

Systematic Botany

Serjania lucianoi (Sapindaceae: Paullinieae), a new species from Northern Bahia, Brazil --Manuscript Draft--

Manuscript Number:	SYSBOT-D-12-00038R1
Full Title:	Serjania lucianoi (Sapindaceae: Paullinieae), a new species from Northern Bahia, Brazil
Short Title:	FERRUCCI AND COULLERI: A NEW SPECIES OF SERJANIA
Article Type:	Research Report
Keywords:	Brazil, endemic, caatinga, Sapindaceae, Serjania, taxonomy
Corresponding Author:	María Silvia Ferrucci, Dra. Univ. Nac. del Nordeste-Instituto de Botánica del Nordeste Corrientes, Corrientes ARGENTINA
Corresponding Author Secondary Information:	
Corresponding Author's Institution:	Univ. Nac. del Nordeste-Instituto de Botánica del Nordeste
Corresponding Author's Secondary Institution:	
First Author:	María Silvia Ferrucci, Dra.
First Author Secondary Information:	
Order of Authors:	María Silvia Ferrucci, Dra. Juan Pablo Coulleri, Degree in Genetic
Order of Authors Secondary Information:	
Abstract:	A new species of Serjania (Sapindaceae, Paullinieae), <i>S. lucianoi</i> from Northern Bahia, Brazil, belonging to Serjania sect. Eurycoccus, is described, illustrated and compared to its putative closest relative. Serjania lucianoi seems to be related to <i>S. glutinosa</i> , and can be distinguished from it by: the 5-foliolate leaves, linear stipules, indument with simple and glandular obconical-headed trichomes, fruits with ovate outline, and seeds in basal portion of locule. In addition, micromorphological characters of leaf and flower epidermis are given, and pollen grains are described. The new species is known only from Bahian caatinga, being an element of the dunes of the São Francisco River. We present a key to the Brazilian species of Serjania restricted to this biome.
Response to Reviewers:	Ref.: Ms. No. SYSBOT-D-12-00038 Serjania lucianae (Sapindaceae: Paullinieae), a new species from Northern Bahia, Brazil Systematic Botany Dear Dr. Silvia Ferrucci, Reviewers have now commented on your paper. You will see that they are advising that you revise your manuscript. For your guidance, reviewers' comments are appended below. There are two attached files that you will be able to download after logging in to the Editorial Manager - Systematic Botany website. You may access these by clicking "Action Links" followed by "View Attachments". If you decide to revise the work, please submit a list of changes or a rebuttal against each point which is being raised when you submit the revised manuscript. Please carefully review the "Checklist for Preparation of Manuscripts and Illustrations",

especially the section on "Preparation of Illustrations". Our graphic quality standards are high and are imposed by our printer. ** Please note that all figure files must be submitted as tiff files with the minimum required resolution for each figure type as explained in the instructions.

Also, please also remember to remove the line numbers when submitting your revised manuscript.

Your revision is due by Sep 18, 2012.

To submit a revision, go to <http://sysbot.edmgr.com/> and log in as an Author. You will see a menu item call Submission Needing Revision. You will find your submission record there.

Yours sincerely

Tom A Ranker, PhD

Systematic Botany

Reviewers' comments:

Reviewer #1: The manuscript represents a moderate contribution to the knowledge of Sapindaceae of South America and therefore should be published. The illustration and photographs are of high quality. Minor editorial and conceptual corrections are directly made into a Word version of the subtitled PDF.

Reviewer #2: Review SYSTBOT-D-12-00038: Ferrucci & Coulleri

In this manuscript the authors are describing a new species of *Serjania* (Sapindaceae) from Northern Bahia, Brazil. I have enjoyed reading this manuscript that represents a good contribution to the taxonomic knowledge of South American Sapindaceae and have only minor comments prior to its publication.

General comments:

1. It could be a good addition to provide an IUCN Red List Assessment for this new species.

2. The authors are dedicating this new species to Luciano P. de Queiroz. Since Luciano did collect this taxon I was wondering why the authors have not used his collection as type specimen?

I am also surprised to see that the authors only cite one duplicate per specimen investigated in this study. Are there really no other duplicates (especially from the type collection) that were distributed to major herbaria in Europe and/or Northern America? If so, it would be relevant to cite the other duplicates.

3. The key to the species. Although on one hand I understand that the authors would like to provide a key to the species growing in the same habitat as the new species, on the other hand I think this approach is somehow misleading. In the manuscript the authors assign the new taxon to the section *Eurycoccus* and compare it with *S. glutinosa* (that I expect belong to the same section). Since this section contains only 8 taxa I would provide a key to the species for the whole section. This would be a very good contribution for people working on the taxonomy of Sapindaceae. In addition, I think that the morphological characters provided in the key to discriminate *S. grammatophora* from *S. lucianae* are not well presented (especially characters related to the indumentum).

4. The authors describe the pollen morphology of the new taxon and I therefore would expect to find a part of the discussion devoted to this new addition. Is it similar or not to other species, e.g. *S. glutinosa*.

Minor comments:

Introduction

p. 3, lines 4-6. The authors provide the schizocarpic fruit as a distinct character to support *Serjania*, but on line 10 they claim it is shared with other genera belonging to the Paullinieae tribe.

p. 3, lines 6-10. How are the pollen characteristics of *Serjania* unique in the family? If you want to comment on pollen morphology you could also mention that Paullinieae share a specific pollen type (type-C in Muller and Leenhouts, 1976 and also see Buerki et al. 2009 for a phylogenetic framework) and provide more details on how the pollen type of *Serjania* differs from the other related genera. Very little is known on chromosome number and therefore I would refrain using it as a distinct character at this stage.

Material and Methods

p. 4, line 9. Please provide the full definition of SEM.

p. 5, line 5. "imaturio" should be translated into English.

References

Buerki S, Forest F, Acevedo-Rodríguez P, Callmander MW, Nylander JAA, Harrington M, Sanmartín I, Küpfer P, Alvarez N. 2009. Plastid and nuclear DNA markers reveal intricate relationships at subfamilial and tribal levels in the soapberry family (Sapindaceae). *Molecular Phylogenetics and Evolution*, 51: 238-258.

Müller, J., Leenhouts, P.W., 1976. A general survey of pollen types in Sapindaceae in relation to taxonomy. In: Ferguson, I.K., Müller, J. (Eds.), *The Evolutionary Significance of the Exine*. Academic Press, London, pp. 407-445.

Respond to Reviewers

We gratefully acknowledge all comments and suggestions made by both reviewers, which were largely considered and included in the revised version.

On the other hand, note below the points we wish to keep in the manuscript:

* Page 3: Line 11: The genus *Balsas* must not be included because the fruit is a capsule (cf. Ramírez et al., *Novon* 21: 196-200. 2011).

* Page 5: Line 5: locules (is more appropriate to refer to the cavity in which the seeds are inserted).

* Page 5: Line 14: in terminal leaflet (in an imparipinnate leaf, 5-foliolate, are distinguished: a terminal leaflet, a proximal pair of leaflets and a distal pair of leaflets).

* Page 6: Line 6: posterior (cf. Solís & Ferrucci, *Ann. Bot. Fennici* 46: 485-495. 2009; Ferrucci & Urdampilleta, *Syst. Bot.* 36(4): 950-956. 2011).

* Page 6: Lines 8-9: posterior ovate oblong, obtuse and pilose at apex, the anterior ones (cf. Solís & Ferrucci, *Ann. Bot. Fennici* 46: 485-495. 2009).

Page 7: Line 23/Page 8-Line 1: In our view this paragraph must be conserved "simple vascular cylinder except for *S. rubicunda* Radlk., or a vascular cylinder radially divide in 5 (6–7) parts, this feature is unique to *Serjania*, and is only present in eight species of this section (Acevedo-Rodríguez and Somner 2002)".

* Page 8: Lines 9-13: In our view this paragraph must be conserved "except *S. faveolata* Radlk.; interestingly, no other Brazilian state has species that are endemic to this biome. The latter species was mentioned only for the Bahian caatinga in Somner et al. (2010), however has also been reported for Minas Gerais (Somner and Ferrucci 2009), and has also been found in gallery forest in both states (Ferrucci pers. comm.)".

* Page 9: Line 3: Petals glandulose in both faces (cf. Ferrucci & Urdampilleta, *Syst. Bot.* 36(4): 950-956. 2011). Are glandular trichomes, multicellular with small secretory head. Personally, I have obtained microphotographs by SEM showing secretory material. Whereas the papilla is the trichome more simple, is unicellular and is not secretory (see Font Quer, 1993 or Metcalfe & Chalk, 1979). If the editor wants I can send by mail some micrographs of different species of the tribe Paullinieae illustrating this character.

* Page 11: Lines 1-4: The citation is correct (cf. Queiroz & Lavin, *Syst. Bot.* 36(1): 69-

79. 2011).

We introduced the following small changes in the text in relation to Editor General Comments:

1. We added a paragraph referring to IUCN Red List Assessment for this species.
2. Page 8: Lines 5-9: Is discussed the relation between the pollen morphology of *S. lucianoi* and *S. glutinosa*. "Regarding pollen morphology, both species share the reticulate-heterobrochate sexine with perforated tectum; although the pollen grains are different in size in *S. lucianoi* are larger than those of *S. glutinosa*, and also in *S. lucianoi* the colpi are reduced to colpoids while in *S. glutinosa* the colpi are linear (Ferrucci and Anzótegui 1993)".

We justify observations of Editor General Comments:

1. We didn't use the specimen collected by Luciano P. de Queiroz because it only had flowers. Instead we choose one with flowers and fruits almost mature. We fully understand the importance of citing where are deposited the duplicates, but we do not have that information from the herbarium HUEFS.
2. The first author considers inappropriate to give a key to Brazilian species of the section because she is preparing a paper where two species of the section will be transfer to the synonymy [*S. Salzmanniana* Schlecht. (= *S. subimpunctata* Radlk.); *S. comata* Radlk. (= *S. acoma* Radlk.)]. Actually this tribe comprises 25 species, including *S. lucianoi*, 20 are represented in Brazil.

We think that in the key *S. grammatophora* is quite well differentiate of *S. lucianoi*, especially in characters related to the indumentum.

Minor Comments:

1. Page 3: Lines 4-6: We added information in order to differentiate *Houssayanthus* and *Thinouia* from *Serjania* "but showing samaroid mericarps with central or proximal locule respectively".
2. Page 3: Lines 6-10: In the text does not say that *Serjania* has a type of pollen unique in the family. In the text says that *Serjania* shares the type of pollen heteropolar, hemitrisyncolporate, peroblate or oblate with *Cardiospermum* L., *Houssayanthus* Hunz., and *Urvillea* Kunth (now we added the genus *Balsas*). The two papers cited by the reviewer have been considered but do not contribute to this work. In our view the reviewer didn't read carefully the paragraph about pollen.



INSTITUTO DE BOTANICA DEL NORDESTE

Facultad de Ciencias Agrarias
Sargento Cabral 2131 – C.C. 209
3400 - Corrientes - República Argentina
Tel.: 03783-422006/427589 - Fax: 03783-427131
ibone@agr.unne.edu.ar - <http://ibone.unne.edu.ar>



Corrientes, 25th June 2012

Dear Dr Tom a. Ranker,
PhD Editor
Systematic Botany

Ref.: Ms. N°. SYSTBOT-D-12-00038

Title: “*Serjania lucianoi* (Sapindaceae: Paullinieae), a new species from Northern Bahia, Brazil”

Author(s): Ferrucci, M. S. & J. P. Coulleri

We gratefully acknowledge all comments and suggestions made by both reviewers, which were largely considered and included in the revised version.

On the other hand, note below the points we wish to keep in the manuscript:

* Page 3: Line 11: The genus *Balsas* must not be included because the fruit is a capsule (cf. Ramírez et al., Novon 21: 196-200. 2011).

* Page 5: Line 5: locules (is more appropriate to refer to the cavity in which the seeds are inserted).

* Page 5: Line 14: in terminal leaflet (in an imparipinnate leaf, 5-foliate, are distinguished: a terminal leaflet, a proximal pair of leaflets and a distal pair of leaflets).

* Page 6: Line 6: posterior (cf. Solís & Ferrucci, Ann. Bot. Fennici 46: 485-495. 2009; Ferrucci & Urdampilleta, Syst. Bot. 36(4): 950-956. 2011).

* Page 6: Lines 8-9: posterior ovate oblong, obtuse and pilose at apex, the anterior ones (cf. Solís & Ferrucci, Ann. Bot. Fennici 46: 485-495. 2009).

Page 7: Line 23/Page 8-Line 1: In our view this paragraph must be conserved “simple vascular cylinder except for *S. rubicunda* Radlk., or a vascular cylinder radially divide in 5 (6–7) parts, this feature is unique to *Serjania*, and is only present in eight species of this section (Acevedo-Rodríguez and Somner 2002)”.

* Page 8: Lines 9-13: In our view this paragraph must be conserved “except *S. faveolata* Radlk.); interestingly, no other Brazilian state has species that are endemic to this biome. The latter species was mentioned only for the Bahian caatinga in Somner et al. (2010), however has also been reported for Minas Gerais (Somner and Ferrucci 2009), and has also been found in gallery forest in both states (Ferrucci pers. comm.)”.

* Page 9: Line 3: Petals glandulose in both faces (cf. Ferrucci & Urdampilleta, Syst. Bot. 36(4): 950-956. 2011). Are glandular trichomes, multicellular with small secretory head. Personally, I have obtained microphotographs by SEM showing secretory material. Whereas the papilla is the trichome more simple, is unicellular and is not secretory (see Font Quer, 1993 or Metcalfe & Chalk, 1979). If the editor wants I can send by mail some micrographs of different species of the tribe Paullinieae illustrating this character.



* Page 11: Lines 1-4: The citation is correct (cf. Queiroz & Lavin, Syst. Bot. 36(1): 69-79. 2011).

We introduced the following small changes in the text in relation to Editor General Comments:

1. We added a paragraph referring to IUCN Red List Assessment for this species.
2. Page 8: Lines 5-9: Is discussed the relation between the pollen morphology of *S. lucianoii* and *S. glutinosa*. “Regarding pollen morphology, both species share the reticulate-heterobrochate sexine with perforated tectum; although the pollen grains are different in size in *S. lucianoii* are larger than those of *S. glutinosa*, and also in *S. lucianoii* the colpi are reduced to colpoids while in *S. glutinosa* the colpi are linear (Ferrucci and Anzótegui 1993)”.

We justify observations of Editor General Comments:

1. We didn't use the specimen collected by Luciano P. de Queiroz because it only had flowers. Instead we choose one with flowers and fruits almost mature. We fully understand the importance of citing where are deposited the duplicates, but we do not have that information from the herbarium HUEFS.
2. The first author considers inappropriate to give a key to Brazilian species of the section because she is preparing a paper where two species of the section will be transfer to the synonymy [*S. Salzmanniana* Schlecht. (= *S. subimpunctata* Radlk.); *S. comata* Radlk. (= *S. acoma* Radlk.)]. Actually this tribe comprises 25 species, including *S. lucianoii*, 20 are represented in Brazil.

We think that in the key *S. grammatophora* is quite well differentiate of *S. lucianoii*, especially in characters related to the indumentum.

Minor Comments:

1. Page 3: Lines 4-6: We added information in order to differentiate *Houssayanthus* and *Thinouia* from *Serjania* “but showing samaroid mericarps with central or proximal locule respectively”.
2. Page 3: Lines 6-10: In the text does not say that *Serjania* has a type of pollen unique in the family. In the text says that *Serjania* shares the type of pollen heteropolar, hemitrisyncolporate, peroblate or oblate with *Cardiospermum* L., *Houssayanthus* Hunz., and *Urvillea* Kunth (now we added the genus *Balsas*). The two papers cited by the reviewer have been considered but do not contribute to this work. In our view the reviewer didn't read carefully the paragraph about pollen.

Please do not hesitate in contacting me for any concern regarding this revised version.

Best regards,

María Silvia Ferrucci

SYSTEMATIC BOTANY

CHECKLIST FOR PREPARATION OF MANUSCRIPTS AND ILLUSTRATIONS

March 2012

Check items (X = done; 0 = n.a.), rename file (e.g., Smith Checklist.doc), and submit with manuscript

I. General Instructions

Membership in ASPT is required for at least one author from date of manuscript submission through to publication. Not a member? Contact the ASPT Business Office to join now (aspt@uwyo.edu).

Consult current issues for guidance on format.

Read Information for Authors on inside back cover of most recent issue or the web site.

Double-space throughout. Do not justify right margin. Either American or international spelling is acceptable.

Use line numbering on initial submission to facilitate reviews of electronic manuscripts (do not use on revised manuscripts submitted for final acceptance).

Font formatting in manuscript corresponds to that used in the journal (e.g., *italics* for genus and species names; LARGE AND SMALL CAPITALS for primary headings and short title on title page; ***Bold Italics*** for second level headings, etc.).

Do not italicize common Latin words or phrases (e.g., et al., i.e., sensu, etc.).

Include surname(s) of author(s) and page number as a header on all manuscript pages.

Assemble manuscript in this order: 1) Title page, 2) Abstract page, 3) Text, 4) Literature Cited, 5) Tables, 6) Appendices, if any, 7) Figure legends. A tiff file for each figure must be submitted separately, prepared following the instructions in section IX, below.

II. Title Page (Page 1)

Running head 6-8 lines below top of page, in all capital letters, no italics, and right justified. Include author(s) surname(s), colon, and a short title (total characters including spaces must not exceed 70).

Center title, in upper and lower case, bold. Omit authors of scientific names. Include family in parentheses unless the genus is the type for the family.

Below title, list all author names in bold upper and lower case in one centered paragraph. Author names are followed by author addresses starting on next line. Each address is a separate, centered paragraph. Addresses are written out in full without abbreviation. Include country in address, including those in the U.S.A.

Use superscript numbers following author names and preceding addresses to associate each author and the appropriate address. Commas between author names precede superscripts. Example- John J. Jones,^{1,3} Amy A. Anderson,² and Steve S. Staley¹. Superscript number(s) following author(s) name(s) are also used to indicate any new addresses. New addresses are numbered sequentially *after* all author primary addresses.

Author for correspondence may be designated using a superscript number. The "Author for correspondence" follows on a new line following author addresses and should be the final superscript number used. Include email address in parentheses.

III. Abstract Page (Page 2)

Abstract must be one paragraph and begins with the word "Abstract" followed by a dash. For example, ***Abstract***—Morphology and molecular data....

Do not cite references, taxonomic authorities, or use abbreviations in the abstract.

Be concise (usually not more than 200 words), but include brief statements about the paper's intent, materials and methods, results, and findings.

Include all new taxonomic names and new combinations, in boldface.

Below abstract, as a separate paragraph, include up to six non-title keywords (or short phrases such as 'adaptive radiation') in alphabetical order, separated by commas, and with a period following the final term. This section should begin with 'Keywords' in bold italics. The keywords themselves should not be in bold. For example, ***Keywords***—Adaptive radiation, chloroplast DNA, nuclear nitrate reductase gene, phylogeography, *Ulmus*.

IV. Text (Page 3, etc.)

Cite each figure and table in the text. Organize text, as far as possible, so that they are cited in numerical order. Use "Figure" only to start a sentence; otherwise, "Fig." or "Figs."

Use these abbreviations without spelling out or punctuation: hr, min, sec, yr, mo, wk, d, diam, m, cm, mm, µm; designate temperature as 30°C.

Write out other abbreviations first time used in the text; abbreviate thereafter. "Transmission electron microscopy (TEM) was used..."

Numbers: Write out one to nine unless a measurement or in taxonomic descriptions (e.g., four samples, 3 mm, 35 sites, 6 yr). Use 1,000 instead of 1000; 0.13 instead of .13; % instead of percent.

If three or more words are joined by a conjunction, use a comma after each word except the last. Example - red, black, and white.

Each reference cited in the text must be listed in Literature Cited section, and vice versa.

Literature citations in the text are as follows:

One author- Jones (1990) or (Jones 1990). No comma is used.

Two authors- Jones and Jackson (1990) or (Jones and Jackson 1990). No comma is used.

Three or more authors- Jones et al. (1990) or (Jones et al. 1990). No comma is used.

Multiple references for same author- Jones (1990, 1994) or (Jones 1990, 1994).

Jones and Smith (in press) or (Jones and Smith, in press)

J. Jones (unpubl. data); J. Jones (in mss.); (J. Jones, pers. obs.); or J. Jones (pers. comm.)

Within parentheses, use a semicolon to separate different types of citation (Fig. 4; Table 2) and (Felix and Smith 1988; Jones and Anderson 1989). Cite several references within parentheses by year, with the oldest one first.

Main headings are large and small capital letters and centered on one line. The following are typical main headings: MATERIALS AND METHODS, RESULTS, DISCUSSION, TAXONOMIC TREATMENT (no Introduction, Conclusion, or Summary sections). Summary or conclusions must be incorporated in discussion.

Second level headings are ***Bold Italics*** with normal indentation. Capitalize first letter of each word. Headings are followed by a dash.

Third level headings are LARGE AND SMALL CAPITALS followed by a dash, with normal indentation.

Taxonomic authorities should be cited for all taxon names at generic rank and below at their first usage in the text, or referenced in a table.

ACKNOWLEDGEMENTS follows discussion section. Style is same as third level heading - the paragraph begins with ACKNOWLEDGEMENTS in large and small capitals followed by a dash, indent first line.

V. Taxonomic Treatment

For nomenclatural matter (i.e., synonymy, typification) use one paragraph per homotypic basionym (see recent *Systematic Botany* or *Regnum Vegetabile* 58:39-40. 1968). Heterotypic basionyms are in separate paragraphs.

New names and new combinations should be in bold (not italicized). All other names of accepted taxa should be in large and small capitals (not italicized). Names of synonyms are italicized in upper and lower case.

Use *Authors of Plant Names* (Brummitt and Powell 1992, Royal Botanic Gardens, Kew) for authors of botanical names. Authors should be given the first time a name is mentioned, or alternately in a table where all relevant names are listed (e.g., table of voucher specimens).

References cited only as part of nomenclatural matter and not elsewhere are not included in literature cited; use TL-2 for abbreviations.

Use *Index Herbariorum* acronyms for designations of herbaria.

If specimens are cited, use the following forms:

TYPE: MEXICO. Nuevo León: 24 km S of San Roberto Jct., 26 Sep 1970, *Turner 6214* (holotype: TEX!; isotype: UC!).

Representative Specimens Examined. U.S.A. Michigan: Lapeer Co., along Flint River, 1.5 mi NE Columbiaville, 5 Jul 1955, *Beal s.n.* (NCSC). Ohio: Wood Co., just W Scotch ridge, 7 Jun 1955, *Beal 1073* (US).

Each country begins a new paragraph.

Descriptions of new taxa (species and below) should include the following: 1) an illustration (line drawing) clearly showing the diagnostic characters, 2) a comparison with related (or sympatric, or similar) taxa in a dichotomous key or table, and 3) a discussion of the characteristics, ecology, geography, or reproductive biology, etc. that are the basis for its distinctiveness.

Abbreviate subspecies as subsp.

VI. Literature Cited

(Continue page numbering, include in same file as text. Not a separate file.)

Verify all entries against original sources, especially journal titles, volume and page numbers, accents, diacritical marks, and spelling in languages other than English. Capitalize all nouns in German.

Cite references in strict alphabetical order by first author's surname. References by a single author precede multiauthored works by same senior author, regardless of date. Of those multiauthored works, 1) references with two authors precede all other multiauthored works and are listed in alphabetical order, and 2) references with three or more authors are listed in alphabetical order of authors, regardless of the number of authors involved.

List works by the same author(s) chronologically, beginning with earliest date of publication.

Write out all authors' names, even if the first author is the same for succeeding citations. "In press" citations must have been accepted for publication and the name of the journal or publisher included.

Insert a period and space after each initial of an author's name.

Leave one space between the colon following the volume number and the page number(s).

Write out journal titles in full using italics font. **Do not** use abbreviations.

Write author's names in upper and lower case. Citations should be in the format:

Authors. Year. Title. Pp. no.-no. in *Book title*, ed. Editor. City: Publisher.

Examples of various citations:

Kim, S.-C., D. J. Crawford, J. Francisco-Ortega, and A. Santos-Guerra. 1996. A common origin for woody *Sonchus* and five related genera in the Macaronesian islands: molecular evidence for extensive radiation. *Proceedings of the National Academy of Sciences USA* 93: 7743-7748.

Specht, C. D. and D. W. Stevenson. In press. A new generic taxonomy for the monocot family Costaceae (Zingiberales). *Taxon*.

Smith, C. F. 1998. *A flora of the Santa Barbara region, California*. Ed. 2. Santa Barbara: Santa Barbara Botanic Garden.

Nooteboom, H. P. 2003. Symplocaceae. Pp. 443-449 in *The families and genera of vascular plants* vol. 6, ed. K. Kubitzki. Berlin: Springer Verlag.

Swofford, D. L. 1998. PAUP* Phylogenetic analysis using parsimony (*and other methods), v. 4.0 beta 10. Sunderland: Sinauer Associates.

Bauml, J. A. 1979. *A study of the genus Hymenocallis (Amaryllidaceae) in Mexico*. M.S. thesis. Ithaca, New York: Cornell University.

DO NOT USE TABS TO MAKE HANGING INDENTS. Use paragraph formatting command.

VII. Tables and Appendices

(Continue page numbering, include in manuscript file following literature cited.)

Each table must start on a separate page, double-spaced.

Include tables in manuscript file, use page or section breaks and landscape layout as necessary to fit the table on the page. Use legal-size paper if necessary to allow adequate margins.

The title should be indented and begin with the word TABLE (large and small caps.) and number (in Arabic) followed by a period.

Do not use footnotes; instead, add notes to the end of the table caption.

Do not use vertical lines in tables.

DO NOT use tabs or spaces to align columns. Use the table building and formatting tools in your word processing package.

Lists of voucher specimens, GenBank numbers, character lists, and any material that is long enough to disrupt the readability of the manuscript should be an appendix, not a table.

VIII. Figure Legends

(Continue page numbering, include in same file as text. Not a separate file)

Double-space legends and group them according to figure arrangements. Quadruple space between groups. Do not use a separate page for each group.

Type legends in paragraph form, starting with statement of inclusive numbers:

FIGS. 3-5. Seeds of orchids. 3. At germination. 4. 2 wk after germination. 5. Seedlings.

FIG. 6. *Ipomopsis spicata* subsp. *robruthii*. A. Habit. B. Flower.

IX. Preparation of Illustrations

Important: Illustrations are either black and white half-tones (photographs), drawings, or graphs. Authors must pay costs for color illustrations.

Prepare illustrations using professional standards. Lines should meet in sharp corners without inappropriate gaps or irregularities, Latin plant names should be italicized, letters and objects should be sharp and not evidently pixellated. Proofread figures carefully. They are the most difficult part of the paper to revise on short notice, or in proof. Printer will not edit or otherwise alter digital figure files in any way.

Final figures should be submitted as tiff files. Line art (e.g., cladograms, botanical illustrations) **must** be at

least 1200 pixels per inch (473 pixels per cm). Photographs (grayscale or color) **must** be a minimum of 350 dpi (138 pixels per cm). Images with mixed line art and grayscale **must** be at least 900 pixels per inch (473 pixels per cm). Be sure to check resolution when the figure is printed at the appropriate size for the journal.

Two widths are possible for figures: a full-page width figure is **177** mm wide, and a one-column width figure is **85** mm wide. Full page height is **240** mm (9.5 inches), but allow space for the caption if possible.

Files must be rasterized or scanned at the full resolution. Rasterizing at a low resolution and later re-saving at a higher resolution will NOT improve the image quality. If you are scanning a paper illustration, make sure the hardcopy is sharp and clear, and both it and the scanning glass are clean. Dust removal/image editing is the author's responsibility.

Color graphics **must** be CMYK mode (**not** RGB). For color graphics, the printer requires a hardcopy printout of the digital image that must match the digital file and show the colors as you want them to appear—submit this hardcopy with the digital images and the final manuscript.

Illustrations of highly magnified areas require a scale bar; a numerical magnification may also be included in the caption. Be sure to calculate magnification accordingly if reproduction is not at 100%.

Include a scale and references to latitude and longitude on each map.

Group several drawings to form a plate of drawings, in the same order as discussed in the text. If several photos are included, group them into one or more plates.

Be sure to save black and white images as grayscale or bitmap, not color (images saved as color take up **much** more memory).

Do not save layers! (in Photoshop, choose "Flatten Image" from the Layer menu).

Crop the image so the image extends from edge to edge - there should be **no** blank white margins.

Save as a tiff file using LZW compression (an option in Photoshop). (Do not use jpeg, which degrades images - line art is especially badly degraded in jpegs).

If you follow these recommendations, most illustrations will be small enough to email.

Consult with editor if uncertain whether image file will be acceptable.

X. Data

All sequences used as data must be deposited in one of the international nucleotide sequence databases, preferably GenBank. Post-review final manuscript will not be accepted until sequence database accession numbers are included. Newly reported sequences **must** be documented by an herbarium specimen. Previously published sequences may cite the voucher or a literature reference where voucher information is given.

All data sets for phylogenetic analyses must be submitted to TreeBASE (<http://www.treeBASE.org>). A TreeBASE accession number (study number alone is acceptable) should be cited in the Materials and Methods section in the final version of the manuscript. For manuscript review, either submit the data file together with the manuscript (if data not yet in TreeBASE) or provide the name and P.I.N. of the author who submitted the data to TreeBASE. Referees will need this information to gain access to the submitted data sets.

Italicize the full name of a gene, e.g., *rbcL*, *matK*.

Representative photographic figures should be provided to document interpretations of isozymes/allozymes.

In addition to character state distributions, consistency index, and retention index (where appropriate), some measure of support for clades (e.g., bootstrap values, decay indices ["Bremer support"], jackknife, etc.) must be provided for phylogenetic analyses.

Indicate in Materials and Methods the percentage of data matrix cells scored as missing data.

When the data matrix is not part of the manuscript the data file or TreeBASE access information must be provided with submitted manuscript for use by reviewers.

Voucher specimens should be cited in an appendix to document sources of morphological and molecular data. Vouchers are herbarium specimens, not living plant accession numbers from botanical gardens or DNA tube numbers, etc.

Additional analyses or bulky non-cladistic data sets can be placed on the ASPT website as online supplemental material. Online posting should be used sparingly, and data and analyses essential to the conclusions in the paper should appear in the published manuscript unless the length is prohibitive. Online supplemental material

should not duplicate materials available on TreeBASE, GenBank, or other online sources.

Materials for online posting should usually be pdf files. Data sets may be in Excel format, or formatted for an appropriate analytical program. Keep files under 1 MB if possible.

XI. Commentaries

Contributions to the Commentary Section may be submitted that discuss recent articles or current topics in systematics. These should be no more than five printed pages. In general, the format for longer articles should be followed.

An attempt will be made to solicit a "Counterpoint" view to be published immediately following the commentary to facilitate more timely discussion on topics of particular interest. The commentary author will receive the counterpoint text before final manuscript is submitted.

XII. What and Where to Submit

Before submission, have all coauthors read the manuscript critically.

Papers longer than 50 printed pages should be sent to Editor-in-Chief of Systematic Botany Monographs.

Initial Submission

Microsoft Word format is preferred; contact the Editor in Chief if you are unable to submit in Word format. Ensure that all files are free of hidden comments or tracked changes.

For review copy, keep file sizes down by using jpeg format and reduced pixel density for figures (keep good quality figure files for later submission of final revised manuscript). If possible, keep files under 3 MB.

File name must include the surname of the first author and date of submission (e.g., Clark20Nov02.doc)

Cover letter. This should include any special instructions, any address change during the next several months, and phone and fax number and email address for the corresponding author. Names, addresses, and email addresses of possible objective reviewers should also be included.

Submit cover letter, manuscript file, data file(s), tables, figures, and completed checklist (download file, complete, and save- file name: "surname checklist.doc") to the Systematic Botany Editorial Manager website (see below).

The author will receive an email message acknowledging receipt of the new submission. The manuscript will be forwarded to an Associate Editor for review.

Revised Manuscript

Final revised manuscript is submitted to the Systematic Botany Editorial Manager website.

File name takes the form: "Clark MS02-80 Final.doc" [the manuscript number is assigned when a new manuscript is received]. The final version **must** be submitted as a word processing file. **Do not** send PDF files.

Proofread figures carefully. They are the most difficult part of the paper to revise on short notice, or in proof. Editors and publisher **cannot** edit figures - author must provide revised files. The full cost of illustration changes in proof will be billed to the author.

Please remember to remove line numbering, remove figures from manuscript file, include final TreeBASE study number, and update information for "in press" citations.

Final revised manuscripts requiring significant editing by the Managing Editor to conform to Syst. Bot. style will be returned to authors causing significant delay in publication.

Proofs and reprint order forms are sent to authors via email attachment as PDF files. Authors send corrected proof to Managing Editor and reprint orders to printer. Authors should make only necessary changes in proof. There is a mandatory charge for more than five changes made in proof.

Cover Illustrations

Authors of accepted manuscripts may submit illustrations relevant to their manuscript to be considered for the cover as digital files directly to the Managing Editor for consideration. Cover illustrations should be square, a minimum of 750 x 750 pixels (8-bit color in CMYK or 8-bit grayscale for black and white photographs) or 2250 x 2250 pixels (black and white line drawings). The name of the species, family, manuscript author names, and manuscript number should be included with the file. Permission of copyright holders is required for any files submitted.

Submit manuscripts to

<http://www.editorialmanager.com/sysbot/>. If this will be your first submission of a manuscript to the Systematic Botany Editorial Manager website, you must first register by clicking "register now" and following the instructions.

Note: All manuscript submissions (electronic, paper) are promptly acknowledged via email. If you do not receive an acknowledgement you should inquire to be sure it was received!

Questions? Contact the Editorial Office:
systbot@gmail.com

1
2
3
4
5
6
7
8
9
10
11
12
13

FERRUCCI AND COULLERI: A NEW SPECIES OF SERJANIA

Serjania lucianoi (Sapindaceae: Paullinieae), a new species from Northern Bahia,
Brazil

María S. Ferrucci^{1,2} & Juan P. Coulleri¹

¹Instituto de Botánica del Nordeste (UNNE-CONICET), Casilla de Correo 209,
W3400CBL - Corrientes, Argentina.

²Author for correspondence (msferrucci@yahoo.com.ar)

Abstract-A new species of *Serjania* (Sapindaceae, Paullinieae), *S. luciano*i from Northern Bahia, Brazil, belonging to *Serjania* sect. *Eurycoccus*, is described, illustrated and compared to its putative closest relative. *Serjania luciano*i seems to be related to *S. glutinosa*, and can be distinguished from it by: the 5-foliolate leaves, linear stipules, indument with simple and glandular obconical-headed trichomes, fruits with ovate outline, and seeds in basal portion of locule. In addition, micromorphological characters of leaf and flower epidermis are given, and pollen grains are described. The new species is known only from Bahian caatinga, being an element of the dunes of the São Francisco River. We present a key to the Brazilian species of *Serjania* restricted to this biome.

Keywords-Brazil, endemic, caatinga, Sapindaceae, *Serjania*, taxonomy.

Serjania Mill. is one of the largest American genera of Sapindaceae, with c. 230 species, 117 (64 endemics) of which occur in Brazil, its major center of diversity (Ferrucci and Acevedo-Rodríguez 2005; Ferrucci 2008; Somner et al. 2010). Within South America, this genus is only absent from Chile. *Serjania* belongs to the tribe *Paullinieae* (sensu Radlkofer 1931-1934) and is distinguished from related genera by its schizocarpic fruits, having mericarps with a distal locule and a proximal wing. This character is also present in the genus *Lophostigma* Radlk. (also in the *Paullinieae*) which is differentiated from *Serjania*, but its floral and pollen morphology (Acevedo-Rodríguez 1993a; Ferrucci and Anzótegui 1993), as well as different chromosome number (Ferrucci and Solís Neffa 1997). Within this tribe, schizocarpic fruits are also present in *Houssayanthus* Hunz., and *Thinouia* Tr. & Planch, but showing samaroid mericarps with central or proximal locule respectively. In *Paullinieae* (sensu Radlkofer 1931-1934) are recognized four types of pollen (Ferrucci and Anzótegui 1993), the pollen type heteropolar, hemitrisyncolporate, peroblate or oblate is shared by *Serjania*, *Balsas* J. Jiménez Ram. & K. Vega, *Cardiospermum* L., *Houssayanthus* Hunz. and *Urvillea* Kunth. Although pollen morphology in *Serjania* seems to be of limited taxonomic value in resolving the systematics of the genus (Van der Ham and Tomlik 1994), it is useful for differentiating *Serjania* from *Lophostigma* and *Paullinia* L. (Acevedo-Rodríguez 1993a, Ferrucci and Anzótegui 1993).

In Brazil, *Serjania* species occur in disturbed vegetation, gallery forest, cerrado, campo rupestre, caatinga, restinga, savannas, terra firme forest and várzea forest (Acevedo-Rodríguez 1993b).

The study of Sapindaceae collection at HUEFS herbarium (Universidade Estadual de Feira de Santana, Bahia, Brazil), allowed us to describe a species of *Serjania* new to

science, known only from the caatinga of Northern Bahia. Pollen analysis is included in this work to complement the characterization of the species.

MATERIAL AND METHODS

This study is based on Serjania's published literature and analysis of collections from CTES and HUEFS herbaria.

Leaf and flower samples were fixed in FAA (formalin - alcohol 70 ° - acetic acid), immersed in CO₂ for critical-point drying, and sputter coated with gold-palladium for scanning electron microscope (SEM) studies.

Pollen grains were obtained from anthers of one collection. Samples for light microscopy (LM) were acetolyzed according to the procedure of Erdtman (1966) and mounted in glycerin jelly. Permanent slides are deposited at the Palynological Laboratory of the Universidad Nacional del Nordeste, Corrientes, Argentina (PAL-CTES). Polar axis and equatorial diameter were measured on twenty grains using a Leica DM LB2 microscope. The terminology used to describe the grains follows Erdtman (1966) and Punt *et al.* (2007).

Scanning electron images (SEM) were taken from leaves, inflorescence axes, sepals and petals epidermis, and acetolyzed pollen grains using a JEOL 5800 LV scanning electron microscope operating at 20 KV.

TAXONOMIC TREATMENT

Serjania lucianoi Ferrucci & Coulleri, sp. nov. TYPE: BRAZIL. Bahia: Pilão Arcado: Barra do lú, ca. 30 Km Oeste de Pilão Arcado, 10°1'25''S, 42°48'15''W, caatinga em solo arenoso, arbustivo-arbóreo, 403 m, 18 March 2006 (fl, fr

immature), *Miranda E.B., E.B. Souza, D.C. Torres & M.M. Castro* 958

(holotype: HUEFS!).

Serjania lucianoi is distinguished by its 5-foliolate leaves, linear stipules, indument of simple and glandular obconical-headed trichomes on vegetative and reproductive organs, fruits with ovate outline, and seeds in basal portion of locules.

Woody vine, pubescent, monoecious, not producing milky sap. Young branches, leaves, inflorescence axes, bracts and bracteoles, margins of leaflets, and external sepals with simple, short, whitish trichomes intermixed with glandular obconical-headed, relatively longer and ferruginous trichomes. Flowering branchlets ca. 1.5 mm diam, with 5 rounded ribs; cross section of stems with a single stele, medulla partially hollow.

Stipules linear, persistent, 7–9×0.6 mm, adaxially and abaxially puberulous, glandular pubescent and setulose on margins. Leaves 5-foliolate; petioles subterete, adaxially furrowed, 2.3–3.3 cm long, pubescent; raquis bicanaliculate, 1.7–2 cm long, pubescent; petiolules marginate, 10–13 mm long in terminal leaflet, 2–5 mm long in the proximal pair of leaflets, subsessile in distal ones; leaflets chartaceous, concolorous, terminal leaflet widely obovate or ovate, 3.7–4×3–3.6 cm; the other leaflets ovate or narrowly ovate, 3.2–3.5×1.4–2.2 cm, symmetric or asymmetric with a narrower acroscopic side; venation craspedodromous; apex acute, mucronate; base rounded or cuneate; margins inciso-dentate or dentate-serrate, with 8–17 obtuse glandular teeth; hypoamphistomatic, adaxial surface with few stomata, veins slightly marked, pilose, with minute, curved, subadpressed, whitish trichomes, midvein with slightly longer pubescence and scattered bent glandular trichomes, abaxial surface pubescent, with thin, prominent veins.

Thyrse axillary, simple, racemiform; peduncle quadrangular, 4–6.5 cm long, pubescent, with 2 delicate tendrils at base; rachis angular, striate, 1.8–2 cm long; cincinnus many-flowered, peduncle 9–12 mm long; pedicel 4–5 mm long, articulate near the base; bracts

1 subulate, persistent, ca. 2 mm long, pubescent, bracteoles similar, 1.2–1.5 mm long.
 2 Flowers functionally staminate or pistillate, whitish, 6.5–9 mm long; sepals 5, ciliate,
 3 outer sepals cucullate, ovate obtuse, 3–4.8×ca. 3 mm, abaxially pubescent, adaxially
 4 glabrous, inner sepals oblong or ovate, obtuse, 5–6×2.5–3 mm, abaxially tomentose but
 5 one of the anterior sepals pubescent; petals 4, obovate, clawed, erose, adaxially and
 6 abaxially eglandular, posterior ones broadly obovate, 5.5–7×5.6–6 mm, with
 7 symmetrical appendage, 4–5× ca. 4 mm, with emarginate crest, and villous; anterior
 8 petals with asymmetrical appendage, 4–7×3–6.5 mm; nectary lobes 4, the posterior
 9 ovate oblong, obtuse and pilose at apex, the anterior ones circular in outline and much
 10 smaller than the posterior ones; androgynophore glabrous or puberulous. Staminate
 11 flowers: stamens 3.7–4 mm long, filaments with a few scattered hairs at base; pistillode
 12 ca. 1.5 mm long, with glandular hairs. Pistillate flowers: sterile stamens 3.5–4 mm long,
 13 filaments flattened, pilose in proximal half, anthers indehiscent, puberulous; gynoecium
 14 6 mm long, ovary trigonous, obovoid in outline, pubescent (glandular and simple
 15 trichomes), and style straight, puberulous, 2–2.25 mm long, longer than the stigmatic
 16 branches. Fruit ovate in outline, chartaceous, brown, 2.6–3.1×2.6–3.2 cm, cordate at
 17 base, cocci subglobose, somewhat laterally compressed, dark brown, 1.5–1.7 cm wide,
 18 narrowly cristate, crest 0.5–1.2 mm wide, emarginate at apex, not constricted at junction
 19 with wing; epicarp pubescent on cocci, simple and glandular trichomes of the same
 20 length, wings puberulous, simple trichomes shorter, endocarp glabrous, except for
 21 simple trichomes around the insertion of the seed. Seeds subspherical, ca. 6.28×5.42
 22 mm in diameter, smooth, dark brown, basally attached. Embryo with abaxial cotyledon
 23 curved and adaxial cotyledon biplicate. Figures 1–3.

24 Pollen grains heteropolar, hemitrisyncolporate, colpi reduced to colpoids,
 25 peroblate or oblate, polar axis 20.15 (26.28) 32.55 μm , equatorial diameter 38.23

(43.51) 50.63 μm ; sexine perforate-fosulate in the distal polar side to reticulate in the proximal side (Fig. 4).

Distribution, Ecology and Phenology-*Serjania lucianoi* is endemic to the state of Bahia, occurring in caatinga vegetations (Fig. 5). Flowering from February to March and fruiting in December.

Etymology-The specific epithet honors Professor Luciano Paganucci de Queiroz, a preeminent botanist from Universidade Estadual de Feira de Santana and editor of Flora of Bahia project.

IUCN Conservation Status- Endangered: B2 ab(ii)(iv). *Serjania lucianoi* is represented by three herbaria collections, two of them were made in the protected area Reserva Ecológica Raso da Catarina, where the principal threat is represented by cattle. Also, the B1 is 2171.87 km^2 reinforcing the endangered status.

Additional Specimens Examined-BRAZIL. Bahia: Casa Nova: Próximo ao rio São Francisco, 9°24'37''S, 41°8'59''W, caatinga, em solo arenoso, alt. 417 m, 28 Dec 2001 (fr), Nunes T.S., A. Carneiro, A. Rocha, B.S. Andrade & B.M. Silva 709 (HUEFS); Casa Nova, Estrada para Pau a Pique, 9°23'12''S, 41°39'48''W, caatinga arbustiva aberta, 542 m, 8 Feb 2004 (fl), Queiroz, L.P. de, J.G. Nascimento, A. Conceição, D. Cardoso & E. Groes 9099 (CTES).

DISCUSSION

The new species belongs to section *Eurycoccus* (Radlkofer 1874, 1931–1934; Acevedo-Rodríguez 1993b) characterized by fruit wing not or hardly distinct from coccus, it somewhat flattened, swollen in the central portion, elliptic in cross section, with a narrow partitioning wall, and crested coccus; simple vascular cylinder except for *S. rubicunda* Radlk., or a vascular cylinder radially divide in 5 (6–7) parts, this last feature is unique to *Serjania*, and is only present in eight species of this section (Acevedo-

Rodríguez and Somner 2002). Among the species of the section, *S. lucianoi* seems to be closely related to *S. glutinosa* Radlk., however it can be distinguished from it by its 5-foliolate leaves (vs. biternate), linear stipules 7–9 mm long (vs. 3–4 mm long), erect glandular trichomes with obconical multicellular head (vs. glandular trichomes with spherical unicellular head) (Fig. 6). Regarding pollen morphology, both species share the reticulate-heterobrochate sexine with perforated tectum; although the pollen grains are different in size, in *S. lucianoi* are larger than those of *S. glutinosa*, and also in *S. lucianoi* the colpi are reduced to colpoids while in *S. glutinosa* the colpi are linear (Ferrucci and Anzótegui 1993). The two species are contrasted on Table 1. Thirty-six species of *Serjania* have been recorded from the state of Bahia, seven of which are endemic to this state (about 20 %), but only two of them (*S. coradinii* Ferrucci & Somner, and *S. grammatophora* Radlk.) are recorded as endemic to the caatinga (Somner et al. 2010, except *S. faveolata* Radlk.); interestingly, no other Brazilian state has species that are endemic to this biome. The latter species was mentioned only for the Bahian caatinga in Somner et al. (2010), however has also been reported for Minas Gerais (Somner and Ferrucci 2009), and has also been found in gallery forest in both states (Ferrucci pers. comm.). The three species restricted to the caatinga can be distinguished from one another using the following key. The caatinga is the dominant vegetation form in the semi-arid area of north-eastern Brazil, this biome is part of the seasonally dry Neotropical woodlands, and Bahia comprises the major portion of this domain (Pennington et al. 2000; Prado 2000). Regarding to the phytogeographical patterns inferred to this region (Queiroz 2006), *S. lucianoi* would be an element of the dunes of the São Francisco River, characterized by extensive deposits of dystrophic quartzose sand.

KEY TO THE BRAZILIAN SPECIES OF *SERJANIA* RESTRICTED TO CAATINGA

1. Leaves 3- or 5-foliolate. Fruit ovate in outline, apex emarginate, cocci globose or subglobose, constriction slight or absent below them; epicarp not setose

.....2

2. Leaves 3-foliolate. Stipules ovato-triangular, ca. 1.2 mm long, glabrous.

Indumentum dense of whitish simple, short and curved trichomes in stems, leaves and inflorescence axes. Petals glandulose in both faces. Cocci without dorsal crest, constriction slight below them; epicarp glabrous.....*S. grammatophora* Radlk.

2. Leaves 5-foliolate. Stipules linear, persistent, 7–9 mm, puberulous.

Indumentum of simple, short, curved, whitish trichomes intermixed with longer glandular trichomes in young stems, leaves and inflorescence axes.

Petals eglandulose. Cocci narrowly cristate, constriction absent below them;

epicarp with glandular and simple trichomes....*S. lucianoii* Ferrucci & Coulleri

1. Leaves biternate. Fruit ovate-obtriangular in outline, apex truncate. Cocci

obtriangular, proximal portion inflated, distal one complanate, with marked

constriction between both portions, epicarp with simple, glandular and setose

trichomes on cocci.....*S. coradinii* Ferrucci & Somner

ACKNOWLEDGEMENTS. We thank L. Simón for preparing the excellent illustration,

W. Medina and G. Pieszko for digitalizing the images, R. Salas for help with the IUCN

conservation status and the observations of two anonymous reviewers which allowed us

improve the paper. Financial support was provided by the Consejo Nacional de

Investigaciones Científicas y Técnicas (PIP N° 112–200801–02248), by the Universidad

Nacional del Nordeste (PI A005–2009) and by the Agencia Nacional de Promoción

Científica, Tecnológica y de Innovación (ANPCyT-UNNE, PICTO 00096).

LITERATURE CITED

- Acevedo-Rodríguez, P. 1993a. A revision of *Lophostigma* (Sapindaceae). *Systematic Botany* 18: 379–388.
- Acevedo-Rodríguez, P. 1993b. Systematics of *Serjania* (Sapindaceae) part. 1: A revision -of *Serjania* sect. *Platycoccus*. *Memoirs of the New York Botanical Garden* 67: 1–93.
- Acevedo-Rodríguez, P. and G. V. Somner. 2002. Two new species of *Serjania* (Sapindaceae) from southeastern Brazil. *Brittonia* 53: 477–481.
- Erdtman, G. 1966. Pollen morphology and plant taxonomy. Angiosperms. New York: Hafner Publishing Company.
- Ferrucci, M.S. and V.G. Solís Neffa. 1997. Citotaxonomía de Sapindaceae Sudamericanas. *Boletín de la Sociedad Argentina de Botánica* 33: 77–83.
- Ferrucci, M. S. 2008. Sapindaceae. Pp. 2938–2951 in *Catálogo de las Plantas Vasculares del Cono Sur*. Vol. 3, eds. F. O. Zuloaga, O. Morrone and M. J. Belgrano. Monographs in Systematic Botany from the Missouri Botanical Garden 107. St. Louis: Missouri Botanical Garden Press.
- Ferrucci, M. S. and P. Acevedo-Rodríguez. 2005. Three new species of *Serjania* (Sapindaceae) from South America. *Systematic Botany* 30: 153–162.
- Ferrucci, M. S. and L. M. Anzótegui. 1993. El polen de Paullinieae (Sapindaceae). *Bonplandia* 6: 211–243.
- Pennington, R. T., D. E. Prado, and C. A. Pendry. 2000. Neotropical seasonally dry forests and Quaternary vegetation changes. *Journal of Biogeography* 27: 261–273.
- Prado, D. E. 2000. Seasonally dry forests of tropical South America: from forgotten ecosystem to a new phytogeographical unit. *Edinburgh Journal of Botany* 57: 437–461.

- 1 Punt, W., P. P. Hoen, S. Blackmore, S. Nilsson, and A. Le Thomas. 2007. Glossary of
- 2 pollen and spore terminology. *Review of Palaeobotany and Palynology* 143: 1–81.
- 3 Queiroz, L. P. de. 2006. The Brazilian caatinga: phytogeographical patterns inferred
- 4 from distribution data of the Leguminosae. Pp. 121-157 in *Neotropical savannas*
- 5 *and seasonally dry forests: plant diversity, biogeography, and conservation*, eds.
- 6 R.T. Pennington, G. P. Lewis, and J. A. Ratter. Boca Raton, Florida: CRC Press.
- 7 Radlkofer, L. 1874. *Conspectus sectionum specierumque generis Serjaniae*. München:
- 8 F. Straub.
- 9 Radlkofer, L. 1931-1934. Sapindaceae. In *Das Pflanzenreich* 4, 165 (Heft 98): 1-1539,
- 10 ed. H. G. A. Engler. Weinheim: Verlag von H. R. Engelmann (J. Cramer).
- 11 Somner, G. V. and M. S. Ferrucci. 2009. *Serjania littoralis* (Paullinieae, Sapindaceae), a
- 12 new species from Rio de Janeiro, Brazil. *Annales Botanici Fennici* 46: 479–483.
- 13 Somner, G. V., Ferrucci, M. S., and P. Acevedo-Rodríguez. 2010. Sapindaceae. Pp.
- 14 1614-1618 in *Catálogo de Plantas e Fungos do Brasil*. Volume 2. Angiospermas,
- 15 coord. Campostrini Forzza, R. and P. Leitman. Rio de Janeiro: Gráfica Santa
- 16 Marta.
- 17 Van der Ham, R. W. J. M. and A. Tomlik. 1994. *Serjania* pollen and the origin of the
- 18 tribe Paullinieae (Sapindaceae). *Review of Palaeobotany and Palynology* 83: 43–
- 19 53.

1 TABLE 1. Morphological differences between *Serjania lucianoi* and *S. glutinosa*.

Character	<i>S. lucianoi</i>	<i>S. glutinosa</i>
Leaves	5-foliolate	Biternate
Stipules	Linear, 7–9 mm long	Subulate, 3–4 mm long
Indument	Simple and glandular obconical-headed trichomes comparative longer	Simple, short glandular globose-headed trichomes and bristles of 2–3.4 (4.5) mm long
Petals	Egladulose	Subeglandulose
Fruit: Out line	Ovate	Subrectangular
Coccus	Subglobose, laterally somewhat compressed, narrowly cristate	Laterally compressed, dorsal crest revolute
Epicarp	Glandular and simple trichomes of the same length on cocci	Short glandular trichomes, simple erect ones and bristles on cocci
Seeds	Basally attached	Inserted just under half of the locule
Environment	Caatinga	Amazônia, cerrado, mata atlântica, pantanal

Geographic distribution	Brasil, Bahia	Argentina, Misiones; Bolivia, Paraguay and Brazil, from Roraima to Paraná
-------------------------	---------------	--

Figure legends

Fig. 1. *Serjania lucianoi*. **A.** Portion of flowering branch. **B.** Detail of stipules. **C.** Staminate flower. **D.** Posterior petal, with adnate appendage. **E.** Anterior petal, with adnate appendage. **F.** Stamens from staminate flower. **G.** Mericarp. **H.** Longitudinal section of seed showing embryo (A-F, *Queiroz et al. 9099*, CTES; G-H, *Nunes et al. 709*, HUEFS).

Fig. 2. *Serjania lucianoi*. Scanning electron micrographs of foliar epidermis. **A.** Upper surface, epidermal cells with slight striations and trichomes. **B.** Lower surface, showing simple trichomes and an elevated number of stomata (A-B, *Queiroz et al. 9099*, CTES).

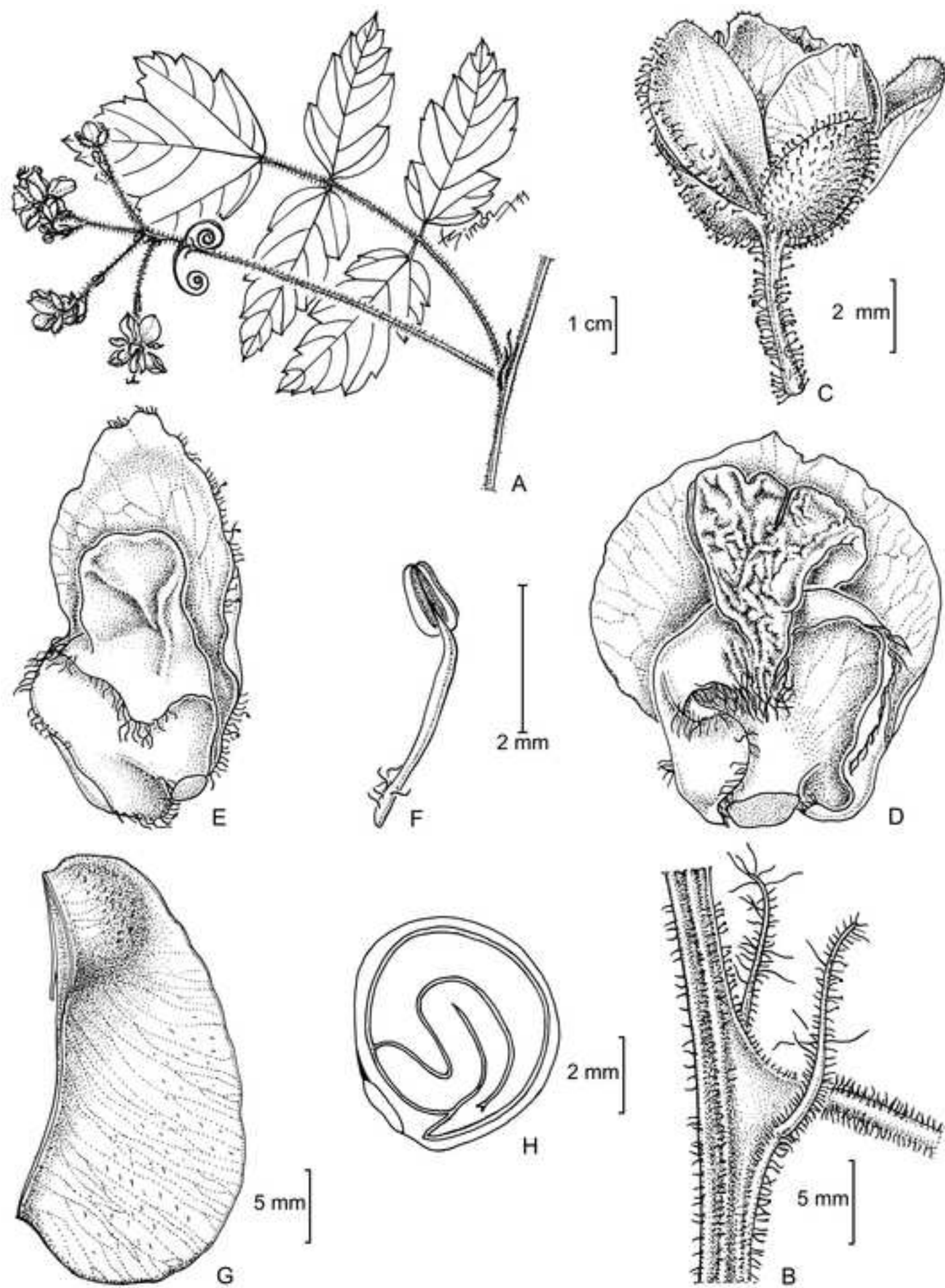
Fig. 3. *Serjania lucianoi*. Scanning electron micrographs of inflorescence and flower bud. **A.** Portion of the inflorescence axe showing the indument. **B.** Detail of trichomes, simple trichomes and glandular ones, note the obconical head. **C.** Flower bud. **D.** Detail of the glandular trichomes of the external sepals (A-D, *Queiroz et al. 9099*, CTES).

Fig. 4. *Serjania lucianoi*. Scanning electron micrographs of pollen grains. **A.** Distal view. **B.** Proximal view, note colpi reduced to colpoids. **C.** Detail of syncolpate aperture. (A-C, *Miranda et al. 958*, HUEFS).

Fig. 5. Known geographical distribution of *Serjania lucianoi*, this new species is restricted to the caatinga.

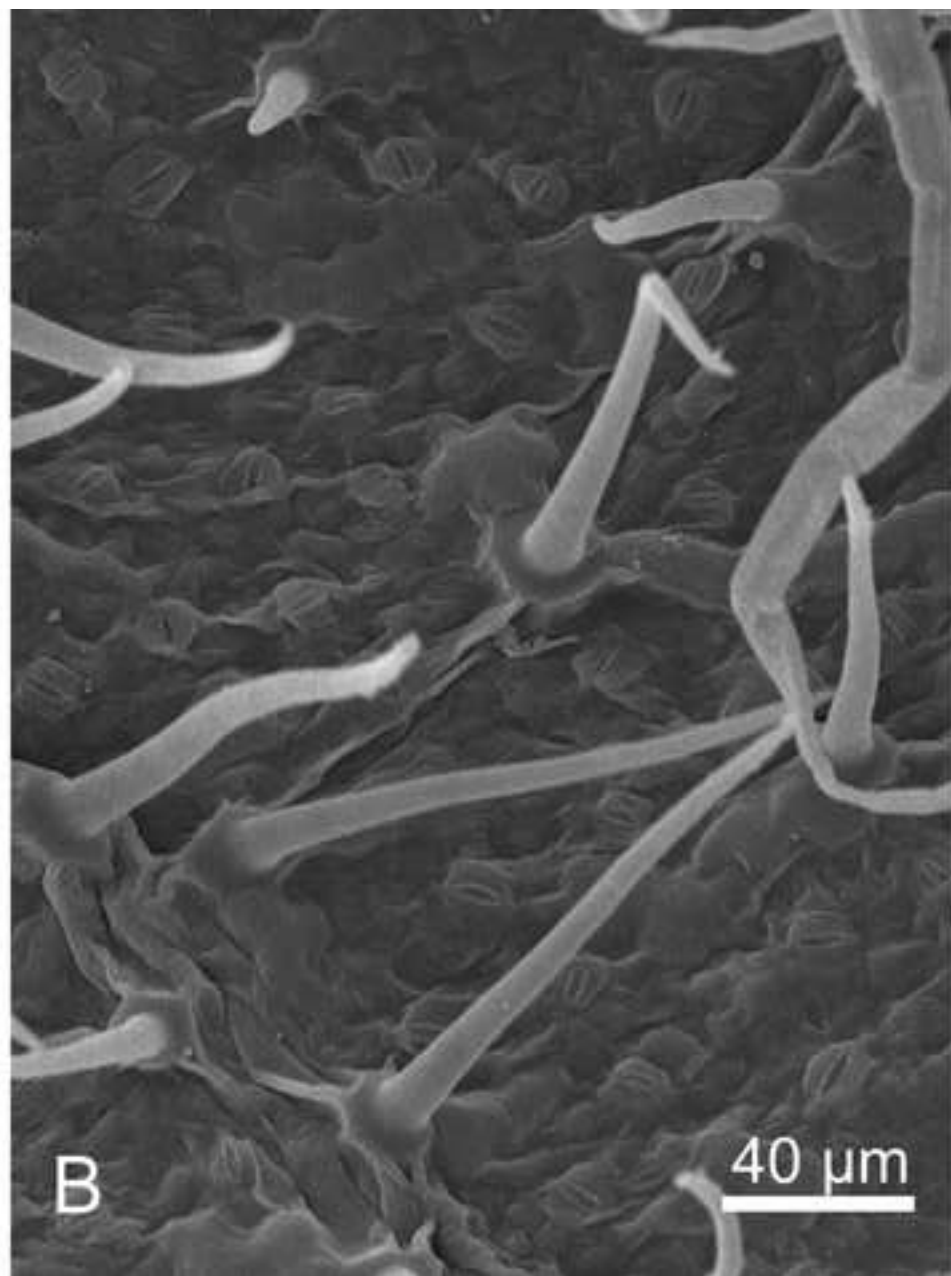
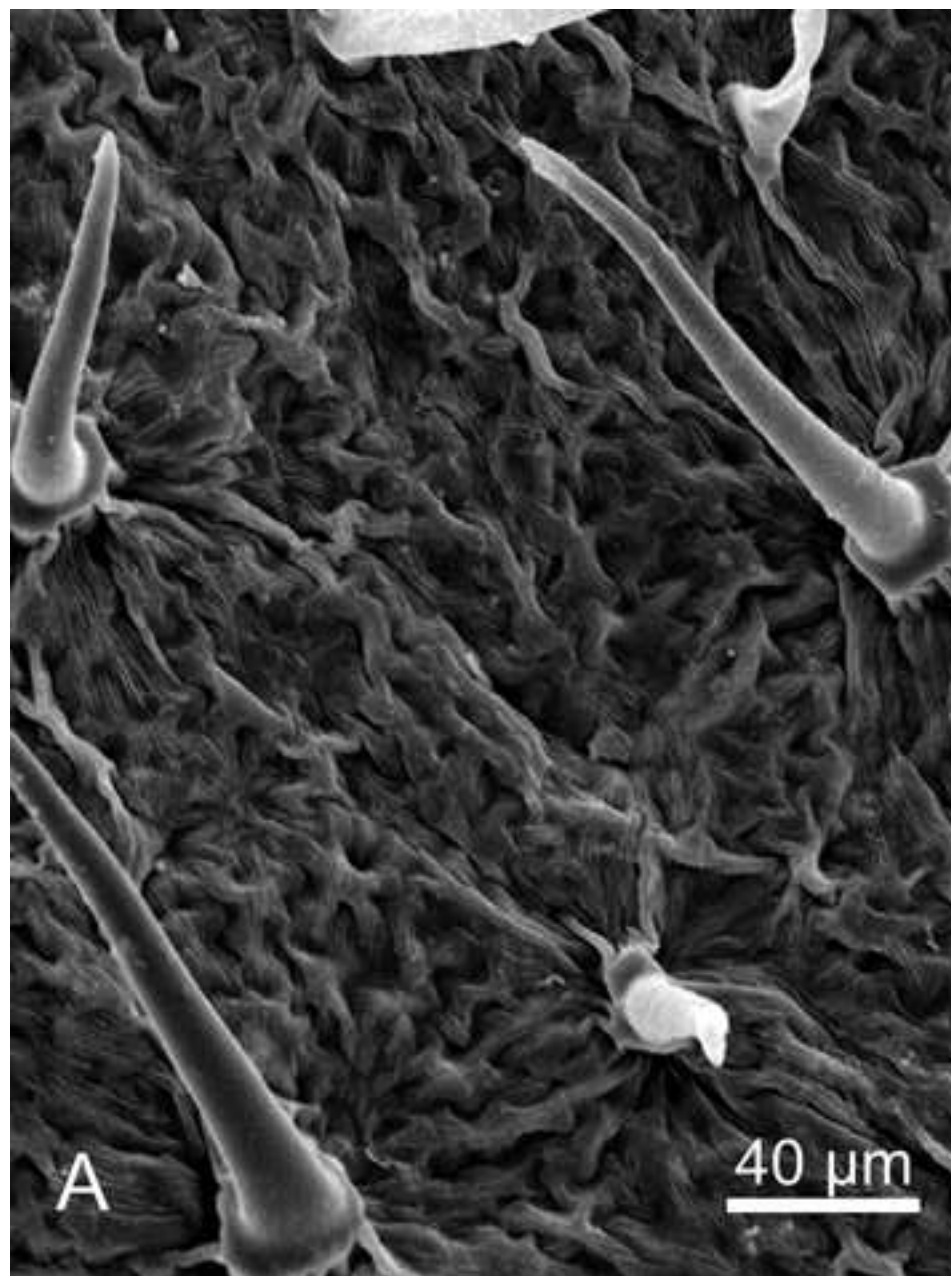
Fig. 6. *Serjania glutinosa*. Scanning electron micrographs of portion of the inflorescence axe, showing the indument, simple and glandular trichomes with spherical head are appreciated.

Figure
[Click here to download high resolution image](#)



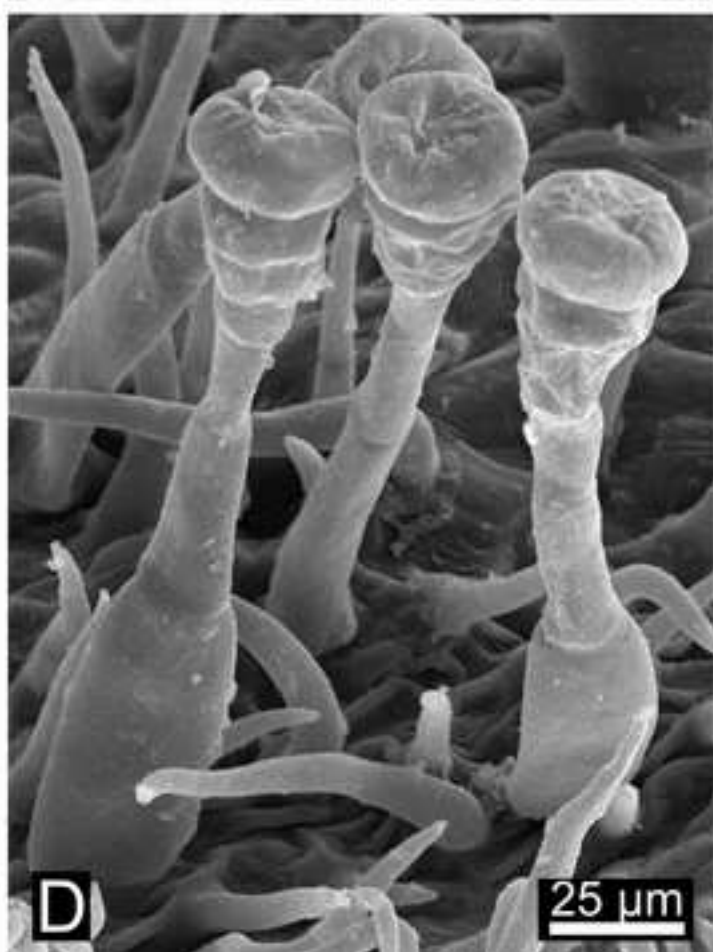
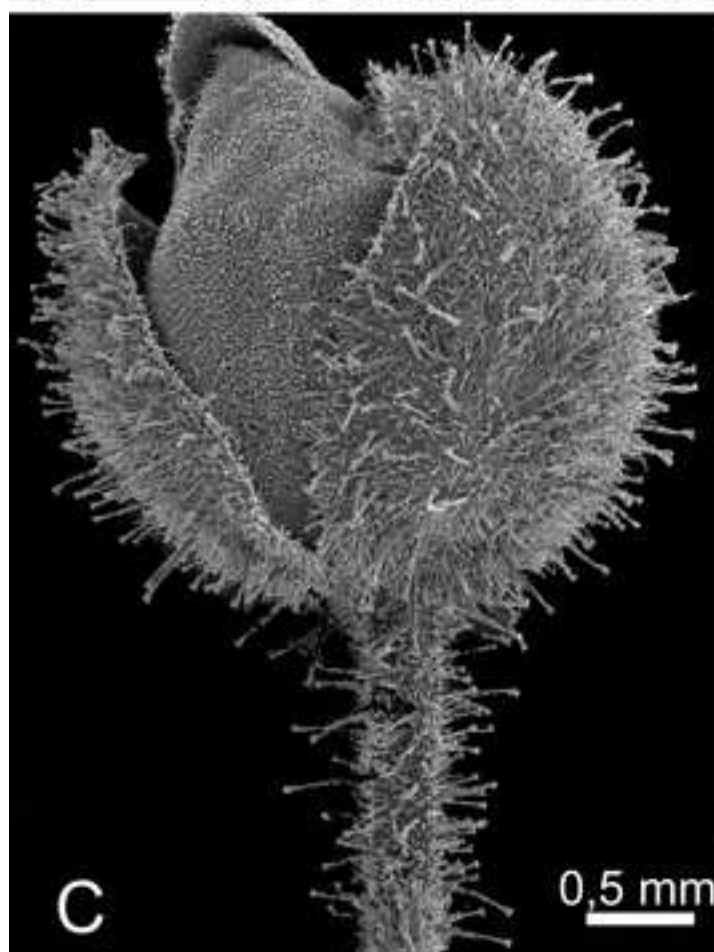
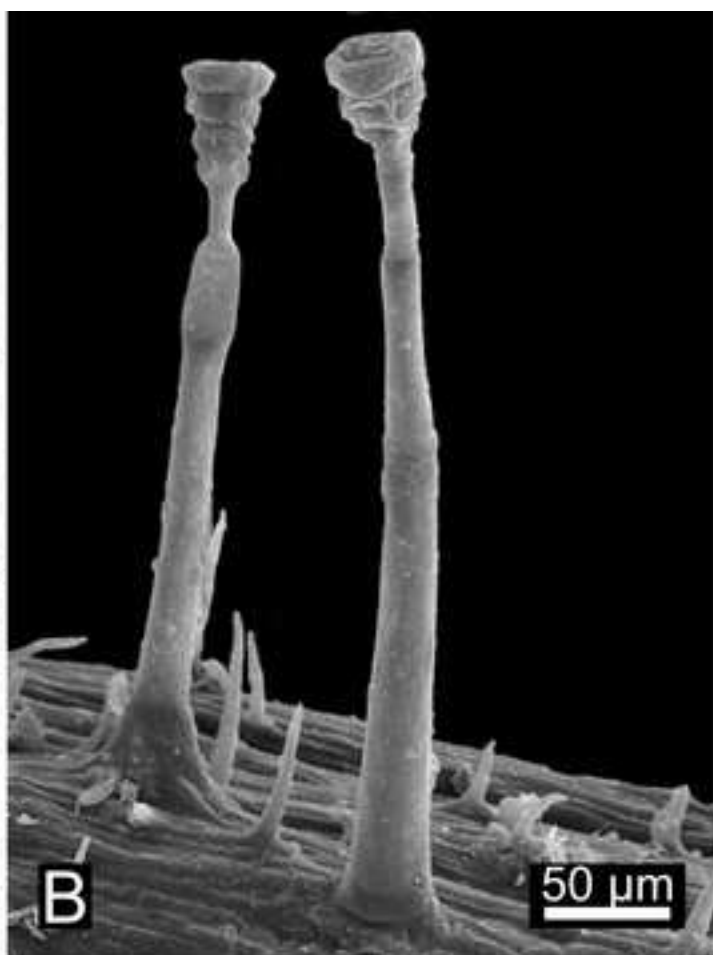
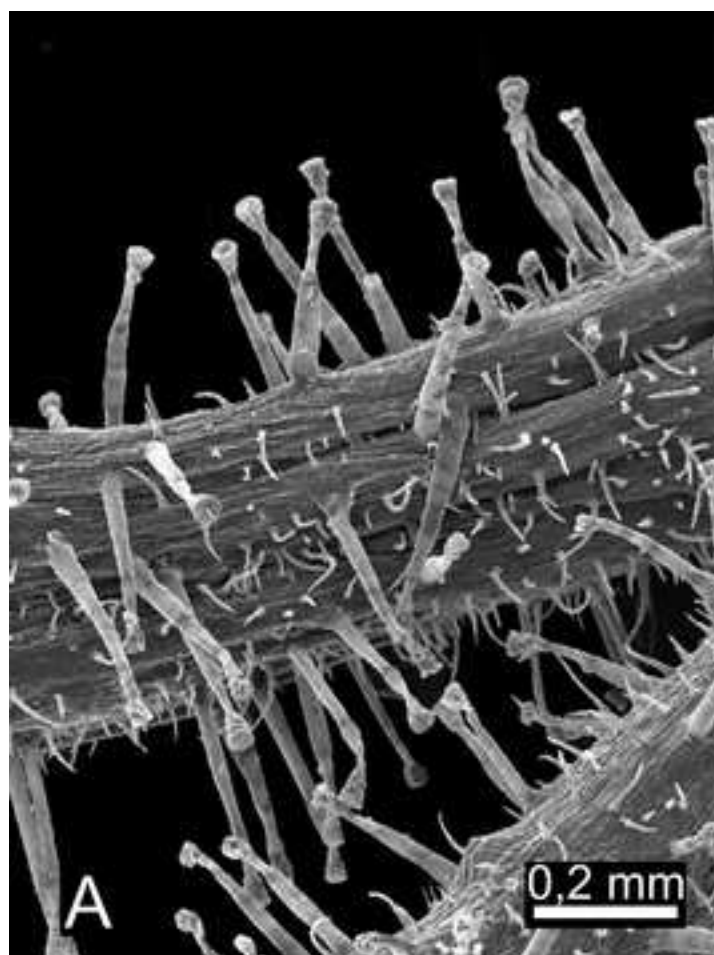
Figure

[Click here to download high resolution image](#)



Figure

[Click here to download high resolution image](#)



Figure

[Click here to download high resolution image](#)

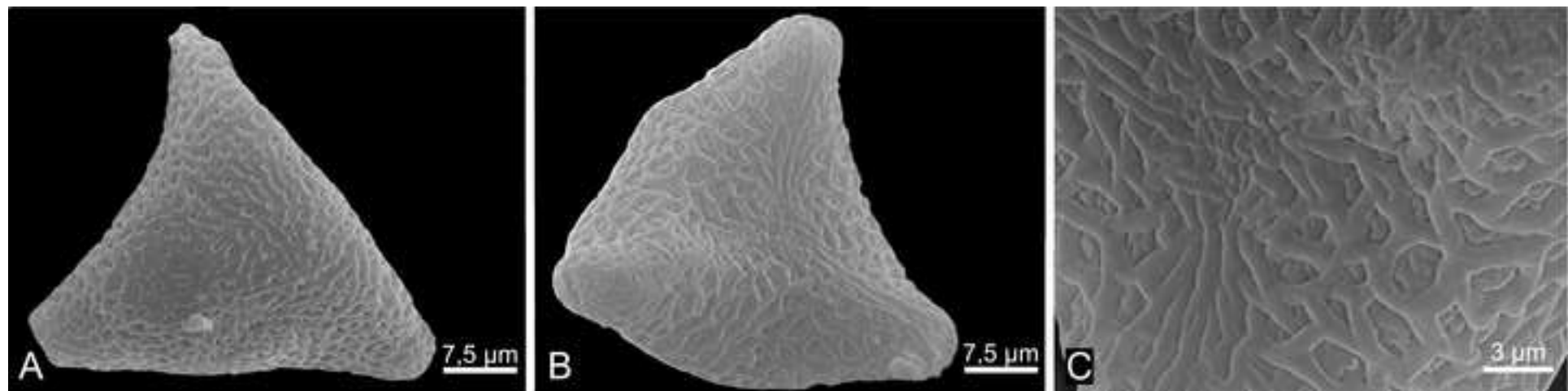
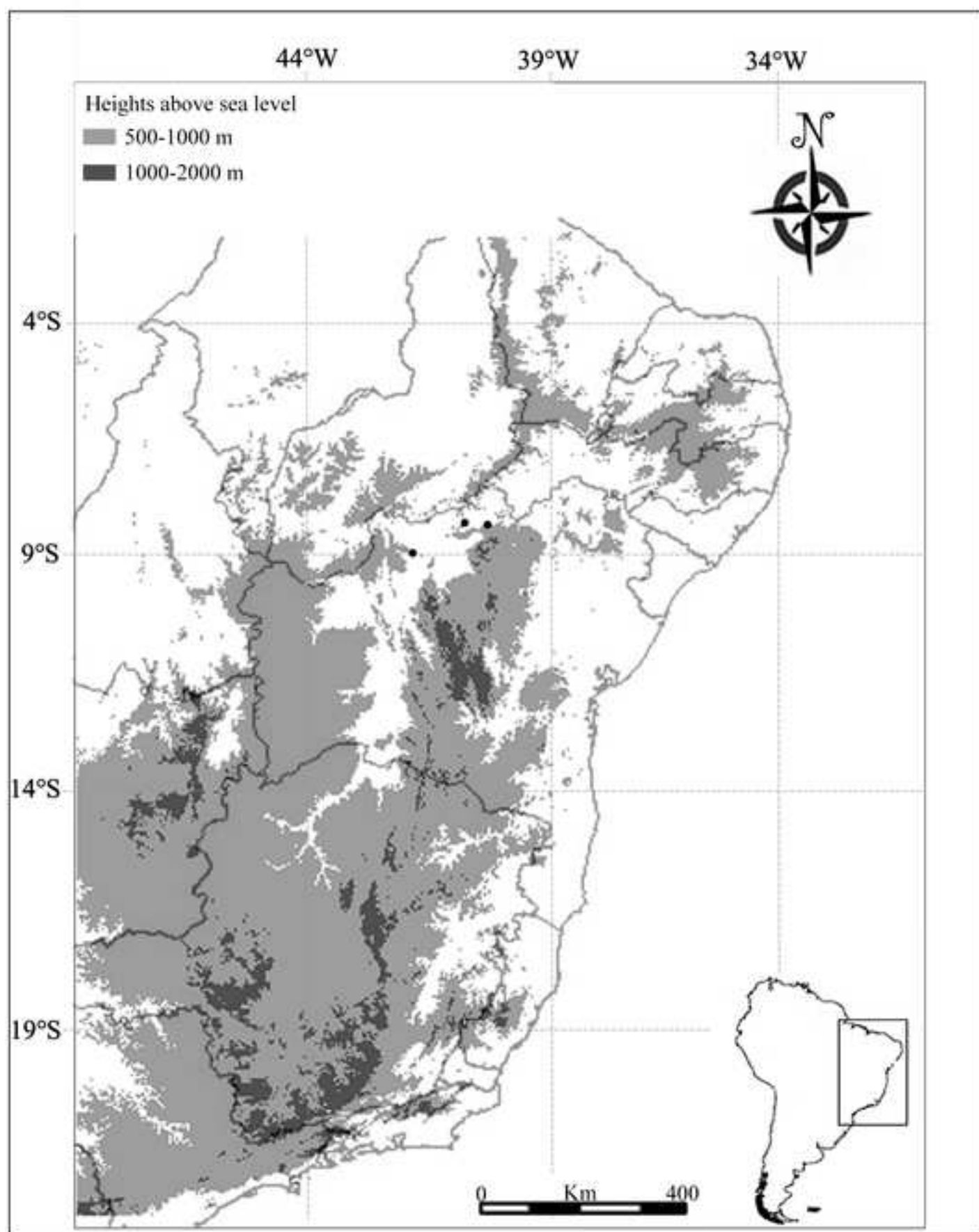


Figure
[Click here to download high resolution image](#)



Figure

[Click here to download high resolution image](#)

