

## NARIKELA (COCOS NUCIFERA LINN.), A HEIGHTED PALM TREE WITH HIGH MEDICINAL VALUE IN AYURVEDA – A REVIEW

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### ABSTRACT :

*Ayurveda* delineates the use of *Narikela* (*Cocos nucifera* Linn. Arecaceae) in classical texts for the management of different diseased conditions. In this article, an attempt has been made to compile as critically and its information related to *Narikela* from six *samhitas*, seven *samgraha granthas*, nine *nighantus* and other published texts. It is observed that Fruit, Root, Flower, Fruit milk, Fruit pulp of *Narikela* are used as an ingredient in 53 formulations, which are effective in more than 25 disease conditions. The main indications include *mutraroga* (urinary disorders), *shula* (pain), *vajikaran* (aphrodisiac), *charma roga* (diseases of skin) , *mutrakruchha* (dysuria), *prameha* (increased frequency of urine), *amlapitta* (acidity), *rak-tapitta* (bleeding disorder), *rasayan* (rejuvenating agent) etc. Different parts of *Narikela* are used in about 15 dosage forms; such as *kvatha* (decoction), *lepa* (paste), *avaleha* (semi-solid preparations), *taila* (oil), *rasa* (mineral preparation), *vati* (pills), *ghrita* (fat soluble preparations), *churna* (powder), *dhuma* (fumigating preparation), *asava* (alcoholic preparation) etc.

**Key words:** *Ayurveda*, *Cocos nucifera* Linn., Formulations, *Mutraroga*, *Narikela*

**INTRODUCTION:** *Ayurveda* deals with drugs of plant, animal, metal and mineral origin, where maximum drugs are of plant origin.<sup>[1]</sup> Information pertaining these drugs are available in the classical texts of *Ayurveda*. *Narikela*, one of the classical drugs of herbal origin, botanically identified as *Cocos nucifera* Linn., has been used by the Ayurvedic physicians.

**Botanical Description:** *Narikela* is a type of palm tree, 20-30 m high. Stem bark grayish-light brown. Leaves pinnately compound, 2-4 m long; Flowers greenish-yellow, Fruit green, yellowish or orange, 20-30 cm long and 15-20 cm in diameter, with thick fibrous covering and a hard, ovoid-ellipsoid shell inside bearing a seed;

endosperm a layer of white, albuminous matter and a watery fluid.<sup>[2]</sup>

**Classical review:** Texts of *Ayurveda*, systematically recorded the varieties, synonyms, part used, pharmacological properties, actions and indications of *Narikela* in the respective texts, in their style of presentation. Its use, as an ingredient of compound formulations is recorded in *samhitas* (treatise) as well as in *samgraha granthas* (compendia of *Ayurveda*). On review it is observed that no single hand information is available regarding the uses and indications of *Narikela* as delineated in classical texts of *Ayurveda*. Hence, in this article, an attempt has been made to present the same.

Various available *samhitas* (classical texts), *nighantus* (lexicons), *samgraha granthas* (compendia) and some other texts related to *prayoga* were referred; the synonyms, properties, actions and various formulations with their *adhikara* (prime indication) were compiled, criti-

cally analyzed and arranged in a systematic manner.

**Synonyms:** Ayurvedic lexicon describes the plant drug through *paryaya* (synonyms). *Narikela* was attributed 60 synonyms for describing its morphological and pharmacological characters, in various texts. (Table 1)

**Table 1: Synonyms attributed to NARIKELA in different Nighantus (lexicons).**

Sr. No.	Synonyms <sup>[3-7]</sup>	Meaning <sup>[8-10]</sup>
1.	<i>Kerah</i>	-
2.	<i>Tungadrumah</i>	Its fruit contains kshira
3.	<i>Keli</i>	Disguise, amusement, concealment
4.	<i>Narikeli</i>	Coconut tree or fermented liquor made from it.
5.	<i>Mahaphalah</i>	Having great fruits / bearing much fruits
6.	<i>Khanodakah</i>	Having udaka inside the green ripen fruit
7.	<i>Jalaphalah</i>	The nut of <i>Bispinosa</i>
8.	<i>Tryakshakah</i>	Fruit have three eyes at the top
9.	<i>Chancho</i>	It is famous plant
10.	<i>Languli</i>	It leaves has pointed end
11.	<i>Rasaphala</i>	Cocoa-nut tree
12.	<i>Tunga</i>	It is a tall tree & grows straight
13.	<i>Kurchashekhara ,langali</i>	Have brush like structure at the top
14.	<i>Taalvruksha</i>	It is resemble to taal tree
15.	<i>Dradha phala</i>	The fruit is hard
16.	<i>Dakshinatyaka</i>	It grows mostly in south
17.	<i>Latavriksha</i>	It provides support to climbers
18.	<i>Dradhabeja</i>	Due to having very hard seed
19.	<i>Skandhaphala</i>	Fruits appear on trunk
20.	<i>Choch</i>	The uneatable part of fruit / the fruit of palm
21.	<i>Trunaraaj</i>	Tree regarded as king of the trun group of plants
22.	<i>Sutungak</i>	It is a very tall tree
23.	<i>Dradhavriksha</i>	It has very strong and very hard stem
24.	<i>Tryakshaphala</i>	Its fruit has three eyes (three partition)
25.	<i>Dradhaneer</i>	It's pulp is hard in dry state
26.	<i>Daakshinatya</i>	It is easily found in South India
27.	<i>Sadaphala</i>	Always bearing fruits
28.	<i>Narikel</i>	It is easily found near river-bank
29.	<i>Kurchashirshaka</i>	Its upper part is brushy / hairy
30.	<i>Junga</i>	-

31.	<i>Nariker</i>	It has very good smell
32.	<i>Nadikeli</i>	It is easily found near river-bank
33.	<i>Narikari</i>	It is easily found near river-bank
34.	<i>Narikeri</i>	It is easily found near river-bank
35.	<i>Sadapushpa</i>	Always bearing flower
36.	<i>Shiraphala</i>	Fruits are on the top of the tree.
37.	<i>Mruduphala</i>	The inner pulp of the fruit is very soft.
38.	<i>Putodaka</i>	Having water in its Hollow or interior
39.	<i>Sutungakurchashekhar</i>	It is very tall tree with brushy structure on the top
40.	<i>Neelataru</i>	It's a tree with sky heights
41.	<i>Malelya</i>	-
42.	<i>Uchchataru</i>	A lofty tree
43.	<i>Skandhataru</i>	Cocoa-nut tree
44.	<i>Dura ruha</i>	Having fibres on dry fruit
45.	<i>Trayambak phala</i>	Having three partition on fruit
46.	<i>Shiraaphala</i>	Fruits mainly obtained at the top of the tree
47.	<i>Karakaambu</i>	-
48.	<i>Payodhar</i>	Contain water or milk
49.	<i>Mutkun</i>	
50.	<i>Kaushikaphala</i>	It is believed that fruit of Narikela liked by Rishi Vishvamitra
51.	<i>Phalamunda</i>	Fruit is very hard
52.	<i>Jataphal</i>	Specific type of fruit
53.	<i>Mundaphala</i>	Having very strong fruit
54.	<i>Vishvamitrapriya</i>	The tree is dear to vishvamitra
55.	<i>Nadikela</i>	It is easily found near river-bank
56.	<i>Nariker</i>	Its fruit with milky pulp
57.	<i>Subhanga</i>	It is dry fruit believed to be auspicious
58.	<i>Phalakeshar</i>	Fruits having fibre
59.	<i>Varaphala</i>	Possessing or yielding the best fruits
60.	<i>Toyagarbha</i>	Containing water

**CLASSIFICATION** :Classical texts of Ayurved mentions *Narikela* under different categories by keeping the drug under various *vargas* ( groups of drugs ) like *Madhurskandha* ( sweet in taste ),<sup>[11]</sup>

*Amradi phala varga*, *Amradi varga*,<sup>[4]</sup> *Aushadhi varga*,<sup>[5]</sup> *Mahavriksha varga*,<sup>[7]</sup> *Haritakyadi varga*.

**Table 2: Pharmacological properties of *Narikela* attributed by different *Nighantus* [12-17]**

<b>Rasa</b>	<b>Guna</b>	<b>Virya</b>	<b>Vipaka</b>	<b>Doshkarma</b>	<b>Karma</b>	<b>Rogaghñata</b>
<i>Madhura</i>	<i>Guru, snigdha</i>	<i>Shita</i>	<i>Madhura</i>	<i>Vaat-pit-tahara</i>	<i>Balya, Bruhaniya, Basti shodhan, Trushnanigrahan, Jvaraghna, Hridya, Mutral, Deepan, Vrushya, Raktapittanashak, Shramhara, Vaatroganashak, Raktashodhan, Vishtambhi, Keshya, Kandughna, Pramehaghna, Shulahara, Vajikaran</i>	<i>Daah, Vaatpitta, Raktapitta, Mutraroga, Shukradosh, Trushna, Shram, Hridya roga, Vaatropa, Rakta vikar, Kshayaroga, Prameha, Daurbalya, Jvara, Khalitya-Palitya, Kandu, Shula, Amlapitta</i>

**Pharmacological properties of *Narikela*:** *Narikela* has been attributed with *madhur rasa, madhur vipak, shita veerya*, has *guru* and *snigdha gunas*. It pacifies *vaat* and *pitta doshas*. (Table 2) It is being recommended to alleviate various disease conditions like *Daah* (burning sensation), *vaatpitta* (diseases due to *vaat* & *pitta doshas*), *raktapitta* (bleeding disorder), *mutraroga* (urinary disorders), *shukradosh* (impurities of semen), *trushna* (thirst), *shram* (exertion), *hridayaroga* (cardiac diseases), *vaatropa* (diseases of joints), *raktavikar* (impurities of blood), *kshyarog* (tuberculosis), *prameha* (frequent passage of urine), *daurbalya* (weakness), *jvara* (febrifuge), *khalitya* (hair fall), *palitya* (early greying of hairs), *kandu* (itching), *shula* (pain), *amlapitta* (acidity).

**Table 3: Formulations of *Narikela* as noted in classical text of *Ayurved***

<b>Sr. No.</b>	<b>Formulation</b>	<b>I/E</b>	<b>Dosage form</b>	<b>Adhikar</b>	<b>Part used</b>	<b>Reference</b>
1.	<i>Arshoghno Dhuma</i>	E	<i>Dhuma</i>	<i>Arsha</i>	Fruit	BR
2.	<i>Baladhyam Ghrutam</i>	I	<i>Ghruta</i>	<i>Unmaad</i>	Fruit water	BBR-3,
3.	<i>Bruhannarikelkhanda</i>	I	<i>Khanda</i>	<i>Amlapitta</i>	Fruit pulp	VS
4.	<i>Chandanavaleha</i>	I	<i>Avaleha</i>	<i>Daah</i>	Fruit water	BBR-2,
5.	<i>Erandpaka</i>	I	<i>Avaleha</i>	<i>Vruddhyadhikar</i>	Fruit pulp	BBR-5
6.	<i>Himasagar Taila</i>	E	<i>Taila</i>	<i>Vaatropa</i>	Fruit	BR

					water	
7.	<i>Ikshvadi Ghrutam</i>	I	<i>Ghruta</i>	<i>Raktapitta</i>	Fruit water	BBR-5,
8.	<i>Kaamvano Rasa</i>	I	<i>Rasayoga</i>	<i>Vajikaran</i>	Fruit	BBR-5
9.	<i>Kumari Tailam</i>	E	<i>Taila</i>	<i>Shiroroga</i>	Fruit	BR,
10.	<i>Kushmandakavaleha</i>	I	<i>Avaleha</i>	<i>Raktapitta</i>	Fruit pulp	BR, BBR-1
11.	<i>Kushthari Tailam</i>	E	<i>Tailam</i>	<i>Kushtha</i>	Fruit pulp	RRS, BBR-5
12.	<i>Lakshmivilas Tailam</i>	E	<i>Taila</i>	<i>Mastishkachikitsa</i>	Fruit water	BR
13.	<i>Loharasayam</i>	I	<i>Rasayoga</i>	<i>Rasayan</i>	Fruit water	BBR-4, VS
14.	<i>Madhukadi Nasyam</i>	E	<i>Taila</i>	<i>Vaatvydhi</i>	Fruit milk	BBR-4,
15.	<i>Mahamartand Tailam</i>	E	<i>Taila</i>	<i>Charmaroga</i>	Fruit	BBR-4, RRS
16.	<i>Naracharasa</i>	E	<i>Rasayoga</i>	<i>Udavart</i>	Fruit	BR
17.	<i>Narikel khanda</i>	I	<i>Khanda</i>	<i>Amlapitta</i>	Fruit pulp & water	VS
18.	<i>Narikela Khanda</i>	I	<i>Khanda</i>	<i>Shularoga</i>	Fruit	BBR-3, CD, BR, YR,
19.	<i>Narikela Khandapaka</i>	I	<i>Khanda</i>	<i>Amlapitta</i>	Fruit pulp	BBR-3, VS, YR
20.	<i>Narikela Kshara</i>	I	<i>Bhasma</i>	<i>Shularoga</i>	Fruit	BR
21.	<i>Narikela Lavan</i>	I	<i>Churna</i>	<i>Parinaamshula</i>	Fruit	VS, CD, RT
22.	<i>Narikelaasava</i>	I	<i>Asava</i>	<i>Vajikaran</i>	Fruit water	BBR-3,
23.	<i>Narikeladi yoga</i>	I	<i>Paniya</i>	<i>Mutrakrucha</i>	Fruit water	YR
24.	<i>Narikeladipeyam</i>	I	<i>Paniya</i>	<i>Mutrakruchha</i>	Fruit water	BBR-3, YR,
25.	<i>Narikeladiyoga</i>	I	<i>Paniya</i>	<i>Murchha</i>	Fruit water	BBR-3,
26.	<i>Narikelajaladipeyam</i>	I	<i>Paniya</i>	<i>Mutrakruchha</i>	Fruit water	BBR-3, YR,
27.	<i>Narikelakhanda (Bruhat)</i>	I	<i>Khanda</i>	<i>Shularoga</i>	Fruit	BR, CD
28.	<i>Narikelambvadiyoga</i>	I	<i>Paniya</i>	<i>Murchha</i>	Fruit	YR

					water	
29.	<i>Narikelamrutam</i>	I	<i>Avaleha</i>	<i>Shularoga,</i>	Fruit pulp & fruit water	BBR-3, BR,
30.	<i>Narikelamrutam</i>	I	<i>Avaleha</i>	<i>Amlapitta</i>	Fruit pulp & water	VS,
31.	<i>Narikelapaka</i>	I	<i>Avaleha</i>	<i>Vajikaran</i>	Fruit	BBR-3,
32.	<i>Narikelapushpadi Kwath</i>	I	<i>Kwath</i>	<i>Stiroga</i>	Flower	BBR-3,
33.	<i>Narikelayoga</i>	I	<i>Paniya</i>	<i>Shularoga</i>	Fruit	BBR-3, VS,
34.	<i>Pugipaka</i>	I	<i>Avaleha</i>	<i>Prameh</i>	Fruit	BBR-3,
35.	<i>Rajvallabh Gutika</i>	E	<i>Gutika</i>	<i>Virechan</i>	Fruit	BBR-4,
36.	<i>Raktanarikeljalyoga</i>	I	<i>Paniya</i>	<i>Mutraroga</i>	Fruit water	BBR-4
37.	<i>Rasonadi Lepa</i>	E	<i>Lepa</i>	<i>Vaatroga</i>	Fruit water	BBR-4,
38.	<i>Raupyarasvati</i>	I	<i>Vati</i>	<i>Prameha</i>	Fruit pulp	BBR-4,
39.	<i>Saushrutnarikelaprayog</i>	I	<i>Churna</i>	<i>Vajikaran</i>	Fruit	RRS
40.	<i>Shankhandhyanjanam</i>	E	<i>Anjan</i>	<i>Netraroga</i>	Fruit	BR
41.	<i>Shriphalakusumavatika</i>	I	<i>Vati</i>	<i>Stiroga</i>		BBR-5,
42.	<i>Shukrastambhakarivatika</i>	I	<i>Vati</i>	<i>Shukrastamban</i>	Fruit	BBR-5,
43.	<i>Snuhyaditailam</i>	E	<i>Tailam</i>	<i>Kushtha</i>	Fruit milk	BBR-5, RRS
44.	<i>Sphatika Churna</i>	I		<i>Prameha</i>	Fruit	BR
45.	<i>Taalksharadhyanjanam</i>	E	<i>Anjan</i>	<i>Netraroga</i>	Fruit	CD
46.	<i>Tamrarasayanam</i>	I	<i>Churna</i>	<i>Rasayan</i>	Fruit water	BBR-2, VS
47.	<i>Tandulapralep</i>	E	<i>Lepa</i>	<i>Kushtha</i>	Fruit water	CD
48.	<i>Trapusivijadiyoga</i>	I	<i>Paniya</i>	<i>Ashmari</i>	Flower	YR, VS, BBR-2
49.	<i>Vaataha Potali</i>	E	<i>Potali</i>	<i>Vaataroga</i>	Fruit	YR
50.	<i>Vajikaro Vatak</i>	I	<i>Vatak</i>	<i>Vajikaran</i>	Fruit water	BBR-4,
51.	<i>Vedavidhya Vati</i>	I	<i>Vati</i>	<i>Prameh</i>	Root	BBR-4, BR
52.	<i>Yashtyadi Kwatha</i>	I	<i>Kwath</i>	<i>Mutraroga</i>	Fruit water	BBR-4,
53.	<i>Yavan Ratneshvar</i>	I	<i>Vati</i>	<i>Unmaad</i>	Fruit	BR



**BBR**- Bharat Bhaishajya Ratnakar [18], **BR**- Bhaishajya Ratnavali [19], **CD**- Chakradata [20], **RRS**- Rasa Ratna Samuchchaya [21], **RT**- Rasa Tarangini, [22] **VS**- Vangasen [23], **YR**- Yoga Ratnakar [24]

It is observed that *Narikela* has been used as an ingredient of 53 formulations comprising of 38 internal and 15 external formulations. In external applications, the formulations are indicated for *charma roga* (diseases of skin), *vaatvyadhi* (diseases of joints), *malavarodh*

(Constipation), *Udavart* (upward movement of gas), *shiroroga* (diseases of head), *netraroga* (diseases of eye), *kushtha* (skin disease), *arsha* (piles), etc.

Formulations indicated for internal administration disease condition like *Raktapitta* (bleeding disorder), *Mutrakruchha* (dysuria), *prameha* (increased frequency of urine), *vajikar* (aphrodisiac), *shula* (pain), *murchha* (faintness), *stiroga* (gynaecological disorder), *unmad* (insanity), *amlapitta* (acidity), *parinamshula* (duodenal ulcer), *daah* (burning sensation), *ashmari* (kidney stone), *rasayan* (rejuvenating agent), etc

Highest number of formulations was found in *mutraroga* (6), *shula* (6) & *vajikaran* (6), followed by *vaatroga* (4), *charmaroga* (4), *prameha* (4), *amlapitta* (4), *raktapitta* (2), *rasayan* (3), *stiroga* (2), *netraroga* (2), etc.

It is also observed that the fruit of *Narikela* is being used in highest number of formulations (49), followed by flower (3) and root (1).

#### PHARMACOLOGICAL ACTIVITIES:

**Antidote effect:**TCW is found to eliminate poisons in case of mineral poisoning, and ameliorate drug induced over dosage toxicity. The TCW aids the quick absorption of drug and makes their peak concentration in the blood easier by its electrolyte effect, which is similar to fructose coupled

faster absorption into the cells and body.<sup>[25]</sup>

**Antioxidant effect:**A free amino acid, L-arginine (30 mg/dl), is present in TCW which significantly reduce the free radical generation. TCW also contain vitamin C (15mg/100ml) that significantly reduce lipid peroxidation when introduced in rats.<sup>[26]</sup> VCO is capable of increasing antioxidant enzymes when supplemented with diets in rats.<sup>[27]</sup>

**Cardio protective effect:**Coconut is composed of the fatty acids caprylic acid C-8:0 (8%), capric acid C-10:0 (7%), lauric acid C- 12:0(49%), myristic acid C 14:0 (18%), palmitic acid C-16:0 (8%), stearic acid C- 16:0 (2%), oleic acid C- 18:1 (6%), linoleic acid C-18:2 (2%).<sup>[28]</sup> It is abundantly (65%) endowed with medium chain saturated fatty acids (MCFAs), which allows them to be directly absorbed from the intestine and sent straight to the liver to be rapidly metabolized for energy production and thus MCFAs do not participate in the biosynthesis and transport of cholesterol. Coconut water has cardioprotective effect.<sup>[29]</sup>

**Antimicrobial and antiviral activities:**The decoction of *Cocos nucifera* L. husk fiber has been used in northeastern Brazil traditional medicine for treatment of diarrhea and arthritis. Water extract obtained from coconut husk fiber and fractions from adsorption chromatography revealed antimicrobial activity against *Staphylococcus aureus*. The crude extract and one of the fractions rich in catechin also showed inhibitory activity against acyclovir-resistant herpes simplex virus type 1 (HSV-1-ACVr). All fractions were inactive against the fungi *Candida albi-*

*cans*, *Fonsecaea pedrosoi* and *Cryptococcus neoformans*. Catechin and epicatechin together with condensed tannins (B-type procyanidins) were demonstrated to be the components of the water extract.<sup>[30]</sup>

**Antioxidant and antimicrobial:** The antioxidant activity of the methanolic extract prepared from different stages of *Cocos nucifera* L. mesocarp was demonstrated, by DPPH, FRAP and deoxyribose assays, and suggests the potential of the mesocarp extract to be used for therapeutic purposes. Antimicrobial activity of the crude mesocarp extract was tested against *Staphylococcus aureus* ATCC 25923, *Bacillus subtilis* ATCC 441, *Escherichia coli* ATCC 25922 and *Pseudomonas aeruginosa* MTCC 7925. The extract exhibits a potent anti-staphylococcal activity. Probable compounds responsible for the bioactivity were identified by means of HPLC and UV/ESI-MS spectroscopic analyses. Their structures were deduced as 5-O-caffeoylquinic acid (chlorogenic acid), dicaffeoylquinic acid and three tentative isomers of caffeoylshikimic acid.<sup>[31]</sup>

**Antinociceptive and free radical scavenging activities:** In the current study, the analgesic and free radical scavenging properties of an aqueous extract from the husk fiber of *Cocos nucifera* L. (Palmae) were demonstrated by the use of in vivo and in vitro models. The orally administered *Cocos nucifera* aqueous extract (200 or 400 mg/kg) inhibited the acetic acid-induced writhing response in mice. Tail flick and hot plate assays demonstrated that treatment of animals with this plant extract at 200 mg/kg induced attenuation in the response to a heat stimulus. A LD<sub>50</sub> of 2.30 g/kg was obtained in acute toxicity tests. Topical treatment of rabbits with the *Cocos nucifera* extract indicated that it does not induce any significant dermic or

ocular irritation. In vitro experiments using the 2,2-diphenyl-1-picryl-hydrazyl-hydrate (DPPH) photometric assay demonstrated that this plant extract also possesses free radical scavenging properties.<sup>[32]</sup>

**Antiulcerogenic effects:** A warm water crude extract of coconut milk and a coconut water dispersion were investigated for their antiulcerogenic effects in male Wistar albino rats. Ulcers were induced in the male rats by subcutaneous administration of indomethacin (40 mg/kg) using standard procedures. The ulcer inhibition rate (UIR) was taken as a measure of the cytoprotection offered by test substances. Coconut milk (2 ml daily oral feeding) produced a stronger percentage (54%) reduction in the mean ulcer area than coconut water (39%). The effect of coconut milk was similar to the effect of sucralfate that reduced the mean ulcer area by 56% in this study. Sucralfate is a conventional cytoprotective agent. The results showed that coconut milk and water via macroscopic observation had protective effects on the ulcerated gastric mucosa. It is concluded that coconut milk offered stronger protection on indomethacin-induced ulceration than coconut water in rats.<sup>[33]</sup>

**Antihyperglycemic activity:** Improvement in the Fasting blood glucose and the restoration of all other biomarker as well as enzymes indicates that hydro-methanol extract of *Cocos nucifera* has very good antidiabetic activity with very low side effects and provides a scientific rationale for the use as an antidiabetic agent.<sup>[34]</sup>

**Antinociceptive and anti-inflammatory activities:** Crude extract (CE, 50, 100, and 150 mg/kg), fraction 1 (F1, molecular weight lesser than 1 kDa, 1, 10, and 50 mg/kg), fraction 2 (F2, molecular weight higher than 1 kDa, 1, 10, and 50 mg/kg), significantly develop periph-



eral and central antinociceptive activity but with less effect on supra-spinal regions of the brain. Administration of the opioid antagonist, naloxone (5 mg/kg) inhibited the antinociceptive effect indicating that *Cocos nucifera* crude extract and fractions may be acting in opioid receptors. CE and F1 also inhibited rat paw edema induced by histamine, and serotonin.<sup>[35]</sup>

**Burn wound healing property:** It was noted that there was significant improvement in burn wound contraction in the group treated with the combination of *Cocos nucifera* and silver sulphadiazine. The period of epithelialization also decreased significantly.<sup>[36]</sup>

**Other Pharmacological activities of *Narikela*:** Modern research has reported different therapeutic activities of the narikel as an electrolyte<sup>[37]</sup>, Antithrombotic effect<sup>[38]</sup>, Antiatherosclerotic effect<sup>[39-42]</sup>, Hypolipidemic effect<sup>[43-46]</sup>, Anticholelcytic effect<sup>[47]</sup>, Antibacterial activity<sup>[48-55]</sup>, Anticaries activity<sup>[56-59]</sup>, Antidermatophytic activity<sup>[60-63]</sup>, Antiviral effect<sup>[64,65]</sup>, Antifungal effect<sup>[66-68]</sup>, Antiprotozoal activity<sup>[69-71]</sup>, Anticancer effect<sup>[72]</sup>, Immunostimulatory effect<sup>[73,74]</sup>, Antidiabetic effect<sup>[75]</sup>, Hepatoprotective activity<sup>[76]</sup>, Disinfectant activity<sup>[77,78]</sup>, Insect repellent<sup>[79,80]</sup>, Hormone like effect<sup>[81]</sup>.

**Therapeutic Uses**<sup>[82, 83, 84]</sup>

1. *Kesharoga*: Its oil is used for the different types of hair problems.
2. *Parinamshoola*: *Narikela Lavana* is used along with *Pippali churna* to cure *Parinamshoola*
3. *Mutrasarkara*: The flower powder of *Narikela* is used along with curd to treat *sarkara* present in stool & urine.
4. *Shirashoola*: Coconut water is used to cure *Shirashoola*.

5. *Kruminasanartha*: The decoction of *Narikela* root is used along with asafoetida to kill worms.

6. *Vrana*: Old coconut oil having quick wound healing property.

7. *Kshyajashirashoola*: Coconut water with sugar is used to treat *Kshyajashirashoola*.

8. *Chardi*: Coconut water along with sugar, honey & *Pippali churna* to pacify vomiting.

9. *Vipadika*: Raw rice are kept inside the coconut (making a hole) until it is decomposed and then it is applied locally.

10. *Dadru*: Kernel oil of *Narikela* is best for skin disease like eczema.

11. *Daha*: Coconut water is applies to reduce the burning sensation (small pox).

12. *Mukha roga*: Powder of kernel mixed with Sunthi is used in oral infection.

13. *Charma roga*: Coconut oil is applied along with *Kapora*, *Safeda* and *Kabila* to cure skin diseases and wound.

14. *Kushtha*: The outer hard shell is burnt to extract out oil, which is used to cure *Kushtha*.

15. *Medoroga*: Ripen fruit oil is used to treat *Medoroga*.

**Dose:** Fruit kernel 10-20 gm; *Kshara* 1-2 gm.

**Formulations:** Various *samgrah granthas* (compendias) were scrutinized for the formulations containing *Narikela* as an ingredient and mentioned in above table 3.

**Conclusion:** *Narikela* (*Cocos nucifera* Linn.) is found throughout India and its description can be traced since Samhita period. *Narikela* is attributed with pharmacological properties i.e *madhura rasa*; *madhura vipaka* and *shita virya*; and useful to combat various disease conditions such as *mutraroga* (urinary disorders), *Shula* (pain), *Vajikaran* (aphrodisiac) etc. It is used in more than 53 classical formu-

lations, more than 15 dosage forms, used in about 25 diseased conditions, 15 external and 38 internally used.

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