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A New Species of *Brassiopsis* Szlachetko & Górnjak (Orchidaceae) is Described From Colombia.
(With spanish translation)

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Abstract

A new species of *Brassiopsis* Szlachetko & Górnjak is described from Colombia, Department of Risaralda.

John Lindley established the genus *Ada* in Folia Orchidaceae (1883-1854) based on *Ada aurantiaca*, a Colombian species. Lindley divided the genus *Brassia*, established in Hortus Kewensis 1813 by Robert Brown, into two sections, *Eubrassia* and *Glumaceae*. He recognized that *Ada* and the glumaceous brassias were similar, but gave four characters, which separated the two groups from *Ada*. However, examination of living material does not support the separation on the characters that Lindley stated. The most distinctive feature between the two groups *Eubrassia* and *Glumaceae* and *Ada* is the lamellae on the labellum. Williams (1972) emended the genus *Ada* as described by Lindley to include species in the *Brassia* section *Glumaceae*. Based on Williams (1972) the genus *Ada* consists of eight species: *Ada aurantiaca* Lindl., *Ada farinifera* (Linden & Rchb. f.) N. H. Williams, *Ada chlorops* (Endr. & Rchb. f.) N. H. Williams, *Ada elegantula* (Rchb. f.) N. H. Williams, *Ada allenii* (L. O. Williams ex C. Schweinf.) N. H. Williams, *Ada keiliana* (Rchb. f. ex Lindl.) N. H. Williams, *Ada glumacea* (Lindl.) N. H. Williams, and *Ada ocanensis* (Lindl.) N. H. Williams. Williams (1972) based his results on morphological analysis.

Neubig *et al.* (2012) lumped *Brachtia* Rchb. f., *Ada* Lindl. and *Mesospinidium* Rchb. f. into *Brassia* based on analyses of both nuclear ribosomal internal transcribed spacer DNA and plastid regions (*matK* exon, *trnH-psbA* intergenic spacer and two portions of *ycf1* exon). Although the DNA sampled does not represent the genetics of the plant, which is responsible for the morphology, the results reported are interesting and can be interpreted differently from the interpretation of Neubig *et al.* (2012, Figure 10, p. 132. Continuation (*Miltonia* to *Rhynchostele*) of single maximum likelihood tree resulting from analysis of the combined five-region data set for 736 individuals).

Neubig *et al.* (2012) compared 26 species, which were identified in the paper as *Brassia*. In the results the 26 species fall into 4 groups, which were labeled *Ada*, *Mesospinidium*, *Brassia* and *Brachtia*. The first group contains 8 species, 4 of which are unknown species, the other four are recognized as species

of *Ada* and the group was labeled *Ada*. This group includes the type of the genus, *Ada aurantiaca*, which would imply that, *Ada aurantiaca* is closely related to the other species in the group. The second group contains 5 different species, with 2 unknown species and the 3 identified species are recognized *Mesospinidium* and the group is so labeled. The third group contains 7 species with 1 unknown species and the 6 species identified are recognized species of *Brassia*. The fourth group has 1 species and the group is labeled *Brachtia*. The single species is recognized as a species of *Brachtia*. These results clearly separate the species sampled into the four distinct genera. However, Neubig *et al.* (2012) based on the molecular data concludes that *Ada* is not monophyletic because *Ada allenii* (L. O. Williams ex C. Schweinf.) N. H. Williams is “sister to *Mesospinidium*. Florally, *Mesospinidium* are small versions of *Ada*. Given the shared suite of floral morphologies and habits and aberrant phylogenetic position of *Ada allenii*, lumping them all into *Brassia* seems the **simplest solution**”.

Szlachetko & Górnjak (2006) removed the *Glumaceae* species of *Brassia* from *Ada* and established a new genus *Brassiopsis* Szlachetko & Górnjak for these species, thus leaving *Ada* again as a monotypic genus. Szlachetko & Górnjak cite pollinarium organization, especially tegula morphology as a distinguishing character in *Oncidieae*. They cite that the bright orange color of the flowers of *Ada* indicate hummingbird pollination, where *Brassia* and the new genus *Brassiopsis* have colors which indicate they are pollinated by wasps.

If a group of species is different from the genus they are included in, then they should be removed and placed in a new genus, not emend an existing genus to accommodate these species. This is precisely what Szlachetko & Górnjak did with their new genus *Brassiopsis* Szlach. & Górnjak, Biodivers. Res. Conservation 1-2: 12 (2006). The new genus includes the *Glumaceae* species of *Brassia* that Williams (1972) transferred to *Ada*.

The molecular analysis of Neubig *et al.* (2012) clearly groups the 26 species sampled into the 4 genera they had previously been placed. This grouping is further supported by the earlier results of the molecular analysis of Chase & Palmer (1992) and Williams *et al.* (2001). Our interpretation of this molecular data combined with the morphological study of Williams (1972), the study of Szlachetko & Górnjak (2006) and our observations of live material of both *Ada*, *Brassiopsis* and *Brassia* species leads us to accept the separation of *Brassiopsis* (*Glumaceae* species of *Brassia*) from *Ada* and the separation of *Brachtia* and *Mesospinidium* from *Brassia*.

A notable difference, which can be used to separate the genera, is the lamellae on the labellum. *Brassia* have two parallel lamellae, *Brassiopsis* have two parallel lamellae terminating with two tooth-like projections and *Ada* has two parallel shallow lamellae with two small tooth-like projections near the center of the lamellae, which extends the full length of the labellum and are confluent.



Brassia with two parallel lamellae on labellum.



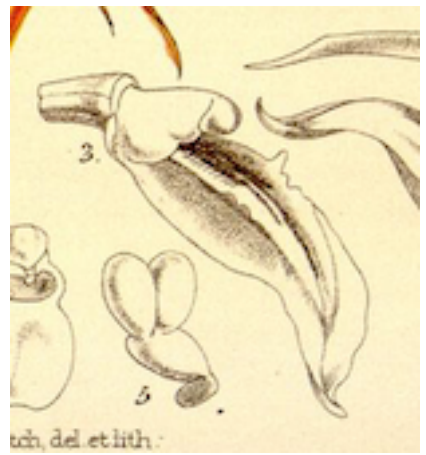
Brassiopsis with two parallel lamellae on labellum terminated with two tooth-like projections.



Ada with parallel lamellae on labellum extending full length of labellum with tooth-like projections near center of lamellae.



Ada aurantiaca Lindl. column and labellum.



Ada aurantiaca Lindl. in Curtis's Botanical Magazine, Vol. 90 (Ser. no. 20) pl 5435 (1864), demonstrating labellum and detail of lamellae on labellum.



Ada aurantiaca Lindl. from Orquideas Tesoro de Colombia vol. 1.

After considerable analysis of the literature to determine the proper genus to use, we here describe a species from the department of Risaralda, Colombia as a new species of *Brassiopsis*.

Brassiopsis colombiana Sauleda & Uribe-Velez, *sp. nov.*

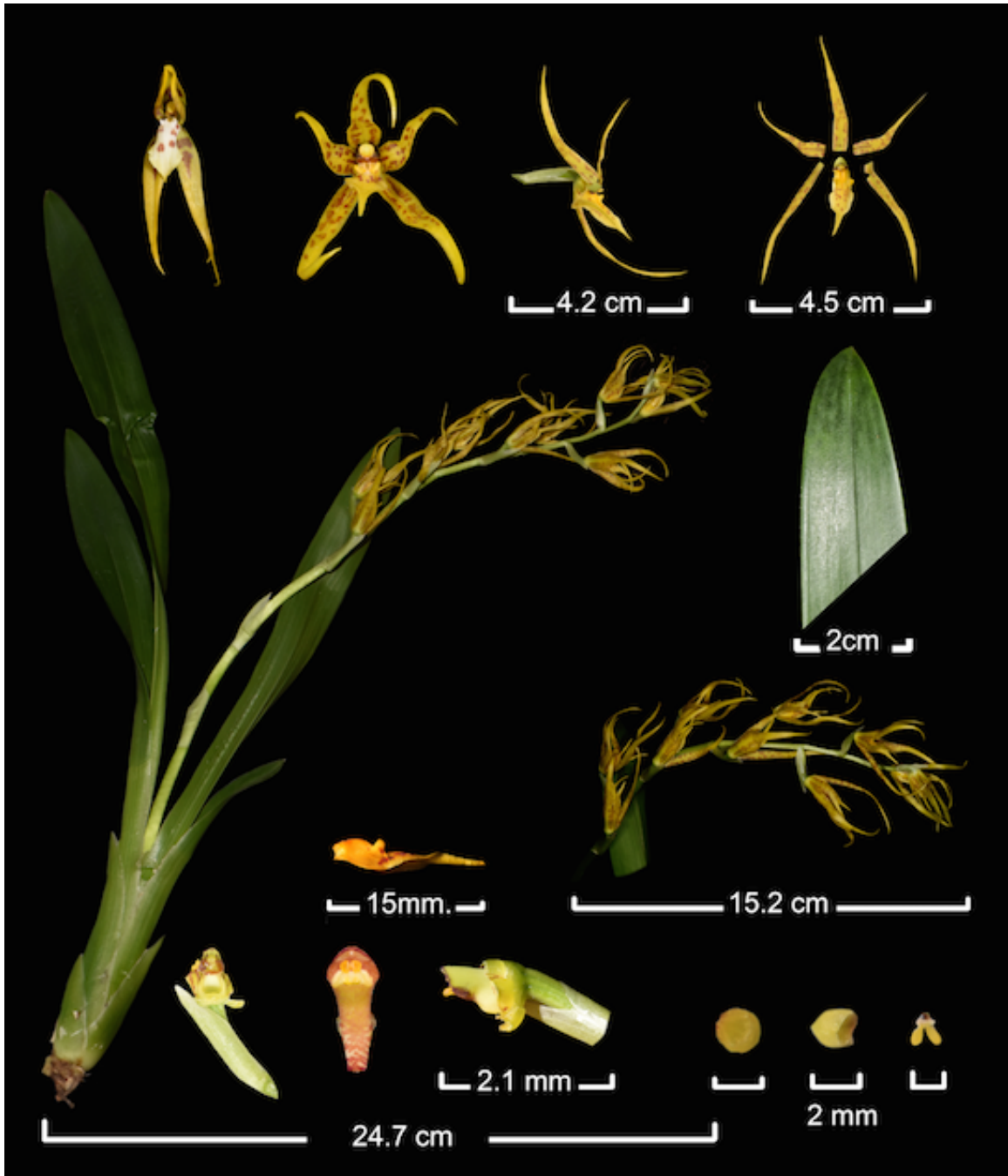
Type: Colombia, department of Risaralda. Exact location and collector unknown.
From cultivation in collection of Melfy Arrubla of Pereira. (Holotype, HPUJ).

Diagnosis

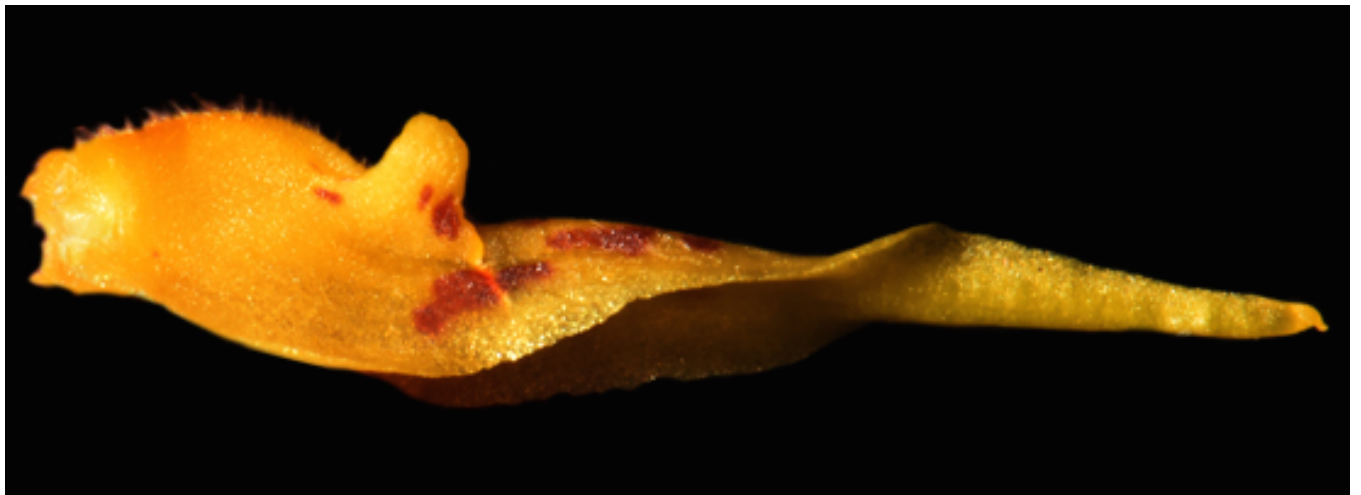
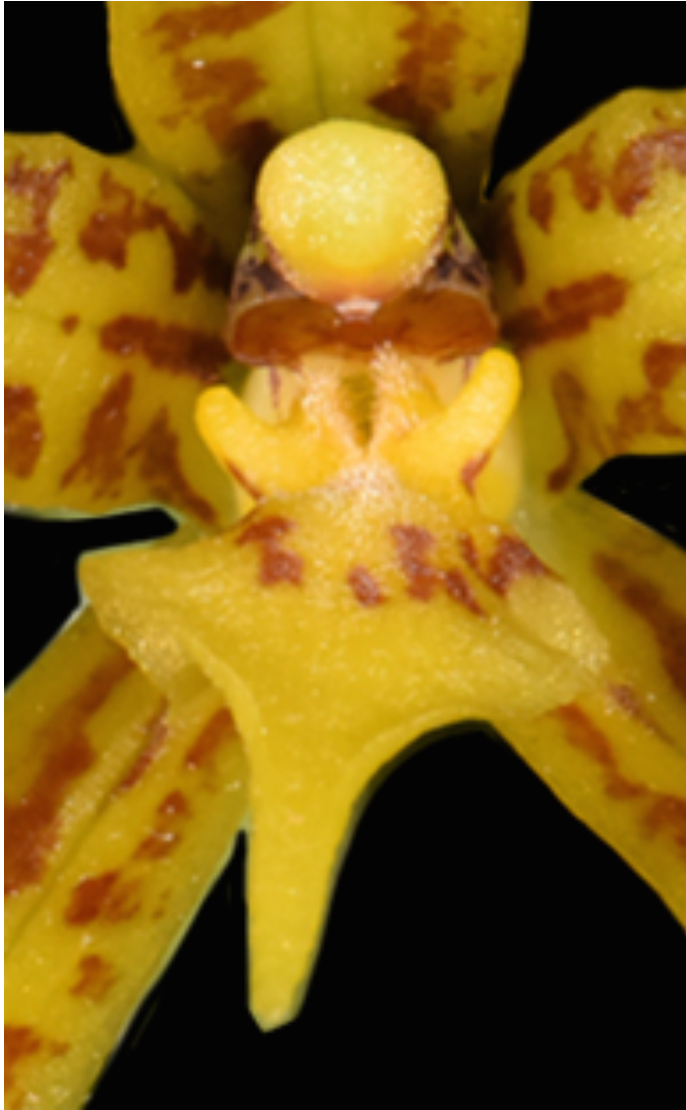
The inflorescence of *Brassiopsis colombiana* resembles *Ada aurantiaca* but the callosity on the labellum differs being characteristic of *Brassiopsis*. The inflorescence is semi-erect resembling species of *Brassiopsis*. *Brassiopsis colombiana* is similar to *Brassiopsis glumacea* (Lindl.) Szlachetko & Gorniak. It differs in color, where *B. glumacea* is green with reddish-brown spots, *B. colombiana* is yellow to reddish-orange with reddish-brown spots. The flowers of *B. glumacea* open completely where *B. colombiana* differs in that the flowers do not open completely, indicating a possible hummingbird pollinator. A notable difference between the two species is in the shape of the labellum and the lamellae on the labellum. Both species have the typical parallel lamellae with two tooth-like projections of a *Brassiopsis* but *B. colombiana* differs from *B. glumacea* in the size and position of the tooth-like projections. In *B. colombiana* the projections are much larger and tend to project outward. In addition, *B. colombiana* has a elliptic to lanceolate labellum and *B. glumacea* has an obovate labellum also they differ in the apex of the labellum which does not recurve in *B. colombiana* but recurves in *B. glumacea*.

Description

Plants epiphytic, cespitose to 37 cm tall; rhizome short; roots thin, fleshy, flexuous; pseudobulbs narrowly elliptic-oblong, to 10 cm long, 1 cm wide, apically 1-leaved, basally with to 6 sheaths, the lower 3-4 sheaths triangular, acute, scarious, 3-6 cm long, 1 cm wide, the upper 2-3 sheaths foliaceous to 10 cm long, 1 cm wide; leaves narrowly ligulate-elliptic, apex acute unequal, subcoriaceous, to 27 cm long, 1 cm wide, constricted at the base into a conduplicate petiole to 3 cm long; inflorescence a lateral raceme, emerging from the foliaceous sheath, to 30 cm long, to 10 flowers; peduncle terete, to 18 cm long, provided with 2-3 imbricating, triangular, inflated, acute bracts, to 1 cm long, 3 mm wide; flower bracts, lanceolate, acute, to 1 cm long, 6 mm wide; ovary pedicellate, terete, to 2 cm long with pedicel; flower segments not spreading, the sepals and petals yellow with reddish-brown spots; sepals narrowly lanceolate, acuminate, to 4 cm long, 5 mm wide; petals lanceolate, acuminate, to 3.5 cm long 5 mm wide; labellum yellow with reddish-brown spots, elliptic, acuminate, to shortly apiculate, with two parallel yellow minutely pubescent lamellae terminating with two erect rounded tooth-like projections; column short, stout, green, basally white, base broad, to 1.5 mm long, 1 mm wide; stigma transverse; anther cap cucullate, elliptic; pollinia 2, ellipsoid; tegula flat, obtriangular.



Brassiopsis colombiana Saulea & Uribe-Velez.



Brassiopsis colombiana Saulea & Uribe-Velez detail of lamellae on labellum.



Brassiopsis colombiana Saulea & Uribe-Velez.



Brassiopsis colombiana Saulea & Uribe-Velez.



Brassiopsis colombiana Saulea & Uribe-Velez detail of uneven apex of leaf.

Acknowledgements

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Literature Cited

- Chase, M. W. and J. D. Palmer. 1992. Floral morphology and chromosome number in Subtribe Oncidiinae (Orchidaceae): evolutionary insights from a phylogenetic analysis of chloroplast DNA restriction site variation. Pp. 340–359 in P. S. Soltis, D. E. Soltis, & J. J. Doyle, eds. *Molecular Systematics of Plants*. Chapman and Hall, London.
- Neubig, K. M., W. M. Whitten, N. H. Williams, M. A. Blanco, L. Endara, J. G. Burleigh, K. Silvera, J. C. Cushman and M. W. Chase. 2012. Generic recircumscriptions of Oncidiinae (Orchidaceae: Cymbidieae) based on maximum likelihood analysis of combined DNA datasets. *Botanical Journal of the Linnean Society*, 2012, 168, 117–146. With 12 figures.
- Szlachetko, D. L. and M. Górniak. 2006. New taxa in the subtribe Oncidiinae (Orchidaceae). *Biodiv. Res. Conserv.* 1-2: 11-13.
- Williams, N. H. 1972. A Reconsideration of *Ada* and the Glumaceous Brassias (Orchidaceae). *Brittonia*. 24. 93-110. 10.2307/2805551.
- Williams, N. H., M. W. Chase, T. Fulcher, & W. M. Whitten. 2001. Molecular systematics of the Oncidiinae based on evidence from four DNA sequence regions: expanded circumscriptions of *Cyrtochilum*, *Erycina*, *Otoglossum*, and *Trichocentrum* and a new genus (Orchidaceae). *Lindleyana* 16(2): 113–139.

Spanish Translation

John Lindley estableció el género *Ada* en Folia Orchidaceae (1883-1854) basado en *Ada aurantiaca*, una especie Colombiana. Dividió el género *Brassia*, establecido en Hortus Kewensis 1813 por Robert Brown, en dos secciones, *Eubrassia* y *Glumaceae*. Lindley reconoció que *Ada* y las brasias glumaceas eran similares, dando cuatro caracteres, que separaron a los dos grupos de el genero *Ada*. Sin embargo, el examen de material vivo no respalda la separación, como lo dijo Lindley. La característica más distintiva son las láminas en el labellum de los dos grupos *Eubrassia* y *Glumaceae* y *Ada*. Williams (1972) modificó el género como descrito por Lindley para incluir especies de la sección *Brassia Glumaceae*. Basado en Williams (1972), el género *Ada* consiste de ocho especies: *Ada aurantiaca*, *Ada farinifera*, *Ada chlorops*, *Ada elegantula*, *Ada allenii*, *Ada keiliana*, *Ada glumacea* y *Ada ocanensis*. Williams (1972) basó sus resultados en análisis morfológico.

Neubig *et al.* (2012) agruparon a *Brachtia* Rchb. f., *Ada* Lindl. y *Mesospinidium* Rchb. f. en *Brassia* basado en análisis de DNA. Aunque el DNA usado no representa la genética de la planta, que es responsable de la morfología, los resultados informados son interesantes y pueden interpretarse de manera diferente a la interpretación de Neubig *et al.* (2012, Figura 10, p. 132).

Neubig *et al.* (2012) comparan 26 especies, que identifican todas como especies de *Brassia*. En los resultados, las 26 especies se dividen en 4 grupos, que denominan: *Ada*, *Mesospinidium*, *Brassia* y *Brachtia*. El primer grupo contiene 8 especies, 4 de las cuales las identifican como *Brassia* desconocidas, las otras cuatro son reconocidas como especies de *Ada* y etiquetan al grupo *Ada*. Este grupo incluye el tipo de género *Ada aurantiaca*, lo que implica que *Ada aurantiaca* está relacionada con las otras especies del grupo. El segundo grupo contiene 5 especies, con 2 que las identifican como *Brassia* desconocidas y 3 identificadas como *Mesospinidium* y el grupo está etiquetado así. El tercer grupo contiene 7 especies con 1 identificada como *Brassia* desconocida. Las otras 6 especies identificadas son especies reconocidas de *Brassia*. El cuarto grupo tiene 1 especie, el grupo está etiquetado como *Brachtia* y la especie individual es reconocida como una especie de *Brachtia*. Estos resultados separan claramente las especies tomadas como muestras en los cuatro géneros distintos. Sin embargo, Neubig *et al.* (2012) basado en los datos moleculares concluye que *Ada* no es monofilética porque *Ada allenii* (L.O. Williams ex C. Schweinf.) N. H. Williams es "hermana de *Mesospinidium*. Floralmente, *Mesospinidium* son versiones pequeñas de *Ada*. Dado el conjunto compartido de morfologías y hábitos florales y la posición filogenética aberrante de *Ada allenii*, agruparlos en *Brassia* parece la solución más simple”.

Szlachetko & Gorniak (2006) transfirieron las especies *Glumaceae* de *Brassia* de *Ada* y establecieron un nuevo género *Brassiopsis* Szlachetko & Gorniak para estas especies, dejando a *Ada* nuevamente como un género monotípico. Los autores citan la organización del pollinarium, especialmente la morfología del tegula como un carácter distintivo en *Oncidieae*. Citan que el color naranja brillante de las flores de *Ada* indica la polinización del colibrí, mientras *Brassia* y el nuevo género *Brassiopsis* tienen colores que indican que son polinizadas por avispas.

Si un grupo de especies es diferente del género en el que están incluidas, entonces deben eliminarse y colocarse en un nuevo género, no modificar un género existente para acomodar estas especies. Esto es precisamente lo que hicieron Szlachetko y Gorniak con su nuevo género *Brassiopsis* Szlach. & Gorniak, Biodiversidad. Res. Conservación 1-2: 12 (2006). El nuevo género incluye las especies *Glumaceae* de *Brassia* que Williams (1972) transfirió a *Ada*.

El análisis molecular de Neubig et al. (2012) agrupa claramente las 26 especies muestreadas en los 4 géneros en los que se habían colocado previamente. Esta agrupación está respaldada por los resultados anteriores del análisis molecular de Chase y Palmer (1992) y el de Williams et al. (2001). Nuestra interpretación de estos datos moleculares combinada con el estudio morfológico de Williams (1972), el estudio de Szlachetko y Gorniak (2006) y nuestras observaciones de material vivo de las especies *Ada*, *Brassiopsis* y *Brassia* nos llevan a aceptar la separación de *Brassiopsis* de *Ada* y la separación de *Brachtia* y *Mesospinidium* de *Brassia*.

Una diferencia notable, que se puede usar para separar los géneros, son las láminas en el labellum. *Brassia* tiene dos láminas paralelas, *Brassiopsis* tiene dos láminas paralelas que terminan con dos proyecciones en forma de diente y *Ada* tiene dos láminas poco profundas paralelas con dos pequeñas proyecciones en forma de diente cerca del centro de las láminas y estas se extienden a lo largo del labelo y son confluentes.

Después de un análisis de la literatura para determinar el género apropiado para usar, aquí describimos una especie del departamento de Risaralda, Colombia, como una nueva especie de *Brassiopsis*.

Brassiopsis colombiana Sauleda y Uribe-Velez, *sp. nov.*

Tipo: Colombia, departamento de Risaralda. Ubicación exacta y colector desconocido.

De cultivo en colección de Melfy Arrubla de Pereira. (Holotipo, HPUJ).