

Chinese Medicinal Plants with Antiviral Activities for Treatment of the Common Cold and Flu [†]

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Abstract: Traditional Chinese medicines (TCM) have been considered as an important source of curative remedy for many years, due to their potential chemical components which can promote health and prevent diseases. According to TCM, influenza is differentiated into 2 kinds, namely, wind-cold syndrome and wind-heat syndrome. Many traditional Chinese medicinal plants have been found to exert impacts against both cold and influenza viruses. This article included randomized control experiments, observational and analytical designs, and review articles which have been searched in Scopus, PubMed, and Google Scholar. The most important antiviral herbs for cold and flue are honey-suckle flowers (*Lonicera periclymenum* L.), thyme leaf (*Thymus vulgaris* L.), green chireta (*Andrographis paniculata* (Burm.f.) Wall. Ex Nees), Calendula (*Calendula officinalis* L.), and peppermints leaf and oil (*Mentha piperita* L.). The most notable expectorant herbs for cold and flu are snake root (*Ageratina altissima* (L.) R.King & H.Rob), tulsi (*Ocimum tenuiflorum* L.), licorice root (*Glycyrrhiza glabra* L.), slippery elm (*Ulmus rubra* Muhl) and marshmallow osha root (*Althea officinalis* L.), clove (*Syzygium aromaticum* (L.) Merr. & L.M.Perry), and sage leaf (*Salvia officinalis* L.). Immunostimulant herbs for cold and flu are eucalyptus (*Eucalyptus globulus* Labill), Echinacea root (*Echinacea purpurea* (L.) Moench), ginseng (*Panax ginseng* C.A. Mey), garlic (*Allium sativum* L.), marshmallow (*Althaea officinalis* L.), Isatis root (*Isatis tinctoria* L.), ginger root (*Zingiber officinale* Rose) and myrrh resin (*Commiphora myrrha* (T.Nees) Engl.). The most famous and practical herbal prescriptions from China are Jinchai, Rorrico, Ge Gen Decoction, Gegen Qinlian Decoction, Xin-Jia-Xiang-Ru-Yin, Yi-Zhi-Hao pellet, IMOD, and Arbidol combination. Traditional Chinese medicinal plants and herbs with antiviral activities and prescriptions which are common in China can be considered for prevention and treatment of influenza and cold.

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1. Introduction

China is the native home to a greater diversity of the world's medicinal plants and herbs than any other regions and countries in the world [1–5], and traditional Chinese medicine (TCM) consists of herbal medicine, massage, moxibustion, acupuncture, physical exercise and food therapy [6–10]. TCM is also an important part of the health care system in almost all Asian countries [11–15], which depends on natural products and components which have been playing a very important function in disease control and health protection for centuries [16–21]. Traditional Chinese herbal medicines also refer to health practices, knowledge, beliefs and approaches incorporating herbs and plants on the basis of both ancient, and modern pharmaceutical science in an organic life [21–34]. The aim of this review is to survey on common medicinal plants and herbs, especially

traditional Chinese medicines with antiviral characteristics for prevention and treatment of cold and flu. All relevant articles in English language of different scholars and researchers from different countries have been searched and collected.

2. Traditional Chinese Medicinal Plants with Anti-Viral Activities

Aloe barbadensis Mill. (Aloevera) belongs to family of Asphodelaceae which contains many important chemical ingredients such as emodin, aloe-emodin, barbaloin, isobarbaloin, and chrysophanic acid, and it also contains quinone components and aloe anthraquinones which have been reported to be active against human influenza [35–40]. *Andrographis paniculata* belongs to *Acanthaceae* which has the great potential to inhibit neuraminidase activity of H1N1, and can be used as an alternative medicinal therapy for swine flu-positive patients [41]. *Berberis vulgaris* has been used for flu, colds, fever, and respiratory tract infections [42], and *Clinacanthus siamensis* Bremek has notable amount of chemical components in its leaves, and the leaf extract has shown activity on influenza virus [43]. The extract of Echinacea (*Asteraceae*) has profound activity against many viruses such as human and avian influenza viruses, H1N1-type IV, H3N2-type IV, and reversed virus-induced proinflammatory responses [44–46], and *Epimedium koreanum* Nakai (*Berberidaceae*) is part of both Korean and traditional Chinese medicine which have significant positive activity against different influenza A subtypes by notable reduction in viral replication [47]. *Flos ioniceriae* (*Caprifoliaceae*) [48–51] and *Radix scutellariae* (*Lamiaceae*) have been used against influenza in different parts of China [52–55]. *Glycyrrhiza glabra* L. (Licorice) belongs to *Fabaceae*, and it is reported that Glycyrrhetic acid, is its major component, and it can be used as a lead compound for the development of potential anti-influenza virus agents [56]. *Camellia sinensis* L. Kuntze (Green tea) is the member of *Theaceae* which is most widely consumed as daily beverage in Asia, and also contains high concentrations of catechins such as epigallocatechin gallate with anti-influenza A virus activity; moreover green tea catechins effects on the pharyngeal mucosa is important character of the anti-influenza A virus activity of green tea extract [57–59]. *Isatidix radix* used against influenza viruses with various strains and subtypes, and in TCM, it has been prescribed for treating fever, sore throat, pestilence, seasonal toxin, and papule, moreover, and antiviral potential of the components is in the order of progointrin, goitrin, epigoitrin and epiprogoitrin [60–44]. In TCM, *Isatis indigotica* Fort. also use in the treatment of fever, colds and sore throats [65,66]. Flavan derivatives extracted from the leaves of *Pithecellobium clypearia* (Jack) Benth. have high activity against respiratory syncytial virus and Flu-1 (H1N1) [67], and *Psidium guajava* Linn (guava tea) which belongs to the family of *Myrtaceae* inhibits viral hemagglutination and sialidase activity and inhibits the growth of clinical influenza A (H1N1) [68]. *Punica granatum* L. (pomegranate), belongs to *Punicaceae*, shown anti-influenza properties by replication suppression of influenza A virus in cell culture [69]. Some of the most important Chinese herbal compound prescription to treat flu and cold are Xin-Jia-Xiang-Ru-Yin, Yi-Zhi-Hao pellet (CYZH), Rorricon, Jinchai, Gegen Qinlian decoction, Ge Gen decoction, and IMOD and Arbidol combination, and most of them consist of Jinyinhua (*Flos ioniceriae*), Huangqin (*Radix astragali*), Chaihu (*Radix bupleuri*), and Dangshen (*Radix codonopsis*) [70–76].

3. Conclusions

Viral infections are spreading quickly, and there are 4 kinds of influenza viruses. The most important antiviral herbs for cold and flu are honey-suckle flowers (*Lonicera japonica*), thyme leaf (*Thymus vulgaris*), green chireta (*Andrographis paniculata*), andrographis (*Andrographis paniculata*), Calendula (*Calendula officinalis*), and peppermints leaf and oil. The most notable expectorant herbs for cold and flu are snake root, tulsi, licorice root, slippery elm and marshmallow osha root, clove, and sage leaf. Immunostimulant herbs for cold and flu are eucalyptus, Echinacea root, ginseng, garlic, slippery elm, marshmallow, Usnea lichen, Isatis root, ginger root and myrrh resin. The most famous

and practical herbal prescriptions from China are Jinchai, Rorrigo, Ge Gen Decoction, Gegen Qinlian Decoction, Xin-Jia-Xiang-Ru-Yin, Yi-Zhi-Hao pellet, IMOD, and Arbidol combination.

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