

# SLIPPERY ELM

## *Ulmus rubra* Muhl.

### *Family*

Ulmaceae.

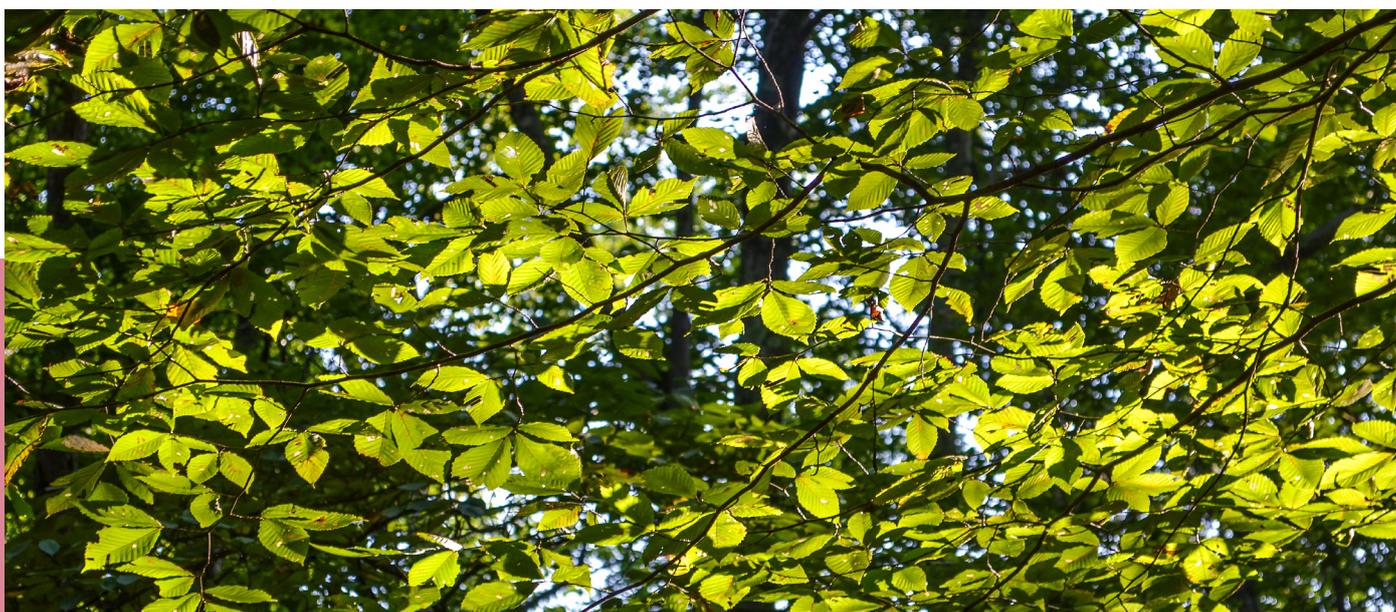
The synonyms are *Ulmus americana* var. *rubra* (Muhl.) Aiton, *Ulmus crispa* Willd., *Ulmus fulva* Michx., *Ulmus pendula* Willd., *Ulmus pubescens* Walter. Pennsylvania botanist Gotthilf Heinrich Ernst Muhlenberg named *Ulmus rubra* in 1793 and this is now accepted as the first formally published name. The slightly later name, and synonym, *Ulmus fulva*, published by French botanist André Michaux in 1803, has been used in much of the older literature and is still used today.<sup>1</sup>

### *Parts Used*

Inner bark.

### *Description*

Slippery elm is a large deciduous tree native to North America, and parts of Canada, but it has also been grown as a botanical specimen in public gardens in many countries. This graceful, arching tree can live to be 200 years old and is identified by its "slippery" inner bark.<sup>2</sup> It is also known as Indian elm, moose elm and red elm, due to the reddish-brown colour of its heartwood. The tree favours moist woodland environments. The leaves are rough and long, unequally toothed and covered with hairs on both sides. The leaves turn a typical golden colour in autumn. The tree commonly reaches 20 metres tall with a trunk diameter of around 50cm. The fruit is an oval winged samara, about 20mm long, which contains a single, central seed. The inner bark of a tree that is 10 years old is normally



recommended for medicinal use. In some cases, the overharvesting of the inner bark can kill the tree.<sup>3</sup>

### *Traditional Use*

No food or drug of today comes close to matching the place of honour that slippery elm held in 18th and 19th century America. The herb was the nation's leading home remedy for anything in need of soothing. An Eclectic physician Dr Beach reported the numerous uses by Native Americans and declared that "in point of utility, it is of far more value than its weight in gold". Its name refers to the slippery consistency the inner bark assumes when it is chewed or mixed with water. This property is responsible for the name used by the Iroquois Indians, do-hoosh-ah, which literally means "it slips." They used it as an eyewash for sore eyes. The Menomini Indians used the inner bark in a tea and it was taken as a purgative. It was used by the Menomini and the Meskwaki in a poultice to heal sores on the body. The fresh inner bark was boiled and the Dakota, Omaha-Ponca and other tribes drank the resulting decoction as a laxative. The indigenous people taught some of these uses to early non-Indian settlers. Native American women inserted slippery elm sticks to induce abortion and settler women adopted the practice which caused many deaths from uterine infection and haemorrhage. As a result, several state legislatures passed laws forbidding the sale of slippery elm bark in pieces longer than one and a half inches (3.8cm).<sup>4,5,6,7,8</sup>

Slippery elm has traditionally been used for a range of ailments, particularly in relation to the mucous membranes, digestive and urinary systems. The highly demulcent and soothing action of the mucilage was employed in the treatment of stomach ulcers, pain, reflux, diarrhoea and colitis. Slippery elm was also used for coughs and sore throats, having a soothing, antitussive and reflex demulcent action. The reflex action of the mucilage on the mucous membranes of the genitourinary tract meant the herb was also useful in cases of cystitis and bladder irritation. Topical applications of the powdered inner bark were traditionally used to help heal and soothe skin ulcers, burns, wounds and boils. Slippery elm was used, to much benefit, for gangrenous wounds as an excellent antiseptic

poultice. It gained a reputation as an effective wound healer among soldiers during the American Civil War. The herb also has a bulk laxative action and was valuable in providing nutrition during convalescence. Slippery elm is an ingredient of Essiac, a herbal formula popularised by a Canadian nurse, Rene Caisse, in the early 1920s and used ever since to assist cancer patients. While anecdotal reports suggest that this combination formulation has anticancer activity, reliable clinical trials are lacking that prove or disprove this use. Slippery elm was taken before festivities to avoid "hangover" and before travelling to avoid travel sickness. It was also used during convalescence, such as cachexia (wasting syndrome) and other wasting diseases such as cancer, to increase body weight. It has been used for vaginitis and the vaginal mucosal membranes by coating some of the powder on a tampon and inserting into the vagina.<sup>9,10,11,12</sup>

### *Constituents*

Slippery elm is best known for its abundant mucilage consisting of hexoses, pentoses, methylpentoses, at least two polyuronides, and yielding on hydrolysis galactose, glucose and fructose (trace), L-rhamnose, galacturonic acid and D-galactose. The inner bark also contains calcium oxalate, phytosterols (beta-sitosterol, citrostadienol, dolichol), sesquiterpenes, cholesterol and small amounts of tannin (3.0-6.5% type unspecified). It also contains a variety of nutritional factors such as iron, vitamin C, thiamine, zinc, magnesium and potassium, providing support for its traditional use as a nutritious gruel.<sup>13,14,15,16</sup>

### *Actions*

Demulcent, emollient, nutritive, antitussive, anti-inflammatory, antioxidant, diuretic, expectorant, astringent.

### *Pharmacological Activity*

There is a lack of information on the pharmacological properties of slippery elm and scientific studies are lacking, so much of the information is based on traditional uses and what is known about key constituents found within the herb. Mucilage is the principal constituent

of slippery elm. Mucilages are known to have demulcent, emollient and antitussive properties. Mucilage forms a soothing and protective layer over inflamed mucous membranes. Tannins, also found in slippery elm, are known to possess astringent and antimicrobial properties so they can help to detoxify the gastrointestinal tract and act as an antiseptic in wound treatment by killing harmful bacteria.<sup>17,18</sup>

### Digestive Activity

The effects and tolerability of two different herbal formulations in treating Irritable Bowel Syndrome (IBS) were examined in a 2010 Australian study by Jason Hawrelak, PhD, BNat of Gould's Naturopathica in Hobart and the School of Health & Human Sciences, Southern Cross University in New South Wales (NSW), and Stephen Myers, PhD, BMed, ND also of the School of Health & Human Sciences, Southern Cross University and NatMed-Research, Southern Cross University. This was a two-arm, open-label, uncontrolled pilot study and patients were recruited from the greater Lismore area (NSW) in 2001. The herbal formulations were designed to treat either a diarrhoea predominant or a constipation predominant IBS. The study involved 31 patients who fulfilled the Rome II criteria for IBS with 21 patients classified as suffering from diarrhoea-predominant IBS and 10 patients with constipation-predominant IBS. The herbal formulas consisted of a mixture of dried, powdered bilberry fruit, slippery elm bark, agrimony aerial parts and cinnamon quills for diarrhoea predominant IBS, and a mixture of dried powdered slippery elm bark, lactulose, oat bran and liquorice root for constipation dominant. The aim of each formula was to normalise stool frequency and stool consistency. Results showed that while the diarrhoea formula was not effective in improving bowel habit it did significantly improve a number of IBS symptoms such as pain, flatulence and bloating. The constipation formula was shown to significantly improve both bowel habit and IBS symptoms in patients. Both formulas were well-tolerated.<sup>19</sup>

Slippery elm was shown to have mid- to high-level validity for its ethnoveterinary (the scientific term for traditional animal health care) use in animal stomach treatment a Canadian study has shown. It documented the medicinal plants used to treat endoparasites and stomach problems in dogs, cats and pigs in British Columbia. Ethnoveterinary data

was collected over a six month period in 2003. The majority of the information on pets came from two naturopaths, 10 herbalists, five dog trainers, breeders and pet shop owners, nine holistic veterinarians and six of 27 organic farmers. Two pig farmers joined the study in the final stages.<sup>20</sup>

### Antioxidant Activity

The antioxidant activity in slippery elm may explain the mechanism by which it contributes to the anecdotal anticancer effects of Essiac formula. Essiac, a tea reportedly developed by the Ojibwa tribe of Canada and widely publicised as a cancer treatment, is prepared from a mixture of four herbs: slippery elm, *Arctium lappa* (burdock root), *Rumex acetosella* (sheep's sorrel) and *Rheum officinale* (rhubarb). Each of these herbs has been reported to possess antioxidant and anticancer activity. Essiac itself has also been reported to demonstrate anticancer activity *in vitro*, although its effects *in vivo* are still a matter of debate. An extract of Essiac tea was prepared from a concentration of 25mg/mL and boiled for 10 minutes. From this preparation concentrations of 5, 10, 25 and 50% were used to measure Essiac effects. The effects of Essiac on free radical scavenging and DNA damage were examined in a non-cellular system, as well as the effects Essiac on lipid peroxidation. Essiac effectively scavenged hydroxyl, up to 84% reduction in radical signal at the 50% tea preparation concentration, and superoxide radicals, up to 82% reduction in radical signal also at the 50% tea preparation concentration, as well as prevented hydroxyl radical-induced DNA damage. In addition, Essiac inhibited hydroxyl radical-induced lipid peroxidation by up to 50% at the 50% tea preparation concentration. This indicates that Essiac tea possesses potent antioxidant and DNA-protective activity, properties that are common to natural anticancer agents. This study may help to explain the mechanisms behind the reported anticancer effects of Essiac.<sup>21</sup>

Slippery elm was found to have dose-dependent peroxy-nitrite-scavenging actions in a Korean study. Peroxy-nitrite is a cytotoxicant with strong oxidizing properties toward various cellular constituents, including sulphhydryls, lipids, amino acids and nucleotides and can cause cell death, lipid peroxidation, carcinogenesis and aging.<sup>22</sup>

Slippery elm merits formal evaluation as a novel therapy in inflammatory bowel disease following an *in vitro* study assessing the antioxidant effects of herbal remedies in cell-free oxidant-generating systems and inflamed human colorectal biopsies. Reactive oxygen metabolites (ROM) are present in excess in inflamed colonic mucosa and are likely to play a pathogenic role in inflammatory bowel disease. Novel drugs or therapies for inflammatory bowel disease that have antioxidant activity may be useful clinically. Slippery elm, dose-dependently, was found to be a superoxide and peroxy radical scavenger. Oxygen radical release from biopsies was reduced after incubation in slippery elm.<sup>23</sup>

### *Indications*

- Gastritis, gastric reflux, dyspepsia and gastric or duodenal ulcers
- Irritable and inflammatory bowel diseases such as Crohn's disease
- Colitis, diarrhoea and constipation
- Upper and lower respiratory complaints including bronchitis and throat inflammation
- Convalescence as a nutrient supplement
- Externally it is applied as a poultice for wounds, boils, burns, abscesses and ulcers

### *Energetics*

Moistening, neutral.

### *Use in Pregnancy*

It is likely to be safe but safety is still to be established.<sup>24</sup>

### *Drug Interactions*

Although there are no controlled studies available, theoretically, the herb should be taken away from medications as the mucilage effects on the digestive tract may impede absorption. Separate doses by two hours.<sup>25</sup>

### *Contraindications*

None known.

### *Administration and Dosage*

Liquid Extract:	1:1
Alcohol:	60%
Weekly Dosage: <sup>26</sup>	40 to 80mL

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