Bocconia and Macleaya

Author(s): J. Hutchinson

Source: *Bulletin of Miscellaneous Information (Royal Botanic Gardens, Kew)*, Vol. 1920, No. 8 (1920), pp. 275-282

Published by: Springer on behalf of Royal Botanic Gardens, Kew

Stable URL: <http://www.jstor.org/stable/4120232>

Accessed: 14-06-2016 14:47 UTC

Your use of the JSTOR archive indicates your acceptance of the Terms & Conditions of Use, available at
<http://about.jstor.org/terms>

JSTOR is a not-for-profit service that helps scholars, researchers, and students discover, use, and build upon a wide range of content in a trusted digital archive. We use information technology and tools to increase productivity and facilitate new forms of scholarship. For more information about JSTOR, please contact support@jstor.org.

Royal Botanic Gardens, Kew, Springer are collaborating with JSTOR to digitize, preserve and extend access to *Bulletin of Miscellaneous Information (Royal Botanic Gardens, Kew)*

an old but no longer common species, 28 ft. high and 5 ft. in girth of trunk; and a fine healthy tree of the newer Japanese *M. hypoleuca* over 30 ft. high.

There is a good collection of hardy bamboos on the lower, damper part of the garden, and it was interesting to see *Phyllostachys aurea* flowering, although not gratifying, since it portends the flowering and consequent death of the species throughout the country.

XLIV.—BOCCONIA AND MACLEAYA.

J. HUTCHINSON.

The genus *Bocconia* (*Papaveraceae*) was founded by Linnaeus* in 1737, the type species being *B. frutescens*† from the West Indies and Central America. Since then several species have been described, of which seven stand as being authentic in the Index Kewensis. These are natives of Central and South America, with the exception of two species, *B. cordata*, Willd., and *B. microcarpa*, Maxim., from North-Eastern Asia. Whilst the close affinity of the floras of North America and North-Eastern Asia has been well established, there is little, if any, connection between those of North-East Asia and South America, and the association of Papaveraceous plants of peculiar type from these two regions in the same genus, were it tenable, would be of considerable phytogeographical interest. That two very distinct genera are involved, however, is shown below.

In the Appendix (p. 218) to the Narrative of Denham and Clapperton (1826), Robert Brown makes the following observation: "Respecting *Bocconia cordata*, though it is so closely allied to *Bocconia* as to afford an excellent argument in favour of the hypothesis in question, it is still sufficiently different, especially in its polyspermous ovary, to constitute a distinct genus, to which I have given the name (*Macleaya cordata*) of my much valued friend, Alexander Macleay, Esq., Secretary of the Colony of New South Wales, whose merits as a general naturalist, a profound entomologist, and a practical botanist are well known." In spite of this trenchant remark, however, Bentham and Hooker considered *Macleaya* to be congeneric with *Bocconia*, although Endlicher‡ had in 1839 supported the views of Robert Brown, as did also subsequently Prantl§ and, lastly, Fedde.||

I give below the differences observable between these two genera, and a revision of the species of *Bocconia* so far as we know them at present.

* Linnaeus, Gen. ed. i. 32 (1837).

† Linnaeus, Sp. Pl. 505 (1753).

‡ Endlicher, Genera Plantarum, ii. 855 (1839).

§ Prantl in Engl. et Prantl. Natürlich. Pflanzenf. iii. 2, 140 (1889).

|| Fedde, Monogr. Papaveraceae, 216 (1909).

Bocconia, Linn.

Stems perennial. Leaves pinnately nerved or lobed; ovary long-stipitate, with a single basifixid ovule; valves of the fruit fleshy, opening from below upwards; seed large and, nearly filling the loculus, surrounded at the base by a large cupular wrinkled aril—See text figures A-E.

Macleaya, R. Br.

Stems annual. Leaves palmately nerved and lobed; ovary subsessile, with one basal or few parietal ovules; valves of the fruit membranous, opening from the top downwards; seeds small, with a lateral crested aril—See text figures F-I.

FIG. A-E—*Bocconia arborea*, Wats.:—A, upper leaf; B, pistil; C, opening fruit; D, seed; E, persistent placentas of fruit; F-H, *Macleaya cordata*, R. Br.; J-I, *Macleaya microcarpa*, Maxim.; leaves $\frac{1}{2}$ nat. size, remainder enlarged.

Clavis specierum Bocconiae.

Folia petiolata:—

Folia plerumque plus minusve pinnati-
lobata:—

Folia (praesertim superiora) basi
acute cuneata, lobis lateralibus
angustis acute acuminatis; folia
inferiora profunde pinnatipar-
tita:—

Stamina circiter 12; sepala 1 cm.
longa; stigmata crassa, 4.5
mm. longa, dense tomentosa ... 1. *B. arborea*.

Stamina circiter 20; sepala
circiter 0.8 cm. longa; stigmata
angusta, puberula ... 2. *B. Pearcei*.

Folia basi plerumque rotundata, lobis lateralibus satis latis apice rotundatis vel breviter acutis (vix acuminatis); folia inferiora haud ultra medium lobata:—

Foliorum inferiorum lobi laterales plerumque 5–10, serrato-dentati:—

Bracteae glabrae vel glabrescentes; stamina 16 ... 3. *B. frutescens*.

Bracteae dense tomentosae; stamina 10 ... 4. *B. pubibractea*.

Foliorum inferiorum lobi laterales 2–5, obscure et remote denticulati ... 5. *B. latisejala*.

Folia haud lobata, serrata vel crenata:—

Folia infra puberula; nervi laterales numerosissimi:—

Folia obtuse serrato-crenata; species austro-americana ... 6. *B. integrifolia*.

Folia profunde repando-dentata; species centrali-americana ... 7. *B. gracilis*.

Folia infra glauca, glabra ... 8. *B. glaucifolia*.

Folia sessilia, crebre et obtuse serrulata; bracteae glabrae; species guatemalensis 9. *B. vulcanica*.

1. **Bocconia arborea**, Wats. in Proc. Amer. Acad. xxv. 141 (1890); Fedde Monogr. Papaveraceae, 219 (1909).

Arbor usque ad 8 m. alta; rami annotini fere glabri, circiter 8 mm. crassi, hornotini foliati, lanato-tomentosi. *Folia* inferiora petiolata, profunde pinnatipartita, usque ad 45 cm. longa et 30 cm. lata, supra glabra, crebre reticulata, infra albescentia, papilloso-puberula, lobis lateralibus lineari-lanceolatis usque ad 15 cm. longis et 2.5 cm. latis serratis; folia superiora circiter 15 cm. longa, basi acute cuneata, supra primum lanato-pubescentia, infra praesertim in costa lanata et albido-papillosa, lobis lateralibus ascendentibus acute acuminatis obscure denticulatis vel fere integris; petioli lanato-tomentosi. *Panicula* circiter 20 cm. longa et 12 cm. lata; bracteae oblongo-lineares, subobtusae acuminatae, apice puberulae, usque ad 1 cm. longae; pedicelli fere 1 cm. longi, glabri. *Sepala* oblongo-elliptica, acuminata, 1–1.2 cm. longa, 3–3.5 mm. lata, glabra, marginibus subhyalinis. *Stamina* circiter 12; filamenta filiformia, 2 mm. longa; antherae 7 mm. longae, acutae. *Ovarium* 5 mm. stipitatum, 2 mm. longum; stylus 4 mm. longus, ramis divergentibus 4–5 mm. longis ad basin stigmatoso-puberulis. *Fructus* 7 mm. stipitatus, nutans, ellipsoideus, carnosus, 1 cm. longus, stylo persistente elongato coronatus. *Semina* (immatura tantum visa) basi arillo crustaceo rugoso.

CENTRAL AMERICA. Mexico: Jalisco State; rich canyons of the mountains near Lake Chapala, young fr. Dec. 1889, C. G. Pringle 2445 (type). Morelos State; lava fields above Cuernavaca,

2200 m., fl. Sept. 1900, *C. G. Pringle* 9145; fr. Nov., *C. G. Pringle* 9682. Guatemala: Cunen, Quiche Depart., 2000 m., fls. Apr. 1892, *Heyde & Lux in Donnell Smith Herb.* 2898. Costa Rica: San Jose, 1100 m., *J. D. Smith* 4739; Rio Tirriti, 1100 m., young fr. Mar. 1896, *J. D. Smith* 6430; Mar. 1894, *J. D. Smith* 4739.

2. **Bocconia Pearcei**, *Hutchinson*, sp. nov.

B. frutescens, forma *glaucescens*, Fedde, Monogr. Papaveraceae, 218, partim.

Arbor tenuis, ramosa, usque ad 6 cm. alta, omnibus partibus glaucis succo cinnabarino scatens (*Spruce*); ramuli ultimi glabri, circiter 8 mm. crassi. *Folia* inferiora usque ad 45 cm. longa et 24 cm. lata, profunde pinnatilobata, lobis oblongis subacutis serrato-dentatis, supra glabra, infra albida, crispato-puberula; costa infra sulcata, circiter 6 mm. lata; folia superiora basi longe cuneata, paucilobata, breviter petiolata, circiter 25 cm. longa et 14 cm. lata. *Panicula* magna, usque ad 40 cm. longa, ramossissima; bractee oblongo-lanceolatae, subacute acuminatae, pedicellis circiter dimidio breviores, marginibus puberulis; pedicelli graciles, 0.8–1 cm. longi, glabri. *Sepala* elliptica, brevissime abrupte acuminata, 1–1.2 cm. longa, glabra. *Stamina* circiter 20; filamenta filiformia, 2 mm. longa; antherae 7 mm. longae. *Ovarium* 5 mm. stipitatum, 2.5 mm. longum; stylus 4 mm. longus, stigmatibus acutis circiter 3 mm. longis breviter puberulis. *Fructus* glaucus, ellipsoideus, circiter 1 cm. longus, longe stipitatus, stylo persistente 5 mm. longo coronatus. *Semina* nigra, 6.5 mm. longa, arillo coccineo.

SOUTH AMERICA. Bolivia: Yungas, fr., *M. Bang* 441. Corvico, May 1866, *Pearce* (type). Peru: near the River Alau, at the foot of Mt. Campana, in moist woods, fr., Nov. 1855, *R. Spruce* 4301.

This species will be found in herbaria under *B. frutescens*, which it resembles very closely. Their differences are shown in the key.

3. **Bocconia frutescens**, *Linn.* Sp. Pl. 505 (1753); *Lam. Encyc.* i. 432; *Ill.* t. 394; *Descourt. Fl. Ant.* i. t. 54; *Macf. Jam.* 22; *Griseb. Fl. Br. W. Ind.* 13; *Urb. Symb. Ant.* iv. 250; *Fedde, Monogr. Papaveraceae*, 216, partim.

B. glauca, *Salisb. Prodr.* 397 (1796). *B. quercifolia*, *Moench. Meth. Suppl.* 122 (1802). *B. sinuatifolia*, *Stokes, Bot. Med.* iii. 8 (1812). *B. subtomentosa*, *L'Herit. ex Stahl, Estud. Fl. Puerторico Foll.* ii. 34 (1884). *Bocconia ramosa*, etc., *Plum. Gen.* 35, t. 25 (1703). *Chelidonium majus arboreum*, etc., *Sloan, Jam.* 82; *Hist.* i. 196, t. 125 (1707).

Frutex; ramuli ultimi lanato-pubescentes. *Folia* inferiora petiolata, fere ad medium pinnatilobata, basi truncata vel rotundata, 15–35 cm. longa, 10–20 cm. lata, tenuiter membranaceo-chartacea, supra glabrescens, infra primum subdense demum laxe crispato-tomentosa, pallida, lobis oblongis subacutis repando-denticulatis; folia superiora minus lobata vel subintegra; petioli 3–7 cm. longi, tomentosi. *Panicula* usque ad 40 cm. longa,

laxe ramosa; bracteae oblongo-lanceolatae, acute acuminatae, pedicellis multo breviores, marginibus puberulis; pedicelli circiter 1 cm. longi, graciles, glabri. *Sepala* oblongo-elliptica, abrupte obtuse acuminata, circiter 1 cm. longa. *Stamina* circiter 16; filamenta filiformia, 3.5 mm. longa; antherae 6 mm. longae. *Ovarium* 4.5 mm. stipitatum, 3 mm. longum; stylus 1 mm. longus, stigmatibus 2.5 mm. longis recurvatis breviter tomentosis. *Fructus* anguste ellipsoideus, utrinque acutus, 7–8 mm. longus, carnosus, longe stipitatus, stylo persistente coronatus. *Semina* 6 mm. longa, leviter muricata, basi arillo crustaceo cincta.

WEST INDIES. Cuba: *Wright* 6; rocky slope, San Antonio de los Banos, Havana Province, Mar. 1905, *A. H. Curtiss* 687. Jamaica: banks of rivers everywhere; *Purdie*; Moneague, Dec. 1849, *Alexander Prior*; St. Marys, 1839, *McNab*; without locality, *McFadyen*; *J. Bryce*; *Distin*; *Marsh* 876. Santo Domingo, *Schomburgk*; *Eggers* 1742. *Porto Rico*: *Sintenis* 181. Martinique: *Sieber* 129. Dominica: *Eggers* 4182.

CENTRAL AMERICA. Mexico: Tamasopo Canyon, San Luis Potosi State, shrub 5–15 ft., Nov. 1890, *E. G. Pringle* 3374. Vera Cruz, Mar. 1839, *Linden* 28. Vera Cruz to Orizaba, *F. Mueller*. Xalapa, Mar. 1840, *Galeotti* 7007. Vallee de Cordova, Jan. 1866, *Bourgeau* 1750; without definite locality, *Jorgensen* 492. Guatemala: Misco, 2000 m., Apr. 1890, *Donnell Smith* 2177; Acatepeque, 1400 m., Mar. 1892, *Donnell Smith* 2505.

4. *Bocconia pubibractea*, *Hutchinson*, sp. nov.

Frutex sempervirens 5–6.5 m. altus (*Pearce*); ramuli ultimi primum lanato-pubescentes mox glabri. *Folia* inferiora petiolata, pinnatilobata, circiter 40 cm. longa et 18 cm. lata, membranaceo-papyracea, supra mox glabra, infra praesertim in nervis et venis lanato-pubescentia, lobis usque ad 4 cm. longis triangulari-oblongis apice rotundatis marginibus crenatis; folia superiora non visa; petioli 6–7 cm. longi, circiter 5 mm. lati, lanato-pubescentes. *Panicula* gracilis, laxiflora, circiter 40 cm. longa, ubique lanata; bracteae demum subglabrescentes, oblongo-lanceolatae, acute acuminatae, pedicellis multo breviores; pedicelli graciles, 1–1.5 cm. longi. *Sepala* obovato-elliptica, abrupte acute acuminata, 1 cm. longa, glabra. *Stamina* 10; filamenta filiformia, 1.5 mm. longa; antherae 4 mm. longae. *Ovarium* 3 mm. stipitatum, 2 mm. longum; stylus 2 mm. longus, stigmatibus 5 mm. longis recurvatis. *Fructus* ellipsoideus, carnosus, 1 cm. longus, siccitate valde rugosus, longe stipitatus, stylo persistente 7 mm. longo coronatus.

SOUTH AMERICA. Colombia: slopes of mountains about Muña, 2600–3600 m., May 1863, *Pearce* (type). Boqueron, mountains near Bogotá, 16 Nov. 1852, *I. F. Holton* 679; *Triana* 157. Andes of Popayan, 1700–2500 m., *Lehmann* 555; 5102.

5. *Bocconia latisepala*, *S. Wats.* in Proc. Am. Acad. xxv. 141 (1890); Fedde, Monogr. Papaveraceae, 219 (1909).

Herbacea usque ad 2 m. alta; rami juniores glabri, caeruleo-glaucci. *Folia* inferiora longe petiolata, usque ad 25 cm. longa et 12 cm. lata, 3–4-pinnatilobata, tenuiter chartacea, supra glabra,

infra crispato-pubescentia, glauca, lobis lateralibus oblongis apice rotundatis remote et obscure denticulatis; petioli 5-5.5 cm. longi, longitudinaliter sulcati, glauci. *Panicula* usque ad 30 cm. longa, e basi laxe ramosa; bracteae oblongo-lanceolatae, subacutae, pedicellis multo breviores, marginibus puberulis; pedicelli 2-3 mm. longi, glauci, glabri. *Sepala* valde imbricata, late elliptica, circiter 6 mm. longa, abrupte acuminata, glabra, glauca. *Stamina* 12-14; filamenta filiformia, 1.5 mm. longa; antherae 4 mm. longae. *Ovarium* 3 mm. stipitatum; stylus 2.5 mm. longus, crassus, ramis curvato-divergentibus 3 mm. longis. *Fructus* 8-10 mm. stipitatus, nutans, ellipsoideus, carnosus, 1 cm. longus, stylo persistente 7 mm. longo coronatus, valvis demum deciduis. *Semina* ellipsoidea, 8 mm. longa, basi arillo crustaceo 2 mm. longo cincta.

CENTRAL AMERICA. Mexico: Guajuco, fl., *E. Palmer* 23. Nuevo Leon State; rich shaded canyons of the Sierra Madre, near Monterey, 3 July, 1888, *C. G. Pringle* 1907. *Hort. Gouan*.

6. ***Bocconia integrifolia***, *Humbl. & Bonpl.* Pl. Aequin. i. 119, t. 35 (1805).

Frutex ramosissimus, usque ad 5 m. altus; ramuli juniores circiter 1.3 cm. crassi, farinaceo-pubescentes. *Folia* breviter petiolata, elongato-elliptica, apice triangularia, usque ad 30 cm. longa et 10 cm. lata, serrata vel crenata, rare apicem versus paucilobata, tenuiter chartacea, reticulata, supra glabra, infra albida, papilloso-puberula; costa infra valde prominens, basin versus sulcata; nervi laterales utrinsecus usque ad 18, leviter arcuati, bifurcati et multiramosi; petioli 2-3 cm. longi, supra concavi et dense lanato-tomentosi. *Panicula* multiflora, ad 35 cm. longa; bracteae inferiores foliaceae, magnae, ultimae oblongo-lanceolatae, subobtusae, glabrae, pedicellis dimidio breviores; pedicelli 5-7 mm. longi. *Sepala* obovato-elliptica, abrupte acuminata, 1 cm. longa, glabra. *Stamina* circiter 10; filamenta filiformia, circiter 2 mm. longa; antherae 5 mm. longae. *Ovarium* 3 mm. stipitatum; stylus 2 mm. longus, stigmatibus crassis valde recurvatis. *Fructus* carnosus, ellipsoideus, circiter 1.3 cm. longus. *Semina* oblongo-ellipsoidea, 6 mm. longa, basi arillo crustaceo verrucoso 2 mm. longo cincta.

SOUTH AMERICA. Colombia: Chipaque, Bogota, 2400 m., *J. Triana*. Bogotà, Jan. 1846, young fr., *Purdie*. Bolivia: near Sorata, 2650-2800 m., Feb.-Mar. 1860, *G. Mandon* 886. Peru: near Cascas, *Humboldt & Bonpland* (type)—not seen.

7. ***Bocconia gracilis***, *Hutchinson*, sp. nov.

Rami crispato-pubescentes, internodiis circiter 1 cm. longis. *Folia* elliptico-ob lanceolata, acute acuminata, basi breviter cuneata, 8-16 cm. longa, 3-6 cm. lata, chartacea, subdupliciter repando-serrata, supra glabra, infra crispato-puberula; nervi laterales utrinsecus 9-12, arcuati, prominuli; petioli 2-2.5 cm. longi, minute puberuli. *Panicula* pauciflora, laxa, usque ad 20 cm. longa; bracteae lineari-lanceolatae, acutae, pedicellis dimidio breviores, extra minute puberuli; pedicelli 1-1.5 cm. longi, mox glabrescentes. *Sepala* obovata, abrupte acuminata, glabra, fere

1 cm. longa. *Stamina* 12; filamenta 2 mm. longa, filiformia; antherae 5 mm. longae. *Ovarium* 5 mm. stipitatum, 2 mm. longum; stylus 3 mm. longus, stigmatibus 3 mm. longis mox recurvatis. *Fructus* non visus.

CENTRAL AMERICA. Guatemala: Pansamalá, Alta Verapaz Department, 1300 m., fls. May 1887, *H. von Tuerckheim in Herb. Donnell Smith* 1236.

Mr. J. Donnell Smith has identified this species with the unpublished figure of *B. frutescens*, var. *cernua*, DC., in Mocino & Sessé Fl. du Mex. t. 14, which, however, differs in having lobed leaves.

8. ***Bocconia glaucifolia***, *Hutchinson*, sp. nov.

B. integrifolia, var. *mexicana*, DC. Prodr. i. 121 (1824)?

Ramuli glabri, glauci, internodiis vix 1 cm. longis. *Folia* oblongo-oblancoolata, acute breviter acuminata, basi valde inaequalia et rotundata, 7–12 cm. longa, 2–4 cm. lata, tenuiter chartacea, serrata, glabra, infra conspicue glauca; nervi laterales utrinsecus 14–16, graciles, arcuati; petioli 1.5–2 cm. longi, glauci. *Panicula* pedunculata, usque ad 35 cm. longa, laxiflora; bractee oblongo-lanceolatae, subobtusae acuminatae, ultimae circiter 5 mm. longae, glabrae; pedicelli circiter 8 mm. demum 10 mm. longi, robusti. *Sepala* late elliptica, subacute acuminata, circiter 1 cm. longa, glabra. *Stamina* circiter 12; filamenta filiformia; antherae 5 mm. longae. *Ovarium* 5 mm. stipitatum, 2 mm. longum; stylus 4 mm. longus, stigmatibus 4 mm. longis crassis spiraliter contortis. *Fructus* non visus.

CENTRAL AMERICA. Guatemala: San Miguel Uspantán, Quiché Department, about 2600 m., Apr. 1892, fl., *Heyde & Lux in Herb. Donnell Smith* 2899.

9. ***Bocconia vulcanica***, *J. D. Smith* in Bot. Gaz. xvi. 1 (1891); Fedde, Monogr. Papaveraceae, 220 (1909).

Arbor; ramuli apice dense foliati, circiter 8 mm. crassi, glabri. *Folia* sessilia, obovata vel elliptico-obovata, subacute et abrupte acuminata, 10–14 cm. longa, 4–5.5 cm. lata, tenuiter chartacea, crebre et obtusissime serrata, utrinque glabra; nervi laterales numerosi, graciles, arcuati. *Panicula* densiflora, pedunculata, usque ad 25 cm. longa; bractee oblongo-lanceolatae, acutae, pedicellis breviores, glabrae; pedicelli circiter 5 mm. longi, robusti. *Sepala* elliptica, caudato-acuminata, 1 cm. longa, subcoriacea, glabra. *Stamina* 10–15; filamenta filiformia, 2 mm. longa; antherae 5–6 mm. longae. *Ovarium* 2 mm. stipitatum, 3 mm. longum, glaucum; stylus crassus, 1.5 mm. longus, stigmatibus 3 mm. longis acutis. *Fructus* immaturus glaucus, carnosus.

CENTRAL AMERICA. Guatemala: Volcan de Agua, Zacatepequez, 3200 m., Apr. 1890, *Donnell Smith* 2172 (type).

Imperfectly known species.

B. ferruginea, *Roezl* in Belg. Hort. xxiv. 39 (1874)—Peru—nomen nudum.

Macleaya, *R. Br.* in Denham et Clapp. Narrat. Append. 218 (1826); Fedde, Monogr. Papaveraceae, 215 (1909).

Stamina 25–30; capsula oblanceolata,
seminibus 4–6 ad suturas sessilibus ... 1. *M. cordata*.

Stamina 8–12; capsula orbicularis, semine
solitario basifixo erecto ... 2. *M. microcarpa*.

1. **Macleaya cordata**, *R. Br.* l.c.; Franch. et Savat. Enum. Pl. Jap. i. 27 (1875); Fedde, Monogr. Papaveraceae, 216, Fig. 27, A–G, incl. var. *yedoensis*, Fedde (1909).

Bocconia cordata, Willd. Sp. Pl. ii. 841 (1797); Bot. Mag. t. 1905 (1817); DC. Prodr. i. 121 (1824).

CHINA. Western Hupeh: *E. H. Wilson* (Veitch Exped.) 1403. Patung District, *A. Henry* 3162, 5213. Nanto and mountains to northward, *A. Henry* 1882. Shansi Province: Ta ho kuan, *F. N. Meyer* 1870. Chekiang: Hang-chow, *H. J. Hickin*. Hillsides, Chekiang, July 1854, *Fortune*.

JAPAN. Tokyo, *Science Coll. Imp. University (Japan) Herb.* Yokohama, *Maximowicz*; *Oldham* 216. Yokoska, *Savatier* 58. Aomori, *Faurie* 578. "Central Mts.," *Maries*.

2. **Macleaya microcarpa**, *Fedde* in Engl. Bot. Jahrb. xxxvi. Beibl. 82, 45 (1905); Monogr. Papaveraceae, 217, fig. 27, J–O (1909).

Bocconia microcarpa, *Maxim.* in Act. Hort. Petrop. xi. 45 (1889).

CHINA. Eastern Kansu: *Potanin* (1885). *Hort. Kew.* 1895. Northern Shensi: *Giraldi* 760, 4468–4472 (ex Fedde).

XLV.—BAMBOOS AND BORING BEETLES.

L. A. BOODLE & W. DALLIMORE.

The fact that Bamboos used in India for building purposes in the normal condition are very liable to injury by boring beetles, whereas those that have been well soaked in water before use are usually left alone, led to the following experiments being made with a view to determining the reason.

The material used in the experiments was grown in the Royal Botanic Gardens, Kew, part being examined in a fresh state, part after soaking for three months in the pond near the Palm House, and part after soaking for three months in water heated to 80° Fahr. in the tank in the Victoria Regia House, the examination in each case being conducted in the Jodrell Laboratory.

Examination of two portions of Bamboo stem (Dendrocalamus giganteus), from the Palm House, one fresh and one after being sunk in the pond near the Palm House for three months.

The untreated piece of stem contained abundant starch, and a considerable amount of soluble carbohydrate, consisting of or including glucose or some other sugar, giving a precipitate with Fehling's solution.

In the stem from the pond, soluble carbohydrate was present in