Research Article

Available Online at: www.ijpir.com

International Journal of Pharmacy and Industrial Research

ISSN Print 2231 – 3648
Online 2231 – 3656

Preliminary Phytochemical Investigation and Evaluation Of Anti-Microbial Activity of Cocos Nucifera Oil

S.A.Vadivel*[1], Dr.P.Dinesh kumar[1], N.Neeraj kumar[1], A.Karthigayani[1], M.Bhuvaneshwari[1], G.Nitish kumar[2]

[1]Smt Gandhimathi College of Pharmacy, Nallan Pillai Petral, Tiruvannamalai, Tamil Nadu.
[2]R.R. College of Pharmacy, Chikkabanavara, Bangalore, Karanataka.

Corresponding author: S A Vadivel
Email: vetrivadivel24@gmail.com

ABSTRACT

The current work extract of oil isolated from the sun dried coconut pieces of Cocos nucifera. Then the antimicrobial activty is evaluated by using suitable standard. The oil was collected from the sun dried coconut pieces of Cocos nucifera using oil extraction Chekku electric machine. The oil extract of the coconut pieces of Cocos nucifera was subjected to Anti-Bacterial studies against gram positive oraganism and gram negative organism (Staphylococcus aureus, staphylococcus epidermidis, Escherichia coli, Klebsiella pneumonia) as compared with ciprofloxacin as standard. Then the antifungal activity done against Aspergillus Niger compared with ketaconazole as a standard.

Keywords: Cocos nucifera oil, Antimicrobial activity. phytochemical investigation

INTRODUCTION

The coconut palm is a palm tree in the family Arecaceae, it is of genus Cocos and botanical name cocos nucifera. The cocos nucifera is also called tēṅkāy in tamil. It is traditional medicine, the coconut has been used as a medicinal plant for centuries. The plant is originally from Southeast Asia and the islands between the Indian and Pacific oceans. From the region, the fruit of the coconut palm is believed to have been brought to India. This coconut palm is also known as coconut, coco, coco-da-Bahia or coconut of the beach. [1] The team coconut is derived from Portuguese and Spanish word coco meaning head or skull. Coconut palm prefers the area with abundant sunlight and regular rain fall. Coconut needs high humidity of about 70-80% for optimum growth. Coconut palms require warm conditions for successful growth and are intolerant of cold weather. Coconut palms are grown in more than 90 countries of the world, with a total production of 61 million tones per year. Most of the world production is in india, asia, indonesia and philippines 73% of the world total. The term coconut can refer to the whole coconut tree or the seed, or the fruit. It is a large palm growing up to 30m (100ft) tall with pinnate leaves 4 to 6m (13 to 20ft) long and pinnae 60 to 90cm(2-3ft) long. The proper care and growing condition coconut palms produce the first fruit in 6-10 years and taking 15-20 years to reach peak production. The coconut tree and its parts widly used in

different disease. Commercially or industrially for preparation of house hold product & cosmetics. It leaves, husk, sheeth, oil, wood flower wide physiological activity human body.

MATERIALS AND METHODS

Collection and Extraction

The inflorescence was collected from coconut trees in sangiyam village 25km away from Thiruvannamalai. The outer sheath was removed using knife in coconut. The oil was collected from the sun dried coconut pieces of Cocos nucifera using oil extraction Chekku electric machine.

Anti Microbial Activity

Two gram positive and two gram negative organism was selected such as Staphylococcus aureus, staphylococcus epidermidis, Escherichia coli, Klebsiella pneumonia, and Aspergillusniger also used from our college microbiology lab.

Anti-Bacterial Studies

The oil extract of the coconut pieces of Cocos nucifera was subjected to Anti-Bacterial studies against various strains of Bacteria

The above organism was identified & used after the confirmation. The media used for the growth of bacteria in nutrient agar media. The organism were maintained on the nutrient agar slant it was tested using nutrient broth.

One loopfulof the respective cultures in each slant, which were maintained below 4 °c was taken and inoculated in the broth & incubated at the 37 °c for 24 hours and were observed for the growth of the organism with the naked eye for their turbidity nature and compared with sterile broth. The presence of turbidity indicates the growth & suitability of the culture for the further work.

The oil of the test drug at the concentration was prepard. The solubility of the drug was facilated by warming the drug solution to 60 °c for 15 minutes while continuously shaking it. Ciprofloxacin with the concentration of 50µ /ml was used as standard for above organism. A suspension of organism was added to steril nutrient agar at 45°c in aseptic environment. The mixture was transferred to strile petridishes & allowed to solidity. Sterile discs of 5mm in diameter (made from whatmann filter paper which is previously sterilized in uv lamp) dipped in the oil of sample using Disc diffusion method. All the plates were allowed to stand at room temperature for 1 hour as a period of preincubation diffusion to minimize of the effect of variation in time between the application of the different solutions.

Then the plates were incubated at 37°c ± 1°c for 18 hrs and observed for antibacterial activity. The diameter of the zone of inhibition was measured for the plates. A similar procedure was carried out for studying the antibacterial activity of compounds against staphylococcus epidermitis, Escherichia coli &Klebsiella pneumonia. The average area of zone of inhibition was calculated & compared with that of standard.

Anti Fungal Studies

Then the oil extract of the coconut pieces of Cocos nucifera was subjected to antifungal activity studies against following strains of fungiby used *ketoconazole* as standard. The disc diffusion method was employed for the screening of antifungal activity. The media used for the growth of fungi was sabour dextrose agar medium formula.

A small inoculam of *aspergillus niger*was added to sterile sabour & dextrose. Agar at 45 °c in an aseptic environment the medium was transferred to sterile petri dish & allowed to solidity. Sterilized discs of 5mm in diameter (made from whatmann filter paper previously sterilized in uv lamp) were dipped in solution of compound, standard & blank were placed on the surface of agar plates. All the plates were allowed to stand at room temperature for 1hour as a period of pre-incubation diffusion to minimize the effect of variation in time between the applied of the different solution. Then the plates were incubated at 37 °c ± °c for 18 hours & observed for antifungal activity. The diameter of the zone of inhibition was measured for the plates in which the zone of inhibition was observed. The zone of inhibition was calculated & and compared with that of standard.

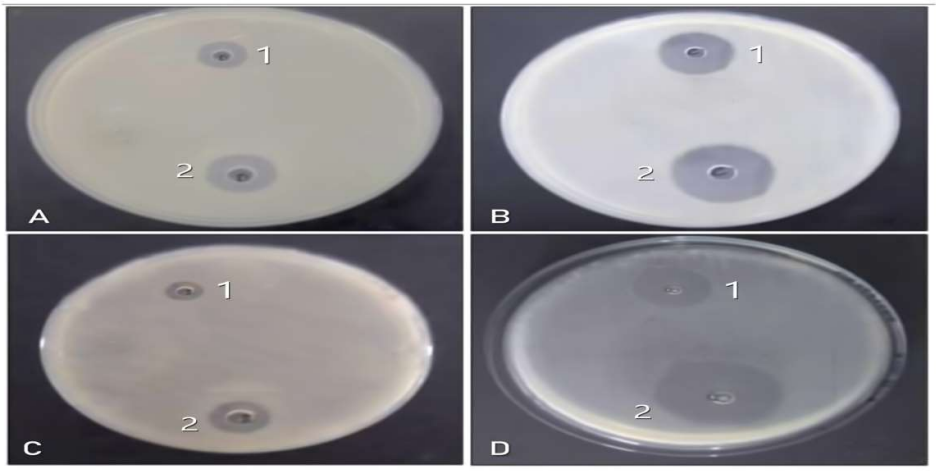
Phytochemical Analysis of Oil of Cocos nucifera

The preliminary phytochemical investigation was done in the oil of cocos nucifera.

RESULTS AND DISCUSSION

Anti-Bacterial Studies

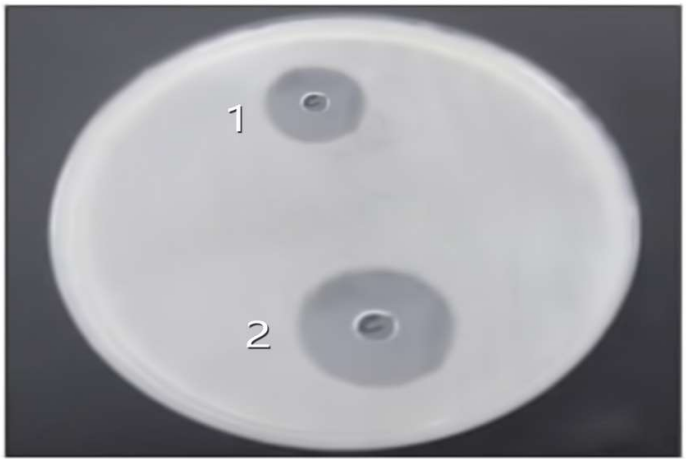
The oil extract of the coconut pieces of Cocos nucifera was subjected to Anti-Bacterial studies against gram positive oraganism and gram negative organism (Staphylococcus aureus, staphylococcus epidermidis, Escherichia coli, Klebsiella pneumonia) as compared with ciprofloxacin as standard.



Figure(A): Petridish Zone of inhibition of antibacterial activity of cocos nucifera oil(A,B,C,D 1 is sample 2 is standard)

Antifungal activities

The oil extract of Cocos nucifera showed antifungal activity against Aspergillus Niger compared with ketaconazole as a standard.



Figure(B):Petridish Zone of inhibition of antifungal activity of cocos nucifera oil (1 is sample, 2 is standard)

Preliminary Phytochemical Investigation of oil of cocos nucifera

Test	Observation	Inference	Intensity
(1) Alkaloids			
(a) Dragendorff reagent	Brick red color	Alkaloids present	Low
(b) Wagner's reagent	Reddish brown color	Alkaloids present	
(2) Flavonoids			
(a) Ammonium test	No yellow color	Flavonoids absent	n.a.
(b) Aluminum chloride test	No yellow color	Flavonoids absent	
(3) Glycosides	Dense red color	Glycosides present	Moderate
(4) Saponins			
(a) Emulsion test	Emulsion formed	Saponins present	Moderate
(b) Frothing test	Stable froth formed	Saponins present	
(5) Resin			
(a) Precipitate test	White precipitate	Resins present	Low
(b) Color test	Light pink color	Resins present	
(6) Tannins	No green precipitate	Tannins absent	n.a.
(7) Steroids	Reddish brown precipitate	Steroids absent	n.a.
(8) Terpenoids	Red precipitate	Terpenoid absent	n.a.
(9) Acid compounds test	No color change in moist blue limus	Acid compounds absent	n.a.

n.a.: not applicable.

CONCLUSION

The current work extract of oil isolated from the sun dried coconut pieces of Cocos nucifera. Then the antimicrobial activty is evaluated by using suitable standard. The preliminary phytochemical investigation also done it on the cocos nucifera oil. The antibacterial activity is done in the two gram positive and two gram negative organism, the antifungal activity is done in aspergillus niger fungi. The zone of inhibition was measured.

REFERENCES

[1]. Dahanukar S.A.Kulkami R.A and Rege N.N.pharmacology of medicinal plants and natural product. In.journal of pharmacology 2000-32 S81,S118.

[2]. Eisebaey M. Abdulbar FM, cytotoxic and antioxidant acticity of coconut shells, the extract used methanolic extract and cytotoxic activity performed towards prostate cancer in cell line compared to normal cells In.journal of pharmacognosy and phytochmical research 2017-9(10), 1288-1292.

[3]. Rafael Vincent, maries silvester, antialzhemers activity of ethanolic extract of cocos nucifera biomedicine 2017:15-20.

[4]. T. Pradeepkumar B.Sumajyothibhaskar and K.N.Satheesan. (2008). *Management of Horticultural Crops* (Horticulture Science Series Vol.11, 2nd of 2 Parts). New India Publishing. Pp, 539–587 Archiver April 21 2016 at the Wayback Machine ISBN 978-889422-49-3

[5]. Grimwood BE. Ashman F (1975). *Coconut Palm Product Their Processing in Developing Countries*. United Nations Food and Agriculture Organization, P.1. ISBN 9789251008539, Archived from the original on December 30,2016.

[6]. Sarian, Zac B. (August 18th, 2010), New coconut yields high Archived November 19th, 2011, at the Wayback Machine. *The Manila Bulletin*. Retrieved April 21, 2011.

[7]. Ravi, Rajesh. (March 16, 2009). Rise in coconut yield, farming area put India on top Archived May 15th, 2013, at the Wayback Machine. *The Financial Express*. Retrieved April 21st 2011.

[8]. How Long Does It Take for a Coconut Tree to Get Coconuts. *Home Guides – SF Gate*. Archived from the original on November 13, 2014.

[9]. Eisbaey.M., AbdulBar. F.M.Cytotoxic and antioxidant activity of Coconut shells (endocarp) the extract used are methanolic extract and cytotoxic activity performed towards prostate cancer in cell line compared to normal cells *In. journal of pharmacognosy and phytochemical research*. 2017:9(10) 1288-1292.

[10]. Rafael, Vincent. Maries, Silvestre, Anti Alzheimers activity ofethanolic leaf extract of cocos nucifera *Biomedicines* 2017: 15-20.

[11]. Verma, V, Bharway, A, Development of a new generationAntibiotic by six different solvent extract of cocus nucifera, *ICSA Journal of biological science*, 2012 Vol:1 (2), 48-54.

[12]. R,Cristiane, D.O, Nascimento, Tavares, figeira., Antimicrobial and cytotoxic activities of crude extract of coconut, *Journal ofchemical and pharmaceutical research*, 2016:8(8) page. 276-282.