

# ANTHER GLANDULARITY IN THE AMERICAN EUGENIINAE (MYRTACEAE)

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## Resumen

Se hizo un estudio de glandularidad de anteras en Eugeniinae (Myrtaceae) Americanas (105 spp.) y en 10 especies de *Syzygium* de Asia y Australia. En general, las anteras no tienen glándulas o solo tienen una. Solo 11.3% de las especies a veces tenían más que una glándula por antera. Este resultado es diferente de lo que se ha encontrado en Myrtinae que a menudo tienen más que una glándula por antera.

## Abstract

A study was conducted of the glandularity of the anthers of American Eugeniinae (Myrtaceae) (105 spp.) and 10 species of *Syzygium* of Asia and Australia. In general, the anthers do not have glands or only have one. Only 11.3% of the species sometimes have more than one gland per anther. This result is different from what has been found in Myrtinae that often have more than one gland per anther.

## Introduction

Anther glandularity has been found to be of taxonomic value in the subtribe Myrtinae (Myrtaceae) (Landrum and Bonilla 1996). They found in a survey of 83 American and 4 Australasian species that the number of glands in the anther was variable but generally fairly stable at the generic level and even more constant at the specific. For instance, *Calycolpus* Berg has anthers that usually have 9-19 glands, *Psidium* L. usually has 1-4, and *Campomanesia* Ruiz & Pavon usually has 0 or 1. In all these genera there are species that are exceptions to the rule, for instance, *Campomanesia speciosa* has several glands in the anther.

Whereas highly glandular anthers are common in the Myrtinae, at least in some genera, Landrum and Bonilla found in a limited sample of 18 species of American Eugeniinae that they are a rarity in that subtribe. If that observation were to hold true in a larger sample, it would mean that anther glandularity has taxonomic significance at the level of subtribe as well. The purpose of our study was to further investigate this possibility by surveying a large number of American Eugeniinae plus a few species of *Syzygium* of Australasia.

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## Methods

Anthers were extracted from 105 species of American Eugeniinae, including the genera *Calycorectes*, *Eugenia*, *Hexaclamys*, *Myrcianthes*, *Myrciaria*, *Neomitranthes*, and *Plinia* and 10 additional species of *Syzygium* native to Asia and Australia, a genus normally placed in the Eugeniinae. A total of 187 specimens were examined. Specimens were prepared following Landrum and Bonilla (1996). Briefly, this method consisted of soaking the anthers in bleach for a few minutes until white, then washing them in water, and mounting them on a glass slide and to be viewed immediately. No stain is necessary because the glands turn white much more slowly than the rest of the anther. They are yellow to reddish brown in color and easily viewed at 100X. Five anthers were observed for each specimen and a sketch was made of a representative. Counts for the five anthers were averaged. Representative anthers are illustrated in figure 1.

## Results

In the study of Landrum and Bonilla (1996) five categories of anther glandularity were used: A, 0-0.9; B, 1.0-1.9; C, 2.0-3.9; D, 4.0-9.9; E, 10.0 or more. In this study we have found it convenient to add the category "b," exactly 1.0, and to modify "B" to be 1.1-1.9. The results of the present study are summarized in Table 1. Most species fall into categories A and b, i.e., the average number of glands in the anthers varies between 0 and exactly 1. Only 13 (11.3%) of the 115 species in our survey ever averaged more than one gland per anther. A reanalysis of the data for the Myrtinae in Landrum and Bonilla (1996) reveals that 44 (50.6%) of the 87 species studied had anthers that at least sometimes exceed an average of 1 gland per anther. Thus, based on these samples, the subtribes Myrtinae and Eugeniinae differ notably, anthers with more than one gland being much more common in the Myrtinae than the Eugeniinae. In both studies, the large majority of specimens studied were American. It is possible that larger samples in other regions where Myrtaceae grow would give different results.

## Discussion

As in the previous study of Landrum and Bonilla (1996), this study indicates that anther glandularity can be of taxonomic value. In the Eugeniinae, it is perhaps less useful than in the Myrtinae, because it is less variable. Still there are particular species of *Eugenia* and

*Calycorectes*, for instance, with notably glandular anthers that distinguish them from other species. It is also noteworthy that on the average, anther glandularity differs between the two subtribes.

This was a simple study, that required only a microscope, glass slides, and common bleach to conduct. It would be interesting if similar studies might be made in other families with glandular tissues.

This study did not attempt to describe the size nor the color of glands in the species observed. Our observations indicate that these characteristics may be of value. Comparisons of these characteristics in a few species in a limited area might prove interesting.

The importance to the plants of the glands in the anthers is not clear. Three potential uses have been suggested (Landrum and Bonilla 1996): 1) floral aromas, 2) protection against insects that might eat anthers, and 3) a food source for insect visitors. If one could find species that lived in a the same area, but differed notably in anther glandularity, then studies of the insects that visited the flowers might be helpful in discovering the adaptive significance of the anther glands.

#### Literature Cited

Landrum, L. R. and Bonilla, J. 1996. Anther glandularity in the American Myrtinae (Myrtaceae). *Madroño* 43(1): 58-68.

Table 1. Summary of anther glandularity in Eugeniinae. Species are classified as to the mean number of glands in the anther connectives. A, 0-0.9. b, 1.0. B, 1.1-1.9. C, 2.0-3.9. D, 4.0-9.9. E, 10.0 or more. Each letter in the table represents at least one specimen. See Appendix for more complete data.

<i>Calycorectes australis</i>	- b - - - -
<i>Calycorectes bergii</i>	- - - C D -
<i>Calycorectes enormis</i>	A - - - - -
<i>Calycorectes grandifolius</i>	- - - - - E
<i>Calycorectus mexicanus</i>	A - - - - -
<i>Calycorectes psidiflorus</i>	- b - - - -
<i>Eugenia acapulcensis</i>	- b - - - -
<i>Eugenia acrensis</i>	- b - - - -
<i>Eugenia aeruginea</i>	- b - - - -
<i>Eugenia anastomosans</i>	A - - - - -

<i>Eugenia aurata</i>	A - - - - -
<i>Eugenia bacopari</i>	A - - - - -
<i>Eugenia bahiana</i>	A - - - - -
<i>Eugenia bahiensis</i>	- - B - - - -
<i>Eugenia beaurepairiana</i>	A - - - - -
<i>Eugenia biflora</i>	A b - - - - -
<i>Eugenia bimarginata</i>	- b - - - - -
<i>Eugenia blastantha</i>	A - - - - -
<i>Eugenia bocainensis</i>	A - - - - -
<i>Eugenia brasiliensis</i>	A - - - - -
<i>Eugenia brevistipitata</i>	- b - - - - -
<i>Eugenia brownsbergii</i>	- b - - - - -
<i>Eugenia buxifolia</i>	- b - - - - -
<i>Eugenia capuli</i>	- b - - - - -
<i>Eugenia catharinae</i>	- b - - - - -
<i>Eugenia cereja</i>	A - - - - -
<i>Eugenia chrysantha</i>	A b - - - - -
<i>Eugenia coffeifolia</i>	- b - - - - -
<i>Eugenia convexinervia</i>	A - - - - -
<i>Eugenia copacabanensis</i>	A - - - - -
<i>Eugenia culminicola</i>	- b - - - - -
<i>Eugenia dichroma</i>	A - - - - -
<i>Eugenia egensis</i>	- - - C D -
<i>Eugenia faramaeoides</i>	- - - - D -
<i>Eugenia feijoi</i>	A - - - - -
<i>Eugenia florida</i>	A b - - - - -
<i>Eugenia foetida</i>	A b - - - - -
<i>Eugenia hyemalis</i>	- b - C - -
<i>Eugenia inundata</i>	A b - - - - -
<i>Eugenia involucrata</i>	A - - - - -
<i>Eugenia itajurensis</i>	- b - - - - -
<i>Eugenia kleinii</i>	A - - - - -

<i>Eugenia klotzschiana</i>	A - - - - -
<i>Eugenia kunthiana</i>	A - - - - -
<i>Eugenia laevis</i>	- b - - - -
<i>Eugenia letreroana</i>	- b - - - -
<i>Eugenia ligustrina</i>	A - - - - -
<i>Eugenia lilloana</i>	A - - - - -
<i>Eugenia luciae</i>	- b - - - -
<i>Eugenia macrocalyx</i>	A b - - - -
<i>Eugenia monticola</i>	- b - - - -
<i>Eugenia moraviana</i>	- b - - - -
<i>Eugenia mosenii</i>	- - - - D -
<i>Eugenia multiovulata</i>	A - - C - -
<i>Eugenia muricata</i>	- b - - - -
<i>Eugenia myrtifolia</i>	A - - - - -
<i>Eugenia octopleura</i>	- b - - - -
<i>Eugenia oerstediana</i>	A - - - - -
<i>Eugenia olivacea</i>	A - - - - -
<i>Eugenia origanoides</i>	- b - - - -
<i>Eugenia ovalifolia</i>	- b - - - -
<i>Eugenia paranaguensis</i>	A - - - - -
<i>Eugenia patrisii</i>	- b - - - -
<i>Eugenia perorebi</i>	- b - - - -
<i>Eugenia pitanga</i>	A - - - - -
<i>Eugenia platysema</i>	- b - - - -
<i>Eugenia pluriflora</i>	- b - - - -
<i>Eugenia prosoneura</i>	- - - C - -
<i>Eugenia pseudomalacantha</i>	A - - - - -
<i>Eugenia pseudopsidium</i>	A - - - - -
<i>Eugenia puniceifolia</i>	A b - - - -
<i>Eugenia pyriformis</i>	A b - - - -
<i>Eugenia ramiflora</i>	- - - - D -
<i>Eugenia repanda</i>	- b B - - -

<i>Eugenia savannarum</i>	- b - - - -
<i>Eugenia sellowiana</i>	A - - - - -
<i>Eugenia speciosa</i>	- b - - - -
<i>Eugenia squamiflora</i>	A - - - - -
<i>Eugenia stipitata</i>	- b - - - -
<i>Eugenia tapacumensis</i>	- - - - D -
<i>Eugenia trunciflora</i>	A - - - - -
<i>Eugenia uniflora</i>	A - - - - -
<i>Eugenia valerii</i>	A b - - - -
<i>Eugenia winzerlingii</i>	A - - - - -
<i>Eugenia xalapensis</i>	A b - - - -
<i>Hexachlamys boliviana</i>	A - - - - -
<i>Hexachlamys edulis</i>	A b - - - -
<i>Myrcianthes callicoma</i>	- b - - - -
<i>Myrcianthes coquimbensis</i>	A b - - - -
<i>Myrcianthes fragrans</i>	- b - - - -
<i>Myrcianthes gigantea</i>	- b - - - -
<i>Myrcianthes mato</i>	- b - - - -
<i>Myrcianthes myrsinoides</i>	- b - - - -
<i>Myrcianthes osteomeloides</i>	A - - - - -
<i>Myrcianthes pungens</i>	A b - - - -
<i>Myrciaria cordifolia</i>	A - - - - -
<i>Myrciaria cuspidata</i>	- b - - - -
<i>Myrciaria delicatula</i>	A b - - - -
<i>Myrciaria floribunda</i>	- b - - - -
<i>Myrciaria tenella</i>	- b - - - -
<i>Neomitranthes cordifolia</i>	A - - - - -
<i>Neomitranthes glomerata</i>	A - - - - -
<i>Paramyrciaria tapiraguayensis</i>	- b - - - -
<i>Plinia rivularis</i>	A - - - - -
<i>Siphoeugenia reitzii</i>	A b - - - -
<i>Syzygium aromaticum</i>	- b - - - -

<i>Syzygium australe</i>	- b - - - -
<i>Syzygium cumini</i>	- b - - - -
<i>Syzygium guineense</i>	A - - - - -
<i>Syzygium jambos</i>	- b - - - -
<i>Syzygium kuskusense</i>	- b - - - -
<i>Syzygium malaccense</i>	A - B - - -
<i>Syzygium paniculatum</i>	- b - - - -
<i>Syzygium pondoense</i>	- b - - - -
<i>Syzygium suborbiculare</i>	- b - - - -

#### Appendix A.

Each specimen is identified by collector and collection number. All specimens are from the Arizona State University Herbarium (ASU) except for four specimens of *Calycorectes* from the New York Botanical Garden (designated with NY after the collection number). The highest and lowest of five counts are given first (if these are the same, only a single number is given), followed by the average of five counts. Thus, "1, 1.0" means all anthers had a single gland; "0-1.0, 0.8" means that anthers had zero to 1 gland and that the mean number for the specimen was 0.8.

*Calycorectes australis* Legrand: Hatschbach 19234 (NY), 1, 1.0; Kummrow & Hatschbach 2537, 1, 1.0.

*Calycorectes bergii* Sandwith: B.W. 6352 (NY), 1-6, 3.8; Cowan 38549 (NY), 5-8, 6.4.

*Calycorectes enormis* McVaugh: Bernardi 7095 (NY), 0-1, 0.8.

*Calycorectes grandifolius* Berg: Prevost 1692, 14 to 21, 16.6.

*Calycorectes mexicanus* Berg: Gereau et al. 2207, 0-1, 0.4.

*Calycorectes psidiflorus* (Berg) Sobral: Hatschbach 40564, 1, 1.0.

*Eugenia acapulcensis* Steud.: Pringle 8333, 1, 1.0.

*Eugenia acrensis* McVaugh: Foster 11317, 1, 1.0.

*Eugenia aeruginea* DC.: Gentle 6561, 1, 1.0; Gentle 8345, 1, 1.0.

*Eugenia anastomosans* DC.: Holst & Liesner 2737, 0-1, 0.4.

*Eugenia aurata* Berg: Gottsberger 13-141090, 0-1, 0.8; Pena 87, 0, 0.0.

*Eugenia bacopari* Legrand: Hatschbach & Kummrow 35744, 0-1, 0.6.

*Eugenia bahiana* Mattos: Hatschbach 30081, 0, 0.0.

- Eugenia bahiensis* DC.: Hatschbach & Silva 60078, 1-2, 1.2.
- Eugenia beaurepairiana* (Kiaerskov) Legrand: Hatschbach & Silva 53527, 0, 0.0.
- Eugenia biflora* (L.) DC.: Callejas et al. 2324, 0-1, 0.2; Froes 23476, 0-1, 0.6; Prance 28527, 1, 1.0; Zandoni et al. 36540, 1, 1.0.
- Eugenia bimarginata* Berg: Hatschbach 52981, 1, 1.0.
- Eugenia blastantha* (Berg) Legrand: Hatschbach 47122, 0, 0.0.
- Eugenia bocainensis* Mattos: Hatschbach & Silva 56137, 0-1, 0.2.
- Eugenia brasiliensis* Lam.: Folli 461, 0, 0.0.
- Eugenia brevistipitata* Lundell: Lundell & Conteras 20606, 1, 1.0.
- Eugenia brownsbergii* Amshoff: Black & Pires 780, 1, 1.0.
- Eugenia buxifolia* (Sw.) Willd.: Conteras 8602, 1, 1.0.
- Eugenia capuli* (Schlecht. & Cham.) Berg.: Conteras 3193, 1, 1.0; Conteras 3195, 1, 1.0; Lundell 17036, 1, 1.0.
- Eugenia catharinae* Berg: Krapovickas et al. 42115, 1, 1.0.
- Eugenia cereja* Legrand: Hatschbach 25940, 0, 0.0; Hatschbach et al. 54349, 0, 0.0.
- Eugenia chrysantha* Berg: Dubs 943, 1, 1.0; Pirani 1210, 0, 0.0.
- Eugenia coffeifolia* DC.: Granville et al. 9563, 1, 1.0; Villiers & Feuillte 1880, 1, 1.0;
- Eugenia convexinervia* Legrand: Hatschbach et al. 51225, 0, 0.0.
- Eugenia copacabanensis* Kiaerskov: Hatschbach 51869, 0-1, 0.4.
- Eugenia culminicola* McVaugh: Wetter et al. 2002, 1, 1.0.
- Eugenia dichroma* Berg: Hatschbach & Guimaraes 47066, 0, 0.0; Hatschbach et al. 58170, 0, 0.0.
- Eugenia egensis* DC.: Hatschbach 34571, 1-4, 2.6; Vasquez & Jaramillo 5821, 3-8, 5.2.
- Eugenia faramoides* A. Rich.: Hernandez 1316, 4-8, 6.0; Martinez 18942, 5-8, 6.8.
- Eugenia feijoi* Berg: Hartshorn & Quijano 2949, 0, 0.0.
- Eugenia florida* DC.: Granville et al. 8207, 0, 0.0; Peters s.n., ASU-148807, 1, 1.0; Silverstone-Sopkin et al. 6049, 1, 1.0.
- Eugenia foetida* Persoon: Zandoni et al. 29809, 1, 1.0; Zandoni et al. 40119, 0-1, 0.6.



***Eugenia hyemalis*** Cambess.: Hatschbach 39841, 1-6, 3.8; Placci & Arditi 136, 1, 1.0; Schinini et al. 27698, 2-5, 3.6.

***Eugenia inundata*** DC.: Froes 23477, 1, 1.0; Pires 84, 0-1, 0.6.

***Eugenia involucrata*** DC.: Ferrucci et al. 698, 0, 0.0.

***Eugenia itajurensis*** Cambess.: Hatschbach 30097, 1, 1.0.

***Eugenia kleinii*** Legrand: Silva & Cordeiro 155, 0-1, 0.6.

***Eugenia klotzschiana*** Berg: Hatschbach & Silva 51535, 0, 0.0.

***Eugenia kunthiana*** DC.: Mello-Silva et al. 754, 0, 0.0.

***Eugenia laevis*** Berg.: Conteras 8598, 1, 1.0; Lundell 15975, 1, 1.0.

***Eugenia letreroana*** Lundell: Conteras 5183, 1, 1.0.

***Eugenia ligustrina*** (Sw.) Willd.: Lewis 40424, 0, 0.0; Nee 35633, 0, 0.0.

***Eugenia lilloana*** Legrand: Landrum et al. 5716, 0, 0.0; Vanni & Randovancich 1034, 0, 0.0.

***Eugenia luciae*** Amshoff: Cremers 9898, 1, 1.0.

***Eugenia macrocalyx*** (Rusby) McVaugh: Callejas & Churchill 2385, 1, 1.0; Granville 7859, 0, 0.0.

***Eugenia monticola*** (Sw.) DC.: Zanoni & Pimentel 31670, 1, 1.0.

***Eugenia moraviana*** Berg: Nee 39035, 1, 1.0; Ribas & Cordeiro 133, 1, 1.0.

***Eugenia mosenii*** (Kausel) M. Sobral: Kummrow & Silva 3242, 5-11, 8.4.

***Eugenia multiovulata*** Mattos & Legrand: Hatschbach 40690, 0-1, 0.4; Silva & Hatschbach 454, 2-3, 2.2.

***Eugenia muricata*** DC.: Ayala et al. 3820, 1, 1.0; Neill 6252, 1, 1.0;

***Eugenia myrtifolia*** Cambess.: Hatschbach 19950, 0, 0.0.

***Eugenia octopleura*** Krug & Urb.: Haber 758, 1, 1.0; Haber 764, 1, 1.0.

***Eugenia oerstediana*** Berg: Ventura 8106, 0-1, 0.8.

***Eugenia olivacea*** Berg: Spada 78, 0, 0.0.

***Eugenia origanoides*** Berg: Conteras 8765, 1, 1.0; Gentle 4811, 1, 1.0.

***Eugenia ovalifolia*** Cambess.: Placci & Arditi 108, 1, 1.0.

***Eugenia paranaguensis*** Mattos & Legrand: Hatschbach & Silva 53534, 0, 0.0.

- Eugenia patrisii* Vahl.: Froes 22088, 1, 1.0.
- Eugenia perorebi* D. Parodi: Schulz 17,559, 1, 1.0.
- Eugenia pintanga* (Berg) Kiaerskov: Gottsberger 11-15990 , 0, 0.0.
- Eugenia platysema* Berg: Hatschbach & Silva 54113, 1, 1.0.
- Eugenia pluriflora* DC.: Hatschbach & Cordeiro 51723, 1, 1.0.
- Eugenia prosoneura* Berg: Zarucchi 3094, 2-4, 2.8.
- Eugenia pseudomalacantha* Legrand: Hatschbach 45280, 0, 0.0.
- Eugenia pseudopsidium* Jacq.: Blanco 389, 0, 0.0; Blanco 390, 0, 0.0; Prevost 1691, 0, 0.0.
- Eugenia puniceifolia* (HBK) DC.: Caballero Marmorini 1757, 1, 1.0; Hatschbach & Barbosa 56671, 1, 1.0; Holst & Liesner 2747, 1, 1.0; Queiroz & Crepaldi 1513, 0, 0.0.
- Eugenia pyriformis* Cambess.: Hatschbach & Silva 52438, 1, 1.0; Gottsberger 11-71090 , 0-1, 0.4.
- Eugenia ramiflora* Desvoux: Laprin 838, 3-7, 5.0.
- Eugenia repanda* Berg: Schulz 7644, 1, 1.0; Schulz 15882, 1-2, 1.4.
- Eugenia savannarum* Standley & Steyermark: Conteras 9607, 1, 1.0.
- Eugenia sellowiana* DC.: Hatschbach 34649, 0, 0.0.
- Eugenia speciosa* Cambess.: Cordeiro & Hatschbach 178, 1, 1.0; Hatschbach & Silva 55752, 1, 1.0;
- Eugenia squamiflora* Mattos: Hatschbach & Kummrow 57110, 0, 0.0.
- Eugenia stipitata* McVaugh: Jong & Shanley 151, 1, 1.0; Peters 146, 1, 1.0.
- Eugenia tapacumensis* Berg: Balée 2135, 6-10, 8.0; Schultz 7582, 4-12, 9.0.
- Eugenia trunciflora* (Cham. & Schlecht.) Berg: Campos 270, 0, 0.0.
- Eugenia uniflora* L.: Lau 2179, 0-1, 0.4; Placci & Arditi 116, 0, 0.0; Zardina 6052, 0, 0.0.
- Eugenia valerii* Standley: Croat 23054, 0, 0.0; McPherson 6689, 1, 1.0.
- Eugenia winzerlingii* Standley: Martinez 9312, 0, 0.0.
- Eugenia xalapensis* (HBK) DC.: Flores 201, 1, 1.0; Ventura 17586, 0-1, 0.8.

*Hexachlamys boliviana* Legrand: Nee 35343, 0, 0.0; Nee & Coimbra 35867, 0, 0.0.

*Hexachlamys edulis* (Berg) Kaus. et. Legr: Arbo et al. 5883, 1, 1.0; Macedo 2438, 0-1, 0.8.

*Myrcianthes callicoma* McVaugh: Vargas 901, 1, 1.0.

*Myrcianthes coquimbensis* (Barn.) Landrum & Grifo: Landrum et al. 5643, 1, 1.0; Landrum et al. 5654, 1, 1.0; Landrum et al. 5632, 0-1, 0.6.

*Myrcianthes fragrans* (Sw.) McVaugh: Martinez 70, 1, 1.0; Torres & Campos 10836, 1, 1.0; Zanoni et al. 36615, 1, 1.0.

*Myrcianthes gigantea* (Legrand) Legrand: Hatschbach 43457, 1, 1.0; Wasum & Bastos 8004, 1, 1.0.

*Myrcianthes mato* (Griseb.) McVaugh: Landrum et al. 5757, 1, 1.0; Landrum et al. 5772, 1, 1.0.

*Myrcianthes myrsinoides* (HBK) Grifo: Silverstone-Sopkin et al. 4413, 1, 1.0; Ulloa 519, 1, 1.0.

*Myrcianthes osteomeloides* (Rusby) McVaugh: Lewis 3511, 0-1, 0.2.

*Myrcianthes pungens* (Berg) Legrand: Hatschbach & Silva 55787, 1, 1.0; Zardini & Aguayo 14801, 0-1, 0.4; Zardini & Velasquez 14566, 1, 1.0.

*Myrciaria cordifolia* Legrand: Cordeiro & Silva 344, 0, 0.0.

*Myrciaria cuspidata* Berg: Hatschbach 48091, 1, 1.0; Zardini et al. 9064, 1, 1.0.

*Myrciaria delicatula* (DC.) Berg: Krapovickas & Schinini 38202, 0-1, 0.6; Wasum et al. 5350, 1, 1.0.

*Myrciaria floribunda* (West ex Willd.) Berg: Froes 23475, 1, 1.0. Gentle 4837, 1, 1.0; Gentle 8931, 1, 1.0; Hatschbach & Silva 54928, 1, 1.0; Pruski et al. 3350, 1, 1.0.

*Myrciaria tenella* (DC.) Berg: Ginzburg et al. 868, 1, 1.0; Silva & Cordeiro 99, 1, 1.0.

*Neomitranthes cordifolia* (Legrand) Legrand: Hatschbach 19635, 0-1, 0.4.

*Neomitranthes glomerata* (Legrand) Legrand: Hatschbach 19578, 0, 0.0; Hatschbach & Cordeiro 51277, 0, 0.0.

*Paramyrciaria tapiraguayensis* (Barb. Rodr.) Sobral: Hatschbach et al. 58872, 1, 1.0.

*Plinia rivularis* (Cambess.) Rotman: Brunner et. al. 888, 0, 0.0; Perez 241, 0, 0.0; Vanni et. al. 2821, 0, 0.0.

*Sipho Eugenia reitzii* Legrand: Cordeiro & Zelma 269, 0-1, 0.6; Hatschbach & Silva 59182, 1, 1.0.

*Syzygium aromaticum* Merr. & Perry: Lehto 16370, 1, 1.0.

*Syzygium australe* Wendl. ex Link B. Hyland: Lehto L7359, 1, 1.0; collector unknown, ASU 156228, 1, 1.0.

*Syzygium cumini* (L.) Skeels: Lehto 16308, 1, 1.0; Pipoly & Ameer 9095, 1, 1.0; Sylvia & Lehto 16330, 1, 1.0.

*Syzygium guineense* (Willd.) DC.: Brown & Opayemi 1025, 0-1, 0.8.

*Syzygium jambos* (L.) Alston: Boom 7052, 1, 1.0; Hernandez 519, 1, 1.0; Ulloa 177, 1, 1.0; Wendt et al. 2372, 1, 1.0.

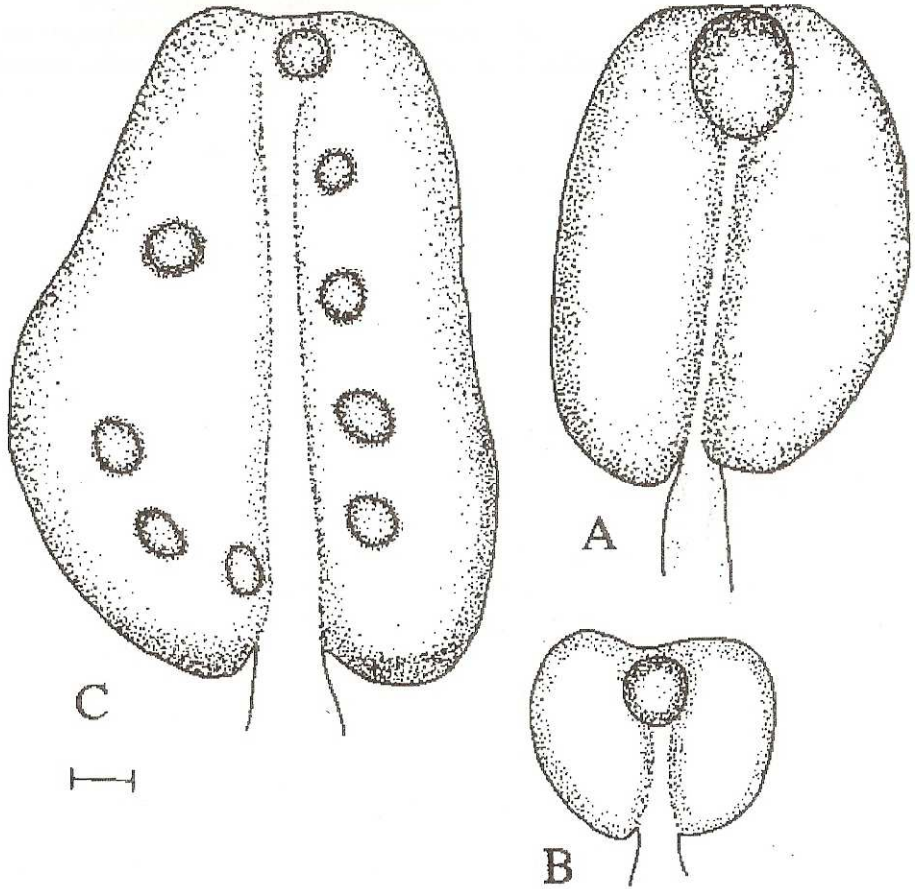
*Syzygium kuskusense* (Hay) Mori: Kao 7316, 1, 1.0.

*Syzygium malaccense* (L.) Merr. & Perry: Rudas et al. 3039, 1-3, 1.6; Tellez & Martinez 8734, 0-2, 0.8; collector unknown 252, ASU-84770, 0-1, 0.4.

*Syzygium paniculatum* Gaertn.: collector unknown, ASU-156229, 1, 1.0.

*Syzygium pondoense* Engl.: Van Wyk & Mathews 7830, 1, 1.0.

*Syzygium suborbiculare* (Benth.) Hartly & Perry: Hind & Forlonge 2684, 1, 1.0.



**Fig. 1. Anthers of American Eugeniinae.** A. *Eugenia speciosa* (Coreiro 178) with one terminal gland. B. *Myrciaria floribunda* (Gentle 8931) with one terminal gland. C. *Eugenia tapacumensis* (Balee 2135) with nine glands. Bar = 0.1 mm.