Revision and taxonomic position of the genus **Euphronia** Martius ex Martius & Zuccarini (Vochysiaceae)

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Abstract

In this paper the generic name **Euphronia** Martius ex Martius & Zuccarini is recognized as the valid name for what has commonly been known as **Lightia** Rob, Schomburgk. The taxonomic position of the genus has been reconsidered, and **Euphronia** has been removed from the Trigoniaceae, and placed in the Vochysiaceae with which its affinities are closest. Only one species has been recognized, due to the high variability in size and shape of the leaves.

The genus *Euphronia* was originally published by Martius and Zuccarini in 1825, based on material collected by Martius, and placed in Kunth's family Spiraeaceae. No further material of the genus was studied until 1847, when Robert Schomburgk published the genus *Lightia* based on material from his own collections.

Lightia has proven to be a synonym for *Euphronia*. *Lightia* is not only unnecessary, but is also invalidated by Schomburgk's usage of the same generic name in a previous (1844) publication to designate what is now known as *Herrania* in the Sterculiaceae; Although illegitimate, *Lightia* has persisted in the literature in spite of occasional references to the correct name. This may be partially due to Warming's usage of *Lightia* in his treatment of the Trigoniaceae for *Flora Brasiliensis* in 1875.

In the present treatment, I am re-establishing *Euphronia* as the correct generic name for the genus. I am also removing the genus from the Trigoniaceae, and placing it in the Vochysiaceae, the family with which its affinities are closest, as will be discussed here.

TAXONOMIC POSITION OF **EUPHRONIA**

Euphronia was placed in the Trigoniaceae by Warming (1875), a decision later questioned on morphological grounds by Chodat (1895) and on anatomical grounds by Barth (1896). Nevertheless, until now *Euphronia* has remained in the Trigoniaceae of all authors. There are, however, many marked anatomical and morphological differences between *Euphronia* and Trigoniaceae. sens. str. A comparison of some characters in Trigoniaceae, *Euphronia* and Vochysiaceae is given below.

Trigoniaceae	*Euphronia*	Vochysiaceae
Pollen 3-5 porate	Pollen tricolporate	Pollen tricolporate
Petals 5	Petals 3	Petals 1-5
Stamens all connate in one structure	Stamens in 2 or 3 groups	Stamens in 1-several groups
Staminodes 0-several	Staminode 1	Staminodes several
Disc glands present	Disc glands absent	Disc glands absent
Ovary lacking a central column	Ovary with a central column	Ovary with a central column

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Trigoniaceae	*Euphronia*	Vochysiaceae
Placentation on inner ends of of the lateral septa	Placentation axile	Placentation axile
Fibers not libriform	Fibers libriform	Fibers libriform
Parenchyma apotracheal	Parenchyma paratracheal	Parenchyma paratracheal
Pith lacking sclereids	Pith with sclereids	No data
Foliar bundles immediately fused with the stele	Foliar bundles extending some distance (down the stem) before fusing with the stele	Foliar bundles extending some distance (down the stem) before fusing with the stele
Petiole epidermis simple	Petiole epidermis multiple and collenchymatous	No data
Hypodermis absent in leaf	Hypodermis present in leaf	Hypodermis present in some leaves
Palisade parenchyma of 1-2 stratified layers	Palisade parenchyma of 2-several irregularly disposed layers	No data

Using anatomical evidence, Barth considered *Euphronia* a possible intermediate between Trigoniaceae and Dichapetalaceae, but at the same time noted that anatomically it could be accommodated in either family. Metcalfe & Chalk (1950) observed the anatomical similarity between Trigoniaceae and Vochysiaceae; several important anatomical characters are shared by *Euphronia* (considered by Metcalfe & Chalk as Trigoniaceae) and Vochysiaceae but are not found in Trigoniaceae. For example, both *Euphronia* and Vochysiaceae have libriform fibers, paratracheal parenchyma, and very small cells on the upper epidermis of the leaf. Intraxylary phloem, the character given most emphasis by Metcalfe and Chalk to distinguish Trigoniaceae and Vochysiaceae, is not found in *Euphronia* (Heimsch, 1942). Although intraxylary phloem is very common in Vochysiaceae, it is not present in all of that family (Metcalfe and Chalk, 1950). This holds true for many families in which this character occurs; that is, usually occurs in a large number of species or genera of a family, but not in all.

Morphological comparison between *Euphronia* and Vochysiaceae shows that the only major difference is in the number and arrangement of stamens and staminodes; the Vochysiaceae, as currently delimited, usually has only 1 fertile stamen and several staminodes, while *Euphronia* has several fertile stamens and one staminode. The staminode in *Euphronia* occupies the position of the fertile stamen in Vochysiaceae. This comparatively small difference in stamen number and arrangement does not seem to me to be sufficient evidence to maintain *Euphronia* apart from Vochysiaceae. It is a relatively easy evolutionary step to change the stamen number in response to selective pressure. It is highly possible that *Euphronia* and Vochysiaceae have diverged from a common ancestor all of whose stamens were fertile, but have diverged in degrees of reduction in the number of stamens.

During the course of my research on the Trigoniaceae, I have come to agree with Chodat (1895) and Barth (1896) that *Euphronia* does not belong in the Trigoniaceae. I believe that the relationships of *Euphronia* are with the Vochysiaceae, and consider that it is superfluous to create a new family to accommodate this unusual genus. I propose to return *Euphronia* to the Vochysiaceae, with which its affinities are closest.

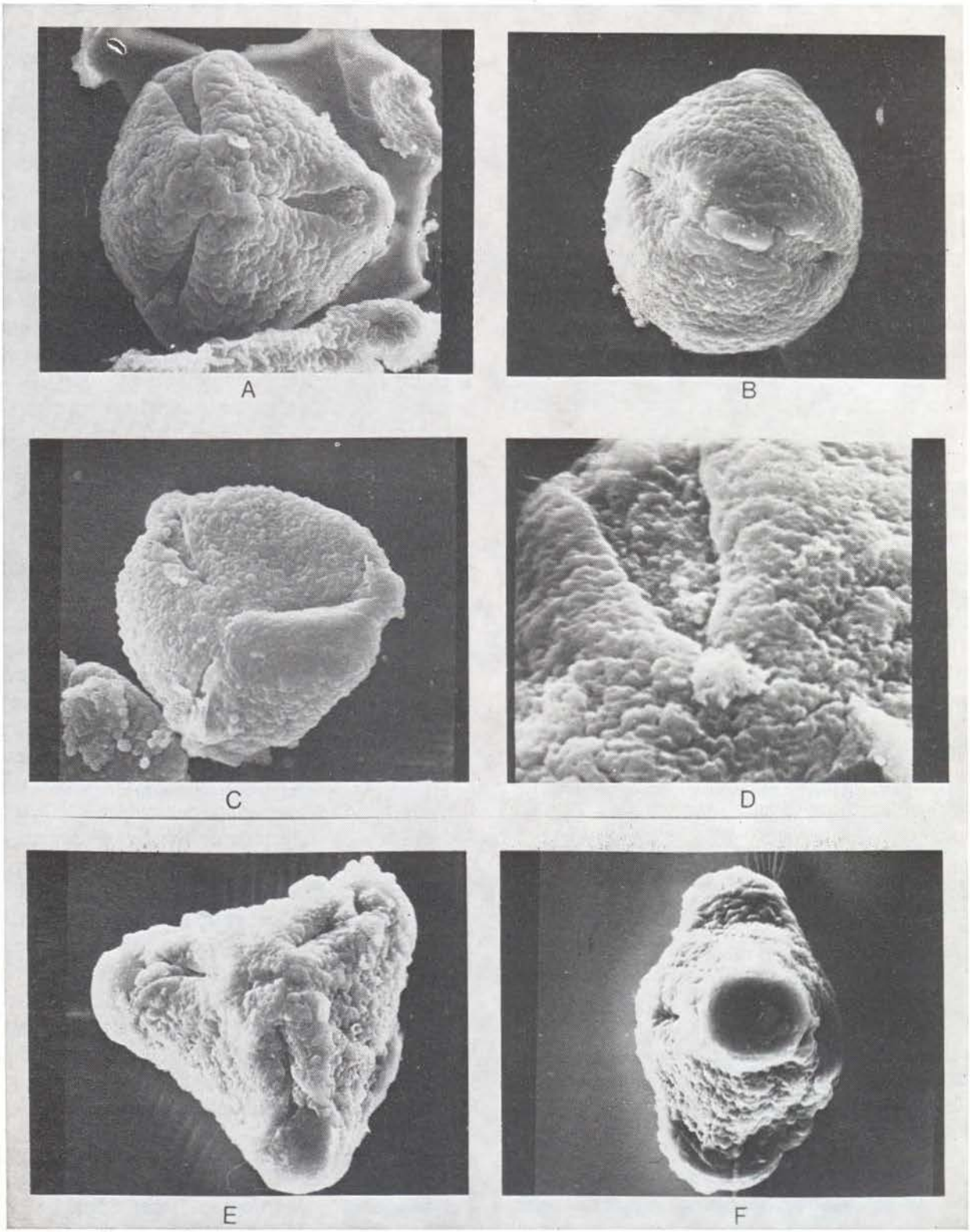

Fig. 1. Scanning electron micrographs of pollen of **Euphronia hirtelloides** . A-B, Maguire et al. 33293, X 660; C-D, **Maguire et al. 34546,** C X 660, D X 2000; E-F, **Vareschi & Jaffe 8016,** E X 660, F X 600.

Euphronia Martius ex Martius & Zuccarini, Nov. Gen. Sp. Pl. Flora 7 (1): 32. 1825; Martius & Zuccarini, Nov. Gen. Sp. 121. 1826.

Lightia Rob. Schomburgk, in Linnaea 20 : 753. 1847; Warming, (Trigoniaceae) Mart. Fl. Bras. 13(2) : 121. 1875.

Tree or shrub, branches terete. Leaves simple, alternate, petiolate, the margins revolute. Inflorescences terminal and subterminal racemes.

Sepals 5, quincuncial, unequal; petals 3, imbricate, adnate to the staminal tube; stamens 5 (-7), fertile 4 (-6), staminode 1, connate into a tube surrounding the ovary, the tube divided to the base opposite the staminode; fertile stamens of two lengths, and divided into two groups separated by the staminode; anthers basifixed, bilocular, introrse, dehiscing along a central slit; ovary trilocular, the ovules anatropous, two per locule; placentation axial. Fruit a trivalvate capsule, dehiscing from the apex towards the base. Seed one per locule.

TYPE SPECIES — *Euphronia hirtelloides* Martius ex Martius & Zuccarini.

DISTRIBUTION — A monotypic tropical genus known only from the Guiana crystalline shield of northern South America.

1 *Euphronia hirtelloides* Martius ex Martius & Zuccarini, Nov. Gen. et Sp., Pl. Flora 7(1) : 32. 1825; Martius & Zuccarini, Nov. Gen. et Sp. 122. 1826.

Lightia guianensis Rob. Schomburgk, in Linnaea 20: 754. 1847; Warming, (Trigoniaceae) Mart. Fl. Bras. 13 (2): 121. 1875. Type. No specimen.

Lightia licanoides Warming (Trigoniaceae) Mart. Fl. Bras. 13 (2): 122. Type. **Spruce 3413**, Venezuela, Amazonas, Casiquiare, fl (holotype W; isotypes F, G, GH, GOET, NY, W).

Tree or shrub, branches terete, lanate pubescent when young, becoming glabrous with age. Leaves with petioles (2.0-) 3.0-6.0 (-7.0) mm long, 1.1-2.0 mm thick, lanate pubescent or glabrous; lamina elliptic to obovate, sometimes ovate, 1.0-5.5 cm long, 3.0-3.6 cm wide, subcoriaceous to coriaceous, the abaxial surface glabrous intercostally, the adaxial surface lanate; midrib plane above, prominulous beneath, lanate pubescent on both surfaces, the secondary nervation inconspicuous, the margins entire to revolute, the revolute portion of variable width, the apex acute or acuminate, the base obtuse. Inflorescences terminal and subterminal racemes 2.0-13.0 cm long, 1-15-flowered, the subterminal ones subtended by leaves, the axis lanate pubescent. Flowers subtended by subulate bracts, 0.3-1.7 mm long, 0.1-0.8 mm wide, barbate pubescent, caducous; pedicels 2.5-5.0 mm long, 0.9-1.2 mm thick, lanate or strigose pubescent; sepals unequal, the outer ones ovate to subtriangular, 4.0-6.0 mm long, 1.8-3.0 mm wide, the margins entire, sometimes with papillae, the apex acute, the base truncate, strigose-pubescent on both surfaces, the inner ones broadly oblong, the margins entire, the apex acute, the base truncate, strigose-pubescent along exposed portions, lanate-pubescent on protected areas; petals unequal, spathulate, lilac to purple, 9.0-16.0 mm long, 4.0-7.0 mm wide, apex rounded, irregular, base truncate, slightly strigose pubescent on both surfaces; stamens of 2 lengths, the longer with filaments 7.0-13.0 mm, exceeding the shorter ones by ca 2.0 mm, and united with them for the basal 2.0-4.5 mm, the anthers reddish-brown, ovate or oblong, 1.5-2.5 mm long, 1.0-1.4 mm wide; style 9.0-13.0 mm long, geniculate 2.0-3.0 mm from the apex, pilose or lanate pubescent, the stigma trilobate, 0.5-0.8 mm in diameter, ca 0.6 thick, cream; ovary subglobose to globose, 1.0-3.0 mm in diameter, lanate pubescent, the ovules 2 per locule. Fruit with valves 1.2-1.6 cm long, 3.5-5.0 (-5.5) mm wide per side; exocarp thin (ca 0.3 mm), fleshy, lanate pubescent, attached to the persistent style; endocarp cartilaginous, tan colored. Seeds subtrullate, slightly winged, 9-11 mm long 3-5 mm wide, glabrous, reddish-brown.

TYPE — *Martius* sn, Colombia, Putumayo, fr (lectotype M; isotype M). The type locality was given by Martius as "Inter Coari et Ega". This locality is phytogeographically improbable as this species is otherwise only known from the Guiana crystalline shield where it is widespread. The only place within the Guiana crystalline shield visited by Martius was the Ara-

racuara Hills near the Putumayo river, and more recent collections from this area are morphologically similar to the type. It is probable that the locality for the type is erroneous.

DISTRIBUTION — Known only from savannas on the Guyana crystalline shield. COLOMBIA. Amazonas: *Maguire, Maguire & Fernández 44153* fl (COL, NY). VENEZUELA. Território Amazonas: *Maguire & Wurdack 34525* fl (COL, NY, VEN); *Maguire & Wurdack 34546* fl (NY, VEN); *Maguire, Wurdack & Keith 41813* fl (NY, VEN), *Medina 83975* fl (VEN); *Vareschi* & Jatte 74033 fl (VEN). *Bolivar: Agostini* 258 fl (NY, VEN); *Bernardi* 2626 fl (NY); *Cardona* 2443 fl (VEN); *Cardona* 2726 fl (NY); *Cardona* 2872 fl (US); *Lasser* 1273 fl (NY, VEN); *Maguire* 32283 fl (COL, NY, VEN); *Maguire 33717* fl (COL, NY, VEN); *Rutkis & Foldats* 540 fl (VEN); *Steyermark 60274* fl (F, MO, US, VEN); *Steyermark 75330* fl (F, NY, VEN); *Tamayo 2699* fl (F, US, VEN). BRAZIL. Amazonas: *Ducke* 159a fl (NY), *Fróes 22753* fl, fr (COL, GH, IAN, M, MO, NY, U, US, VEN). *Pires 15036* st (IAN, INPA). Roraima: *Ducke 1407* fl (F, GH, MG, NY, US); *Pires, Cavalcante & Magnano 14021* fl (MG); *Pires, Cavalcante, Magnano & Silva 14190* st (IAN, INPA, INPA); *Ule 8628* fl (G,L).

This species is extermely variable in respect to leaf morphology, the character that was used previously to separate it into two species. No consistency, geographical or otherwise, can be noted in respect to leaf shape, size or pubescence, thus making it impossible to delimit varieties.

RESUMO

Nesta publicação o nome genérico **Euphronia** Martius ex Martius & Zuccarini é reconhecido como o nome válido para o que tem sido comumente conhecido como **Lightia** Rob. Schomburgk.

A posição taxonômica do gênero tem sido reconsiderada, e **Euphronia** foi excluído das Triponiaceae, sendo inserido nas Vochysiaceae, família com a qual tem maior afinidade.

Somente uma espécie foi reconhecida, devido a alta variabilidade na forma e tamanho das folhas.

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