

# Pyrola

## Lu Xian Cao, Lu Han Cao, Lu Ti Cao

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Pyrola refers to about a dozen species of the genus *Pyrola*, formerly in the Family *Pyrolaceae* (now reclassified as a division of the *Ericaceae*) collected for Lu Xian Cao. The primary source plant currently is *Pyrola decorata*, the species that is unique to China (known as Pu Tong Lu Ti Cao), but *P. calliantha* is more frequently referenced in Chinese medicine reports. The Chinese plant name is often translated as “deer grass,” but the term grass is not applicable; it is a translation of cao which, while it can refer to grasses, is more aptly translated as weed. The plant has been given several common names, mainly Lu Xian Cao and Lu Han Cao, the lu meaning deer, while the terms xian and han, different characters but same meaning, are usually ignored in describing the herb, these characters mean “to hold in the mouth.” A third name, Lu Ti Cao refers to deer hoof, which has been suggested as making reference to the

leaf appearance. *Pyrola* is a food that deer feed on in winter—the plant has been called wintergreen—as it retains its leaves in winter, so the reference to deer is likely from observation of the animals eating the plant.

The herb used in Chinese medicine is collected whole after three to four years’ growth, and is then bundled to allow some warm fermentation to occur, a process that tends to turn the leafy matter purplish brown (see photo next page), which is taken as a sign of the higher quality herb (compared to simple drying, which turns the leaf matter brown). The whole plant material has leaves dominant, but includes the relatively small stems, rhizomes, and rootlets.

In the modern *Materia Medica*, this herb is placed with those for treating wind-damp, sometimes translated as herbs that are anti-rheumatic. This classification may fit with its anti-inflammatory activity confirmed in pharmacology studies; however, the herb is also widely known in China as a tonic, especially for kidney yang, and is used for strengthening muscles, tendons, and bones, and helping overcome weakness or strains from overwork. Such uses are often listed second to those for wind-damp in deference to the major classification scheme, but traditional and folk uses as a tonic have been recognized by TCM publications from China especially in the post-revolutionary period.

A sample application for yang tonification is in the modern prescription Qian Jing An, a decoction for male infertility, where it is among the yang tonics epimedium (yin yang huo) and cynomorium (suo yang). In a study of immune enhancing effects, pyrola decoction was compared with a decoction of three yang tonics, cistanche (rou cong rong), epimedium, and psoralea (bu gu zhi), and claimed to have a stronger effect than the three herb combination. For promoting bone strengthening against osteoporosis, the main herbs under research consideration were dipsacus (xu duan), epimedium, and pyrola. In the treatment of sciatica, pyrola was combined with cibotium (gou ji) and dipsacus for yang tonification.



A 2020 publication in *Current Topics in Medicinal Chemistry*, titled “A comprehensive review of the genus *Pyrola* herbs in traditional uses, phytochemistry, and pharmacological activities,” from researchers in Wuhan, China, noted that: “*Pyrola* herbs were used as medicinal plants for a long history with wide-ranging activities such as nourishing kidney yang, strengthening muscles and bones, activating blood, stopping bleeding, dispelling rheumatism, and eliminating dampness. A similar, but longer description is presented in a paper published in *Pharmaceutical Biology* (2017) titled “Antioxidant activity against H<sub>2</sub>O<sub>2</sub>-induced cytotoxicity of the ethanol extract and compounds from *Pyrola decorata* leaves:”

As a Yang-tonic agent, *Pyrola decorata* H. Andr (Pyrolaceae), also known as Luxiancao or Luticao, has been extensively used as a valuable tonifying agent for more than 2000 years in China. It has been included in Shengnong’s herbal classic and came out of the top grade lists. According to traditional Chinese medicine (TCM) theory, tonic herbs have been used for various patterns of body deficiency and anti-aging (Hoet al.2009). *P. decorata* has been used to nourish ‘kidney’ and strengthen ‘bone and muscle’ for long history. Therefore, it has been used as treatment for kidney deficiency, gastric hemorrhage and rheumatic arthritic diseases in Chinese medicine (Zhang et al.2013). As a tonifying agent, *P. decorata* is an important component in many Chinese prescription formulas for aging-associated diseases, such as Alzheimer’s disease (AD), Parkinson’s disease (PD) and other neurodegenerative diseases (Luo et al.2004).

The claim that pyrola was included in Shen Nong Ben Cao Jing (ca 100 A.D.) has been made in several reports, but others indicate the first textual reference was actually Ben Cao Gang Mu (ca 1600 A.D.) or Dian Nan Ben Cao (Materia Medica of Southern Yunnan, ca 1450 A.D.) and then included in Ban Cao Gang Mu.

The herbs ingredients include iridoid glycosides and other phenolic glycosides, quinones, flavonoids, and ursolic acid. One of the highly studied constituents is chimaphilin (see chemical illustration, right), a naphthoquinone which arises as a breakdown from another naphthoquinone during the drying process, and this component may contribute the purplish color. Iridoid glycosides have been associated with reducing inflammation of autoimmune disorders, and naphthoquinones have been shown to have anti-pathogenic effects, inhibiting bacteria, viruses, and molds.

