



Research Progress on Medicinal Plants of the Pleurospermum of Apiaceae

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Abstract

According to the "Flora of China", there are 39 species of Pleurospermum in the Apiaceae family distributed in China. The commonly used medicinal plants of the genus Pleurospermum in traditional medicine include Pleurospermum yajiangensis, Pleurospermum tibetum, Pleurospermum tianshanense, Pleurospermum melitensis, etc. This paper reviews the current research status of the chemical components and pharmacological effects of medicinal plants of the genus Pleurospermum in the Apiaceae family through domestic and foreign literature, so as to provide a theoretical basis for the development of medicinal plants of the genus Pleurospermum in the Apiaceae family.

Keywords

Apiaceae; Pleurospermum; Medicinal plants; Research progress; Traditional Mongolian Medicine

There are about 40 species of Pleurospermum plants in the world, mainly distributed in central Asia and eastern Europe, especially in the Himalayas. According to the Flora of China, there are 39 species distributed in China, including 22 species of It is a unique species, mainly distributed in the Hengduan Mountains in the southwest, with a few species distributed in the northwest and northeast regions, accounting for about 80% of the world's total species [1]. Species commonly used in traditional medicine include Yajiang lanceolate, Tibet lanceolate, Tianshan There are more than ten species of celery, celery with heart leaves, etc. This genus has diverse species and rich resources in China, but most of them are still unknown for their uses, and there is a broad space for research on potential medicinal value. Literature review on the research status of medicinal plants of the genus Apium.

Tibetan celery (*Pleurospermum hookeri* var. *thomsonii* C. B. Clarke), the Tibetan medicine name is "Jia Wa", the medicinal part is the dried root and rhizome, and it is an important component of the formula preparations commonly used in Tibetan medicine such as 25-flavor ercha pills, five-root powder and six-flavor wolfberry syrup. "Jingzhu Materia Medica" records that this product often has the fragrance of sandalwood, musk and borneol. There is no poison or snake in the place where this product grows. It can treat poisoning and fever like borneol. Whether it is a decoction, broth or juice, it can detoxify gemstone poison, egg poison, hair poison, syphilis, etc., with unexpected effects. There is no disease that this medicine cannot treat [2]. The main chemical components of Tibetan celery are ferulic acid, licorice chalcone A, chuanxiongpirin, isoliquiritigenin, lauric anhydride, etc. According to the GC-MS-DS system analysis, the volatile oil components of Tibetan celery are palmitic acid (24.8%), linoleic acid (9.2%), ligustilide (1.8%), n-butenyl lactone (2.5%), mentha dialdehyde (3.0%), 4,7-dimethoxy-5-(2-propenyl)-1-3-benzodioxole (5.6%), decanoic acid (3.7%) and other compounds [3]. Pharmacological studies have found that the water

extract and alcohol extract of Tibetan celery have good anti-inflammatory effects. The hot plate method and acetic acid writhing test have been observed to have significant analgesic effects [4]. Celery is one of the ingredients of the Tibetan medicine tonic Basangmu butter pills, which has a tonic effect, strengthening the body or nourishing the blood; the Tibetan medicine Wugensan containing celery promotes the proliferation of bone marrow mesenchymal stem cells (MSCs); Tibetan medicine believes that celery can treat rheumatoid arthritis and can be soaked in highland barley wine to make medicinal wine [5]. Research reports on celery are limited to reports on chemical components and anti-inflammatory effects. Further research is needed on the pharmacological effects of active ingredients and their mechanisms of action.

Pleurospermum lindleyanum mainly contains coumarin compounds, flavonoid compounds, phytol, fatty acid esters, volatile oils, etc. Tan Junjie et al. [6] isolated 6,7-dihydroxycoumarin, (+)-marmesin, marmesinin, 5,7,4'-trihydroxyflavone, kaempferol 3-O- α -L-pyranorhamnoside, luteolin 3'-O- β -D-pyranoglucoside, (R)-6-hydroxy-3-(2-hydroxypropan-2-yl)-6-methylcyclohex-2-enone, 4-hydroxybenzoic acid, 3-methoxy-4-hydroxybenzoic acid, -methoxy - 4,5-methylenedioxybenzoic acid, methyl syringate and other compounds from *Pleurospermum lindleyanum*. Chen Jie [7] et al. isolated six coumarin compounds from the ethanol extract of the aerial part of *Herba Lycopersici*, five of which are furanocoumarins (bergamot lactone, isoimperatorin, isoimperatorin lactone, oxyimperatorin lactone, saxalin), scopolamine and β -sitosterol. Kim Jin-Eun [8] et al. found that the coumarin components of *Herba Lycopersici* may enhance the therapeutic effect of 5-FU on liver cancer cells, and its mechanism of action may be through synergistically blocking the G1 phase of the cell cycle and inducing cell apoptosis. This suggests that *Herba Lycopersici* contains anticancer active ingredients, and other active ingredients and their mechanisms need to be further studied.

Increased NAG-1 expression was detected in HT-29 cells treated with *Pleurospermum kamschaticum* Hoffm. In an in vivo study, intraperitoneal injection of fenugreek inhibited the formation of tumor nodules in the lungs of mice. These results suggest that celeriac can be used as a beneficial supplement in the treatment and prevention of colon cancer [9]. Eleven new triterpene saponin compounds and 14 known triterpene saponins were screened from the methanol extract of *C. elegans*. These new compounds were found to be effective against four human tumor cell lines through the radishine B bioassay (SRB). (A549, SKOV-3, skmel2, HCT15) have no obvious cytotoxicity ($IC_{50} > 30 \mu M$) [10]. Studies have found that buddlejasaponin IV can significantly inhibit hypercholesterolemia and hyperlipidemia through external and internal inducers, and its effect is equivalent to probucol. The traditional treatment of atherosclerosis is celery and its active buddleia saponin IV, which can be used to treat hypercholesterolemia or hyperlipidemia [11]. buddlejasaponin IV significantly inhibited the production of nitric oxide (NO) and significantly reduced the release of prostaglandin E2 and tumor necrosis factor α in lipopolysaccharide (LPS)-activated macrophages Raw 264.7, whereas the activity of buddlejasaponin IV was much lower [12]. Through research, it was found that buddlejasaponin IV can be considered as an excellent candidate drug for chemopreventive drugs to block the progression of HPV-induced oral mucosal cancer [13]. This reminds us that *Buddleja* saponin IV has a good anti-cancer effect, and its component buddlejasaponin IV has potential anti-cancer effect.

Pleurospermum amabile Craib ex WW Smith is a traditional medicinal plant in Bhutan, used to treat symptoms such as indigestion, poisoning and fever. Phurpa Wangchuk et al. [14] isolated 10 chemical components from *Pleurospermum amabile* Craib, among which oxypeucedanin methanolate had weak antibacterial activity against *Bacillus subtilis* and the best antimalarial activity against *Plasmodium falciparum* strains and K1CB1 (multidrug resistant). The results of Phurpa Wangchuk et al. [15] showed that *Pleurospermum amabile* Craib exhibited good TNF- α inhibition activity and had good anti-inflammatory effects. This suggests that the drug has good antibacterial, anti-inflammatory and antimalarial effects, and its mechanism of action needs to be further studied.

Pleurospermum astringens is the root and whole plant of the Umbelliferae plant *Pleurospermum astringens* [16]. The name of Mongolian medicine is Jiga Ritu Ebu Su, and its synonyms are Sad, Gu Tubu, Hadan Qi Guri, etc. It has the functions of clearing away heat and detoxifying, treating poisoning and old fever, and can warm the body, transform food, stop vaginal discharge, etc. effect. It is mainly used for symptoms such as stomach cold, abdominal pain, bloating, inability to eat, leucorrhea and other symptoms. According to the monograph "Xilingol Grassland Medicine Interpretation Code" by Mr. Ao Debilig, Mongolian medicine folk use Yajiang celery instead of musk [17]. Some traditional Mongolian medicine clinics in Xilinhot City use Yajiang Lingziqin instead of musk, which has good anti-inflammatory, antibacterial and other clinical effects. Through literature search, it was found that no relevant research on the chemical composition, pharmacological activity and mechanism of *C. elegans* has been reported at home and abroad.

To sum up, the medicinal plants of the genus Apiaceae mainly contain coumarins, flavonoids, fatty acid esters, volatile oils, terpenes, saponins and other chemical components. Different species have different activities. substance. Traditional medicinal plants of the genus *Erythium* have significant anti-inflammatory, anti-atherosclerotic, anti-tumor, anti-malarial and antibacterial effects. Through literature search, it was found that medicinal plants of the genus *Erythium* have high research value. The research on the traditional medicinal plants of the genus *Erythium* has insufficient research on chemical composition, pharmacological effects and mechanisms, and is not in-depth enough, and there is insufficient research on the mechanism of clinical application. etc. questions. In particular, there are no relevant research reports on the authentic medicinal material of Xilingol League, Yajiang Leziqin, and systematic research is needed from aspects such as quality standards, chemical composition, pharmacological effects, and planting development. If it can be used rationally, it will bring significant benefits to human health and social development.

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