Hops *(Humulus lupulus) strobiles*

Common Indications:

- Sedative; helps promote sleep
- Anxiety
- Phytoestrogen; may be useful in hormonal imbalances such as menopause or PMS

General Comments:

Hops have been used since the Roman times in brewing and as a traditional nerve and sedative tonic. Hops are stated to possess sedative, hypnotic, antispasmodic and topical bactericidal properties. Traditional uses of hops include neuralgia, insomnia, excitability, topically for skin ulcerations and primarily for restlessness associated with nervous tension.

Benefits & Mechanism of Action:

Sedative/Anxiety

The sedative effect of hops is not fully understood. Early research demonstrating the sedative action of hops in laboratory animals produced conflicting results. Human studies of the sedative action generally refer to hops being used in combinations with one or more additional herbs. In laboratory studies, hops have been reported to increase the sleeping time induced by pentobarbital. Hops were reported to improve sleep disturbances when given in combination with other sedative herbs such as valerian root and passionflower. The constituent 2-methyl-3-buten-2-ol was found to have a central nervous system depressant activity when given intraperitoneally in laboratory animals at high dosages. Even though only a small amount of this compound is usually present in hops products, it is formed *in vivo* through metabolism of the α-bitter acids humulone and lupulone, which may explain the sedative action of hops.[1-3]

Menopause/PMS

Hops have also been reported to have a mild estrogenic activity, but the research has conflicting evidence. However, a recent study reported estrogenic activity of a hops extract by sensitive *in vitro* bioassays reflecting binding to estrogenic receptors. The compound with an affinity for

estrogen receptors (isolated from rat uteri) was 8- prenylnaringenin. This phytoestrogen can also be detected in beer, but the levels are low and should not cause the physiological changes associated with estrogen receptor binding.[4-8]

Anticancer

Lupulone, a β-acid derived from hop extracts has been shown to exhibit antibacterial and anticancer activity. Screening of natural and new lupulone derivatives for their anticancer activity demonstrated that one (lupulone derivative 1h) displayed stronger anticancer activity than lupulone itself on PC3 and DU145 prostate cancer cells. Lupulone derivatives induced caspase-dependent apoptosis that is associated with activation of caspases 8, 9, and 3. Furthermore, caspase 8 inhibitor Z-IETD-fmk reduced cell death induced by lupulone derivatives, suggesting that apoptosis is mediated by caspase 8. Lupulone and its synthetic derivatives also increased formation of LC3II suggesting that autophagy is also implicated in prostate cancer cell death. The new lupulone derivatives induce caspase-dependent apoptosis and autophagy in prostate cancer cells and appear to be good candidates for further preclinical studies of prostate cancer treatment.[10-13]

Dose:

100mg, 2 times a day as needed of a standardized product.

Cautions & Side Effects

- Hops supplements should be standardized to contain 5.2% bitter acids and 4% flavonoids.
- Hops have been reported to be safe in recommended doses.
- Hops may cause drowsiness. Caution should be use if operating heavy machinery or an automobile and/or if taking medications that can cause drowsiness.

References:

Sedative/Anxiety

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Menopause/PMS

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Anti-inflammatory

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Anticancer

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