1994, *W. Díaz* 2538 (MO); **Falcon:** cerca del Puente de Jobo, entre Curimagua y San Luis., 20 Jul 1967, *J. A. Steyermark* 99246 (NY, US); Parque Nacional Quebrada de la Cueva El Toro, trail going to La Piedra, 10°50'N 069°07'W, 22 Jun 1979, *R. L. Liesner et al.* 7813 (MO); Parque Nacional Quebrada de la Cueva El Toro, 10°50'N 069°07'W, 23 Jun 1979, *R. L. Liesner et al.* 7893 (MO); **Miranda:** Chacao, 28 Aug 1939, *L. Williams* 11191 (F); **Yaracuy:** Distrito Bruzual, East of Aroa on road to Cumaragua, 9 km from junction, 25 Jul 1986, *L. A. McDade* 1027 (DUKE); Distrito Bruzual, West of San Felipe, road leading over mountains to Aroa from Cocorote which is just south of San Felipe, mountain called "El Cilindro", 10°20'N 068°49'W, 27 Jul 1986, *L. A. McDade et al.* 1056 (DUKE, MO).

*Passiflora cisanana* was originally described by Harms in 1895 as a species from Loja, Ecuador distributed from 1200 to 1500 m altitude. Later Killip in 1938 placed *P. cisanana* in synonymy, under *P. rubra* because it appeared to be simply a form of that species from Ecuador with denser indumentum and smaller leaves.

Sterile collections of *P. cisanana* and *P. rubra* are indeed difficult to distinguish. However, there are differences in sepals, petals, corona filaments, and ovary shape

between the two. *Passiflora cispnana* is characterized by having sepals with acute apices, petals about half as long as the sepals and with a slightly praemorse to obtuse or retuse apices; while *P. rubra* is characterized by having sepals with acuminate apices, petals shorter than sepals and with acute apices. The corona of *P. cispnana* usually has two series of filaments (but see *Lasser 1552* and *Knapp 2838*), the length of the outer series is intermediate between that of the sepals and of the petals; while *P. rubra* has 1 or 2 series of corona filaments, the outer shorter than both sepals and petals. The color of the corona filaments also differs between the species: The filaments are purplish or red at the base, and cream to white above in *P. cispnana* or with purple or pink dots their entire length in *P. rubra*. The ovary shape is also different: ellipsoid in *P. cispnana* and ovoid to globose in *P. rubra*. *Passiflora cispnana* is widely distributed in South America while *P. rubra* is restricted to the Caribbean islands.



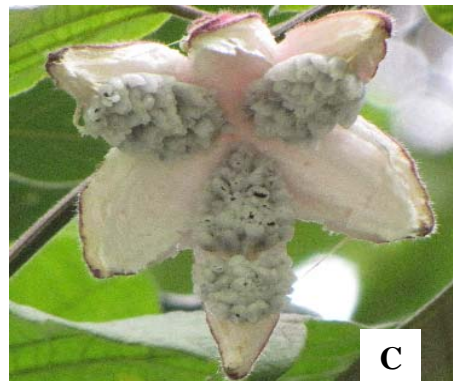
**Figure 16.** Distrubion of *Passiflora cispnana* Harms.



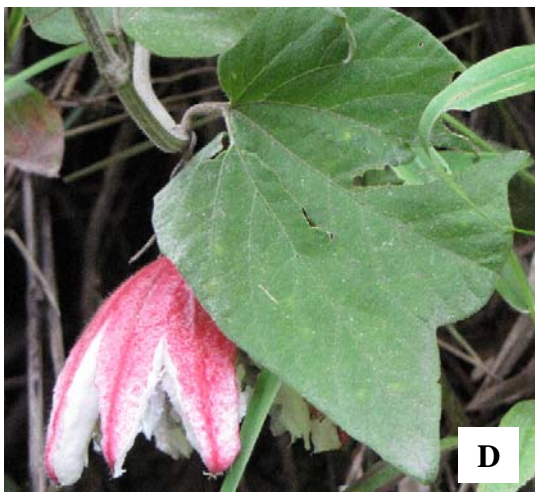
A



B



C



D



E

**Plate 2.** *Passiflora cispiana* Harms. A. Flower (*Boza 2048*). B. Fruits (*MacDougal 1520*). C, D. Dehiscent fruit (*Boza 2048*). E. Seed (from *Cutler 8129*).  
Photos: A, C, D, E. Boza, T. E.; B. MacDougal, J. M.



4. ***P. citrina*** J.M. MacDougal, Ann. Missouri Bot. Gard. 76: 354 (1989).

TYPE: Honduras. Comayagua: El Carrizal, 14 km NW of Siguatepec, 900 m, 27 Jun 1971, *Molina & Molina 26057* (holotype, F; isotypes, EAP not seen, NY, US not seen)

Vine 2--4 m tall, pubescent throughout with 0.4--0.8 mm long, erect trichomes. Stem 5-angular, striate; internodes 5.9--8.1 cm long. Stipules (2.8--4.4--5.5(--8.1) × (0.3--0.6--0.7(--0.8) mm, linear to narrowly triangular, very sparsely pubescent abaxially, apex acuminate; petiole (4--7--10(--19) mm long; lamina (2.5--4.2--5.4(--8.6) × (1.4--3.3--3.9(--5.8) cm, broadly obovate or obtriangular, base rounded or slightly cordate, sparsely pubescent abaxially with trichomes 0.6--0.8 mm long, densely pubescent adaxially, trichomes 0.7--0.8 mm long, 2(--3)-lobed, the lateral lobes acuminate to rounded (a small central lobe obtuse to mucronulate), the angle between the lateral veins (26--43--48(--66)°). Peduncles, 1--2 mm long, solitary (pairs), (one bract near the apex); floral stipe 1.3--3.9 mm long; flowers light to bright yellow, floral tube (0.5--0.8--0.9(--1.4) × (0.5--0.6--0.8(--1.3) cm; sepals (11.5--18.4--19.5(--27.4) × (1.8--2.7--3.3(--5.1) mm, triangulate, sparsely pubescent outside, apex obtuse, light to bright yellow; petals (9.5--15.5--16.7(--25.7) × (1.3--2.0--2.7(--3.8) mm; narrowly triangular, apex acute; corona filaments in 1(2) series, pale yellow with yellow tips, filaments of outer series 15, (6.2--10.7--11.9(--15.5) mm long, erect, filiform, filaments of inner series (2.2--4.8--5.8(--8.6) mm long; operculum (1.0--1.6--1.9(--2.8) mm long, slightly plicate; nectary concave; androgynophore (18.9--20.6--22.2(--28.6) mm long; stamens with filaments (3.5--4.9--5.4(--7.3) mm long, flattened; anthers (4.1--5.0--5.2(--6.2) × (0.9--1.2--1.5(--2.0) mm; ovary 3.5--3.8(--5.5) × 1.1--1.5(--3.2) mm, fusiform-ellipsoid, densely pubescent; styles (2.8--3.7--4.3(--5.4) × 0.3(--0.4) mm long; stigma 0.6--0.8(--1.1) mm diam. Fruit (29--34--38(--42) × (12)13--14(--19) mm, fusiform-ellipsoid or slightly ovoid, strongly 6-angular, reddish; stipe 3.8--4.9 mm long; seeds (2.7--3.0--3.3(--3.6) × (1.6--1.9--2.1(--2.4) mm, obovate, testa transversely grooved, with 6--7 sulcae, the ridges continuous, smooth.

**Local Names:** “*hoja de hechizería*” (Chiquimula – Guatemala).

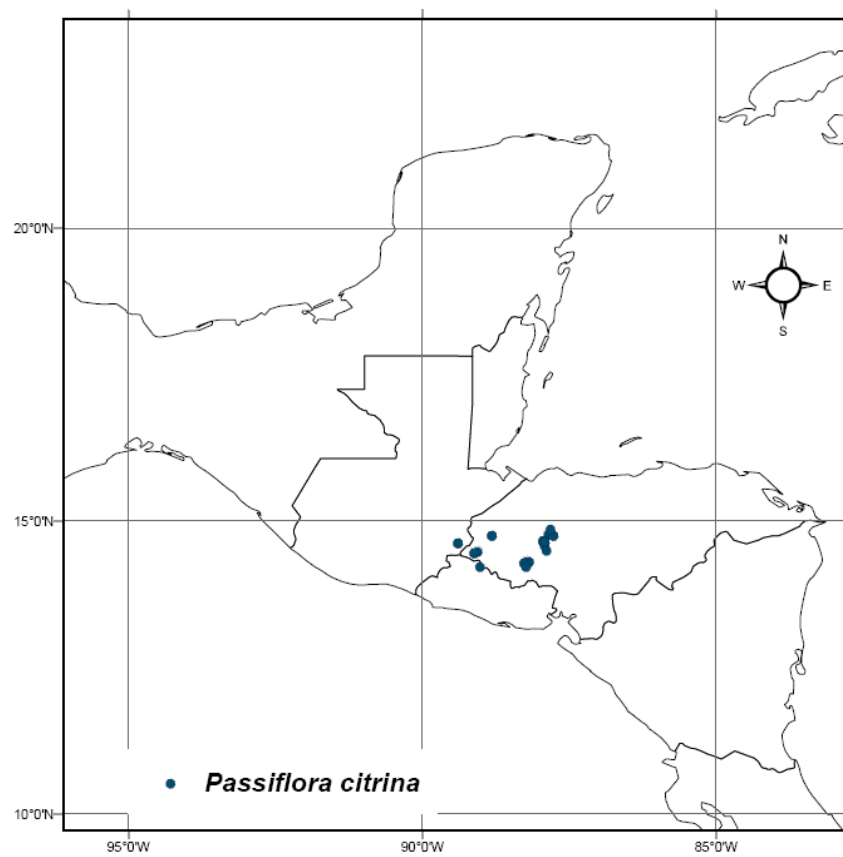
**Distribution and Ecology:** central and western Honduras, adjacent eastern Guatemala, and recently collected in northern El Salvador; in moist *Pinus--Liquidambar* forest.

**Phenology:** Flowers observed in May to December. Fruits documented from April to July and from December to January.

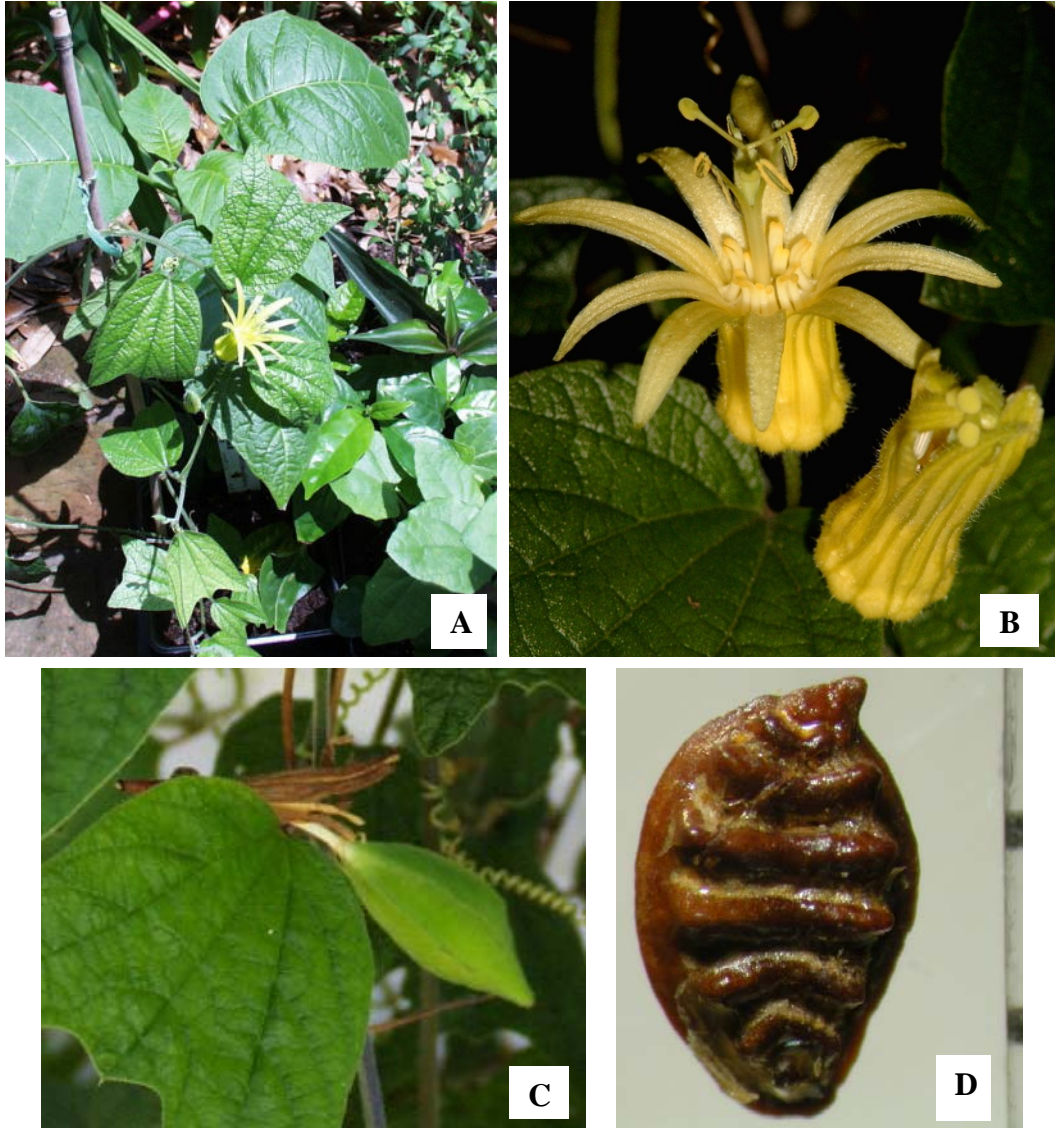
**Selected specimens examined:** GUATEMALA. **Chiquimula:** Cut-over forest of La Cumbre on old road to Quezaltepeque, 14°37'37"N 089°23'11"W, 28 Sep 1971, A. Molina R. & A. R. Molina 26821 (EAP, F, U); Olopa, Olopa roadside, 10 Feb 2002, J. Kufer 379a (MSB); Quezaltepeque, Volcán Quezaltepeque, 3-4 mi NE of Quezaltepeque, 14°37'21"N 089°23'26"W, 8 Nov 1939, J. A. Steyermark 31508 (F). HONDURAS. Honduras, 14 Km NW of Singuatepeque, Comayagua, El Carrizal, 17 Nov 2003, Chase 18932 (K); **Comayagua:** Barranco Trincheras 3 km a Montañuela, 14°39'N 087°55'W, 28 Mar 1964, A. Molina R. 13637 (EAP, F); Temagua, 5 Aug 1933, J.B. Edwards P-640 (F, GH); Trincheras and associated barrancos on NE side of Trincheras just below highest point, old road from Singuatepeque toward Lago Yojoa, 14°39'N 087°55'W, 1 Nov 1988, J. M. MacDougal et al. 3048 (MO); Near Cerro Trincheras, side road at Km post 127.5 on road between Singuatepeque and Lago Yojoa, S side of mountain, 14°39'N 087°56'W, 11 Nov 1988, J. M. MacDougal et al. 3469 (BM, EAP, MEXU, MO, TEFH); Tenagua, Comayagua, 05 Aug 1933, J. B. Edwards 640 (A); Along trail from San José de Los Planes to Cerro El Maneadero, ca. 13-14 km E of Lago Yojoa, just outside Parque Nacional Azúl Meámbar, 14°47'N 087°51'W, 14 March 1993, R. Evans 1421 (MO); San Juanillo: Cordillera de Montecillos Biological Reserve Forest, 14°30'N 087°53'W, 03 Jun 1993, R. L. Liesner 26796 (MO); Singuatepeque, moist pine forest bank in ravine 8 miles west of Singuatepeque, 14°34'39"N 087°54'55"W, 7 Sep 1975, A. Molina R. 31167 (EAP, F, MO); 24 Kms S of Lake Yojoa along road to Singuatepeque, 14°38'56"N 087°55'17"W, 26 Mar 1976, G. E. Pilz & M. Pilz 1572 (MO); Singuatepeque, 10 km N of town on road to Lago de Yojoa, 14°39'01"N 087°56'07"W, 6 May 1987, S. Blackmore & M. Chorley 3656 (BM, MO, TEFH); Taulabé, Barranco de Trincheras, 14°39'N 087°55'W, 29 Aug 1955, A. Molina R. 5826 (EAP, F); El Carrizal 14 kms NW of Singuatepeque, 14°40'22"N 087°56'55"W, 27 Jun 1971, A. Molina R. & A. R. Molina 26057 (F, NY); Barranco de Trincheras, 18 km N of Singuatepeque, 14°39'N 087°55'W, 15 Apr 1951, L. O. Williams & A. Molina R. 17991 (EAP, F, US); Trincheras, 20 km N of Singuatepeque, 14°45'N

087°46'W, 29 Jul 1951 - 10 Aug 1951, *R. A. Howard et al.* 637 (B, MICH, NY, US);  
**Copán:** Santa Rosa de Copán, 5 km suroeste de Santa Rosa de Copán, 14°45'N  
 088°49'W, 29 Mar 1963, *A. Molina R.* 11705 (EAP, F, G, LL, NY, US); 5 km suroeste de  
 Santa Rosa de Copán, 14°45'N 088°49'W, 29 March 1963, *A. Molina R.* 11655 (F, NY);  
**Intibucá:** El Duraznillo, Cordillera Opalaca, 14°13'21"N 088°14'01"W, 24 May 1964, *A.*  
*Molina R. & A. R. Molina* 14086 (EAP, F); La Esperanza, forest around Balneario, 22  
 May 1970, *F. A. Barkley & S. Hernandez* 40324 (GH); La Esperanza, cerca de los baños  
 y la presa, 14°18'28"N 088°10'57"W, 14 May 1973, *J. R. Martinez* 110 (BM, MO);  
 Alrededores de La Esperanza, 14°18'28"N 088°10'57"W, 14 May 1973, *J. Rómulo M. &*  
*C. Bejarano* 110 (MO); Yamaranguila, Barranco Yamaranguila, cerca de Yashse [Yase],  
 14°17'N 088°16'W, 12 Apr 1956, *A. Molina R.* 6510 (EAP, F, US); Municipio  
 Yamaranguila: 3.7 mi WNW of La Esperanza along the road from La Esperanza to  
 Gracias, Sierra de Opalaca, 14°18'43"N 088°13'31"W, 22 Jun 1994, *D. Gerrit et al.*  
 35221 (MO); **Ocotepeque:** La Labor, a 41 km al NE de Nueva Ocotepeque, camino a  
 San Pedro Sula, 14°29'N 089°03'W, 12 Jun 1985, *E. M. Martínez S. & O. Téllez V.* 12932  
 (DUKE, MEXU); Sinuapa, El Moral in Cordillera Merendón, 14°28'N 089°07'W, 27 Aug  
 1968, *A. Molina R.* 22263 (EAP, F, NY); 17 km NE of Nueva Ocotepeque, 14°27'N  
 089°07'W, 13 Aug 1970, *W. E. Harmon & J. D. Dwyer* 3785 (MO).

*Passiflora citrina* is characterized by yellow flowers with a distinctive long floral tube. The long tube separates the species from other members of sect. *Xerogona* except *P. sanguinolenta* Masters. However, *P. sanguinolenta* differs from *P. citrina* by having triangular stems and red to purplish flowers that consistently have a second very small row of coronal filaments. Although, section *Xerogona* is characterized by absence of bracts, *P. citrina* occasionally has been observed with a single bract at the apex of the peduncle 1.6--4.0 × 0.2--0.3 mm (See *Molina 6510*).



**Figure 17.** Distribution of *Passiflora citrina* J.M. MacDougal



**Plate 3.** *Passiflora citrina* J. M. MacDougal. A. Plant (*MacDougal 3469*). B. Flower.  
C. Fruit (*MacDougal 3469*). D. Seed (*Molina 26057*).  
Photos: A, C. MacDougal, J.; B. Ulmer & MacDougal; D. Boza, T. E.

## 5. *Passiflora cobanensis* Killip.

Vine 3--6 m long, puberulous to densely pubescent throughout. Stems 3--5 angular, and striate. Stipules (6.0--7.7--8.6(10.4--))  $\times$  (1.6--2.5--3.0(--5.1)) mm, linear-lanceolate or oblongate, more or less falcate, very sparsely pubescent abaxially; petiole (6--8--11(--17)) mm long; lamina (5.6--7.9--10.0(--19.6))  $\times$  (2.6--3.7--4.5(--7.1)) cm, narrowly obovate to very broadly obovate, rounded or slightly cordate at the base, densely hispid abaxially with trichomes 0.2--0.4 mm long, sparsely to densely hispid adaxially with trichomes 0.2--0.3 mm long, unlobed, strongly 3-nerved in proximal half, the angle between the lateral veins (18--35--41(--64))°. Peduncles (5--9--11(--18)) mm long, usually in pairs; floral stipe 2.4--3.0 mm long; flowers (8--16--20(--29)) mm diam., pale green to light greenish-yellow; sepals (10.1--11.8--13.0(--14.2))  $\times$  (1.7--2.4--2.7(--3.4)) mm, narrowly triangular, sparsely hirsutulous pubescent outside, apex acute, greenish; petals (4.9--6.5--6.8(--9.2))  $\times$  (1.0--1.5--1.8(--2.3)) mm, linear to narrowly triangular; apex obtuse, greenish; corona filaments in 2 series (1), filaments of outer series 20--25, (3.0--3.8--4.3(--6.0)) mm long, purplish brown and yellowish at the apex, linear-clavate to filiform; filaments of the inner row (1.2--1.4--1.6(--1.8)) mm long; operculum (1.1--1.5--1.8(--2.3)) mm long; androgynophore (3.1--3.9--4.1(--5.1)) mm long, green; stamens with filaments (2.3--2.9--3.2(--3.8)) mm long; anthers (1.8--2.2--2.4(--2.9))  $\times$  (0.6--0.9--1.1(--1.3)) mm; ovary 1.3--3.5  $\times$  0.7--1.6 mm, obovoid to slightly fusiform, puberulous to densely tomentose; styles (1.7--2.1--2.5(--3.2))  $\times$  0.2--0.3 mm; stigma (0.4--0.5--0.7(--1.2)) mm diam. Fruit (26--34--38(--49))  $\times$  (12--13--16(--24)) mm, obovoid or ellipsoid, basally stipitate or attenuate, acutely 6-angled, reddish brown; stipe 5.1--6.6 mm long; seeds (1.9--3.7--4.1(--5.0))  $\times$  (1.6--2.1--2.3(--2.7)) mm, transversely sulcate with 6--7 sulci.

*Passiflora cobanensis* is unique within section *Xerogona* in having unlobed leaves. *Passiflora cobanensis* is found from Atlantic lowland humid forest to lower montane rainforest, especially on ridges and limestone outcrops of Chiapas, Mexico through central Guatemala to Belize from 120--1700 m altitude. There are two variants within *P. cobanensis*: one grows in mesic to wet uplands in Chiapas, Mexico, and the

other one grows in lowland warmer and seasonally drier areas. The recognition of these two variants as subspecies was suggested before by MacDougal (2003) in Flora Mesoamerica (still unpublished). In the present revision the two variants have been recognized as subspecies based on differences in stem, leaf, corona filaments, and ovary characters.

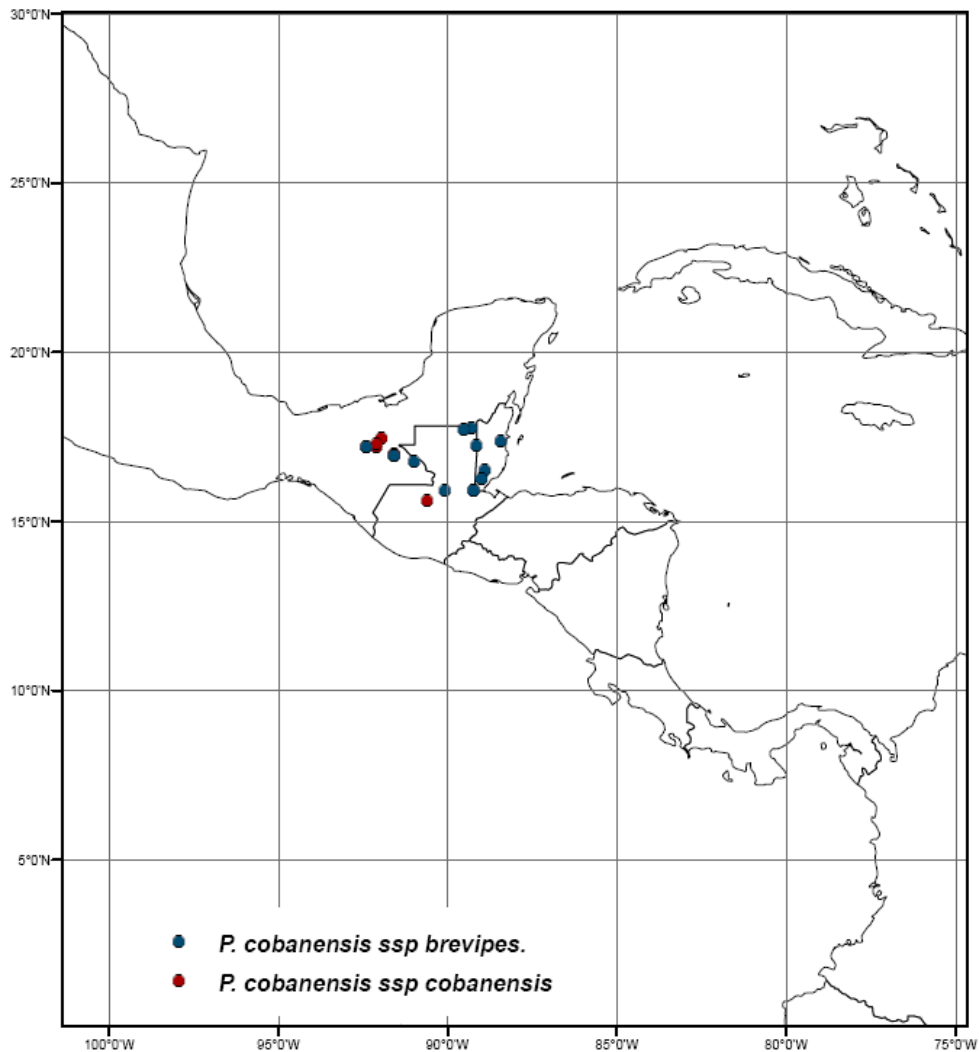
**Key to the subspecies of *Passiflora cobanensis***

**1a.** Stem 4--5-angular; stipules oblong, subfalcate; lamina 2.6--5.2 cm across, thinner with rounded base, slightly reticulate beneath and sparsely pubescent; outer corona filaments linear-clavate; ovary glabrous or puberulous (rarely densely tomentose).

**5A.** *P. cobanensis* ssp. *cobanensis*.

**1b.** Stem 3 angular; stipules linear-lanceolate; lamina 3.0--7.1 mm across, thicker with cordate base, conspicuously reticulate beneath with nerves and veins elevated and densely pubescent; outer corona filaments filiform; ovary densely tomentose.

**5B.** *P. cobanensis* ssp. *brevipes*.



**Figure 18.** Distribution of *Passiflora cobanensis* Killip.

**5A. *Passiflora cobanensis* subsp. *brevipes* (Killip) Boza Comb. nov.**

**BASIONYM:** *Passiflora brevipes* Killip, Publ. Carnegie Inst. Wash. 461(13): 312--313, t. 2. (1936). – **TYPE:** British Honduras: Jacinto Hills, alt. 120 m, *W. A. Schipp 1304* (holotype, F; isotypes, BRH not seen, G, MICH, MO.).

Vine densely short hispid throughout. Stems 3-angular, striate. Stipules (6.8--7.7--8.8(--10.4) × (2.0--2.8--3.2(--5.1) mm, linear-lanceolate, very sparsely pubescent abaxially; petiole (6--8--10(--15) mm long, lamina (5.6--6.7--8.2(--11.4) × (3.0--3.8--



4.6(--7.1) cm, broadly obovate, cordate at the base, densely pubescent abaxially, trichomes 0.2--0.4 mm long, glabrous to densely pubescent adaxially with trichomes ca. 0.3 mm long, unlobed, strongly 3-nerved in proximal half with conspicuous reticulation beneath (nerves and veins elevated), the angle between the lateral veins (32--42--50(--64))°. Peduncles (6--9--11(--18)) mm long, in pairs; floral stipe 0.8--2.8 mm long; flowers (8--17--23(--29)) mm diam.; sepals (10.1--11.3--12.7(--13.4)) × (1.7--2.1--2.4(--3.3)) mm, sparsely hirsutulous pubescent outside; petals (4.9--6.4--7.3(--9.2)) × (1.0--1.4--1.6(--2.0)) mm, linear to narrowly triangular; corona filaments in 2 series, filaments of outer series 20--25, (3.0--3.6--4.2(--6.0)) mm long, filiform; filaments of the inner series (0.9--1.1--1.3(--1.5)) mm long; operculum (1.1--1.5--1.7(--2.3)) mm; androgynophore (3.1--4.3--4.5(--5.1)) mm long; stamens with filaments 2.9--3.5(--3.8)) mm long; anthers (1.8--2.1--2.3(--2.7)) × (0.6--0.9--1.1) mm; ovary 2.0--3.5 × 0.9--1.6 mm, obovoid to ellipsoid, puberulous; styles (1.8--2.3--2.8(--3.2)) mm long; stigma (0.4--0.5--0.7(--1.2)) mm diam. Fruit (23--30--32(--38)) × (12--13--14(--15)) mm, obovoid; stipe 1.1--5.1 mm long; seeds (3.6--3.8--3.9(--4.2)) × (1.9--2.1--2.2) mm.

**Distribution and Ecology:** From Mexico to northern Guatemala and Belize in warm and seasonally dry areas from 150--1700 m altitude.

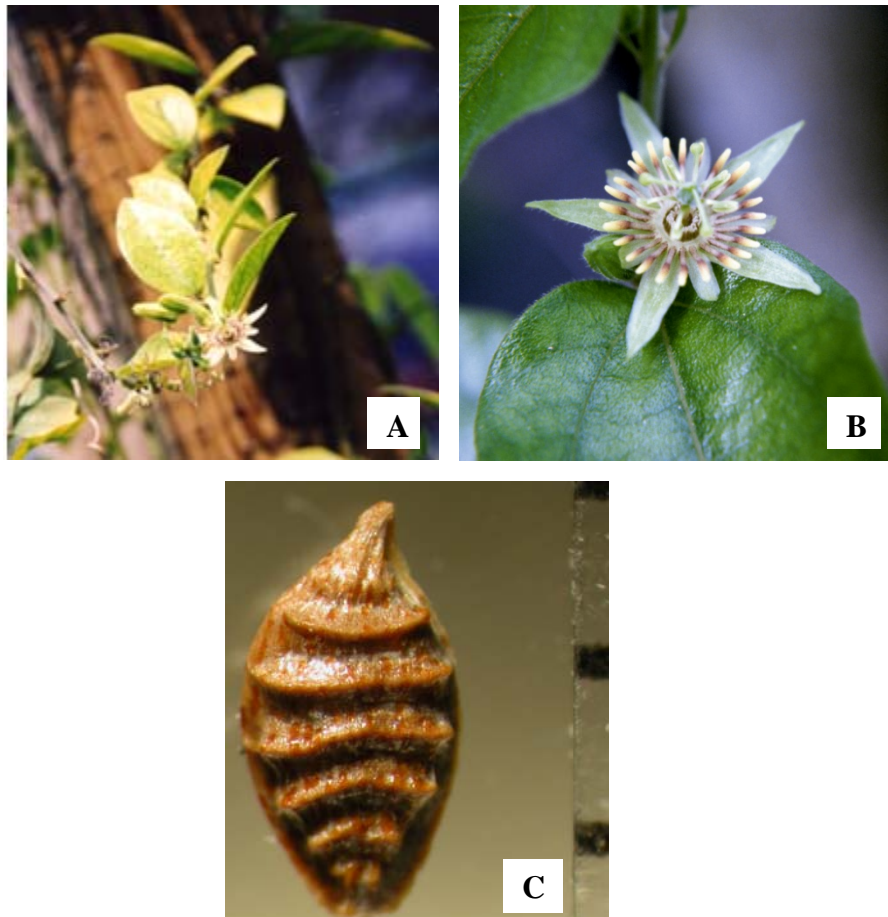
**Phenology:** Flowers observed from Feb to June. Fruits in March and from Jun to July.

**Selected specimens examined:** BELIZE. **Belize:** Gracie Rock, 1.5 mi. S of Mile 22 on Western Highway, 17°23'N 088°26'W, 04-05 Jun 1973, *T. B. Croat 23843* (MO, US);

**Cayo:** North of Bullet Tree Falls, 1.5 miles south of Pilar archeological site, 17°13'N 089°09'W, 23 Jul 1995, *J. Walker & D. E. Atha 1536* **Toledo:** Southern Maya Mountains, Bladen Nature Reserve, Ek Xux Canyon, ca. 2 airline km NE of Ek Xux archeological site, 16°31'05"N 088°54'54"W, 19 May 1996, *G. Davidse 36149* (BRH, MO); Jacinto Hills, 16°15'00"N 089°00'16"W, 11 Mar 1934, *W. Schipp 1304* (A, F, G, GH, MICH, MO).

GUATEMALA. **Alta Verapaz:** Cerro Chinajá, between Finca Yalpemech and Chinajá, above source of Río San Diego, 15°55'54"N 090°05'36"W, 01 Apr 1942 - 02 Apr 1942, *J. A. Steyermark 45674* (F, US); **Petén:** Dos Lagunas, km. 9, Ixcanrio road, 17°41'38"N 089°31'52"W, 14 Jun 1969, *E. Contreras 8722* (LL, TEX); Cadenas, on Morales Road,

15°55'46"N 089°14'06"W, 13 March 1967, *E. Contreras 6731* (LL, MO); 15°55'46"N 089°14'06"W, 13 Mar 1967, *E. Contreras 6739* (LL, MO); Dos Lagunas, Ixcancario, Km 28 of Ixcancario Road, 17°44'56"N 089°18'12"W, 9 Jun 1969, *E. Contreras 8694* (MO); MEXICO. **Chiapas**: Laguna Ocotolito a 12 km al N de Monte Líbano camino a Chancala, Mun. Ocosingo, 16°57'36"N 091°35'24"W, 02 Feb 1986, *E. Martínez 17075* (MO); Ocosingo, en Crucero Corozal sobre el camino Palenque-Boca Lacantum, 16°45'36"N 091°00'00"W, 18 Jun 1986, *E. Martínez S. & M. A. Soto A. 18844* (MO); Tila, Steep slope of Ahk'ulbal Nab above Peltalcingo, Mun. of Peltalcingo, 17°10'37"N 092°24'33"W, 28 Mar 1981, *D. E. Breedlove 50409* (CAS, DUKE, MO).



**Plate 4.** *Passiflora cobanensis* ssp. *brevipes* (Killip) Boza. A. Plant. B. Flower. C. Seed (Walker1536).

Photos: **A, B.** Ulmer & MacDougal; **C.** Boza, T. E.

**5B. *Passiflora cobanensis* subsp. *cobanensis*.**

*Passiflora cobanensis* Killip. J. Wash. Acad. Sci. 14: 111. 1924. TYPE:

Guatemala: Alta Verapaz: between Chama and Cobán, 950 m, 26 July 1920, *Johnson 411* (holotypes, F not seen, US not seen).

Vine 3--6 m long, sparsely short hispid throughout. Stems 4--5 angular, striate. Stipules (6.0--7.9--8.6(10.0--)) × (2.2--2.4--3.1(--4.2)) mm, oblong, more or less falcate, very sparsely pubescent abaxially; petiole (6--8--12(--17)) mm long; lamina (7.0--9.5--12.8(--19.6)) × (2.6--3.4--4.4(--5.2)) cm, margin entire, narrowly obovate, rounded at the base, sparsely to densely hispid abaxially with trichomes 0.1--0.2 mm long, glabrous to sparsely hispid adaxially with trichomes ca. 0.1 mm long, unlobed, strongly 3-nerved in proximal half and slightly reticulate beneath, the angle between the lateral veins (18--27--31(--36))°. Peduncles (5--7--9(--12)) mm long, usually in pairs; floral stipe 2.4--3.0 mm long; flowers (13--19--20(--25)) mm diam; sepals (12.2--12.7--13.9(--14.2)) × (2.9--3.1--3.3(--3.4)) mm, sparsely hirsutulous outside; petals (6.0--6.2--7.1(--7.4)) × (1.6--1.8--2.1(--2.2)) mm, linear to narrowly triangular; corona filaments in 2 series, filaments of outer series ca. 20, (4.0--4.1--4.4(--4.5)) mm long, filaments linear clavate; filaments of the inner series (1.1--1.2--1.5) mm long; operculum (1.4--1.5--1.8(--2.0)) mm; androgynophore (3.0--4.3--4.5) mm long; stamens with filaments (2.3--2.9--3.2) mm long; anthers (2.2--2.3--2.6(--2.9)) × (0.9--1.1(--1.2)) mm; ovary 1.3--1.6 × 0.7--1.0 mm, obovoid, glabrous to puberulous (rarely densely tomentose); styles (1.7--1.8--1.9) mm long; stigma (0.4--0.5--0.7) mm diam. Fruit 44--45(--49) × (12--18--23(--24)) mm, obovoid; stipe 3.6--6.6 mm long; seeds (3.8--4.2--4.8(--5.0)) × (2.2--2.3--2.4(--2.7)) mm.

**Distribution and Ecology:** From Mexico to northern Guatemala in lower montane rainforest, especially limestone outcrops or ridges in Chiapas, Mexico, from 300--1700 m altitude.

**Phenology:** Flowers observed in February. It fruits from February to April.

**Selected specimens examined:** GUATEMALA. **Alta Verapaz:** Chamá to Cobán, 15°36'08"N 090°36'40"W - 15°37'00"N 090°34'00"W, 26 Jul 1920, *H. Johnson 411*

(MO, US); MEXICO. **Chiapas:** Mun. Ocosingo, 70 km SW of Palenque on rd. to Ocosingo along the Jol Uk'um, 17°10'12"N 092°06'36"W, 12 Apr 1981, *D. E. Breedlove* 50924 (CAS); Adjacent to small cascading river at Agua Azul, 17°15'36"N 092°06'36"W, 26 Feb 1981, *D. E. Breedlove* 49862 (CAS, MEXU); Ocosingo, en Naha a 15 km al N de Monte Líbano camino a hancala, 16°58'48"N 091°35'24"W, 13 Apr 1986, *E. Martínez* 18045 (MEXU, MO); En Laguna Ocotolito, a 12 km al N de Monte Líbano camino a Chancala, 16°57'36"N 091°35'24"W, 10 Apr 1986, *E. Martínez* S. 17604 (MO); Palenque. Slopes and small streams, along the ridges 6-12 km S of Palenque on the road to Ocosingo, 17°27'36"N 091°57'36"W - 17°26'45"N 091°58'48"W, 22 Feb 1972, *D. E. Breedlove* 24225 (CAS); Tila, Steep slope of Ahk'ulbal Nab above Peltalcingo [Petalcingo], Mpio. of Peltalcingo., 17°10'41"N 092°24'20"W, 27 Feb 1981, *D. E. Breedlove* 49881 (CAS, MO).

*Passiflora cobanensis* subsp. *cobanensis* and *P. cobanensis* subsp. *brevipes* both are to be found in Peltalcingo Chiapas, Mexico and Alta Verapaz, Guatemala. The subspecies can be distinguished by stem shape which is 3-angular in *P. cobanensis* ssp. *brevipes* and 4--5-angular in *P. cobanensis* subsp. *cobanensis*. The stipules of *P. cobanensis* subsp. *cobanensis* are oblong, more or less falcate, while those of *P. cobanensis* subsp. *brevipes* are linear to lanceolate stipules. The leaves of *P. cobanensis* subsp. *cobanensis* are longer, narrower, thinner with a rounded base, acuminate apex, less indumentum, and are slightly reticulate beneath; in *P. cobanensis* subsp. *brevipes* the leaves are wider, thicker, with a cordate base, acute apex, dense indumentum and are conspicuously reticulate (veins are prominent) beneath. There are 2 (1) series of corona filaments in *P. cobanensis* subsp. *cobanensis*, members of the outer series filaments having a clavate apex; while in *P. cobanensis* subsp. *brevipes* the corona always has 2 series, the outer filaments being liguliform. The ovary in *P. cobanensis* subsp. *cobanensis* is obovoid and glabrous to puberulous; whereas in *P. cobanensis* subsp. *brevipes* it is narrowly obovoid and densely tomentose.



**Plate 5.** *Passiflora cobanensis* ssp. *cobanensis* (Killip) Boza (Veliz et al. 1996).  
 Photo: Veliz, M.

6. **Passiflora konzattiana** Killip. J. Wash. Acad. Sci. 17: 425(1927)

TYPE: Mexico: Veracruz: Mirador, June 1921, *Purpus* 8804 (holotype, US not seen; isotype, MO).

Vine 5--7 m long, sparsely pubescent to glabrescent. Stems 3-angular, slender, terete, turning reddish brown. Stipules (1.6--3.6--4.4(--5.6) × (0.2--0.4--0.5(--0.8) mm, linear to linear triangular, very sparsely pubescent abaxially; petiole (7--13--17(--29) mm long; lamina (1.8--3.2--4.0(--6.1) × (3.1--4.3--5.3(--6.9) cm, depressed obovate, cordate at the base, densely hirsute abaxially with trichomes 0.3--1.0 mm long, sparsely hirsute adaxially with trichomes 0.6--1.2 mm long, 2(--3)-lobed, the lateral lobes acuminate to acute, (the central lobe reduced or cusp-like), 3-nerved (nerves often terminating in a short mucro); the angle between the lateral veins (44--79--87(--122)°. Peduncles (8--17--20(--44) mm long, slender, solitary (in pairs); floral stipe 0.8--3.3 mm long; flowers (16--19--20(--27) mm diam., greenish white to yellowish green; sepals (4.6--8.4--9.4(--14.1) × (1.6--2.1--2.7(--3.9) mm, linear to narrowly elliptic, sparsely hirsutulous pubescent outside, yellowish green, apex acute, yellowish green; petals (3.2--5.9--6.7(--9.4) × (1.0--1.4--1.8(--2.5) mm, linear to narrowly elliptic; about half as long as the sepals, apex slightly praemorse to retuse, greenish white; corona filaments in 1(2) series, filaments of outer series 20, (2.2--3.5--4.0(--6.2) mm long, densely spotted with deep purple in the lower two-thirds, yellow in the upper third; filaments of the inner series (0.7--0.9--1.2(--1.3) mm long; operculum (0.7--1.1--1.3(--1.9) mm, pale purple, limen erect; androgynophore 2.4--3.3(--4.0) mm long, green; stamens with filaments (1.8--2.3--2.7(--3.4) mm long; anthers (1.6--2.1--2.2(--2.6) × (0.5--0.9--1.1(--1.4) mm; ovary (1.2--1.7--2.0(--2.7) × (0.8--1.0--1.3(--2.0) mm, ellipsoid to ovoid or fusiform, densely puberulous; styles (1.1--1.8--2.1(--2.7) × (0.1--0.2--0.7(--1.8) mm; stigma (0.5--0.7--0.9(--1.2) mm diam. Fruit (27--40--51(--63) × (8--9--12(--15) mm, narrowly ellipsoid to fusiform, finely pubescent to glabrous, 6-keeled, dark purplish red; stipe 3.2--4.0 mm long; seeds (2.5--2.7--3.0(--3.1) × (1.5--1.9--2.4(--2.6) mm, transversely sulcate with 5--6 sulci, ridges smooth.

**Local Names:** “*Ehiil i okob thut*” (Huasec San Luis Potosí, Mexico).

**Distribution and Ecology:** East-central Mexico in wet montane cloud forest from 800 to 1980 m altitude mainly in woodlands of pine and oak forest.

**Phenology:** Flowers were observed in May to August. Fruits were observed from July to August.

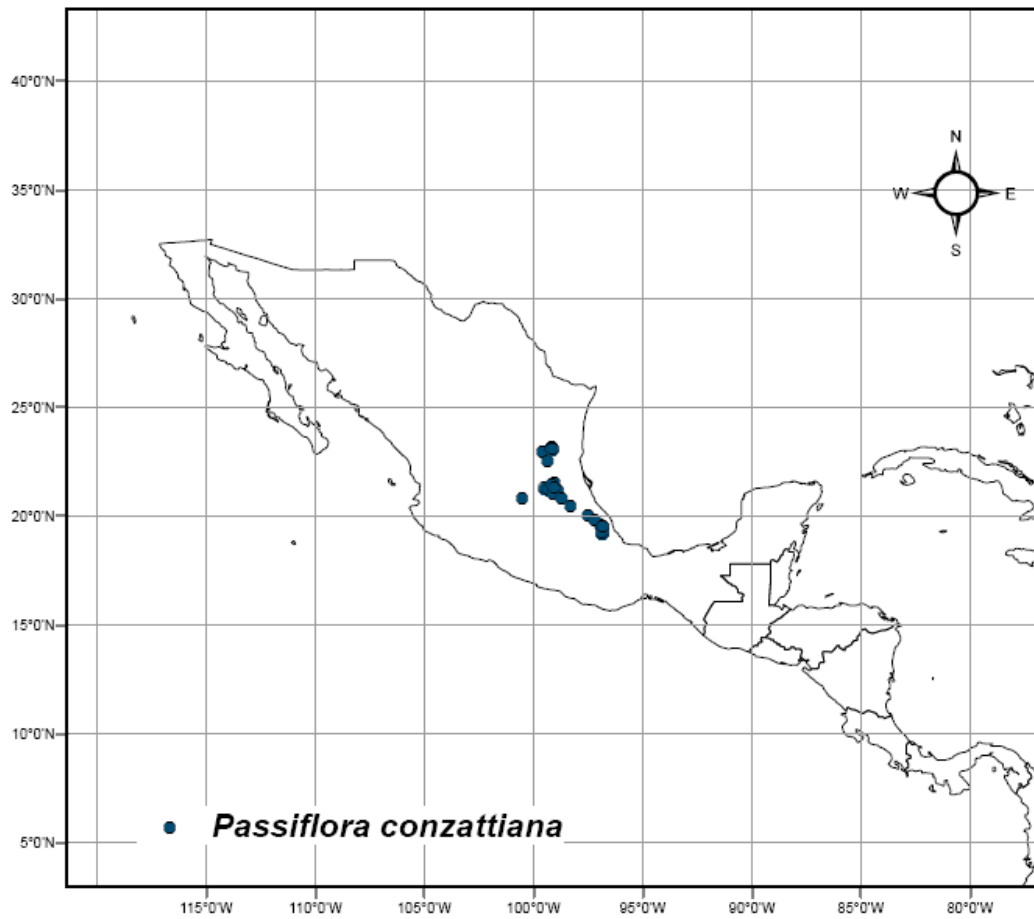
**Selected specimens examined:** MEXICO. Tortula, *F. M. Liebmann 4154* (C); Tampico - Canoas, May 1927, *K. Reiche 669* (M); **Hidalgo:** Chapulhuacan, 21°09'00"N 098°54'00"W, Jul 1937, *C. L. Lundell & A. A. Lundell 7156* (LL, MICH, TEX, US); Jacala, 6.5 air km E-NE of Jacala, between Cuesta Colorado and El Pinalito on Mex 85, 21°01'28"N 099°08'05"W, 13 Jul 1991, *Mayfield 809* (LL, TEX); Molango, Distr. Molango; Mpo. Molango, Loc. Trailside thickets between Molango and Lake Atexca, 20°47'24"N 098°43'48"W, 28 May 1947, *H. E. Moore 2992* (BH, CU); **Puebla:** Mpo. de Apulco, km 22 de la carretera que va hacia Cuetzalán, 20°02'N 097°32'W, 21 Jun 1976, *Inzunza, F. M. 94* (CHAPA, F); **Querétaro:** Along back road from Río Verdito to Agua Zarca, 0.6 Km (road) northeast of Agua Zarca, 21°13'12"N 099°06'00"W, 04 Jul 2003, *M. Fishbein et al. 5163* (ARIZ); Amoles, Aprox. 1 km al NE de El Llano, 20°47'N 100°33'W, 30 Jun 1988, *E. Carranza 688* (MO); aprox. 3 km al S de La Tinaja, 21°16'03"N 099°32'39"W, 1 Aug 1988, *E. Carranza 948* (MO); Jalpan, Cerro El Pilón, S de La Parada, 21°26'N 099°11'W, 1 Aug 1989, *C. Guzmán 49* (MO); Landa de Matamoros, ca. 5 km al Sur de El Parador de El Medroño, 21°12'13"N 099°19'31"W, 21 Jun 1989, *E. González 681* (MO); Puerto del Hambre, ca. 6 km al Noroeste de Acatitlán de Saragoza, 21°16'N 099°09'W, 2 Jun 1989, *E. González 628* (MO); Cerca de Neblinas, 21°16'N 099°05'W, 14 Sep 1988, *Rzedowski 46400* (MO); **San Luis Potosí:** Mpo. Ciudad del Maiz, .5 km al NE de Las Abritas, 22°29'24"N 099°23'24"W, 30 Jun 1959, *J. Rzedowski 1130* (MICH); Aquismón trail between Tampaxal and La Parada, 21°32'N 099°04'W, 06 Jun 1979, *J. B. Alcorn 3191* (DUKE, LL, TEX, XAL); San Luis Potosí, Hills Las Canoas, 09 Jul 1890, *C. G. Pringle 3638* (GH); **Tamaulipas:** Rancho del Cielo, arriba de Gomez Farias, 23°03'00"N 099°12'36"W, 02 May 1967, *A. Gómez 2040* (GH, MICH); Gomez Farias. Rancho del Cielo, 23°03'N 099°09'W, 05 Jun 1969, *A.T. Richardson 1351* (LL, TEX); NE Gomez Farias, road to Rancho Cielo, 23°10'N 099°11'W, 14 Jul 1972, *Eloy s.n.* (LL, TEX); Mpo. de Gomez Farias, Sierra de

Guatemala, Rancho del Cielo Biological Station of Texas Southmost College, 23°03'00"N 099°13'48"W, 08 Jun 1971, *J. R. Sullivan 371* (LL, NY, TEX); Mpo. Gomez Farias, Sierra de Guatemala, San Pablo adjust below San Pablo on the road toward Gomez Farias, 23°05'24"N 099°12'00"W, 10 Jun 1971, *J. R. Sullivan 413* (LL, TEX); gate to Rancho del Cielo, 6 mi W of Gomez Farias, 23°03'00"N 099°12'00"W, 09 Jun 1967, *T. Stuessy 838* (LL, TEX); Gomez Farias Region: Rancho del Cielo and environs, 23°02'24"N 099°09'00"W, Spring 1965, *M. Webster 172* (LL, TEX); Tula, 10.2 mi SE of Tula (centro) on road to Ocampo, 22°56'N 099°36'W, 16 Jun 1987, *G. L. Nesom et al. 6018* (LL); **Veracruz:** Mirador, 19°13'N 096°53'W, Jun 1921, *C. A. Purpus 8804* (B, F, GH, MO, NY, UC, US); El Mirador, 19°13'N 096°53'W, Mar 1939, *C. A. Purpus 16343* (F); Jalapa, 19°29'N 096°51'W, 1899, *C. G. Pringle 7840* (US); Mirador, 19°13'N 096°51'W, Jun 1840 - Oct 1840, *Galeotti 3658* (BR); Mirador, 19°13'N 096°51'W, 1838-ca. 1839, *J. J. Linden 752a* (K); Jalapa, 19°29'51"N 096°51'47"W, *J. N. Rose & W. Hough 4938* (US); Atzalan, Mpo. Atzalan, La Calavera, Carretera Altotonga-Tlapacoyan, 19°48'N 097°13'W, 17 May 1973, *W. Marquez & J. Dorantes 140* (F, XAL); Jalapa, Salto del Gato, E de Xalapa, Municipio de Xalapa, 02 May 1971, *Dorantes & Acosta 2011* (ENCB, SLPM); Mun. Xalapa, 3 km al W de Xalapa, 19°33'00"N 096°57'00"W, 08 May 1973, *Dorantes & Acosta 2069* (ENCB, SLPM); near Jalapa, 19°29'51"N 096°51'47"W, *Rose & R. B. Hough 4260* (US);

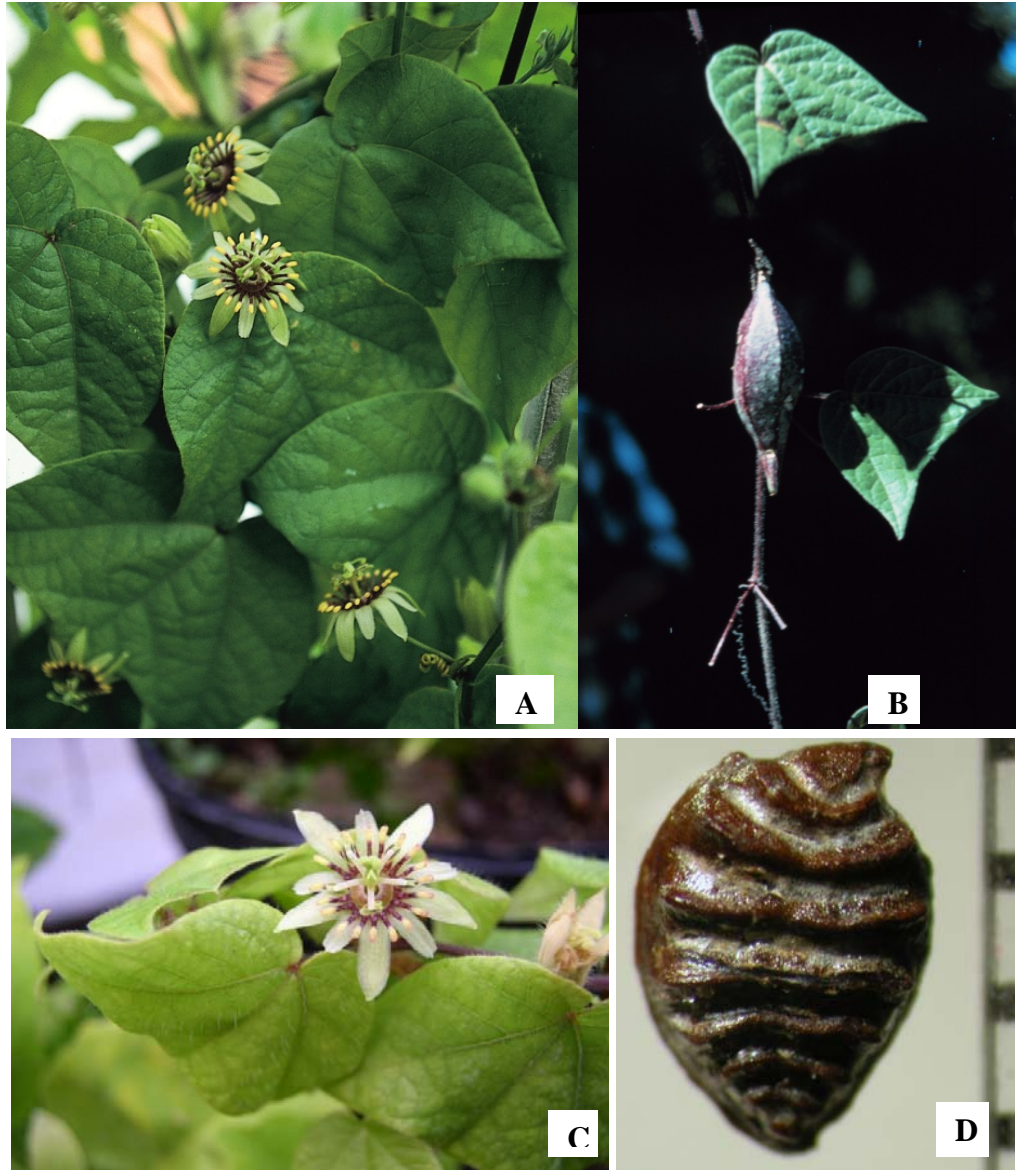
The flowers of *P. konzattiana*, *P. cobanensis*, and *P. goniosperma* are very similar. It is possible to distinguish among these species by the shape of their leaves and by the number of coronal rows. *Passiflora goniosperma* has 2-lobed leaves, *P. konzattiana* has 2-lobed leaves and rarely 3-lobed leaves, while *P. cobanensis* has unlobed leaves. *Passiflora konzattiana* has only one series of corona filaments, as well as *P. goniosperma*, while *P. cobanensis* has 2 series of corona filaments.

Although species of section *Xerogona* characteristically lack floral bract *P. konzattiana* rarely has a single bract 1.7--2.5 × 0.2--0.4 mm (*Marquez 140A* and *Inzunza 94*).





**Figure 19.** Distribution of *Passiflora konzattiana* Killip.



**Plate 6.** *Passiflora konzattiana* Killip. A. Plant. B. Fruit. C. Flower.  
D. Seed (*MacDougal 3014*).

Photos: **A.** Ulmer & MacDougal; **B.** Lau, A.; **C.** Ochoa, J.; **D.** Boza, T. E.

7. ***Passiflora costaricensis*** Killip. J. Wash. Acad. Sci. 12: 257(1922)

TYPE: Costa Rica: Talamancas: Xirores [Shirores], *Tonduz* 9327 (holotype, US not seen; isotypes, BR, CR not seen, US not seen).

Vine 4--12 m long, sparsely to densely tomentose throughout. Stems sharply 3-angular, hirsute with light brown hairs. Stipules (3.1--6.0--6.8(--13.5) × (0.6--0.9--1.1(--1.8) mm, linear-falcate, entire, very sparsely pubescent abaxially; petiole (10--21--28(--64) mm long; lamina (7.9--10.6--12.4(--16.0) × (5.4--7.7--8.9(--12.8) cm, broadly obovate, rounded to cordate at the base, densely tomentose abaxially with trichomes 0.5--1.5 mm long, densely pilose adaxially with trichomes 0.8--2.0 mm long, 2-lobed, the lateral lobes acuminate or acute, mucronate, 3-nerved, the angle between the lateral veins (28--36--40(--59)°. Peduncles (6--9--12(--16) mm long, slender, solitary (in pairs); floral stipe 1.9--7.4 mm long; flowers (41--44--46(--52) mm diam., white, cream, or pale greenish white; sepals (13.5--18.1--19.5(--21.2) × (2.4--3.9--4.6(--6.0) mm, linear to triangular, sparsely hirsutulous pubescent outside, apex acute, pale green to white (flushed purple); petals (10.7--12.6--13.1(--16.4) × (1.9--3.3--3.8(--5.3) mm, linear to narrowly triangular; apex obtuse to rounded, white occasionally flushed purple; corona filaments in 1 or 2 series, those of outer series 30--36, (8.3--11.0--12.0(--14.8) mm long, white with pink base; those of the inner series 1.4--1.6(--1.7) mm long; operculum (1.9--2.2--2.5(--2.9) mm, closely plicate, usually finely pubescent, trichomes ca. 0.6 mm long; androgynophore 4.4--7.6 mm long, green; stamens with filaments (2.8--4.3--5.0(--6.0) mm long; anthers (2.9--3.9--4.2(--5.7) × (1.0--1.4--1.7(--2.3) mm; ovary 3.1--7.1 × 0.7--3.0 mm, ellipsoid to fusiform, minutely puberulous; styles (3.5--4.6--4.9(--6.3) × (0.2--0.3--0.4(--0.5) mm; stigma (1.1--1.3--1.5(--2.3) mm diam. Fruit (50--69--93(--134) × (10--14--18(--31) mm, ellipsoid or fusiform, glabrous, 6-keeled, dark red to purplish-red and often pink to white between the ridges (nearly all white); stipe 3.5--11.4 mm long; seeds (1.3--3.3--3.4(--4.4) × (1.2--1.8--1.9(--2.2) mm, narrowly ovate, transversely sulcate with 7--9 sulci, smooth ridges.

**Distribution and Ecology:** From eastern Mexico to the pacific coast of Colombia and Ecuador in lowland to premontane tropical wet forest, from 0 to 1800 m in the edges of primary forest and in secondary growth.

**Phenology:** Flowers and fruits observed during most of the year.

**Selected specimens examined:** BELIZE. **Toledo:** Southern Maya Mountains, Bladen Nature Reserve, West Snake Creek, 16°27'24"N 089°01'01"W, 28 May 1997, *D. L. Holland & B. Kid 95* (BRH, MO). COSTA RICA. 26 Km from Turrialba or 16 Km from Siquirres on the road that joins the two cities, 1980, *J. M. MacDougal 1118* (CAS, DUKE); Monteverde Reserve, Peñas Blancas river valley, Atlantic slope, Eladio Cruz farm, 10°20'N 084°43'W, 1 Nov 1986, *W. A. Haber ex E. Bello C. 6171* (MO); **Alajuela:** Reserva Biológica Monteverde, Río Peñas Blancas, Finca de Juan Cruz, 10°18'36"N 084°03'36"W, 7 Dec 1989, *E. Bello 1563* (MO); Reserva Forestal San Ramón, sendero Miramar, 10°12'53"N 084°36'28"W, 2 Nov 1986, *G. Herrera et al. 167* (MO); Alajuela, Province of Alajuela, area of the Reserva Biológica Alberto MI Brenes, 10°13'N 084°36'W, 21 Jun 2002, *J. Homeier 1149* (USJ); San Ramon, N of San Ramon, km 15-35 of road de La Tigra and Fortuna, 07 Jun 1984, *C. M. Taylor et al. 4190* (DUKE); Reserva Foresta, de San Ramón, sendero a la fila al S.O. de la Estación, 10°13'N 084°37'W, 05 Sep 1992, *J. Gómez-Laurito et al. 12285* (USJ); Along road from San Ramón northward through Balsa, ca. 5.7 km north of bridge over Quebrada Volio, southwest of road, 10°07'48"N 084°28'48"W, 10 Sep 1979, *W. D. Stevens 14104* (MO); **Cartago:** Jiménez, Selva, Reserva El Copal, 09°47'00"N 083°45'20"W, 02 Jun 2001, *M. A. Blanco & R. Narit 1874* (USJ); Forests de Las Vueltas, Tucurrique, 09°49'48"N 083°42'36"W, Jan 1899, *Tonduz, A. 13146* (B, G, US, W); Turrialba, Margen del Río Dantas P. N. Barbilla, 09°58'30"N 083°27'00"W, 26 Nov 2000, *A. Estrada & J. Solano 2558* (K); Parque Nacional Barbilla, Cuenca del Matina, Sendero Quebrada, saliendo por el sendero El Felino, 09°58'20"N 083°27'10"W, 23 Aug 2000, *E. Mora C. 1455* (MO); Terrenos del Instituto, Turrialba, 09°53'24"N 083°39'00"W, 23 Jul 1949, *J. Leon 1696* (US); **Guanacaste:** 26 Km from turnoff from Pan Am Highway to Upala, below Volcan Tenorio, 23 Aug 1980, *W. J. Kress 80-1227* (DUKE); **Heredia:** Finca La Selva, the OTS field station on the Río Puerto Viejo just E of its junction with the Río Sarapiquí,

10°25'53"N 084°00'13"W, 14 Apr 1982, *B. Hammel 11697* (DUKE); Zona Protectora Northern slopes Volcan Barba, between Rio Peje and Rio Guacimo, along Quebrada Cantarana, downstream from base camp located at abandoned sawmil, 13 Jan 1983, *M. H. Grayum & G. E. Schatz 3100* (DUKE); Sarapiquí, Estación Biológica La Selva, 05 Apr 1999, *D. Hearn s.n.* (USJ); Zona Protectora-Q, Canta Rana Magsasay, 10°22'48"N 084°03'00"W, 26 May 1983, *I. A. Chacón 863* (CR, MO); La Selva Biological Station, 10°25'53"N 084°00'13"W, 3 Aug 1980, *J. M. MacDougal 1047* (DUKE); La Selva Biological Station, 10°25'53"N 084°00'13"W, 4 Aug 1980, *J. M. MacDougal 1066* (DUKE); **Limón:** Cordillera de Talamanca Along Río Madre de Dios, 10°03'00"N 083°25'48"W, 2 Sep 1988, *M. Grayum et al. 8677* (MO); La Colombiana Farm of the United Fruit Co., 10°09'N 083°35'W, 06 March 1924 - 07 March 1924, *P. C. Standley 36989* (US); Forest de Shirores [Xirores], Talamanca, 09°34'48"N 082°57'00"W, Feb 1895, *Tonduz 9327* (BR, MO, US); Forests de Tsaki, 09°29'24"N 082°57'36"W, Apr 1895, *Tonduz 9594* (BR); Between La Junta and Florida on the Río Reventazón, 10°06'00"N 083°33'00"W, 11 Jul 1920, *W. W. Rowlee & A. L. Stork 723* (BH, CU, NY, US); Limon, about 5 km inland from town of S to Santa Rosa; 1-4 Km from main road, 30 Jul 1981, *C. J. Taylor 720* (DUKE); Siquirres, a la vera del río Barbilla, 24 Sep 1978, *J. Gómez-Laurito 4038* (USJ); **Puntarenas:** Parque Nacional Corcovado El Tigre Cerro Mueller, 08°27'N 083°33'W - 08°30'N 083°38'W, 22 May 1988, *C. Kernan & P. Phillips 488* (MO); Along short-cut road to Golfito from Villa Briceño on Interamerican HWY., W side of Fila Gamba, ca. 6 km from Golfito airport, 08°41'24"N 083°12'00"W, 6 Mar 1985, *T. Croat & M. Grayum 59915* (MO); San Vito: Finca Las Cruces, 18 Aug 1977, *J. M. MacDougal 210* (DUKE); Valley of Laguna Chocuaco, ca. 9 km W of Rincón de Osa, 08°42'00"N 083°33'36"W, 8 Oct 1984, *M. Grayum 4071* (MO); Parque Nacional Corcovado Sirena, 08°27'36"N 083°34'48"W, 28 Jun 1991, *P. Delprete 5130* (LL, MO); Coto Brus, San Vito de Java, Estacion Biologica Las Cruces, 4 m uphill from Trail Marker Ft 67, 08°47'09"N 082°57'29"W, 11 March 1996, *A. Krings 271* (F, USJ); Golfito, Cantan de Golfito, R.F. Golfo Dulce, Peninsula de Osa, Finca de Luis Mata, Sendero Homo, 08°31'40"N 083°25'00"W, 8 Nov 1997, *A. Azofeifa 485* (MO); Puntarenas: Golfito, R. F. Golfo Dulce, Osa Peninsula, Río Tigre, Quebrada pizote, 08°31'20"N 083°24'50"W, 12 Jun 1998, *A. Azofeifa 792* (USJ); Cantón de Golfito, R. N.

V. S. Golfito, Valle de Coto Colorado, Golfito, 08°38'50"N 083°10'05"W, 20 Oct 1993, *J. F. Morales et al. 1901* (MO); R. N. V. S. Golfito, Bosques aledaños a la presa de captación de agua, 08°38'49"N 083°12'06"W, 28 Oct 2002, *J. Gómez-Laurito 13921* (USJ); P. N. Piedras Blancas, Serranías de Golfito, Parque Nacional Piedras Blancas, 08°41'06"N 083°13'41"W, 06 Jun 2000, *L. Acosta et al. 1521* (MO); R. F. Golfo Dulce, Península de Osa, Estación Agujas, Finca La Leiva de Delfin Vindas, 08°32'22"N 083°25'07"W, 18 Feb 1998, *M. Lobo 203* (MO); R. F. Golfo Dulce; Península de Osa, La Palma, trocha La Tarde, 2 Km arriba unión Quebrada La Tarde con Río Rincón, 08°34'48"N 083°30'00"W, 23 Apr 1993, *R. Aguilar 1748* (CR, MO); Refugio Nacional de Vida Silvestre Golfito; 6 km from Zona Franca near Golfito, along road to La Esquina, 08°38'45"N 083°10'44"W, 30 Jun 1994, *W. John Kress & C. M. Christy 94-4856* (US); Osa, No protegida, Cuenca Térraba-Sierpe, Sendero La Bananita, 08°49'57"N 083°16'26"W, 09 May 1998, *E. Fletes 624* (MO); carretera entre Los Mogos y Rinco, 08°43'12"N 083°28'48"W, 28 Sep 1990, *G. Herrera 4405* (CR, MO); Corcovado National Park, Primary 0 km to 1 km from Los Chiles, 08°30'36"N 083°30'36"W, 11 Jul 1977, *R. Liesner 3204* (MO); **San José:** Acosta, Cantón de Acosta, Fila Bustamante, Tiquires, 09°43'07"N 084°12'15"W, 4 Jun 1995, *J. F. Morales 4348* (MO). ECUADOR. **Los Ríos:** Quevedo, Parroquia Centinela-La Pirámide, Vía Santo Domingo de los Colorados-Quevedo entrando por Patricia Pilar Km. 41, 01°40'S 079°20'W, 25 Feb 1992, *C. Quelal & G. Tipaz 340* (MO); **Pichincha:** On border with Pichincha: Path following ridge line at El Centinela at crest of Montañas de Ila on road from Patricia Pilar to 24 de Mayo at km 12, Patricia Pilar is at km 45 on road from Sto. Domingo to Quevedo, 00°37'S 079°18'W, 27 Nov 1978, *Dodson 7292* (AAU, F, MO); Santo Domingo de Los Colorados, Vicinity of El Centinela, 0.2 km past Escuela Mixta El Centinela, along trail to left of road, exactly 13 km E from main Santo Domingo-Quevedo Highway in Patricia Pilar, 00°32'S 079°11'W, 14 Mar 1992, *T. B. Croat 73012* (MO). GUATEMALA. **Alta Verapaz:** Cubilquitz, Sep 1901, *H. von Tuerckheim 7877* (US); Cubilquitz [Cubilquitz]., 15°40'N 090°25'W, Sep 1901, *H. von Tuerckheim 7877* (GH, US); Chahal. Chahal airport, in high forest, 15°46'59"N 089°35'01"W, 18 Oct 1968, *E. Contreras 7956* (LL, MO); **Izabal:** Puerto Barrios. En la torre de GUATEL, Sierra del Mico, 15°40'18"N 088°41'33"W, 8 Sep 1988, *E. M. Martínez et al. 23587* (MEXU, MO). HONDURAS.

**Atlántida:** Tela: Lancetilla Valley, above Experiment Station, 15°43'N 087°27'W, 04 Nov 1988, *J. M. MacDougal, et al. 3145* (MO); *H. W. Pfeifer 2141* (US); *H. W. Pfeifer 2138* (US); Tela: Lancetilla Valley, Valley above Experiment Station, along stream and slopes above stream but below the dam, 15°43'00"N 087°27'30"W, 04 Nov 1988, *J. M. MacDougal et al. 3185* (MO); 15°42'40"N 087°27'28"W, 06 Dec 1927 - 20 March 1928, *P. C. Standley 52806* (F, US); 15°44'N 087°27'W, 3 Aug 1977, *T. B. Croat 42591* (EAP, MO); Campamento Quebrada Grande ca. 10 km south west of La Ceiba, at base of north slope of Pico Bonito, slope north east of camp, 15°42'N 086°51'W, 16 May 1993, *R. L. Liesner 26384* (MO); **Cortés:** Area along Lake Yojoa about 6 km north of Rancho Agua Azul, 11 Apr 1951, *L. O. Williams & A. Molina R. 17776* (EAP, US); Santa Cruz de Yojoa, Mountains E of Lake Yojoa, 14°55'50"N 088°13'19"W, 11 Apr 1951, *C. V. Morton 7760* (F, US); **Yoro:** Slopes above E part of San José in the Río Leán Valley, between Río Texíguat and Río Guán Guán, slopes of Cordillera de Nombre de Dios, 15°30'30"N 087°27'00"W, 6 Nov 1988, *J. M. MacDougal et al. 3274* (MEXU, MO, TEFH); cerro between Rio Guñan and Rio Texiguat S of San Jose in the Rio Lean Valley, 15°29'30"N 087°27'00"W, 06 Nov 1988, *J. M. MacDougal et al. 3208* (MEXU, MO, TEFH); MEXICO. **Chiapas:** Ixtacomitán, Steep slopes, along road 7 km SW of Ixtacomitan, 17°25'18"N 093°08'28"W, 6 Oct 1980, *D. E. Breedlove 45938* (CAS); **Oaxaca:** Chinantla, 17°30'00"N 096°00'00"W, Jul 1884, *Galeotti 3671* (BR, G, P); Along a footpath running generally eastward from Vistahermosa (a point on the highway at ca 1650 m elevation and ca 25 km above [ SW of ] Puente RioPapaloapan at Valle Nacional); trail descends in ca 17 km to ca 425 m at Rio Soyaloapan, then rises ca 3 km to settlement of Ladu., 21 Sept 1971 - 22 Sept 1971, *W.L. Graham 1405* (MICH); *W. L. Graham 1401* (MICH); Tuxtepec, Mpio. San Felipe Usila, alrededores del poblado Nueva Santa Flora, 11 km en línea recta al NNE de San Felipe 17°54'59"N 096°26'59"W, 26 Sep 1992, *G. Ibarra et al. 3678* (MO); **Veracruz:** 19°12'N 096°08'W, 1 Aug 1986, *G. Ibarra et al. 2979* (MO); San Andres Tuxtla: Estación Biológica Tropical "Los Tuxtlas", 18°34'48"N 095°03'36"W, 13-16 Jul 1978, *Gilbert, L. s.n.* (L, LL, TEX); Estacion de Biologia "Los Tuxtlas" near Catamaco, 18°36'N 095°09'W, 30 Jun 1995, *J. B. Fisher et al. 40* (MICH); Estacion de Biologia " Los Tuxtlas" near Catamaco, 18°36'N 095°09'W, 30 Jun 1995, *J. B. Fisher et al. 29* (MICH); U.N.A.M Estación Biológica de los Tuxtlas,

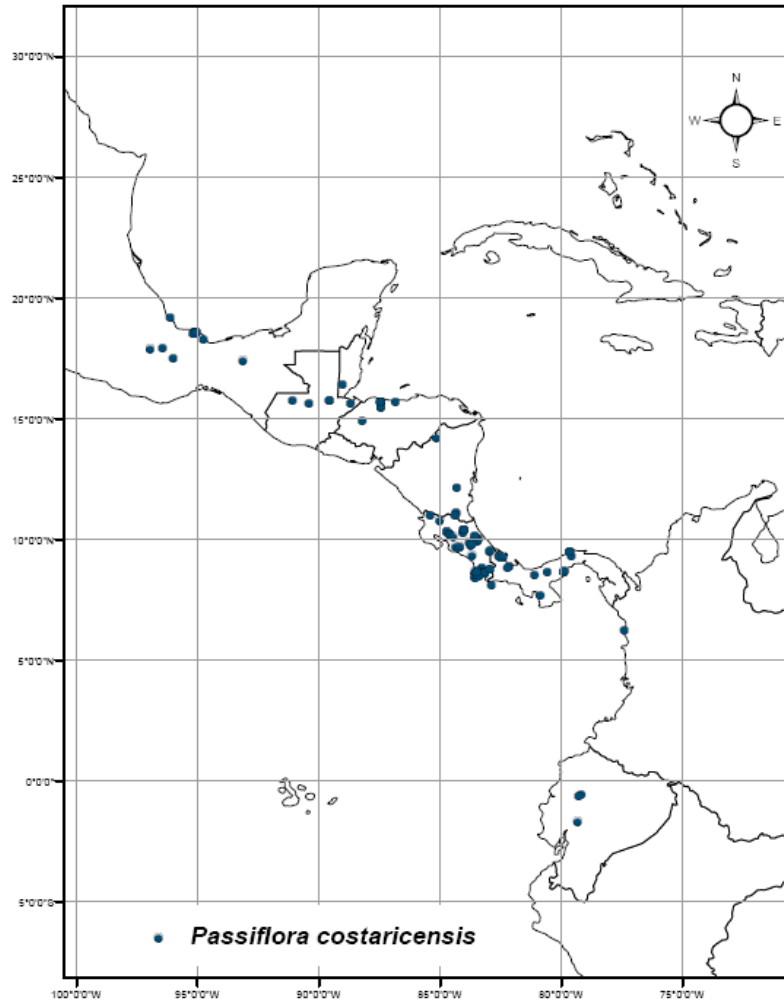
18°34'48"N 095°03'36"W, 15 Dec 1969, A. Lot 705 (F, MEXU); in saddle between Volca Santa Marta and Volca San Marti Pajapan, 7.5 km (by rd.) NE of Tatahuicapan on dirt rd. to Benigno Mendoza, Mun. Mecayapan, 18°18'00"N 094°45'36"W, 16 Jul 1982, M. Nee, et al. 25090 (MO); Loc. Camino a Balzapote, 1km al N de la Estacion de Biologia Tropical Los tuxtlas, Mpio. San Andres Tuxtla, 18°34'N 095°04'W - 18°36'N 095°09'W, 31 Jul 1986, S. Sinaca C. & L. M. Mota 878 (MO); Catemaco, Camino Bastona a Santa Martha, 26 Nov 1978, Gomez-Pompa et al. 5421 (F, XAL); Estación biológica Los Tuxtlas (UNAM), Near Catemaco, 1979, L. Albert de Escobar 1591 (LL).

NICARAGUA. **Jinotega:** Municipio de Wiwilí, Reserva de Bosawas, comunidad de Tuburus, entre Uruskirna y Río Bocay, 14°14'N 085°09'W, 7 Feb 2005, I. Coronado et al. 1080 (MO); **Río San Juan:** Municipio "El Castillo", vicinity of Comunidad Las Maravillas, 4 km al Sur, 11°07'15"N 084°21'04"W, 5 Nov 2004 - 28 Nov 2004, R. Guzmán 2256A (HULE, MO); Municipio El Castillo, comunidad Boca de Escalera, 4 km al norte de la Las Maravillas, 11°03'59"N 084°20'56"W, 28 Feb 2005, R. Guzmán 800A (HULE, MO). PANAMA. **Bocas del Toro:** Hillside above Almirante, 09°18'N 082°24'W, 28 Nov 1971, A. Gentry 2690 (MO); along road to Chiriquí Grande, 08°49'36"N 082°13'06"W, 26 Oct 1985, G. McPherson 7375 (MO); near Chiriqui Grande, on side-road ca. 10 road-miles from continental divide, 08°54'48"N 082°09'00"W, 28 Jun 1987, G. McPherson 11107 (MO); al N del campamento Changuinola 1 de Corriente Grande, Cerro Bracha, 09°20'42"N 082°34'24"W, 18 Jan 1980, M. D. Correa A et al. 3215 (MO, PMA); ca. 15 km S of the town of Changuinola, vicinity of Changuinola 1 dam site, along the ridge northeast of the campsite, 09°18'30"N 082°32'30"W, 13 Dec 1979, T. M. Antonio 3122 (MO); **Chiriquí:** Burica Peninsula, Quebrada Tuco; 9 mi. (15 km) south of Puerto Armuelles, 08°07'N 082°53'W, 21 Feb 1973, R. L. Liesner 168A (MO); **Coclé:** El Copé, Parque Nacional Omar Torrijos, 08°40'06"N 080°35'34"W, 13 Jun 2000, J. E. Aranda B. & A. Virgo H. 4452B (F, PMA, US); **Colón:** ca. 2-3 miles up the Río Guanche, 09°30'30"N 079°39'30"W, 19 Jan 1973, H. Kennedy & R. Foster 2202 (MO); Ridges and drainages NW of Mina Boquerón #1 (manganese mine), near the end of the road past Salamanca, Río Boquerón drainage, 09°20'N 079°35'W, 12 Dec 1981, S. Knapp & K. Sytsma 2427 (MO); Walking upstream from bridge over the Río Guanche, 09°30'N 079°39'W - 09°30'N 079°41'W, 19 Jan 1980,



*T. M. Antonio 3348* (MO); Portobelo, along Río Guanache, E of Colón, W of Portobelo, 09°30'N 079°40'W, 28 Feb 1986, *G. McPherson 8514* (MO); Forest edge, along stream running into Río Buenaventura, south of Portobello, 30 Dec 1970, *R. B. Foster 2061* (DUKE, PMA); **Herrera:** Azuero Peninsula, El Chepo, 11 Jun 1994, *A. Aiello & C. Snyder 1467* (PMA); Las Minas, 18 km W of Las Minas, S side of Cerro Alto Higo, N slope of Cerro Alto Higo locally el Montoso[originally reported from Veraguas province], 07°43'04"N 080°51'54"W - 07°43'24"N 080°51'47"W, 07 Aug 1978, *B. Hammel 4310* (MO, PMA); **Los Santos:** Collected in Chepo, "El Mentuoso", 10 Jul 1993, *A. Aiello & C. Snyder 1449* (PMA); **Panamá:** Cerro Campan, trail above FSU Field Station and area of field station, 08°43'N 079°54'W, 03 Jan 1973, *Kennedy et al. 2054* (MO); Sendero al Cerro de la Cruz, 08°40'N 079°55'W, 08 Aug 1996, *M. D. Correa et al. 11345* (PMA); Almirante, Bocas, 11 Nov 1962, *R. A. Sharp s.n.* (TTC); Capira, Cerro Campana, trocha desde el mirador a la cima, 08°41'N 079°55'W, 15 Dec. 1994, *C. Galdames et al. 1830* (PMA, SCZ); **Veraguas:** Forests above Primero Brazo del Río Santa María, N of Escuela Agricola Alto de Piedra, just W of Santa Fé, 08°34'N 081°07'W, 4 Jun 1982, *S. Knapp & R. Dressler 5380* (MO).

*Passiflora costaricensis* is closely related to *P. rubra* by its leaves and thick triangular stem. However, its 2-lobed leaves and relatively long and conspicuously tomentose indumentum distinguish it from *P. rubra* which has two lobed leaves that are broader than long, and have hirsute indumentum.



**Figure 20.** Distribution of *Passiflora costaricensis* Killip.



**Plate 7.** *Passiflora costaricensis* Killip. A. Plant. B. Fruits (*MacDougal 1118*).

C. Seed (*Quelal 340*).

Photos: **A.** Gilbert, L. E.; **B.** Atherton, N.; **C.** Boza, T. E.

8. **Passiflora escobariana** J.M.MacDougal. Novon 2: 365(1992)

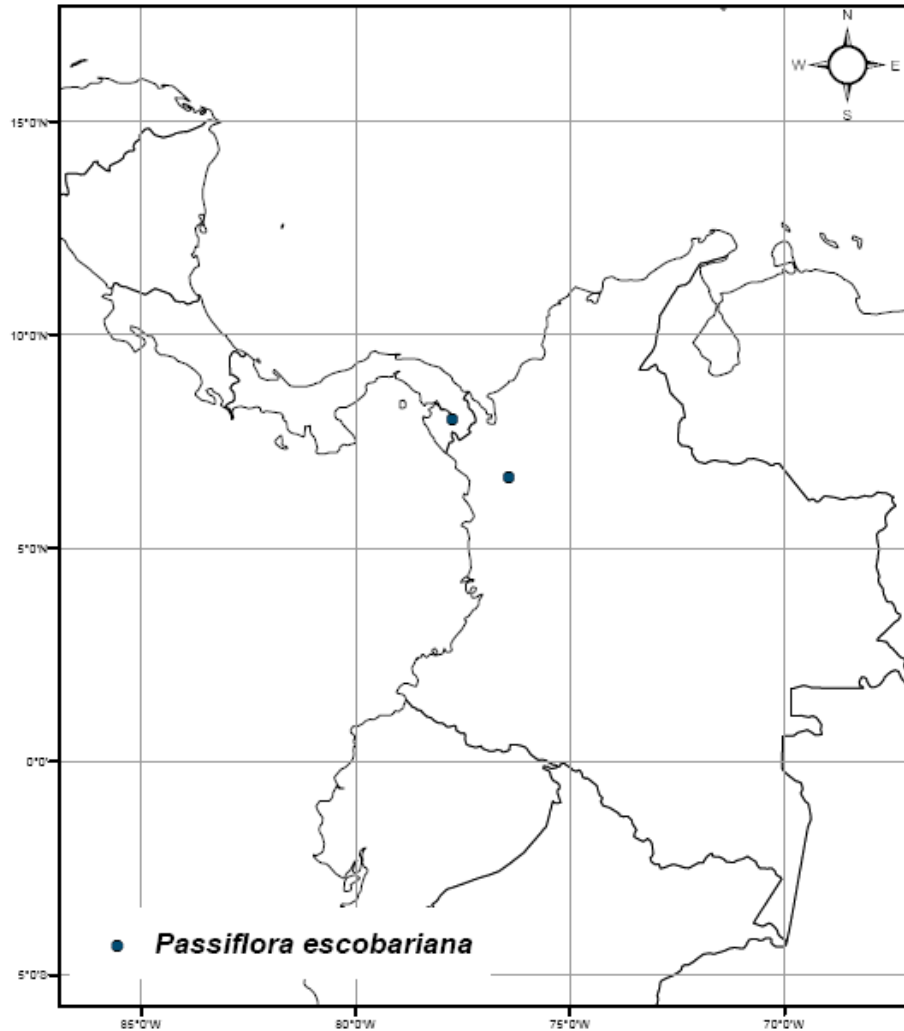
TYPE: Colombia: Antioquia: Mun. de Frontino: road between Nutibarra and La Blanquita, region of Murrí, ca. 24.5 km from Nutibarra, 06°40'N, 076°26'W. Bosque pluvial premontano. 1090 m, 8 Feb. 1991 [1989], *J. M. MacDougal, Restrepo, and Sylvia* 3823 (holotype, HUA not seen; isotypes, BM not seen, COL not seen, CR not seen, HUA not seen, MEDEL not seen, MO, TEX, US not seen).

Vine 5--10 m long, minutely puberulous throughout. Stems 3--5-angular, reddish. Stipules (3.6--4.4--5.2(--6.6) × (0.3--0.6--0.8(--1.0) mm, linear-triangular to falcate; petiole (16--29--36(--61) mm long; lamina (7.0--8.7--9.9(--11.1) × (7.3--7.7--8.5(--10.1) cm, broadly obovate, base cordate, densely hirsute abaxially with trichomes 0.1--0.3 mm long, sparsely hirtellous adaxially with trichomes 0.1--0.6 mm long, 2(--3)-lobed, the lateral lobes acute to acuminate (the central lobe, obtuse); the angle between the lateral veins (35--43--48(--58)°. Peduncles 14--18(--23) mm long, slender, solitary or usually in pairs, red; floral stipe 2.4--2.9 mm long; flowers 40--50 mm diam., cream to whitish (pale pink); sepals (23.0--24.1--26.4(--28.0) × (2.1--2.7--3.2(--4.3) mm, narrowly triangular, sparsely hirsutulous pubescent outside, apices acute, cream or whitish (base pale pink); petals (16.8--19.1--20.0(--22.8) × 1.3--1.9 mm, linear to narrowly triangular, apices acute, whitish to pale pink; corona filaments in 1 or 2 series, filaments of outer series 20--26, (12.0--12.4--14.4(--14.5) mm long, white in the lower half, pale yellow in the upper half; filaments of the inner series 2.0--2.3 mm long; operculum (1.3--1.6--1.7(--1.9) mm, light purple; limen erect; androgynophore 7.0--7.6(--19.7) mm long, light greenish; stamens with filaments (4.9--5.1--5.4(--6.4) mm long; anthers (3.6--4.6--4.7(--5.7) × (1.0--1.2--1.3(--1.4) mm; ovary 3.2--5.6 × 1.8--1.9 mm, ellipsoid to fusiform, densely puberulous; styles (4.0--4.4--4.8(--5.3) × 0.2--0.4(--0.6) mm; stigma (1.1--1.4--1.7 mm diam. Fruit 29--70 × 25--29 mm, fusiform, 6-keeled, red on ridges cream between; stipe ca. 4.3 mm long; seeds unknown.

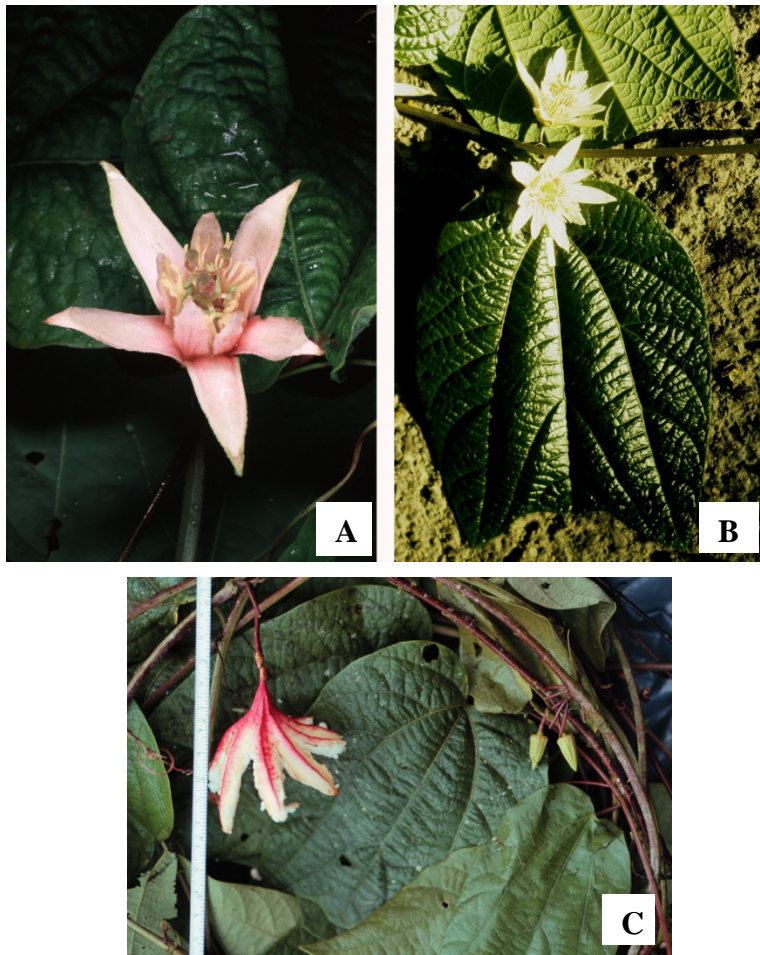
**Distribution and Ecology:** Northern Colombia and Panama in lowland and premontane tropical wet forest, from 100 to 1000 m. at the edge of primary forest.

**Phenology:** Flowers and fruits observed in February.

**Selected specimens examined: Cultivated: PANAMA. Darién:** Parque Nacional Darién, Estación Pirre, a orillas del Río Perresénico entre la Estación Pirre y la cascada, 08°00'N 077°45'W, 10 Oct 1990, *H. Herrera* 720 (MO).



**Figure 21.** Distribution of *Passiflora escobariana* J.M. MacDougal.



**Plate 8.** *Passiflora escobariana* J. M. MacDougal. A. Flower. B. Plant.

C. Dehisced fruit (*MacDougal 3823*).

Photos: **A.** Gilber, L. E.; **B, C.** MacDougal, J. M.

9. **Passiflora goniosperma** Killip. J. Wash. Acad. Sci. 17: 424(1927)

TYPE: Mexico: Oaxaca: Niña [Mina] de Dolores, Aug 1842, *Liebman 4076* (holotype, C).

Vine 3--4 m long, hirsutulous throughout. Stems sub 3-angular. Stipules (2.4--3.5--4.0(--6.0) × (0.3--0.5--0.7(--1.2) mm, linear, subfalcate, sparsely pubescent abaxially; petiole (2--7--12(--29) mm long; lamina (3.3--3.8--5.2(--6.9) × (2.7--3.3--4.7(--7.5) cm, very broadly obovate, rounded at the base, densely hirsute abaxially, trichomes ca. 0.3--0.9 mm long, densely hirsute adaxially, trichomes ca. 0.8--1.0 mm long; 2-lobed, the lateral lobes obtuse or slightly rounded, often mucronate at the end of the midnerve, the angle between the lateral veins (31--46--52(--70)°. Peduncles (4--14--17(--27) mm long, usually in pairs or occasionally solitary; floral stipe 1.0--3.1 mm long; flowers 16--17 mm diam., pale yellowish green; sepals (6.3--8.5--9.2(--17.6) × (1.6--2.0--2.3(--2.8) mm, triangular, sparsely hirsutulous pubescent outside, apex acute, pale yellowish green; petals (3.2--4.4--6.2(--12.1) × (0.9--1.3--1.6(--2.3) mm, narrowly elliptic, apices acute, white or white with pale pink nerves; corona filaments in 1 series, filaments 20, (1.7--3.3--4.0(--10.4) mm long, purplish red at base, light greenish yellow or light yellow at the slightly swollen apex; operculum (0.7--0.9--1.2(--1.9) mm, closely plicate, white or pale purple; androgynophore 2.7--4.4 mm long, green; stamens with filaments (1.6--2.4--4.1(--4.3) mm long; anthers (1.9--2.5--2.7(--4.2) × (0.6--1.1--1.3(--1.8) mm; ovary 1.5--4.1 × 0.7--1.3 mm, ellipsoid or ovoid, white puberulous; styles (1.0--2.1--2.3(--3.8) × (0.1--0.2--0.4 mm; stigma (0.4--0.5--0.7(--0.9) mm diam. Fruit (31--36--42(--67) × (7--8--9(--12) mm, narrowly ellipsoid or fusiform, slightly to sharply hexagonal, 6-keeled, light green or yellowish green at maturity or the ribs flushed with red; stipe 3.0--5.5 mm long; seeds (2.9--3.0--3.5(--3.7) × (1.7--1.9--2.1(--2.2) mm, obovoid and strongly compressed laterally with a narrow longitudinal ridge, and transverse grooves are reduced to a row of teeth along longitudinal ridge.

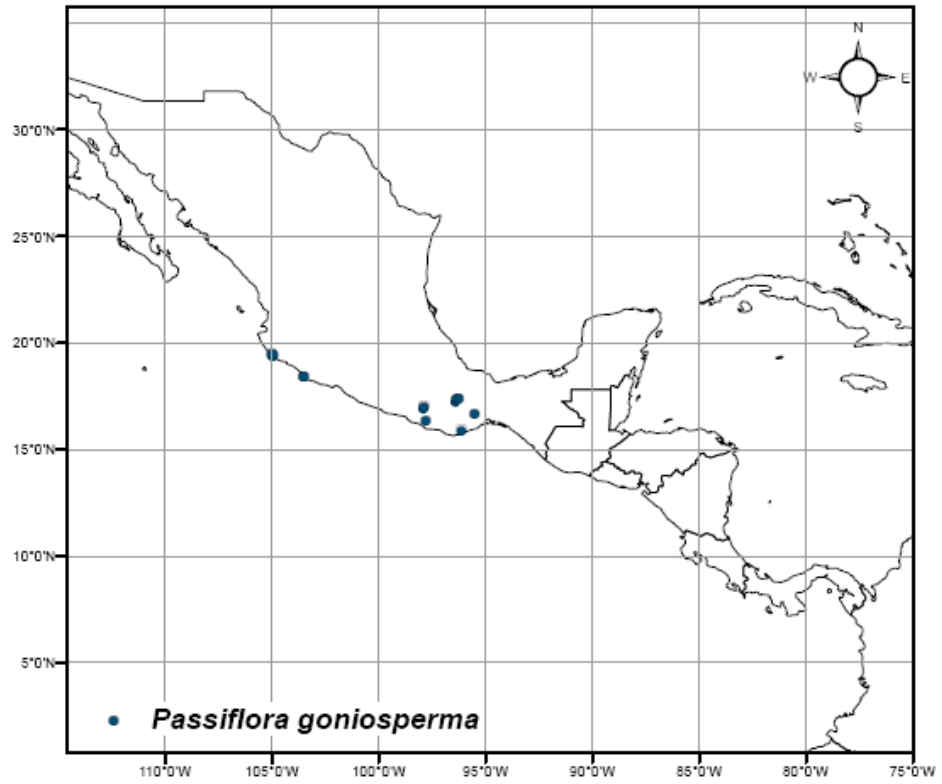
**Distribution and Ecology:** Southern Mexico in tropical deciduous forest from 30 to 1350 m altitude, mainly in secondary forest edges and roadsides.

**Phenology:** Flowers observed in April to August. Fruits observed in August and November.

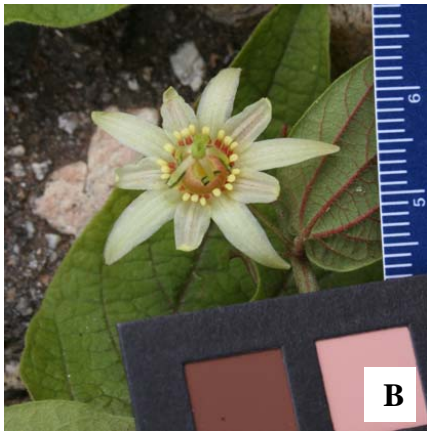
**Selected specimens examined:** MEXICO. **Jalisco:** Mun. La Huerta, Rancho Cuixmala, Cumbres 01, last bajada on rd. between Cumbres 01 and Station 45, just before arriving at 45, 19°26'24"N 104°58'48"W, 10 Jul 1991, *E. J. Lott & Phillips 3670* (MO); La Huerta, Rancho Cuixmala, Cumbres 01, hills and canyons behind Station, Km 45 of the Puerto Vallarta-Barra de Navidad Hwy., 19°26'N 104°59'W, 18 Aug 1991, *E. J. Lott et al. 3785* (CAS, LL, MO, RSA, XAL); Rancho Cuixmala, Cumbres 01, Arroyo Cajonas, ca. 3 km inland from the Puerto Vallarta, Barra de Navidad Hwy., 19°22'48"N 104°58'48"W, 19 Aug 1991, *E. J. Lott et al. 3799* (CAS, LL, MICH, MO, NY); Camino antiguo sur, camino a las cuencas 4 y 5, cerca de la brecha de la Cia. Luz & Fuerza, Estación de biología Chamela (UNAM), 19°30'N 105°03'W, 02 Aug 1983, *E. J. Lott 1741* (DUKE); Transecto de diversidad Subtransecto #4, camino antiguo Norte M 500, subiendo 25 m al pendiente E, perpendicular al Camino Antiguo, 09 Aug 1983, *E. J. Lott & J. A. Solís M. 1802* (MICH); **Michoacán:** Aguililla, 9 mi SE on Hwy 200 from La Placita toward Maruata, or 11 mi NW by road of El Faro, 18°26'29"N 103°32'09"W, 7 Nov 1979, *J. M. MacDougal 501* (DUKE, MICH); **Oaxaca:** cerca a Santiago Lachiquiri, 16°40'48"N 095°31'48"W, 09 Jun 1985, *Chazaro & Leach 3371* (WIS); Santa Gertrudis, Aug 1842, *F.M. Liebmann 4075* (C); Sierra San Pedro Nolasco, Talea, 17°22'N 096°15'W, 1843 - 1844, *Jurgensen 886* (C, MO); Ixtlan, Tepanguacales, Sierra de Ixtlán, 17°15'45"N 096°24'48"W, 1913 [1918?], *Conzatti s.n.* (GH, MO, US); Jamiltepec, al N del Pueblo Dos Caminos, brecha hacia San Agustin Nacional-Puerto Escondido, 16°22'43"N 097°48'15"W, 06 Apr 1982, *P. Tenorio L. & R. Torres C. 226* (DUKE).

The seeds of *P. goniosperma* differ from the other species of section *Xerogona*. They are strongly compressed laterally with a narrow longitudinal ridge and the transverse grooves which normally extend from margin to margin in the species of section *Xerogona* are reduced to a row of teeth along this longitudinal ridge. The dehiscent narrowly ellipsoid or fusiform 6-keeled fruit and the absence of bracts and foliar nectaries show the relationship of *P. goniosperma* to section *Xerogona*.





**Figure 22.** Distribution of *Passiflora goniosperma* Killip.



**Plate 9.** *Passiflora goniosperma* Killip. A. Plant (*Porter-Utley 473*). B. Flower (*Porter-Utley 473*). C. Fruits (*MacDougal 501*). D. Seed (*Lott 3799*).

Photos: **A, B.** Porter-Utley, K.; **C.** MacDougal, J. M.; **D.** Boza, T. E.

10. **Passiflora pusilla** J. M. MacDougal. Ann. Missouri Bot. Gard. 75(1): 392 -- 395 (1988)

TYPE: Nicaragua: Chontales: Hacienda Corpus, W of Juigalpa, ca. 100 m, 14 Jun 1984, *Stevens 22968* (holotype, MO; isotype, HMNH not seen).

Herbaceous vine 12--55(--90) cm long, hirsutellous throughout. Stems triangular or subtriangular. Stipules (0.2--2.0--2.7(--4.4) × (0.1--0.3--0.5(--1.1) mm, linear to linear triangular, sparsely hirsutellous abaxially; petiole (15--20--27(--47) mm long; lamina (1.2--2.1--2.7(--4.6) × (2.1--3.4--4.3(--6.6) cm, depressed obovate, cordate at the base, densely hirsutellous abaxially with trichomes 0.8--1.2 mm long, sparsely hirsutellous adaxially with trichomes 1.0--1.9 mm long, 3-lobed, the lateral lobes obtuse or rounded, the central lobe broadly obtuse; the angle between the lateral veins (79--85--98(--106)°. Peduncles (7--10--12(--25) mm long, solitary; floral stipe 0.8--2.5 mm long; flowers ca. 14.5 mm diam., pale yellowish green; sepals (4.8--6.0--6.7(--8.4) × (0.8--1.2--1.5(--2.2) mm, narrowly triangular, sparsely hirsutulous pubescent outside, apex acute, pale yellowish green; petals (3.2--3.4--4.0(--4.4) × (1.0--1.2--1.3(--1.9) mm, linear to narrowly elliptic, acute to round apex, pale yellowish green; corona filaments in 2 series, filaments of outer series 20, (2.1--3.8--4.3(--5.8) mm long, yellowish green or greenish, yellow toward the apex; filaments of the inner series (1.0--1.3--1.4(--1.7) mm long; operculum (0.5--0.8--0.9(--1.1) mm; androgynophore 3.0--5.0 mm long; stamens with filaments (1.2--1.5--1.7(--2.1) mm long; anthers (1.5--1.8--2.0(--2.3) × (0.5--0.7--0.8(--1.0) mm; ovary 1.4--2.3 × 0.5--1.0 mm, narrowly ellipsoid, densely puberulous or tomentose; styles (0.9--1.8--2.1(--2.8) × 0.1--0.2 mm; stigma 0.3--0.5 mm diam. Fruit (6--23--30(--45) × (3--4--5(--8) mm, narrowly fusiform, 6-keeled, sparsely puberulous, green; stipe 1.9--3.0 mm long; seeds (2.7--3.1--3.3(--3.4) × (1.5--1.7--1.8(--1.9) mm, transversely sulcate with 5--6 sulci, with 2 longitudinal rows of 5--6 teeth down each margin edge.

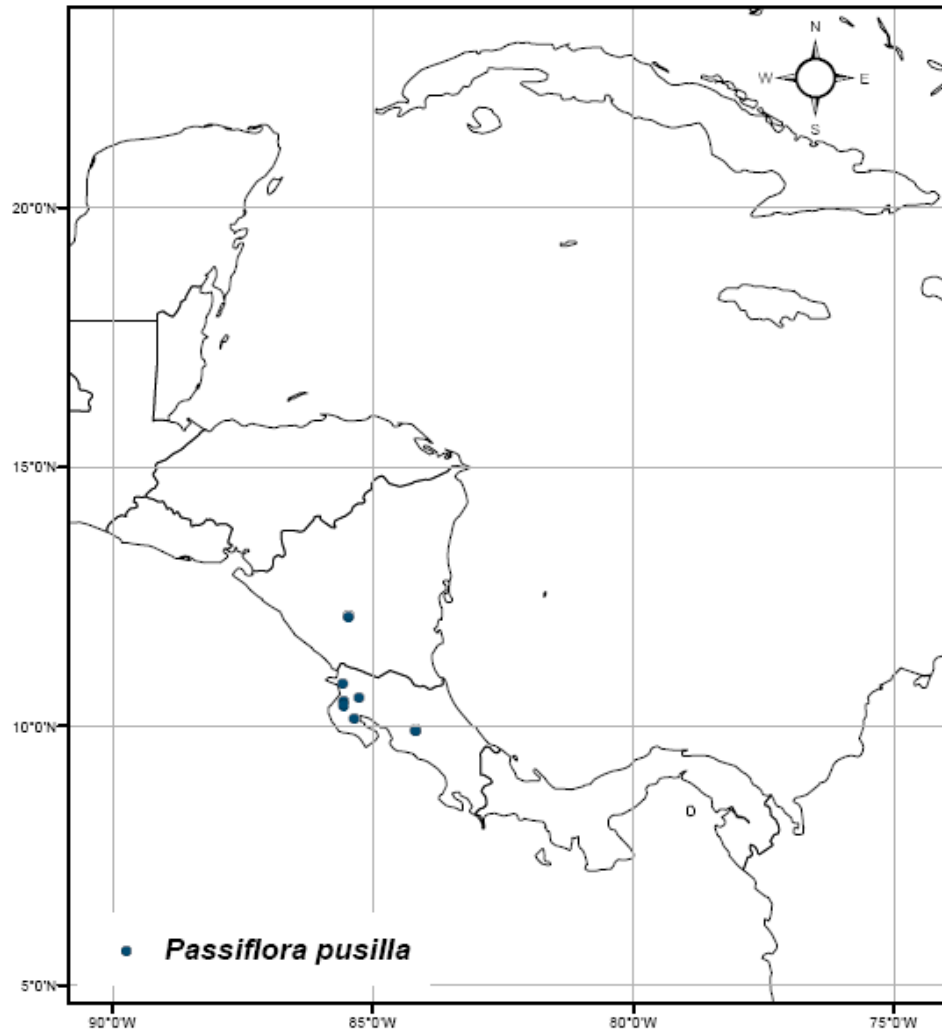
**Distribution and Ecology:** Southern Mexico, Nicaragua and Costa Rica. It is found in low tropical moist and dry forest associated with the distinctive soil type called “sonsocuite” in Nahuatl and characteristic of poorly drained, seasonally inundated forest

(MacDougal, 1988) below 300 m altitude. *P. pusilla* grows mainly in open areas, roadsides, and pastures edges.

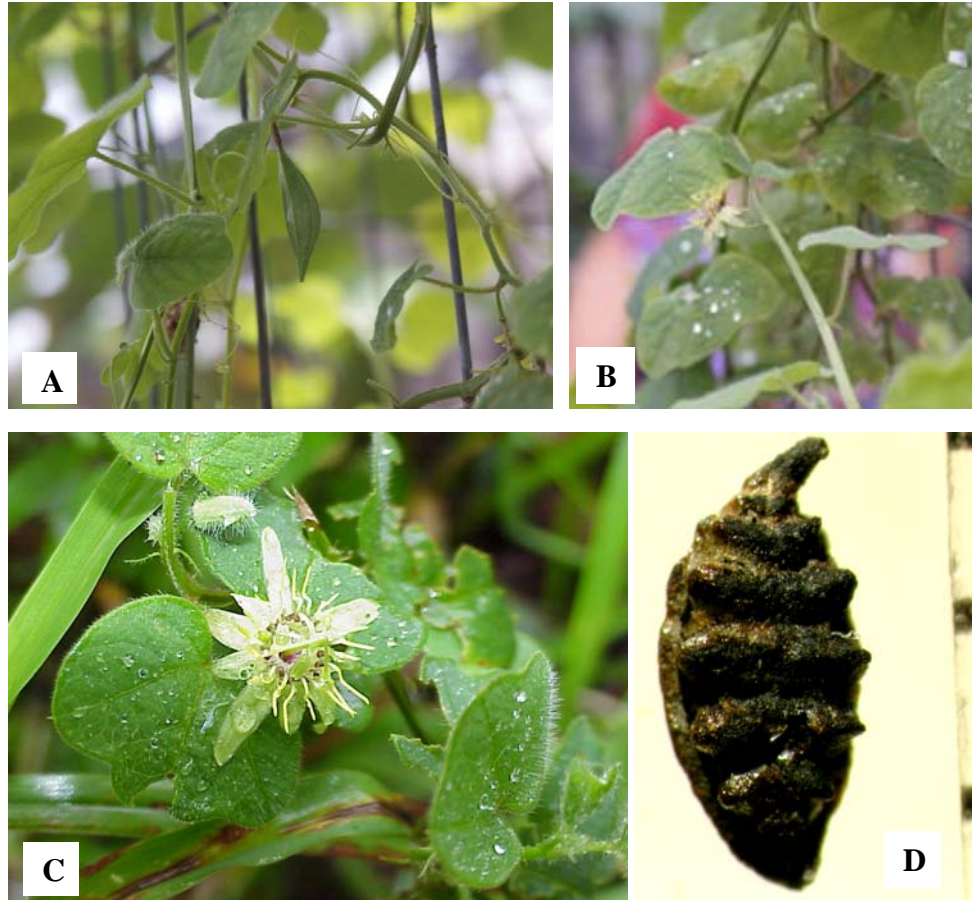
**Phenology:** Flowers observed from May to June and from August to December. Fruits from July to August and from November to December.

**Selected specimens examined:** COSTA RICA. **Guanacaste:** Santa Rosa National Park, 30 km W of Liberia, 10°49'48"N 085°34'48"W, 18 Aug 1984, *Janzen 12412* (MO); En bosquecillo sobre monticulo rocoso, en terreno plano 5 km al NE de Bagaces, 10°33'36"N 085°16'12"W, 22 Jul 1964, A. *Jiménez 2136* (CR, F, NY); Savannah, 10 km W of Liberia, west of Airport., 10°30'00"N 085°33'36"W, 25 Jun 1977, *R. L. Liesner & R. Lockwood 2516* (MO); 23 km SW of Liberia, 10°24'00"N 085°33'36"W, 23 Jul 1964, *Tessene 1424* (WIS); Nicoya, P.N. Barra Honda, Península de Nicoya, sendero hacia el mirador, 10°09'36"N 085°21'36"W, 22 Sep 1992, *M. Reyes et al. 15* (CR, MO); **San José:** Santa Ana, 09°55'48"N 084°10'48"W, 25 Nov 1963, A. *Jiménez 1319* (CR, F). MEXICO. **Oaxaca:** Open grazed areas about 2 km N of the village Ixhuatán, 23 Jul 1959, *R. Merrill 1983* (LL). NICARAGUA. **Chontales:** Hda. Corpus, W of Juigalpa, 12°07'N 085°28'W, 20 May 1984, *W. D. Stevens 22898* (HNMN, MO).

*Passiflora pusilla* and *P. tenella* are similar vegetatively, but they have different geographic distributions. *Passiflora pusilla* is distributed in Mexico, Nicaragua and Costa Rica while *P. tenella* is endemic to the tropical deciduous forest of Ecuador and Peru (Holm-Nielsen et al., 1988). The two species share a much reduced size. *Passiflora pusilla* is characterized by having densely pubescent leaves with obtuse or rounded apices to the lateral lobes and a tomentose ovary, while *P. tenella* has less pubescent leaves with acute apices of the lateral lobes and a nearly glabrous ovary.



**Figure 23.** Distribution of *Passiflora pusilla* J. M. MacDougal.



**Plate 10.** *Passiflora pusilla* J.M. MacDougal. A. Fruit. B. Plant. C. Flower.  
D. Seed (*MacDougal 6006*).

Photos: **A, B.** Szirland, P.; **C.** Boender, R.; **D.** Boza, T. E.

11. ***Passiflora quinquangularis*** S. Calderón ex J. M. MacDougal. Novon. 14(4): 454--456, f. 4 (2004)

TYPE: El Salvador: San Salvador: S of San Salvador, July 1922, *Calderón 851* (holotype, US; isotypes, GH not seen, US not seen).

Vine 2--4 m long, pubescent throughout. Stems 5-angular, sometimes glabrescent with age. Stipules (2.2--3.9--4.6(--8.4) × (0.3--0.5--0.7(--1.0) mm, linear to narrowly triangular, falcate, very sparsely pubescent abaxially; petiole (6--11--14(--24) mm long; lamina (4.3--6.6--8.2(--12.6) × (3.4--5.2--6.2(--10.4) cm, very broadly obovate, rounded to subcordate at the base, densely hirsute abaxially with trichomes 0.2--0.5 mm long, sparsely hirsute adaxially with trichomes 0.4--0.8 mm long, 2(--3)-lobed, the lateral lobes long, acuminate (the central lobe reduced and cusp-like); the angle between the lateral veins (30--41--50(--68)°. Peduncles (18--26--32(--42) mm long, slender, solitary, very rarely in pairs; floral stipe 2.2--4.8 mm long; flowers 43--45(--54) mm diam., greenish white to cream; sepals (12.2--19.6--21.5(--29.2) × (2.1--3.8--4.2(--6.4) mm, narrowly triangular, sparsely hirsutulous pubescent outside, apex acuminate, light yellow green and often flushed with red spots abaxially; petals (7.6--9.8--11.8(--14.8) × (1.1--1.9--2.4(--3.8) mm, linear to narrowly triangular; apex acuminate or obtuse, white or pale green yellow; corona filaments in 2 series, filaments of outer series 35--39, (5.9--12.3--14.0(--19.5) mm long, pure white with purple or purplish red base; filaments of the inner series (2.0--2.6--3.3(--4.2) mm long; operculum (0.9--1.6--1.9(--2.4) mm, light purple and white apex; limen pale red-purple; androgynophore 5.8--8.7 mm long, green; stamens with filaments ca. 3.5 mm long; anthers (3.1--3.6--3.8(--4.2) × (0.8--1.2--1.4(--1.8) mm; ovary 3.1--7.7 × 1.2--3.0 mm, narrowly ellipsoid or obovoid, densely minute puberulous; styles (1.9--3.2--4.0(--5.4) × 0.2--0.3(--0.4) mm; stigma (0.5--0.7--1.1(--1.6) mm diam. Fruit 38--49 × 15--16 mm, ellipsoid to broadly fusiform, 6-keeled, slightly puberulous, yellowish green; stipe 5.2--8.5 mm long; seeds (3.1--3.3--3.6(--3.9) × 1.6--1.7(--1.8) mm, transversely sulcate with 6--7(--8) sulci, smooth ridges.

**Local Names:** “*calzoncillo, bejuco calzoncillo, calzón de mujer blanco, bejuco calzón de hembra, ala murciélago*” (El Salvador).

**Distribution and Ecology:** Southern Mexico, Guatemala, El Salvador and Costa Rica in seasonally dry and deciduous forest from 580--1600 m altitude, mainly in thickets and brushy hillsides.

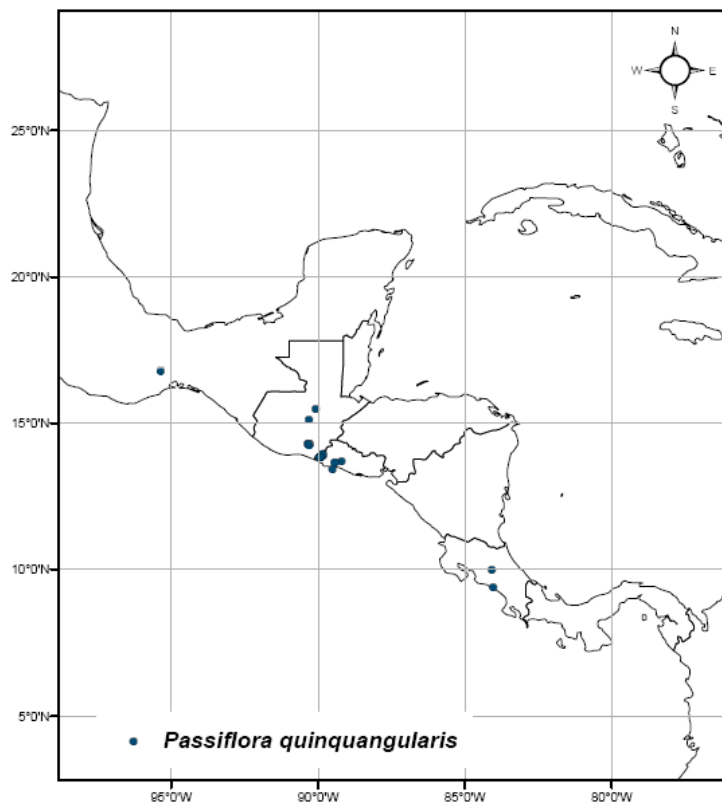
**Phenology:** Flowering and fruiting throughout the year.

**Selected specimens examined:** COSTA RICA. **Heredia:** Santo Domingo, Cuenca del Tárcoles, INBio parque, 09°58'20"N 084°05'40"W, 04 March 2002, *A. Rodriguez 7550* (USJ); EL SALVADOR. **Ahuachapán:** Las Pilitas, San Benito, P. N. El Imposible, 13°49'N 089°56'W, 12 Mar 1990, *A. Sermen 141(JBL 1056)* (LAGU, MO); 13°49'N 089°56'W, 23 May 1996, *E. A. Montalvo & R. Villacorta 6492* (MO); 13°49'N 089°57'W, 22 Sep 1989, *R. Villacorta & S. Martínez 429* (LAGU, MO); P. N. El Imposible, alrededores de la cancha, 13°49'N 089°56'W, 30 Jul 1991, *Villacorta et al. RV854* (B, LAGU, MO); Departamento Ahuachapán, San Benito al N del pasito, bajadero de los Escobos, 13°49'N 089°56'W, 19 Jun 1992, *E. A. Sandoval 450* (MO); 13°49'N 089°56'W, 27 Apr 1994, *F. Chinchilla s.n.* (B, LAGU, MO); Vicinity of Ahuachapán, 13°55'17"N 089°50'42"W, 09 Jan 1922 - 27 Jan 1922, *P. C. Standley 19733* (GH, MO, NY, US); P.N. El Imposible, Camino al mirador del mulo. Creciendo en un bosque primario, 13°49'N 089°56'W, 26 Sep 1991, *R. Morales et al. 1261 (JBL01261)* (CR, MO); Near Ataco [Concepcion de Ataco], 13°52'13"N 089°50'55"W, 19 Jan 1947, *Standley & E. Padilla 2644* (F); **La Libertad:** Finca El Paraíso, Jayaque, 13°40'N 089°26'W, 13 Jul 1976, *E. A. Montalvo 4711* (MO); Teotepeque, 13°25'N 089°31'W, 04 May 1996, *J. C. González 331* (LAGU, MO); Jayaque, 13°40'N 089°26'W, 9 Nov 1996, *J. González 409* (B, EAP, LAGU, MO); **San Salvador:** S of San Salvador, 13°43'N 089°12'W, Jul 1922, *S. Calderón 851* (GH, MO, US). GUATEMALA. **Alta Verapaz:** E of San Pedro Carchá, near Xicacao on road to Rubelcruz., 15°29'24"N 090°04'36"W, 07 July 2008, *J. M. MacDougal & E. Moroni 6221* (MO); **Baja Verapaz:** Salama, Puente Barranca, al W de Salamá, 15°06'47"N 090°18'41"W, 24 Jul 1988, *P. Tenorio et al. 14740* (MEXU, MO); **Santa Rosa:** Cuajiniquilapa, 14°16'38"N 090°17'55"W, Sep 1893, *E. T. Heyde & E. Lux 6142A* (GH, US); Santa Rosa: 6 mi. E of rd. to Cuilapa on CA-1, ca. 3 mi. W of

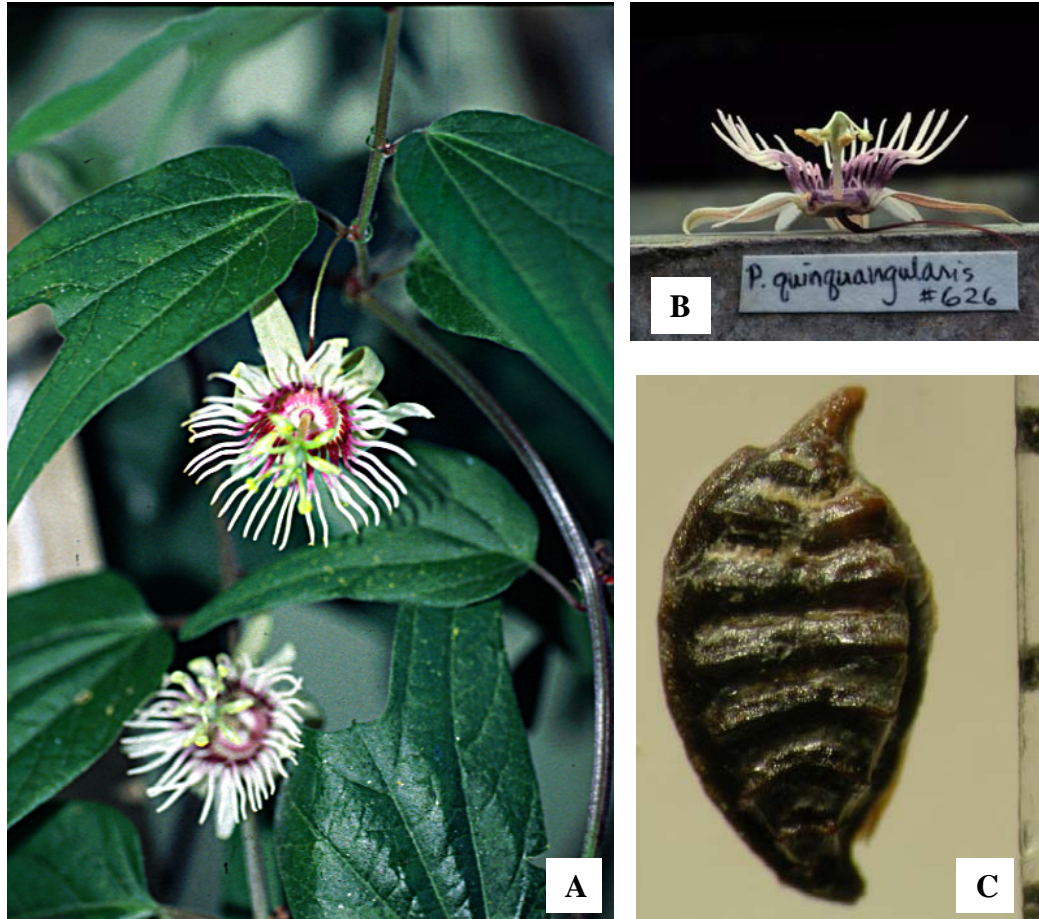


intersection of CA-1 with CA-8 to Valle Nuevo, Jul 1983, *J. M. MacDougal* 626 (CU, DUKE, F, MO, US); along road SE of Barberena, 14°18'23"N 090°21'30"W, 21 Nov 1940, *P. C. Standley* 77729 (F, US); near Cuilapilla, 14°16'47"N 090°19'20"W, 23 Nov 1940, *P. C. Standley* 78118 (F); MEXICO. **Oaxaca:** Juchitan, 1 km al S de Guevea de Humboldt, 16°47'24"N 095°21'36"W, 16 Mar 1983, *R. Torres et al.* 2521 (F, MEXU, MO, XAL).

The name of *P. quinquangularis* refers to the 5-angulate stems of this species. *Passiflora quinquangularis* can be confused with *P. rubra*, both having acute flower buds, although the buds of *P. quinquangularis* hang down on very slender peduncles, while those of *P. rubra* are more robust. Additionally, *P. rubra* does not occur in Mexico or Central America.



**Figure 24.** Distribution of *Passiflora quinquangularis* S. Calderón ex J. M. MacDougal.



**Plate 11.** *Passiflora quinquangularis* S. Calderón ex J.M. MacDougal. A. Plant (Rodríguez 7550). B. Flower (J.M. MacDougal 626). C. Seed (Calderon 851).  
Photos: **A.** Rodríguez, A.; **B.** MacDougal, J. M.; **C.** Boza, T.E.

12. *Passiflora rovirosae* Killip. J. Wash. Acad. Sci. 12:259(1922)

TYPE: Mexico: Tabasco: Atasta, 15 Jun 1890, *J. N. Rovirosa 813* (holotype, PH, US not seen).

Vine 4--15 m long, puberulous throughout. Stems 5-angular, striate. Stipules (3.7--5.0--5.8(--8.8) × (0.3--0.5--0.6(--1.2) mm, linear-triangular, falcate, very sparsely pubescent abaxially; petiole (12--21--26(--35) mm long; lamina (5.3--8.6--9.8(--12.9) × (4.2--6.0--6.7(--8.4)cm, narrowly obovate to obovate, deeply cordate at the base, densely tomentose abaxially with trichomes 0.2--0.4 mm long, glabrous to sparsely hirsute adaxially with trichomes 0.1--0.6 mm long, 2-lobed or truncate at apex, the lateral lobes acute; the angle between the lateral veins (15--27--33(--48)°. Plants often cauliflorous, the inflorescences being borne on short shoots thus appearing racemose. Peduncles (5--10--14(--25) mm long, in pairs (solitary); floral stipe 5.2--11.2 mm long; flowers (38--48--54(--64) mm diam., cream, or pale yellow; sepals (15.5--21.7--22.9(--30.4) × (3.5--4.9--5.6(--7.1) mm, narrowly triangular or narrowly elliptic, apex obtuse, light greenish yellow; petals (11.7--18.7--19.8(--24.4) × (2.8--3.5--4.1(--5.1) mm, linear to narrowly triangular apex obtuse, cream; corona filaments in 2 series, filaments of outer series 24--30, (7.5--12.8--13.9(--16.5) mm long, white or cream tinged with purplish red at the base; filaments of the inner series (2.1--2.9--3.4(--5.8) mm long; operculum (2.0--2.8--3.1(--4.5) mm, closely plicate; limen erect; androgynophore 6.1--10.2 mm long, green; stamens with filaments 4.6--4.9 mm long; anthers (3.5--4.7--5.0(--6.2) × (1.0--1.6--1.8(--2.5) mm; ovary 3.1--5.7 × 1.6--2.8 mm, narrowly ovoid, sharply 6-angled, densely puberulous; styles (3.8--5.2--5.7(--7.0) × 0.3--0.5 mm; stigma (1.1--1.6--1.9(--2.8) mm diam. Fruit (65--72--79(--90) × (18--24--25(--36) mm, ellipsoid to fusiform, 6-keeled, dark reddish or purplish red; stipe 5.4--18.9 mm long; seeds 3.6--3.8 × 2.0--2.3 mm, transversely sulcate with 7--9 sulci, slightly rugulose ridges.

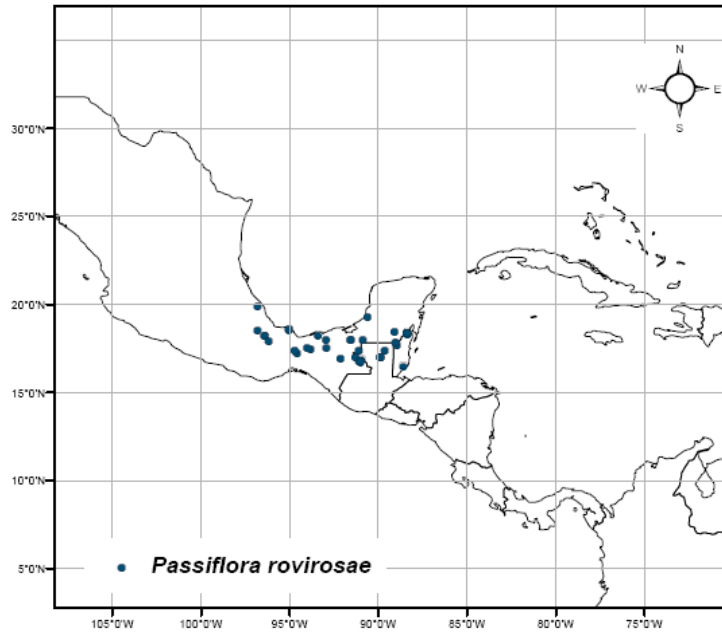
**Distribution and Ecology:** Southeastern Mexico, northeastern Guatemala and Belize in tropical wet forests from sea level to 350 m. altitude, mainly on the edges of primary forest.

**Phenology:** Flowers observed in Feb, March and from June to December. Fruits from June to August and from October to December.

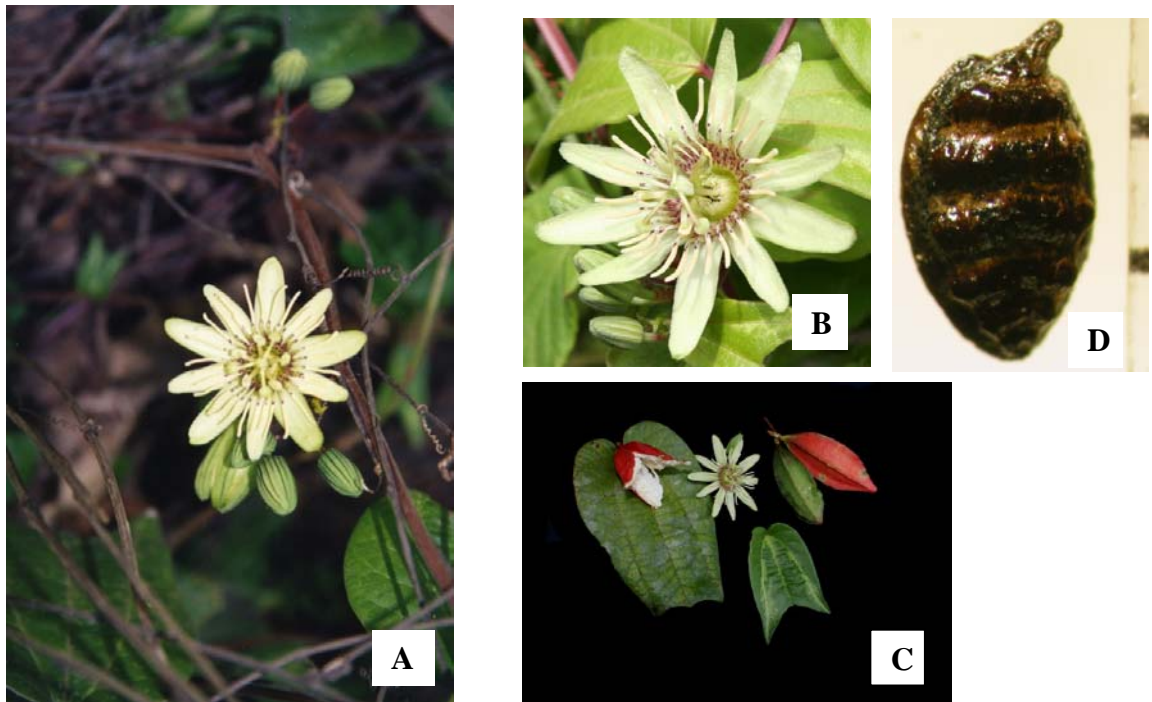
**Selected specimens examined:** BELIZE. **Corozal:** Cerros Maya Ruins, Lowry's Bight, coastal area, 18°20'58"N 088°21'51"W, 29 Mar 1981, *C. J. Crane 176* (LL); Corozal, 18°23'N 088°23'W, *P. H. Gentle 434* (US); *P. H. Gentle 608* (US); Paraiso, 18°24'40"N 088°23'23"W, Oct 1933, *P. H. Gentle 810* (A, MICH, MO, US, WIS); **Orange Walk:** Rio Bravo Conservation and Management Area, 17°49'N 089°02'W, 04 Nov 1991, *N. Brokaw & Schulze 195* (MO); **Toledo:** Las Sierritas, 20 km west of Big Creek Settlement, southern slopes of Cerrito, in the Las Sierritas hills, 16°31'38"N 088°36'05"W, 6 Dec 1997, *T. Hawkins 1678* (MO). GUATEMALA. **Petén:** Westufer des Lago Petén Itzá; Sekundar vegetation inm Nereich des ehemaligen Aserradero Covaco, das ist SW bei Nuevo San José bzw., 16°59'08"N 089°53'00"W - 16°59'16"N 089°54'00"W, 30 Aug 1993, *B. Wallnöfer & F. M. Tut-Tesucum 7171* (MO, W); Uaxactún, 17°23'37"N 089°38'01"W, 22 Apr 1931, *H. H. Bartlett 12691* (CAS, MICH, US); Westufer des Lago Petén Itzá; Sekundar-Vegetation im Breeich des Seeufers, das ist ca. 1.3 km NNE-NE Zentrum von San José, 16°59'26"N 089°53'00"W - 16°59'32"N 089°54'00"W, 27 - 30 Aug 1993, *B. Wallnöfer & F.M. Tut-Tesucum 6061* (MO, MSB, W). MEXICO. **Chiapas:** Ruins of Yaxchilán on the banks of the Rio Usumacinta, 16°53'24"N 090°57'36"W, 26 Feb 1973, *D. E. Breedlove 33970* (CAS, DS); el Ojo de Agua de San Javier a 24 km al NW de Crucero Corozal camino a Palenque, Mun. Ocozingo, 16°47'24"N 091°06'00"W, 09 Jan 1986, *E. Martinez 15775* (MEXU, MO); Ocosingo, en Nvo. Guerrero a 100 km al SE de Palenque camino a Boca Lacantum, 16°59'24"N 091°17'24"W, 27 Jun 1986, *E. M. Martínez 19080* (MO); Ruinas de Bonampak, 16°55'30"N 092°07'15"W, 26 Aug 1993, *N. Ramírez-Marcial et al. 411* (TEX); Ocozocoautla de Espinosa, cerro El Perico, SE 1.5 km, 17°01'00"N 093°46'45"W, 14 Sep 1990, *ALUSH 9534* (XAL); **Oaxaca:** Tuxtepec, Chiltepec, 17°57'N 096°11'W, Jul 1940-Feb 1941, *G. Martinez-Calderon 250* (A, GH); **Tabasco:** Límite norte de la Reserva Federal Sur del Plan Balancan-Tenosique, Municipio San pedro de Balancan, 12 March 1976, *J. G. García F. 157* (XAL); La Palma, Balancán, 18°00'36"N 091°33'43"W, 1 Jun 1939 - 6 Jun 1939, *E. Matuda 3283* (F, MEXU, MICH, US); Centro

Atasta, 18°00'00"N 092°57'00"W, 15 Jun 1980, *J. N. Rovirosa 813* (PH); Teapa, Puyacatengo, 17°31'45"N 092°55'48"W, 26 Sept 1983, *F. Ventura A. 20663* (GH); Tenosique, ca. 15 km arriba de La Palma por el río, a 5 km del Rancho Punta de Montaña del Sr. Angel Zubieta, 17°22'12"N 091°07'12"W, 4 Jul 1981, *C. P. Cowan & Ma. del R. Niño C. 3372* (CAS, MEXU); **Veracruz:** Las Cruces, 17°28'12"N 093°49'12"W, 13 Jul 1970, *Gomez-Pompa & Nevlin 1470* (F); on the Sierra Madre Oriental, 8-18 km NW of Campo Experimental de Hule, El Palmar, Zongolica, from El Rancho de Papaluatempa the sub-agencia Municipal de Xinicuila, 18°33'00"N 096°49'48"W, 26 Jun 1944, *J. Vera Santos 3186* (MICH); on Rd. to Montepio from Estación Biológica "Los Tuxtlas", 13--16 July 1978, *L. E. Gilbert s.n.* (TEX); Hidalgotitlán, brecha La Escuadra-Hnos, Cedillo, Hidalgotitlán, *B. Vázquez 1011* (MEXU, XAL); Las Choapas, Rancho "El Milagro", 5 km en línea recta al suroeste de la colonia Nueva Tabasquena, 17°31'48"N 094°01'44"W, 27 Aug 2002, *E. López 236* (XAL); Misantla, 19°55'34"N 096°49'50"W, Aug 1912, *C. A. Purpus 5881* (BM, F, GH, MO, UC, US); San Andrés Tuxtla, cerro Lazaro Cardenas, Estación de Biología Tropical Los Tuxtlas, 18°33'36"N 095°03'36"W - 18°36'00"N 095°09'00"W, 21 Jul 1986, *S. Sinaca C. 871* (MO).

*Passiflora rovirosae* can be distinguished from *P. costaricensis* by its short indumentum and 5-angular stem, *P. costaricensis* has 3-angular stem and long indumentum. Very rarely *P. rovirosae* can have a bract-like structure ca. 0.5 mm long associated with the flower (see *Matuda 3283*).



**Figure 25.** Distribution of *Passiflora rovirosae* Killip



**Plate 12.** *Passiflora rovirosae* Killip. A. Plant. B. Flower. C. Fruits. D. Seed (MacDougal 2013).

Photos: A. Ellison, D.; B. Boender, R.; C. Ibarra, L.; D. Boza, T. E.

13. *Passiflora rubra* L. Sp.Pl. 2:956(1753)

TYPE: Caribbean: Jamaica, Browne s. n. (lectotype, LINN).

*Granadilla rubra* (L.) Moech, Suppl. Meth. 15. 1802. – *Decaloba rubra* (L.) M. Roem., Fam. Nat. Syn. Monogr. 2:153. 1846.

Vine 2--3 m long, densely, softly pubescent, slightly woody. Stems 3--4-angular. Stipules (2.7--4.2--4.9(--7.1) × (0.2--0.4--0.6(--0.8) mm, linear to linear triangular, more or less falcate, very sparsely pubescent abaxially; petiole (9--17--23(--40) mm long; lamina (4.0--5.4--6.6(--9.5) × (4.7--7.0--8.5(--12.4) cm, very broadly obovate to depressed obovate, deeply cordate at the base, densely hirsute abaxially with trichomes 0.2--0.7 mm long, sparsely hirsute adaxially with trichomes 0.2--0.8 mm long, 2-lobed, the lateral lobes acuminate to acute; the angle between the lateral veins (48--66--75(--108)°. Peduncles (9--21--25(--62) mm long, slender, solitary or in pairs; floral stipe 1.0--3.5 mm long; flowers (27--35--38(--49) mm diam., greenish white or pale yellow-green; sepals (11.7--14.8--15.9(--24.5) × (2.2--3.2--3.8(--5.4) mm, narrowly triangular, sparsely hirsutulous pubescent outside, apex acuminate, pale green to white (base pink); petals (6.4--8.9--9.8(--11.8) × (1.0--1.8--2.1(--2.8) mm, linear to narrowly triangular, apices slightly praemorse, white; corona filaments in 1(2) series, filaments of outer series 24--32, (8.1--9.9--10.8(--17.2) mm long, white with pink base; filaments of the inner series (0.4--1.3--1.5(--2.3) mm long; operculum (1.0--1.3--1.5(--2.3) mm; limen erect; androgynophore 5.5--8.0 mm long, green; stamens with filaments (2.7--3.8--4.2(--4.8) mm long; anthers (2.8--3.4--3.6(--4.5) × (1.0--1.3--1.5(--2.0) mm; ovary 2.1--4.0 × 2.1--3.0 mm, ovoid to spherical, densely whitish hirsute; styles (1.7--3.0--3.5(--4.3) × 0.3--0.4(--0.7) mm; stigma (0.7--1.0--1.2(--1.6) mm diam. Fruit (11--29--32(--48) × (10--13--16(--32) mm, globose to ovoid, 6-ribbed, reddish brown, dark purplish red or red; stipe 0.8--2.9 mm long; seeds (2.7--3.1--3.4(--3.8) × (1.4--1.7--1.8(--2.2) mm, transversely sulcate with 6--7 sulci, smooth ridges, apex with a large projection oriented to one side.

**Local Names:** “*Pasionaria de cerca*” (Cuba); “*liane couleuvre*” (Haiti); “*bull hoof*.” “*Dutchman’s laudanum*” (Jamaica).

**Distribution and Ecology:** From the Bahamas, throughout Greater and Lesser Antilles to Trinidad and Tobago at 50 to 1300 m altitude.

**Phenology:** Flowers and fruits are observed throughout the year.

**Selected specimens examined:** CARIBBEAN. **Guadeloupe:** 11 Nov 1942, *A. Questel* 5012 (US); 10 May 1936, *H. Stehlé* 1851 (US); 25 Jul 1937, *H. Stehlé* 2704 (US); **Martinique:** along Chateaubelair, 15 - 25 Apr 1947, *C. V. Morton* 5108 (US); Near St Joseph, 22 May 1928, *G. Degelius s.n.* (GB); 11 Sep 1917, *H. Stehlé* 2255 (US); Antigua British West Indies, 30 May 1937, *H. E. Box* 811 (US); 17 Feb 1871, *P. W. Magnus* (HAM); **St. Croix:** Mt. Steward, 03 Jan 1906, *Ch. Raunkiaer s.n.* (C); St. Jan Hill, Coral Bay, 02 March 1906, *Ch. Raunkiaer s.n.* (C); **Bahama Archipelago:** New Providence, near Nassau, N.P., 25°05'N 077°21'W, 30 Jan 1903, *A. H. Curtiss* 56 (B, BM, BSC, E, F, G, GH, HBG, K, L, M, MIN, MO, NY, P, US); Lake Cunningham, 25°04'N 077°25'W, 08 Apr 1904, *C. F. Millspaugh* 2228 (F); corner of Village Road and Shirley St., Nassau, 15 Dec 1977, *D. S. Correll* 49304 (NY); on edge of coppice on south side of Lake Cunningham, 25°01'40"N 077°25'36"W, 7 Jun 1979, *D. S. Correll* 50722 (MO, NY); in undeveloped but disturbed land along Blue Hill Road where it intersects with Pametto Avenue, Nassau, 25°05'N 077°21'W, 28 March 1976, *D. S. Correll* 47009 (F, MO, NY); in Edward Strickland Poinciana Nursery on Fountain Road off John F. Kennedy Drive, Nassau, 25°05'N 077°21'W, 21 May 1980, *D. S. Correll* 51385 (DUKE, F, MO, NY); near Lake Curining [Cunningham]. 25°04'N 077°25'W, 07 Feb 1905, *E. G. Britton* 3301 (F, NY); Prospect Waterworks area, 25°04'N 077°23'W, 15 July 1960, *G. L. Webster et al.* 10491 (DUKE, GH); 04 Jul 1879, *L. J. K. Brace* 225 (NY); Abaco, 19 Dec 1904, *L. J. K. Brace* 1758 (NY); woodlands, 07 Apr 1904 - 08 Apr 1904, *N. L. Britton* 133 (NY); East of Clifton Point, 25°01'N 077°34'W, 15 March 1946, *O. Degener* 18962 (BH, CU, GH, MO, NY, PH); Post Charlotte, 25°05'N 077°23'W, 4 Jun 1909, *P. Wilson* 8377 (F, NY); **Grand Bahama:** Sunland Hammock, Freeport, 25 May 1975, *D. S. Correll, et al.* *H* 45433 (F, NY); North Andros, edge of coppice along Bail Road, just south of Gus Adderley Farm., 24°42'N 077°46'W, 8 Dec 1976, *D. S. Correll* 47860 (F, MO, NY) **Barbados:** near Providence, 17 Feb 1946, *O. Degener* 18931 (GH, NY); **Cuba:** Loma del Palmacito, Apr 1889, *B. Eggers* 5061 (B, K, US); Cuba Reservoir, 1-3-1928, *J. T.*



*Bijhouwer 416* (WAG); in Cuba Orientali, 20°52'00"N 076°54'00"W, 1856 - 1857, *C. Wright 201* (BR, G, K, MO, NY, PH, S); Oriente, Sierra de Niipe, Farallones de Cayo del Rey, 15 Apr 1940, *J. P. Carabia 3534* (NY); Provincia Oriente, La Carmita, Hongolosongo, Apr 1947, *B. Clemente 5264* (GH); Saqua el Grande, Apr 1881, *E. H. Day s.n.* (NY); Sierra Maestra, inter Rio Oro et Rio Bayamo in montibus, 06 May 1916, *E. L. Ekman 7263* (RSA, S); Trinidad Mts., Buenos Aires, Province of Santa Clara, 12 March 1930, *F.W. Hunnewell 11381* (GH); Yumury, 1849, *F. Rugel 351* (B, BM, L, MO, NA, NY, US); Province of Santa Clara, Las Vegas de Mataquá, Buenos Aires, 09 Apr 1928, *J. G. Jack 5971* (GH, K, US); Cape Maisi Oriente, 20°15'N 074°09'W, 19 March 1931, *L. H. Bailey 15150* (BH, US); Prov. Santa Clara, San Blas, 16 March 1929, *L. H. Bailey 12379* (BH); El Cuero, 18 - 19 March 1912, *N. L. Britton 12759* (NY); El Junco region above Siguanea, in San Juan Mts., 01 - 20 Jul 1950, *R. A. Howard 164* (GH); Las Villas, El Junco region above Siguanea, in San Juan Mts., 01 - 20 July 1950, *R. A. Howard et al. 162* (GH, K, MICH, MIN, NO, NY); Trinidad Mountains, tope de Collantes an vicinity, 29 Jun 1955, *R. E. Schultes 184* (GH); along trail in hills above Mina Carlota, Trinidad, 28 Jul 1948, *T. G. Yuncker 12442* (NY); Camaguey, La Gloria, 21°44'N 077°39'W, 31 Jan 1909, *J. A. Shafer 178* (F, NY); Province of Santa Clara, Colonia Limones, Ingenio Soledad, near Cienfuegos, 22°17'N 080°30'W, 26 Jan 1903, *C. G. Pringle 52* (GH); Province of Santa Clara, Cieneguita, 22°16'N 080°37'W, 07 March 1895, *R. Combs. 279* (B, F, GH, MO, NY); Holguin, foot of upper incline down arroyo to Piedra Gordas, Oriente, 20°35'53"N 075°38'14"W, 08 - 18 Jan 1910, *J. A. Shafer 3492* (B, F, NY, US); Sierra Nipe, near Woodfred, Oriente, 20°33'29"N 075°43'09"W, 7 Dec 1909, *J. A. Shafer 3054* (NY); La Habana, Loma del Gato, Sierra Maestra, 20°07'00"N 075°41'00"W, Aug 1944, *Bro. Alain 352* (GH); Puerto Boniato, Santiago, Jul 1949, *Bro. Alain & Bro. Clemente 825* (GH); Florida Blanca, Alto Songo, April 1947, *Bro. Clemente 5265* (GH); Jimbambay, Cayo Rey, 03 Sep 1942, *Bro. Clemente 2492* (GH); Prov. Oriente, Jimbambay, Nov 1943, *Bro. Clemente 3098* (GH); Vedado, Habana, Prov. Oriente, Miranda, Jul 1941, *F. Leon & Bro. Clemente 20421* (GH); Caval rock hills, Madruga, 22°54'51"N 081°51'22"W, 2 Apr 1903, *J. A. Shafer 465* (NY); Matanzas, Vicinity of Matanzas, Valley of the San Juan, 18 March 1903, *N. L. Britton et al. 415* (NY); Pinar del Rio, Reserva de Biosfera de Sierra del Rosario, 22°50'N 083°00'W, 30

Jun 1990, *A. Gentry & O. Valdes L. 71405* (MO); junto a Soroa, 4-5 km al norte sobre serpentinas, 22°50'N 083°02'W, 23 Jun 1988, *F. J. Fernández & R. Morales 10769* (CAS, MA, MO, NY); Lomas del Río, Rangel (Pinar del Río), 29 Oct 1925, *León 12535* (NY); Provincia de Pinar del Río, Sierra del Rosario, Loma del Salon, 22°45'00"N 083°10'00"W, 6 Jul 1993, *P. Acevedo & et al. 005642* (NY); Sancti Spiritus, Loma de Cantú, Banao Mountains (Sta. Clara), 21°51'N 079°36'W, 05 Aug 1915, *León 5329* (LS, NY); Trinidad Mountains, Santa Clara Siguaná, 21°56'N 080°00'W, 02 - 05 March 1910, *N. L. Britton & P. Wilson 4905* (NY); Santiago de Cuba, Oriente, Bayate, 20°22'N 075°56'W, 17 Jul 1914, *E. L. Ekman 1986* (F, S); **Dominican Republic:** Banks of Arroyo de Arriba, Sierra de Palo Quemado, Santiago, 30 Apr 1968, *A. H. Liogier 10998* (GH); Cabirma de La Loma, San Cristobal, 28 Nov 1970, *A. H. Liogier 17762* (NY); Santo Domingo, Jardín Botánico Nacional (Rafael M. Moscoso), 19 Nov 1976, *A. H. Liogier & P. Liogier 25992* (NY); a lo largo del río Comatillo, Bayaguana, 20 Apr 1974, *A. H. Liogier & P. Liogier 21592* (NY); Sierra de Yamasá, sección Pedregal, loma Los Jobs, 18°39'N 070°05'W, 28 Abril 2000, *B. Peguero et al. 1124* (MO); Jardín Botánico Nacional, en la parte norte de la reserva forestal, 18°29'N 069°57'W, 6 Junio 2000, *B. Peguero et al. 1577* (MO); San Juan, El Cereado, Juan Santiago, Hondo Valle, 02 Sep 1946, *R. A. Howard, & E. S. Howard 8779* (B, GH, NY, US); Vicinity of Sanchez, Samaná Peninsula, 29 Nov - 12 Dec 1920, *W. L. Abbott 178* (US); *W.L. Abbott 414* (US); Layou River Valley, stream northeast of Clarke Hall, Brookhill Estate (Manette Gutter), 22 Jul 1965, *E. Wallace 1938* (US); Barahona, Dec 1909, *H. von Türckheim 2680* (BR, E, G, GH, HBG, L, M, NY); prope Parubis, Jul 1910, *M. Fuertes 443* (B, BM, C, F, G, GH, HBG, K, L, M, MIN, MO, NY, S, US); forested hillslopes S.E. of Polo, 21 Aug 1946, *R. A. Howard & E. S. Howard 8426* (GH, NY, US); Enriquillo, 17°54'18"N 071°14'22"W, 15 - 17 Feb 1922, *W. L. Abbott 1751* (GH, US); Duarte, Loma Quita Espuela; subiendo por Los Bracitos hasta el firme, 19°21'N 070°09'W, 6 May 1993, *R. Bastardo et al. 4* (MO); Monte Redondo, east of Jovero, Seibo Province, 09 Nov 1923, *W.L. Abbott 2787* (G, US); *W. L. Abbott 2822* (US); *W. L. Abbott 2873* (US); 18°59'N 068°55'W, 23 Nov 1923, *W. L. Abbott 2835* (GH, US); La Vega, Los Calabazos across Yaque del Norte river, river trail, 19°04'33"N 070°43'00"W, 06 Nov. 2000, *Ososki 172* (NY); Dist. La Vega, 22.4 km S of Jarabocoa, between Constanza and Jarabocoa, 8 Dec 1986, *R. Carter*

5174 (MO); Pedernales, en las orillas de Río Mulito, 22 km desde el centro de Pedernales, en el camino a Los Arroyos y Duvergé, 18°09'N 071°45'W, 6 May 1982, *T. Zanoni et al.* 20405 (MO, NY); "carretera internacional" al norte de Pedernales y al sur de Los Arroyos, 18°13'48"N 071°45'00"W, 12 Jun 2006, *W. R. Greuter & R. R. Rodríguez* 26623 (B, G, MO, US); Loma Pan de Azucar, Samana Peninsula, 12 km NE of Samana, 19°16'N 069°16'W, 8 Apr 1985, *A. Gentry & T. Zanoni* 50590 (MO); Road Sánchez - Las Terrenas, ca. 3 km, 23 Apr 1985, *B. Ståhl & M. Lindstrom* 251 (GB); 5 km N of junction of highway Samana-Los Cacaos, on road to El Valle, 19°15'N 069°20'W, 29 May 1980, *M. Mejía & T. Zanoni* 6592 (MO); Cañon, Las Cañitas, 19°17'N 069°43'W, 23 Oct 1909, *N. Taylor* 42 (NY); 3.5 Km este del pueblo de Las Terrenas y 4.5 Km Sur de la Playa, en el interior de la Hacienda Nydia (Propiedad de la familia Paiewonsky), 19°18'00"N 069°30'30"W, 04 Nov 1981, *T. Zanoni & M. Mejía* 17788 (NY); San Cristobal en el Pueblo rural de Mano Matuey Arriba, 12.9 km. Norte de Cambita El Cruce, 18°29'00"N 070°15'00"W, 19 Feb 1982, *M. Mejía et al.* 19157 (NY); Arroyo El Molino, at populated village of El Molino, at NW base of Loma Siete Picos, due N of Villa Altagracia, 18°44'30"N 070°11'00"W, 01 Dec 1980, *M. Mejía & T. Zanoni* 9518 (NY); Santiago, El Choco, Puerto Plata, Feb 1971, *F. V. Votava & Alain s.n.* (MO, NY); **Haiti**: Mission, Fonds Varettes, 18°23'27"N 071°52'11"W, 17 Apr 1920 - 4 May 1920, *E. C. Leonard* 3668 (NY, PH, US); Vicinity of St. Michel de l'Atalaye, Department du Nord, 23 Nov 1925, *E.C. Leonard* 7394 (US); Vicinity of Marmelade, Department du Nord, 1925, *E. C. Leonard* 8319 (NY, US); 19°31'N 072°21'W, 24 Aug. 1903, *G. V. Nash* 746 (NY); Vicinity of Furcy, 18°24'43"N 072°18'20"W, 26 May 1920 - 15 Jun 1920, *E. C. Leonard* 4767 (BM, F, GH, NY, US); Vicinity of Mission Varettes, 17 Apr - 04 May 1920, *E. C. Leonard* 3685 (US); Vicinity of Jean Rabel, 02 March 1929, *E. C. Leonard & G. M. Leonard* 13625 (US); La Vallee, Tortue Island, 20°02'N 072°52'W, 28 Dec 1928 - 09 Jan 1929, *E. C. Leonard & G. M. Leonard* 11367 (GH, US); Vicinity of St. Louis de Nord, ridge southeast of town, 19°54'N 072°43'W, 30 March 1929 - 7 Apr 1929, *E. C. Leonard & G. M. Leonard* 14120 (MO, US); Vicinity of Bombardopolis, 21 Feb 1929, *E. C. Leonard & G. M. Leonard* 13376 (US); Vicinity of La Vallee, Tortue Island, 20°02'N 073°52'W, 28 Dec 1928 - 9 Jan. 1929, *E. C. Leonard & G. M. Leonard* 11549 (NY, US); Massif de la Selle, Port-au-Prince, Morne Malanga, 23 Jan 1928, *E. L.*

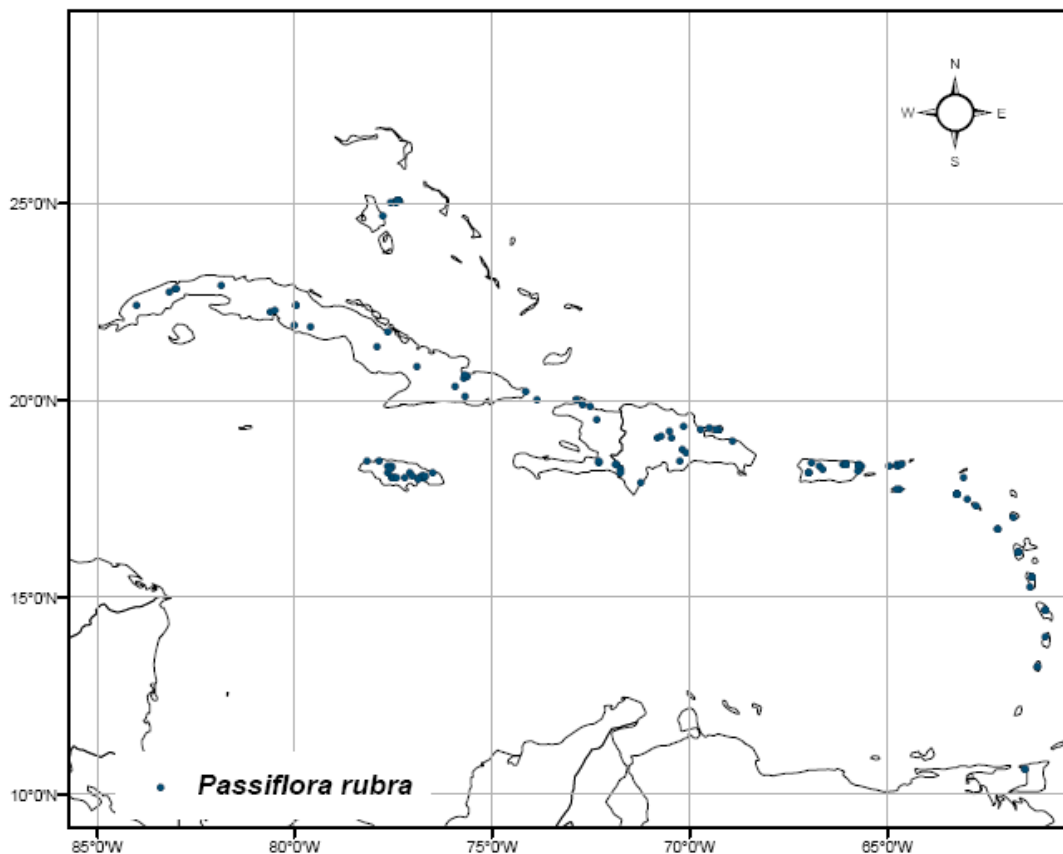
*Ekman 9520* (US); Borgne, Rocky hillside, 14 Aug 1903, *G. V. Nash 418* (NY);  
 19°50'21"N 072°31'29"W, 7 Aug 1903, *G. V. Nash 562* (NY); San Francisco, 14 March  
 1925, *G. S. Miller 287* (US); *Jaeger 138* (B, G, H, US, W); Fondos Verrettes,  
 18°23'29"N 071°51'25"W, 26 March 1937, *L. H. Bailey 183* (BH, US); **Jamaica:** Near  
 St. Margarets Bay, 18°11'N 076°30'W, 20 Jul 1897, *A. Fredholm 3272* (NY, US); Lucea,  
 18°27'N 078°10'W, 1 May 91, *A. S. Hitchcock s.n.* (MO); Porus, 18°02'N 077°25'W, Jan  
 1892, *F. E. Lloyd 1073* (F, MO); juxta Gordontown., 1882, *J. Ball s.n.* (E); Cockpit  
 Country, Banks, Balaclava, 18°10'N 077°39'W, 13 Sep 1906 - 18 Sep 1906, *N. L. Britton*  
*418* (F, NY, US); Roadside mall, Noodstock, 13 Sep 1907 - 22 Sep 1907, *N. L. Britton*  
*1568* (NY); Gordontown to Cinchona, 18°02'00"N 076°43'00"W - 18°04'15"N  
 076°40'27"W, 01 Sep 1906, *N. L. Britton 50* (NY); Kingston, 1897, *O. Hansen s.n.* (C);  
 near Troy, 18°15'28"N 077°35'55"W, 03 Apr 1917, *J. R. Perkins 1434* (B, GH); Between  
 Marshalls Pen & Somerset, Manchester, 16 Apr 1959, *E. T. Robertson 5469* (X);  
 Buschwald westlich Clark's Town Trelawny, 02 Sep 1985, *U. Hecker 2206* (B); Orange  
 River valley near Montego Bay, 18°27'N 077°52'W, 29 - 30 March 1920, *W. R. Maxon*  
*1676* (GH, NY, US); Hermitage Dam and vicinity, 18°04'58"N 076°46'10"W, 03 Jun  
 1926, *W. R. Maxon 8800* (GH, RSA, US); Ferry River, on the Spanish Town Road,  
 18°01'N 076°52'W, 24 May 1904, *W. R. Maxon 2171* (G, NY, US); Rio Cobre, below  
 Bog Walk, 18°06'N 077°01'W, 3 Aug 1939, *W. R. Philipson 598* (MO); Vicinity of  
 Ewarton, 18°08'57"N 077°05'22"W, 23 - 29 Feb 1920, *W. R. Maxon & E. P. Killip 390*  
 (GH); Clarendon, 2 miles SE of crooked river. 10 Jun 1952, *G. R. Proctor 6750* (LL,  
 NY); North slopes of Round Hill, 15 Jun 1959, *G. L. Webster & K. I. Miller 8259* (G);  
 Hanover, Hopewell, 26 Jun 1975, *L. L. Clarkson & W. J. Kress 75-122* (DUKE);  
 Manchester. Mandeville, 18°02'N 007°30'W, 26 Apr 1910 - 30 Apr 1910, *Crawford 738*  
 (PH); 14 Nov 1962, *G. R. Proctor 22916* (NY); Cockpit Country (limestone), ca. 2 mi.  
 SW of Craig Head, 20 Jun 1959, *G. L. Webster et al. 8419* (G); Mandeville to Lincoln,  
 18°02'N 077°13'W - 18°02'N 077°34'W, 03 Sep 1908 - 07 Sep 1908, *N. L. Britton 3134*  
 (NY); Marshall's Pen, 2.25 mi. due NW of Mandeville, 18°04'00"N 077°32'53"W, 16  
 Mar 1983, *P. K. Bretting J-126* (MO, NY); St. Andrew, 09 Oct 1961, *C. D. Adams 9771*  
 (DUKE); Ferry Pen, Ferry Hill, 10 Jun 1959, *G. L. Webster et al. 8075* (G); on northern  
 slope of Long Mountain, 26 Oct 1957, *T. G. Yuncker 17197* (F, G, MICH, NY); St. Ann

near Luidas Vale, 14 March 1936, *F. W. Hunnewell 14347* (NY); near Hopewell, 02 Feb 1938, *F. W. Hunnewell 15319* (GH); Reynolds Mine near Lydford P.O., 21 Sep 1954, *R. A. Howard & G. R. Proctor 14053* (GH); St. Elizabeth, March 1926, *I. Maxwell s.n.* (NY); St. Thomas, 1824, *N. Bang s.n.* (C); **Leeward Islands:** Antigua, Hill above Blubler Valley, 17°03'N 061°48'W, 04 - 16 Feb 1913, *J. N. Rose et al. 3459* (B, GH, NY, US); Walling's area, 11 - 28 Jun 1950, *R. A. Howard 11988* (A, GH); Dominica, Rosean Valley, 15°30'N 061°20'W, 1903, *E. Lloyd 553* (NY); St. Paul Parish, Sylvania, 29 Oct 1964, *D. H. Nicolson 1870* (B, CAS, US); Guadeloupe, Crete de Village, debut de sentier des cretes, 23 Apr 1974, *C. Sastre & F. Sastre 2644* (GH); Montserrat Slopes of the Centre Hills, above Salem, 26 Jan 1959, *G. R. Proctor 18885* (A, GH); St. Kitts, St. Kitts, 17°20'N 062°45'W, 08 Sep - 05 Oct 1901, *N. L. Britton & J. F. Cowell 103* (NY); **Netherland Antilles:** Saba Mountain, 25 Aug 1906, *I. Boldingh 2217B* (U); Rosalie Valley-Morne Jaune Road, 14 March 1993, *S. R. Hill 24781* (NY); Trailhead of Sandy Cruz Trail from Upper Hell's Gate, 17°38'23"N 063°14'01"W, 06 Aug 2006, *S. A. Mori et al. 25953* (NY); **Puerto Rico:** on the Adjuntans road five miles from Ponce, 24 Dec 1902, *A. A. Heller s.n.* (F, US); along the Bucana River east of Ponce, 11 Dec 1902, *A. A. Heller s.n.* 11 Dec 1902 (NY); on roadside, SW of Fajardo, 16 Jan 1979, *A. H. Liogier et al. 28034* (NY); Rio Piedras, 17°50'26"N 096°45'01"W, 16 Jun 1930, *F. Arsene s.n.* Dec 1913 (B, NY); Mpio. de Yauco, N of Yauco norte 128 at ca. km 5, 02 Nov 1986, *C. M. Taylor 7301* (DUKE); Municipio de Penueles, N of Penueles along rte 387 at the end of the pavement, ca 2 miles from its intersection with rte 386, 22 Feb 1986, *C. M. Taylor 6841* (DUKE); Municipio de Patillas, along rte 184 ca. 0.6-0.8 miles N of the bridge over the Rio Grande, 02 Nov 1985, *C. M. Taylor 6410* (DUKE); Municipio de Cayey, S of Cayey along rte 15, at Km 14.7, 19 Nov 1985, *C. M. Taylor 6489* (DUKE); Municipio Quebradillas route 437 ca. 1-2 km S of route 113, 18°25'N 066°55'W, 24 Jun 1991, *C. M. Taylor & R. E. Gereau 10486* (MO); Naguabo, Rio Blanco, Caribbean National Forest, along closed portion of Rt 191 from gate at Rio Caboy to landslide area, 18°12'49"N 065°44'07"W, 23 Sep 1991, *F. Axelrod & P. Chavez 2959* (MO, NY, UPRRP); Juana Diaz, Collores, dirt road from end of Rt. 512, 04 Oct 1992, *F. S. Axelrod & I. Sastre de Jesús 5246* (US); Luquillo, Sabana, Caribbean National Forest, along abandoned road to Río del Cristal, 18°22'28"N 065°43'01"W, 01 March 1993, *F. S. Axelrod 5812* (MO, NY,

UPRRP, US); Rio Piedras, Guaynabo, 18°21'34"N 066°06'41"W, 06 May 1993, *F. S. Axelrod & O. Silva 6178* (MO, UPRRP); Toro Negro Forest Reserve, N slope of Monte Jajuya, 17 Jan 1992, *F. S. Axelrod et al. 3773* (NY, US); El Río, 14 Nov 1899, *G. P. Goll et al. 303* (US); Caguas, 14 Nov 1899, *G. P. Goll et al. 374* (US); Candelaria, 14 Nov 1899, *G. P. Goll et al. 250* (US); Cerro Ventana, 20 Feb 1914 - 21 Feb 1914, *J. A. Shafer 2987* (NY, US); Fajardo, 18°19'32"N 065°39'08"W, 2 March 1913 - 6 March 1913, *N. L. Britton & J. A. Shafer 1698* (NY, US); near Utuado, 18°14'50"N 066°37'28"W, 15 March 1906, *N. L. Britton & J. F. Cowell 824* (NY, US); Mun. Arecibo, Rio Abajo Forest Reserve, area surrounding the Parrot project aviary (Old Campamento Radley), 18°19'58"N 066°43'04"W, 20 Feb 1997, *P. Acevedo & B. Angell 9375* (US); Sierra de Luquillo in monte Jimenes, 18°19'N 065°43'W, Jun 1885, *P. Sintenis 1724* (B, MO); Maricao in fruticetis, 18°10'58"N 066°58'49"W, Nov 1884, *P. Sintenis 341* (B, CORD, G, GH, GOET, K, M, MICH, P, S, US); Yauco, 18°02'14"N 066°51'01"W, 27 Feb 1880, *P. A. Garber s.n.* (GH); Sabana road, N. side of Luquillo Mts, 05 Oct 1967, *R. J. Wagner 1245* (GH); Luquillo Mts, 15 Nov 1968, *R. J. Wagner 1756* (GH); Río Piedras, 18°23'58"N 066°03'01"W, 05 Oct 1913, *J. A. Stevenson 153* (MIN, US); **Trinidad & Tobago:** 2 miles Blanchuesse Rd., 12 March 1960, *H. Fleming s.n.* (NY); Port of Spain, 10°39'N 061°31'W, Apr 1874, *Kuntze 786* (NY); Trinidad, Morne Cocoa Road, 09 Apr 1920, *N. L. Britton & T. E. Hazen 1605* (GH, K, NY, US); *Sieber 241* (B, BM, E, G, L, P, W); *Sieber s.n.* (MO); Botanic Gardens, Look-out hill, 10°39'N 061°31'W, 10 Jul 1928, *W. E. Broadway 6995* (F, K, MO, PH); **Virgin Islands:** St. John. Francis Bay area, 18°21'52"N 064°44'34"W, 6 Jun 1985, *Acevedo et al. 905* (NY, VIST); Reef Bay Trail from Centerline, Rd to Genti Bay, 16 Jun 1984, *G. T. Prance et al. 29292* (NY); Maho Bay, Intersection of Centerline Road and Bondaux Mountain Road, 20 Jan 1988, *P. Acevedo R. 2438* (NY); Coral Bay Quarter; Bordeaux, 100 m from Center Line Road (Road 10). Along dirt road, 18°20'14"N 064°43'17"W, 27 Jan 1991, *P. Acevedo & B. Angell 4052* (MO, NY, US); St. Thomas. 18°21'20"N 064°56'49"W, Feb 1887, *B. Eggers 962* (B, BR, G, GH, M, P, US, WU); St. Peter, 17°44'38"N 064°41'35"W, 11 - 22 Feb 1913, *E. G. Britton & D. W. Marble 1216* (NY, US); Tortola. Shady ghut, Sage Mountain, 18°24'N 064°39'W, 10 Jul 1965, *W. G. D'Arcy 186A* (GH, MO); **Windward Islands:** Dominica, W of High Ridge Rd. Bataka, 6 Jan 1994, *J. Higgins & P. Paris 98*

(GH, NY); St. Luke, vicinity of South Chiltern Estate, 15°15'N 061°23'W, 21 Jun 1966, *W. L. Stern & D. Wasshausen 2526* (B, US); Carib trail from Salybia to Hatton Garden, 30 Apr 1940, *W. H. Hodge 3284* (GH, NY, US); Sylvania Estate, 09 Aug 1938 - 24 Aug 1938, *W. H. Hodge s.n.* (GH); Layou River Valley, ridges north of river between Layou Village and Cocoa Center, 01 Aug 1965, *W.R. Ernst 1987* (GH, US); Martinique, 14°40'N 061°00'W, 1878, *A. Duss 872* (B, NY); Ravine Pilote, 14°40'N 061°00'W, 1869, *L. Hahn 868* (G, K, P); St. Lucia, Middle W slope of Gros Piton, 19 May - 1958, *G. R. Proctor 18070* (A); Belfond, 14°N 061°W, 23 May 1985, *V. Slane 576* (A); St. Vincent, 13°14'25"N 061°11'08"W, Sep 1889, *H. H. Smith & G. W. Smith 607* (B, E, GH, HBG, K, NY). COSTA RICA. **San José:** San Francisco, 09°55'N 084°03'W, *Pittier 8032* (BR).

For comments, see *P. capsularis*, *P. cervii* and *P. cisanana*.



**Figure 26.** Distribution of *Passiflora rubra* L.



**Plate 13.** *Passiflora rubra* L. A. Plant. B. Dehisced fruit. C. Flower.  
D. Seed (*Britton 1605*).

Photos: **A.** Hillewaert, H.; **B, C.** Steele, R.; **D.** Boza, T. E.



14. **Passiflora sanguinolenta** Mast. & Linden. Gard. Chron. 1868: 1162(1868)

Type: locality unknown, probably Loja, Ecuador or Northern Peru, *Wallis s.n.* (holotype, K not seen).

*Passiflora mastersiana* Harms, Bot. Jahrb. Syst. 18(Beibl. 46): 8. 1894. – TYPE: Ecuador: Loja. Las Juntas et Pucala, 1800--2200 m, *Lehmann 4836* (holotype, B (destr); isotypes, F, GH, K not seen, S).

Vine 2--3 m long, densely villous throughout. Stems 3-angular, striate. Stipules (1.3--2.8--3.4(--5.9)) × (0.2--0.3--0.4(--0.8)) mm, linear, setaceous; petiole (5--12--17(--44)) mm long; lamina (2.1--3.7--4.7(--10.2)) × (3.2--4.4--5.7(--12.2)) cm, depressed obovate, cordate at the base, densely hirsute pubescent abaxially with trichomes 0.2--0.8 mm long, sparsely hirsute adaxially with trichomes 0.2--0.8 mm long, 2(--3)-lobed, the lateral lobes obtuse to acuminate (the central lobe reduced and obtuse); the angle between the lateral veins (42--56--64(--85))°. Peduncles (4--18--21(--40)) mm long, solitary; floral stipe 2.5--4.8 mm long; flowers are red or reddish violet; floral tube (9--11--14(--16)) × (4--6--7(--11)) mm reddish; sepals (19.4--25.0--26.5(--29.0)) × (3.2--3.6--4.8(--5.8)) mm, narrowly triangular, sparsely hirsutulous pubescent outside, apex acuminate, reddish; petals (15.0--17.8--21.5(--24.1)) × (1.5--2.3--2.4(--3.3)) mm, linear to narrowly triangular; apex obtuse, reddish; corona filaments in 2 series, filaments of outer series 28--30, (2.7--5.7--6.6(--17.7)) mm long, red with white apex; filaments of the inner series (0.9--1.5--1.7(--2.7)) mm long; operculum 1.4--1.9 mm; limen erect; androgynophore 14.7--29.1 mm long, green; stamens with filaments (3.1--4.1--4.8(--7.2)) mm long; anthers (3.5--4.1--4.2(--4.7)) × (1.3--1.5--1.9) mm; ovary 2.3--7.3 × 1.0--3.2 mm, ellipsoid to obovoid, densely puberulous to villous; styles (2.6--3.4--3.6(--4.0)) × 0.2--0.3 mm; stigma (0.6--0.8--1.0(--1.4)) mm diam. Fruit (20--32--35(--53)) × (8--12--13(--27)) mm, ellipsoid or fusiform, slightly to sharply hexagonal, dark red; stipe 3.9--9.5 mm long; seeds (2.1--2.5--2.9(--3.3)) × (1.4--1.7--1.9(--2.5)) mm, transversely sulcate with 7--8 sulci, the ridges slightly rugulose.

**Distribution and Ecology:** Mountains of southern Ecuador from 800 to 2800 m altitude.

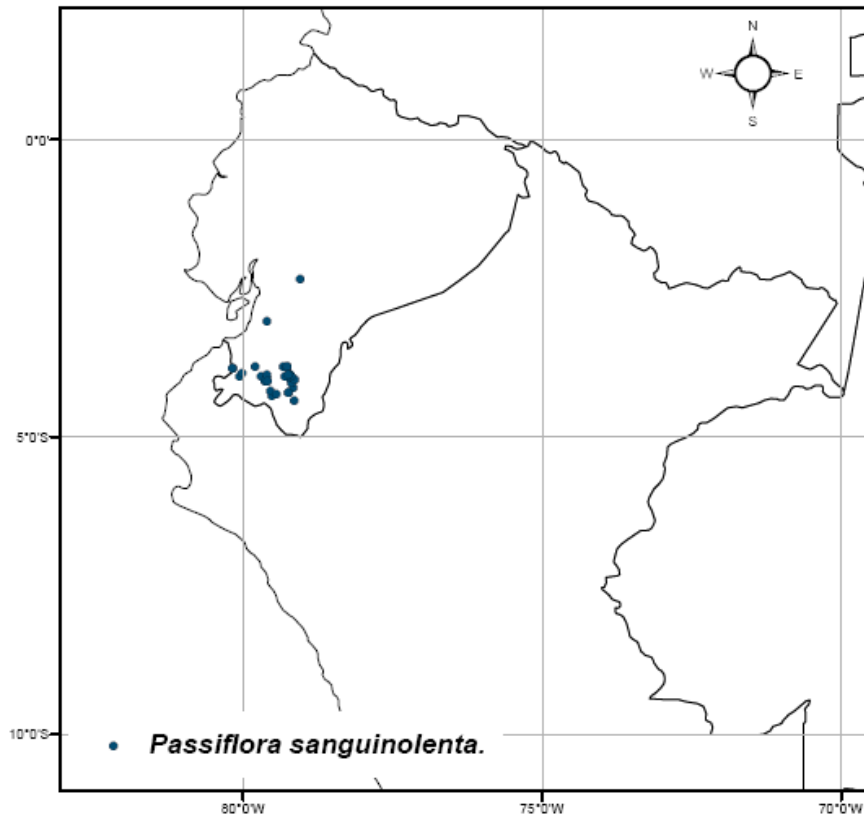
**Phenology:** Flowers observed in September to February. Fruits in January, February, and in September to November.

**Selected specimens examined:** ECUADOR. **El Oro :** Between Chaguarpamba and Balzas, 03°49'15"S 079°48'15"W, 15 Nov 1982, *G. Harling et al.* 20757 (AAU, GB); **Loja:** btw. Loja and San Lucas, 03°59'35"S 079°12'15"W - 03°45'00"S 079°15'00"W, 06 Sep 1923, *A. S. Hitchcock* 21494 (GH, NY, US); Motupe (6 km N of Loja), 03°56'32"S 079°13'40"W, 08 Oct 1955, *Asplund* 18048 (B, C, CAS, F, G, H, K, LL, NO, NY, PI, S, UC, UPS, US); ca. 2 km N of Loja, along road to Saraguro, 03°57'S 079°13'W, 20 Feb 1985, *B. Øllgaard* 57803 (AAU, MO, NY, U, UPS); Road Gonzanamá-Quilanga, km 8-9, 04°17'S 079°27'W, 19 Jun 1996, *B. B. Klitgaard & G. P. Lewis* 227 (AAU, MO, NY, QCA); Carretera Yangana- Cerro Toledo, 24 Feb 1988, *C. Ulloa* 638 (GB, QCA); Häufig in offenen Wäldern um Las Juntas und Pucála, 03°49'S 079°16'W - 03°51'S 079°14'W, Oct 1888, *F. C. Lehmann* 4836 (B, F, GH, K, S, US); Vilcabamba-Yangana, 11 Feb 1993, *G. Harling & B. Ståhl* 26305 (GB, QCA); Road Gonzamaná - Cariamanga, 6 km of Gonzamaná, 15 Feb 1993, *G. Harling & B. Ståhl* 26420 (GB); Alamor - Cazaderos Road, just W of El Limo, 20 Feb 1985, *G. Harling & L. Andersson* 22331 (GB, QCA); Alamor-Puyango Road, km 12-15, 07 Apr 1980, *G. Harling & L. Andersson* 1800 (QCA); Loja-Malacatos Road, Km 20, 04°06'S 079°12'W, 23 Apr 1980, *G. Harling & L. Andersson* 18582 (AAU, GB, MO); Cariamanga-Gonzanama Road, 04°13'S 079°33'W, 25 Jun 1980, *G. Harling & L. Andersson* 18677 (AAU, GB, NY); Celica- Alamo Road at crossing with Rio Alamor, 18 Feb 1985, *G. Harling & L. Andersson* 22190 (GB, QCA); Alamor - Puyango Road, km 12 -15, 03°55'45"S 080°01'07"W - 03°57'53"S 080°01'50"W, 07 Apr 1980, *G. Harling & L. Andersson* 18000 (AAU, GB); Alamor - Cazaderos Road, 6-7 km E of El Limo, 03°58'54"S 080°03'58"W - 03°59'27"S 080°02'54"W, 04 Apr 1980, *G. Harling & L. Andersson* 17911 (GB); N of Cariamanga, 04°18'04"S 079°31'31"W, 12 Nov 1982, *G. Harling et al.* 20634 (AAU, GB, US); Road Loja - Catacocha, ca 10 km N of Catacocha, 04°00'52"S 079°36'19"W, 09 Nov 1977, *G. Harling et al.* 15254 (AAU, GB); Road Loja to Catamayo, km 22, 300m along track to the right, 79 18 678' W; 3 59 809'S, 03°59'08"S 079°18'06"W, 5 Jul 1996, *G. P. Lewis & B. B. Klitgaard* 2400 (MO); Below Cangonamá towards Panamerican Highway west of Catacocha, 03°59'S

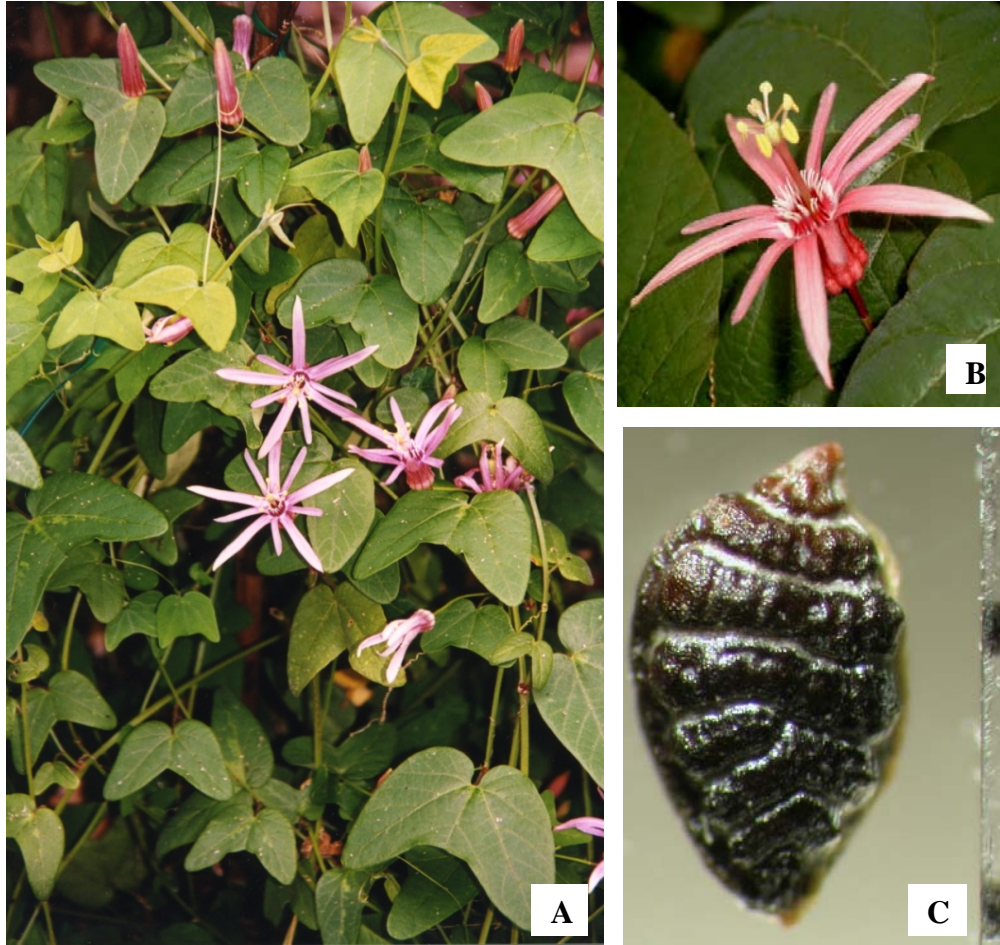
079°42'W, 1 Jan 1981, *H. Balslev 1342* (AAU, NY); 46 km S of Loja, Hda Anganuma, heawaters of Rio Cachiyacu, 04°24'10"S 079°09'01"W, *H. Jørgensen & J. P. Prieto 53* (NY, US); Between Loja and San Lucas, 03°59'35"S 079°12'15"W - 03°45'00"S 079°15'00"W, *Hitchcock 21470* (GH, NY, US); Km 2-5 SE of Catacocha along gravel road, 03°04'S 079°36'W, 23 Nov 2000, *J. E. Madsen & O. A. Sanchez 7539* (AAU, MO); From Catacocha - Catamayo (at km 10) app. 8 km S along gravel road, 04°03'09"S 079°35'13"W, 1 May 2001, *J. E. Madsen et al. 7830* (AAU, MO); 70.1 km SSW of Loja (old road to La Toma) on road to Gonzanamá, 08 Jul 1992, *J. L. Panero & B. L. Clark 2964* (MICH); Loja, 03°59'35"S 079°12'15"W, *J. N. Rose 23900* (US); between Vilcabamba and Cachiyacu, 04°15'S 079°15'W - 04°25'S 079°08'W, 06 Oct 1943, *J. A. Steyermark 54397* (F, NY, US); Motupe 6 Km N. Loja, 03°57'S 079°14'W, 25 Jul 1979, *L. Albert de Escobar 1542* (CAS, LL, QCA, TEX); Motupe, 03°57'S 079°14'W, 25 Jun 1979, *L. K. Albert de Escobar 1540* (TEX); carretera entre Motupe y Loja, 03°57'S 079°14'W - 04°00'S 079°13'W, 25 Jul 1979, *L. K. Albert de Escobar 1539a* (LL, MO, TEX); Las Juntas, 03°49'S 079°16'W, 29 Sep 1918, *Mrs. J. N. Rose 23233* (GH, NY, US); Cerro Villonaco, old road La Toma-Loja, 03°59'S 079°16'W, 22 Feb 1988, *P. M. Jorgensen 65058* (AAU, QCA); Catacocha-Guano-Cariamanga, Km 1.2-4.5, 04°03'50"S 079°38'29"W, 15 Dec 1994, *P. M. Jørgensen et al. 1550* (MO, NY, QCA); Pucala, norte de Loja, 06 Apr 1946, *R. Espinosa E62* (US); Cotacocha, 04 Jul 1946, *R. Espinosa E-617* (US); Aguaedionda (norte de Loja), 16 Oct 1946, *R. Espinosa 806* (US); entre San pedro y Chinchas (55 km O de Loja), 01 March 1947, *R. Espinosa E1314* (US); Vicinity of Chaguarbamba on Catamayo-Machala road, ca. 21 km W of Las Chinchas, 03°57'S 079°36'W, 27 Oct 1994, *S. Knapp & J. Mallet 9079* (MO); along road between Loja and San Lucas (on road to Cuenca), 19 km N of Loja on road embankment ca. 20 m above the road, 04°10'S 079°10'W, 21 Oct 1980, *T. B. Croat 50839* (MO, QCA); along road between Loja and San Lucas, 18.7 Km N of terminal terrestre in Loja, 3.7 Km N of Solaman, 03°53'S 079°13'W, 01 Jun 2003, *T. B. Croat & M. Menke 89968* (MO, US); Catamayo, Km 7 at Villonaco, 24 km along track to Cera and Chantaco and onwards to La Toma, 03°59'57"S 079°13'49"W, 09 March 1997, *G. P. Lewis & B. B. Klitgaard 3078* (K); PERU. **Tumbes:** Zarumilla, Matapalo, El Caucho-Campo Verde, parcela de evaluación permanente "E", 03°50'46"S 080°10'43"W, 17 Jan 1995, *C. Diaz et al. 7428*

(MIN, MO); Matapalo, Carretera entre "Naranjal" y "Campo Verde", 03°51'S 080°10'W,  
21 Jan 1995, C. Díaz *et al.* 7462 (MO).

For comments, see *P. citrina*.



**Figure 27.** Distribution of *Passiflora sanguinolenta* Mast. & Linden.



**Plate 14.** *Passiflora sanguinolenta* Mast. & Linden. A. Plant. B. Flower.  
C. Seed ( *Madsen 7830*).

Photos: **A.** Ellison, D.; **B.** Ulmer & MacDougal; **C.** Boza, T. E.

15. **Passiflora tenella** Killip. J. Wash. Acad. Sci. 20: 375(1930)

TYPE: Peru: Tumbes: SE of Hacienda La Choza, 100 -- 200 m, *Weberbauer 7704*  
(holotype, F; isotypes, G, K not seen, MO photo, US not seen).

Vine 10--50 cm long, glabrous throughout. Stems subangular, striate. Stipules (1.1--1.9--2.3(--3.5) × (0.1--0.2--0.3(--0.5) mm, linear; petiole (9--17--21(--30) mm long; lamina (1.3--2.1--2.5(--3.2) × (3.2--4.9--5.8(--7.6)cm, depressed obovate, cordate at the base, sparsely pilose abaxially with trichomes 0.5--1.0mm long, sparsely pilose adaxially with trichomes 0.6--1.2 mm long, 3-lobed, the lateral lobes acute, the central lobe retuse or obtuse; the angle between the lateral veins (88--111--119(--134)°.

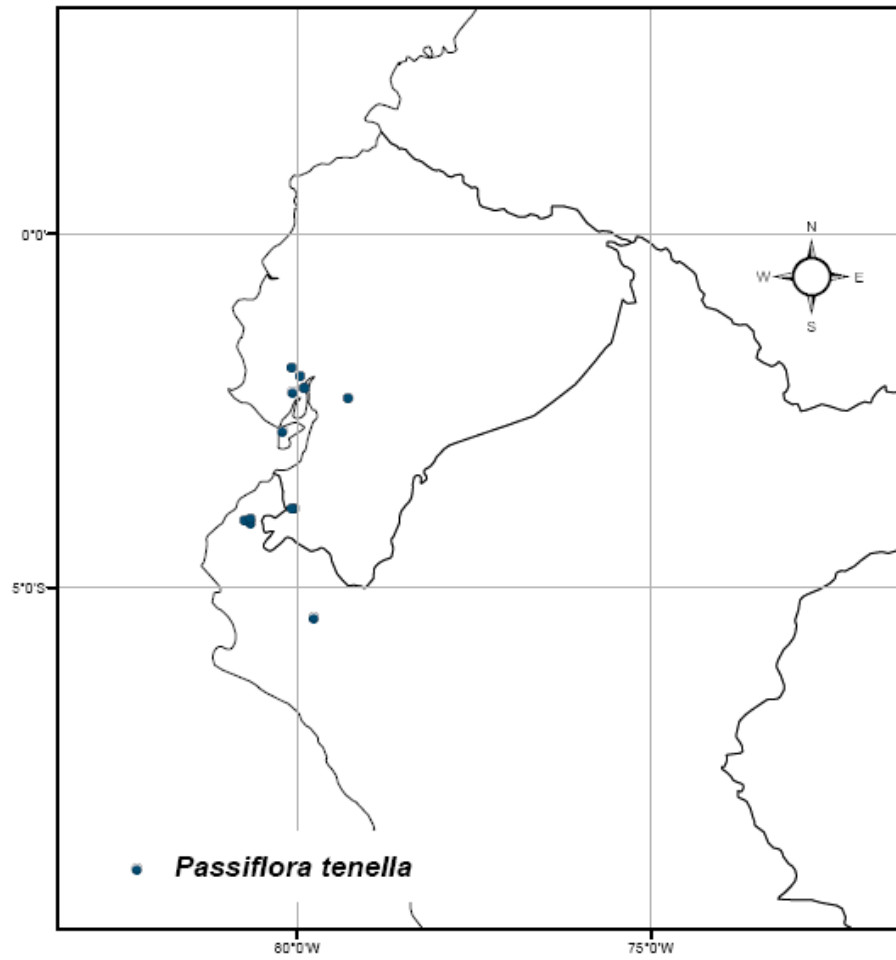
Peduncles (7--15--18(--22) mm long, solitary (pairs); floral stipe 0.4--0.9mm long; flowers (14.7--15.1--15.9(--16.8) mm diam., greenish white; sepals (5.7--7.6--8.3(--10.8) × (0.7--1.3--1.7(--2.4) mm, narrowly linear or narrowly elliptic, sparsely pilose pubescent outside, apex acute, greenish white; petals (2.1--2.9--3.3(--4.0) × 0.8--1.0(--1.1) mm, linear to narrowly triangular, apex retuse, greenish white; coronal filaments in 2 series, filaments of outer row 20--26, (4.2--6.1--7.1(--9.6) mm long, greenish white; filaments of the inner row 0.9--1.1(--1.2) mm long, violet tinged; operculum (0.4--0.7--0.9(--1.2) mm, slightly plicate; androgynophore 2.8--4.8 mm long, green; stamens with filaments 2.0--2.3(--2.5) mm long; anthers (1.1--1.6--1.8(--2.1) × (0.6--0.7--0.9(--1.1) mm; ovary 1.4--1.9 × 0.8--1.3 mm, narrowly ellipsoid, glabrous (sparsely puberulous); styles (1.7--2.5--3.0(--4.1) × 0.1--0.2 mm; stigma (0.2--0.3--0.5 (--0.6) mm diam. Fruit (17--23--26(--32) × (5--6--7(--11) mm, ellipsoid to fusiform acuminate at apex, 6-ribbed; stipe 0.8--1.9 mm long; seeds (2.3--2.7--2.9(--3.1) × 1.4--1.6(--1.8) mm, ovate, transversely sulcate with 4--5 sulci, the ridges strongly rugulose.

**Distribution and Ecology:** Dry coast of Peru and Ecuador in degraded primary dry forest from 0 to 450 m altitude mainly on forest edges and roadsides.

**Phenology:** Flowers and fruits observed in January to April, August and November.

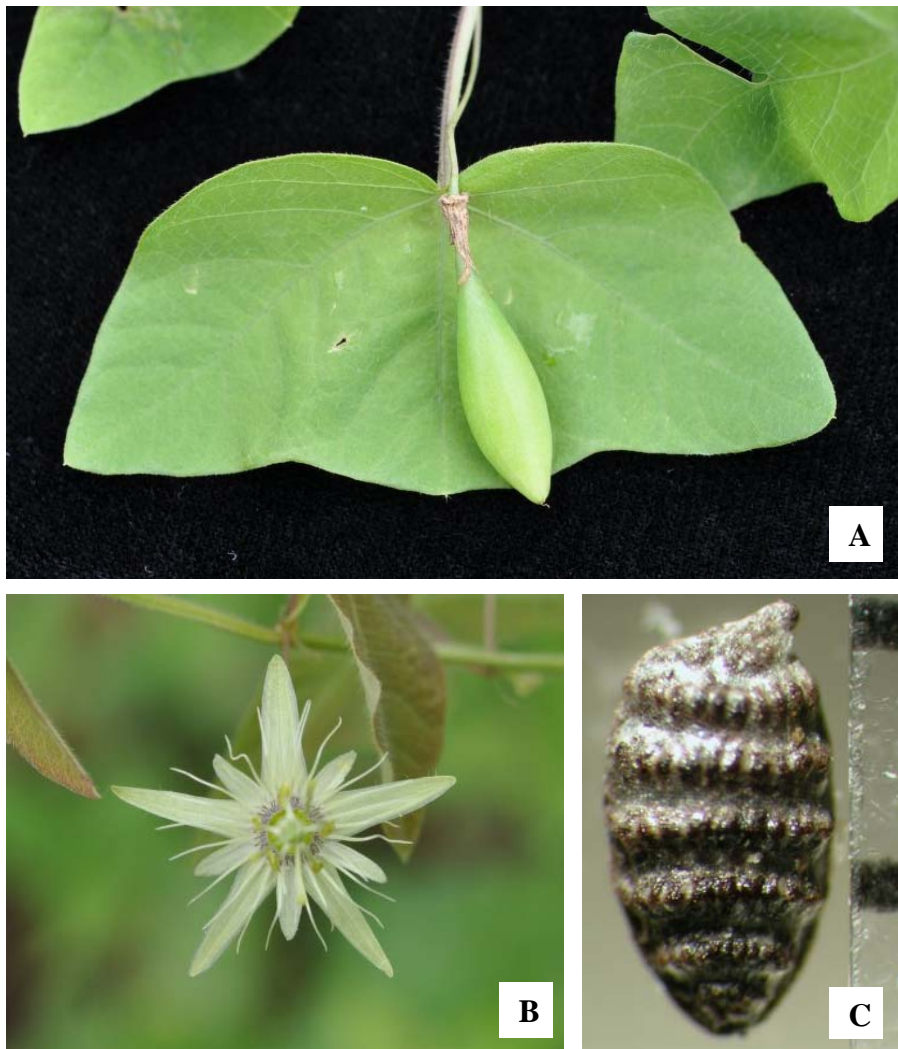
**Selected specimens examined:** ECUADOR. **El Oro :** "Bosque Petrificado Puyango", slopes from Mirador #2 to rock pools, 03°52'30"S 080°05'01"W, 26 Feb 1997, *B. B. Klitgaard et al.* 426 (AAU, MO, NY); **Guayas:** Capeira, km 21, Guayaquil to Daule, near entrance to el Matapalo, 02°00'S 079°58'W, 11 Feb 1982, *Dodson & A. Gentry* 12337 (MO); Road Nobol - Las Lomas del Sargentillo, 01°53'S 080°05'W - 01°55'S 080°01'W, 18 Nov 1977, *G. Harling et al.* 15680 (AAU, GB); near Soledad, 02°18'42"S 079°17'04"W, *Haught* 3052 (F, GH, K, S, UC, US); Isla Punà, vicinity of Bellavista, 02°47'S 080°13'W, 10-11 Aug 1987, *Madsen* 63868 (AAU, MO, QCA); Guayaquil, 02°10'S 079°54'W, 31 Jan 1943, *O. Haught* 3523 (G, US); PERU. **Piura:** Huancabamba, Serran, 05°25'45"S 079°46'25"W, 02 Apr 1939, *H. E. Stork* 11374 (GH); **Tumbes:** ca. 10 km S of Cherrelique on trail to Cerros de Amotape, 04°05'S 080°40'W, 9 Jun 1987, *A. Gentry & C. Diaz* 58234 (MO); Tumbes, SE of Hacienda La Choza, 04°00'57"S 080°39'54"W, 28 Feb 1927 - 03 March 1927, *A. Weberbauer* 7704 (B, F, G, K, MO, US); Contralmirante Villar, near La Huaca between Papayal and Cienago, 04°02'52"S 080°44'49"W, *T. C. Plowman* 5409 (GH).

*Passiflora tenella* is a poorly known species from dry coastal Ecuador and Peru that is apparently a diminutive annual; the plant reaches only 90 cm tall. The fruit does not appear to be a capsule and the seeds have transversely rugulose ridges unlike those other members of section *Xerogona*, but the shape of the leaves and the absence of floral bracts and laminar nectaries suggest affiliation with this section, molecular studies of section *Xerogona* (Porter-Utley comm. pers.) place *P. tenella* as sister to the rest of the section.



**Figure 28.** Distribution of *Passiflora tenella*.





**Plate 15.** *Passiflora tenella* Killip. A. Fruit (Jørgensen 2455). B. Flower (Jørgensen 2455). C. Seed (Jørgensen 2455).

Photos: **A, B.** Jørgensen, P. M.; **C.** Boza, T. E.

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**APPENDIX 1:** List of specimens measured for PCA analysis. The plant names used in this table are the names assigned to the specimens after this study.

Species	Senior Collector	Collection No.	Herbarium
<i>P.capsularis</i>	Bernardi, M.	18893	NY
<i>P.capsularis</i>	Cazalet, P. C. D.	5240	B K NY UC
<i>P.capsularis</i>	Chase, M. A.	11060	GH MICH US
<i>P.capsularis</i>	Croat, T. B.	44486	MO
<i>P.capsularis</i>	Daviña, J.	206	CTES G
<i>P.capsularis</i>	Eiten, G.	1844	GH NY
<i>P.capsularis</i>	Fernández Casas, F. J.	5663	MA MO
<i>P.capsularis</i>	Fiebrig, K. A. G.	6027	B BM E G GH P US
<i>P.capsularis</i>	Fonnegra, G. R.	5181	GH HUA MO U
<i>P.capsularis</i>	Haber, W. A.	3932	MO
<i>P.capsularis</i>	Haber, W. A.	9536	MO
<i>P.capsularis</i>	Hamilton, C. W.	1260	MO
<i>P.capsularis</i>	Hassler, É.	7913	A B BM G GH K P W
<i>P.capsularis</i>	Hassler, É.	11531	B BM C E G GH K L MO NY US WIS
<i>P.capsularis</i>	Hatschbach, G. G.	36609	GH HBG MO
<i>P.capsularis</i>	Hatschbach, G. G.	45793	BR G
<i>P.capsularis</i>	Haught, O. L.	6396	US
<i>P.capsularis</i>	Heyde, E. T.	6141	B G GH US
<i>P.capsularis</i>	Howard, R. A.	163	GH
<i>P.capsularis</i>	Imaguire, N	1838	US
<i>P.capsularis</i>	Jardim, A.	1924	MO NY USZ
<i>P.capsularis</i>	Kalbreyer, W.	s.n.	HBG
<i>P.capsularis</i>	Knapp, S. D.	5500	MO
<i>P.capsularis</i>	Leonard, E. C.	9465	F GH US
<i>P.capsularis</i>	Lindman, C. A. M.	1141	GH MO S UPS US
<i>P.capsularis</i>	MacDougal, J. M.	685	DUKE
<i>P.capsularis</i>	Mamani, M. F.	1281	USZ

P.capsularis	Meyer, T.	11814	CTES
P.capsularis	Molina, R. A.	12920	EAP F
P.capsularis	Moreno, P. P.	7907	MO
P.capsularis	Múlgura de Romero, M. E.	3091	MO SI
P.capsularis	Múlgura de Romero, M. E.	1851	MO SI
P.capsularis	Múlgura de Romero, M. E.	1909	MO SI
P.capsularis	Pennell, F. W.	3424	GH MO NY US
P.capsularis	Perdonnet, G.	264	G
P.capsularis	Rambo, B.	47127	B
P.capsularis	Reineck, E. M.	s.n.	HBG
P.capsularis	Reitz, P. R.	6116	US
P.capsularis	Ribas, O. S.	2227	C G HBG
P.capsularis	Rodríguez G, A.	5186	MO
P.capsularis	Rodríguez G, A.	5110	G
P.capsularis	Romanczuk, M. C.	486	BAB SI
P.capsularis	Santa, J.	773	MO NY
P.capsularis	Schinini, A.	19878	CTES
P.capsularis	Silva J. M.	1944	C G HBG MO
P.capsularis	Silva J. M.	51	C CAS
P.capsularis	Silverstone-Sopkin Ph.	4044	MO
P.capsularis	Smith, H. H.	2780	NY
P.capsularis	Smith, L. B.	15012	GH
P.capsularis	Soria, N.	3491	FCQ MO
P.capsularis	Uribe U., L.	2511	MA
P.capsularis	Woolston, A. L.	1206	C GH U
P.capsularis	Zardini, E. M.	47522	AS MO NY
P.capsularis	Zuloaga, F. O.	5095	MO SI
P.capsularis	Zuloaga, F. O.	743	GH



P.cervii	Mexía, Y. E. J.	5402	CAS G GH MO NY S US
P.cervii	Oliveira, P. I.	691	HBG NY SP
P.cervii	Sehnem, A.	2430	CAS
P.cisnana	Abbott W. L.	178	US
P.cisnana	Acevedo-Rodríguez, P.	5642	NY
P.cisnana	Alain, Brother	825	GH
P.cisnana	Arbeláez, A. L.	621	MO NY
P.cisnana	Axelrod, F. S.	6178	MO UPRRP
P.cisnana	Axelrod, F. S.	2959	MO NY UPRRP
P.cisnana	Axelrod, F. S.	5812	MO NY UPRRP
P.cisnana	Bang, M.	2836	B BM CTES G GH K MICH MIN MO NY PH S US W
P.cisnana	Beck, S. G	23428	LPB MO
P.cisnana	Beck, S. G.	6367	LPB M
P.cisnana	Beck, S. G.	22281	
P.cisnana	Benítez de Rojas, C. E.	1173	F MY U
P.cisnana	Betancur, B. J.	4986	COL MO
P.cisnana	Britton, N. L.	1605	GH K NY US
P.cisnana	Brown, S.	29	NY PH
P.cisnana	Buchtien, O.	3852	
P.cisnana	Camp, W. H.	3014	G GH MO NY
P.cisnana	Campos de la Cruz, J.	4813	MO
P.cisnana	Clarke D.	858	
P.cisnana	Correll, D. S.	47009	MO NY
P.cisnana	Correll, D. S.	47860	F MO NY
P.cisnana	Correll, D. S.	51385	DUKE F MO NY
P.cisnana	Day E. H.	s.n.	K
P.cisnana	Díaz Santibáñez, C.	3197	MO
P.cisnana	Duss, A.	2231	B C F NY US

P.cisnana	Ernst, W. R.	1987	GH US
P.cisnana	Escobar, L. K. A. de	4824	
P.cisnana	Fernández Casas, F. J.	10769	CAS MO
P.cisnana	Fontaine D.	s.n.	G
P.cisnana	Harling, G. W.	22410	GB QCA
P.cisnana	Harling, G. W.	22173	GB
P.cisnana	Heller, A. A.	s.n. Dec 11 1902	NY
P.cisnana	Heller, A. A.	1218	F K NY US
P.cisnana	Hunnewell, F. W.	11381	GH
P.cisnana	Jardim, A.	1555	
P.cisnana	Jiggins, C.	38	
P.cisnana	Knapp, S. D.	2838	MO
P.cisnana	Knapp, S. D.	6323	BH
P.cisnana	Lasser, T.	1552	NY
P.cisnana	Leonard, E. C.	14120	MO US
P.cisnana	Leonard, E. C.	3668	NY PH US
P.cisnana	Leonard, E. C.	3685	US
P.cisnana	Lewis, G. P.	3499	E K MO
P.cisnana	Lewis, G. P.	3077	MO QCA
P.cisnana	Madsen, J. E.	7412	
P.cisnana	Maxon, W. R.	8800	GH RSA US
P.cisnana	McDade, L. A.	1056	DUKE MO
P.cisnana	McDade, L. A.	1027	
P.cisnana	Molina, A.	457	MO
P.cisnana	Mori, S. A.	26998	NY
P.cisnana	Mori, S. A.	25953	NY
P.cisnana	Nash, G. V.	746	NY
P.cisnana	Nicolson, D. H.	1870	B CAS US
P.cisnana	Proctor, G. R.	18885	A
P.cisnana	Proctor, G. R.	6750	LL NY
P.cisnana	Rose, J. N.	3459	B GH NY US

P.cisnana	Rubio, D.	2364	MO
P.cisnana	Silverstone-Sopkin Ph.	6184	MO
P.cisnana	Silverstone-Sopkin Ph.	2573	
P.cisnana	Smith, H. H.	607	B E GH HBG K NY
P.cisnana	Smith, J. F.	2046	
P.cisnana	Stevenson, J. A.	153	MIN US
P.cisnana	Stoffers, A.L.	186	
P.cisnana	Ule, E. H. G.	6546	B G HBG L
P.cisnana	Uribe, A. & Uribe, L	3471	NY
P.cisnana	Valenzuela, L.	1356	CUZ MO
P.cisnana	Weberbauer, A.	7653	F G US
P.cisnana	Webster, G. L.	10491	DUKE GH
P.cisnana	Webster, G. L.	8259	G
P.cisnana	Weigend, M.	98/382	M MO USM
P.cisnana	Weigend, M.	98/185	
P.cisnana	Wright, Ch.	201	BR G K MO NY PH S
P.rubra	Abbott, W. L.	178	US
P.rubra	Acevedo-Rodríguez, P.	5642	NY
P.rubra	Alain, Brother	825	GH
P.rubra	Arbeláez, A. L.	621	MO NY
P.rubra	Axelrod, F. S.	6178	MO UPRRP
P.rubra	Axelrod, F. S.	2959	MO NY UPRRP
P.rubra	Axelrod, F. S.	5812	MO NY UPRRP
P.rubra	Britton, N. L.	1605	GH K NY US
P.rubra	Brown, S.	29	NY PH
P.rubra	Correll, D. S.	47009	MO NY
P.rubra	Correll, D. S.	47860	F MO NY
P.rubra	Correll, D. S.	51385	DUKE F MO NY
P.rubra	Day E.H.	s.n.	K
P.rubra	Duss, A.	2231	B C F NY US
P.rubra	Ernst, W. R.	1987	GH US

P.rubra	Fernández Casas, F. J.	10769	CAS MO
P.rubra	Fontaine, D.	s.n.	G
P.rubra	Heller, A. A.	s.n. Dec 11 1902	NY
P.rubra	Heller, A. A.	1218	F K NY US
P.rubra	Hunnewell, F. W.	11381	GH
P.rubra	Leonard, E. C.	14120	MO US
P.rubra	Leonard, E. C.	3668	NY PH US
P.rubra	Leonard, E. C.	3685	US
P.rubra	Maxon, W. R.	8800	GH RSA US
P.rubra	Mori, S. A.	26998	NY
P.rubra	Mori, S. A.	25953	NY
P.rubra	Nash, G. V.	746	NY
P.rubra	Nicolson, D. H.	1870	B CAS US
P.rubra	Proctor, G. R.	18885	A
P.rubra	Proctor, G. R.	6750	LL NY
P.rubra	Rose, J. N.	3459	B GH NY US
P.rubra	Smith, H. H.	607	B E GH HBG K NY
P.rubra	Stevenson, J. A.	153	MIN US
P.rubra	Webster, G. L.	10491	DUKE GH
P.rubra	Webster, G. L.	8259	G
P.rubra	Wright, Ch.	201	BR G K MO NY PH S