Immunomodulating herbs

Herbs contain many bioactive compounds. Why sometimes people opt for the usage of such herbs is because there is a natural synergy between the active principles, which can boost the human homeostasis in a more rounded way (somehow plants know how and where to act in regard with the various lacks of the body), in opposition with the synthesised drugs which, indeed, are more concentrated than herbs in active compounds (they are usually single compounds in a drug formulation), but usually they treat only specific disruptions in the body. The common drugs do not prevent the human body from getting unbalanced (medically speaking)- the way herbs do.

Herbs can have different impacts on a person's immune system: they can activate the immune response, they can slow down the immune response or, as most of the medicinal herbs are, they can be immune modulators (flexibility in the human immune system).

Herbs can be consumed in various forms: by cooking with them, in teas, but also in food supplements and in volatile oil forms (when the plant produces the oils which can then be extracted). According to the concentration of the active compound needed, the intake should vary as well as the form of administration.

1. *Immune stimulants*

   Why herbal immune stimulants should be implemented in a day-to-day lifestyle is because they are similarly effective as conventional drugs, but they do not affect the immune memory of the cells (which means that they should be constantly taken). They are also known as Antimicrobials because they can act directly on a bacteria or virus.

   Such herbs are:

- Allium sativum (Garlic)
- Baptisia tinctoria (Wild Indigo)
- Echinacea sp. (Echinacea)
- Thuja occidentalis (Thuja)
- Usnea sp. (Old Man's Beard)[1]

More antiviral herbs [4]:

- Origanum vulgare (Oregano- due to *carvacrol)*
- Salvia officinalis (Sage)
- Ocimum basilicu (Basil)
- Salvia rosmarinus (Rosemary)
- Sambucus nigra (Elder)
- Glycyrrhiza glabra (Licorice)
- Zingiber officinale (Ginger)

2. *Immune modulation (Tonic herbs)*
   The saponins and polysaccharides can have a general impact on the immune system responsiveness. They can either increase or decrease the effects of the natural fighting cells in the body (T cells, macrophages, lymphocytes etc). They are generally used when the immune system needs a boost (due to certain weaknesses that have occurred).

- Astragalus membranaceus (Astragalus)
- Codonopsis tangshen (Codonopsis)
- Ganoderma lucidum (Reishi mushroom)
- Lentinus edodes (Shitake mushroom)
- Trametes versicolor (Turkey tail)
- Ligustrum lucidum (Privet)
- Schisandra chinensis (Schizandra)[1]
- Curcuma longa

3. *Hormonal modulation*

The action of the herbs is indirect: the immune response is triggered via endocrine functions (in persons who might be suffering from stress or emotional/ mental irregularities). Example: the activity of the adrenal glands can be boosted through the saponins that can be found in:

- Eleutherococcus senticosus (Siberian ginseng)
- Panax ginseng (Chinese/Korean Ginseng)
- Glycyrrhiza glabra (Licorice) [1]

Moreover, the *lifestyle* is really important when it comes to the well being of people. "Our emotions play a central role in the functioning of our immune systems—so much so, that there's a whole field of science called *psychoneuroimmunology*. Our moods—and sense of connection—have a profound effect on our white blood cells (immune cells, such as B cells, T cells, natural killer [NK] cells, and macrophages). The feelings of stress and social isolation are some of the biggest immune "downers" out there. Stress hormones, such as adrenaline (epinephrine) and cortisol, weaken immune function. "[2]

A more holistic approach would be if one implement the ideology of the articles: "Psychological Stress and Susceptibility to the Common Cold"[3] that states that the psychological stress (which can be generated by the media in the Covid-19 situation) has been associated with an increased risk of acute respiratory illness. The research is based on only about 400 healthy subjects, but it is a start and the well-being of the pacients should definitely not be left out of consideration.

Folk antiviral herbs:

In the Asian part of the world, people take preventing herbs in order to diminish the possibility of contracting the corona-type viruses:

In *TCM* (Traditional Chinese Medicine):

- People start drinking herbs to relieve symptoms even before being tested as positive and therefore the patients in Guangdong and Zhejiang have been reported to have a mortality rate of 0.1% in the case of the Covid-19. [5] The study mentioned in [5], however states that the recovery was due to o combination of modern and traditional therapy.

- "a **blend of Forsythia, Chinese skull cap and Honeysuckle** is categorized as antiviral, antibacterial and found to be good for the immune system)"[5]
- **Cimicifuga rhizoma, Meliaecortex, Coptidis rhizoma, Phellodendron cortex and Sephorasubstrata** have also been proven to have anti-coronaviral effects
- **Lycoris radiata** was showed to be effective in a study from 2005 that underlined the antiviral activities of certain herbs against the SARS-associated coronavirus (a virus that comes from the same "family" as the Covid-19) [6]: "*Lycoris radiata*, *Artemisia annua*, *Pyrrosia lingua*, and *Lindera aggregata* exhibited significant inhibition effects on virus"

Herbs with anti-viral actions:

First of all we should understand how the coronavirus proliferates: "Corona virus infection is caused by a rapidly dividing virus which works by injecting it's genome into the human hosts' cells and multiplies there; hence it depends on other organisms for its growth and therefore makes it more difficult to vanish from the host organism. It is becoming a great topic of research among the drug developers, researchers and scientists." [5]

- Elderberry (Sambucus nigra)—has been traditionally used for treating influentza and colds; it is high and flavonoids that inhibit the Haemagglutinin (HA) (prevents the viral replications- that is vital in inhibiting the proliferation of the coronavirus)

- **Turmeric (Curcumin longa)** as well targets HA to inhibit virus entry

- **Rosemary (Rosmarinus officinalis)** inhibits HA

Surface spike protein inhibitors (the spike proteins located on the coronavirus) facilitate the entry of coronaviruses into the human host cells. Two small molecules, tetra-O-galloyl-beta-D-glucose (TGG) and luteolin have been identified as displaying anti-SARS-CoV activities in wild-type SARS-CoV infection system. Indian gooseberry (Phyllanthus embelica) has displayed anti-CoV activities.

Some believe that the coronavirus has very out-of-the-ordinary effects due to the way it triggers the cytokine storm in the host's body. There are herbs that can prevent this inflammatory cascade: Andrographis (Andrographis paniculata), Echinacea (Echinacea purpurea), Curcumin (Curcuma longa). [7]

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