

# Traditional approach in prevention and treatment of COVID-19 in Republic of North Macedonia

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## Introduction

Natural products are the fundamental unit of traditional medicine system in Republic of North Macedonia. Macedonian people are rich in traditional medicine (Dervendzi, 1992) especially in folk medicine (ethnomedicine), and this system is gaining much attention after 1991 year (Stojanova et al., 2010).

Corona viruses are important animal and human pathogens. Towards the end of 2019 year, the novel corona virus was identified in Wuhan, China, presented as a cluster of symptoms of pneumonia. Its quick spread resulted in a global pandemic. The dissemination of COVID-19 around the globe has been followed by an increased consumption of antibiotics. This is related to the concern for bacterial super infection in COVID-19 patients. The wrong consumption of antibiotics during the COVID-19 pandemic will raise disastrous effects on antimicrobial resistance (Lucien et al., 2021; Ghosh et al., 2021). Therefore there has been high interest in the use of traditional medicines for COVID-19 from early in the course of pandemic (Yimer et al., 2021).

This research documents detailed ethno pharmacological information on the natural products usage by respondents against corona virus disease in Republic of North Macedonia compared with the literature data.

## Materials and methods

The study was conducted from March 10<sup>th</sup> 2020 to March 31<sup>st</sup> 2022. The investigation was conducted in two stages on the subject above by using electronic databases,

such as Web of Science, Scopus, Medline, PubMed, Google Scholar and face to face interviews were held with respondents and collected the names of local species and traditional remedies being used in this period.

## Results and discussion

Corona virus disease is a worldwide pandemic resulting in a severe acute respiratory syndrome. The study found that the use of natural products has increased during COVID-19 and most of respondents recommended natural products to prevent and treatment.

Functional foods could have co-therapeutic and protective effects against COVID-19 infection (Brown, 2020; Mosleh, 2021). Traditional medicine, has recommended potential functional foods candidates to manage such a global pandemic. Ten traditional medicine functional foods were found in Republic of North Macedonia including a soup and syrup. They are combinations of two to seven ingredients, such as onion, garlic, apple vinegar, honey, pollen, propolis, *Zingiber officinale*, *Cochlearia armoracia*, *Inula helenium* etc. Natural compounds of mentioned formulations have the main pharmacological mechanisms including antiviral, anti-inflammatory, antioxidant, antihistamine, bronchodilator, immunomodulatory, and mucoactive effects as well as central or peripheral antitussive activities.

Respondents focused more on an immunity-boosting diet. Fruits, vegetables, spices, herbs, seeds, nuts, cereals, millets, and superfoods like chlorella and spirulina are good sources of vitamin-C, A, E and D, iron, zinc, folic acid, probiotics and prebiotics. Some studies

(Vishwakarma et al., 2022) have shown reduction in the severity of COVID-19 patients with functional foods with bioactive compounds and plant-based foods.

The study found that the use of medicinal plants has increased during COVID-19 and most of the respondents recommended medicinal plants to prevent COVID-19. This study recorded a total of 50 plants belonging to 30 families. The leaves of the plants were the most frequently used. Most of the people were getting medicinal plants from herbal pharmacies.

The consumption of herbal medicine such as *Origano vulgare*, *Urtica dioica*, *Echinacea purpurea*, *Nigella sativa*, *Matricaria chamomilla*, *Salvia officinalis*, *Plantago major*, *Tussilago farfara*, *Sambucus nigra*, has increased during the global pandemic. We could notice that the respondents are well informed and the use of *Geranium robertianum* increased after the literature data (Kuman et al. 2020) suggest that geranium is valuable natural anti-viral agents that may contribute to the prevention of the invasion of COVID-19 into the human body. Also, the use of *Glycyrrhiza glabra*, increased when studies (Abraham et al. 2021) have suggested licorice to be necessary for COVID-19 treatment.

Significant advances in the science of ethnopharmacology have helped to introduce chemical entities identified from natural sources into modern medicine. However, the wider integration of natural products into the modern drug discovery process will require enhanced collaboration amongst the pharmaceutical industry, academic research units and regulatory bodies. Revisiting this topic holds promise of benefit for both the current and future pandemics.

## Conclusion

Functional foods are cost-effective, easily accessible, and safe options for both treatment and prevention of COVID-19. They might have positive psychological effects along with their pharmacological effects and nutritional virtues. They could also manage persistent

respiratory discomforts after recovery from COVID-19.

People were using more medicinal plants during COVID-19 claiming that they can prevent or cure COVID-19.

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