Chapter 23
Ethnic Use, Phytochemistry, and Pharmacology of Cyperus rotundus: A Medicinal Plant

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ABSTRACT

Cyperus rotundus (nut grass in English) is a perennial erect sedge plant and is distributed in over 90 countries of the world, where it has been mostly classified as a highly invasive weed. Despite this classification, the plant has been considered from traditional times to be medicinally important. The traditional uses of the plant in various countries include uses against various gastrointestinal tract disorders, skin diseases, leprosy, fever, and neurological disorders. Evaluation of the plant and especially its rhizomes in a scientific manner has revealed the presence of numerous phytochemicals and wide-ranging pharmacological activities, which include anti-microbial, gastrointestinal, wound healing, anti-diabetic, anti-cancer, anti-malarial, anti-obesity, hepatoprotective, and anti-pyretic activity. The scientific validation of a number of traditional uses strongly indicates that the plant may prove useful in the discovery of a number of lead compounds and novel drugs.

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INTRODUCTION

Cyperus rotundus L. is a perennial herbaceous plant belonging to the Cyperaceae family. It has an extensive network of rhizomes, tubers, bulbs and roots through which it can propagate easily, which has made it a very invasive plant and as such been classified as an invasive weed in the more than 90 countries that the plant is now found. The plant is believed to have originated from India, where its Sanskrit name as in Ayurveda is 'nagarmotha' (Bajpay, Nainwal, Singh & Tewari, 2018). The plant is found at present in various countries of Asia, Africa, Europe, North America, South America, and the Pacific Islands. Being present in so many countries, the plant has numerous names in the local vernacular. Some of the vernacular names given in The Global Invasive Species Database (GISD) [http://www.iucngisd.org/gisd/species.php?sc=1448] are tiririca-vermelha (Portuguese, Brazil), oniani lau (Maori, Cook Islands), vuthesa (Fijian), souchet à tubercules (French), zigolo infestante (Italian), soro ni kabani (Fijian), pakopako (Tongan, Tonga), coco grass (English), mauku'oniani (Maori, Cook Islands), mothe (English, Nepal), chufa (Spanish), mumuta (Samoan), oniani tita (Maori, Cook Islands), ya khon mu (Thai), vucesa (Fijian), juncia (Spanish), tiririca (Portuguese, Brazil), sur-sur (Pampangan), capim-alho (Portuguese, Brazil), tuteoneon (Marshallese), mala-apulid (Pampangan), alho-bravo (Portuguese, Brazil), castanuela (Spanish), brown nut sedge (English), almendra de tierra (Spanish), Rundes Zypergras (German), xiang fu zi (Chinese), mutha (Tagalog), coquito (Spanish), coquillo purpura (Spanish), ya haeo mu (Thai, Central Thailand), coquillo (Spanish), tamanengi (Palauan), coco (Spanish), purple nut sedge (English), pakopako (Tagalog), herbe à oignons (French), and juncia real (Spanish). In Bangladesh, the plant is known as 'mutha' or 'mutha ghas'.

The plant also has a number of synonyms. Some of the synonyms according to the Plant List [http://www.theplantlist.org/tpl1.1/record/kew-238342] are *Chlorocyperus rotundus* (L.) Palla, *Chlorocyperus salaamensis* Palla, *Cyperus agrestis* Willd. ex Spreng. & Link, *Cyperus arabicus* Ehrenb. ex Boeckeler, *Cyperus bicolor* Vahl, *Cyperus bifax* C.B.Clarke, *Cyperus bulbosostoloniferus* Miq., and *Cyperus comosus* Sm. The taxonomic hierarchy of the plant is given below.

Kingdom: Plantae
SubKingdom: Viridiplantae
Division: Tracheophyta
Subdivision: Spermatophytina
Class: Magnoliopsida
Order: Poales
Family: Cyperaceae
Genus: *Cyperus*
Species: *Cyperus rotundus* L.

[https://www.itis.gov/servlet/SingleRpt/SingleRpt?search_topic=TSN&search_value=39900#null]

As reviewed by Bajpay et al. (2018), traditional medicinal uses in a number of countries of the plant include "indigestion, constipation, dysentery, abdominal distension, neurogenic gastralgia, chest pains, irregular as well as painful catatonia, skin diseases, furuncle infections, staphylococcal infections, leprosy, and sprains and bruises". The substantial number of ethnic or traditional medicinal uses combined with a plethora of pharmacological activities with the whole plant or plant parts, which include anti-microbial, gastrointestinal, wound healing, anti-diabetic, anti-cancer, anti-malarial, anti-obesity, hepatoprotective

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