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Autor: Wasshausen, Dieter C. / Ezcurra, Cecilia

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New names and new combinations in *Justicia* sects. *Simonisia*, *Plagiacanthus* and *Orthotactus* (Acanthaceae) from southern South America

DIETER C. WASSHAUSEN
&
CECILIA EZCURRA

ABSTRACT

WASSHAUSEN, D. C. & C. EZCURRA (1997). New name and new combinations in *Justicia* sects. *Simonisia*, *Plagiacanthus* and *Orthotactus* (Acanthaceae) from southern South America. *Candollea* 52: 171-179. In English, English and Spanish abstracts.

Seven new combinations and a new name are proposed in *Justicia*: *Justicia asclepiadea* (Nees) Wassh. & C. Ezcurra, *J. consanguinea* (Lindau) Wassh. & C. Ezcurra, *J. consanguinea* var. *pubescens* (Lindau) Wassh. & C. Ezcurra, *J. mandonii* (Lindau) Wassh. & C. Ezcurra, *J. phyllocalyx* (Lindau) Wassh. & C. Ezcurra, *J. oncodes* (Lindau) Wassh. & C. Ezcurra, *J. corumbensis* (Lindau) Wassh. & C. Ezcurra and *J. chacoënsis* Wassh. & C. Ezcurra, based on epithets of species previously described in *Simonisia*, *Beloperone* and *Poikilacanthus*. In addition, several other new synonymies are proposed. The pollen morphology and taxonomic position of the seven species is discussed, and their geographic distribution is given. All are little known species that occur in eastern Bolivia, south-central Brazil, Paraguay, and/or northern Argentina.

RESUMEN

WASSHAUSEN, D. C. & C. EZCURRA (1997). Nuevo nombre y nuevas combinaciones en *Justicia* sects. *Simonisia*, *Plagiacanthus* y *Orthotactus* (Acanthaceae) de Sudamérica austral. *Candollea* 52: 171-179. En Inglés, resúmenes en Inglés y Español.

Se proponen siete nuevas combinaciones y un nuevo nombre en *Justicia*, basados en epítetos de especies previamente descritas en *Simonisia*, *Beloperone* y *Poikilacanthus*: *Justicia asclepiadea* (Nees) Wassh. & C. Ezcurra, *J. consanguinea* (Lindau) Wassh. & C. Ezcurra, *J. consanguinea* var. *pubescens* (Lindau) Wassh. & C. Ezcurra, *J. mandonii* (Lindau) Wassh. & C. Ezcurra, *J. phyllocalyx* (Lindau) Wassh. & C. Ezcurra, *J. oncodes* (Lindau) Wassh. & C. Ezcurra, *J. corumbensis* (Lindau) Wassh. & C. Ezcurra y *J. chacoënsis* Wassh. & C. Ezcurra. Además se proponen varias otras sinonimias nuevas. Se discute la morfología del polen y la posición taxonómica de las siete especies tratadas, y se da su distribución geográfica. Todas son especies poco conocidas que habitan el este de Bolivia, el centro-sur de Brasil, Paraguay, y/o el norte de Argentina.

KEY-WORDS: *Justicia* – ACANTHACEAE – Palynology – Taxonomy – Nomenclature.

Introduction

Justicia is the largest and taxonomically most complex genus of the *Acanthaceae*. Traditionally, studies in the genus have followed two opposite trends, either recognizing a large number of small segregate genera, or adopting a very broad definition of *Justicia* that includes

them all as synonyms. The problems of generic synonymy of this genus have been discussed several times in the last quarter of the century (e.g., EZCURRA, 1988; GIBSON, 1972; GRAHAM, 1988; McDADE, 1982).

Currently *Justicia* is treated by most authors in its broadest sense following GRAHAM (1988) (e.g. DANIEL, 1995; KAMEYAMA, 1995; PROFICE, 1993; WASSHAUSEN, 1992), and estimates of 420 (DURKEE, 1986) to 600 species (GRAHAM, 1988) have been published for it during the last ten years.

Species of *Justicia* are cytologically diverse (DANIEL & al., 1984; PIOVANO & BERNARDELLO, 1991) and morphologically very variable (GRAHAM, 1988), but are generally characterized by their two-lipped corollas with a stylar furrow on the upper lip, their two stamens (and no staminodes) exerted under the upper lip, their 2-3(-4) porate or colporate, subprolate to perprolate pollen, and their four-seeded capsules.

During revisionary work on the *Acanthaceae* of South America we have discovered several species that we consider that have to be treated within the limits of *Justicia*. We make the necessary new names, combinations and synonymies below. We also place them in a sectional position based on macromorphological characters, and comment on their pollen morphology, taxonomic relations, and geographic distribution in southern South America.

Material and methods

The present study is based on the investigation of herbarium material deposited at the United States National Herbarium (US) and from specimens obtained on loan from the following herbaria: BM, C, GZU, G, K, P, LIL, RB, U (abbreviations according to HOLMGREN & al., 1990). For the photomicrographs, pollen from at least one individual of each species was examined with a scanning electron microscope (Hatachi 911b SEM) for shape, size and exine sculpture. Untreated air dried pollen grains were taken directly from herbarium specimens, floated onto glass cover slips which in turn were affixed to aluminium stubs. The specimens were subsequently sputter-coated with gold. We did not attempt to acetolyse the material because, in most instances, we did not have sufficient flowering material to sacrifice the anthers.

Results

Justicia sect. *Simonisia* (Nees) V. A. W. Graham

Justicia asclepiadea (Nees) Wassh. & C. Ezcurra, **comb. nova**

≡ *Simonisia asclepiadea* Nees in Mart., Fl. Bras. 9: 145. 1847.

Holotype: BRAZIL, Mato Grosso: "Serra da Chapada", Riedel 1063 (LE). **Isotype:** (GZU!).

= *Justicia alboreticulata* Lindau in Bull. Herb. Boissier ser. 2, 5: 370. 1905.

Syntypes: BRAZIL, Mato Grosso: "Serra da Chapada", Malme 3449 (B, destroyed; F photo B 8805); «Santa Anna da Chapada», Malme 3449a (B, destroyed).

Geographical distribution. – In gallery forest and margins of campo cerrado in the states of Goias, Mato Grosso and Minas Gerais, Brazil and in Bolivia, department of Santa Cruz.

Justicia asclepiadea is characterized by presenting 2-colporate pollen (Fig. 1 A, B), with the trema area traversed by 4 rows of insulae that tend to join and form 2 raised bands towards the poles. The reticulum outside the trema area has large lumina containing circular elements

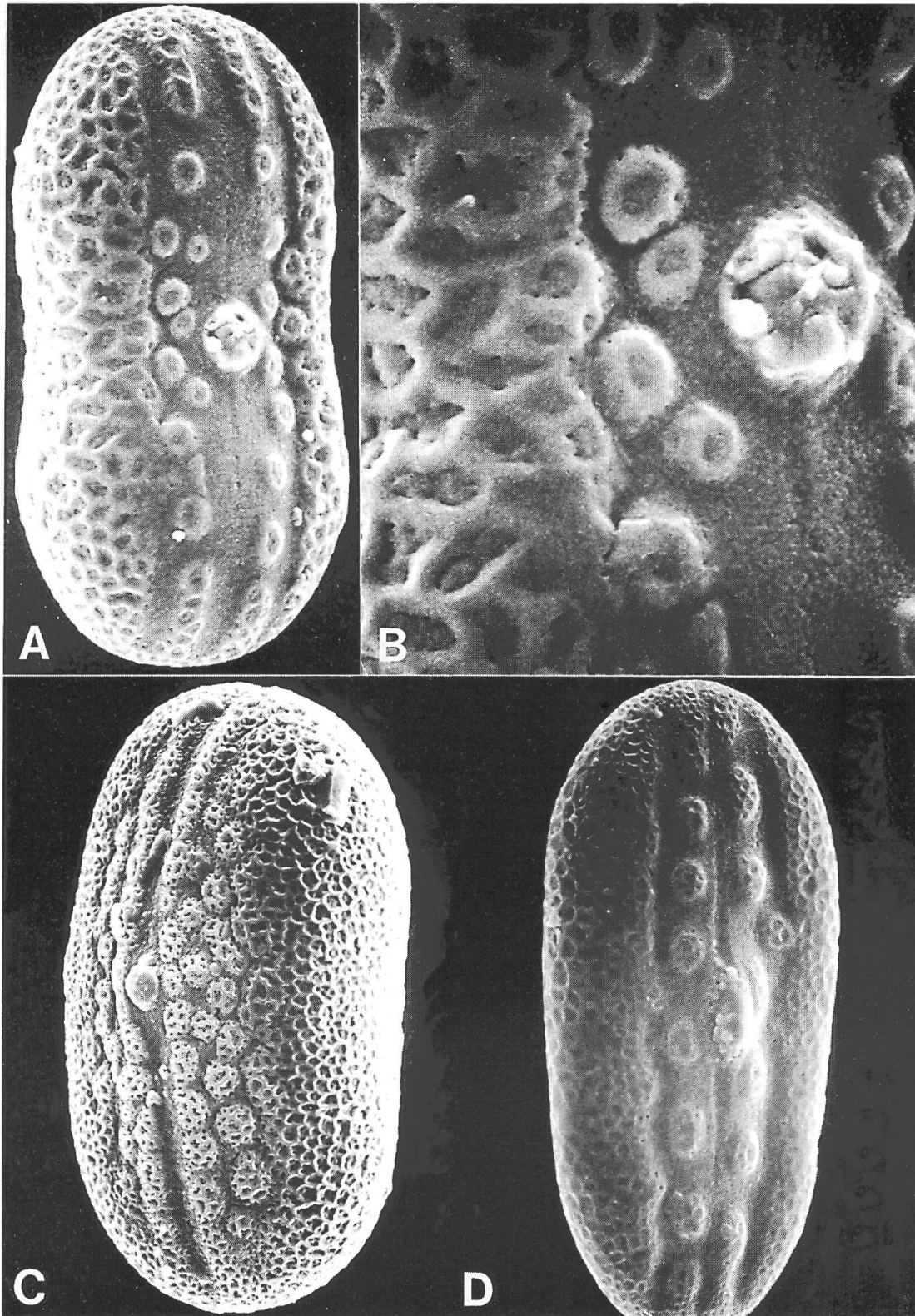


Fig. 1. – Scanning electron (SEM) photomicrographs of *Justicia* pollen.

A, B, *J. asclepiadea* (Kirkbride 3314). **A**, equatorial view, $\times 1300$; **B**, portion of surface, $\times 3500$. – **C**, *J. consanguinea*, equatorial view, $\times 1300$ (Beck 870). – **D**, *J. mandonii*, equatorial view, $\times 1300$ (Steinbach 9853).

(tips of columellae) (Fig. 1 B). This type of pollen is similar to type 10 of GRAHAM (1988), described by this author, together with type 7, as characteristic of species of sect. *Simonisia*.

Justicia consanguinea* (Lindau) Wassh. & C. Ezcurra, *comb. nova

≡ *Beloperone consanguinea* Lindau in Bull. Herb. Boissier 5: 676. 1897.

Holotype: BOLIVIA, La Paz: “Larecaja, in the vicinity of Sorata near San Pedro”, Mandon, 298 (B, destroyed; F photo B 8927). **Isotypes:** BM!, G!, K!, P!.

Geographical distribution. – In sandy soils in xeromorphic shrublands and along slopes of semi-deciduous forests in Bolivia’s departments of La Paz, Cochabamba, Santa Cruz and Potosi.

Justicia consanguinea presents 2-colporate pollen (Fig. 1 C), with the trema area traversed by 4(-6) rows of insulae that tend to join and form 2(-4) raised bands towards the poles. The reticulum outside the trema area has large lumina (though smaller than in *J. asclepiadea* and not containing circular elements). This type of pollen is somewhat intermediate between types 7 and 10 to GRAHAM (1988), both present in species of sect. *Simonisia*.

Justicia consanguinea* var. *pubescens* (Lindau) Wassh. & C. Ezcurra, *comb. nova

≡ *Beloperone consanguinea* var. *pubescens* Lindau in Bull. Herb. Boissier 5: 676. 1897.

Syntype: BOLIVIA, La Paz: “Larecaja, in the vicinity of Sorata, Cerro Iminapi”, Mandon 297 (B, destroyed; F photo B 8936 as “*Beloperone mandoni*” Lindau; BM!, G!, K!, P!).

Geographical distribution. – At edge of forests in Bolivia’s department of La Paz.

Justicia consanguinea var. *pubescens* and var. *consanguinea* are sympatric, and studies of additional material could prove them to be ecologic forms of a single, variable, species.

Justicia mandonii* (Lindau) Wassh. & C. Ezcurra, *comb. nova

≡ *Beloperone mandonii* Lindau in Bull. Herb. Boissier 5: 675. 1897.

Holotype: BOLIVIA, La Paz: “Larecaja, in the vicinity of Sorata, Cerro Iminapi”, Mandon 297 (B, destroyed). **Isotypes:** BM!, K!, P!.

= *Justicia odonellii* N. De Marco & Ter. Ruiz in Publ. Espec. Inst. Lillo: 53. 1976.

≡ *Justicia tucumanensis* Lillo in Lilloa 1: 59. 1937 [nom. nudum].

Holotype: ARGENTINA, Tucumán: Dpto. Chicligasta: “Puesto Las Pavas”, Meyer 15125 (LIL!).

Geographical distribution. – In semi-deciduous forests in Bolivia (La Paz) and northern Argentina (Jujuy, Salta and Tucumán).

Justicia mandonii presents 2-colporate pollen (Fig. 1 D), with the trema area traversed by 2(-4) rows of insulae that tend to join and form 2 raised bands towards the poles. The reticulum outside the trema area has large lumina, and is similar to that of *J. consanguinea*. This type of pollen is somewhat intermediate between types 7 and 10 of GRAHAM (1988), both present in species of sect. *Simonisia*.

***Justicia phyllocalyx* (Lindau) Wassh. & C. Ezcurra, comb. nova**

- ≡ *Poikilacanthus phyllocalyx* Lindau in Bot. Jahrb. Syst. 25, Beibl. 60: 48. 1898.
Holotype: BRAZIL, Goyas: “between As Brancas and Cocal”, *Glaziou 21876* (B, destroyed; F photo B 8785). **Isotypes:** BR!, P!.
- = *Sericographis macedoana* Rizzini in Arq. Jard. Bot. Rio de Janeiro 8: 357. 1948.
Holotype: BRAZIL, Minas Gerais: “Uberlandia”, *Macedo 952* (RB!). **Isotype:** U!
- = *Sericographis macedoana* f. *redacta* Rizzini in Dusenya 3: 189. 1952.
Holotype: BRAZIL, Minas Gerais: “Ituiutaba”, *Macedo 1617* (RB!). **Isotype:** US!

Geographical distribution. – Common in the cerrado and campo areas of the planalto of Brazil (Mato Grosso, Goias, Federal District and Minas Gerais) and northeastern Paraguay (Amambay).

Justicia phyllocalyx is characterized by its 2-colporate pollen (Fig. 2 A), as in most species of *Justicia*, but its whole surface is covered by raised, more or less circular insulae, arranged in approximately 10 subparallel longitudinal rows. The insulae in the two rows bordering each colporous tend to join towards the poles forming 2 raised bands. All the insulae are coarsely reticulate and present large lumina in which the tips of the columellae appear as circular elements (Fig. 2 B). In these two latter aspects, the pollen of *J. phyllocalyx* is clearly similar to that described as type 10 by GRAHAM (1988), characteristic of species of *Justicia* sect. *Simonisia*.

Justicia phyllocalyx was originally described by Lindau in the related genus *Poikilacanthus*, due to its unique pollen ornamentation of raised insulae covering the whole surface of the grain. However, the pollen of *Poikilacanthus* is typically 5-6 porate (DANIEL, 1991; PETRIELLA, 1968; RAMAMOORTHY, 1989). Therefore we consider that this species with 2-aperturate pollen grains should be treated in *Justicia*. Nevertheless, we agree with DANIEL (1991) in that detailed studies of both genera are needed to assess whether *Poikilacanthus* should be maintained as distinct from *Justicia*.

***Justicia oncodes* (Lindau) Wassh. & C. Ezcurra, comb. nova**

- ≡ *Poikilacanthus oncodes* Lindau in Bot. Jahrb. Syst. 25, Beibl. 60: 48. 1898.
Holotype: BRAZIL, Goyas: “Chapada dos Veadeiros, at Jaz. de Boa de Vista”, *Glaziou 21869* (B, destroyed; F photo B 8784). **Isotypes:** BR!, P!.
- = *Poikilacanthus humilis* Lindau in Bull. Herb. Boissier 3: 481. 1895 [non *Justicia humilis* Michx., Fl. Bor.-Amer. 1: 8. 1803].
Holotype: BRAZIL, São Paulo: “Campo Franco”, *Lofgren & Edwall 2040* (B, destroyed; F photo B 8781). **Isotype:** C!.
- = *Sericographis macedoana* var. *elegans* Rizzini in Dusenya 3: 189. 1952.
Holotype: BRAZIL, Minas Gerais: “Ituiutaba”, *Macedo 1604* (RB). **Isotype:** US!.

Geographical distribution. – Common in campo on red clay or cerrado or in sandy soils in gallery and adjacent cerrado on the planalto of Brazil, in the states of Bahiá, Goias, Minas Gerais and São Paulo, and in the Federal District.

Justicia phyllocalyx and *J. oncodes* are sympatric species. They can be distinguished from each other, especially in the field, because *J. phyllocalyx* is distinctly and prominently pubescent (branches, leaf blades, calyx lobes), whereas *J. oncodes* has branches that are usually either decumbent or ascending while in *J. phyllocalyx*, they are often scandent.

Justicia oncodes is clearly related to *J. phyllocalyx*, and has a very similar type of pollen (Fig. 2 C, D). This species was also originally described by Lindau in *Poikilacanthus* due to its whole pollen surface covered by raised insulae, but it also presents the biaperturate pollen typical of *Justicia*.

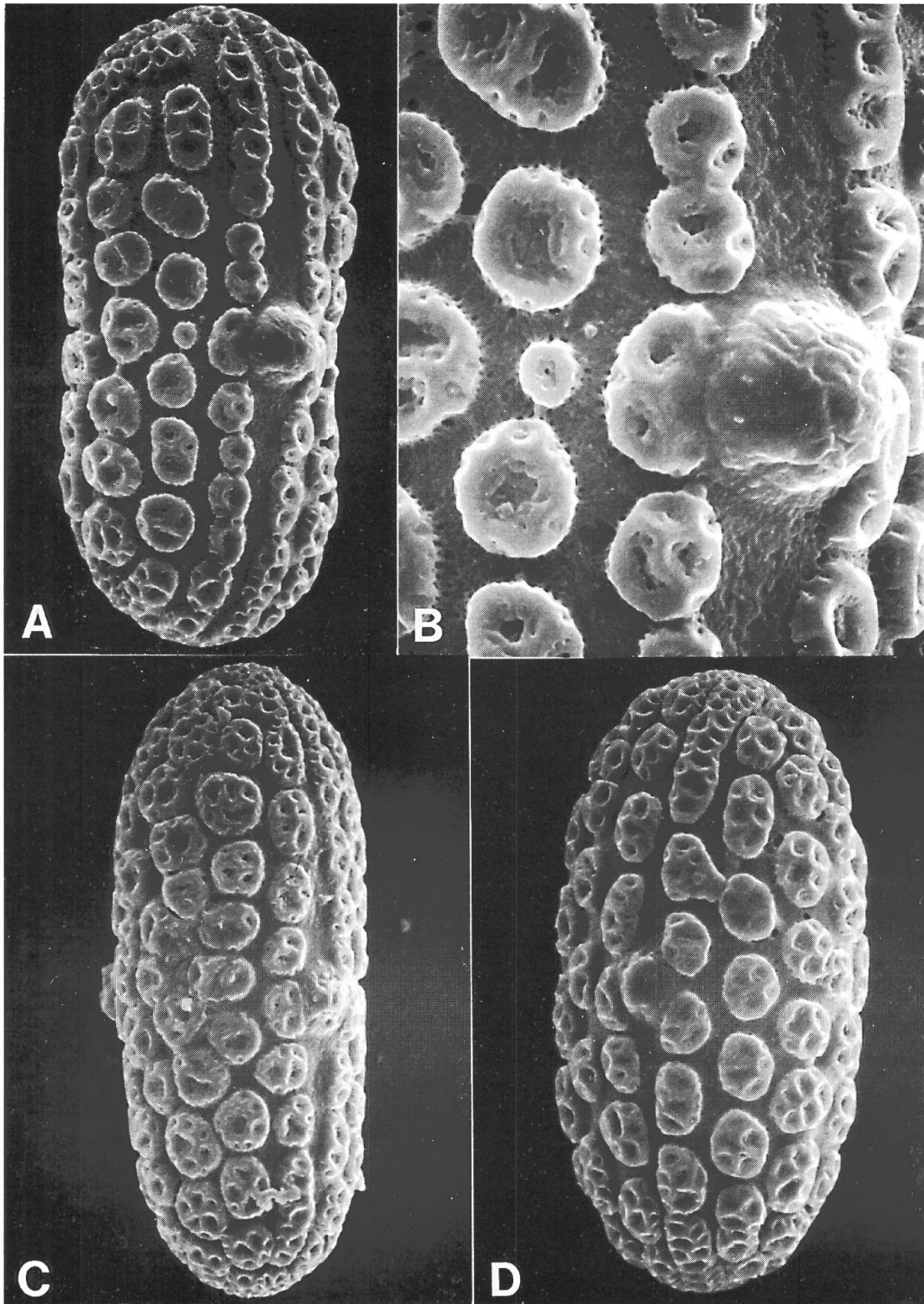


Fig. 2. – Scanning electron (SEM) photomicrographs of *Justicia* pollen.

A, B, *J. phyllocalyx* (Irwin 19492). **A,** equatorial view, $\times 1200$; **B,** portion of surface, $\times 3000$. – **C, D,** *J. oncodes*. **C,** equatorial view, $\times 1200$ (Hatschbach 39450); **D,** equatorial view, $\times 1200$ (Irwin 19457).

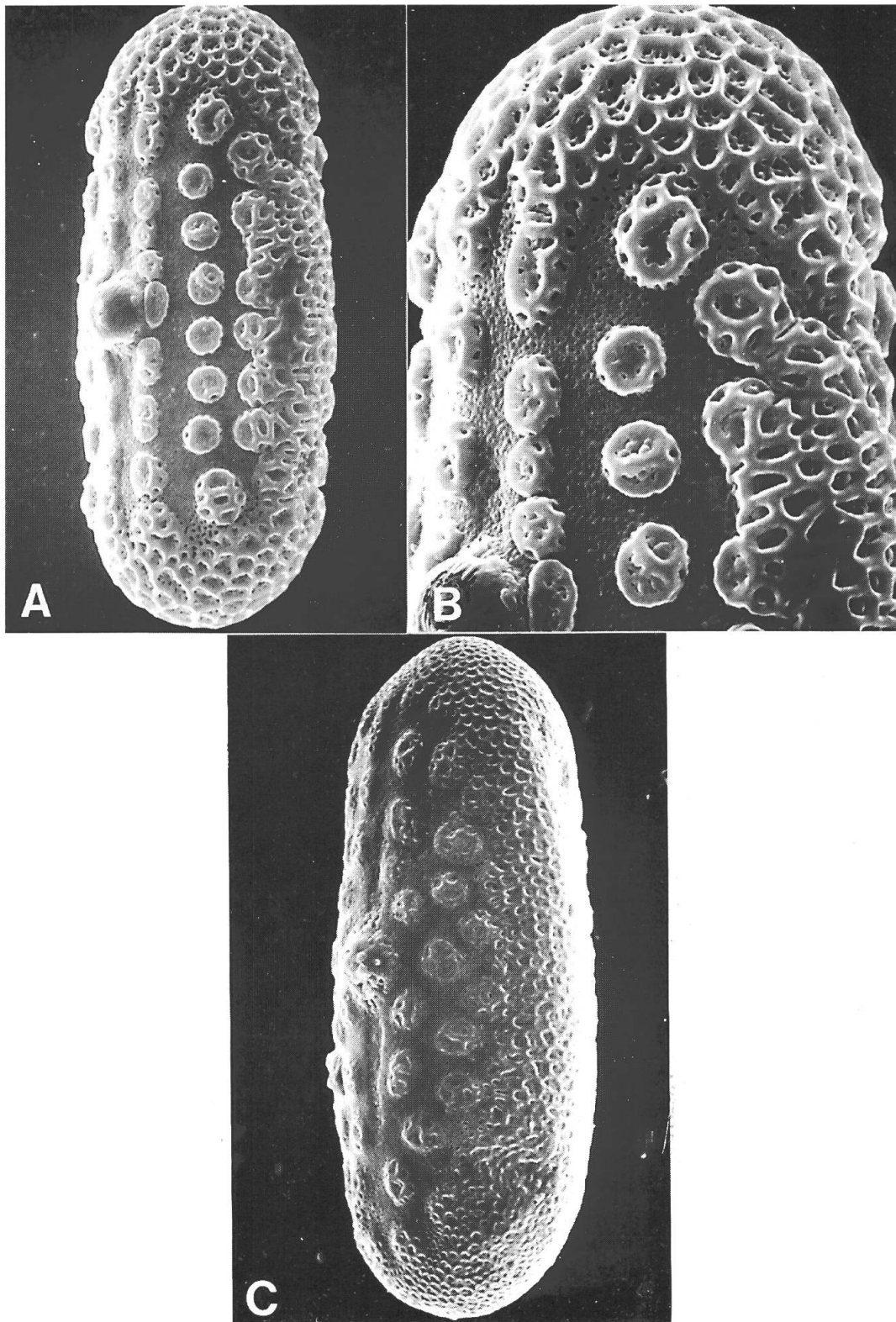


Fig. 3. – Scanning electron (SEM) photomicrographs of *Justicia* pollen.

A, B, *J. corumbensis* (Williams 679). **A**, equatorial view, $\times 1500$; **B**, portion of surface, $\times 3000$. – **C**, *J. chacoënsis*, equatorial view, $\times 1500$ (Schinini 18090).

Justicia sect. *Plagiacanthus* (Nees) V. A. W. Graham*Justicia corumbensis* (Lindau) Wassh. & C. Ezcurra, **comb. nova**

≡ *Beloperone corumbensis* Lindau in Bull. Herb. Boissier ser. 2, 5: 373. 1905.

Holotype: BRAZIL, Mato Grosso: "Corumbá", *Malme 3029* (B, destroyed; F photo B 8928).

Geographical distribution. – Common in forests or along shady edges of forests or forests of middle elevations or along periodically inundated river margins in Mato Grosso, Brazil and adjacent Bolivia, dept. Santa Cruz, Paraguay, dept. Pres. Hayes, and Argentina, prov. Chaco and Formosa.

This species is closely allied to *Justicia jujuyensis* C. Ezcurra, but differs in the pedunculate axillary spikes, these frequently being as long as the ascending leaf blades. *Justicia jujuyensis* is characteristic of the Yungas mountain forests while *J. corumbensis* grows in the lower areas in the Chaco region.

Justicia corumbensis presents 2-porate pollen (Fig. 3 A, B), with the trema area traversed by 4(-6) rows of insulae. The insulae of the two rows bordering each aperture tend to join and form two raised bands in some sectors. The reticulum outside the trema area has large lumina (though smaller than in *J. asclepiadea*), which sometimes show circular elements (tips of columellae) (Fig. 3 B). This pollen morphology generally matches type 7 of GRAHAM (1988), a type present in several sections of *Justicia* of the New World, including sect. *Plagiacanthus*, although the reticulum is somewhat intermediate with type 10, present in sect. *Simonisia*.

Justicia sect. *Orthotactus* (Nees) V. A. W. Graham*Justicia chacoënsis* Wassh. & C. Ezcurra, **nom. nov.**

≡ *Beloperone riparia* S. Moore in Trans. Linn. Soc. London, Bot. 4: 432. 1895 [non *Justicia riparia* Kameyama in Bol. Bot. Univ. São Paulo 14: 204. 1995].

Holotype: BRAZIL, Mato Grosso: "near Corumbá", *S. Moore 1047* (BM!). **Isotype:** B, destroyed; F photo B 8944.

Geographical distribution. – In open xerophitic forest and open quebracho and samuhú forest, in dry sandy soil, Mato Grosso, Brazil, and adjacent Paraguay, dept. Chaco, and Bolivia, dept. Santa Cruz.

Justicia chacoënsis presents 2-colporate pollen (Fig. 3 C), with the trema area traversed by 4(-6) rows of insulae. The reticulum outside the trema area has relatively small lumina which do not show circular elements (tips of columellae). This type of pollen clearly matches type 7 of GRAHAM (1988), present in many sections of *Justicia* of the New World, including sect. *Orthotactus*.

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Addresses of the authors: D.C.W.: Department of Botany, National Museum of Natural History, Smithsonian Institution, Washington D.C. 20560, United States.

C.E.: Departamento de Botánica, Centro Regional Universitario Bariloche, Universidad Nacional del Comahue, Unidad Postal UNC, 8400 Bariloche, Argentina.

