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FIELD SURVEY OF THERAPEUTIC UTILIZATION OF *Cocos nucifera L* IN INDIGENOUS MEDICINE AND IDENTIFICATION OF CHEMICAL CONSTITUENTS OF INFLORESCENCE OF *Cocos nucifera L*

PABA SURANGI SATHSARA SARANASINGHA EDIRISURIYA

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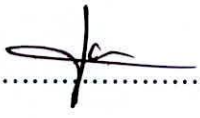
DECLARATION

I do here by declare that the work reported in this thesis was exclusively carried out by me under the supervision of Prof. A.M Abeysekara. It describes the result of my own independent research except where due reference has been made in the text. No part of this thesis has been submitted earlier or concurrently for the same or any other degree.



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P. S. S. S Edirisuriya — Date

Certified by:

....

Supervisor:
Prof. A. M. Abeysekara
Department of chemistry
University of Sri Jayewardenepura

Date

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List of abbreviations

TLC	Thin layer chromatography
NP/PEG	Natural products reagent
UV	Ultra violet
R_f	Retention Factor
cm	Centimeter
g	Grams
nm	Nano meter
v/v	Volume to volume
L	Liter
M	Molarities
^oC	Celsius
ml	Milliliters
hrs	Hours

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Field survey of therapeutic utilization of *Cocos nucifera L* in indigenous medicine and identification of chemical constituents of inflorescence of *Cocos nucifera L*

P. S. S. S. Edirisuriya

ABSTRACT

Coconut palm (*Cocos nucifera L)* has been well known for centuries for its healing properties in indigenous medicine. Especially the immature coconut Inflorescence is consumed for treating diseases of gynecological system. So the current study was done with the aim of gathering ethno medico botanical knowledge about *Cocos nucifera L* and identifying the chemical constituents of the coconut inflorescence. Field survey of therapeutic utilization of *Cocos nucifera L* was carried out in Galle and Colombo districts of Sri Lank with randomly selected 50 indigenous practitioners using semi-structured questionnaire. The objectives of the survey were searching ethno-medico botanical literature, collecting data from the informants and observing morphological characters for identifying the varieties *Cocos nucifera L.* From the study it was indicated that every part of the coconut tree has medicinal value. Coconut water, kernel, inflorescence, leaves and roots are the commonly used (75% - 100%) plant materials of *Cocos nucifera L* in indigenous medicine. High percentages (93%) of practitioners supply evidence of the effectiveness of the coconut inflorescence for treating gynaecological problems. In addition to that common varieties of coconut according to their vernacular names were identified. The phytochemical screening of inflorescence of *Cocos nucifera* L was studied

to determine the major phytochemicals present in the inflorescence and possibly relate the constituents to its medicinal/pharmacological uses. Phytochemical analysis was carried out on the water, ethanol and hydrolyzed aqueous extracts of *Cocos nucifera L* inflorescence. Identification was done using phytochemical screening tests, thin layer chromatography and UV Spectrometry. The results obtained from the phytochemical analysis of the inflorescence of *Cocos nucifera L* showed the presence of saponins, flavonoids, triterpenoids, steroids, and the absence of alkaloids. The inflorescence of *Cocos nucifera L* contained proanthocyanidin that could be the major constituent of the immature plant tissues. This study also reveals the utilization of inflorescence of *Cocos nucifera* L in indigenous medicine of Sri Lank and its efficacy for treating many debilitating ailments included gynaecological diseases.

Chapter 1

1.0 Introduction

1.1 Background significance

Coconut palm which is botanically known as *Cocos nucifera L* has been well known for centuries for its healing properties in folk systems of medicine all over the world. In Ayurvedic and traditional medicine of Sri Lanka, coconut is one of the commonly used trees where all the parts are being used for various therapeutic purposes.

Since almost all parts of the coconut tree are believed to have medicinal properties, they are used for various medicinal preparations. Coconut Oil is the base oil of most of the herbal oil preparation in indigenous medicine. Coconut milk and liquid of immature coconut are also widely used as the base material of various formulas in indigenous medicine.

Modern medical science is now confirming the use of coconut in treating many of the conditions, which were used for ancient remedies.

1.2. Botanical description

Cocos nucifera L is a member of the monocotyledonous family Arecaceae (Palmaceae) and is the only species of the genus.

1.2.1 Scientific classification

Kingdom	:	Plantae
Subkingdom	:	Tracheobionta
Super division	:	Spermatophyta
Division	:	Magnoliophyta
Class	:	Liliopsida
Subclass	:	Arecidae
Family	:	Arecaceae
Genus	:	*Cocos L.*
Species	:	*Cocos nucifera L.*

1.2.2 Synonyms of *Cocos nucifera L*

Some of the synonyms used for the coconut are given below.

Common	:	Coconut, coconut palm
Dutch	:	Kokos, Kokosnoot
French	:	Coco, Noix de coco
German	:	Kokos, Kokosnub
Hindi	:	Gari, Nariyal, Narial
Indonesian	:	Kelapa
Italian	:	Cocco
Malay	:	Kelapa, Nyiur
Sanskrit	:	Narikela
Sinhala	:	Pol, Polgasa
Spanish	:	Coco fruto
Tamil	:	Tengai, Tengu

1.2.3 Area of origin and culture

Cocos nucifera L is native to tropical eastern regions. Today it is grown both in the Asian continent (India, Sri Lanka, Indonesia) and in Central and South America (Mexico, Brazil). In Africa, the largest producing countries are Mozambique, Tanzania and Ghana.

1.2.4 Etymology

The name Cocos probably derives from a Portuguese word meaning monkey, because its nut, bearing three germinating pores, resembling a monkey face. Its specific name is derived from Latin, meaning nut-bearing.

1.2.5 Ecology

The coconut palm thrives on sandy, saline soils. It requires abundant sun light and regular rainfalls over the year.

1.2.6 Morphology

The coconut palm is a single trunk plant that may live as long as 100 years and reaching up to 100 feet in height. Its bark is smooth and grey, marked by ringed scars left by fallen leaf bases.

The leaves (from 4 to 6 m long) are pinnately compound with 200 or more leaflets, and borne in a spiral arrangement at the apex of the trunk. Leaflets are linear-lanceolate, rigid and bright green. Healthy palms have about 30 leaves.

The inflorescences, arising at leaf axils and enveloped by a carinate spathe, are un branched spadices. Flowers are off-white to gray or yellow and unisexual. Separate male and female flowers are borne in the same inflorescence. They are generally protandrous, meaning that male flowers release pollen before females become receptive. Female flowers are Larger, oval in shape, less numerous and borne basally. Male flowers are numerous in the peak, bear 6 stamens since each leaf axil produces one inflorescence, and new leaves are produced approximately monthly.

Coconuts are large, dry drupes ovoid in shape, up to 15" long and 12" wide and 1-2 kg in weight. The exocarp or skin is green, yellow, or bronze-gold, turning to brown, depending on cultivar and maturity. The mesocarp is fibrous and dry at maturity. As it is rather light, it can be carried long distances by water while keeping its germinability for a long time. The endocarp is the hard shell enclosing the seed. Seeds are filled with endosperm which is partly liquid (coconut milk) and partly solid (kernel).