

GILOY AS IMMUNITY BOOSTER IN COVID 19 PANDEMIC DISEASE

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ABSTRACT

GiLOY (*Tinospora cordifolia*) is an Ayurvedic medicinal plant distributed throughout the Indian subcontinent and China. The whole plant is used in folk and the Ayurvedic system of medicine alone and in combination with other plants. Due to its commercial importance, *T. cordifolia* has been of intense research interest for the last four decades with the isolation of diverse compounds such as alkaloids, sesquiterpenoids, diterpenoids, phenolics, steroids, aliphatic compounds and polysaccharides, along with the discovery of a wide spectrum of pharmacological properties like immunomodulation, anticancer, hepatoprotective and hypoglycemic. Although

pharmacological activities of extracts and compounds of *T. cordifolia* have been studied both in vitro and in vivo, only few mechanisms of action have been explored and need further elaboration. In the present review, the pharmacological activities of compounds and different extracts of *T. cordifolia* are highlighted, along with those of the marketed products, showing the relevance of phytochemicals and the standardization of the marketed products for medicinal use. This compilation of the extensive literature of *T. cordifolia* here will be a referral point for clinical study and the development of standardized phytomedicines in healthcare during COVID 19 disease.

KEYWORDS: *Tinospora cordifolia*, Chemical constituents, Pharmacological activity.

INTRODUCTION

The outbreak of the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) or Covid-19 was reported for the first time in Wuhan, of Hubei province in China in December 2019.^[1] The outbreak was referred to as the outbreak of pneumonia of unknown cause. It was confirmed by Chinese scientists that the disease outbreak was started zoonotic transmission events associated with a large seafood market but soon it also transferred from the person to

person and took the face of “Pandemic” all over the world.^[2] The standard treatment against COVID-19 is presently lacking. Only a few antiviral agents, some antibiotics, and anti-inflammatory agents are being used for the treatment.^[1]

As there is no standard treatment against COVID-19 all preventative measures such as hand cleaning with soap and sanitizer, mouth, and nose coverage with mask during sneezing and coughing are being advised to stop the spread of COVID-19.^[3] The observation of the death pattern of COVID 19 patients revealed that early deaths were in older people, probably because of the poor immunity, which promotes faster progress of COVID-19.^[4] Therefore, it is significant to boost our immune system. It is important to suggest that people should use some supplements to boost their immune systems.

Plants materials are used in Ayurvedic methods of the treatment. Generally, they are non-toxic and without any side effects. Various parts of medicinal plants are popular for their antiviral activities and immunity strengthening capacity.^[5] Pandemic such as COVID19 teaches few important lessons to mankind; such as the importance of hygiene and health. In times, when the world is busy fighting deadly coronavirus, it is necessary to take extra precautions to keep yourself protected from getting infected. Therefore, you need a healthy and strong immune system. The best way is to strengthen our immunity naturally with the help of medicinal plants/herbs. Mother

MATERIALS AND METHODS

This literature review was limited to published articles and books in the English language. Different computerized medical databases were searched for the entire duration of each database as available on the computer search service and other search resources. The following keywords were used for the search: giloy, guduchi and *Tinospora cordifolia*. Results of these searches were reviewed to identify relevant articles.

RESULTS AND DISCUSSION

Tinospora herb has heart-shaped leaves and is been used and advocated in Indian medicine for ages. Drinking fresh Giloy juice helps to improve immunity. It enhances the activity of macrophages (the cells responsible for fighting foreign bodies as well as microorganisms) and thus helps in early recovery. Giloy is also popularly known for its antiinflammatory benefits and helps reduce respiratory problems like frequent cough, cold, tonsils. Giloy powder, Kadha (tea) or tablets can also be used for various skin problems as it helps to remove toxins from the

body. It also shows pharmacological properties like immunomodulation, anticancer, hepatoprotective, and hypoglycemic.^[6]

The immunomodulatory activity of *T. cordifolia* is due to the synergistic effects of compounds including low molecular weight alkaloids, clerodane diterpenoids, sesquiterpenoids and phenyl propanoids (magnoflorine, Nformylannonain, N-methyl-2-pyrrolidone, 11-hydroxymuskatone, cordioside, cordifolioside A, cordifolioside B, cordial, tinocordiside and syringin), a high molecular weight arabinogalactan named G1- 4A, 1,4- α -D-glucan (RR1), and the enzyme thiol amylase.^[7] Clerodane furano diterpenoid glycosides like cordioside, cordifolioside A and cordiol were reported for their macrophage activation, which plays an important role in specific and non-specific immune responses.^[8] Cordifolioside A is an active immunostimulant used in the quality control and standardization of the plant's formulations.^[9] A cadinane sesquiterpenoid glycoside, tinocordiside, possesses immunomodulatory activity. The polysaccharide fraction from *T. cordifolia* effectively reduced the metastatic potential of B16F-10 melanoma cells due to its antioxidant activity towards DPPH and superoxide radicals.^[10]

Literature documentation across different disciplines of study reveals that *T. cordifolia* has been considerably explored in the area of biological activity of different extracts, fractions and compounds with the quantification of some bioactive compounds. The plausible mechanisms of action in in vitro and in vivo models were also explored for crude extracts, formulations, and compounds along with clinical and toxicological studies. The pharmacological data for *T. cordifolia* and its several isolated compounds undisputedly support its use as an ingredient in herbal drugs and formulations. Furthermore, the compounds isolated from *T. cordifolia* having antidiabetic, anti-inflammatory, anticancer and immunomodulatory activity can be used as therapeutic agents against COVID 19 diseases either alone or in combination in a standardized form.

CONCLUSION

There are other certain ways to boost the 'immune system' such as active lifestyle, physical exercise, healthy diet, relaxation, and sound sleep. Practically, the medicinal plants giloy play a supplementary role in developing the immune system and fighting deadly viruses including COVID-19. Comprehensive scientific studies required to make medicinal plants available as robust medicine to fight against viral diseases like COVID-19.

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