

Polygonum perfoliatum

Mile-a-minute

Introduction

The genus *Polygonum* is comprised of 230 species worldwide, primarily in the northern temperate regions of the world. In China, 113 species and 26 varieties have been reported from all provinces of the country^[99].

Taxonomy

Order: Polygonales

Family: Polygonaceae

Subfamily: Polygonideae

Tribe: Polygoneae

Genus: *Polygonum* L.

Section: Echinocaulon Meisn.

Species: *Polygonum perfoliatum* L.

Description

Polygonum perfoliatum is an annual vine that can reach 1-2 m or more in length. The stems are furrowed with short recurved prickles along the ridges. Nearly as long as the petiole, the thin, papery leaves are triangular, about 3-7 cm long and 2-5 cm wide, glabrous on the upper surface with prickles along the mid-rib on the underside. The saucer-shaped ochrea (stipule sheath) is green and connate perfoliate with a diameter of 1.5-3 cm. The flowers, 1-3 cm in length, are borne on racemes that emerge from the leaf axil or at the end of the stem in June through August. Bracts are ovoid, each containing 2-4 flowers with 8 stamens and 3 styles. The perianth consisting of 5 deep lobes, is white or light red in color, becoming blue at fruiting in July to October. Each shiny, black achene is globose, 3-4 mm in diameter, and contained in a persistent perianth^[95, 99].

Habitat

P. perfoliatum occurs in moist areas at elevations of 80 – 2300 m. *P. perfoliatum* can be found along rivers and roadsides in eastern China^[1128];



along valley streams and in thickets in northern China^[17, 67]; mountain thickets, forest margins and stream banks at elevations of 200 – 1300 m in the the Qinling Mountains and Loess Plateau areas of northwestern China^[48, 79]; ditches, stream banks and wasteland in central and southern China^[88, 120, 180]; hillside thickets at 2100m in southern Tibet^[184]; and grassy slopes, forest margins, roadsides and river banks at 500 – 2100 m in Yunnan, southwestern China^[2].

Distribution

P. perfoliatum occurs in the provinces of Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hainan, Hebei, Heilongjiang, Henan, Hubei, Hunan, eastern Inner Mongolia, Jiangsu, Jiangxi, Jilin, Liaoning, southern Shaanxi, Shandong, Sichuan, Taiwan, Chayu of southern Tibet, Yunnan, Zhejiang, and possibly eastern Gansu^[95, 99, 128, 184].



Economic Importance

Polygonum perfoliatum is traditionally regarded as medicinally useful in China, and it is also utilized for suppressing vegetable insect pests^[95, 120]

Related Species

P. thunbergii Sieb. et Zucc. has hastate leaves, occurs in wet valleys and on grassy slopes, at elevations of 90-2400 m. Its distribution includes Gansu, Guizhou, Shaanxi, Sichuan, Yunnan provinces. ^[95].

Natural Enemies of Polygonum

Seventy one species of fungi have been reported as associated with various *Polygonum* species, of which 2 are associated with *P. perfoliatum*. The taxonomic status of *Puccinia* spp. on members of the Polygonaceae in China was reviewed in the 1980s^[101]. The 30 reported species are included in the second flora on *Puccinia*^[229]. Sixty-six arthropods have been



reported as associated with members of the genus *Polygonum*. One hundred eleven arthropod species were found during a survey to identify potential biological control agents against *P. perfoliatum*. More than half are Coleopteran species, with one weevil species, *Rhinoncomimus latipes* Korotyaev (Coleoptera: Curculionidae), regarded as the most promising agent. In addition, 3 oligophagous leaf beetles, *Smaragdina nigrifrons* (Coleoptera: Eumolpidae), *Gallerucida*

bifasciata and *Galerucella placida* (Coleoptera: Chrysomelidae), were dominant at most of the surveyed sites as well as *Timandra griseata* (Lepidoptera: Geometridae), a geometrid moth. One bug, *Cletus schmidti* (Hemiptera: Coreidae), and one sawfly, *Allantus nigrocaeruleus* (Hymenoptera: Tenthredinidae), were recommended for further host specificity evaluations^[32].



Species of *Polygonum* in China^[95, 99]

Scientific Name	Scientific Name
<i>P. acerosum</i> Ledeb. ex Meisn.	<i>P. macrophyllum</i> D. Don
<i>P. acetosum</i> Bieb.	<i>P. manshuriense</i> V. Petr. ex Kom.
<i>P. affine</i> D. Don	<i>P. microcephalum</i> D. Don
<i>P. ajanense</i> (Regel et Til.) Grig.	<i>P. milletii</i> (Lévl.) Lévl.
<i>P. alopecuroides</i> Turcz. ex Besser	<i>P. molle</i> D. Don
<i>P. alpinum</i> All.	<i>P. molliiforme</i> Boiss.
<i>P. amphibium</i> L.	<i>P. muricatum</i> Meisn.
<i>P. amplexicaule</i> D. Don	<i>P. nepalense</i> Meisn.
<i>P. angustifolium</i> Pall.	<i>P. nummulariifolium</i> Meisn. ^{IV}
<i>P. arenastrum</i> Boreau	<i>P. ochotense</i> V. Petr. ex Kom.
<i>P. argyrocoleon</i> Steud. ex Kuntze ^I	<i>P. ochreatum</i> L.
<i>P. assamicum</i> Meisn.	<i>P. orientale</i> L.
<i>P. aviculare</i> L.	<i>P. pacificum</i> V. Petr. ex Kom.
<i>P. barbatum</i> L.	<i>P. paleaceum</i> Wall. ex Hook. f.
<i>P. biconvexum</i> Hayata	<i>P. palmatum</i> Dunn
<i>P. bistorta</i> L.	<i>P. paralimicola</i> A. J. Li
<i>P. bungeanum</i> Turcz.	<i>P. paronychioides</i> C. A. Mey. ex Hohen.
<i>P. campanulatum</i> Hook. f.	<i>P. patulum</i> Bieb.
<i>P. capitatum</i> Buch.-Ham. ex D. Don	<i>P. perfoliatum</i> L.
<i>P. cathayanum</i> A. J. Li	<i>P. persicaria</i> L.
<i>P. chinense</i> L.	<i>P. pinetorum</i> Hemsl.
<i>P. cognatum</i> Meisn.	<i>P. platyphyllum</i> Li et Chang
<i>P. coriaceum</i> Sam.	<i>P. plebeium</i> R. Br.
<i>P. coriarium</i> Grig.	<i>P. polycnemoides</i> Jaub. et Spach
<i>P. criopolitanum</i> Hance	<i>P. polystachyum</i> Wall. ex Meisn.
<i>P. cyanandrum</i> Diels	<i>P. popovii</i> Borod.
<i>P. darrisii</i> Lévl.	<i>P. posumbu</i> Buch.-Ham. ex D. Don
<i>P. delicatulum</i> Meisn.	<i>P. praetermissum</i> Hook. f.
<i>P. dichotomum</i> Blume	<i>P. pubescens</i> Blume
<i>P. dissitiflorum</i> Hemsl.	<i>P. pulchrum</i> Blume
<i>P. divaricatum</i> L.	<i>P. purpureonervosum</i> A. J. Li

Scientific Name	Scientific Name
<i>P. ellipticum</i> Willd. ex Spreng.	<i>P. rigidum</i> Skv.
<i>P. emodi</i> Meisn.	<i>P. runcinatum</i> Buch.-Ham. ex D. Don
<i>P. fertile</i> (Maxim.) A. J. Li	<i>P. sagittatum</i> L. ^v
<i>P. filicaule</i> Wall. ex Meisn.	<i>P. schischkinii</i> Ivan. ex Borod.
<i>P. foliosum</i> H. Lindb.	<i>P. senticosum</i> (Meisn.) Franch. et Sav.
<i>P. forrestii</i> Diels	<i>P. sibiricum</i> Laxm.
<i>P. glabrum</i> Willd.	<i>P. sinomontanum</i> Sam.
<i>P. glaciale</i> (Meisn.) Hook. f.	<i>P. songaricum</i> Schrenk
<i>P. griffithii</i> J. D. Hooker ⁱⁱ	<i>P. sparsipilosum</i> A. J. Li
<i>P. hastatosagittatum</i> Mak.	<i>P. strigosum</i> R. Br.
<i>P. honanense</i> Kung	<i>P. strindbergii</i> Schust.
<i>P. hookeri</i> Meisn.	<i>P. subscaposum</i> Diels
<i>P. huananense</i> A. J. Li	<i>P. suffultoides</i> A. J. Li
<i>P. humifusum</i> Merk ex C. Koch	<i>P. suffultum</i> Maxim.
<i>P. humile</i> Meisn.	<i>P. taquetii</i> Lév.
<i>P. hydropiper</i> L.	<i>P. thunbergii</i> Sieb. et Zucc.
<i>P. intramongolicum</i> A. J. Li	<i>P. Tibeticum</i> Hemsl.
<i>P. japonicum</i> Meisn.	<i>P. tinctorium</i> Ait.
<i>P. jucundum</i> Meisn.	<i>P. tortuosum</i> D. Don
<i>P. kawagoeanum</i> Makino ⁱⁱⁱ	<i>P. umbrosum</i> Sam.
<i>P. lapathifolium</i> L.	<i>P. vacciniifolium</i> Wall. ex Meisn. ^{vi}
<i>P. lichiangense</i> W. W. Smith	<i>P. viscoferum</i> Mak.
<i>P. limicola</i> Sam.	<i>P. viscosum</i> Buch.-Ham. ex D. Don
<i>P. limosum</i> Kom.	<i>P. viviparum</i> L.
<i>P. longisetum</i> De Br.	<i>P. wallichii</i> Meisn.
<i>P. maackianum</i> Regel	

ⁱ Recorded as *P. argyrocoleum* Steud. ex Kunze in *FRPS*

ⁱⁱ Recorded as *P. calostachyum* Diels in *FRPS*

ⁱⁱⁱ Recorded as *P. tenellum* Blume in *FRPS*

^{iv} Recorded as *P. nummularifolium* Meisn in *FRPS*

^v Recorded as *P. sieboldii* Meisn. in *FRPS*

^{vi} Recorded as *P. vaccinifolium* Wall. ex Meisn. in *FRPS*

Fungi

Phylum	Family	Species	H. R.	Ref.
Ascomycota	Erysiphaceae	<i>Erysiphe betae</i> (Vaňha) Weltzien	po	[26] ^I
			po	[24] ^I
		<i>Sphaerotheca pannosa</i> (Wallr.) Lév.	mo	[26]
	Sclerotiniaceae	<i>Sclerotinia sclerotiorum</i> (Lib.) de Bary	po	[26]
Basidiomycota	Atheliaceae	<i>Athelia rolfsii</i> (Curzi) C.C. Tu & Kimbr.	po	[26] ^{II}
	Melanopsichiaceae	<i>Melanopsichium nepalense</i> (Liro) Zundel	po	[26] ^{III}
			mo	[64] ^{IV}

Phylum	Family	Species	H. R.	Ref.
		<i>Melanopsichium pennsylvanicum</i> Hirschh.	po	[26]
			oo	[64]
	Microbotryaceae	<i>Liroa emodensis</i> (Berk.) Cif.	mo	[64]
			oo	[26]V
		<i>Microbotryum reticulatum</i> (Liro) R. Bauer & Oberw.	oo	[26]VI
			oo	[64]VII
		<i>Sphacelotheca hydropiperis</i> (Schumach.) de Bary	oo	[26]
			o	[64]
	Pucciniaceae	<i>Puccinia barclayi</i> S. Ahmad	mo	[229]
			oo	[26]
		<i>Puccinia benokiyamensis</i> Hirats. f.	oo	[229]
			oo	[26]
		<i>Puccinia bistortae</i> (F. Strauss) DC.	oo	[229]
			oo	[26]
		<i>Puccinia calumnata</i> Syd. & P. Syd.	mo	[229]
			oo	[26]
		<i>Puccinia congesta</i> Berk. & Broome	oo	[229]
			oo	[26]
		<i>Puccinia fagopyricola</i> Jørst.	po	[26]
		<i>Puccinia hanyuenensis</i> F.L. Tai	mo	[26]
			oo	[229]
		<i>Puccinia iwateyamensis</i> Hirats. f.	mo	[229]
		<i>Puccinia kweichowana</i> Cummins	mo	[26]
			oo	[229]
		<i>Puccinia mammillata</i> J. Schröt.	oo	[26]
			mo	[229]
	<i>Puccinia nitidula</i> Tranzschel	mo	[26]	
		oo	[229]	
	<i>Puccinia omeiensis</i>	mo	[26]	
<i>Puccinia phragmitis</i> (Schumach.) Körn.	po	10		
<i>Puccinia polygoni-alpini</i> Cruchet & Mayor	mo	[229]		
<i>Puccinia polygoni-amphibii</i> Pers.	o	[26]		
	p	[229]		

Phylum	Family	Species	H. R.	Ref.
		<i>Puccinia polygonicola</i> F.L. Tai	oo	[26]
			oo	[229]
		<i>Puccinia polygoni-lapathifolii</i> T. N. Liou & Y. C. Wang	mo	[229]
		<i>Puccinia polygoni-sieboldii</i> (Hirats. & S. Kaneko) B. Li	mo	[229]
		<i>Puccinia polygoni-weyrichii</i> Miyabe	oo	[26]
		<i>Puccinia septentrionalis</i> Juel	mo	[229]
		<i>Puccinia taliensis</i> F.L. Tai	oo	[26]
			oo	[229]
		<i>Puccinia taylorii</i> Balf.-Browne	oo	[229]
		<i>Puccinia thibetana</i> J.Y. Zhuang	mo	[229]
		<i>Puccinia vivipari</i> Jørst.	mo	[26]
			oo	[229]
		<i>Puccinia wulingensis</i> B. Li	mo	[229]
		<i>Puccinia yunnanensis</i> F.L. Tai	po	[26]
		<i>Uromyces polygoni-avicularis</i> (Pers.) P. Karst.	po	[26]
	Ustilaginaceae	<i>Ustilago anhweiana</i> Zundel	oo	[26]
		<i>Ustilago anomala</i> J. Kunze ex G. Winter	oo	[26]
		<i>Ustilago bistortarum</i> (DC.) Körn.	oo	[64]
		<i>Ustilago bosniaca</i> Beck	oo	[64]
		<i>Ustilago cordae</i> Liro	oo	[64]
			oo	[26]
		<i>Ustilago dehiscens</i> L. Ling	mo	[64]
		<i>Ustilago filamenticola</i> L. Ling	mo	[64]
			mo	[26]
		<i>Ustilago koenigiae</i> Rostr.	mo	[26]
			mo	[64]
		<i>Ustilago longiseti</i> Vánky & Oberw.	mo	[64]
		<i>Ustilago ochrearum</i> Berk.	oo	[26]
			oo	[64]
<i>Ustilago picacea</i> Lagerh. & Liro	mo	[64]		
<i>Ustilago piperi</i> G.P. Clinton	mo	[64]		
<i>Ustilago polygoni-alati</i> Thirum. & Pavgi	mo	[64]		
<i>Ustilago pustulata</i> (DC.) G. Winter	mo	[64]		

Phylum	Family	Species	H. R.	Ref.
		<i>Ustilago sinkiangensis</i> Y.C. Wang	oo	[26]
		<i>Ustilago tuberculiformis</i> Syd. & P. Syd.	mo	[64]
			oo	[26]
Oomycota	Albuginaceae	<i>Albugo polygoni</i> Z.D. Jiang & P.K. Chi	oo	[202]
	Peronosporaceae	<i>Peronospora sinensis</i> D.Z. Tang	po	[202]
		<i>Phytophthora polygoni</i> Sawada	oo	[26]
	oo		[202]	
Anamorphic <i>Guignardia</i>		<i>Phyllosticta polygoni-bungeani</i> Miura	mo	[26]
		<i>Phyllosticta polygonorum</i> Sacc.	po	[26]
Anamorphic <i>Lewia</i>		<i>Alternaria alternata</i> (Fr.) Keissl.	po	[26]
Anamorphic <i>Mycosphaerella</i>	Pythiaceae	<i>Cercospora persicariae</i> W. Yamam.	oo	[26]
		<i>Cercospora polygonaceae</i> Ellis & Everh.	oo	[26]
		<i>Cercospora polygonorum</i> Cooke	oo	[26]
		<i>Cladosporium effusum</i> Berk. & M.A. Curtis	po	[210]
		<i>Passalora polygoni</i> Y. L. Guo	mo	[65]
		<i>Pseudocercospora avicularis</i> (G. Winter) A.Z.M. Khan & Shamsi	mo	[129]
		<i>Pseudocercospora persicariae</i> (W. Yamam.) Deighton	oo	[129]
		<i>Pseudocercospora polygonicola</i> (A.K. Kar & M. Mandal) Deighton	oo	[129]
		<i>Pseudocercospora polygonorum</i> (Cooke) Y.L. Guo & X.J. Liu	oo	[129]
		<i>Septoria polygonicola</i> (Lasch) Sacc.	oo	[26]
		<i>Septoria polygonorum</i> Desm.	oo	[26]
			po	[1]
		Anamorphic Mycosphaerellaceae		<i>Ascochyta polygoni</i> Rabenh.
Anamorphic Uredinales		<i>Aecidium polygoni-cuspidati</i> Dietel	oo	[26]

ⁱRecorded as *Erysiphe polygoni* DC.

ⁱⁱRecorded as *Corticium centrifugum* (Lév.) Bres.

ⁱⁱⁱRecorded as *Ustilago nepalensis* Lindr.

^{iv}Recorded as *Ustilago nepalensis* Liro

^vRecorded as *Ustilago emodensis* Berk.

^{vi}Recorded as *Ustilago reticulata* Lindr.

^{vii}Recorded as *Ustilago reticulata* (Zundel) Vánky & Oberwinkler

Arthropods

Order	Family	Species	H. R.	Ref.	
Acariformes	Tetranychidae	<i>Tetranychus truncatus</i> Ehara	po	[167]	
Coleoptera	Chrysomelidae	<i>Chaetocnema bella</i> (Baly)	oo	[165]	
		<i>Chaetocnema concinna</i> (Marsham)	oo	[75]	
		<i>Entomoscelis orientalis</i> Motschulsky	oo	[201]	
		<i>Galeruca barovskyi</i> Jacobson	po	[201]	
		<i>Galerucella grisescens</i> (Joannis)	po	[201]	
		<i>Gallerucida bifasciata</i> Motschulsky	po	[75]	
		<i>Gallerucida singularis</i> (Harold)	po	[201]	
		<i>Gastrophysa atrocyanea</i> (Motschulsky)	oo	[201]	
		<i>Gastrophysa polygona</i> (L.)	po	[201]	
		<i>Geinella invenusta</i> (Jacobson)	mo	[201]	
		<i>Geinella splendida</i> Chen, Jiang & Wang	po	[201]	
		<i>Hespera auricuprea</i> Chen & Wang	po	[165]	
		<i>Hespera brachyelytra</i> Chen & Wang	po	[201]	
		<i>Stenoluperus flavipes</i> Chen	po	[165]	
		<i>Stenoluperus nipponensis</i> (Laboissiere)	po	[178]	
				po	[75]
				po	[165]
		Crioceridae	<i>Lema lacosa</i> Pic	po	[75]
			<i>Lema paagai</i> Chûjô	po	[164]
			<i>Lilioceris merdigera</i> (L.)	po	[164]
			po	[75]	
			po	[164]	
	Curculionidae		<i>Lagenolobus sieversi</i> Faust	oo	[211]
			<i>Basilepta pubiventer</i> T'an	oo	[165]
	Eumolpidae		<i>Basilepta ruficollis</i> (Jacoby)	po	[75]
			po	[164]	
		<i>Chlamisus mosaicus</i> T'an	mo	[165]	
		<i>Cryptocephalus aberrans</i> Jacoby	oo	[164]	
		<i>Nodina pilifrons</i> Chen	oo	[165]	
		<i>Pachnophorus seriatus</i> Lefèvre	po	[164]	
		<i>Smaragdina aurita hammarstraemi</i> (Jacobson)	po	[164]	
	Hemiptera	Coreidae	<i>Cletus punctulatus</i> (Westwood)	po	[207]
<i>Mictis angusta</i> Hsiao			po	[207]	
Lygaeidae		<i>Nysius ericae</i> (Schilling)	po	[207]	
Pentatomidae		<i>Hoplistodera fergussoni</i> Distant	po	[208]	
Plataspidae		<i>Coptosoma parvipicta</i> Montandon	m	[208]	

Order	Family	Species	H. R.	Ref.
Homoptera	Aphalaridae	<i>Aphalara fasciata</i> Kuwayama	po	[178]
			mo	[160]
		<i>Aphalara polygonia</i> Foerter	mo	[160]
	Aphididae	<i>Capitophorus javanicus</i> Hille Ris Lambers	p	[205]
		<i>Margituberculatus longituberculatus</i> Zhang	oo	[165]
	Coccidae	<i>Ceroplastes ceriferus</i> (Anderson)	po	[173]
		<i>Ceroplastes floridensis</i> Comstock	po	[173]
Triozidae	<i>Eubactericera drepanoides</i> Li	mo	[160]	
Hymenoptera	Tenthredinidae	<i>Tenthredo mesomelas</i> (L.)	po	[166]
Lepidoptera	Arctiidae	<i>Hyphantria cunea</i> (Drury)	po	[45]
		<i>Lemyra phasma</i> (Leech)	po	[45]
		<i>Rhyparioides metelkana</i> (Lederer)	po	[44]
			po	[45]
		<i>Spilosoma lubricipedum</i> (L.)	po	[45]
			po	[178]I
	Crambidae	<i>Chilo suppressalis</i> (Walker)	po	[169]
		<i>Mecyna gilvata</i> Fabricius	po	[169]
			po	[25]
	<i>Nomophila noctuella</i> Denis & Schiffermüller	po	[169]	
	Geometridae	<i>Calothyranis comptaria</i> Walker	po	[78]
			mo	[189]
		<i>Dysstroma citrata</i> (L.)	po	[195]
	<i>Lythria purpuraria</i> (L.)	po	[195]	
	Lycaenidae	<i>Heliophorus ila matsumurae</i> (Fruhstorfer)	po	[219]
	Lymantriidae	<i>Cifuna locuples</i> Walker	po	[166]
	Noctuidae	<i>Acronicta rumicis</i> (L.)	po	[75]
			po	[178]
			po	[25]
			po	[224]II
		<i>Anaplectoides prasina</i> (Denis & Schiffermüller)	po	[11]
			?	[181]
		<i>Discestra trifolii</i> (Hüfnagel)	po	[15]III
		<i>Grammodes geometrica</i> (Fabricius)	po	[224]IV
		<i>Lacanobia w-latinum</i> (Hüfnagel)	po	[25]V
		<i>Polia thalathina</i> (Rottemburg)	po	[15]
		<i>Simyra nervosa</i> (Denis & Schiffermüller)	?	[25]
<i>Trachea atriplicis</i> (L.)		po	[224]	
		?	[25]	
<i>Xylena formosa</i> (Butler)	p	[224]VI		
Nymphalidae	<i>Speyeria aglaja</i> (L.)	po	[219]	

Order	Family	Species	H. R.	Ref.
Thysanoptera	Phlaeothripidae	<i>Haplothrips aculeatus</i> (Fabricius)	po	[66]
		<i>Haplothrips chinensis</i> Priesner	po	[66]
	Thripidae	<i>Scolothrips takahashii</i> Priesner	po	[66]
		<i>Thrips hawaiiensis</i> (Morgan)	po	[66]

ⁱRecorded as *Spilosoma pura* Leech

ⁱⁱRecorded as *Acronycta rumicis* (L.)

ⁱⁱⁱRecorded as *Scotogramma trifolii* (Rottemberg)

^{iv}Recorded as *Chalciope geometrica* (Fabricius)

^vRecorded as *Polia w-latinum* Hufnagel

^{vi}Recorded as *Xylina formosa* (Butler)