Persicaria perfoliata 简体中文 正體中文

System: Terrestrial

Kingdom	Phylum	Class	Order	Family
Plantae	Magnoliophyta	Magnoliopsida	Polygonales	Polygonaceae

Common name Asiatic tearthumb (English), minuteweed (English), tearthumb (English), mile-a-minute-weed (English), mile-a-minute-vine (English), ishimikawa (Japanese), devil's-tail tearthumb (English)

Synonym *Ampelygonum perfoliatum* , (L.) Roberty & Vautier
Polygonum perfoliatum , L.

Similar species *Polygonum arifolium, Polygonum sagittatum, Polygonum scandens*

Summary Persicaria perfoliata is a herbaceous, annual, trailing vine of the buckwheat family (Polygonaceae) that is native to Asia. It generally colonises open and disturbed areas, along the edges of woods, wetlands, stream banks and roadsides. It also occurs in environments that are extremely wet with poor soil structure. Available light and soil moisture are both integral to the successful colonisation of P. perfoliata. Birds are probably the primary long-distance dispersal agents, but water is also an important mode of dispersal, especially during storm events when high water may spread the plant throughout watersheds. P. perfoliata is also spread by the transporting of nursery stock.

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Species Description
Persicaria perfoliata has a reddish stem that is armed with downward pointing hooks or barbs, which are also present on the underside of the leaf blades. The light green coloured leaves are shaped like an equilateral (equal-sided) triangle and alternate along the narrow, delicate stems. Distinctive, circular, cup-shaped leafy structures, called ocreas, surround the stem at intervals. Flower buds, and later flowers and fruits, emerge from within the ocreas. Flowers are small, white and generally inconspicuous. The fruits are attractive, metallic blue, and segmented; each segment contains a single glossy, black or reddish-black seed (Okay, 1999).

Lifecycle Stages
Okay (1999) states that a temperature of 10 degrees C or below must be sustained for an eight-week period to stimulate germination.

Habitat Description
Persicaria perfoliata invades a wide range of habitats. It has been found on stream banks, moist thickets, roadsides, nurseries, wood-piles, clearings and ditches in the U.S.A. It thrives where forests are clear-cut (Oliver, 1996). Available light and soil moisture are both integral to the successful colonization of this species. It will tolerate shade for a part of the day but needs a good percentage (63-100%) of the available light. Weak growth can occur in low light (16% of ambient) under greenhouse conditions (Van Clef, 2001). It can reach areas of higher light intensity by attaching to and climbing over other plants with its recurved barbs. It can survive in areas with relatively low soil moisture, but demonstrates a preference for high soil moisture. *P. perfoliatum* generally grows in areas with an abundance of leaf litter on the soil surface (Okay, 1999).

Reproduction
The weed is primarily a self-pollinating plant (supported by its inconspicuous, closed flowers and lack of a detectable scent), with occasional outcrossing. Fruits and viable seeds are produced without assistance from pollinators. Vegetative propagation from roots has not been successful for this plant. It is a very tender annual, reproducing successfully from July until the first frost, after which it withers. Stahl (2002) states that until frost, the plant can grow up to 6mtrs (20 feet) long (15cms (6 inches) per day), bearing about 50-100 seeds. The species may exhibit a bet-hedging strategy by producing a small peak of production in July (which may safeguard production in years of severe drought) and a large peak of production in September (which coincides with major bird migration). Seed production can reach 66 per square metre on the date of peak production. Seed germination after 1, 2, and 3 years buried in forest soils was 96%, 25%, and 33%, respectively, which indicates that the species forms a long-term seed bank (Van Clef and Stiles, 2001).

General Impacts
Persicaria perfoliata is known to grow rapidly, scrambling over shrubs and other vegetation, blocking the foliage of covered plants from available light and reducing their ability to photosynthesize, which stresses and weakens them. If left unchecked, the shaded plants are killed, and large infestations eventually reduce native plant species in natural areas. It is commonly called mile-a-minute. Small populations of extremely rare plants may be eliminated entirely. Because it can smother tree seedlings, this weed has a negative effect on Christmas tree farms, forestry operations on pine plantations and reforestation of natural areas. It has the potential to be a problem to nursery and horticulture crops that are not regularly tilled as a cultivation practice. IPANE (2001) state that trees and other native plants could suffer mechanical damage due to the weight of this plant. Mile-a-minute weed is a threat to ecosystems as it has the ability to outgrow other species (Oliver, 1996).

Management Info
Persicaria perfoliata can form a long-term seed bank, which must be considered regardless of the chosen management technique (Van Clef, pers.comm., 2004).
Preventative measures: Considering the potential of invasiveness and the very limited distribution of *Persicaria perfoliata* (=*Polygonum perfoliatum*) in the EPPO region, the EPPO Secretariat considered that this species could be added to the EPPO Alert List. *P. perfoliata* was included in the EPPO A2 List (pests locally present in the EPPO region). As of September 2009, nine species including *P. perfoliata* (*Crassula helmsii*, *Eichhornia crassipes*, *Heracleum sosnowskyi*, *H. persicum*, *Hydrocotyle ranunculoides*, *Lysichiton americanus*, *Pueraria lobata*, *Solanum elaeagnifolium*) have been subject to Pest Risk Assessments (PRAs) and are now recommended for regulation to the 50 EPPO countries. All these species have a limited distribution within the EPPO. *P. perfoliata*, *H. sosnowskyi*, *H. persicum*, *S. elaeagnifolium* fall into a category of species that have been unintentionally introduced as contaminants associated with international movement of various commodities and articles, including soil and vehicles (EPPO, Archives, 2007; Brunel & Petter, 2010)
In the USA, *P. perfoliata* has been classified as a 'Class A noxious weed' in the states of Alabama and North Carolina; as a 'invasive banned weed' in the state of Connecticut; as 'prohibited' in Massachusetts; as a 'Prohibited noxious weed' in Ohio; as a 'noxious weed' in Pennsylvania and a 'plant pest' in South Carolina (USDA, NRCS, 2011)
Physical: Hand pulling of seedlings is best done before the recurved barbs on the stem and leaves harden but may be done afterwards with the help of thick gloves. Removal of vines by hand may be conducted throughout the summer, if tough gloves and protective clothing (coveralls) are worn to avoid the skin shredding ability of the recurved hooks. The delicate vines can be reeled in fairly easily and balled up in piles that can be left to dehydrate for several days before disposal. The site must be rechecked at frequent intervals, and removal of new plants should continue until the seed germination period is complete, roughly early April until early July in the mid-Atlantic region of the United States. Physical removal is not recommended after fruit production begins in July (in the mid-Atlantic region of the U.S.) because it will aide dispersal of the species (Van Clef, pers.comm 2004). Repeated mowing or trimming of plants will prevent the plants from flowering and thus reduce or eliminate fruit and seed production. Cultural methods can be utilized to discourage the introduction of *P. perfoliatum* to an area. It is important to maintain vegetative community stability and to avoid creating gaps or openings in existing vegetation. Maintaining broad vegetative buffers along streams and forest edges will help to shade out and prevent establishment of this weed. This will also help to reduce the dispersal of fruits by water.
Mechanical: Mechanical control is ineffective as seeds are often left behind (Oliver, 1996).
Chemical: Studies have shown that pre-emergence applications of herbicide are most effective in controlling mile-a-minute weed, with the herbicides Oust, Velpar L, Arsenal, Aatrex, Pursuit and Pursuit Plus being the most effective. Roundup and Arsenal are best for post-emergence control (McCormick and Hartwig, 1995). Herbicidal soap, helps burn back foliage of *P. perfoliatum*. Because these products do not have the systemic (i.e., travels to the roots) ability of herbicides like glyphosate, they must be reapplied all season long to any regrowth. Glyphosate (e.g., Roundup for upland areas and Rodeo for wetland applications), applied at a low rate will probably be effective in killing the weed.
Biological: A number of potential biological control agents for *P. perfoliatum* have been identified in China. The weevil *Rhinoncomimus latipes* (Coleoptera: Curculionidae) was regarded as the most promising agent (Ding *et al.* 2004). This study concluded that *R. latipes* is a host specialist for *P. perfoliatum* and would have minimal potential non-target effects if released in the U.S.A (Colpetzer *et al.* 2004).\r\nOther possibilities included the oligophagous leaf beetles *Smaragdina nigrifons* (Coleoptera: Eumolpidae), *Gallerucida bifasciata* (Coleoptera: Chrysomelidae) and *Galerucella placida* (Coleoptera: Chrysomelidae), and the geometrid moth *Timandra griseata* (Lepidoptera: Geometridiae). These all impacted the growth and reproduction of *P. perfoliatum*. The bug *Cletus schmidti* (Hemiptera: Coreidae) and the sawfly *Allantus nigrocaerulleus* (Hymenoptera: Tenthredinidae) were recommended for further trials of host specificity (Ding *et al.* 2004). *Timandra griseata* was found to have too broad a host range to be considered for release in the U.S.A., as it also fed on common buckwheat (*Fagopyrum esculentum*) and tartary buckwheat (*Fagopyrum tartaricum*). *Homorosoma chinensis* (Coleoptera: Cureulionidae) is possibly host-specific to *P. perfoliatum*, but further trials are needed with other potential host plants before its release in the U.S.A. could be recommended (Price *et al.*. 2004).

Pathway
Moul (1948) states that the introduction of *P. perfoliatum* in the late 1930s to a nursery site in York County, Pennsylvania produced a successful population of this plant. It is speculated that the seed was spread with Rhododendron stock.

Principal source: Mile - A - Minute weed: *Polygonum perfoliatum*L. (Okay, 1999)

Compiler: National Biological Information Infrastructure (NBII) & IUCN/SSC Invasive Species Specialist Group (ISSG)

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ALIEN RANGE

[1] CANADA
[1] UNITED STATES

[1] TURKEY

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