

Broussonetia papyrifera

Paper mulberry

Introduction

The genus *Broussonetia* contains four species and one variety, mainly distributed in East Asia and the Pacific islands. Although *B. papyrifera* is considered an invasive species in North America, it has great economic value in China. All four species are also produced in China, mostly in the southwest and southeast of the country [194]. Paper mulberry is well-known for drought tolerance.

Species of *Broussonetia* in China

Scientific Name
<i>B. papyrifera</i> (Linn.) L'Hert. Ex Vent.
<i>B. kaempferi</i> Sieb.
<i>B. kazinoki</i> Sieb.
<i>B. kurzii</i> (Hook. F.) Corner

Taxonomy

Family: Moraceae
Genus: *Broussonetia* L'Hert. ex Vent.

Description

B. papyrifera is a woody tree that can reach 10-20 m in height. The bark is dark gray in color. Leaves are broadly ovate to narrowly elliptic-ovate, 3 - 5 lobed or without lobes, 6-18 cm long and 5-9 cm wide, with coarsely serrate edges, acuminate apexes and asymmetrically cordate bases, arranged spirally on densely pubescent branchlets. Leaves are densely tomentose beneath and sparsely tomentose above. The scabrous petiole is 2.3-8 cm in length. Stipules are ovate, 1.5-2 cm long and 0.8-1 cm wide with an attenuate apex. Flowers are dioecious, blooming from April to May. Male inflorescences are catkins, 3-8 cm long, with lanceolate, pubescent bracts. The perianth of the male flower is four-lobed. Each lobe is triangular-ovate and pubescent. Female inflorescences are globose-capitate, and bracts are clavate, apically pubescent.



Leaves of *Broussonetia papyrifera*. (Photo USDA-PD.)

The female perianth is pipelike, apically lobed and adnate to the style. Appearing from June to July, fruits are syncarps or achenes. The syncarp is fleshy, 1.5-3 cm in diameter and orange-red when mature. Achenes are equal in length to the peduncle and have a verrucose surface [194].

Habitat

B. papyrifera is cultivated in some regions [22], and occurs naturally on hillsides, roadsides, ditch banks, crop field margins, valleys, forests, and open ground near urban areas at elevations below 1,500 m [68] [72] [194] [201].

Distribution

B. papyrifera is widely distributed in China. It occurs in most of the provinces south of the Yellow River, including

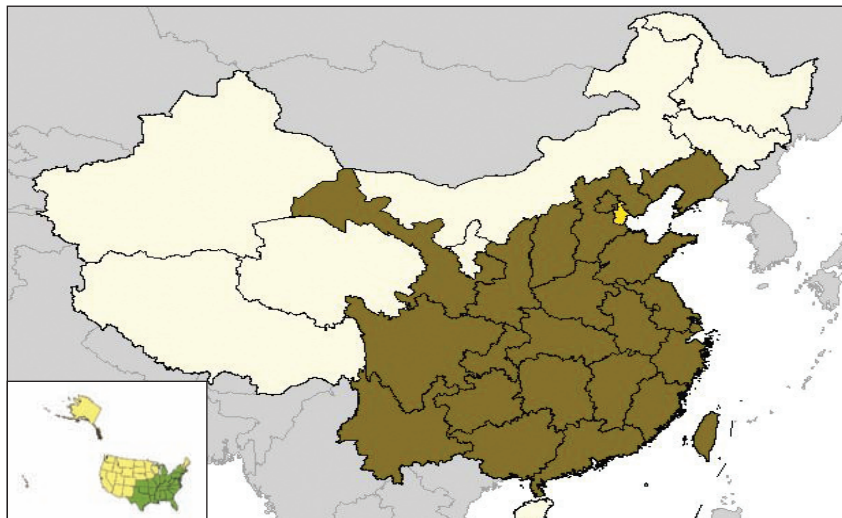
Anhui, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Shaanxi, Shanxi, Shandong, Sichuan, Taiwan, Yunnan, and Zhejiang. It also occurs in Liaoning, in northeastern China, and an adjacent province of Hebei.

Economic Importance

The phloem fiber of *B. papyrifera* is used in papermaking. The fruits, root and bark have numerous medicinal uses [105].

Related Species

There are two species similar to *B. papyrifera* under Section *Broussonetia* *Broussonetia kazinoki* Sieb, which produces male and female flowers on



the same plant, has a distribution similar to that of paper mulberry, occurring in the same habitat type; *Broussonetia kurzii* (Hook. F.) Corner, with leaves arranged alternately in two rows, grows in tropical rainforests in Yunnan and southern China, at elevations of 200-600 m.

Natural Enemies of *Broussonetia*

Twelve species and one variety of fungi have been reported to cause damage to *B. papyrifera*. Three species, *Aecidium mori* Barcl. var. *broussonetia*, *Dendryphiella broussonetiae* Y. L. Guo et Z. Y. Zhang

and *Phomopsis broussonetiae* (Sacc.) Diet., are reportedly host specific to *Broussonetia papyrifera*. Thirteen species of insects and mites belonging to six families and five orders are reported to attack members of the genus *Broussonetia*.

Fungi

Phylum	Family	Species	H. R.	Ref.
Ascomycota	Erysiphaceae	<i>Phyllactinia broussonetiae-kaempferi</i> Sawada	o	22
		<i>Phyllactinia moricola</i> (Henn.) Homma	p	23
	Mycosphaerellaceae	<i>Mycosphaerella mori</i> (Fuckel) F.A. Wolf	p	23 [†]
Basidiomycota	Incertae sedis	<i>Aecidium mori</i> Barclay	po	23
		<i>Aecidium mori</i> var. <i>broussonetia</i>	m	186
	Phakopsoraceae	<i>Phakopsora fici-erectae</i> S. Ito & Y. Otani ex S. Ito & Muray.	p	23
	Septobasidiaceae	<i>Septobasidium bogoriense</i> Pat.	p	23
Oomycota	Pythiaceae	<i>Phytophthora boehmeriae</i> Sawada	p	188
Anamorphic Ascomycetes		<i>Myxosporella miniata</i> Sacc.	p	23
		<i>Nothopatella chinensis</i> Miyake	p	23
Anamorphic <i>Diaporthe</i>		<i>Phomopsis broussonetiae</i> (Sacc.) Died.	m	23
Anamorphic <i>Mycosphaerella</i>		<i>Pseudocercospora broussonetiae</i> (Chupp & Linder) Y.L. Guo & X.J. Liu	oo	23 [‡]
			o	110
Anamorphic <i>Pleospora</i>		<i>Dendryphiella broussonetiae</i> Y.L. Guo & Z.Y. Zhang	m	55

[†] Recorded as *Septogloeum mori* Briosi et Cav.

[‡] Recorded as *Cercospora broussonetiae* Chupp et Linder

Arthropods

Order	Family	Species	H. R.	Ref.
Acariformes	Tetranychidae	<i>Eotetranychus broussonetiae</i> Wang	m	143
		<i>Eotetranychus smithi</i> Pritchard et Baker	p	143
		<i>Eotetranychus suginamensis</i> (Yokoyama)	p	143
		<i>Tetranychus cinnabarinus</i> (Boisduval)	p	143
		<i>Tetranychus kanzawai</i> Kishida	p	143
Coleoptera	Cerambycidae	<i>Megopsis sinica ornaticollis</i> (White)	p	79
Hemiptera	Pentatomidae	<i>Cantao ocellatus</i> (Thunberg)	p	192
		<i>Dalpada smargdina</i> (Walker)	po	192
Homoptera	Callaphididae	<i>Tiliaphis coreanus</i> Quednau	p	100
	Ricaniidae	<i>Ricania speculum</i> (Walker)	po	204
Lepidoptera	Sphingidae	<i>Enpinanga transtriata</i> Chu et Wang	p	65
		<i>Marumba sperchius</i> Ménéntriès	p	206
			p	208
			p	65
		<i>Parum colligata</i> (Walker)	p	141
			p	158
			po	206
		p	208	