

## Persicaria minor

### Polygonum minus Huds.

*Persicaria minor* is species of herb in the family Polygonaceae. Common names include pygmy smartweed,[2] small water pepper and swamp willow weed.[3] This herb is native to Asia, but distributed widely in Europe and Australia.[4] It is used in South East Asian cooking.

*Persicaria minor* is native to South East Asia, including Malaysia, Thailand, Vietnam and Indonesia.[5] It grows wild in cooler highlands, but is also found in wet lowland areas near rivers, ditches, and canals. It is a creeping plant with slender stems, and grows upright to a height of 1 to 1.5 meters. The creeping stem is green with reddish tinge, is cylindrical in shape, and has short nodes about 9 mm apart. Its leaves are long and narrowly-tapering, alternately arranged, and green with short, reddish petioles. Its flowers are minute, pale violet, and are 12 to 15 cm long.[6]

*Persicaria minor* is an edible, aromatic herb. In Malaysia and Indonesia it has the common name "kesum", and its shoots and young leaves are eaten raw as part of salad (ulam); used as an aroma spice additive in peppery dishes such as laksa, nasi kerabu, asam pedas and tom yam; used as tea leaves; and used for topical applications in traditional medicine.[7][8] Its oil has been used for aromatherapy and in treatments for dandruff. In Malaysian traditional medicine, *P. minor* has been used in post-natal tonics and for treatment of digestion.[6]

Pharmacological studies on *P. minor* have indicated anti-oxidant, LDL oxidation, anti-inflammatory and anti-microbial activities,[9][10] digestive enhancing and anti-ulcer activities,[11] cognitive enhancing activities,[12] immuno-modulating activities,[13] acetylcholinesterase-inhibiting activity[10] and as a microbial inhibitor to prevent food spoilage.[14] Comparative studies have been carried out to analyse the metabolites not only in the plant's leaves, but also in its stem and roots.[15] Clinical studies have been carried out on this plant, looking at reported abilities to improve cognition,[16][17] mood and stress,[18] and memory.[16]

Compared with other four Malaysian herbs (*Cosmos caudatus*, *Piper sarmentosum*, *Centella asiatica*, *Syzygium polyanthum*), the *Persicaria minor* showed the highest concentration of phenols and the highest antioxidant activity. It has been used as a bioactive component for packaging film for edible foods, based on a semi-refined carrageenan and glycerol as plasticizers.[19]

*P. minor* has high content of dietary fiber, thiamine, carbohydrate, protein and minerals.[5] It is also rich in calcium, potassium, vitamin A and vitamin C, which reportedly gives it a high level of antioxidant properties.[6][5] Other constituents include quercetin, quercetin-3-glucuronide, myricetin, apigenin, hyperoside and astragalin.[20][16]

