Herbs that might be effective for the management of COVID-19: A bioinformatics analysis on anti-tyrosine kinase property

COVID-19 is an important new infectious disease that affects >150 countries worldwide. This respiratory infection is a public health emergency to be managed. As a new disease, there is limited knowledge of treatment. In general, many drugs are tests for possible efficacy in disease management. The widely used antiviral drugs include oseltamivir and anti-HIV drugs.[1] In medical science, there are also attempts to find herbs, natural products, which might be effective in the treatment of the coronavirus disease.[2] In the previous report, an important target that is useful for the treatment of coronavirus disease is tyrosine kinase.[3] Any herbs that pose anti-tyrosine kinase property might be useful for the treatment of COVID-19. Here, the authors perform a pharmacoinformatics study to search for herbs that have antipeptidase property and might be useful. Using the same database mining technique as in the referencing publication,[4] the PubMed database is used as a primary tool for data mining. According to data mining, there are at least herbs that present anti-tyrosine kinase properties and might be useful for the treatment of COVID-19. Those herbs are *Hesperethusa crenulata*,[5] *Perilla frutescens*,[6] *Ephedra equisetina*,[7] *Shiraia bambusicola*,[8] *Panax ginseng*[9] and *Carthamus tinctorius L* [Table 1].[10] Of interest, those herbs are the classical well-known herbs in East Asia, where the COVID-19 first emerged. The present data mining is only to roughly include potential herbs for further studies on the possible usefulness in the management of COVID-19. Some of these herbs are already confirmed for their advantages in the management of viral respiratory infections. For example, *E. equisetina* and *P. ginseng* are confirmed for its anti-influenza property.[11,12]

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Conflicts of interest
There are no conflicts of interest.

Table 1: Local herbs that have potentials for the treatment of coronavirus disease 2019

Herbs	Origin	Ehnopharmacological indication	Administration	Dose/day*
Hesperethusa crenulata Perilla frutescens Ephedra equisetina Shiraia bambusicola Panax ginseng Carthamus tinctorius L.	Myanmar	Dermatological disorder	Skin paste	Powder paste
	Myanmar, China	Gastrointestinal disorder	Ingestion	2.5 g
	Japan	Cardiovascular disorder	Ingestion	30 mg
	China	Respiratory disorder	Ingestion	25 mg
	Korea, China	Many disorder30	Ingestion	6 g
	Korea	Cardiovascular disorder	Ingestion	30 g

*Dose is referred to local ethnopharmacological practice

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