

Modern Research and Application of *Lobelia chinensis* Lour

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Abstract. Objective: Induction of modern research and clinical application of *Lobelia chinensis* Lour, it provides support for clinical safety application of *Lobelia chinensis* Lour. Methods: Inductive and summary of the literature, summed up the chemical composition, pharmacological effects and clinical application characteristics of *Lobelia*. Results: *Lobelia chinensis* Lour mainly contains alkaloids and polysaccharides. It have pharmacological effects such as anti-tumor, anti-oxidation, anti-bacteria, anti-venom. Conclusion: The chemical composition and pharmacological action of *Lobelia chinensis* Lour are relatively clear. However, there is a lack of basic material research on polysaccharides, coumarins and pharmacological effects. Its anti-tumor and anti-bacterial value need to be further explored.

Introduction

Lobelia chinensis Lour is the dried whole grass of *Lobelia chinensis* Lour platycodon. Alias half-flower, urgent cable, parsnip, thin rice grass, half-chrysanthemum and so on. Its taste is acrid, flat, centring, small intestine, lung meridian. First published in Dian Nan Ben Cao, "The main treatment of blood hemorrhoids, hemorrhoids. And everything. The branches and leaves boil water, wash various toxic sores, ringworm, its effect as god" [1]. In the current study, the medicinal value of *Lobelia chinensis* Lour has been further expanded, but there are still many deficiencies. The purpose of this paper is to summarize the chemical composition, pharmacological action, clinical application and application of Chinese patent medicine preparation of the *Lobelia chinensis* Lour, to provide reference for rational drug use, to provide ideas for the development of new drugs, and further expand the use value of *Lobelia chinensis* Lour.

Research Overview of *Lobelia chinensis* Lour by CNKI

Research Overview of Chemical Constituents of *Lobelia chinensis* Lour by CNKI

From 2000 to 2018, 30 literatures on the chemical composition of *Lobelia chinensis* Lour were included. It mainly contains alkaloids, flavonoids, coumarins and polysaccharides.

Alkaloids

Alkaloids are the main active components of *Lobelia chinensis* Lour. For example, New mountain stem alkaloid B, New mountain terrier alkaloid A, mountain terrier vegetables base, Lobelanidine, Lobelanine, Lobelite A, Lobelite B, *Lobelia set,8-ethyl-10-phenylisothione*, Kuo et al. also found a new alkaloid structure, named lobechine[2-3].

Flavonoids

The flavonoids in *Lobelia chinensis* Lour are also one of its main active ingredients. So far, there are 25 kinds of flavonoids isolated from *Lobelia chinensis* Lour. For example, 3'-hydroxy genkwanin, Mignonette, Diflavone of *taxus cuspidate*, Pomelo peel, hesperidin, Celery, Agaric lignin, Poplar flavonoids, hesperidin, Receive flowers glycosides, Bay leaf wood glycosides, Salicin, kaempferol [4-8].

Coumarin

The main coumarin compounds in the *Lobelia chinensis* Lour *sinensis* are: 5, 7-dimethoxycoumarin [6], 5-hydroxyl-6, 7-dimethoxycoumarin [4], 6-hydroxyl-7-methoxycoumarin [11], 5, 7-dimethoxyl-8-hydroxycoumarin [7].

Overview of Studies on the Pharmacological Action of *Lobelia Chinensis* Lour in CNKI

In 53 papers on the pharmacological action of the *Lobelia chinensis* Lour, There were 22 references on the pharmacological action of alkaloids in *Lobelia chinensis* Lour alkaloid, accounting for 41.6%. There were 15 studies on the pharmacological effects of *Lobelia chinensis* Lour Water decoction, accounting for 28.3%. 5 pieces of studies on the pharmacological effects of compound preparation containing *Lobelia chinensis* Lour, accounting for 9.4%; Three studies on the pharmacological effect of compound *Lobelia chinensis* Lour injection, accounting for 5.7%; Two studies on the pharmacological effects of *Lobelia chinensis* Lour flavonoids, accounting for 3.8%. There were 6 studies on other forms of pharmacological action of *Lobelia chinensis* Lour, it includes ethanol extract of *Lobelia chinensis* Lour, *Lobelia chinensis* Lour, *Lobelia chinensis* Lour powder, and *Lobelia chinensis* Lour alcohol ether extract.

In addition, a total of 18 pharmacological actions of *Lobelia chinensis* Lour were reported in the 53 references. There are 13 references to inhibition of cancer cells, examples: Hela cells, myeloma cells U266, bladder cancer T24 cells, liver cancer cells smmc-7721, liver cancer H22, etc, accounting for 22.8%. There were 12 references to inhibit vascular remodeling, accounting for 21.1%. There were 10 references for bacteria inhibition, examples: *Escherichia coli*, *Staphylococcus aureus*, *Micrococcus luteus*, *Salmonella*, *Pseudomonas aeruginosa*, etc. accounting for 17.5%. There were 5 references on protecting vascular cells, accounting for 8.8%. Other pharmacological effects, such as anti-inflammation, anti-oxidation, anti-venom, protection of liver, protection of nerve cells, against myocardial ischemia reperfusion, inhibition of alpha-Glucosidase, treatment of diarrhea, inhibition of leukemia cells, and anti-virus, were 10, accounting for 17.5%.

Pharmacological Action

Inhibiting Tumor. It is reported that the inhibition effect of *Lobelia chinensis* Lour alkaloid on Hela cells was stronger than that of ethanol extract of *Lobelia chinensis* Lour at the same concentration of administration [2]. Therefore, it can be judged that *Lobelia chinensis* Lour has anti-tumor effect, and the material basis for its pharmacological effect is the alkaloid composition of *Lobelia chinensis* Lour alkaloid.

Bacteria Inhibition. *Lobelia chinensis* Lour has good inhibiting bacteria effects on *Escherichia coli*, *Staphylococcus aureus*, *Micrococcus luteus*, *Salmonella*, *Pseudomonas aeruginosa*, etc. [9]. The inhibitory effect of *Lobelia chinensis* Lour flavonoids on G- was stronger than that of G+ [10].

Anti-venom. *Lobelia chinensis* Lour dissolve to CMC Na in the solution, to normal mice to fill the stomach, then injected with the venom of a five-footed snake, to build a model of damage caused by the venom of a five-footed snake, the results in mice fed *Lobelia chinensis* Lour mortality was 30%, significantly lower than the mice without the *Lobelia chinensis* Lour mortality rate (50%), which tells us *Lobelia chinensis* Lour - with the role of snake venom.

Overview of Clinical Application of *Lobelia Chinensis* Lour in CNKI

In 113 references to clinical use, there were 12 references for the treatment of liver diseases, accounting for 10.6%. There were 15 references related to respiratory tract, accounting for 13.3%. There were 6 references related to kidney, accounting for 5.3%. There were 6 references related to stomach diseases, accounting for 6.2%. There were 9 references related to lung diseases, accounting for 8.0%. There were 6 references for the treatment of snake bite, accounting for 14.2%. There were 65 treatments for the above 6 diseases, accounting for 57.5%. There were 48 references on the treatment of diarrhea, urinary tract infection, cancerous pain, fever, ovarian cyst, leukemia, phlebitis, and paronychia, accounting for 42.5%.

Clinical Application

Infantile laryngitis. Treatment of infective laryngitis in children by compound *Lobelia chinensis* lour injection combined with pulmicort spray inhalation was compared with pulmicort spray inhalation alone, the combined treatment significantly shortened the disappearance time of symptoms such as barking cough, inhaled laryngeal singing and hoarseness in children [11].

Pneumonia. Treatment of acute bronchial pneumonia in children with compound *Lobelia chinensis* lour injection retention enema, Among the 100 patients, 61 patients were effective, 31 patients were improved, and 8 patients were not effective, with a total effective rate of 92%[12].Treatment of asthmatic pneumonia in children by compound *Lobelia chinensis* lour injection atomization inhalation,63 cases were observed, 47 cases showed obvious effect, 13 cases were effective, 3 cases were ineffective, and the total effective rate was 95.2%[13].The treatment effect of compound *Lobelia chinensis* lour injection atomization inhalation for children with asthmatic pneumonia was obviously better than that of the control group[14].

Application Status Analysis of the Preparation Containing *Lobelia Chinensis* Lour

There are 12 kinds of Chinese patent medicines containing half lotus in the 2015 edition of China pharmacopoeia and the drug standard of the ministry of health of the People's Republic of China. For example: Zhonghuadiedawan, zhonghuadiedajiu, shenzhoudiedawan, jingwanhongruangan, jingwanhongzhichuanggao, luoshuganjiaonang, luoshuganpian, chansuzhentonggao, erdingchongji, qimensheyaopian, yunnansheyaopian, zhanjiangsheyaopian. There are 8 kinds of internal or external use, 3 kinds of external use, 1 kind can be internal or external use. Four of the 12 Chinese patent medicine preparations were used to treat bruising injuries. Consistent with the analgesic and anti-inflammatory effects of *Lobelia chinensis* lour. There are 3 kinds of Chinese patent medicine used for the treatment of snake venom, which is consistent with the anti-venom effect of *Lobelia chinensis* lour. Although *Lobelia chinensis* lour is an antipyretic and antipyretic, it has the effect of antipyretic detoxification and diuretic detumescence.

Discuss

Lobelia chinensis lour is a commonly used heat clearing drug in clinic. Based on literature mining, the study on the pharmacological effect of *Lobelia chinensis* lour was only 14.1% of all references, and only 52 references were summarized, which had a strong effect on inhibiting tumor cells, inhibiting bacteria and inhibiting vascular remodeling. *Lobelia chinensis* lour relatively large proportion in clinical application, accounted for 30.7% of all literature, after a summary of 113 articles were reported by Outlines *Lobelia chinensis* lour in clinic for more bite and the treatment of snake venom, respiratory diseases, liver, kidney, lung diseases, such as acute nephritis, liver cirrhosis, herpes zoster, tracheitis, mumps, etc.

It is also a commonly used clinical Chinese medicine against cancer, used to treat liver cancer, lung cancer, stomach cancer, esophageal cancer, cervical cancer, breast cancer, and can be applied to treat cancer. In addition, a substance derived from *Lobelia chinensis* lour has a significant inhibitory effect on the migration activity of peripheral vascular fibroblasts in the basilar artery of hypertensive rats, and can reduce the expression of et-1 protein and et-1 mRNA. Therefore, it is of great significance in the prevention and treatment of hypertension-induced cerebral vascular remodeling.

However, there are few studies on the chemical composition, pharmacological action and clinical application of *Lobelia chinensis* lour at present. In addition, Polysaccharides in *Lobelia chinensis* lour content in *Lobelia chinensis* lour is high. At present, only about 12 kinds of Chinese patent medicine preparations containing *Lobelia chinensis* lour are commonly used in clinical practice, but the anti-tumor and anti-bacterial effects of *Lobelia chinensis* lour are not fully utilized in theoretical studies.

In the future research, we should devote ourselves to the study of the physical basis of the *Lobelia chinensis* lour, explore *Lobelia chinensis* lour new pharmacological effects, the

development of new antitumor, bacteriostasis of proprietary Chinese medicine, enrich the existing *Lobelia chinensis* four proprietary Chinese medicine varieties, to explore the pharmacological effects. Of *Lobelia chinensis* four polysaccharide at the same time based on the role of the antioxidant *Lobelia chinensis* four, *Lobelia chinensis* four can be as a new natural antioxidant.

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