

Humulus scandens (*Humulus japonicus*)

Japanese hop

Introduction

The genus *Humulus* contains only three species that are confined to the temperate and subtropical regions of the northern hemisphere. All three species of hops are reported from across southern China [194].

Species of *Humulus* in China

Species Name
<i>Humulus lupulus</i> L.
<i>H. yunnanensis</i> Hu
<i>H. scandens</i> (Lour.) Merr.

Taxonomy

Family: Moraceae

Genus: *Humulus* L.

Description

Humulus scandens is a twining or prostrate vine that grows as an annual in northeastern China and as a perennial in southern China [109]. The opposite leaves are 7-10 cm in length and deeply divided into five distinct palmate lobes with a serrate margin and rough surface. The underside of the leaf is pubescent, bearing yellow glands. The stems and petiole are covered with sharp, downward-curving hairs. Bracts occur at the bases of leaf petioles. Flowers appear spring through summer, followed by achenes that are exposed from the bract at maturity in the autumn [194]. Male flowers are yellowish green panicles 15-25 cm long. Female flowers are catkin-like drooping spikes about 5 mm in diameter. The ovary, covered in a white tomentum, is triangular with an acuminate apex, and enclosed in a papery bract with two external stigmata.

Habitat

Humulus scandens occurs in wastelands, forest margins, and thickets along streams [194][74]. It has also been reported to grow along roads, hedges and buildings, in cropland, stony ground,



lawns, and under willow trees on river banks [37][68][76][109]. Elevational distribution ranges from 500-1,200 m (max. 1,800 m) in eastern Yunnan province [76], to below 1500 m in Hubei province [201]; 300-2100 m in areas of the Loess-Plateau [72]; and 500-1500 m on both the south and north slopes of the Qinling Mountains [68].

Distribution

H. scandens is distributed widely in most provinces in China, with the exception of Hainan, Tibet, and Qinghai [144][74][130].

Economic Importance

In China, *H. scandens* is a useful traditional herb. The stem fibers can

be used for papermaking, and the seed oils are used in soap production. The flowers can be substituted for *H. lupulus* in brewing [94]. As a climbing twining vine, *H. scandens* may cause damage to fruit trees and grain crops or decrease production because of its climbing and twining tendency [34]. It is also an alternate host for *Hemiptera* pest species that cause serious damage to cotton [37].

Leaves and flowers of *Humulus scandens*. (Photo by Bennie Bengston, LBJWC.)

Related Species

Humulus yunnanensis Hu, which has raised veins on the bracts, is native to Yunnan province, occurs in the lower



elevation forests at 1,200-2,800 m. *Humulus lupulus* L., which lacks raised veins, is native to Xinjiang, and is cultivated in some northern provinces. These two species are delineated from *H. scandens* by their entire leaf margins and fruits that are

enclosed within glabrous bracts.^[194]
Natural Enemies of *Humulus*
Agrobacterium tumefaciens Biotype 1 is a gram-negative baculiform bacterium that can cause crown gall on the common hop^[129].
 Nine fungi are known to infect plants

of the genus *Humulus*, but only one, *Pseudocercospora humuli*, may be specific to Japanese hop. Of the 27 insects associated with the genus *Humulus*, two species, *Epirrhoe sepegressa* and *Chytonix segregata*, may have narrow host ranges.

Fungi

Phylum	Family	Species	H. R.	Ref.
Ascomycota	Erysiphaceae	<i>Sphaerotheca humuli</i> (DC.) Burrill	po	23
			mo	22 [†]
Oomycota	Peronosporaceae	<i>Pseudoperonospora humuli</i> (Miyabe & Takah.) G.W. Wilson	oo	23
	Pythiaceae	<i>Phytophthora citrophthora</i> (R.E. Sm. & E.H. Sm.) Leonian	o	188
Anamorphic <i>Botryotinia</i>		<i>Botrytis cinerea</i> Pers.	po	23
Anamorphic <i>Hypomyces</i>		<i>Verticillium albo-atrum</i> Reinke & Berthold	po	23
Anamorphic <i>Mycosphaerella</i>		<i>Cercospora cantuariensis</i> E.S. Salmon & Wormald	mo	23
		<i>Pseudocercospora humuli</i> (Hori) Y.L. Guo & X.J. Liu	mo	23 [‡]
			m	110
Anamorphic Mycosphaerellaceae		<i>Ascochyta humuli</i> Kabát & Bubák	oo	23
Anamorphic <i>Pyrenopeziza</i>		<i>Cylindrosporium humuli</i> Ellis & Everh.	mo	23

[†] Recorded as *Sphaerotheca macularis* (Wallr. : Fr.) Lind.

[‡] Recorded as *Cercospora humuli* Hori

Arthropods

Order	Family	Species	H. R.	Ref.
Acariformes	Tetranychidae	<i>Tetranychus urticae</i> (Koch)	po	57
Coleoptera	Chrysomelidae	<i>Psylliodes attenuata</i> (Koch)	po	57
			p	185
	Elateridae	<i>Agriotes fuscicollis</i> Miwa	po	57
	Melolonthidae	<i>Maladera orientalis</i> Mots	po	57
Homoptera	Aphididae	<i>Aphis craccivora usuana</i> Zhang	p	100
		<i>Aphis humuli</i> (Tseng et Tao)	p	100
		<i>Phorodon japonensis</i> Takahashi	p	57
			po	58
			p	189
	Cicadellidae	<i>Empoasca bipunctata ulmicola</i> A. Z.	po	57
		<i>Tettigoniella viridis</i> (Linné)	po	57 [†]
Triozidae	<i>Triozia magnisetosa</i> Log	po	57	

Lepidoptera	Geometridae	<i>Epirrhoe supergressa</i> (Butler)	m	138
	Noctuidae	<i>Abrostola triplasia</i> (Linnaeus)	oo	65
			oo	209
		<i>Chytonix segregata</i> Butler	m	67
			m	178
			m	209
		<i>Crino satura</i> (Schiffermüller)	po	209
	<i>Heliothis armigera</i> (Hübner)	po	57	
	Nymphalidae	<i>Inachis io</i> (Linnaeus)	po	24
			po	203
		<i>Polygonia c-album</i> (Linnaeus)	po	203
		<i>Polygonia c-album hemigera</i> Butler	p	24
		<i>Polygonia c-aureum</i> Linnaeus	p	24
		<i>Polygonia c-aureum lunulata</i> Esaki et Nakahara	p	203
	<i>Vanessa indica</i> Herbst	p	24	
	Psychidae	<i>Clania minuscular</i> Butler	p	66
	Tortricidae	<i>Adoxophyes orana</i> Fischer von Röslerstamm	p	65
<i>Grapholitha delineana</i> Walker		p	66	
Parasitiformes	Phytoseiidae	<i>Amblyseius anuwati</i> Ehara et Bhandhufalck	p	65
Thysanoptera	Thripidae	<i>Megalurothrips distalis</i> (Karny)	po	132
		<i>Thrips tabaci</i> Lindeman	po	57

† recorded as *Cicadella viridis* L.