WORLD JOURNAL OF PHARMACEUTICAL RESEARCH
SJIF Impact Factor 8.084
Volume 11, Issue 14, 630-634. Research Article ISSN 2277– 7105

EXAMINATION OF IN VITRO ANTIVIRAL ACTIVITY OF AQUEOUS EXTRACT OF SMILAX CHINA RHIZOME

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Article Received on
22 August 2022,

Revised on 12 Sept. 2022,
Accepted on 02 Oct. 2022

DOI: 10.20959/wjpr202214-25828

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ABSTRACT

Phytochemicals are secondary plant metabolites that are ecologically derived from plants. Plants develop phytochemicals in order to protect themselves against environmental stress and invasions by harmful microorganisms. It is well established that the phytochemical substances in question can provide therapeutic as well as pharmacological effects on human diseases. It is a well-established fact that the active elements that are found in medicinal plants work together in a synergistic manner to alleviate the primary and secondary difficulties that are associated with a number of different ailments. For the treatment of new Corona virus infections, Smilax china is frequently utilized both as a pharmaceutical agent and as a dietary supplement (COVID-19). In the current investigation, the aforementioned plant is examined to determine whether or not it inhibits the binding of SARS CoV-2 spike protein (RBD) to Human ACE-2 receptors. The findings demonstrated that the aqueous extract has considerable suppression of COVID 19 spike protein when combined with human ACE-2. The data that were presented provide scientific evidence for the antiviral activity, with inhibition of viral entry and therapeutic efficacy. This antiviral activity, inhibition of viral entry, and therapeutic efficacy may be, in turn, due to the presence of biologically active molecules present in the medicinal plant Smilax china.

KEYWORDS: *Smilax china*; *in-vitro* antiviral activity, covid 19, SARS COV2, SARS COVID.

INTRODUCTION

The versatile medicinal plant known as Smilax china has a number of value-added bioactive chemicals. Smilax china can be found in China. In COVID 19/SARSCoV-2 and other viral

infections, it is frequently utilized as a therapeutic drug as well as a preventative supplement. The excellent pharmacological and therapeutic effects of the aforesaid medicinal plant are attributed to the fact that their constituents are rich in phytochemicals and micronutrients. The proposed plant Smilax china has been documented to have a wide range of pharmacological action due to the chemical components it contains and the combination of those compounds with higher therapeutic qualities. Because of the medical benefits it offers, the chosen plant was suggested for use in the treatment of COVID - 19 as an immunomodulator. In the current research, the capacity of the aqueous extract to suppress the SARS COV-2 spike protein was studied. There is a pressing and immediate demand for poly pharmacy, which is required for the dramatic cure of COVID-19 infections. The investigated medicinal plant has a wide range of chemical components that can be used to treat SARS CoV-2.

Smilax china

The perennial climbing deciduous shrub known as Smilax china L. (Liliaceae) can be found growing in abundance throughout Southern China and the countries of Southeast Asia. In traditional Chinese medicine, the leaves of S. china are employed in the role of a detoxicant. The chemical extract that is obtained from Smilax china L. possesses a variety of pharmacological activities, including anti-inflammatory, anti-cancer, and antioxidant properties. Stilbene, flavonoids, polyphenols, and steroidal saponins are the primary active components that can be found in Smilax china L. Additionally, polyphenol chemicals such as resveratrol have been discovered in Smilax china L. The root extracts of Smilax china L. were shown to have actions that included scavenging free radicals and boosting the activity of antioxidant enzymes. The alcoholic extract of Smilax china protects against the induction of lipid peroxidation caused by FeSO4, which can be found in many foods. This could be the result of the chelation of iron, the conversion of Fe2+ to Fe3+, an increase in the level of reduced glutathione, or the scavenging of hydroxyl radicals, superoxide radicals, and other oxygen molecules that are responsible for lipid peroxidation. DPPH tests, in vitro anti-inflammatory activity, and anti-diabetic activity against alpha-amylase were used in our research to evaluate the ability of the aqueous extract and the ethanolic extract (SC-A and SC-ET) to scavenge free radicals. Additionally, SC was tested for its antiviral activity against inhibiting SARS COV 2 spike protein.

ANTI-VIRAL EXAMINATION

MATERIALS AND METHODS

Preparation of extract

Dried powder of *Smilax china* with extracted aqueous (S.C A). 10 grams of crude powder extraction including 100 ml (1:10 ratio) of solvent by Soxhlet apparatus by hot continuous extraction for 10 hours in the water bath. Extract had been harvested and made cool. The extract had been filter out and the clear filtrate is concentrated under vacuum dried and dried extracts give a good yield. Vacuum dried extract used for the pharmacological activity.

Inhibition of covid 2019 spike protein rbd binding with human ace- 2

The extracts were employed in the Ministry of AYUSH-recommended COVID -19/SARS CoV-2 management. For understanding working of action –explore prevention of viral entrance, the extracts were tested for inhibition of COVID-19 Spike protein Receptor Binding Domain (R.B.D) with Human Angiotensin Converting Enzyme (H-ACE-2) in this study (Hilal et al., 2020). SC A used for management of COVID 2019/SARS CoV 2 investigated for inhibition of COVID 2019 Spike protein Receptor binding domain (R.B.D) with Human Angiotensin converting enzyme (H ACE 2) for understanding working of action –explore inhibition of viral entry. KSK aqueous extract (KSK A) inhibits COVID 2019/SARS CoV 2 investigated for inhibition of COVID 2019 Spike protein Receptor binding domain (RBD) with Human Angiotensin converting enzyme (H ACE 2).

RESULTS AND DISCUSSION

Inhibition of covid 2019 spike protein rbd binding with human ace-2

Smilax china rhizome extract was investigated for inhibition of COVID 2019 Spike protein Receptor binding domain (R.B.D) with Human Angiotensin converting enzyme (H ACE 2). Aqueous extract inhibits COVID 2019/SARS CoV 2 in the range of 63-89 % inhibition at 1 mg/ml (Table 26). The compounds Quercetin and Rutin were found to be 92.41 and 49.21% respectively. Extract SCA had significant inhibition of 90.67 and 83% respectively at 1mg/ml.

Table 1: inhibition of COVID 2019 Spike protein assay by using SC A, SC ME I & SC ME II Extracts.

Compounds stock: 2mg/ml		**mg/ml**	**Percentage of inhibition**		
	Working: 1mg/ml	**1**	**49.21**	**92.41**	**83.00**
		0.5	29.16	84.40	62.88
RBD-Baculo: added 1mg/ml	RBD-working-0.5 mg/ml	0.25	11.65	78.40	43.06
		0.125	7.92	72.06	22.33
		0.0625	4.20	55.88	18.01
		0.03125	1.11	29.02	5.94
		0.015625	0.24	13.18	6.84
		0.007813	0	0	0
			Rutin	Quercetin	SCA

CONCLUSION

The inhibition of COVID 2019 Spike protein RBD binding with Human ACE 2 by aqueous plant extracts of Smilax china is vital for the development of therapeutic potentials against SARS Covid. More research is required to fully understand the pharmacological potential of the plant species that have been investigated.

Declaration of interest

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of this article.

ACKNOWLEDGEMENTS

The authors acknowledge “This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.”

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