Journal of Pharmacognosy and Phytochemistry
Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
https://www.phytojournal.com
JPP 2023; 12(2): 84-87
Received: 06-12-2022
Accepted: 14-01-2023

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Morphological and pharmacological study of herbal medicine: *Corchorus olitorius* L.

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Abstract
Corchorus olitorius L. is an edible herbal plant belonging to the family Malvaceae. Commonly; it is called "Jew's mallow" or "Jute Nalta." It is widely used as a vegetable in Asia and Africa. In India, it is used in the Textile and paper industries. *Corchorus olitorius* has been shown to have various pharmacological activities such as antitumor activity, antihyperglcaemic effect, antipyretic effect, analgesic effect. The aim of this article is to provide information regarding the pharmacological activity and botanical description of the Jute plant.

Keywords: *Corchorus olitorius*, Herbal plant, antipyretic, analgesic

Introduction
Since the beginning of human history, herbal treatments have been utilised to treat ailments. On a global basis, some 20,000 plant species are used as medicinal herbs. Around 25% of all medications administered globally are manufactured using plant materials. The demand for medical plants is increasing in both developed and developing nations as more people become aware of how efficient, safe, non-narcotic, inexpensive, and side-effect-free natural medicines may be. In the past, there have been many different types of medicinal plant species in India [1]. Native vegetables are crucial to human nutrition. They provide the body with protein, energy, as well as vitamins, minerals, and certain precursors to hormones [11]; despite the popularity of exotic vegetables, some native vegetables have been found to be more nutrient-dense and more affordable. The commerce in medicinal plants is widespread on a global basis. Jute plant, also known as *Corchorus olitorius* L, is one such therapeutic plant. It is a native leafy vegetable whose leaves are particularly rich in critical minerals and amino acids and are eaten by people in parts of Asia, the Middle East, and Africa [10]. Leaves are used as an herbal remedy for typhoid or malaria. Leaves are an herbal remedy for typhoid or malaria. The seeds are edible, and the dried leaves are used to make tea and thicken soup. The chemical components corchorin, corchorgenin, capsularin, corchoritin, olitoriside, and corchortoxin are obtained from the seeds of *Corchorus olitorius*, which is a good source of a variety of cardiac glycosides [8]. With a substantial amount of easily absorbed tocopherol, the plant also exhibits antioxidant action [17]. The fibre from plant stems is used to make a variety of products, including garments, bags, ropes, and packaging. Because it can be broken down organically, its fibre is environmentally beneficial [7].

Origin
A leafy vegetable called *Corchorus olitorius* L. is grown both in Africa and the Middle East. Egypt and the southern U.S. are two warm locales where nalta jute is grown. The world's largest producers of tossa jute, Bangladesh and India, are believed to be the countries that originally produced it. The leaves are used to make the mucilaginous herb "molokhiya." Currently, *Corchorus olitorius* is widespread across the tropics and is likely present in every country of tropical Africa.
Many nations in tropical Africa claim it is a wild or domesticated vegetable. It is a popular leaf vegetable in Zimbabwe, Kenya, Uganda, Benin, Nigeria, Cameroon, and Côte d'Ivoire. As a leaf vegetable, Jew's mallow is also grown in the Caribbean, Brazil, India, Bangladesh, China, Japan, Egypt, and the Middle East [14].

History of jute
The conservator of the Kolkata botanical garden sir William Roxburg, introduced the jute plant to the world in 1975 as the first fiber producing plant. The East India Company immediately started using Bengali jute fiber in place of linen in the Dundee mill.

With the help of a linen weaving machine, the scientist name Thomas Neigh was produced jute yarn by spinning jute fiber [19]. Jute Agricultural Research Laboratory (JARL) in Bangladesh and the Jute Technological Research Laboratory (JTRL) in Taliganj were established by The Indian Central Jute Committee (ICJC) which was founded in 1938. The study of jute on a large scale was carried out from 1936 to 1947; however, operations came to an end as a result of the partition of India in 1947. The Pakistani government then established the (PCJC) Pakistan Central Jute Committee. In Dhaka, in the years 1951–1952, this group managed the founding of the Jute Research Institute (JRI), today known as the Bangladesh Jute Research Institute (BJRI). This organization works on both agricultural and industrial aspects of jute and allied fiber crops, from field sowing through final fiber and jute products, for its many functions at the end-user level [18].

Vernacular name
English- Nalta Jute, Jew's mallow, Tossa Jute
Hindi- Pat-sag, Mithapat
Bengali- Bhungipat
Tamil- Punaku
Telugu- Parinta

Geographical climate
Plain alluvial soil and stagnant water are requirements for jute. The monsoon climate, during the monsoon season, provides the ideal environment (warm and wet) for cultivating jute. Typically, between February and June, it is sown. Relative humidity levels between 70% and 80% and temperatures between 20 °C and 40 °C are ideal for optimal growing. Weekly rainfall of 5-8 cm is necessary for jute, and more during the sowing season [13, 15].

Taxonomy [16]
Kingdom: Plantae
Super division: Embryophyta
Division: Tracheophyta
Class: Angiospermae
Order: Malveles
Family: Malvaceae
Genus: Corchorus
Species: *Corchorus olitorius*

Morphology of jute plant [20]
Root: Taproot system, numerous branches developed.

Stem: The jute plant's stem is used to make jute. Herbaceous, erects cylindrical. Solid, slender, smooth at the top but rough at the base, branching near the top, green in color, mucilaginous.

Leaves: Simple, alternate, deciduous, petiolate, petiole long, margin serrate, auriculate, lower two serrations prolonged into fine pointed auricles, apex acuminate, venation reticulate.

Flowers: Complete, pedicellate, bracteate, small, bisexual, (Dichlamydeous, actinomorphic,) regular, (Pentamerous, hypogynous yellow in color.

Male: Stamen are numerous, polyandrous, the filament is long and thin, and the anthers are small, kidney-shaped, and 2- lobed.

Female: Carpels5, syncarpous, ovary superior, 5-locular with many ovules, style is short, stigma is capitate, placentation axile.

Nutrient contents
High molecular weight ester waxes made up the majority of the lipophilic chemicals, accounting for 24% of the total extract, followed by free fatty acids (17%), free fatty alcohols (17%), and -hydroxyfatty acids (14%). Alkanes (6%), hydroxyfatty acids (6%), sterols (6%), steroid and triterpeneoids ketones (3%), and steryl glycosides (1%) were also found in large quantities. Jute is made of cellulose that has been joined together by un-celluloses like lignin, pectin, and hemicelluloses etc. α-cellulose (57.8-63.1%), hemicelluloses (21.1-24.2%), lignin (11-14%), wax (0.3-0.8%), pectin (0.3-0.5%), protein (0.7-2.5%), mineral matter (0.5-1.2%), and tannin and other coloring pigments are the typical components of this chemical in jute. Proteins, beta-carotene, iron, calcium, vitamin B, folic acid, amino acids, and vital minerals are abundant in *C. olitorius* leaves [2-4]). They are abundant in minerals including (Ca^{+2}) calcium and iron as well as vitamins A, C, and E. [5, 6]. More magnesium is found in jute leaves than in spinach or cabbage. A variety of bioactive substances, including phenolics, glycosides, polysaccharides, triterpenes, ionones, sterols, and fatty acids, are found in the genus Corchorus, claims the study [9].

Pharmacological activity
1. Hypoglycemic property [23]
Methanol extract of aerial parts (MECO) treatment has been shown to have a hypoglycemic effect in mice, resulting in dose-dependent drops in blood glucose levels in animals that had been given a glucose load. The extract decreased blood glucose levels in comparison to control rats by 18.6, 29.3, 32.9, and 50.7% at dosages of 50, 100, 200, and 400 mg per kg, respectively. In contrast, glibenclamide, a common anti-hyperglycemic medication, decreased glucose levels in the blood by 48.9% when given at a dose of 10 mg per kg. In a study by Momo *et al*., it was found that traditional leafy vegetables could alter the metabolism of lipids and carbohydrates to prevent and treat diabetes. In a few investigations, *C. olitorius* showed a drop in serum blood glucose levels [26].

2. Analgesic property [23, 24]
MECO at dosages of 50, 100, 200, and 400 mg per kg decreased the amount of writhing by 19.2, 42.3, 53.8, and 57.7%, respectively, in analgesic activity tests. (Acetyl salicylic acid) Aspirin, a common painkiller, decreased the

amount of writhing by 38.5 and 65.4% at doses of 200 and 400 mg per kg, respectively.

3. Antimicrobial effect [25]
The observations are beneficial for standardizing the plant *C. olitorius* leaf components. The leaf extract in aqueous form had antibacterial properties.

4. Antipyretic effect [28]
The aqueous extract of the leaves of the jute plant, *C. capsularis* L., showed strong analgesic activity, anti-inflammatory, and anti-pyretic properties in a dose-dependent manner.

5. Antitumor activity [27]
To examine the anti-cancer promoting impact, an immunoblotting investigation was performed using a mouse antiserum against P3HR-1 cells that produce EBV. At dosages of 15 g/ml (50.7 mM) and 30 g/ml (38.8 mM), respectively, phytol and monogalactosyldiacylglycerol completely blocked the induction of the EBV early antigen.

Conclusion
Presently, natural medications and excipients are becoming increasingly popular. Because they are non-toxic, more affordable, and readily available, natural materials do have advantages over synthetic ones. Additionally, they can be altered to produce materials specifically suited for the medication delivery system and compete with synthetic agents already on the market. One of the most significant sources of medications comes from plants. The therapeutically significant essential oils and secondary metabolites found in medicinal plants are abundant. In addition to being affordable, efficient, and readily available, medicinal plants' major benefits for therapeutic usage in treating various illnesses include safety. Since the beginning of time, medicinal plants have been utilized to treat a variety of illnesses. People living in villages have long used indigenous plants as medicines because this knowledge has been carried from generation to generation and is based on lifelong experiences. Because these are widely used by the local population and are of great importance, many people trade in important medicinal herbs around the world, especially. In addition, villages lack sufficient health facilities and are located far from cities. Jute is the world's second most important natural fiber crop, after cotton. The study emphasizes the effectiveness of "traditional medicine," an old practice still practiced in some regions of India.

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