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EDITORIAL

Black Cumin in Fighting with Coronaviruses

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The recent pandemics caused by the coronaviruses have become major threats for human species in the twenty first century, especially the novel coronavirus disease (COVID-19) caused by SARS-CoV-2 has serious effects on human health and normal lifestyles across the globe with heavy death tolls. Till today (20th June, 2021), a total of 178,936,640 cases have been officially reported, with 3,874,801 cases of death due to COVID-19 across the world [1]. Two previous pandemics of this century were Severe Acute Respiratory Syndrome (SARS) and Middle East Respiratory Syndrome (MERS), which were caused by coronaviruses SARS-CoV/MERS-CoV infections, and emerged in 2002 and 2012 respectively. In all of the three cases of pandemics, the respiratory tract is the site of infection with fatal consequences [2 - 4]. Since the beginning of COVID-19, different drugs have been used, and nowadays, several vaccines are in use to fight against this deadly disease, but still no complete cure [5]. Natural products, especially from plants and herbs have been used for medicinal purposes for thousands of years in different parts of the world. In fact, it is thought that 80% of the world population are dependent on traditional medicines based on natural products. Studies revealed that different natural products or medicinal plants are effective against viral diseases, and more specifically, what we discuss here, their potential against recent viral pandemics are well documented [4].

Black cumin (*Nigella sativa*) has a long history of being used for medicinal purposes traditionally, mainly in Arabaian, African, South Asian and some parts of East Asian countries. In this COVID-19 pandemic situation, I found many rural people relying on black cumin to keep themselves healthy, but certainly, there are little scientific works on black cumin against COVID-19 and other coronavirus causing diseases. Although few, there remain scientific evidences that black cumin is effective against coronaviruses. For example, extracts of black cumin were found to suppress the virus load through

the induction of interleukin 8 (IL-8), and thus interfere with the replication of coronaviruses [6]. Black cumin supplementation is speculated to be beneficial for improving the conditions of COVID-19 patients, and it can be used in combination along with repurposed conventional drugs for the management of COVID-19 patients [7]. A phase III clinical investigation (NCT04347382) has been performed against COVID-19 recently, where the patients were given a mixture of black cumin powder (80 mg/Kg/day) and natural honey (1 gm/kg/day) for 14 days orally, but the result is yet to come out [8]. Usually in any kind of infection, Zn can improve both of innate and adaptive immunity, and bioactive components of black cumin might act as ionophores, so the combination of black cumin and Zn supplementation is also supposed to be beneficial for COVID-19 patients [9].

Thymoquinone is one of the major ingredients of black cumin, and this natural product is a strong candidate for drug development against coronaviruses, including SARS-CovV-2 [10]. Thymoquinone is well-known for its immune-modulatory role, which is probably associated with its anti-viral effects. In an in vitro study, Xu *et al.* [11] found that thymoquinone can inhibit SARS-CoV and SARS-CoV-2 by binding with the human angiotensin-converting enzyme 2 (ACE2), thus blocking the viral entry into host cells. Molecular docking and molecular dynamics simulation study also indicated thymoquinone as a potential inhibitor of ACE2 [12]. The broad spectrum antimicrobial activity of thymoquinone could also be beneficial to minimize secondary infections in COVID-19 patients [13].

There are some recent reviews discussing the possible beneficial role of black cumin or thymoquinone against COVID-19 [14, 15], but the exact molecular mechanism of thymoquinone action against coronaviruses or in COVID-19 patients is not yet clear. However, from preclinical studies and clinical trials as well as the history of traditional medicinal usage, it is clear that black cumin or its major component thymoquinone is a potential candidate of drug development to fight against coronaviruses, especially against SARS-CoV-2 causing deadly COVID-19. There should be more focus on

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black cumin and thymoquinone research in coronavirus or COVID-19 studies.

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