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Ethnobotanical use of *Commelina* in gastrointestinal disorders

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ABSTRACT

Today digestive problems are common disorders in every household. Gastrointestinal (GI) disorders are of major concern because they cause mortality in humans. In modern medicine treatment of Gastrointestinal disorders involve surgeries and synthetic drug. However, a huge import of drugs at high cost did not improve digestive disorders in rural areas and urban areas. Urban and rural people search for alternative treatment with low cost and safer. According to WHO 80% people use herbal medicinal products for their critical disorder. Traditional medicines are more affordable and easily accessible for Gastrointestinal (GI) treatment sources. That's why *Commelina* species is the best choice for Gastrointestinal (GI) treatment because it contains various bioactive compound. Traditionally *Commelina* species are used for the treatment of a variety of digestive problem. Different studies have shown that *Commelina* species are considered as curing agent for digestive disorders. This study investigated the diversity of *Commelina* sp. used to treat Gastrointestinal (GI) disorders and documented the traditional knowledge associated with them.

Key Words - Traditionally, *Commelina* sp., Medicinal Plant, GI, digestive problems

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INTRODUCTION

In the 21st century, digestive problems are increasing due to urban life and changes in lifestyle diet such as cigarette smoke, alcohol consumption and environmental pollution such as ionizing radiation, pesticides, and heavy metals, are constantly being exposed to an increasing number of people. Over 8 million deaths occur annually in high- and upper-middle-income countries because of chronic and fatal illnesses, especially gastrointestinal (GI) problems (Mousavi *et al.,* 2020). A global public health campaign is launched by the World Gastroenterology Organization (WGO) on May 29th year in recognition of World Digestive Health Day. Each year, this campaign emphasizes prevention and treatment of a specific digestive illness (Talley, 1998; Baumgart *et al.,* 2011) Physiologically, digestion is one of our body's most important functions. Several factors are important

for proper digestion and absorption, including the motility of the stomach and intestines, the activity of enzymes, the right function of the mucosa, and optimal blood flow (Derakhshan *et al.,* 2019). Common symptoms of digestive problems are General malaise, Stomach pain, Nausea, Irritable Bowel Syndrome (IBS), Indigestion, Dyspepsia, Vomiting, Gas, Constipation, Bloating, Heartburn, Diarrhoea, Fatigue, Headache and Epigastric pain (Cheema *et al.,* 2021). In this time various synthetic drug including Antacids, H2 blockers and other medicine like Metoclopramide, Homatropine methylbromide, chronic idiopathic constipation available in the market for various digestive disorders. An antacid can lead to complications mostly in infants or people over 65, common side effects are Gas (flatulence) Anaemia, headache, Osteopenia, Nausea and vomiting, Stomach cramps or pain in the abdomen. Currently, four H2 receptor blockers are available in the United States; these drugs have side effects that include constipation, fatigue, drowsiness, headaches, and muscle aches (Zimmerman *et al.,* 1999; Weberg *et al.,* 1985). However, Worldwide, traditional people treat digestive system disorders with plant-based preparations or herbal medicines. Regular use of herbal remedies in the diet can help people treat a variety of digestive system issues and enhance the system's functionality. Today 80,000 plants are used for therapeutic purposes. (Cheema *et al.,* 2021, Konar *et al.,* 2022; Konar *et al.,* 2023; Kaur *et al.,* 2023). This review's objective is to provide several instances of research that have attempted to confirm and document *Commelina*'s use as a digestive tonic and stimulant.

The herbaceous plant *Commelina* is found in the pantropic, belonging to the Commelinaceae family. This plant sometimes called climbing dayflower. This herb is widely distributed throughout South Asian countries, Africa and America and commonly grows from June to September. Tropical Asia and Africa have several species of *Commelina*. Throughout southern Asia, humans also consume it (Khan *et al.,* 2011; Rahman *et al.,* 2021; Malarvizhi *et al.,* 2019). Different human ailments are treated with whole plants and their parts by folk medicine. According to tradition, almost 95% of Unani, Siddha, Ayurvedic and Homeopathic prescriptions are plant-based (Malarvizhi *et al.,* 2019; Konar *et al.,*2022, Konar *et al.,* 2024).

MORPHOLOGY

Commelina is a perennial herb with a very short flowering time and hence also known as dayflowers. If the stem is cut or injured they secrete thread-like secretion, giving it the appropriate name spiderwort. This plant shows somewhat scrambling growth habit and most commonly found in shady & damp places. Roots are primarily fibrous and rooting occurs at lower nodes. Stems are soft swollen and brittle in nature, it is solid, round and elongated. The leaves are simple cauline with ovate or elliptic-ovate in shape, base is rounded or subtruncate with obtuse or acute apex, pubescent and margin being ciliate. Flowers are cleistogamous in nature, bisexual, actinomorphic, or zygomorphic and trimerous in nature. Sepals are subequal, outer ones linear; inner ones orbicular. Petals blue in colour, larger ones, broadly ovate. Stamens 3 in number, staminodes 2. Ovary 1mm long, fruit is a dry, dehiscent capsule with few seeds. seed with a linear hilum and mealy endosperm. Seed shows epigeal germination and hypocotyl is absent (Rahman *et al.,* 2021).

LOCAL NAME (Rahman *et al.,* 2021; Orni *et al.,* 2018)**:**

English	:	Day flower
Bengali	:	Kanaibashi
Myanmar	:	Myetcho
Philippines	:	Bias-bias
Hindi	:	Kanchara, Kanasiri
Sanskrit	:	Kanchata
Malayalam	:	Adukkavettila
Marathi	:	Kena
Tamil	:	Aduthinnathalai

SYNONYMS (Rahman *et al.,* 2021; Orni *et al.,* 2018)**:**

Commelina diffusa, Commelina cucullata, *Commelina radiciflora*, *Commelina delicatula*,

Commelina hirsuta, *Commelina mollis*, *Commelina rhizocarpa*, *Commelina benghalensis*, Commelina prostrata, *Commelina senegalensis*, *Commelina procurrens*, *Commelina turbinate*, *Commelina uncata*.

APPLICATION PART AND ABOUT DIGESTIVE PROBLEM:

Botanical and Phytochemical Profile of *Commelina* sp.:

These substances importance in therapeutic settings, especially for digestive health (Khare, 2007; Rahmatullah *et al.,* 2010). GC-MS spectrum profiles verified the presence of 21 phytochemical components, most of which were alkanes, terpenoids, and sterols. According to scientific research, *Commelina diffusa* and *Commelina mollis* has anti-inflammatory, antioxidant, antibacterial, antifungal, nephro-protective, hepatoprotective, diuretic, and central nervous system depressive qualities. There was no indication of toxicity in terms of toxicology (Rahman *et al.,* 2021). The phytochemical profile of *Commelina* species reveals a diverse array of bioactive compounds, primarily flavonoids, phenolic acids, alkaloids, terpenoids, and saponins (Ghosh *et al.,* 2015). Flavonoids, especially kaempferol and quercetin derivatives, are abundant in the leaves and have been linked to strong antioxidant activity, which may provide protective effects against oxidative stress in biological systems (Santos *et al.,* 2016). Other important compounds include caffeic acid and ferulic acid, phenolic compounds known for their anti-inflammatory and antimicrobial activities, making them suitable for therapeutic applications, particularly in gastrointestinal and inflammatory disorders (Pandey *et al.,* 2014; Zhang *et al.,* 2020).

Traditional Use of *Commelina* sp. in Digestive Health:

Traditional medicines used to cure a variety of illnesses are largely derived from plants. Over 50,000 of the approximately 4,22,000 flowering plants known to exist have been utilized medicinally worldwide. The majority of the local population, who are sustaining the centuries-old tradition, heavily depend on wild plants for everyday necessities including food, medicine, and fodder. Around the world, traditional medicine is becoming more and more popular, especially on the Indo-Pak subcontinent, where it is referred to as Ayurvedic or Unani. Nowadays, protecting medicinal plants is a major concern (Adnan *et al.,* 2015). An overview of the use of *Commelina* species in traditional medicine. Its usage for stomach and intestinal problems is supported by ethnobotanical data (Balick & Cox, 1996; Longuefosse & Nossin, 1996). Folk medicine made from herbs and natural materials has been used for ages in all cultures. Undoubtedly, plants are a source of potentially beneficial chemical substances that can be used as medications. These molecules have also yielded more recent leads and hints for contemporary design through synthesis. Bengal dayflower, or *Commelina benghalensis*, is a perennial medicinal plant that grows in tropical Asia and Africa. As a traditional medicine, *Commelina benghalensis* is used to treat and prevent a number of illnesses, including burns, sore throats, headaches, leprosy, fever, snake bites, and jaundice (Kansagara, & Pandya,2019). Traditional herbal plants are highly valuable both medicinally and commercially everywhere in the world. Numerous pharmacological effects of *Commelina benghalensis* are recognized in this review. Research on this plant has demonstrated its wide range of pharmacological characteristics and significant therapeutic benefits. It has been observed that practically every plant part, but particularly the leaf, has a variety of active and inactive chemical compounds with a broad spectrum of therapeutic benefits that have been utilized extensively as traditional or folk medicine for ages (Kansagara *et al.,* 2019).

Despite the massive importation of expensive veterinary medications, intestinal diseases continued to plague livestock in Benin. However, there are many diverse and abundant anti-gastrointestinal plants in the nation that are little known, ignored, and misused. The current study documented the traditional knowledge related to the variety of plants used to treat gastrointestinal ailments (Ouachinou *et al.,* 2019). The existence of traditional medicine around the world is largely

dependent on the wide variety of plants and the associated knowledge about their application in herbal therapy. Many ethnic communities still rely on these therapeutic plants to preserve their health and well-being. Traditional medicine has grown in popularity as a result of the generally low economic conditions in rural areas and the limited access to mainstream care. Additionally, many researchers are focusing on the utilization of medicinal plants to treat childhood illnesses in rural areas (Ndhlovu *et al.,* 2023).

Pharmacological Mechanisms Related to Digestive Health:

Many medicinal systems have long utilized *Commelina* species, especially *Commelina benghalensis* and *Commelina communis*, to treat digestive disorders. We go over bioactive substances, historical applications, and recent studies that back up their use in the management of common digestive issues like inflammation, indigestion, and imbalances in the gut microbiota. With symptoms ranging from minor dyspepsia to chronic diseases like irritable bowel syndrome (IBS) and inflammatory bowel disease (IBD), digestive disorders are common throughout the world. As people's choice for natural and less invasive therapies grows, there is increased interest in using plant extracts to manage digestive health. Traditional medical systems use *Commelina* species because of their possible anti-inflammatory, antibacterial, and antioxidant qualities, which can help can benefit gastro-intestinal (GI) health. It has been investigation of the antioxidant, antibacterial, and anti-inflammatory qualities of *Commelina* sp.

How these qualities might help treat digestive issues like stomach ulcers, diarrhoea, and dyspepsia. In vivo and in vitro effects of *Commelina* extracts have been studied by Pandey *et al.*, 2014; Che *et al.*, 2017. *Commelina benghalensis* is used as an anti-inflammatory, demulcent, emollient, and depressive medication in India to treat a variety of conditions, including epilepsy, leprosy, headache, constipation, mouth thrush, fever, snake bite, jaundice, insanity, and psychosis sickness. It is used to treat female infertility in Lesotho. It is used as a febrifuge and diuretic in China (Kansagara, & Pandya, 2019)

Application of *Commelina* Extracts in Digestive Health: Evidence:

An overview of clinical and laboratory research on extracts from *Commelina* sp. used to treat digestive disorders. Experimental results or case studies demonstrating *Commelina* sp.'s beneficial effects on digestive health (Zhang *et al.*, 2020). An overview of the several types of preparation, including tinctures, teas, and capsules. Gastro-intestinal problems are among the most concerning diseases since they frequently occur in farms, resulting in the death of young animals and a reduction in output. Treating cattle in Benin is difficult, as it is everywhere else, because breeders have to deal with the high price of contemporary veterinary medications and the emergence of treatment resistance. The possible existence of residues in goods obtained from animals (meat and milk) which poses a health hazard to the consumer; thus, reinforcing the need for user-friendly ethno-veterinary medicine (Ouachinou *et al.,* 2019).

Application of *Commelina* sp. Extracts for Digestive Health:

Commelina sp. extracts significant phytochemical content, which contains flavonoids, phenolic acids, and other bioactive components, has drawn attention to its use in treating digestive issues (Rahmatullah *et al.,* 2010). According to Pandey (2014), flavonoids in particular are well-known for their capacity to regulate gastrointestinal motility and have antioxidant properties that guard against damage to the stomach mucosa. *Commelina* sp. has been shown in numerous studies to be beneficial in treating gastrointestinal inflammation, diarrhoea, and dyspepsia. According to traditional methods, the leaves are frequently made into a tea or infusion to ease digestive discomfort and stomach aches (Balick & Cox, 1996). Experimental studies support the traditional use of *Commelina* sp. for its antimicrobial properties. For example, a study by Che *et al.* (2017) found that *Commelina diffusa* extract exhibited significant anti-

inflammatory effects, which are beneficial in reducing intestinal inflammation and improving overall gut health. Furthermore, Zhang et al. (2020) demonstrated that the antioxidant activity of *Commelina* sp. extracts may reduce oxidative stress in the digestive tract, potentially alleviating symptoms of irritable bowel syndrome (IBS).

CONCLUSION

Commelina species are essential herbal medicinal to human survival as medicine. eases. To counter the danger from serious illnesses of GI and to guarantee the survival of human beings, extract of bioactive compound of *Commelina* species is necessary to continually produce better.

It's bioactive compound plays a significant role to treat in stomach ulcers, diarrhea, and dyspepsia. This plant has also been found to be used as a folk medicine for treating GI. *Commelina* species is not only used for digestive disorders but also treats several illnesses, including burns, sore throat, headache, leprosy, fever, snake bites, and jaundice. There is evidence that this plant possesses remarkable therapeutic properties. For future clinical trials, more research is needed to determine the mechanisms mediating the *Commelina* 's bioactivities and any potential toxicity.

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CONFLICT OF INTEREST

Authors declare no conflict of interest.

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