Review

Medicinal Plants to Strengthen Immunity during a Pandemic

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Abstract: The development of new effective anti-coronavirus drugs and therapies is important, but it requires significant human, financial and, most importantly, time expenditures. The current pandemic is neither the first nor the last. Humanity has already accumulated considerable survival experience. We cannot do without prevention and epidemiological protection measures. This study reviews medicinal plants that grow in Northeast Asia and whose antioxidant, antiviral, anti-inflammatory and immunomodulatory characteristics are already known, also in the framework of the prevention and treatment of pneumonia of various etiologies. The need for a comprehensive approach to maintaining immunodefences, including functional foods and positive emotions, is emphasized. In the period of pandemics, it is important to research various areas that allow us to accumulate a critical mass of information and cope with the next global disease.

Keywords: medicinal plants; antiviral activity; prevention; phenolic compounds; flavonoids

1. Introduction

Throughout history, mankind has been accompanied by infectious diseases that have, in one way or another, raised the question of its survival. This was the case with the Spanish influenza (H1N1 virus) at the beginning of the last century, which resulted in the death of 5% of the world’s population. Almost all the time, mutations in strains of influenza A viruses lead to the emergence of infectious diseases with new symptoms and consequences. Avian flu, swine flu and other zoonotic influenza virus infections in humans lead to diseases ranging from mild upper respiratory tract infections to severe pneumonia, acute respiratory failure syndrome and death [1]. Each of them is initially regarded as a pandemic, but as soon as a treatment medication and a vaccine are developed, it is considered a regular seasonal flu. The coronavirus that led to the COVID-19 pandemic is similar to the pathogen SARS-CoV (viral respiratory disease of zoonotic origin) that caused the epidemic of 2003. A drug for atypical pneumonia that has passed clinical trials is yet to be developed. In 2020, humanity is being forced to return to the unfinished solution of the problem, whose initial conditions will be amended with new criteria. This SARS-CoV-2 virus has affected many people, not only in China but spreading to almost all countries and territories in a short time [2,3]. Many countries (China, the United States,
Germany, Great Britain, Russia, etc.) are intensively working on creating a vaccine, but even in this case, time is needed. The population only needs to wait for the work to be completed. However, every new day brings thousands of infected people [4], and some of them are not going to make it. Until there is a vaccine, all countries issue the same recommendations as follows: compliance with sanitary and hygienic standards; limited contacts up to complete self-isolation; strengthening of body’s defense systems that will both protect and lead to recovery in the event of infection [5,6].

Herbs are traditionally used in many therapeutic practices, if not as the main, then as the accompanying therapy in combination with medications, aimed at boosting immunity for prevention. Phytotherapy has repeatedly proven its effectiveness, including its ability to cope with infectious diseases [7]. There are medicinal plants whose extracts have an inhibitory effect on viruses such as herpes simplex virus type 2, HIV, hepatitis B virus (HBV), smallpox virus and severe acute respiratory syndrome, as well as on viral strains resistant to conventional antiviral drugs [8,9].

Plants from traditional Chinese medicine are rich sources of compounds used for the development of medicines for a wide range of diseases (from coughs and colds to parasitic infections and inflammations) [10–12]. Chinese scientists were the first to search for medicinal plants against a new coronavirus infection. On the one hand, they have centuries of experience in using medicinal plants both in treatment and prevention; on the other hand, the epicenter of COVID-19 is located on their territory [4,13].

The authors [7] proposed two principles for selecting medicinal plants (efficacy of oral administration and compatibility of traditional use). As a result, 26 plants were identified, of which only one is recommended for prevention—Fortunes bossfern (rhizome)—and the rest are recommended for intake at different stages of COVID-19 therapy.

It is believed that the most beneficial for a person are those fruits and plants that grow on the territory of their residence. On the other hand, the territories of China and the Far East are geographically close, which allows that preventive medicinal plants can be found on the territory of Northeast Asian. This review examines in vitro and in vivo studies that report on the immunomodulatory potential of medicinal plants growing in Northeast Asia.

2. Methods

Conducted in March–August 2020, the literature review covered the articles published between 1 January 2015 and the present. Databases of Scopus and Web of Sciences articles were used for cross-checking. We used a multi-query search strategy. The final results were selected after several search passes by qualitative evaluation of the number of results obtained and their relevance.

Table 1 lists the queries used and the number of articles defined by each of them. The entire bibliography of the included publications was manually checked for compliance with the subject of the search by title and abstract. Articles in the title and/or abstract containing “medical plants COVID” were passed to the full-text selection stage by default. After excluding intersections in all search databases, 318 sources remained under consideration.

| Data Base | Search Query (Title/Abstract/Keywords) | Number of Articles | Matching the Search |
|-----------|----------------------------------------|--------------------|---------------------|
| Scopus    | Medical Plants COVID                   | 18                 | 4                   |
|           | Strengthen immunity COVID              | 4                  | 2                   |
|           | Medical Plants Immunity                | 110                | 22                  |
|           | Medical Plants influenza               | 61                 | 18                  |
|           | Antiviral Medical Plants               | 215                | 36                  |
| WoS       | Medical Plants COVID                   | 2                  | 1                   |
|           | Strengthen immunity COVID              | 8                  | 2                   |
|           | Medical Plants Immunity                | 32                 | 3                   |
|           | Medical Plants influenza               | 17                 | 9                   |
|           | Antiviral Medical Plants               | 70                 | 12                  |
3. Results and Discussion

Medicinal plants have great potential for use as alternative medicines and are the basis for the discovery of natural compounds for the development of therapeutic agents in pharmacology. Flavonoids of medicinal plants are considered to be powerful immunomodulatory agents [14]. For colds, doctors in Russia traditionally advise to use herbs and forest berries, such as raspberries, rosehip, sage, chamomile, St. John’s wort, etc. They can be used for brewing teas and making gargle solutions. However, the new coronavirus infection is more insidious than all previously encountered flu infections. It is known that the lungs are the organ most severely affected by COVID-19, similar to SARS [15, 16]. Thus, special attention was paid to medicinal plants that protect the lungs and support the immune system.

Traditionally, ginger and ginger volatile oils, curcumin, *Panax* L. (*Araliaceae*) and garlic are recommended and used to strengthen immunity and reduce the likelihood of inflammatory respiratory diseases [2, 17, 18]. In an in vitro study [19], *Allium sativum* L. (*Amaryllidaceae*) extract inhibited influenza A (H1N1) virus by inhibiting the synthesis of viral nucleoproteins and polymerase activity. The paper recommended a decoction of *Allium cepa* L. (*Amaryllidaceae*) for colds [20].

Based on the experience gained during the SARS epidemic, we selected plants that are effective before or at the initial stage of infection. Roy et al. suggested a number of medicinal plants with these properties, although most of them grow in warm and hot areas, but there are plants found in Northeast Asia [11].

The action of *Lycoris radiate*, *Artemisia annua* and *Pyrosia lingua* against severe acute respiratory syndrome (SARS) is noted, which is determined by the active substances of these plants and has been confirmed in COVID-19 therapeutic practices [21, 22].

*Lycoris radiate* (L’Hé.) Herb. (*Amaryllidaceae*) originally grew in China, Korea and Nepal and was later distributed to other countries, including Russia. It is a source of pharmacologically active alkaloids, with lycorine being the main one [11, 23–26]. Lycorine has selective antiviral activity, including against severe acute respiratory syndrome associated with coronavirus and influenza virus [11, 21, 27].

Wormwood (*Artemisia annua* L. (*Compositae*)) is an annual herbaceous plant that is common in Europe, Asia and North America and is considered a weed in Russia. The plant contains essential oils, ascorbic acid and traces of alkaloids. Wormwood is traditionally used to treat malaria in the form of tea or pressed juice throughout Asia and Africa [28]. It is known that sesquiterpene lactone artemisinin, isolated from wormwood, is the main ingredient of malaria medicines [29]. Modern phytochemical studies have shown that wormwood contains many active components other than artemisinin, including flavonoids, coumarins, other sesquiterpenes, volatile oils, monoterpenoids and lignans, which determine the prospects for its use in preventive measures [30–32]. The antitumor [33], antioxidant [34], anti-inflammatory [35] and anti-asthmatic [36] activity of these wormwood components has already been proven.

*Pyrosia lingua* (Thunb.) Farw. (*Polypodiaceae*) is a perennial plant that grows in China, India, Japan and other territories of the Asia-Pacific region, and in Russia, it is found in the Far East. Plants of this type contain chlorogenic acid, flavonoids and xanthones. It is known (in vitro study) that flavonoids contribute to antioxidant capacity more than vitamin C and other antioxidants [37–39].

The components, including phenolic compounds, of *Isatis indigotica* Fortune ex Lindl. are described as natural with activity against SARS-CoV [22, 40, 41]. *Isatis indigotica* is widely used in traditional Chinese medicine for the treatment of influenza, viral pneumonia and hepatitis [42, 43]. It grows in Armenia, Lebanon, Turkey, Kazakhstan, China, many European countries, North Africa and Russia (North Caucasus, Eastern Siberia and the European region). For centuries, the Chinese have used the roots of *Isatis indigotica* in the clinical treatment of flu, colds, fevers, hepatitis and encephalitis [43, 44]. The main chemical components of the plant are alkaloids, flavonoids and phenolic acids [45–48], which determine its antibacterial, antitumor, anti-inflammatory, antiviral and antioxidant activity [43, 49–52]. It was found that this plant’s polysaccharides also exhibit antiviral activity against herpes simplex virus type
II [53], influenza A virus (IAV) [48] and strengthen the immune response in mice as part of the flu vaccine [54].

Liquid elderberry extract is characterized by antiviral action in vitro against influenza, as well as respiratory bacterial pathogens [22,55]. There is preclinical evidence that elderberry (Sambucus nigra L. (Adoxaceae)) inhibits the replication and viral attachment of the human coronavirus NL63 (HCoV-NL63) [56], which differs from COVID-19 but also belongs to coronaviruses. Elderberry is the most effective means of preventing or combating coronavirus infections at an early stage [57]. The authors of [58] provide evidence of the effectiveness of elderberry use against influenza, which can be useful in determining COVID-19 preventive tactics (the authors provide daily recommendations for a typical daily dosage of elderberry extract for adults and children).

There is some antiviral activity of components of dandelion water extract, which prevents infection and reduces the growth of virus cells of influenza type A and H1N1 [22,59]. Taraxacum officinale L. Weber ex F.H.Wigg (Compositae) is one of the most common plants in Ukraine, Belarus, the Caucasus, Moldova, Transnistria, Central Asia and Russia, including Siberia and the Far East. It is often considered as a weed in fields and gardens. Milky juice of the plant contains taraxacin and taraxacerin, 2–3% rubber substances, while blossoms and dandelion leaves are rich in taraxasterol, flavoxanthin, vitamins (C, A, B2, E), choline and saponines, and roots are rich in triterpene compounds (taraxasterol, taraxerol, pseudotranslation, β-amyrin) and sterols (β-sitosterol, stigmasterol, tarksol) [60,61].

Spirooliganone from the roots of Illicium oligandrum Merr. & Chun (Schisandraceae), chalconoids from Glycyrrhiza inflata Batalin (Leguminosae) [22,62], xanthenes from Polygala karensium Kurz. (Polygalaceae) [22,63] and homosoflavonoids from Caesalpinia sappan L. (Leguminosae) [22,64] showed powerful antiviral activity [65,66], determining the prospects of using secondary plant metabolites both for inhibiting the growth of influenza cells and possibly coronavirus infection, and for therapeutic purposes.

The antioxidant and antiviral properties of plant-derived flavonoids are described in [2,67,68]. Quercetin inhibits the penetration of SARS-CoV into host cells and shows antiviral activity against HIV-luc/SARS [69–71]. The elixir approved by the FDA in the USA for use in SARS-CoV-2 therapy contains quercetin. Quercetin is widely present in leafy vegetables, red onions, seeds and grains, in medicinal plants, is a plant flavonol from the group of flavonoid polyphenols and has proven itself as a pharmacological agent in the treatment of inflammation and oncology [72]. Flavonoid baicalin is isolated from Scutellaria baicalensis Georgi (Lamiaceae) and is used in traditional Chinese herbal medicine. It proved its antiviral activity against 10 clinical isolates of ARVI using neutralizing tests [73].

Saposhnikovia divaricata (Turcz.) Schischk. (family Apiaceae) is found in the Northern and Northeastern territories of China, cultivated in many other provinces. As a traditional Chinese medicine, dried root and/or its ethanolic extract are used. It is also used in medical practice in Japan [74]. In the Russian Federation, Saposhnikovia divaricata grows in Eastern Siberia and the Far East. The anti-inflammatory, analgesic, antipyretic, anti-allergic, antioxidant, antitumor and antiviral activity of its root extracts has been established [75–78]. Chromones, coumarins, unsaturated fatty acids, volatile oils and polyacetylene compounds were isolated from the chemical composition [74,79,80]. Polysaccharides of the dried root of Saposhnikovia divaricata possess immunoregulatory and antitumor characteristics [77].

Hyssopus officinalis L. (Lamiaceae) grows in large numbers on dry, stony, calcareous soils in Europe and Southwest and Central Asia. On the territory of Russia, it is found only in the Far East [81,82]. Health-preserving properties of hyssop are due to the richness and variety of secondary metabolites of their extracts [82]. Leaf extracts and essential oils of Hyssopus officinalis have been widely studied, both chemically and biologically. Its antimicrobial, antioxidant, antifungal, insecticidal and antiviral effects have been studied [82–85]. The antibacterial and antifungal properties of hyssop have been attributed to the presence of pinocamphone, isopinocamphone and β-pinene. The antiviral activity of the plant is explained by the presence of caffeic acid, tannins and unidentified high-molecular compounds [85,86].
Golden root (*Rhodiola rosea* L.) belongs to the plant family *Crassulaceae* and is considered a plant adaptogen with various protective effects (antidiabetic, anticancer, anti-aging, cardio-protective and neuroprotective). It is known that golden root has an excellent immunoregulatory effect and weakens inflammatory damage in various diseases by regulating the differentiation of immune cells, activating inflammatory signaling pathways and secreting inflammatory factors [87–89]. Polysaccharides isolated from the rhizomes and roots of *Rhodiola rosea* have antioxidant, antiviral and antitumor activity and are widely used in traditional Chinese medicine [90–92]. Active compounds (salidroside, tyrosol, ferulic acid, kaempferol, Gallic acid, catechin and phenethyl ether of caffeic acid, etc.) have confirmed anti-inflammatory effects in various models in vivo and in vitro [89,93,94], including induced lung damage in mouse models [91,95]. It was found that salidroside can weaken asthma [96].

*Rhaponticum* (*Rhaponticum carthamoides* (Willd.) Iljin. (*Compositae*)) is a perennial herb that grows in the Altai Mountains, Western and Eastern Siberia and Central Asia. In medicine, rhizomes with rhaponticum roots are used as a general tonic and adaptogenic drug [97–99]. It is widely used as a dietary supplement and is valued as a rich natural source of ecdysteroids, which are present in all parts of the plant [97]. Studies of the phytochemical composition have shown that the plant contains various classes of secondary metabolites (phenolic acids with caffeoylquinic acid derivatives, flavonoids, ecdysteroids, polyacetylenes, sesquiterpene lactones and triterpenoid glycosides) [97,100,101]. Extracts have a wide range of biological activity due to the presence of flavonoids, sesquiterpene lactones and polyacetylenes [98].

Amur maackia (*Maackia amurensis* Rupr. (*Leguminosae*)) is common in Korea, Japan, Northeastern China and Eastern Russia. The trunk bark of this tree has traditionally been used for the treatment of cancer, cholecystitis, arthritis and hyperthyroidism, as well as for hepatoprotection [102,103]. The chemical composition of *M. amurensis* has been determined with identified isoflavonoids, polyphenol and isoflavone glycosides, prenylated flavonoids [104–106]. Flavonoids are known for their antioxidant and antiviral activity [107], which allows this plant to be included in the group of plant prevention agents during the coronavirus pandemic.

Licorice (*Glycyrrhiza inflata* Batalin.) grows in Europe, North Africa, Asia, Russia, Siberia and the Caucasus. For centuries, dried roots and rhizomes of *glycyrrhiza* (*Leguminosae*) have been used as herbal medicines in many countries. *Glycyrrhiza glabra* L. is cultivated in Europe; *Glycyrrhiza uralensis* Fisch. and *Glycyrrhiza inflata* are common in traditional Chinese medicine. Licorice extracts have antiviral, antimicrobial, antioxidant, anti-inflammatory and antitumor characteristics [108,109], determined by triterpene saponins and flavonoids. The main triterpene saponin is glycyrrhizin (5–10% of roots), from phenolic compounds liquiritigenin, isoliquiritigenin and their glycosidic derivatives (around 1% of licorice water extract) [110–112].

The authors of [113] describe the results of studying the antiviral characteristics (against avian influenza - H5N1) of extracts of five Asian medicinal plants (*Andrographis paniculata*, *Curcuma longa*, *Gynostemma pentaphyllum*, *Kaempferia parviflora*, *Psidium guajava*). Both water and ethanol extracts from all the plants studied showed significant antiviral activity against H5N1 virus, but the authors name *C. longa* and *K. parviflora* the most active ones.

*Andrographis paniculata* (Burm.f.) Nees (*Acanthaceae*) is common in tropical Asian countries, often in isolated locations. Wild populations can be found throughout Southern India and Sri Lanka; cultivated populations are found in Northern India, Java, Malaysia, Indonesia, the West Indies, parts of the Americas, the Philippines, Hong Kong, Thailand, Brunei, Singapore and other regions of Asia. The main compound of the plant is andrographolide secondary metabolite, the highest content of which is concentrated in the stem, flowering tops and roots [114]. Antitumor, anti-inflammatory, antimicrobial, antioxidant, cytotoxic, hepatoprotective, immunostimulating and antiviral activities of this metabolite have been established [114,115]. The ability of *Andrographis paniculata* to treat viral respiratory infections has been confirmed in ayurvedic and other non-traditional medical practices [116,117]. The components of this plant inhibit the increased NOD-like receptor protein (NLRP3), caspase-1 and interleukin-1β
molecules that are actively involved in the pathogenesis of SARS-COV, which determines the potential in the treatment and prevention of SARS-CoV-2 [118].

Curcuma longa L. (Zingiberaceae) is a perennial herbaceous plant of the Ginger family found wild in India and South Asia, cultivated in areas with warm climates, including the countries of Northeast Asia. The plant’s roots have antiviral, antimicrobial, immunomodulatory, anti-inflammatory and other characteristics [119]. The main active ingredient of the plant is polyphenol curcumin, which also contains lipids, dietary fiber, carbohydrates, vitamins, minerals, polyunsaturated fatty acids and essential oils. Curcumin is well known for its anti-inflammatory potential; many clinical studies have been conducted to evaluate its bioactive effect in various inflammatory conditions. Curcumin has a relieving and preventive effect on respiratory disorders [120].

Gynostemma pentaphyllum (Thunb.) Makino (Cucurbitaceae) is found in China and in South and East Asia. Traditional medicine uses it in the form of teas, extracts and dietary supplements. It is widely used in Chinese alternative medicine. Positioned as a general tonic, it also treats viral and infectious diseases [121–124]. Due to the significant content of saponins and antioxidants, it has a rejuvenating effect [125]. In terms of the saponin content, Gynostemma pentaphyllum significantly outperforms ginseng. Due to this, the plant effectively increases physical endurance and tones up the body. Rich in vitamins, the plant prevents colds and viral diseases. Amino acids provide better protein digestibility.

Kaempferia parviflora Wall. ex Baker (Zingiberaceae) is an herbaceous plant native to Thailand. It has strengthening and stimulating properties. Due to the high content of methoxyflavones, this plant demonstrates antioxidant properties in vitro. Methoxyflavones (flavones with an attached methoxyl group) are the main components of the plant (there are three of them: 3,5,7,3′, 4′-pentamethoxyflavone (PMF), 5,7-dimethoxyflavone (DMF), and 5,7,4′-trimethoxyflavone (TMF)), which are most often studied. Kaempferosides—unique components of Kaempferia parviflora—are not considered active ingredients. Kaempferia parviflora rhizomes have been reported to have antioxidant, anti-inflammatory and antimicrobial activity due to the high content of biologically active phenolic and methoxyflavone compounds [126]. It was found that the chemical components and extracts of Kaempferia parviflora have a variety of biological active properties. Flavone (5-hydroxy-7-methoxyflavone and 5,7-dimethoxyflavone) inhibits viral protease, flavonoids inhibit Mycobacterium tuberculosis and Candida albicans. Rhizomes prepared in the form of alcohol or water decoction are prescribed for the treatment of various diseases [127].

Psidium guajava L. (Myrtaceae) is found in tropical and some subtropical areas of Asia, Africa and South and North America. In the traditional medicine practiced by many cultures and peoples of these territories, Psidium guajava is used for inflammation, diabetes, fever, lung diseases, hypertension, etc. The greatest biological activity is demonstrated by the bark of shoots and unripe fruits; to a greater extent, it is associated with the antioxidant effect of secondary metabolites, mainly flavonoids. The bark contains diglycosides of ellagic acid, ellagic acid, leucodelfinidine and saponins. Iha et al. [128] found tannins (epicatechin) and flavonoids (rutin and quercetin) in the chemical composition of the plant. Psidium guajava has antibacterial, antifungal, antiviral, antioxidant and other properties [129–131].

Echinacea purpurea (L.) Moench (Compositae) has a certain potential in the prevention of COVID-19. Native to America, this plant is cultivated everywhere. The ground part of Echinacea purpurea contains polysaccharides, essential oils, flavonoids, hydroxycinnamic acids, tannins, saponins, echinacin, echinolone, echinacoside, organic acids, resins and phytoestrogens; the roots contain inulin, glucose, essential and fatty oils, phenolcarboxylic acids, betaine and resins. All parts of the plant contain enzymes, macro- and microelements. Echinacea is one of the most popular natural health products purchased worldwide, with most commercially available products containing E. purpurea alone or mixed with E. angustifolia DC. (Compositae). Many naturopathic doctors recommend echinacea for immune support [132].

Studies [133,134] have shown that echinacea can reduce the severity and/or duration of acute respiratory infections when taken at the beginning of the disease when the first symptoms appear.
Echinacea purpurea reduces the risk of recurrent respiratory infections and the incidence of complications. The high content of essential oils, antioxidants, organic acids, vitamins of groups A, B and E. Echinacea-based preparations boosts the immune system and helps the body to fight flu viruses, herpes and SARS. The immunomodulatory, antiviral and anti-inflammatory effects of this plant can serve as a basis for research on its activities in relation to COVID-19.

Effects and activity of the medicinal plants are identified in Table 2.

| Plant                          | Condition | Solvent       | Part Used       | Effects                                              | References |
|-------------------------------|-----------|---------------|-----------------|------------------------------------------------------|------------|
| *Allium cepa*                 | Extract   | Chloroform    | Bulb            | Antiviral activity IFA H₁N₁                           | [19]       |
|                               | Natural   | -             | Bulb            | Antiviral activity (SARS—cold and flu)               | [20]       |
| *Allium sativum*              | Extract   | Ethanol or aqueous | Roots        | Antiviral activity (IFA—H₂N₂)                       | [19]       |
|                               | Natural   | -             | Bulb            | Immunoregulatory effect                              | [20]       |
| *Andrographis paniculata*     | Extracts  | Aqueous or ethanol | Leaves       | Antiviral activity (IF H₅N₁)                         | [113,116]  |
| *Artemisia annua*             | Extract   | Ethanol       | Whole plant     | Antiviral activity (SARS-CoV)                        | [21,22]    |
| *Caesalpinia sappan*          | Extract   | Ethanol       | Heartwood       | Antiviral activity (IFA—H₁N₁, H₂N₂, H₄N₂)           | [22,64]    |
| *Curcuma longa*               | Extract   | Aqueous or ethanol | Roots       | Antiviral activity (IF H₅N₁), prevention             | [113,120]  |
|                               | Essential oil | -           | Flowers         | Antiviral activity (SARS), Immunoregulatory, anti-inflammatory effects | [132–134] |
|                               | Syrup     | -             | Flowers, Roots  |                                                       |            |
|                               | Extract   | Ethanol       | Flowers         |                                                       |            |
|                               | Sap       | -             | Herb            |                                                       |            |
|                               | Herb mix  | -             | Herb and root   |                                                       |            |
| *Echinacea purpurea*          | Powder    | -             | Centuries, dried roots and rhizomes | Antiviral, antimicrobial, antioxidant, antitumor activity | [108,109] |
|                               | Extract   | Acetone       | Roots           | Antiviral activity (IFA—H₂N₁)                        | [22,62]    |
|                               | Powder    | -             | Centuries, dried roots and rhizomes | Antiviral, antimicrobial, antioxidant, antitumor activity | [108,109] |
| *Glycyrrhiza glabra*          | Powder    | -             | Centuries, dried roots and rhizomes | Antiviral, antimicrobial, antioxidant, antitumor activity | [108,109] |
| *Glycyrrhiza inflata*         | Extract   | Aqueous or ethanol | Leaves or ground part | Antiviral (IF H₂N₁), antioxidant, antiproliferative activity | [113,123,124] |
|                               | Ethanol   | Leaf          |                 | Antiviral, antimicrobial, antioxidant, antifungal, insecticidal activity | [84]       |
|                               | Essential oils | - | Leaf, flower and stem |                                                       | [85,86]    |
| *Hyssopus officinalis*        | Powder    | -             | Roots           | Antiviral activity (IFA)                             | [22,65]    |
| *Illicium oligandrum*         | Extract   | -             | Roots           | Antiviral activity (SARS-CoV, influenza—H₁N₁, H₂N₂, H₄N₂, H₆N₂, H₉N₂, viral pneumonia, and hepatitis) | [22,48]    |
Table 2. Cont.

| Plant                        | Condition       | Solvent                  | Part Used | Effects                                      | References        |
|------------------------------|-----------------|--------------------------|-----------|----------------------------------------------|-------------------|
| *Kaempferia parviflora*      | Extract         | Aqueous or ethanol       | Roots     | Antiviral (IF H3N2) and antimicrobial activity| [113,126,127]     |
|                             | Essential oil   | -                        | -         |                                              |                   |
| *Lycoris radiate*            | Extract         | Ethanol                  | Stem cortex | Antiviral activity (SARS-CoV)               | [21,22]           |
| *Maackia amurensis*          | Extract         | Ethanol                  | Bark      | Antiviral and antioxidant activity          | [105–107]         |
| *Polygala karensium*         | Extract         | Ethanol                  | Roots     | Antiviral activity (IFA)                    | [22,63]           |
| *Psidium guajava*            | Extract         | Aqueous or ethanol       | Leaves    | Antiviral (IF H3N2), antimicrobial activity  | [113,128,129,131] |
|                             | Ethanol         | Whole plant              |           |                                              |                   |
|                             | CH3OH/H2O/formic acid | Pulp                   |           | Antioxidant activity                        | [130]             |
| *Pyrosia lingua*             | Extract         | Chloroform               | Leaf      | Antiviral activity (SARS-CoV)               | [21,22]           |
| *Rhaponticum carthamoides*   | Essential oil   | -                        | Roots     | antiviral, antimicrobial, antioxidant and antitumor activity, immunoregulatory activity | [98]               |
|                             | Extract         | Acetone, ethyl acetate or methanol | Leaf |                                              | [97]               |
| *Rhodiola rosea*             | Extract         | Aqueous                  | Roots     | Emmunoregulatory effect; antiviral, antioxidant, anti-asthma activity | [92,94,96]         |
| *Sambucus nigra*             | Extract *       | -                        | -         | Antiviral activity (IFA, IFB)               | [22,55]           |
| *Saposhnikovia divaricata*   | Extract         | Ethanol                  | Roots     | Emmunoregulatory effect                      | [77]               |
| *Taraxacum officinale*       | Extract         | Aqueous                  | Herb      | Antiviral activity (IFA—H1N1)               | [22,59]           |

IF—influenza, IFA—influenza A, IFB—influenza B, SARS—severe acute respiratory syndrome, SARS-CoV—viral respiratory disease of zoonotic origin. * commercial preparat Rubini, BerryPharma AG, Germany.

4. Conclusions

Epidemics and pandemics are always a test for humanity, and COVID-19 is no exception. Currently, there is no established pharmacological strategy for the prevention and/or treatment of a new coronavirus infection. Since the beginning of the COVID-19 epidemic, people around the world have been under constant stress and are experiencing significant negative emotions, fear, anxiety and anger [135,136]. All this immediately affects the state of their immune system and reduces the body’s resistance not only to the SARS-CoV virus but to other viral and bacterial infections as well. It is established that believing in the world’s justice helps to increase the level of positivity in a person’s life [137], while family support also plays an important role. In this situation, we only have to wait for the vaccine and strengthen immunity to keep ourselves and our loved ones healthy.

The list of medicinal plants that grow in the eastern territories of our country and can help support the body during the pandemic is yet to be completed. We are aware of the danger of unauthorized use of medications without a doctor’s supervision. There can be only one answer: strictly follow the recommendations of pharmacists and stop immediately in the event of the slightest complications or inadequate reactions of the body.

It is believed that the only sustainable way to survive in the current situation is to boost the immune system. Many foods and herbs have antiviral and immunomodulatory properties. A balanced diet and dietary intake of nutrients affect the immune system through gene expression, cell activation and modification of signaling molecules. In addition, various food ingredients are determinants of the gut microbial composition and subsequently form immune responses in the body [138–140]. A diet...
combined with medicinal plants with immunomodulatory, antiviral and anti-inflammatory effects can significantly enhance this protection.

Diet plays a huge role in disease prevention. During seasonal colds, it should be rich in vitamins and antioxidants. Key dietary components, such as vitamins C, D, E, zinc, selenium and polyunsaturated fatty acids, have an immunomodulatory effect. Recent studies have shown that dietary supplements can have beneficial effects, potentially decreasing the viral load of SARS-CoV-2 and reducing the recovery period in patients with COVID-19 [107,141].

Vitamin A supplementation reduces the incidence of various infectious diseases and lowers the mortality rate [107,142]. Vitamin B2 together with UV light effectively reduces the SARS-CoV titer in human plasma products [143]. Vitamin D deficiency in calves leads to greater infection with bovine coronavirus [144]. Vitamin C is widely known both as an antioxidant and as an aging process inhibitor [145]. It also participates in chemotaxis and phagocytosis, increasing the amount of reactive oxygen species for the destruction of microorganisms. It is often considered as an antibacterial agent and has an anti-inflammatory effect [146]. It was found that vitamin C inhibits lung fibrosis [59,107], has a direct virulent effect at higher concentrations and reduces the viral load on infected cells with Ebstein–Barr virus [2,147]. However, there is still no consensus on the antiviral effectiveness of this vitamin. However, it is vitamin C infusion that has already been tested on patients with pneumonia infected with SARS-CoV-2, and numerous clinical studies are continuing with their relevance maintained [2]. Products rich in vitamin C traditionally include lemons, oranges, kiwis, guavas and grapes, but it is extremely difficult to cultivate them in Siberia and the Far East. However, nature is also rich in fruits with this vitamin: black currant (Ribes nigrum L. (Grossulariaceae)), sea buckthorn (Hippophae rhamnoides L. (Elaeagnaceae)), rosehip (family Rosaceae), and vegetable crops such as broccoli (Brassica oleracea var. italica Plenk (Brassicaceae)), cauliflower (Brassica oleracea var. botrytis L. (family Brassicaceae)), sweet pepper (Capsicum annuum L. (Solanaceae)), wild garlic (Allium ochotense Prokh. (Amaryllidaceae)), etc. Moreover, in every territory, perhaps with the exception of the Arctic and Antarctic, there are plants that can improve health, while emotional state [148,149] plays an important role in all these activities too.

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References
1. Alschuler, L.; Weil, A.; Horwitz, R.; Stamets, P.; Chiasson, A.M.; Crocker, R.; Maizes, V. Integrative considerations during the COVID-19 pandemic. Explore 2020, in press. [CrossRef] [PubMed]
2. Pooladanda, V.; Thatikonda, S.; Godugu, C. The current understanding and potential therapeutic options to combat COVID-19. Life Sci. 2020, 117765. [CrossRef] [PubMed]
3. Vellingiri, B.; Jayaramayy, K.; Iyer, M.; Narayanasamy, A.; Govindasamy, V.; Giridharane, B.; Ganesan, S.; Venugopal, A.; Venkatesan, D.; Ganesan, H.; et al. COVID-19: A promising cure for the global panic. Sci. Total Environ. 2020, 725, 138277. [CrossRef] [PubMed]
4. Sohrabi, C.; Alsaﬁ, Z.; O’Neill, N.; Khan, M.; Kerwan, A.; Al-Jabir, A.; Iosifidis, C.; Agha, R. World Health Organization declares global emergency: A review of the 2019 novel coronavirus (COVID-19). Int. J. Surg. 2020, 76, 71–76. [CrossRef]
5. WHO. Novel Coronavirus (2019-nCoV) Advice for the Public. 2020. Available online: https://www.who.int/emergencies/diseases/novel-coronavirus-2019/advice-for-public (accessed on 25 April 2020).
6. WHO. Global Epidemiological Surveillance Standards for Influenza. 2014. Available online: https://www.who.int/influenza/resources/documents/WHO_Epidemiological_Influenza_Surveillance_Standards_2014.pdf?ua=1 (accessed on 25 April 2020).

7. Zhang, D.-H.; Wu, K.-L.; Zhang, X.; Deng, S.-Q.; Peng, B. In silico screening of Chinese herbal medicines with the potential to directly inhibit 2019 novel coronavirus. J. Integr. Med. 2020, 18, 152–158. [CrossRef]

8. Mukhtarad, M.; Arshad, M.; Ahmad, M.; Pomerantz, R.J.; Wigdahl, B.; Parveen, Z. Antiviral potentials of medicinal plants. Virus Res. 2008, 131, 111–120. [CrossRef]

9. Lubbe, A.; Verpoorter, R. Cultivation of medicinal and aromatic plants for specialty industrial materials. Ind. Crops Prod. 2011, 34, 785–801. [CrossRef]

10. Chen, Z.; Nakamura, T. Statistical evidence for the usefulness of Chinese medicine in the treatment of SARS. Phytother. Res. 2004, 18, 592–594. [CrossRef]

11. Roy, M.; Liang, L.; Xiao, X.; Feng, P.; Ye, M.; Liu, J. Lycorine: A prospective natural lead for anticancer drug discovery. Biomed. Pharmacother. 2018, 107, 615–624. [CrossRef]

12. Luo, H.; Tang, Q.L.; Shang, Y.X.; Liang, S.-B.; Yang, M.; Robinson, N.; Liu, J.-P. Can Chinese medicine be used for prevention of Corona Virus Disease 2019 (COVID-19)? A review of historical classics, research evidence and current prevention programs. Chin. J. Integr. Med. 2020, 26, 243–250. [CrossRef]

13. Ling, C.-Q. Traditional Chinese medicine is a resource for drug discovery against 2019 novel coronavirus (SARS-CoV-2). J. Integr. Med. 2020, 18, 87–88. [CrossRef] [PubMed]

14. Xiao, C.; Guan, Q.; Tan, Y.; Hou, L.; Xie, W. Medical Plants and Immunological Regulation. J. Immunol. Res. 2018, 2018, 9172096. [CrossRef] [PubMed]

15. Zhu, N.; Zhang, D.; Wang, W.; Li, X.; Yang, B.; Song, J.; Zhao, X.; Huang, B.; Shi, W.-F.; Lu, R.-J.; et al. A novel coronavirus from patients with pneumonia in China, 2019. N. Engl. J. Med. 2020, 382, 727–733. [CrossRef]

16. Huang, C.; Wang, Y.; Li, X.; Ren, L.; Zhao, J.; Hu, Y.; Zhang, L.; Fan, G.; Xu, J.; Gu, X.; et al. Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China. Lancet 2020, 395, 497–506. [CrossRef]

17. Gandhi, G.R.; Silva Vasconcelos, A.B.; Haran, G.H.; da Silva Calisto, V.K.; Jothi, G.; de Souza Siqueira Quintans, J.; Cuevas, L.E.; Narain, N.; Quintans Júnior, L.J.; Cipolotti, R.; et al. Essential oils and its bioactive compounds modulating cytokines: A systematic review on anti-asthmatic and immunomodulatory properties. Phytomedicine 2020, 73, 152854. [CrossRef]

18. Liu, L.; Fu-RongXu, F.-R.; Wang, Y.-Z. Traditional uses, chemical diversity and biological activities of Panax L. (Araliaceae): A review. J. Ethnopharmacol. 2020, 263, 112792. [CrossRef] [PubMed]

19. Chavan, R.D.; Shinde, P.; Girkar, K.; Madage, R.; Chowdhary, A. Assessment of Anti-Influenza activity and hemagglutination inhibition of Plumbago indica and Allium sativum extracts. Phcog. Res. 2016, 8, 105–111. [CrossRef] [PubMed]

20. Uzun, M.; Kaya, A. Ethnobotanical research of medicinal plants in Mihalgazi (Eskişehir, Turkey). J. Pharm. Biol. 2016, 54, 1194863. [CrossRef]

21. Li, S.Y.; Chen, C.; Zhang, H.Q.; Guo, H.Y.; Wang, H.; Wang, L.; Zhang, X.; Hua, S.-N.; Yu, J.; Xiao, P.-G.; et al. Identification of natural compounds with antiviral activities against SARS-associated coronavirus. Antivir. Res. 2005, 67, 18–23. [CrossRef]

22. Lin, L.-T.; Hsu, W.-C.; Lin, C.-C. Antiviral Natural Products and Herbal Medicines. J. Tradit. Complement. Med. 2014, 4, 24–35. [CrossRef]

23. Nair, J.J.; Wilhelm, A.; Bonnet, S.L.; van Staden, J. Antibacterial constituents of the plant family Amaryllidaceae. Bioorg. Med. Chem. Lett. 2017, 27, 4943–4951. [CrossRef]

24. Cimmino, A.; Masi, M.; Evidente, M.; Superchi, S.; Evidente, A. Amaryllidaceae alkaloids: Absolute configuration and biological activity. Chirality 2017, 29, 486–499. [CrossRef]

25. Nair, J.J.; van Staden, J. Antifungal constituents of the plant family Amaryllidaceae. Phytother. Res. 2018, 32, 976–984. [CrossRef]

26. Hulcova, D.; Breiterova, K.; Siatka, T.; Klimova, K.; Davani, L.; Safatlova, M.; Hostalkova, A.; de Simone, A.; Andrisano, V.; Cahlikova, L. Amaryllidaceae alkaloids as potential glycogen synthase Kinase-3beta inhibitors. Molecules 2018, 23, 719. [CrossRef] [PubMed]

27. He, J.; Qi, W.B.; Wang, L.; Tian, J.; Jiao, P.R.; Liu, G.Q.; Ye, W.C.; Liao, M. Amaryllidaceae alkaloids inhibit nuclear-to-cytoplasmic export of ribonucleoprotein (RNP) complex of highly pathogenic avian influenza virus H5N1. Influenza Other Respir. Viruses 2013, 7, 922–931. [CrossRef]
28. Lang, S.J.; Schmiech, M.; Hafner, S.; Paetz, C.; Steinborn, C.; Huber, R.; El Gaafarya, M.; Werner, K.; Schmidt, C.Q.; Syroverts, T.; et al. Antitumor activity of an Artemisia annua herbal preparation and identification of active ingredients. *Phytochemistry*. 2019, 62, 152962. [CrossRef]

29. Slezakova, S.; Ruda-Kucerova, J. Anticancer activity of artemisinin and its derivatives. *Anticancer Res.* 2017, 37, 5995–6003. [CrossRef]

30. Zhao, Y.; Ni, F.; Song, Y.; Wang, S.; Huang, W.; Wang, Z.; Xiao, W. Chemical constituents from Artemisia annua. *China J. Chin. Mater. Med.* 2014, 39, 4816–4821.

31. Fu, C.; Yu, P.; Wang, M.; Qiu, F. Phytochemical analysis and geographic assessment of flavonoids, coumarins and sesquiterpenes in Artemisia annua L. based on HPLC-DAD quantification and LC-ESI-QTOF-MS/MS confirmation. *Food Chem.* 2020, 312, 126070. [CrossRef]

32. Li, K.M.; Dong, X.; Ma, Y.N.; Wu, Z.H.; Yan, Y.M.; Cheng, Y.X. Antifungal coumarins and lignans from Isatis indigotica. *Fitoterapia* 2019, 134, 323–328. [CrossRef]

33. Ko, Y.S.; Lee, W.S.; Panchanathan, R.; Joo, Y.N.; Choi, Y.H.; Kim, G.S.; Jung, J.-M.; Ryu, C.H.; Shin, S.C.; Kim, H.J. Polyphenols from Artemisia annua L inhibit adhesion and EMT of highly metastatic breast cancer cells MDA-MB-231. *Phytother. Res.* 2016, 30, 1180–1188. [CrossRef] [PubMed]

34. Song, Y.; Desta, K.T.; Kim, G.-S.; Lee, S.J.; Lee, W.S.; Kim, Y.H.; Jin, J.S.; Abd El-Aty, A.M.; Shin, H.-C.; Shim, J.-H.; et al. Polyphenolic profile and antioxidant effects of various parts of Artemisia annua L. *Biomed. Chromatogr.* 2016, 30, 588–595. [CrossRef] [PubMed]

35. Li, Y.J.; Guo, Y.; Yang, Q.; Weng, X.-G.; Yang, L.; Wang, Y.-J.; Lin, S.; Shi, J.G.; et al. Flavonoids casticine and chrysosplenol D from Artemisia annua L inhibit inflammation in vitro and in vivo. *Toxicol. Appl. Pharmacol.* 2015, 286, 151–158. [CrossRef] [PubMed]

36. Wang, J.S. Casticin alleviates lipopolysaccharide-induced inflammatory responses and expression of mucus and extracellular matrix in human airway epithelial cells through Nrf2/Keap1 and NF-kappaB pathways. *Phytother. Res.* 2018, 32, 1346–1353. [CrossRef]

37. Proteggente, A.R.; Pannala, A.S.; Paganga, G.; Buren, L.V.; Wagner, E.; Wiseman, S.; Put, F.V.D.; Dacombe, C.; Rice-Evans, C.A. The antioxidant activity of regularly consumed fruit and vegetables reflects their phenolic and vitamin C composition. *Free Radic. Res.* 2002, 36, 217–233. [CrossRef]

38. Wang, X.; Wu, Y.H.; Cao, J.G.; Wang, Q.X.; Xiao, J.B. Flavonoids, antioxidant potential, and acetylcholinesterase inhibition activity of the extracts from the gametophyte and archegoniophore of Marchantia polymorpha L. *Molecules* 2016, 21, 360. [CrossRef]

39. Wang, X.; Wang, M.; Cao, J.; Wu, Y.; Xiao, J.; Wang, Q. Analysis of flavonoids and antioxidants in extracts of ferns from Tianmu Mountain in Zhejiang Province (China). *Ind. Crops Prod.* 2017, 97, 137–145. [CrossRef]

40. Yu, M.; Lee, S.J.; Lee, J.M.; Kim, Y.; Chin, Y.W.; Lee, J.G.; Keum, Y.-S.; Jeong, Y.-J. Identification of myricetin and scutellarein as novel chemical inhibitors of the SARS coronavirus helicase, nsP13. *Bioorg. Med. Chem. Lett.* 2012, 22, 4049–4054. [CrossRef]

41. Ryu, Y.B.; Jeong, H.J.; Kim, J.H.; Kim, Y.M.; Park, J.Y.; Kim, D.; Naguyen, T.T.H.; Park, S.-J.; Chang, J.S.; Rho, M.-C.; et al. Biflavonoids from Torreya nucifera displaying SARS-CoV 3CL (pro) inhibition. *Bioorg. Med. Chem.* 2010, 18, 7940–7947. [CrossRef]

42. Liu, J.F.; Jiang, Z.Y.; Wang, R.R.; Zheng, Y.T.; Chen, J.J.; Zhang, X.M.; Ma, Y.B. Isatisine A, a novel alkaloid with an unprecedented skeleton from leaves of Isatis indigotica. *Org. Lett.* 2007, 9, 4127–4129. [CrossRef]

43. Liu, S.-F.; Zhang, Y.-Y.; Zhou, L.; Lin, B.; Huanga, X.-X.; Wang, X.-B.; Song, S.-J. Alkaloids with neuroprotective effects from the leaves of Isatis indigotica collected in the Anhui Province, China. *Phytochemistry* 2018, 149, 132–139. [CrossRef]

44. Ke, L.; Wen, T.; Bradshaw, J.P.; Zhou, J.; Rao, P. Antiviral decoction of Radix isatidis (板藍根 bàn lán gēn) inhibited influenza virus adsorption on MDCK cells by cytoprotective activity. *J. Tradit. Complement. Med.* 2012, 2, 47–51. [CrossRef]

45. Wang, X.; Chen, M.H.; Wang, F.; Bu, P.B.; Lin, S.; Zhu, C.G.; Li, Y.H.; Jiang, J.D.; Shi, J.G. Chemical constituents from root of Isatis indigotica. *China J. Chin. Mater. Med.* 2013, 38, 1172–1182. [CrossRef]

46. Meng, L.J.; Guo, Q.L.; Zhu, C.G.; Xu, C.B.; Shi, J.G. Isatindigodiphindolase, an alkaloid glycoside with a new diphenylpropylindole skeleton from the root of Isatis indigotica. *Chin. Chem. Lett.* 2017. [CrossRef]

47. Meng, L.J.; Guo, Q.L.; Chen, M.H.; Jiang, J.D.; Li, Y.H.; Shi, J.G. Isatindolignanoside A, a glucosidic indole-lignan conjugate from an aqueous extract of the Isatis indigotica roots. *Chin. Chem. Lett.* 2017. [CrossRef]
48. Li, Z.; Li, L.; Zhou, H.; Zeng, L.; Chen, T.; Chen, Q.; Hu, P.; Yang, Z. *Radix isatidis* polysaccharides inhibit influenza A virus and influenza A virus-induced inflammation via suppression of host TLR3 signaling in vitro. *Molecules 2017*, 22, 116. [CrossRef]

49. Hsuan, S.L.; Chang, S.C.; Wang, S.Y.; Liao, T.L.; Jong, T.T.; Chien, M.S.; Lee, W.C.; Chen, S.S.; Liao, J.W. The cytotoxicity to leukaemia cells and antiviral effects of *Isatis indigotica* extracts on pseudorabies virus. *J. Ethnopharmacol. 2009*, 123, 61–67. [CrossRef] [PubMed]

50. Hu, Y.; Qiao, J.; Lu, R.; Ge, J.-R. Study on antibacterial activity of *Arnebia euchroma* (Royle) Johnst and *Isatis indigotica* Forte extracts in vitro. *Med. Plants 2010*, 90, 47–54.

51. Liu, Y.F.; Chen, M.H.; Wang, X.L.; Guo, Q.L.; Zhu, C.G.; Lin, S.; Xu, C.B.; Jiang, Y.P.; Li, Y.H.; Jiang, J.D.; et al. Antiviral enantiomers of a bisindole alkaloid with a new carbon skeleton from the roots of *Isatis indigotica*. *Chin. Chem. Lett. 2015*, 26, 931–936. [CrossRef]

52. Zhao, G.H.; Li, T.; Qu, X.Y.; Zhang, N.N.; Lu, M.; Wang, J. Optimization of ultrasound-assisted extraction of indigo and indirubin from *Isatis indigotica* Forte. and their antioxidant capacities. *Food Sci. Biotechnol. 2017*, 26, 1313–1323. [CrossRef]

53. Wang, T.; Wang, X.; Zhuo, Y.; Si, C.; Yang, L.; Meng, L.; Zhu, B. Antiviral activity of a polysaccharide from *Radix Isatidis (Isatis indigotica Fortune)* against hepatitis B virus (HBV) in vitro via activation of JAK/STAT signal pathway. *J. Ethnopharmacol. 2020*, 257, 112782. [CrossRef] [PubMed]

54. Shan, J.; Zhao, C.; Li, Q.; Zhu, T.; Ren, J.; Li, H.; Wu, J.H.; Ma, H.; Qu, W.S.; Wang, Y.X. An arabinogalactan from *Isatis indigotica* and its adjuvant effects on H1N1 influenza and hepatitis B antigens. *J. Funct. Foods 2015*, 18, 631–642. [CrossRef]

55. Krawitz, C.; Mraheil, M.A.; Stein, M.; Imirzalioglu, C.; Domann, E.; Pleschka, S.; Hain, T. Inhibitory activity of a standardized elderberry liquid extract against clinically-relevant human respiratory bacterial pathogens and influenza A and B viruses. *BMC Complement. Altern. Med. 2011*, 11, 16. [CrossRef] [PubMed]

56. Back, A.T.; Lundkvist, A. Dengue viruses—an overview. *Infect. Ecol. Epidemiol. 2013*, 3, 19839. [CrossRef]

57. Wang, T.; Niu, H.; Chen, Y.; Mao, Z.; Zhang, Y.; Li, Y.; Ye, D.; Lu, X.; Wang, Y.; Qu, W.S.; et al. Bioflavonoid against dengue virus type-2. *Virol. J. 2011*, 8, 560. [CrossRef]

58. He, W.; Han, H.; Wang, W.; Gao, B. Anti-influenza virus effect of aqueous extracts from dandelion. *Virol. J. 2011*, 8, 538. [CrossRef]

59. Lis, B.; Beata Olas, B. Pro-health activity of dandelion (*Taraxacum officinale L.*) and its food products—History and present. *J. Funct. Foods 2019*, 59, 40–48. [CrossRef]

60. Lis, B.; Rolnik, A.; Jedrzejek, D.; Soluch, A.; Stochmal, A.; Olas, B. Dandelion (*Taraxacum officinale L.*) root components exhibit anti-oxidative and antiplatelet action in an in vitro study. *J. Funct. Foods 2019*, 59, 16–24. [CrossRef]

61. Grienke, U.; Schmidtke, M.; von Grafenstein, S.; Kirchmair, J.; Liedl, K.R.; Rollinger, J.M. Influenza neuraminidase: A druggable target for natural products. *Nat. Prod. Rep. 2012*, 29, 11–36. [CrossRef]

62. Li, H.; Liu, S.-M.; Yu, X.-H.; Tang, S.-L.; Tang, C.-K. Coronavirus disease 2019 (COVID-19): Current status and future perspectives. *Int. J. Antimicrob. Agents 2020*, 55, 105951. [CrossRef] [PubMed]
69. Yi, L.; Li, Z.; Yuan, K.; Qu, X.; Chen, J.; Wang, G.; Zhang, H.; Luo, H.; Zhu, L.; Jiang, P.; et al. Small molecules blocking the entry of severe acute respiratory syndrome coronavirus into host cells. *J. Virol.* 2004, 78, 11334–11339. [CrossRef]

70. Chen, L.; Li, J.; Luo, C.; Liu, H.; Xu, W.; Chen, G.; Liew, O.W.; Zhu, W.; Puah, C.M.; Shen, X.; et al. Binding interaction of quercetin-3-β-galactoside and its synthetic derivatives with SARS-CoV 3CL(pro): Structure–activity relationship studies reveal salient pharmacophore features. *Bioorg. Med. Chem.* 2006, 14, 8295–8306. [CrossRef]

71. Elumalai, P.; Gunadharini, D.N.; Senthilkumar, K.; Banudevi, S.; Arunkumar, R.; Benson, C.S.; Sharmila, G.; Arunakaran, J. Induction of apoptosis in human breast cancer cells by nimbidolide through extrinsic and intrinsic pathway. *Toxicol. Lett.* 2012, 215, 131–142. [CrossRef] [PubMed]

72. Wen, C.-C.; Kuo, Y.-H.; Jan, J.-T.; Liang, P.-H.; Wang, S.-Y.; Liu, H.-G.; Lee, C.-K.; Chang, S.-T.; Kuo, C.-J.; Lee, S.-S.; et al. Specific plant terpenoids and lignoids possess potent antiviral activities against severe acute respiratory syndrome coronavirus. *J. Med. Chem.* 2007, 50, 4087–4095. [CrossRef] [PubMed]

73. Chen, F.; Chan, K.H.; Jiang, Y.J.; Kao, R.Y.; Lu, H.T.; Fan, K.W.; Cheng, V.C.; Tsui, W.H.; Hung, I.F.N.; Lee, T.S.W.; et al. In vitro susceptibility of 10 clinical isolates of SARS coronavirus to selected antiviral compounds. *J. Clin. Virol.* 2004, 31, 69–75. [CrossRef] [PubMed]

74. Urbagarova, B.M.; Shults, E.E.; Taraskin, V.V.; Radnaeva, L.D.; Petrova, T.N.; Rybalova, T.V.; Frolovad, T.S.; Pokrovskii, A.G.; Ganbaatar, J. Chromones and coumarins from Saposhnikovia divaricata (Turcz.) Schischk. Growing in Buryatia and Mongolia and their cytotoxicity. *J. Ethnopharmacol.* 2020, 112517. [CrossRef] [PubMed]

75. Yua, X.; Niua, Y.; Zheng, J.; Liu, H.; Jiang, G.; Chen, J.; Hong, M. Radix Saposhnikovia extract suppresses mouse allergic contact dermatitis by regulating dendritic-cell-activated Th1 cells. *Phytomedicine* 2015, 22, 1150–1158. [CrossRef] [PubMed]

76. Chun, J.M.; Kim, H.S.; Lee, A.Y.; Kim, S.H.; Kim, H.K. Anti-inflammatory and antiosteoarthritis effects of Saposhnikovia divaricata ethanol extract: In vitro and in vivo studies. *Evid. Based Complement. Altern. Med.* 2016, 2016, 1984238. [CrossRef] [PubMed]

77. Yang, J.-M.; Jiang, H.; Dai, H.-L.; Wang, Z.-W.; Jia, G.-Z.; Meng, X.-C. Polysaccharide enhances Radix Saposhnikoviae efficacy through inhibiting chromosomes decomposition in intestinal tract. *Sci. Rep.* 2016, 6, 326981–326988. [CrossRef] [PubMed]

78. Yang, J.-L.; Dhodarya, B.; Ha, T.K.Q.; Kim, J.; Kim, E.; Oh, W.K. Three new coumarins from Saposhnikoviae divaricata and their porcine epidemic diarrhea virus (PEDV) inhibitory activity. *Tetrahedron* 2015, 71, 4651–4658. [CrossRef]

79. Chen, L.; Li, J.; Su, L.; Jiang, Y.; Liu, B. Rapid characterisation and identification of compounds in Saposhnikovia Radix by high-performance liquid chromatography coupled with electrospray ionisation quadrupole time-of-flight mass spectrometry. *Nat. Prod. Res.* 2018, 32, 898–901. [CrossRef] [PubMed]

80. Venditti, A.; Bianco, A.; Frezza, C.; Conti, F.; Bini, L.M.; Giuliani, C.; Bramucci, M.; Quassinti, L.; Damiano, S.; Lupidi, G.; et al. Essential oil composition, polar compounds, glandular trichomes and biological activity of Hyssopus officinalis subsp. Aristatus (Godr.) Nyman from central Italy. *Ind. Crops Prod.* 2019, 140, 11594. [CrossRef]

81. Borrelli, F.; Pagano, E.; Formisano, C.; Piccolella, S.; Fiorentino, A.; Tenore, G.C.; Izzo, A.A.; Rigano, D.; Pacifico, S. *Hyssopus officinalis* subsp. aristatus: An unexploited wild-growing crop for new disclosed bioactives. *Ind. Crops Prod.* 2019, 140, 11594. [CrossRef]

82. Ozer, H.; Sokmen, M.; Guilluce, M.; Adiguzel, A.; Kilic, H.; Sahin, F.; Sokmen, A.; Baris, O. In-vitro antimicrobial and antioxidant activities of the essential oils and methanol extracts of *Hyssopus officinalis* L. ssp. Angustifolius. *Ital. J. Food Sci.* 2006, 18, 73–83.

83. Vlase, L.; Benedec, D.; Hanganu, D.; Damian, G.; Csilag, I.; Sevastre, B.; Mot, A.C.; Silaghi-Dumitrescu, R.; Tilea, L. Evaluation of antioxidant and antimicrobial activities and phenolic profile for *Hyssopus officinalis*, Ocimum basilicum and Teucrium chamaedrys. *Molecules* 2014, 19, 5490–5507. [CrossRef] [PubMed]

84. Pandey, V.; Verma, R.S.; Chauhan, A.; Tiwari, R. Compositional variation in the leaf, flower and stem essential oils of Hyssop (*Hyssopus officinalis* L.) from Western-Himalaya. *J. Herb. Med.* 2014, 4, 89–95. [CrossRef]
86. Letessier, M.P.; Svbodt, K.P.; Walters, D.R. Antifungal activity of the essential oil of Hyssop (Hyssopus officinalis). J. Phytopathol. 2001, 149, 673–678. [CrossRef]

87. Drayton, D.L.; Liao, S.; Mounzer, R.H.; Ruddle, N.H. Lymphoid organ development: From ontogeny to neogenesis. Nat. Immunol. 2006, 7, 344–353. [CrossRef]

88. Wang, Q.; Kuang, H.; Su, Y.; Sun, Y.; Feng, J.; Guo, R.; Chan, K. Naturally derived anti-inflammatory compounds from Chinese medicinal plants. J. Ethnopharmacol. 2013, 146, 9–39. [CrossRef]

89. Pu, W.L.; Zhang, M.-Y.; Bai, R.-Y.; Li, W.-H.; Yu, Y.-L.; Zhang, Y.; Song, L.; Wang, Z.-X.; Peng, Y.-F.; et al. Anti-inflammatory effects of Rhodiola rosea L.: A review. Biomed. Pharmacother. 2020, 121, 109552. [CrossRef]

90. Nan, J.-X.; Jiang, Y.-Z.; Park, E.-J.; Ko, G.; Kim, Y.-C.; Sohn, D.H. Protective effects of Rhodiola sachalinensis extract on carbon tetrachloride-induced liver injury in rats. J. Ethnopharmacol. 2003, 84, 143–148. [CrossRef]

91. Amsterdam, J.D.; Panossian, A.G.; Rhodiola rosea, L. as a putative botanical antidepressant. [PubMed]

92. Xu, Y.; Jiang, H.; Sun, C.; Adu-Frimpong, M.; Deng, W.; Yu, J.; Xu, X. Antioxidant and hepatoprotective effects of purified Rhodiola rosea polysaccharides. Int. J. Biol. Macromol. 2018, 117, 167–178. [CrossRef] [PubMed]

93. Zimmers, T.A.; Fishel, M.L.; Bonetto, A. STAT3 in the systemic inflammation of cancer cachexia. Sem. Cell Dev. Biol. 2016, 54, 28–41. [CrossRef]

94. Hillmer, E.J.; Zhang, H.; Li, H.S.; Watowich, S.S. STAT3 signaling in immunity. JAK2-STAT3 pathway activation and preventing STAT3 transfer into nucleus. J. Cytokine 2016, 31, 1–15. [CrossRef] [PubMed]

95. Qi, Z.; Qi, S.; Ling, L.; Lv, J.; Feng, Z. Salidroside attenuates inflammatory response via suppressing JAK2-STAT3 pathway activation and preventing STAT3 transfer into nucleus. Int. Immunopharmacol. 2016, 35, 265–271. [CrossRef] [PubMed]

96. Wang, J.; Jin, R.-G.; Xiao, L.; Wang, Q.-J.; Yan, T.-H. Anti-asthma effects of synthetic salidroside through regulation of Th1/Th2 balance. Chin. J. Nat. Med. 2014, 12, 500–504. [CrossRef]

97. Kokoska, L.; Janovska, D. Chemistry and pharmacology of Rhaponticum carthamoides: A review. Phytochemistry 2009, 70, 842–855. [CrossRef]

98. Havlik, J.; Budesinsky, M.; Kloucek, P.; Kokos, L.; Valterova, I.; Vasickov, S.; Zeleny, V. Norsesquiterpene hydrocarbon, chemical composition and antimicrobial activity of Rhaponticum carthamoides root essential oil. Phytochemistry 2009, 70, 414–418. [CrossRef] [PubMed]

99. Wu, J.; Gao, L.; Shang, L.; Wang, G.; Wei, N.; Chu, T.; Chen, S.; Zhang, Y.; Huang, J.; Wang, J.; et al. Ecdysterones from Rhaponticum carthamoides (Willd.) Iljin reduce hippocampal excitotoxic cell loss and upregulate mTOR signaling in rats. Fitoterapia 2017, 119, 158–167. [CrossRef]

100. Skala, E.; Kicel, A.; Olszewska, M.A.; Kiss, A.K.; Wysokińska, H. Establishment of hairy root cultures of Rhaponticum carthamoides (Willd.) Iljin for the production of biomass and caffeic acid derivatives. Biomed. Res. Int. 2015, 2015, 181908. [CrossRef] [PubMed]

101. Skala, E.; Picot, L.; Bijak, M.; Saluk-Bijak, J.; Szemraj, J.; Kicel, A.; Olszewska, M.A.; Sitarek, P. An efficient plant regeneration from Rhaponticum carthamoides transformed roots, enhanced caffeoylquinic acid derivatives production in pRi-transformed plants and their biological activity. Ind. Crops Prod. 2019, 129, 327–338. [CrossRef]

102. Shim, M.; Bae, J.Y.; Lee, Y.J.; Ahn, M.J. Tectoridin from Maackia amurensis modulates both estrogen and thyroid receptors. Phytotherapy 2014, 21, 602–606. [CrossRef]

103. Oh, J.M.; Jang, H.-J.; Kim, W.J.; Kang, M.-G.; Baek, S.C.; Lee, J.P.; Park, D.; Oh, S.-R.; Kim, H. Calycosin and 8-O-methylretusin isolated from Maackia amurensis as potent and selective reversible inhibitors of human monoamine oxidase-B. Int. J. Biol. Macromol. 2020, 151, 441–448. [CrossRef] [PubMed]

104. Fedoreyev, S.A.; Pokushalova, T.V.; Veselova, M.V.; Glebko, L.I.; Kulesh, N.I.; Muzarok, T.I.; Seletskaya, L.D.; Bulgakov, V.P.; Zhuravlev, Y.N. Isoflavonoid production by callus cultures of Maackia amurensis. Fitoterapia 2000, 71, 365–372. [CrossRef]

105. Li, X.; Li, J.F.; Wang, D.; Wang, W.N.; Cui, Z. Flavonoids from the bark of Maackia amurensis. Yao Xue Xue Bao 2009, 44, 63–68.

106. Li, X.; Wang, D.; Xia, M.Y.; Wang, Z.H.; Wang, W.N.; Cui, Z. Cytotoxic prenylated flavonoids from the stem bark of Maackia amurensis. Chem. Pharm. Bull. 2009, 57, 302–306. [CrossRef]
107. Khodadadi, E.; Maroufi, P.; Khodadadi, E.; Esposito, I.; Ganbarov, K.; Esposito, S.; Yousefi, M.; Zeinalzade, E.; Kafil, H.S. Study of combining virtual screening and antiviral treatments of the Sars-CoV-2 (Covid-19). Microb. Pathog. 2020, 146, 104241. [CrossRef] [PubMed]

108. Asl, M.N.; Hosseinzadeh, H. Review of pharmacological effects of Glycyrrhiza sp. and its bioactive compounds. Phytother. Res. 2008, 22, 709–724. [CrossRef] [PubMed]

109. Rizzato, G.; Scalabrin, E.; Radaelli, M.; Capodaglio, G.; Piccolo, O. A new exploration of licorice metabolome. Food Chem. 2017, 221, 959–968. [CrossRef] [PubMed]

110. Zheng, Y.; Qi, L.; Zhou, J.; Li, P. Structural characterization and identification of oleanane-type triterpeno epimers in Gynostemma unilensis Fischer by rapid-resolution liquid chromatography coupled with time-of-flight mass spectrometry. Rapid Commun. Mass Spectrom. 2010, 24, 3567–3577. [CrossRef]

111. Wang, C.; Chen, L.; Xu, C.; Shi, J.; Chen, S.; Tan, M.; Chen, J.; Zou, L.; Chen, C.; Liu, Z.; et al. A Comprehensive Review for Phytochemical, Pharmacological, and Biosynthesis Studies on Glycyrrhiza spp. (Review). Am. J. Chin. Med. 2020, 48, 17–45. [CrossRef]

112. Stanković, N.; Mihajilov-Krstev, T.; Zlatković, B.; Stankov-Jovanović, V.; Mitić, V.; Jović, J.; Čomić, L.; Kocić, B.; Bernstein, N. Antibacterial and Antioxidant Activity of Traditional Medicinal Plants from the Balkan Peninsula. NJAS-Wagening. J. Life Sci. 2016, 78, 21–28. [CrossRef]

113. Sornpet, B.; Potha, T.; Tragoonpu, Y.; Pringproa, K. Antiviral activity of five Asian medicinal pant crude extracts against highly pathogenic H5N1 avian influenza virus. Asian Pac. J. Trop. Med. 2017, 10, 871–876. [CrossRef]

114. Kumar, G.; Singh, D.; Tali, J.A.; Dheer, D.; Shankar, R. Andrographolide: Chemical modification and its effect on biological activities. Bioorg. Chem. 2020, 95, 103511. [CrossRef] [PubMed]

115. Sharma, S.; Sharma, Y.P. HPLC quantification of andrographolide in different parts of Andrographis paniculata (Burm.) Wall. ex Nees. J. Pharmacog. Phytochem. 2018, 7, 168–171.

116. Yarnell, E. Herbs for viral respiratory infections. Altern. Complement. Ther. 2018, 24, 35–43. [CrossRef]

117. Liu, Y.T.; Chen, H.W.; Li, C.K.; Huang, J.H.; Huang, C.S.; Li, M.L.; Yao, H.T. A diterpenoid, 14-deoxy-11,115-didehydroandrographolide, in Andrographis paniculata reduces steatohepatitis and liver injury in mice fed a high-fat and high-cholesterol diet. Nutrients 2020, 12, 523. [CrossRef]

118. Liu, Z.; Xiao, X.; Wei, X.; Li, J.; Yang, J.; Tan, H.; Zhu, J.; Zhang, Q.; Wu, J.; Liu, L. Composition and divergence of coronavirus spike proteins and host ACE2 receptors predict potential intermediate hosts of SARS-CoV-2. J. Med. Virol. 2020, 92, 595–601. [CrossRef]

119. Salehi, B.; Stojanović-Radić, Z.; Matejić, J.; Sharifi-Rad, M.; Anil Kumare, N.V.; Martins, N.; Sharifi-Radh, J. The therapeutic potential of curcumin: A review of clinical trials. Eur. J. Med. Chem. 2019, 163, 527–545. [CrossRef]

120. Boskabady, M.H.; Shakeri, F.; Naghdi, F. The effects of Curcuma Longa L. and its constituents in respiratory disorders and molecular mechanisms of their action. In Studies in Natural Products Chemistry; Atta-ur-Rahman, Ed.; Elsevier: Oxford, UK, 2020; Volume 65, pp. 239–269. [CrossRef]

121. Zhang, X.; Shi, G.; Wu, X.; Zhao, Y. Gypsengasaponigen H from hydrolyze of total Gynostemma pentaphyllum saponins induces apoptosis in human breast carcinoma cells. Nat. Prod. Res. 2020, 34, 1642–1646. [CrossRef]

122. Li, K.; Ma, C.; Li, H.; Dev, S.; He, J.; Qu, X. Medicinal value and potential therapeutic mechanisms of Gynostemma pentaphyllum (Thunb.) makino and its derivatives: An overview. Curr. Top. Med. Chem. 2019, 19, 2855–2867. [CrossRef]

123. Wang, Y.-R.; Xing, S.-F.; Lin, M.; Gu, Y.-L.; Piao, X.-L. Determination of flavonoids from Gynostemma pentaphyllum using ultra-performance liquid chromatography with triple quadrupole tandem mass spectrometry and an evaluation of their antioxidant activity in vitro. J. Liq. Chromatogr. Relat. Technol. 2018, 41, 437–444. [CrossRef]

124. Chen, P.-Y.; Chang, C.-C.; Huang, H.-C.; Zhang, L.-J.; Liaw, C.-C.; Lin, Y.-C.; Nguyen, N.-L.; Vo, T.-H.; Cheng, Y.-Y.; Morris-Natschke, S.L.; et al. New dammarane-type saponins from Gynostemma Pentaphyllum. Molecules 2019, 24, 1375. [CrossRef] [PubMed]

125. Lundqvist, L.C.E.; Rattigan, D.; Ehtesham, E.; Demmou, C.; Östenson, C.-G.; Sandström, C. Profiling and activity screening of Dammarane-type triterpen saponins from Gynostemma pentaphyllum with glucose-dependent insulin secretory activity. Sci. Rep. 2019, 9, 627. [CrossRef] [PubMed]
126. Ab Rahman, Z.; Abd Shukor, S.; Abbas, H.; AL Machap, C.; Suhaimi Bin Alias, M.; Mirad, R.; Sofiyanand, S.; Othman, A.N. Optimization of extraction conditions for total phenolics and total flavonoids from Kaempferia parviflora rhizomes. Adv. Biosci. Biotechnol. 2018, 9, 205–214. [CrossRef]

127. Tuan, N.H.; Tung, N.T.; Khanh, P.N. Research on chemical compositions and anti-microbial activity of the essential oil of the rhizome of Kaempferia daklakensis N.H.Tuan & N.D.Trong—A new record from Vietnam flora. J. King Saud Univ. Sci. 2019, 31, 1505–1510. [CrossRef]

128. Iha, S.M.; Migliato, K.F.; Vellosa, J.C.R.; Sacramento, L.V.S.; Pietro, R.C.L.R.; Isaac, V.L.B.; Brunetti, I.L.; Corrêa, M.A.; Salgado, H.R.N. Estudo fitotóxico de goiaba (Psidium guajava L.) com potential antioxidante para o desenvolvimento de formulação fitocosmética. Rev. Bras. Farmacog. 2008, 18, 387–393. [CrossRef]

129. Rajan, S.; Suveltha, P.; Thirunalamendar, T.; Jeeva, S. Anti-enteric bacterial activity of the traditional medicinal plants of Kanyakumari coast, Tamilnadu, India. J. Coast Life Med. 2015, 3, 640–644. [CrossRef]

130. Flores, G.; Wu, S.B.; Negrin, A.; Kennelly, E.J. Chemical composition and antioxidant activity of seven cultivars of guava (Psidium guajava) fruits. Food Chem. 2015, 170, 327–335. [CrossRef]

131. Sobral–Souza, C.E.; Silva, A.R.P.; Leite, N.F.; Rocha, J.E.; Sousa, A.K.; Costa, J.G.M.; Menezes, I.R.A.; Cunha, F.A.B.; Rolime, L.A.; Coutinho, H.D.M. Psidium guajava bioactive product chemical analysis and heavy metal toxicity reduction. Chemosphere 2019, 216, 785–793. [CrossRef]

132. Kembuan, G.; Lie, W.; Tumimomor, A. Potential usage of immune modulating supplements of the Echinacea genus for COVID-19 infection. Int. J. Med. Rev. Case Rep. 2020, 4, 1. [CrossRef]

133. Aucoin, M.; Cooley, K.; Saunders, P.R.; Car&#xE9;es, J.; Anheyer, D.; Medina, D.N.; Cardozo, V.; Remy, D.; Hannan, N.; Garber, A. The effect of Echinacea spp. on the prevention or treatment of COVID-19 and other respiratory tract infections in humans: A rapid review. Adv. Integr. Med. 2020, in Press. [CrossRef]

134. David, S.; Cunningham, R. Echinacea for the prevention and treatment of upper respiratory tract infections: A systematic review and meta-analysis. Complement. Ther. Med. 2019, 44, 18–26. [CrossRef]

135. Li, S.J.; Wang, Y.L.; Xue, J.; Zhao, N.; Zhu, T.S. The impact of COVID-19 epidemic declaration on psychological consequences: A study on active Weibo users. Int. J. Environ. Res. Public Health 2020, 17, 2032. [CrossRef]

136. Wang, J.X.; Gao, W.J.; Chen, M.Q.; Ying, X.P.; Tan, X.Y.; Liu, X.L. A survey of social attitudes during the COVID-19 epidemic: Analysis of survey data based on 24–25 January 2020. Natl. Gov. Wkly. 2020, 55–64. [CrossRef]

137. Wang, J.; ZhuoWang, Z.; Liu, X.; Yang, X.; Zheng, M.; Bai, X. The impacts of a COVID-19 epidemic focus and general belief in a just world on individual emotions. Pers. Individ. Dif. 2020, 168, 110349. [CrossRef]

138. Aman, F.; Masood, S. How Nutrition can help to fight against COVID-19 Pandemic. Pak. J. Med. Sci. 2020, 36, COVID19–S4. [CrossRef]

139. Panyod, S.; Ho, C.-T.; Sheena, L.-Y. Dietary therapy and herbal medicine for COVID-19 prevention: A review and perspective. J. Tradit. Complement. Med. 2020, 20, 420–427. [CrossRef]

140. Babich, O.; Prosekov, A.; Zaushistsena, A.; Sukhikh, A.; Dyshlyuk, L.; Ivanova, S. Identification and quantification of phenolic compounds of Western Siberia Astragalus danicus in different regions. Helixyon 2019, 5, e02245. [CrossRef] [PubMed]

141. Shakoor, H.; JackFeehan, J.; Al Dhaferi, A.S.; Alia, H.I.; Platat, C.; CheikhIsmail, L.; Apostolopoulos, V.; Stojanovska, L. Immune-boosting role of vitamins D, C, E, zinc, selenium and omega-3 fatty acids: Could they help against COVID-19? Maturitas 2020, 143, 1–9. [CrossRef]

142. Semba, R.D. Vitamin A and immunity to viral, bacterial and protozoan infections. Proc. Nutr. Soc. 1999, 58, 719–727. [CrossRef] [PubMed]

143. Keil, S.D.; Bowen, R.A.; Marschner, S. Inactivation of Middle East respiratory syndrome coronavirus (MERS-CoV) in plasma products using a riboflavin-based and ultraviolet light-based photochemical treatment. Transfusion 2016, 56, 2948–2952. [CrossRef]

144. Nonnecke, B.; McGill, J.; Ridpath, J.; Sacco, R.; Lippolis, J.; Reinhardt, T. Acute phase response elicited by experimental bovine diarrhea virus (BVDV) infection is associated with decreased vitamin D and E status of vitamin-replete preruminant calves. J. Dairy Sci. 2014, 97, 5566–5579. [CrossRef] [PubMed]

145. Rajagopal, S.; Kumar, R.A.; Deevi, D.S.; Satyanarayana, C.; Rajagopalan, R. Andrographolide, a potential cancer therapeutic agent isolated from Andrographis paniculata. J. Exp. Ther. Oncol. 2003, 3, 147–158. [CrossRef] [PubMed]

146. Jeong, J.-H.; An, J.Y.; Kwon, Y.T.; Rhee, J.G.; Lee, Y.J. Effects of low dose quercetin: Cancer cell-specific inhibition of cell cycle progression. J. Cell. Biochem. 2009, 106, 73–82. [CrossRef] [PubMed]
147. Cheng, P.-W.; Ng, L.-T.; Chiang, L.-C.; Lin, C.-C. Antiviral effects of saikosaponins on human coronavirus 229e in vitro. *Clin. Exp. Pharmacol. Physiol.* 2006, 33, 612–616. [CrossRef] [PubMed]

148. Deng, J.-G.; Hou, X.-T.; Zhang, T.-J.; Bai, G.; Hao, E.-W.; Chua, J.J.H.; Wattanathorna, J.; Sirisaarda, P.; Eea, C.S.; Lowa, J.; et al. Carry forward advantages of traditional medicines in prevention and control of outbreak of COVID-19 pandemic. *Chin. Herb. Med.* 2020, in press. [CrossRef]

149. Jayawardena, R.; Sooriyaarachchi, P.; Chourdakis, M.; Ranasinghe, C.J.P. Enhancing immunity in viral infections, with special emphasis on COVID-19: A review. *Diabetes Metab. Syndr.* 2020, 14, 367–382. [CrossRef]

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