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Plant based Chemical Inhibitors against SARS-Associated Coronavirus

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ABSTRACT: Severe Acute Respiratory Syndrome (SARS) is a respiratory illness caused by the Severe Acute Respiratory Syndrome coronavirus (SARS-CoV). CoVs are known to cause lot of potentially lethal human respiratory infectious diseases, such as severe acute respiratory syndrome (SARS), Middle East respiratory syndrome (MERS), and the very current spreading infection like coronavirus disease 2019 (COVID-19) outbreak. Regrettably, neither medicine nor vaccine has yet been identified to date to prevent and treat these diseases caused by CoVs. Therefore, effective prevention and treatment medications against human coronavirus are in urgent need. So far the aim of this study was to investigate the available natural drugs show in vitro anti SARS- CoV activity.

Keywords: SARAS-COV, Natural drugs, Amino acids and Antiviral mask.

INTRODUCTION

The severe acute respiratory syndrome (SARS) is a viral infection caused by a newly discovered human coronavirus (SARS-CoV). The condition can cause severe pneumonia, with a 15% to 20% fatality rate. There is currently no effective treatment for SARS-CoV infection. The outbreak's urgency has resulted in the usage of broad-spectrum antibiotics and antiviral medicines in afflicted individuals in various nations. Intensive efforts are being made to get a better understanding of viral replication mechanisms in order to develop targeted antiviral medicines and vaccines (Emily *et al.*, 2004). Some natural medications have been reported to have direct antiviral effects, limit viral entrance and replication at the cellular level by targeting virus-related processes, and increase the host immune response (Driscoll, 2002). These natural molecules extracted from living organisms can play an important role in the development of new drugs because they may have advantages over conventional chemical compound-based medications, such as fewer side effects, lower long-term toxicity, variable bioavailability, and unknown chemical structures and biological activities. As a result, the current investigation identified certain natural chemical inhibitors of coronaviruses.

NATURAL DRUGS

1. Saikosaponins (Isolation from Plant Source)
It is more effective against COVID- 19

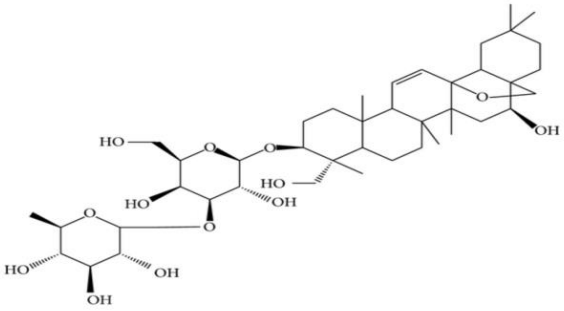

Fig. 1. Molecular formula $C_{42}H_{68}O_{13}$.

It is used in the treatment of viral diseases, inhibiting viral DNA polymerase, binding to specific cell-surface receptors and preventing viral penetration or uncoating, blocking late stages of virus assembly, inhibiting viral protein synthesis, and suppressing immune function are all potential mechanisms of action when treating viral diseases. Others may operate by activating T-cells (Al-Jabri *et al.*, 1996). This chemical has the potential to enter the COVID-19 virus, inhibit viral replication, and halt future development. So far, this medicine has

proven to be more effective and active in the development of virally infected individuals (Hao *et al.*, 2012). It is a completely natural medication made entirely of plant ingredients. When certain chemical-based medications are taken, there are no negative effects (Figure 1).

2. Amentoflavone (Isolation from Plant Source)
It is more effective against COVID- 19

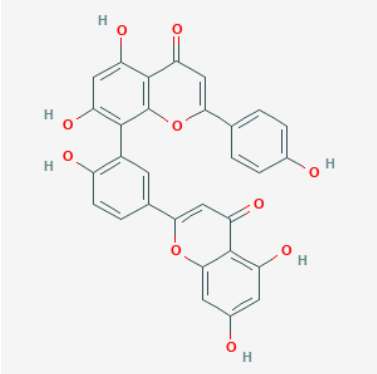

Fig. 2. Molecular formula $C_{30}H_{18}O_{10}$.

Amentoflavone or biflavonoid with anti-inflammatory, antiviral, and cancer-preventive properties. It prevents tumor vascularization by inhibiting the action of angiogenic VEGFs. COX-2 induction is inhibited, and PPAR is increased. It inhibits the GABAA receptor at the benzodiazepine binding site (Chang *et al.*, 2007). These drugs blocked the SARS protease inhibitor, which has been discovered and inhibits the virus's peptide DNA replication (Fig. 2 and 3).

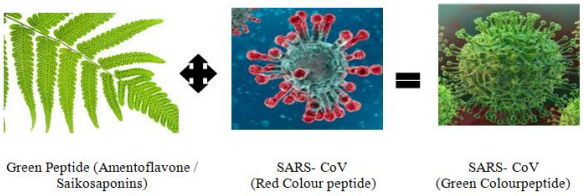

Fig. 3. Mechanism of natural drug binds with SARS COV.

New Developing Product against COVID-19
Face mask with antimicrobial properties:
This mask will be made using natural ingredients such as saikosaponins or amentoflavones. It functions as a SARS-CoV protease inhibitor. It is more resistant to germs and the SARS virus, and it is better for the environment. This chemical has been linked to the following pharmacological activities:

• Antibacterial properties
• It has anti-oxidant and anti-inflammatory characteristics that can protect against neuro-inflammation.
• May help to prevent the development of cancer.
• Aids in the treatment of depression and anxiety.
• Protects the skin from aging, inflammation, and damage to the vascular system.
• Protects the liver and metabolism, promotes bone growth, and prevents hair loss.

Properties of natural drugs
• It exists in the divided solid state and has a melting range of more than 400 °F.
• It is slightly miscible in water. The solubility is expressed in grams per liter.
• It is a pale yellow powder that does not dissolve well in water.

Note: The information above is more beneficial for preparing masks against COVID-19. It is not easily soluble in water, and its melting point is also high, so we can prepare and wear the mask for an extended period of time.

3. L-Isoleucine –Essential amino acid (Vaccine for COVID-19).

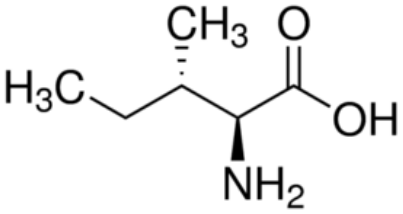

Fig. 4. Molecular Formula $C_6H_{13}NO_2$.

Isoleucine is a type of branched-chain amino acid that is required for certain physiological functions in humans and other mammals (Fig. 4). L-isoleucine will be particularly formed into immune cell proteins such as lymphocytes (Zakaryan *et al.*, 2017; Chuang *et al.*, 1990). They are essential for immunological functions in humans and other animals, such as sustaining the growth of immune organs and cells and increasing the release of immune chemicals and substances. A recent clinical investigation found that dietary l-isoleucine supplementation can help with acute diarrhea, cardiovascular illness, and other organ dysfunction. Which is connected to isoleucine-induced host defense peptide production (Hale *et al*., 2004; Rivas-Santiago *et al.*, 2001). As a result, isoleucine has the ability to limit pathogen invasion through increasing immunity. Because L isoleucine is required to degrade the surface protein of the COVID-19 virus and to limit DNA replication, it may work as a vaccination against the virus (Fig. 5).

Fig. 5. Commercial drug of L-Isoleucine.

CONCLUSIONS

According to the report, several natural medications derived from plant extracts and the chemical L-isoleucine could be used to generate novel anti-SARS-CoV therapies for the treatment of SARS. Furthermore, research on these compounds is required in order to produce an antiviral medication against COVID-19.

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Conflict of Interest. None.

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