

Review of The Investigation of The Medicinal Plant *Commiphora caudata*

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Abstract- The evaluation provided options for future research and development as well as the therapeutic potential of the *Commiphora caudata* based on a thorough assessment of traditional applications, phytochemistry, pharmacological, and toxicological data on the genus.

The importance of Ethnopharmacology

In traditional Indian medicine, the resinous exudates of the *Commiphora caudata*, sometime known as **hill-mango** are used to heal injuries, arthritis, fractures, and disorders brought on by blood stagnation. The therapeutic properties of myrrh against inflammatory disorders, coronary artery diseases, gynaecological diseases, obesity, etc. have led to its usage in the Ayurvedic medical system as well.

The review's objective

The possibilities for future study and development as well as the medicinal potential of the genus *Commiphora caudata* are examined based on an extensive examination of traditional applications, phytochemistry, pharmacology, and toxicology data.

Methods

Electronic searches (using Pubmed, SciFinder, Scirus, Google Scholar, and Web of Science) and a library search for publications published in peer-reviewed journals were used to gather information on the *Commiphora caudata*. Additionally, data was gathered from a few local works on ethnopharmacology. This study examines the pharmaceutical literature, especially from 2005 through the month of 2022.

Results

In Ayurvedic medicine, traditional Indian medicine, and other indigenous medical systems, the resinous exudates from the bark of plants in the genus *Commiphora caudata* are significant indigenous medicines that have a long history of medicinal use for arthritis, hyperlipidaemia, pain, wounds, fractures, and blood stagnation. More than 300 secondary

metabolites from this species have been detected by phytochemical analysis. Several *in vitro* and *in vivo* pharmacological activities, including antiproliferative, antioxidant, anti-inflammatory, and antibacterial, have been found in the separated metabolites and crude extract. Guggulsterones are bioactive steroids that have gained the greatest interest for their powerful anti-inflammatory and anti-tumour activities, as well as their foresaid X receptor-targeting hypolipidemic actions.

Conclusions

The *Commiphora caudata* have emerged as a good source of the traditional remedies used in the treatment of inflammation, arthritis, obesity, microbial infection, wound pain, fractures, malignancy, and gastrointestinal problems. Anti-hyperlipidaemia and anti-schistosomula drugs have been created from the resin of *C. caudata*. Pharmacological findings have supported the genus' usage in conventional treatments. Because plant materials used in certain bioassays have not been precisely characterized, it is critical to develop an analytical technique and standardise extracts before proceeding with biological testing. This genus' stem, bark, and leaf should be given greater consideration. The availability of ongoing research resources would increase prospects for identifying novel bioactive components from *Commiphora caudata*.

Keywords- *Commiphora caudata*, anti-microbial activity, anti-oxidant activity, anti-inflammatory and anti-tumour activities.

I. INTRODUCTION

Hill-mango, or green *Commiphora*, is another name for *Commiphora caudata* (Wight & Arn). Between the months of March and October, crimson blooms are formed in axillary cymes. The Burseraceae family member *Commiphora caudata* (Wight & Arn) is widely distributed in India, Sri Lanka, and the Western Peninsula. It is referred to as "Pachai kiluvai" in Tamil and "Konda mamidi" in Telugu, respectively. Its anti-inflammatory properties are well-known [1]. The plant's different components have been said to have a range of

biological qualities, including antiviral, antispasmodic, cytotoxic, hypothermic, anticomdogenesis, antioxidant, and antiacne effects [2]. Alkaloids, amino acids, flavonoids, glycosides, proteins, reducing sugars, starch, steroids, tannins, and glycosides may all be found in the roots of *Commiphora caudata*. Despite traditional and scientific data supporting a variety of claims and advantages of these plants, adequate assessment and exploitation are still required.[4]

Taxonomy	
Kingdom	Plantae
Phylum	Tracheophyta
Class	Magnoliopsida
Order	Sapindales
Family	Burseraceae
Genus	Commiphora
Species	<i>Commiphora caudata</i> (Wight & Arn.) Engl.



FAMILY

Burseraceae. *Commiphora* is a genus with roughly 185 species. *C. africana*, *C. boranensis*, *C. caudata*, *C. corrugata*, *C. gileadensis*, *C. guidottii*, *C. habessinica*, *C. kataf*, *C. madagascariensis*, *C. mossambicensis*, *C. myrrha*, *C. schimperii*, and *C. Wightii* are a few examples.

II. MORPHOLOGICAL CHARACTERISTICS

A medium-sized, deciduous tree that is thornless and may reach heights of 12 to 15 metres, *C. caudata* has

distinctive papery greenish bark. Compound leaves, alternatives 3 to 7 foliate, with a light green lower surface and a dark green top surface. It has a mucilaginous flavour and no distinctive odour. The shape is ovate-oblong, with dimensions of 4.5 to 6.5 cm in length, 2.2 to 3.5 cm in width, an acuminate apex, and a base that is somewhat asymmetric. The pedicle length ranges from 3.5 to 6.2 cm, and the texture is glabrous, glossy above and sub glaucous below. *C. caudata's* blooms are divided into few flowered and axillary cymes. Unit 4-merous are the flowers. The cupular calyx tube has four lobes. The lobes are triangular and one.5 millimetres long and broad, while the tube is two millimetres long and three millimetres in diameter. The Whorl is hairless and has a yellowish-pink colour. The gyre is made up of four hairless, yellow-pink petals. The petals are five millimetres long and a few millimetres broad, rectangular, and curved at the tip. The eight stamens that make up the androecium. The anthers are rectangular because the filaments are connate and 5-2 millimetre long. The lobe has a two-lobed stigma and a one-millimetre-long style. The flowers smell good. *Commiphora caudata* produces a globose, meaty drupe as its fruit. The size of the fruit is 1.5 cm. *Commiphora caudata* has papery bark. It starts to peel off, revealing the fresh bark's vivid green. Root are diuretic, aphrodisiacs, astringent, sweet, cooling, diabetic, strep throat, fever.

III. SCREENING FOR PHYTOCHEMICALS IN DIFFERENT *Commiphora caudata* EXTRACTS

A major section of the population relies on traditional healers and their arsenal of medicinal plants to address their healthcare needs, which suggests that herbal medicines have a long history of use. The goal of the current study was to look into the presence of different phytochemicals in the bark of *Commiphora caudata*, extracted in hexane, ethyl acetate, and methanol. The three distinct bark extracts were discovered to include a variety of compounds, including phenols, saponins, coumarins, tannins, glycosides, phyosterols, and flavonoids.

IV. PHARMACOLOGICAL ACTIVITIES

4.1 Anti-arthritis properties [8]

According to Girijapashikanti *et al.* (2014), ethanolic extract from commiphora leaves has antiarthritic properties. With experimental rats, in full Freund's adjuvant produced arthritis. The anti-arthritis efficacy of the ethanolic concentrate of *Commiphora caudata* leaves was investigated at 200 and 400 mg/kg. Following their investigation, they came to the conclusion that the ethanolic extract of *Commiphora caudata* leaves likely has anti-arthritis effect.

4.2 Action that is antispasmodic, cytotoxic, and hypothermic [9]

The medicinal herb *C. caudata* may be used for its cytotoxic, hypothermic, and antispasmodic effects.

4.3 Antioxidant and antibacterial properties [10]

Compared to flowers, fruits produced more oil with a greater variety of components. The two primary components of leaf oil are cyclofenchene and -pinene. The two primary components of fruit oil were cyclofenchene and dihydrocarveol.

C. rugosa and *S. aureus* were the 2 fungus and 4 bacteria that were increasingly sensitive to both oils. Both oils demonstrated anti-oxidant properties, which are utilized to preserve and prepare food. Fruit oil has greater antimicrobial and antioxidative action, providing assurance for subsequent tests.

4.4 Anti-inflammatory properties [11]

Commiphora caudata, also known as Protium caudatum, was found to have ester and methanolic extracts, according to Siva kumar T *et al.* were examined for anti-inflammatory effects in rats using a carrageenan-induced technique of hind paw oedema. As compared to control, the ester and methanolic extracts of *Commiphora caudata* (200 mg/kg of body weight) significantly reduce inflammation. Used as a model anti-inflammatory medication was indomethacin. Activity that Improves Learning and Memory Scopolamine was observed to cause amnesia in rats given *Commiphora caudata* 200 and 400, according to Sumanth M *et al.* mg/kg body weight, p.o. enhances memory and learning. This may result from the substance's antioxidant properties, which are linked to flavonoids, tannins, and polyphenols.

4.5 Diabetic activity in a model of diabetes caused by HFD+STZ [13]

According to Anitha *et al.*, the EECC demonstrated significance due to the antidiabetic potential at 400 mg/kg as opposed to 200 mg/kg. Therefore, the ethanolic extract of *C. caudata* roots has demonstrated several alterations in lipoprotein that suggest the extract has antidiabetic potential in this HFD + STZ induced paradigm.

4.5 Anti-inflammatory effect

Anti-inflammatory effect *Commiphora caudata* is a drug of folklore relevance that is, according to S. Bala Sundar

et al. Due to its therapeutic properties, it is frequently used by traditional practitioners. Consequently, it's crucial to biodiversity. *Commiphora caudata* has been shown through experimental analysis of intentionally produced inflammation to have strong anti-inflammatory effects, with oral treatment being superior than external application. The conclusion implies that the trial medicine is successful in lowering inflammation. The decision is hence for inflammatory conditions.

4.6 Antiulcer activity

Indian traditional medicine use *Commiphora caudata* as an antiulcerogenic substance. Despite its potential use, there is no scientific evidence to support its antiulcer action. Therefore, the purpose of this study was to assess the antiulcer properties of the gum exudate and bark extract of *Commiphora caudata* on aspirin-induced ulcer in rats. Following an acute toxicity investigation, the effective dosage of 200 mg/kg was determined. This study included four groups of albino Swiss rats. Rats in group 1 were administered aspirin suspension in 0.5% carboxymethyl cellulose (CMC) orally as a negative control group. Animals in groups 2 and 3 respectively received *commiphora caudata* gum exudate and methanolic extract. Animals in group 4 were administered sucralfate orally as a positive control. It has been discovered that sucralfate does not reduce overall acidity as much as the methanolic extract of *Commiphora caudata*. The fluid secretion has not changed, nevertheless. In addition to lowering overall acidity, the gum formulation also significantly lowered gastric fluid output. When compared to aspirin, sucralfate, methanolic extract, and gum have caused a low ulcer score. Bark extract and gum exudate may increase the stomach mucosal protection mechanism because they contain active plant compounds. But further research is needed to determine how exactly their anti-ulcer action works.

4.7 Anti-diabetic efficacy in rats with diabetes caused by alloxan [16]

According to Siva Kumar T *et al.*, this project will look at *C. caudata*'s ability to reduce blood sugar levels. In diabetic rats caused by alloxan, (Wight & Arn) Engl extracts were used. In comparison to diabetes control medications like Glibenclamide, both extracts significantly decreased blood sugar levels (**P 0.001) at the end of the seventh and fourteenth consecutive days of oral intubations. Additionally, they considerably lowered the levels of TGL, HDL, VLDL, LDL, and total cholesterol.

4.8 Analgesic, anti-oxidant, and anti-inflammatory actions [17]

The results of this investigation showed that the leaves of *C. caudata* had anti-inflammatory properties, according to Annu W *et al.* Its analgesic qualities support its usage in conventional medicine to treat painful and anti-inflammatory disorders. These findings suggest that *C. caudata's* positive benefits may potentially include free essential scavenging activities.

4.9 Cardioprotective potential

According to Sangeetha d, *et al* Zebrafish larvae, an emerging innovative preclinical in vivo model that supports quick decision-making in the early stages of the drug development process, were employed in our work. Due to its benefits, it is adaptable to medium to high throughput screening (HTS). The characteristics of the zf genome have made it a top model system that is applicable to research on human disorders. We conducted preliminary toxicological studies of EECCL on the zebrafish embryo and larvae and discovered no significant retardation in Zf embryo development when exposed to normal concentration (0.5 to 2 ng/ml). This demonstrated that EECCL of leaf would propose no hazard to early life stages of Danio rerio, whereas standard toxin podophyllotoxin showed 100% mortality at 0.01 g/ml. When larval toxicity tests were done on Zf larvae that were 5 dpf, it was shown the absence of mortality at doses of 0.5g and 0.75g/ml. 1, 2 ng/ml of EECCL and 0.5 g/ml of podophyllotoxin, respectively, resulted in 5, 10, 100% mortalities. (Previous investigations utilizing EECCL in acute toxicological studies indicated no mortality in rats up to 2g/kg.) Doxorubicin's overt morphological effects on the heart, such as ventricular collapse and pericardial edema, were avoided by EECCL. Additionally, it entirely restored the heart's ability to contract as indicated by fractional shortening and effectively shielded the organ from the damaging effects of doxorubicin.

V. CONCLUSIONS

The *Commiphora caudata* have emerged as a good source of the traditional remedies used in the treatment of inflammation, arthritis, obesity, microbial infection, wound pain, fractures, malignancy, and gastrointestinal problems. Anti-hyperlipidaemia and anti-schistosomula drugs have been created from the resin of *C. caudata*. Pharmacological findings have supported the genus' usage in conventional treatments. Because plant materials used in certain bioassays have not been precisely characterized, it is critical to develop an analytical technique and standardise extracts before proceeding with biological testing. This genus' stem, bark, and leaf should be given greater consideration. The availability of ongoing research resources would increase prospects for

identifying novel bioactive components from *Commiphora caudata*

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