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The Natural Products Journal, XXXX, XX, 1-39

MINI-REVIEW ARTICLE

A Comprehensive Study on Natural Products and their Bioactive Constituents to Cure Respiratory Diseases

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Abstract: ***Background:*** In terms of death rates, occurrence, costs, and prevalence, respiratory tract diseases, which include minor issues like the common cold and life-threatening ones like bacterial pneumonia, lung cancers, and tuberculosis, are extremely significant. People have been worried about their health for a long time because of respiratory diseases. Old-style medication has tended to these diseases; however, the accumulation of information produced by elective methodologies, among which medication assumes a significant role, is insignificant. Phytotherapy has consistently given proficient solutions for constant and moderate wellbeing inconveniences and, occasionally, for intense and serious problems. Alleviating the aggravated nasal sections and aviation routes was a shared need in antiquated societies. In this study, we conducted a systematic literature review to gain evidence about herbal products and their phytoconstituents that play a role in respiratory illness. We also predicted the physicochemical properties of various phytoconstituents from therapeutic plants employed to cure respiratory ailments (such as asthma, COPD, cough, tuberculosis, *etc.*).

Objectives: The main objective of this critical study is to explore phytotherapy-based molecules for respiratory illnesses. The physicochemical properties of already isolated compounds have been evaluated to screen for the drug-like behavior of phytoconstituents.

Methodology: A wide variety of literature has been collected from PubMed, Google Scholar, Medline, and other scientific databases. After an exhaustive review, the chemical structures of phytoconstituents responsible for curing respiratory illness were sketched in ChemDraw Ultra 8.0, and these structures have been taken for further analysis of the physicochemical properties of these phytoconstituents. The crucial parameters of phytoconstituents' physicochemical properties were analyzed using the pkCSM webserver.

Result: The results suggest that a variety of phytoconstituents have the potential to treat respiratory illnesses, and the physicochemical parameters reveal that 65 compounds out of 130 screened compounds exhibit Lipinski's rule of five and Veber's rule, while others don't obey these rules. Compounds with optimal physicochemical properties could be promising candidates for emerging respiratory illness treatments.

Conclusion: This critical review highlights the possible therapeutic potential of plant-based medicine to cure respiratory illnesses. The finding shows that a wide range of alkaloids, glycosides, terpenoids, and flavonoids isolated from different herbs may be able to treat respiratory problems. More research is needed to find out the IC50 and MIC values of these compounds against respiratory pathogens like *S. pneumoniae* and *M. tuberculosis*.

ARTICLE HISTORY

Received: November [illegible], 2022
Revised: March 30, 2023
Accepted: May 12, 2023

DOI:
10.2174/[illegible]

Keywords: Respiratory illness, asthma, COPD, physicochemical properties, lipinski's rule, veber's rule.

1. INTRODUCTION

The term "respiratory tract diseases" refers to health problems that affect the airways, like the nose, bronchi, and lungs [1]. These health issues vary from acute infections like pneumonia and bronchitis to chronic disorders like asthma and chronic obstructive pulmonary disease (COPD) [2]. A significant number of people all over the world suffer from the detrimental effects of chronic respiratory fatigue [3]. Some respiratory illnesses, such as bacterial pneumonia, pulmonary embolism, tuberculosis, and lung cancer, are mild

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http://dx.doi.org/10.1016/S0378-8741(03)00232-0 PMID: 12963148

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