

Reserva Florestal do Instituto de Biociências, Universidade de São Paulo

# Identification of Lianas by stem anatomy and external bark

Caian S. Gerolamo, Cairo F. Figueiredo, André C. Lima, Marcelo R. Pace, Veronica Angyslossy & Gregório C.T. Ceccantini

2021

# Identification of Lianas by stem anatomy and external bark

Caian S Gerolamo<sup>1</sup>, Cairo F Figueiredo<sup>1</sup>, André C Lima<sup>1</sup>, Marcelo R Pace<sup>2</sup>, Veronica Angyalossy<sup>1</sup> & Gregório CT Ceccantini<sup>1</sup>

<sup>1</sup>Universidade de São Paulo, Brazil; <sup>2</sup>Universidad Nacional Autónoma de México, México

Photos and co-first authorship: CF Figueiredo and CS Gerolamo [caiansg@gmail.com]. Produced by: authors with the assistance of Valéria Sampaio & Juliana Philipp Field Museum. Support from: CNPq, CAPES and FAPES [2018/06917-7]. This study is part of the master's thesis of Cairo F. Figueiredo.



© Field Museum (2021) CC BY-NC 4.0. Licensed works are free to use/share/modify with attribution, but commercial use of the original work is not permitted.

[fieldguides.fieldmuseum.org]

[1425] version 1 10/2021



# Identification of Lianas by stem anatomy and external bark

Caian S Gerolamo<sup>1</sup>, Cairo F Figueiredo<sup>1</sup>, André C Lima<sup>1</sup>, Marcelo R Pace<sup>2</sup>, Veronica Angyalossy<sup>1</sup> & Gregório CT Ceccantini<sup>1</sup>

<sup>1</sup>Universidade de São Paulo, Brazil; <sup>2</sup>Universidad Nacional Autónoma de México, México

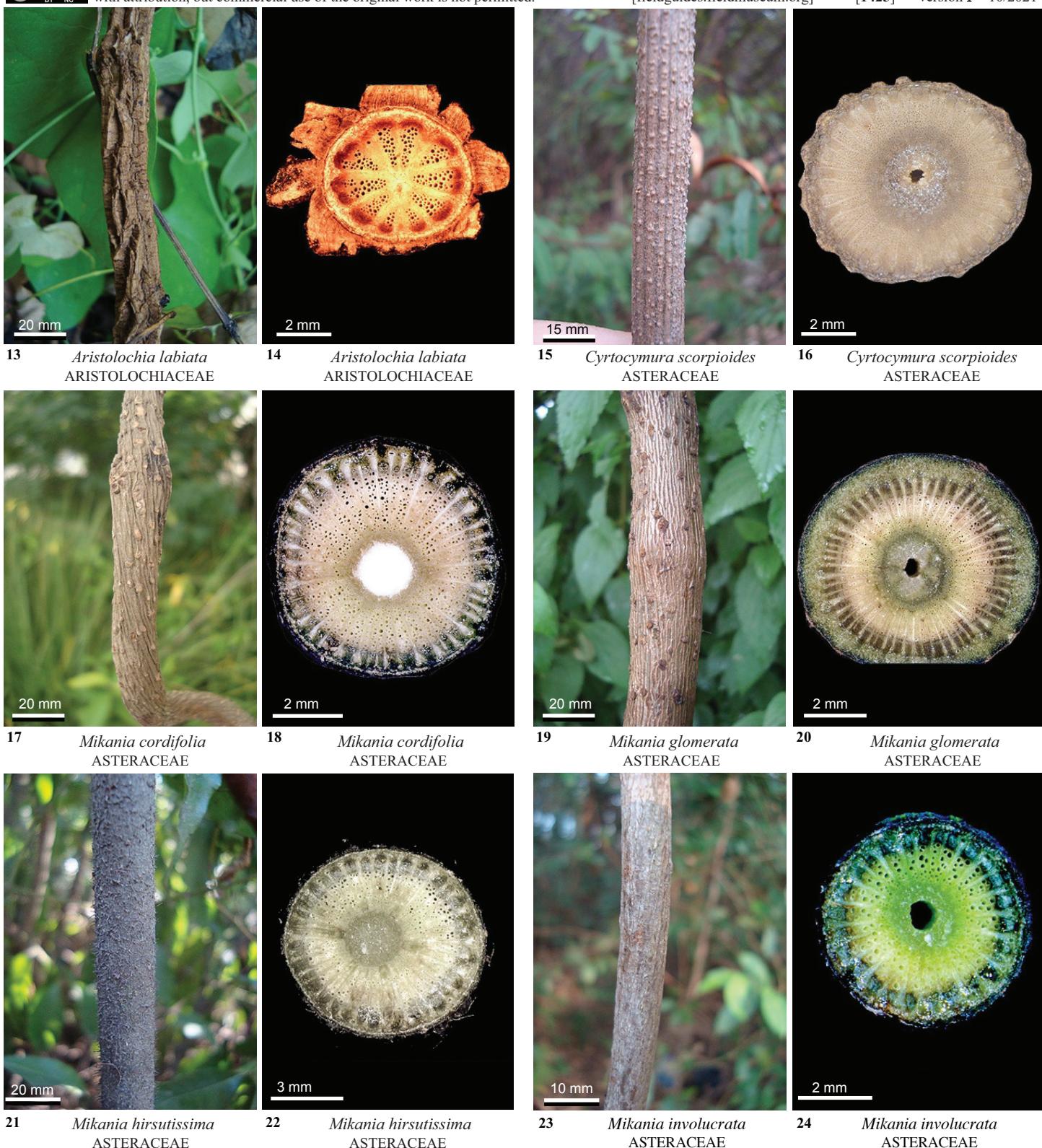
Photos and co-first authorship: CF Figueiredo and CS Gerolamo [caiansg@gmail.com]. Produced by: authors with the assistance of Valéria Sampaio & Juliana Philipp Field Museum. Support from: CNPq, CAPES and FAPES [2018/06917-7]. This study is part of the master's thesis of Cairo F. Figueiredo.



© Field Museum (2021) CC BY-NC 4.0. Licensed works are free to use/share/modify with attribution, but commercial use of the original work is not permitted.

[fieldguides.fieldmuseum.org]

[1425] version 1 10/2021



# Identification of Lianas by stem anatomy and external bark

Caian S Gerolamo<sup>1</sup>, Cairo F Figueiredo<sup>1</sup>, André C Lima<sup>1</sup>, Marcelo R Pace<sup>2</sup>, Veronica Angyalossy<sup>1</sup> & Gregório CT Ceccantini<sup>1</sup>

<sup>1</sup>Universidade de São Paulo, Brazil; <sup>2</sup>Universidad Nacional Autónoma de México, México

Photos and co-first authorship: CF Figueiredo and CS Gerolamo [caiansg@gmail.com]. Produced by: authors with the assistance of Valéria Sampaio & Juliana Philipp Field Museum. Support from: CNPq, CAPES and FAPES [2018/06917-7]. This study is part of the master's thesis of Cairo F. Figueiredo.



© Field Museum (2021) CC BY-NC 4.0. Licensed works are free to use/share/modify with attribution, but commercial use of the original work is not permitted.

[fieldguides.fieldmuseum.org]

[1425] version 1 10/2021



25 *Mikania salviifolia*  
ASTERACEAE



26 *Mikania salviifolia*  
ASTERACEAE



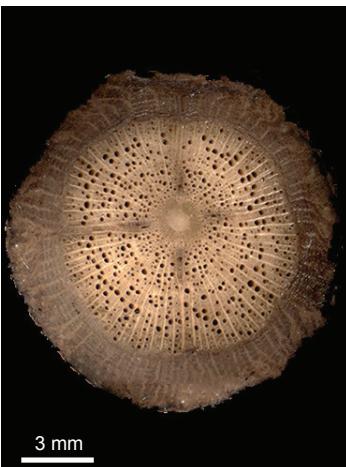
27 *Mikania triangularis*  
ASTERACEAE



28 *Mikania triangularis*  
ASTERACEAE



29 *Amphilophium crucigerum*  
BIGNONIACEAE



30 *Amphilophium crucigerum*  
BIGNONIACEAE



31 *Dolichandra unguis-cati*  
BIGNONIACEAE



32 *Dolichandra unguis-cati*  
BIGNONIACEAE



33 *Lundia corymbifera*  
BIGNONIACEAE



34 *Lundia corymbifera*  
BIGNONIACEAE



35 *Mansoa diffcilis*  
BIGNONIACEAE



36 *Mansoa diffcilis*  
BIGNONIACEAE

# Identification of Lianas by stem anatomy and external bark

Caian S Gerolamo<sup>1</sup>, Cairo F Figueiredo<sup>1</sup>, André C Lima<sup>1</sup>, Marcelo R Pace<sup>2</sup>, Veronica Angyalossy<sup>1</sup> & Gregório CT Ceccantini<sup>1</sup>

<sup>1</sup>Universidade de São Paulo, Brazil; <sup>2</sup>Universidad Nacional Autónoma de México, México

Photos and co-first authorship: CF Figueiredo and CS Gerolamo [caiansg@gmail.com]. Produced by: authors with the assistance of Valéria Sampaio & Juliana Philipp Field Museum. Support from: CNPq, CAPES and FAPES [2018/06917-7]. This study is part of the master's thesis of Cairo F. Figueiredo.



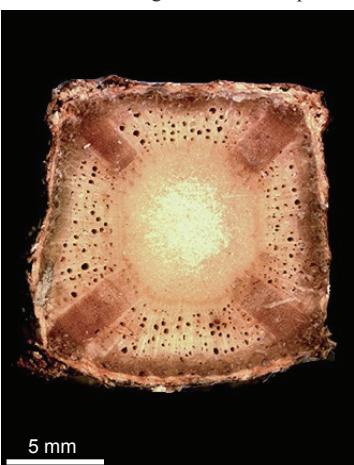
© Field Museum (2021) CC BY-NC 4.0. Licensed works are free to use/share/modify with attribution, but commercial use of the original work is not permitted.

[fieldguides.fieldmuseum.org]

[1425] version 1 10/2021



37 *Pleonotoma tetraquetra*  
BIGNONIACEAE



38 *Pleonotoma tetraquetra*  
BIGNONIACEAE



39 *Pyrostegia venusta*  
BIGNONIACEAE



40 *Pyrostegia venusta*  
BIGNONIACEAE



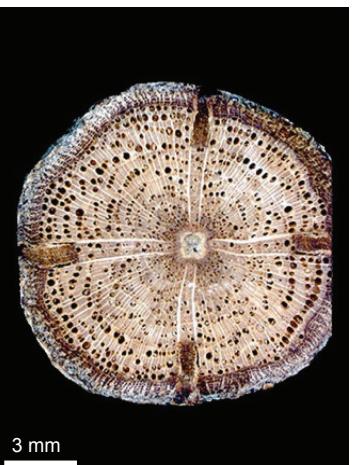
41 *Stizophyllum riparium*  
BIGNONIACEAE



42 *Stizophyllum riparium*  
BIGNONIACEAE



43 *Tanaecium pyramidatum*  
BIGNONIACEAE



44 *Tanaecium pyramidatum*  
BIGNONIACEAE



45 *Tynanthus cognatus*  
BIGNONIACEAE



46 *Tynanthus cognatus*  
BIGNONIACEAE



47 *Myriopus paniculatus*  
BORAGINACEAE



48 *Myriopus paniculatus*  
BORAGINACEAE

# Identification of Lianas by stem anatomy and external bark

Caian S Gerolamo<sup>1</sup>, Cairo F Figueiredo<sup>1</sup>, André C Lima<sup>1</sup>, Marcelo R Pace<sup>2</sup>, Veronica Angyalossy<sup>1</sup> & Gregório CT Ceccantini<sup>1</sup>

<sup>1</sup>Universidade de São Paulo, Brazil; <sup>2</sup>Universidad Nacional Autónoma de México, México

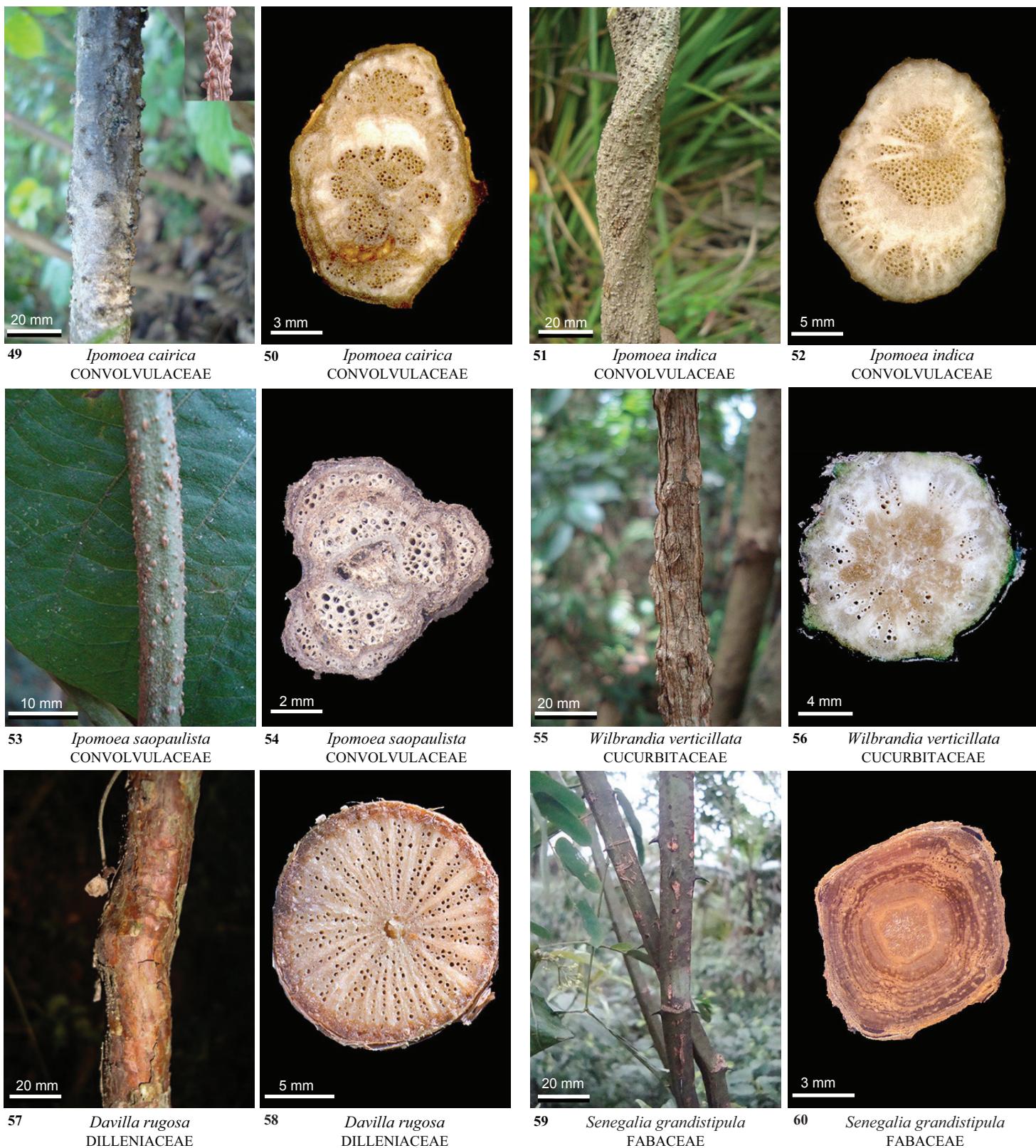
Photos and co-first authorship: CF Figueiredo and CS Gerolamo [caiansg@gmail.com]. Produced by: authors with the assistance of Valéria Sampaio & Juliana Philipp Field Museum. Support from: CNPq, CAPES and FAPES [2018/06917-7]. This study is part of the master's thesis of Cairo F. Figueiredo.



© Field Museum (2021) CC BY-NC 4.0. Licensed works are free to use/share/modify with attribution, but commercial use of the original work is not permitted.

[fieldguides.fieldmuseum.org]

[1425] version 1 10/2021



# Identification of Lianas by stem anatomy and external bark

Caian S Gerolamo<sup>1</sup>, Cairo F Figueiredo<sup>1</sup>, André C Lima<sup>1</sup>, Marcelo R Pace<sup>2</sup>, Veronica Angyalossy<sup>1</sup> & Gregório CT Ceccantini<sup>1</sup>

<sup>1</sup>Universidade de São Paulo, Brazil; <sup>2</sup>Universidad Nacional Autónoma de México, México

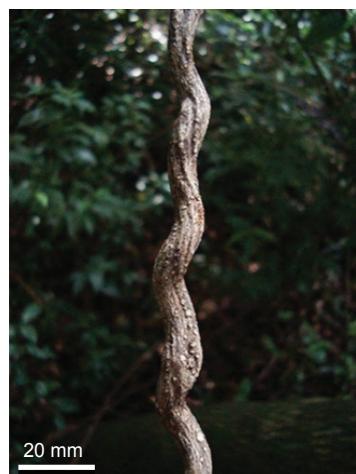
Photos and co-first authorship: CF Figueiredo and CS Gerolamo [caiansg@gmail.com]. Produced by: authors with the assistance of Valéria Sampaio & Juliana Philipp Field Museum. Support from: CNPq, CAPES and FAPES [2018/06917-7]. This study is part of the master's thesis of Cairo F. Figueiredo.



© Field Museum (2021) CC BY-NC 4.0. Licensed works are free to use/share/modify with attribution, but commercial use of the original work is not permitted.

[fieldguides.fieldmuseum.org]

[1425] version 1 10/2021



61 *Canavalia picta*  
FABACEAE



62 *Canavalia picta*  
FABACEAE



63 *Dalbergia frutescens*  
FABACEAE



64 *Dalbergia frutescens*  
FABACEAE



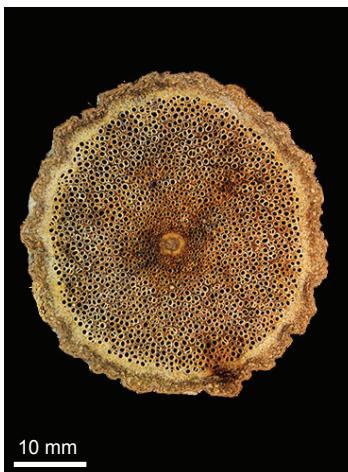
65 *Machaerium oblongifolium*  
FABACEAE



66 *Machaerium oblongifolium*  
FABACEAE



67 *Macropsychanthus rufescens*  
FABACEAE



68 *Macropsychanthus rufescens*  
FABACEAE



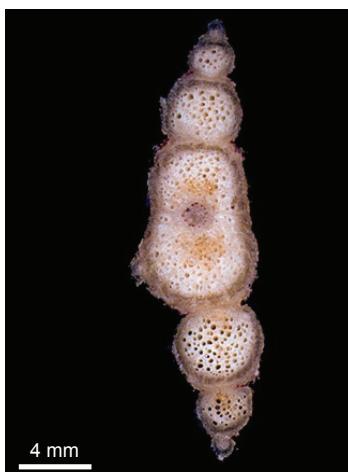
69 *Mimosa velloziana*  
FABACEAE



70 *Mimosa velloziana*  
FABACEAE



71 *Rhynchosia phaseoloides*  
FABACEAE



72 *Rhynchosia phaseoloides*  
FABACEAE

# Identification of Lianas by stem anatomy and external bark

Caian S Gerolamo<sup>1</sup>, Cairo F Figueiredo<sup>1</sup>, André C Lima<sup>1</sup>, Marcelo R Pace<sup>2</sup>, Veronica Angyalossy<sup>1</sup> & Gregório CT Ceccantini<sup>1</sup>

<sup>1</sup>Universidade de São Paulo, Brazil; <sup>2</sup>Universidad Nacional Autónoma de México, México

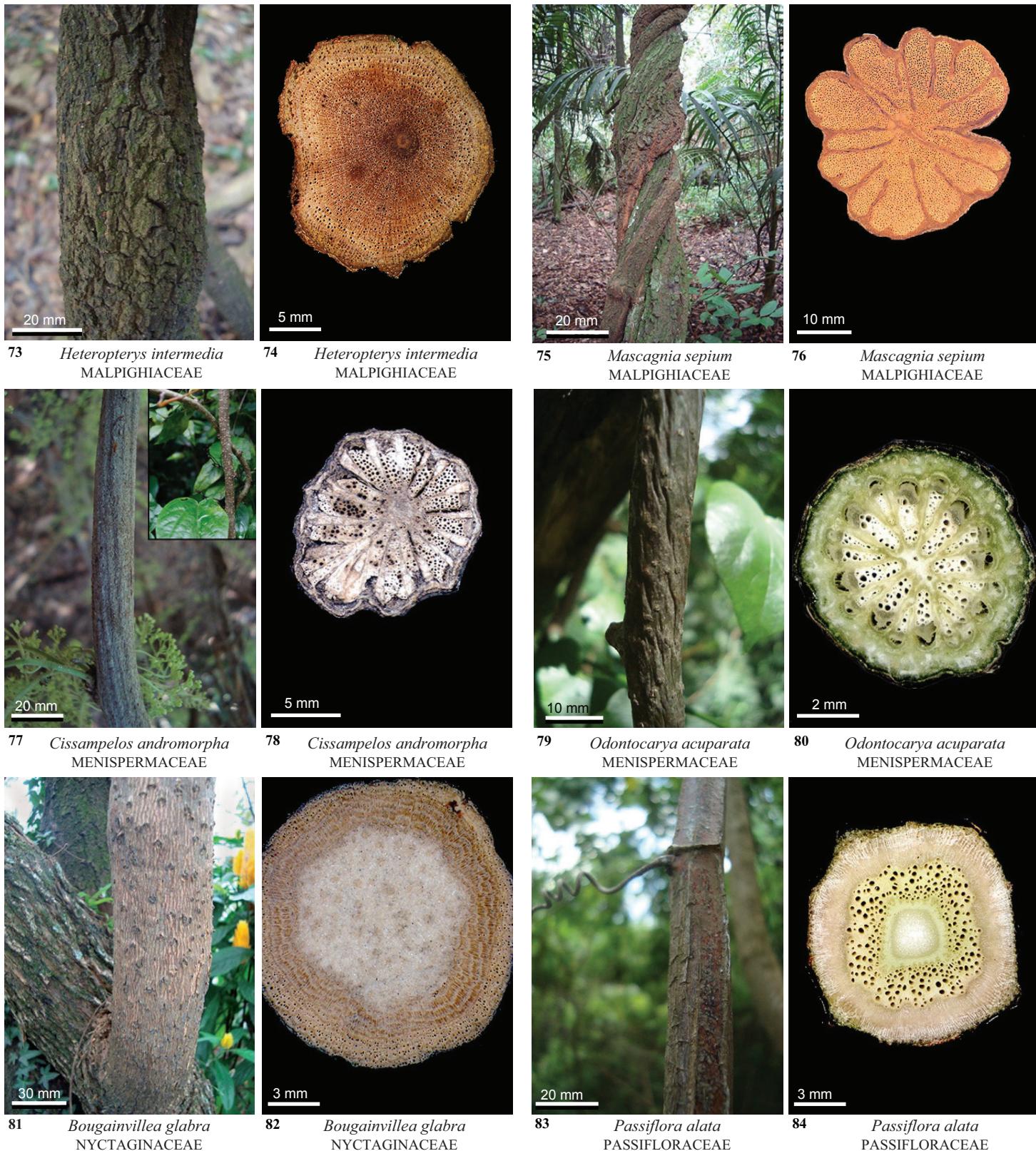
Photos and co-first authorship: CF Figueiredo and CS Gerolamo [caiansg@gmail.com]. Produced by: authors with the assistance of Valéria Sampaio & Juliana Philipp Field Museum. Support from: CNPq, CAPES and FAPES [2018/06917-7]. This study is part of the master's thesis of Cairo F. Figueiredo.



© Field Museum (2021) CC BY-NC 4.0. Licensed works are free to use/share/modify with attribution, but commercial use of the original work is not permitted.

[fieldguides.fieldmuseum.org]

[1425] version 1 10/2021



# Identification of Lianas by stem anatomy and external bark

Caian S Gerolamo<sup>1</sup>, Cairo F Figueiredo<sup>1</sup>, André C Lima<sup>1</sup>, Marcelo R Pace<sup>2</sup>, Veronica Angyalossy<sup>1</sup> & Gregório CT Ceccantini<sup>1</sup>

<sup>1</sup>Universidade de São Paulo, Brazil; <sup>2</sup>Universidad Nacional Autónoma de México, México

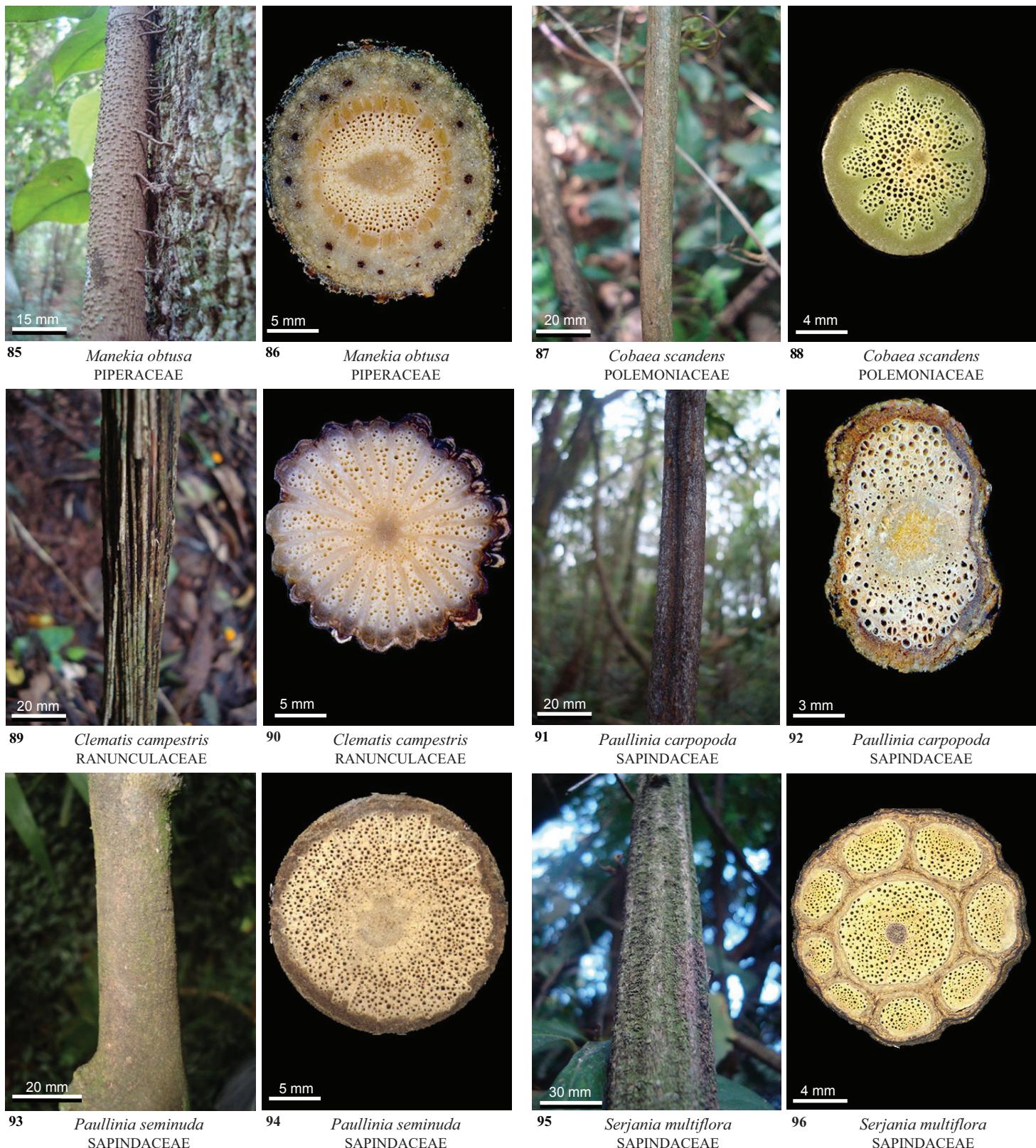
Photos and co-first authorship: CF Figueiredo and CS Gerolamo [caiansg@gmail.com]. Produced by: authors with the assistance of Valéria Sampaio & Juliana Philipp Field Museum. Support from: CNPq, CAPES and FAPES [2018/06917-7]. This study is part of the master's thesis of Cairo F. Figueiredo.



© Field Museum (2021) CC BY-NC 4.0. Licensed works are free to use/share/modify with attribution, but commercial use of the original work is not permitted.

[fieldguides.fieldmuseum.org]

[1425] version 1 10/2021



# Identification of Lianas by stem anatomy and external bark

Caian S Gerolamo<sup>1</sup>, Cairo F Figueiredo<sup>1</sup>, André C Lima<sup>1</sup>, Marcelo R Pace<sup>2</sup>, Veronica Angyalossy<sup>1</sup> & Gregório CT Ceccantini<sup>1</sup>

<sup>1</sup>Universidade de São Paulo, Brazil; <sup>2</sup>Universidad Nacional Autónoma de México, México

Photos and co-first authorship: CF Figueiredo and CS Gerolamo [caiansg@gmail.com]. Produced by: authors with the assistance of Valéria Sampaio & Juliana Philipp Field Museum. Support from: CNPq, CAPES and FAPES [2018/06917-7]. This study is part of the master's thesis of Cairo F. Figueiredo.



© Field Museum (2021) CC BY-NC 4.0. Licensed works are free to use/share/modify with attribution, but commercial use of the original work is not permitted.

[fieldguides.fieldmuseum.org]

[1425] version 1 10/2021



97 *Serjania communis*  
SAPINDACEAE



98 *Serjania communis*  
SAPINDACEAE



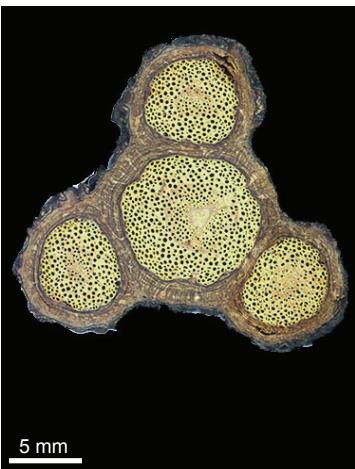
99 *Serjania laruotteana*  
SAPINDACEAE



100 *Serjania laruotteana*  
SAPINDACEAE



101 *Serjania lethalis*  
SAPINDACEAE



102 *Serjania lethalis*  
SAPINDACEAE



103 *Urvillea ulmacea*  
SAPINDACEAE



104 *Urvillea ulmacea*  
SAPINDACEAE



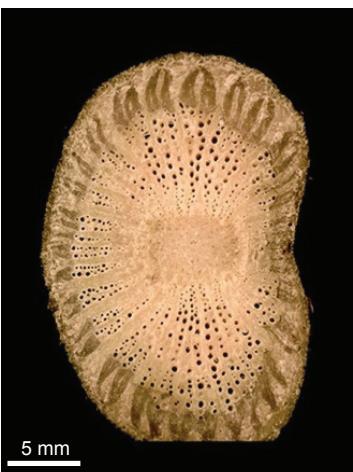
105 *Cissus tinctoria*  
VITACEAE



106 *Cissus tinctoria*  
VITACEAE



107 *Cissus verticillata*  
VITACEAE



108 *Cissus verticillata*  
VITACEAE

# Identification of Lianas by stem anatomy and external bark

Caian S Gerolamo<sup>1</sup>, Cairo F Figueiredo<sup>1</sup>, André C Lima<sup>1</sup>, Marcelo R Pace<sup>2</sup>, Veronica Angyalossy<sup>1</sup> & Gregório CT Ceccantini<sup>1</sup>

<sup>1</sup>Universidade de São Paulo, Brazil; <sup>2</sup>Universidad Nacional Autónoma de México, México

Photos and co-first authorship: CF Figueiredo and CS Gerolamo [caiansg@gmail.com]. Produced by: authors with the assistance of Valéria Sampaio & Juliana Philipp Field Museum. Support from: CNPq, CAPES and FAPES [2018/06917-7]. This study is part of the master's thesis of Cairo F. Figueiredo.



© Field Museum (2021) CC BY-NC 4.0. Licensed works are free to use/share/modify with attribution, but commercial use of the original work is not permitted.

[fieldguides.fieldmuseum.org]

[1425] version 1 10/2021

Photo number	Photo author	Family	Species	Geographic Coordinates (Datum WGS84)
1	Cairo F Figueiredo	Amaranthaceae	<i>Hebanthe eriantha</i> Poir. Pedersen	23°33'48.20"S 46°43'43.20"W
2	Cairo F Figueiredo	Amaranthaceae	<i>Hebanthe eriantha</i> Poir. Pedersen	23°33'48.20"S 46°43'43.20"W
3	Cairo F Figueiredo	Apocynaceae	<i>Forsteronia rufa</i> Müll.	23°33'55.16"S 46°43'41.05"W
4	Cairo F Figueiredo	Apocynaceae	<i>Forsteronia rufa</i> Müll.	23°33'55.16"S 46°43'41.05"W
5	Cairo F Figueiredo	Apocynaceae	<i>Gonolobus parviflorus</i> Decne.	23°33'59.81"S 46°43'48.57"W
6	Cairo F Figueiredo	Apocynaceae	<i>Gonolobus parviflorus</i> Decne.	23°33'59.81"S 46°43'48.57"W
7	Cairo F Figueiredo	Apocynaceae	<i>Orthosia urceolata</i> E.Fourn.	23°33'53.40"S 46°43'43.26"W
8	Cairo F Figueiredo	Apocynaceae	<i>Orthosia urceolata</i> E.Fourn.	23°33'53.40"S 46°43'43.26"W
9	Cairo F Figueiredo	Apocynaceae	<i>Macropharynx peltata</i> (Vell.) Woodson	23°33'59.10"S 46°43'45.00"W
10	Cairo F Figueiredo	Apocynaceae	<i>Macropharynx peltata</i> (Vell.) Woodson	23°33'59.10"S 46°43'45.00"W
11	Cairo F Figueiredo	Aristolochiaceae	<i>Aristolochia cymbifera</i> Mart. E Zucc.	23°33'56.20"S 46°43'51.50"W
12	Caian S Gerolamo	Aristolochiaceae	<i>Aristolochia cymbifera</i> Mart. E Zucc.	23°33'56.20"S 46°43'51.50"W
13	Cairo F Figueiredo	Aristolochiaceae	<i>Aristolochia labiata</i> Willd.	23°33'56.63"S 46°43'53.33"W
14	Cairo F Figueiredo	Aristolochiaceae	<i>Aristolochia labiata</i> Willd.	23°33'56.63"S 46°43'53.33"W
15	Cairo F Figueiredo	Asteraceae	<i>Cyrtocymura scorpioides</i> (Lam.) H. Rob.	20°34'03.53"S 46°33'49.33"W
16	Cairo F Figueiredo	Asteraceae	<i>Cyrtocymura scorpioides</i> (Lam.) H. Rob.	20°34'03.53"S 46°33'49.33"W
17	Cairo F Figueiredo	Asteraceae	<i>Mikania cordifolia</i> (L.f.) Willd.	23°34'02.50"S 46°43'47.23"W
18	Cairo F Figueiredo	Asteraceae	<i>Mikania cordifolia</i> (L.f.) Willd.	23°34'02.50"S 46°43'47.23"W
19	Cairo F Figueiredo	Asteraceae	<i>Mikania glomerata</i> Spreng.	23°33'55.00"S 46°33'42.00"W
20	Cairo F Figueiredo	Asteraceae	<i>Mikania glomerata</i> Spreng.	23°33'55.00"S 46°33'42.00"W
21	Cairo F Figueiredo	Asteraceae	<i>Mikania hirsutissima</i> DC	20°34'02.09"S 46°33'47.67"W
22	Cairo F Figueiredo	Asteraceae	<i>Mikania hirsutissima</i> DC	20°34'02.09"S 46°33'47.67"W
23	Cairo F Figueiredo	Asteraceae	<i>Mikania involucrata</i> Hook. F. & Arn.	23°33'45.20"S 46°43'40.69"W
24	Cairo F Figueiredo	Asteraceae	<i>Mikania involucrata</i> Hook. F. & Arn.	23°33'45.20"S 46°43'40.69"W
25	Cairo F Figueiredo	Asteraceae	<i>Mikania salvifolia</i> Gardner	23°33'44.61"S 46°43'43.25"W
26	Caian S Gerolamo	Asteraceae	<i>Mikania salvifolia</i> Gardner	23°33'44.61"S 46°43'43.25"W
27	Caian S Gerolamo	Asteraceae	<i>Mikania triangularis</i> Baker	23°33'58.30"S 46°43'46.80"W
28	Cairo F Figueiredo	Asteraceae	<i>Mikania triangularis</i> Baker	23°33'58.30"S 46°43'46.80"W
29	Cairo F Figueiredo	Bignoniaceae	<i>Amphilophium crucigerum</i> (L.) L.G.Lohmann	23°34'00.40"S 46°43'49.10"W
30	Marcelo R Pace	Bignoniaceae	<i>Amphilophium crucigerum</i> (L.) L.G.Lohmann	23°34'00.40"S 46°43'49.10"W
31	Cairo F Figueiredo	Bignoniaceae	<i>Dolichandra unguis-cati</i> (L.) A.H.Gentry	23°33'43.63"S 46°43'43.21"W
32	Caian S Gerolamo	Bignoniaceae	<i>Dolichandra unguis-cati</i> (L.) A.H.Gentry	23°33'43.63"S 46°43'43.21"W
33	Cairo F Figueiredo	Bignoniaceae	<i>Lundia corymbifera</i> (Vahl) Sandwith	23°33'46.94"S 46°43'42.16"W
34	Cairo F Figueiredo	Bignoniaceae	<i>Lundia corymbifera</i> (Vahl) Sandwith	23°33'46.94"S 46°43'42.16"W
35	Cairo F Figueiredo	Bignoniaceae	<i>Mansoa diffcilis</i> (Cham.) Bureau & K. Schum	23°33'50.89"S 46°43'41.79"W
36	Caian S Gerolamo	Bignoniaceae	<i>Mansoa diffcilis</i> (Cham.) Bureau & K. Schum	23°33'50.89"S 46°43'41.79"W
37	Cairo F Figueiredo	Bignoniaceae	<i>Pleonotoma tetraquetra</i> (Cham.)	23°38'54.70"S 47°03'29.80"W
38	Cairo F Figueiredo	Bignoniaceae	<i>Pleonotoma tetraquetra</i> (Cham.)	23°38'54.70"S 47°03'29.80"W
39	Cairo F Figueiredo	Bignoniaceae	<i>Pyrostegia venusta</i> (Ker-Gaw.) Miers	23°33'45.59"S 46°43'42.20"W
40	Cairo F Figueiredo	Bignoniaceae	<i>Pyrostegia venusta</i> (Ker-Gaw.) Miers	23°33'45.59"S 46°43'42.20"W
41	Caian S Gerolamo	Bignoniaceae	<i>Stizophyllum riparium</i> (Kunth) Sandwith	23°33'55.93"S 46°43'44.26"W
42	Caian S Gerolamo	Bignoniaceae	<i>Stizophyllum riparium</i> (Kunth) Sandwith	23°33'55.93"S 46°43'44.26"W
43	Cairo F Figueiredo	Bignoniaceae	<i>Tanaecium pyramidatum</i> (Rich.) L.G.Lohmann	23°33'55.90"S 46°43'42.50"W
44	Cairo F Figueiredo	Bignoniaceae	<i>Tanaecium pyramidatum</i> (Rich.) L.G.Lohmann	23°33'55.90"S 46°43'42.50"W
45	Cairo F Figueiredo	Bignoniaceae	<i>Tynanthus cognatus</i> (Cham.) Miers	23°33'57.80"S 46°43'44.20"W

# Identification of Lianas by stem anatomy and external bark

Caian S Gerolamo<sup>1</sup>, Cairo F Figueiredo<sup>1</sup>, André C Lima<sup>1</sup>, Marcelo R Pace<sup>2</sup>, Veronica Angyalossy<sup>1</sup> & Gregório CT Ceccantini<sup>1</sup>

<sup>1</sup>Universidade de São Paulo, Brazil; <sup>2</sup>Universidad Nacional Autónoma de México, México

Photos and co-first authorship: CF Figueiredo and CS Gerolamo [caiansg@gmail.com]. Produced by: authors with the assistance of Valéria Sampaio & Juliana Philipp Field Museum. Support from: CNPq, CAPES and FAPES [2018/06917-7]. This study is part of the master's thesis of Cairo F. Figueiredo.



© Field Museum (2021) CC BY-NC 4.0. Licensed works are free to use/share/modify with attribution, but commercial use of the original work is not permitted.

[fieldguides.fieldmuseum.org]

[1425] version 1 10/2021

Photo number	Photo author	Family	Species	Geographic Coordinates (Datum WGS84)
46	Caian S Gerolamo	Bignoniaceae	<i>Tynanthus cognatus</i> (Cham.) Miers	23°33'57.80"S 46°43'44.20"W
47	Cairo F Figueiredo	Boraginaceae	<i>Myriopus paniculatus</i> (Cham.) Feillet	23°33'51.52"S 46°43'39.28"W
48	Cairo F Figueiredo	Boraginaceae	<i>Myriopus paniculatus</i> (Cham.) Feillet	23°33'51.52"S 46°43'39.28"W
49	Cairo F Figueiredo	Convolvulaceae	<i>Ipomoea cairica</i> (L.) Sweet	23°33'57.80"S 46°43'46.80"W
50	Cairo F Figueiredo	Convolvulaceae	<i>Ipomoea cairica</i> (L.) Sweet	23°33'57.80"S 46°43'46.80"W
51	Cairo F Figueiredo	Convolutaceae	<i>Ipomoea indica</i> (Burm. F.) Merr	23°33'47.78"S 46°43'40.56W
52	Cairo F Figueiredo	Convolutaceae	<i>Ipomoea indica</i> (Burm. F.) Merr	23°33'47.78"S 46°43'40.56W
53	Cairo F Figueiredo	Convolutaceae	<i>Ipomoea saopaulista</i> O'Donnell	23°33'47.78"S 46°43'40.56W
54	Cairo F Figueiredo	Convolutaceae	<i>Ipomoea saopaulista</i> O'Donnell	23°33'47.78"S 46°43'40.56W
55	Cairo F Figueiredo	Curcurbitaceae	<i>Wilbrandia verticillata</i> Cogn.	23°33'47.30"S 46°43'44.10" W
56	Cairo F Figueiredo	Curcurbitaceae	<i>Wilbrandia verticillata</i> Cogn.	23°33'47.30"S 46°43'44.10" W
57	Cairo F Figueiredo	Dilleniaceae	<i>Davilla rugosa</i> Poir.	23°33'59.60"S 46°43'44.20"W
58	Cairo F Figueiredo	Dilleniaceae	<i>Davilla rugosa</i> Poir.	23°33'59.60"S 46°43'44.20"W
59	Cairo F Figueiredo	Fabaceae	<i>Senegalia grandistipula</i> (Benth.) Seigler	23°33'56.79"S 46°43'39.39"W
60	Caian S Gerolamo	Fabaceae	<i>Senegalia grandistipula</i> (Benth.) Seigler	23°33'56.79"S 46°43'39.39"W
61	Cairo F Figueiredo	Fabaceae	<i>Canavalia picta</i> Benth.	23°33'59.55"S 46°43'44.93"W
62	Caian S Gerolamo	Fabaceae	<i>Canavalia picta</i> Benth.	23°33'59.55"S 46°43'44.93"W
63	Cairo F Figueiredo	Fabaceae	<i>Dalbergia frutescens</i> Vell. Britton	23°33'59.50"S 46°43'44.90" W
64	Caian S Gerolamo	Fabaceae	<i>Dalbergia frutescens</i> Vell. Britton	23°33'59.50"S 46°43'44.90" W
65	Cairo F Figueiredo	Fabaceae	<i>Macropsychanthus rufescens</i> (Benth.) L.P.Queiroz & Snak	23°33'57.80"S 46°43'44.60" W
66	Cairo F Figueiredo	Fabaceae	<i>Macropsychanthus rufescens</i> (Benth.) L.P.Queiroz & Snak	23°33'57.80"S 46°43'44.60" W
67	Cairo F Figueiredo	Fabaceae	<i>Machaerium oblongifolium</i> Vog.	23°33'58'40"S 46°43'45.40" W
68	Caian S Gerolamo	Fabaceae	<i>Machaerium oblongifolium</i> Vog.	23°33'58'40"S 46°43'45.40" W
69	Cairo F Figueiredo	Fabaceae	<i>Mimosa velloziana</i> Mart.	23°34'03.62"S 46°43'49.22" W
70	Cairo F Figueiredo	Fabaceae	<i>Mimosa velloziana</i> Mart.	23°34'03.62"S 46°43'49.22" W
71	Cairo F Figueiredo	Fabaceae	<i>Rhynchosia phaseoloides</i> (Sw.) DC.	3°33'45.90"S 46°43'40.40" W
72	Cairo F Figueiredo	Fabaceae	<i>Rhynchosia phaseoloides</i> (Sw.) DC.	3°33'45.90"S 46°43'40.40" W
73	Cairo F Figueiredo	Malpighiaceae	<i>Heteropterys intermedia</i> (A.Juss.) Griseb	23°33'57.69"S 46°43'45.82" W
74	Caian S Gerolamo	Malpighiaceae	<i>Heteropterys intermedia</i> (A.Juss.) Griseb	23°33'57.69"S 46°43'45.82" W
75	Cairo F Figueiredo	Malpighiaceae	<i>Mascagnia sepium</i> (A.Juss.) Griseb	23°33'55.60"S 46°43'42.84" W
76	Caian S Gerolamo	Malpighiaceae	<i>Mascagnia sepium</i> (A.Juss.) Griseb	23°33'55.60"S 46°43'42.84" W
77	Cairo F Figueiredo	Menispermaceae	<i>Cissampelos andromorpha</i> DC.	23°33'44.63"S 46°43'43.09" W
78	Cairo F Figueiredo	Menispermaceae	<i>Cissampelos andromorpha</i> DC.	23°33'44.63"S 46°43'43.09" W
79	Cairo F Figueiredo	Menispermaceae	<i>Odontocarya acuparata</i> Miers	23°34'02.10"S 46°43'43.50" W
80	Cairo F Figueiredo	Menispermaceae	<i>Odontocarya acuparata</i> Miers	23°34'02.10"S 46°43'43.50" W
81	Cairo F Figueiredo	Nyctaginaceae	<i>Bougainvillea glabra</i> Choisy	23°33'48.50"S 46°43'44.60" W
82	Cairo F Figueiredo	Nyctaginaceae	<i>Bougainvillea glabra</i> Choisy	23°33'48.50"S 46°43'44.60" W
83	Cairo F Figueiredo	Passifloraceae	<i>Passiflora alata</i> Curtis	23°33'48.81"S 46°43'40.69" W
84	Cairo F Figueiredo	Passifloraceae	<i>Passiflora alata</i> Curtis	23°33'48.81"S 46°43'40.69" W
85	Cairo F Figueiredo	Piperaceae	<i>Manekia obtusa</i> (Miq.) T.Arias, Callejas & Bornst.	23°33'56.90"S 46°43'44.00" W
86	Cairo F Figueiredo	Piperaceae	<i>Manekia obtusa</i> (Miq.) T.Arias, Callejas & Bornst.	23°33'56.90"S 46°43'44.00" W
87	Cairo F Figueiredo	Polemoniaceae	<i>Cobaea scandens</i> Cav.	23°33'54.69"S 46°43'54.38" W
88	Cairo F Figueiredo	Polemoniaceae	<i>Cobaea scandens</i> Cav.	23°33'54.69"S 46°43'54.38" W
89	Cairo F Figueiredo	Ranunculaceae	<i>Clematis campestris</i> A.St.-Hill.	23°33'57.84"S 46°43'46.66" W
90	Cairo F Figueiredo	Ranunculaceae	<i>Clematis campestris</i> A.St.-Hill.	23°33'57.84"S 46°43'46.66" W

# Identification of Lianas by stem anatomy and external bark

Caian S Gerolamo<sup>1</sup>, Cairo F Figueiredo<sup>1</sup>, André C Lima<sup>1</sup>, Marcelo R Pace<sup>2</sup>, Veronica Angyalossy<sup>1</sup> & Gregório CT Ceccantini<sup>1</sup>

<sup>1</sup>Universidade de São Paulo, Brazil; <sup>2</sup>Universidad Nacional Autónoma de México, México

Photos and co-first authorship: CF Figueiredo and CS Gerolamo [caiansg@gmail.com]. Produced by: authors with the assistance of Valéria Sampaio & Juliana Philipp Field Museum. Support from: CNPq, CAPES and FAPES [2018/06917-7]. This study is part of the master's thesis of Cairo F. Figueiredo.



© Field Museum (2021) CC BY-NC 4.0. Licensed works are free to use/share/modify with attribution, but commercial use of the original work is not permitted.

[fieldguides.fieldmuseum.org]

[1425] version 1 10/2021

Photo number	Photo author	Family	Species	Geographic Coordinates (Datum WGS84)
91	Cairo F Figueiredo	Sapindaceae	<i>Paullinia carpopoda</i> Cambess	23°34'03.25"S 46°43'46.20"W
92	Cairo F Figueiredo	Sapindaceae	<i>Paullinia carpopoda</i> Cambess	23°34'03.25"S 46°43'46.20"W
93	Cairo F Figueiredo	Sapindaceae	<i>Paullinia seminuda</i> Radlk	23°34'00.70"S 46°43'45.50"W
94	Cairo F Figueiredo	Sapindaceae	<i>Paullinia seminuda</i> Radlk	23°34'00.70"S 46°43'45.50"W
95	Cairo F Figueiredo	Sapindaceae	<i>Serjania multiflora</i> Cambess.	23°34'0.10"S 46°43'38.60"W
96	Caian S Gerolamo	Sapindaceae	<i>Serjania multiflora</i> Cambess.	23°34'0.10"S 46°43'38.60"W
97	Cairo F Figueiredo	Sapindaceae	<i>Serjania communis</i> Cambess.	23°33'50.90"S 46°43'43.50"W
98	Cairo F Figueiredo	Sapindaceae	<i>Serjania communis</i> Cambess.	23°33'50.90"S 46°43'43.50"W
99	Cairo F Figueiredo	Sapindaceae	<i>Serjania laruotteana</i> Cambess.	23°33'45.30"S 46°43'41.70"W
100	Caian S Gerolamo	Sapindaceae	<i>Serjania laruotteana</i> Cambess.	23°33'45.30"S 46°43'41.70"W
101	Cairo F Figueiredo	Sapindaceae	<i>Serjania lethalis</i> A.St.-Hil.	23°33'58.00"S 46°43'46.60"W
102	Caian S Gerolamo	Sapindaceae	<i>Serjania lethalis</i> A.St.-Hil.	23°33'58.00"S 46°43'46.60"W
103	Cairo F Figueiredo	Sapindaceae	<i>Urvillea ulmacea</i> Kunth	23°33'55.00"S 46°43'44.81"W
104	Cairo F Figueiredo	Sapindaceae	<i>Urvillea ulmacea</i> Kunth	23°33'55.00"S 46°43'44.81"W
105	Cairo F Figueiredo	Vitaceae	<i>Cissus tectoria</i> Mart.	23°33'45.80"S 46°43'42.30"W
106	Cairo F Figueiredo	Vitaceae	<i>Cissus tectoria</i> Mart.	23°33'45.80"S 46°43'42.30"W
107	Cairo F Figueiredo	Vitaceae	<i>Cissus verticillata</i> (L.) Nicolson & C. E. Jarvis	23°33'50.96"S 46°43'41.36"W
108	Cairo F Figueiredo	Vitaceae	<i>Cissus verticillata</i> (L.) Nicolson & C. E. Jarvis	23°33'50.96"S 46°43'41.36"W

## Plant material and analyses

Lianas (woody vines) were identified and collected at the Institute of Biosciences of the University of São Paulo, SP, Brazil. After collection, part of the vegetative and reproductive material was herborized and the vouchers of the specimens collected were deposited in the University of São Paulo Herbarium (SPF) and were confirmed by specialists. From the base of the liana, about 1.30 m from the rooting point, we took a photo of the bark and selected one to three samples of the stem (approx. 1.5 - 2.5 cm in diameter) for polishing with razors or waterproof sandpaper of different particle sizes until the transverse surface of the stem sample was smooth, highlighting the anatomical pattern found at the time of collection. After polishing and while still fresh, the cross-sections of the stems were photographed with a camera, highlighting the characteristics seen in the field. For more details on the method and anatomical characteristics of the lianaceous species found, as well as some useful observations on the color of stem or sap released soon after cutting for collection, among other field characters, see the master's thesis of the co-author CF Figueiredo ([https://teses.usp.br/teses/disponiveis/41/41132/tde-23012012-110851 /fr.php](https://teses.usp.br/teses/disponiveis/41/41132/tde-23012012-110851/fr.php)).