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# Characterizations of *Commiphora Gileadensis* Plant: A Review and Future Trends

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**Abstract.** Since Ancient times, *Commiphora gileadensis* has been used to treat a variety of illnesses, and it is still utilised in several Middle Eastern countries' traditional medicine today. There is a lack of data on the leaf and stem extracts of *C. gileadensis*'s phytochemical and structural qualities. The purpose of this review is to highlight the analyses that were carried out to characterise the *C. gileadensis* extract and to point out their results. The method used in this study is focused on a thorough search of the literature, and data from book chapters, research articles, review articles, and conference papers was used. The obtained results of the search to investigate the *C. gileadensis* genus were including the of using Fourier-Transform Infrared Spectroscopy (FTIR), Gas Chromatography–Mass Spectrometry (GC-MS), Liquid Chromatography–Mass Spectrometry (LC–MS), and Nuclear Magnetic Resonance (NMR). Overall, the findings of the characterizations showed that *C. gileadensis* included phenolic compounds, which can be a significant natural antioxidant source for therapeutic applications. The future trends include the suggestions for conducting more characterizations such as Liquid chromatography-mass spectrometry-quadrupole time-of-flight (LC-Q-TOF-MS), Inductively coupled plasma-mass spectrometry (ICP-MS).

## INTRODUCTION

The genus *Commiphora* contains hundred-ninety plant species and is found in the Indian subcontinent (India, Pakistan), northeastern Africa (Somalia, Ethiopia, and Sudan), and southern Arabia (Yemen and Oman) [1,2]. A one-three-meter-tall shrub belonging to the Burseraceae family and genus *Commiphora* is called *C. gileadensis* [3,4]. In the Kingdom of Sheba, *C. gileadensis* has been discovered south of the Arabian Peninsula [5,6]. It was referred to as (Old World) balsam, Mecca balsam, and Judaea balsam [7]. Balm of Mecca, known as *C. gileadensis* (also known as *C. Opobalsamum*), is widely used throughout the Mediterranean Basin, as well as in Asia [1,2,8]. The plant, which is also known as balsam, is well known for the pricey perfume it produces as well as the extraordinary medicinal properties of its seeds, sap, bark, wood, and leaves [2,9]. In Yemen and Saudi Arabia, the aromatic *C. gileadensis* plant is widely grown. In the Middle East, it is used in herbal remedies under the name's balsam and becham/besham [3,10]. Since Biblical times, *C. gileadensis* has been prescribed to treat a variety of illnesses, and it is still used in traditional medicine in several Middle Eastern nations today [5,11,12]. In addition to treating a variety of illnesses like pain and inflammation, *C. gileadensis* has a potent anti-proliferative effect on cancer cell lines [3]. Also, the herb was studied for its anti-cancer effectiveness against cancer cell-lines [9]. Furthermore, it had therapeutic benefits for treating symptoms like urinary retention, headache, jaundice, constipation, urinary retention, liver issues, stomach issues, inflammatory disorders, and joint pain [9]. Balsam from *C. gileadensis* was used as a perfume in the Roman and Hellenistic eras [13-15]. This crop's resin was sold for 2-