Drug Status Report

Drug: Niu Huang Jie Du Pian

Drug Name Status: Niu Huang Jie Du Pian is the brand name.

Other names: Cholinex; Cow-Bezoar Detoxicating Tablet

Niu Huang Jie Du Pian (http://www.maxnature.com/chnjipishtrc.html) is a herbal supplement that is used in traditional Chinese medicine (TCM) for clearing away heat and toxic materials. The herbal supplement contains the following ingredients:

Rhubarb root (Radix et Rhizoma Rhei), Scutellaria root (Radix Scutellariae), Lonicera flower (Lonicera japonica), Coptis rhizome (Coptis chinensis), Gardenia fruit (Gardenia jasminoides), Angelica root (Angelica sinensis), Mentha herb (Mentha haplocalyx) and Ligusticum rhizome (Ligusticum sinensis).

Rhubarb root, also known as *Radix et Rhizoma Rhei*, is widely used in TCM for treating conditions such as sinus infections, lung infections, nose bleeds and eye infections[1] and has also been shown to be effective in the treatment of diabetes[2]. Emodin and rhein are two well-characterised anthraquinone derivatives which have been identified as the major bioactive components in *Radix et Rhizoma Rhei,* and produce a variety of pharmacological effects including anti-viral[3], anti-cancer[4], anti-inflammatory and antiseptic effects[5]. Emodin and rhein are not listed in the CDSA and are not structurally similar to any of the compounds listed in the Schedules to the CDSA.

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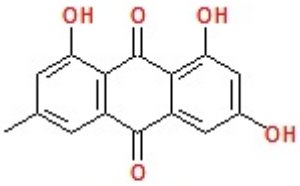
[1] http://findarticles.com/p/articles/mi_g2603/is_0006/ai_2603000630/

[2] Choi, SB. *et al*. (2006) Insulin sensitising and alpha-glucoamylase inhibitory action of sennosides, rheins and rhaponticin in Rhei Rhizoma, Life Sci. **78**:934-42.

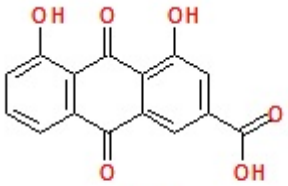
[3] Ho, TY. *et al*. (2007) Emodin blocks the SARS coronavirus spike protein and angiotensin-converting enzyme 2 interaction, Antiviral Res. **74**:92-101.

[4] Lin, ML. *et al*. (2007) Rhein induces apoptosis through induction of endoplasmic reticulum stress and Ca^{2+}-dependent mitochondrial death pathway in human masopharyngeal carcinoma cells. Anticancer Res. **27**:313-322.

[5] Liu, X. *et al*. (2009) Targeting CpG DNA to screen and isolate anti-sepsis fraction and monomers from traditional Chinese herbs using affinity biosensor technology, Int. Immunopharmacol. **9**:1021-1031.

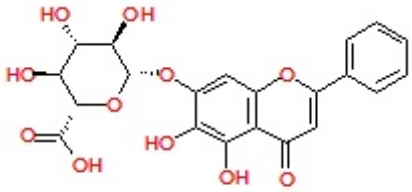


Emodin
(1,3,8-trihydroxy-6-methyl-anthracene-9,10-dione)



Rhein
(4,5-dihydroxy-9,10-dioxo-anthracene-2-carboxylic acid)

Scuterllaria root (*Radix Scutellariae*), specifically the root of *Scutellaria Baicalensis* Georgi, has traditionally been used in TCM to treat infections and enteric diseases such as diarrhea and dysentery[6]. Various flavanones have been identified in the root of *Scutellaria Baicalensis* Georgi and are believed to possess anti-inflammatory, anti-tumour, anti-viral and antioxidant properties[7]. However, the pharmacological effects of *Scutellaria Bacialensis* Georgi have mainly been ascribed to the flavanone baicalin[8]. Baicalin is not listed specifically in the CDSA and is not structurally similar to any of the substances in the Schedules to the CDSA.



Baicalin
7-D-Glucuronic acid-5,6-dihydroxyflavone

Lonicera flower, more commonly known as the Japanese Honeysuckle flower (*Flos Lonicera japonica*), is a plant that is native to Asian countries such as Japan, China, Korea and Taiwan. The Japanese Honeysuckle flower has been shown to display anti-pyretic, antibacterial and mild anti-inflammatory properties[9,10] and has been used in TCM for the treatment of headaches, fever and sore throat.

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[6]http://www.healthphone.com/consump_english/encyclopedia/chinese_herbal_files/scutellaria_root.htm

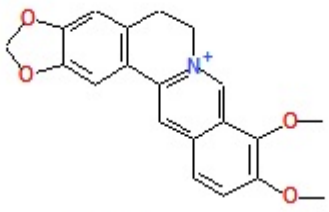
[7]Horvath, CR. *et al*. (2005) Identification and quantification of eight flavones in the root and shoot tissues of the medicinal plant Huang-qin (*Scutellaria baicalensis* Georgia) using high-performance liquid chromatography with diode array and mass spectrometric detection, J. Chromatogr. A. **1062**:199-207.

[8]Chang, Y. *et al*. (2007) Orthogonal array design for the optimization of supercritical fluid extraction of baicalin from root of Scutellaria bacicalensis Georgi, J. Sep. Sci. **30**:1568-1574.

[9]Lee, S. J. *et al.* (1998) Antiinflammatory effects of *Lonicera japonica*, Phytother. Res. **12**:445-447.

[10]Li, H-J. *et al*. (2003) Determination of five major iridoid glucosides in Flos Lonicerae by high-performance liquid chromatography coupled with evaporative light scattering detection. J. Chromatogr. A. **1008**:167-172.

Coptis rhizome (*Coptis chinensis*) has been used in traditional Chinese medicine for the treatment of diarrhea, dysentery and jaundice. Recently, berberine was identified as the bioactive compound in *Coptis chinensis* and shown to display a range of pharmacological effects including anxiolytic, anti-inflammatory and anti-cancer effects. The substance was also effective for lowering blood cholesterol, particularly low density lipoprotein (LDL) cholesterol[11]. Berberine is not listed specifically in the CDSA and is not structurally similar to any substances in the Schedules to the CDSA.



Berberine
9,10-Dimethoxy-2,3-(methylenedioxy)-7,8,13,13a-tetrahydroberbinium

Gardenia fruit is the fruit of *Gardenia jasminoides* Ellis and has been used historically in TCM for its antiphlogistic, analgesic, antipyretic and anti-oxidant properties. Recent studies have shown that a variety of iridoid glycosides and crocins as the bioactive components of *Gardenia jasminoides*[5-7].

Angelica root (*Angelica Sinensis*) is more commonly known as "dong quai" or "female ginseng" has been used in TCM for the treatment of gynecological conditions, fatigue, mild anaemia and high blood pressure for thousands of years[15]. It is believed to display anti-inflammatory, antispasmodic and sedative effects, with coumarins, phytosterols, polysaccharides, and flavonoids constituting its active ingredients. It is also used as an aphrodisiac.

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[11]Liu, B. *et al*. (2006) Extraction of berberine from rhizome of Coptis chinensis Franch using supercritical fluid extraction, J. Pharm. Biomed. Anal. **41**:1056-1060.

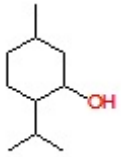
[12]Chen Y. *et al*. (2008) Antioxidant potentail of crocins and ethanol extracts of Gardenia jasminoides Ellis and Crocus stavius L.: A relationship investigation between antioxident activity and crocin contents, Food Chem. **109**:484-492.

[13]Chen, Y. *et al*. (2009) Crocin and geniposide profiles and radical scavenging activity of gardenia fruits (Gardenia jasminoides Ellis) from different cultivars and at the various stages of maturation, Fitoterapia, in press.

[14]Fu X-M. *et al*. (2008) Iridoid glycosides from Gardenia jasminoides Ellis, Helvetic Chimica Acta, **91**:646-653

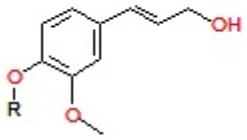
[15]http://www.umm.edu/altmed/articles/dong-quai-000238.htm

Mentha herb (*Mentha haplocalyx*) is a Chinese peppermint that is used in TCM to disperse heat in the treatment of skin conditions, fever, headache, sore throat and aches[16,17]. Menthol is an essential oil and one of the principal active ingredients in *Mentha haplocalyx* with anti-inflammatory, analgesic and anti-fungal properties. Menthol is not listed on the CDSA and is not structurally similar to any substances in the Schedules to the CDSA.

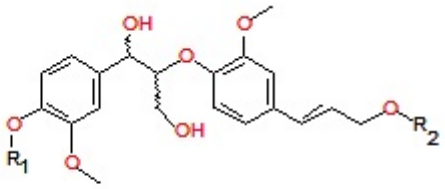


Menthol

Ligusticum rhizome (*Ligusticum Sinensis* OLIV.) is used in TCM for various medical conditions including headache, arthralgia and diarrhea, and has also been shown to demonstrate anti-cancer effects[18]. In recent studies, a number of ligusinenosides have been identified as the bioactive components in the rhizome of Ligusticum Sinensis OLIV[19]. These bioactive substances are not specifically listed in the CDSA and are not structurally similar to any substances in the Schedules to the CDSA.



Ligusinenoside A; R=Api(1->6)Glc



Ligusinenoside B; R_1=R_2=Glc
Ligusinenoside C; R_1=H; R_2=Api(1->6)Glc

Canadian Status: Niu Huang Jie Du Pian does not contain any substances listed on the schedules to the CDSA.

Recommendation: Niu Huang Jie Du Pian is not a controlled substance.

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[16]Lin, R. *et al*. (2002) Analysis of menthol in three traditional Chinese medicinal herbs and their compound formulation by GC-MS. Biomed. Chromatogr. **16**:229-233.

[17]Chan, B.C.L. *et al*. (2008) Traditional Chinese medicine for atopic eczema: PentaHerbs formula suppresses inflammatory mediators release from mast cells, J. Ethnopharmacol. **120**:85-91.

[18]Wu, C-Y. *et al.* (2006) Inhibition of melanogenesis in murine B16/F10 melanoma cells by Liguticum sinensis Oliv. Am. J. Chinese. Med. **34**:523-524.

[19]Ma, J-P. *et al.* (2007) Chemical constituents of Ligusticum sinensis OLIV. Helvetica Chimica Acta, **90**:158-162.

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