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Phytochemical Screening, Acute Toxicity Study and Antidiabetic Potential of Hydro-Methanolic Extract of *Cocos nucifera (Coconut)* Husk on Normal and Alloxan-Induced Diabetic Wistar Male Rats

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Phytochemical screening, acute toxicity and antidiabetic effect of the hydo-methanolic extract of *Cocos nucifera* L. husk on alloxan induced diabetic rats were investigated. Diabetes was induced by intraperitoneal administration of a single dose of alloxan (150 mg/kg b.wt), after the confirmation of diabetes, extracts at two different dose levels (40 mg/kg and 400, mg/kg b.wt) and Glibenclamide 5 mg (Standard drug) were administered daily to alloxan induced diabetic rats for the period of 14 days. The experiment lasted for 21 days and within this period both blood glucose and body weight were measured at day 0, 3, 7 and 14. From the result of the oral toxicity study obtained, the oral minimum lethal dose (LD_{50}) of hydo-methanolic extract of *Cocos nucifera* husk was calculated to be > 4000 mg/kg body weight of rats, showing that *Cocos nucifera* husk extract has no toxicity. The preliminary phytochemical screening test of hyro-methanolic husk extract of *Cocos nucifera* revealed the presence of phenols, terpenoids with high amount of tannins and moderate amount of alkaloids and cardiac glycoside while the test for flavonoids showed negative result. The presence of these various chemical compounds might be responsible for the physiological/biological activities of the plant. In this study, the body weight of all animals except those in the normal control group reduced upon induction and increases significantly throughout the experiment. Blood glucose levels decreased to 103.4 ± 21.08 significantly at ($p<0.05$) in diabetic treated with 40 mg/kg of the plant extract compared to 400 mg/kg which reduced to 144.75 ± 20.71 and that of 5mg of Glibenclamide . This reduces to 165.75 ± 41.40. Based on the result of this study, optimum antidiabetic effect was observed in the animal group treated with 40 mg/kg b.wt of hydo-methanolic extract of *Cocos ncifera* husk and this differ significantly at ($p<0.05$) from that of Glibenclamide-treated group. This finding scientifically proves its use for the treatment of diabetes.

Keywords: *Cocos nucifera, alloxan, Glibenclamide, diabetes*

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INTRODUCTION

In today's world, *Diabetes mellitus* is recognized as a highly complex metabolic disorder, partly caused by excessive glucose production in the liver (Banday *et al*., 2020). A significant global health challenge is posed by diabetes, with over half a billion people reported to have been affected in 2021. It is projected that this number will continue to rise, with 783.2 million people expected to be living with diabetes by 2045, resulting in high morbidity and mortality rates (Ansari *et al*., 2023). These limitations have led to the search for alternative therapeutic approaches that are effective, economical and safe in managing *Diabetes mellitus*.

It has been reported that medicinal plants account for about 90% treatment of diseases and ailments in developing countries. Treatment of diseases including wound healing, asthma, pneumonia, gastro intestinal disorders, diabetes mellitus, malaria, diarrhea and infections (Abu-Odeh and Talib, 2021). At present, several people have reported the discovery of over 400 species of herbal plants with their promising anti liver dysfunction and antidiabetic potentials thereby restoring pancreatic tissue function and ameliorate hyperglycemia by promoting insulin secretion and enhancing insulin –dependent metabolic processes.

Medicinal plants have a vast potential in the treatment of various ailments due to the presence of therapeutically important bioactive compounds (Jacob and Narendhirakannan, 2019). *Diabetes mellitus* is a serious metabolic disorder and several available synthetic drugs to alleviate the drugs are expensive and associated with several complications (Abu-Odeh and Talib, 2021). Traditional medicinal plants are gaining importance as they are less costly show improved therapeutic effects with lesser side effects. Hence, the importance of this study.

Cocos nucifera L. belongs to the family *Acrecaceae* (*Palmaceae*) commonly known as coconut. The coconut (*Cocos nucifera L.*) is an important fruit crop in the tropical countries (Lima *et al*., 2015). The seed comprises the dark brown shell and kernel. The surrounding husk, which is brown and dry at maturity, always remains intact (Edward and Craig, 2006). Unlike some other plants, the palm tree has neither tap root nor root hairs; but has a fibrous root system. Leaves pinnate, feather shaped, 4-7 m long and 1-1.5 m wide at the broadest part. Leaf stalks 1-2 cm in length and thorn less. Leaves are among the largest of any plant (up to 20 ft), pinnately compound with 200 or more leaflets, and borne in a spiral arrangement at the apex of the trunk (Orwa *et al*., 2009).

The constituents of *Cocos nucifera* L. have some medicinal properties, including anti-inflammatory, antihelminthic, antinociceptive, antioxidant, antifungal, antimicrobial, antidiabetic, and antitumor activities (Lima *et al*., 2015). Therefore, the current research seeks to determine the phytochemicals present in the coconut husk as well as antidiabetic potential of hydro-methanolic extract of *Cocos nucifera* husk on wistar male rats.

MATERIALS AND METHODS

Plant Collection and Extraction

Six healthy ripped coconut fruits were purcharsed at Wurukum market, Markurdi, Benue State, Nigeria. The fruits were identified at Social and Environmental Forestry, Joseph Sarwuan Tarka, University (Formerly Federal University of Agriculture, Makurdi). The fruits of *Cocos nucifera* husk were manually separated from mesocarp and the fibrous tissue (husk) was carefully removed. The husks were air dried at room temperature (25^0C) for 14 days and pulverised to powdery form using blender. The powder was stored in an airtight container. 100 g of the powdered husk was dissolved in 350 ml of 99.5 % analytical grade methanol and 150 ml distilled water for 72 hours and filtered using Whatman's No 1 filter paper. The filtrate was concentrated using steam bath evaporator at 45^0C.

Chemicals and Drugs

Alloxan, methanol, 5mg Glibenclamide, Tween 20, normal saline, distilled water ferric chloride solution, Aluminium solution, dilute sulphuric acid solution, Alluminium chloride, Wagners reagent, iodine crystals, potassium iodide, Dragrendorff reagent, glacial acetic acid, Mayers reagent, mercuric chloride, Fe^{3+} chloride, chloroform, tetraoxosulphate (vi) acid (H_2SO_4). All the chemicals and solvents were of standard and analytical grade.

Preparation of Reagents for Phytochemical Analysis

The dried husk of *Cocos nucifera L.* were extracted by soaking 100 g of powdered sample in 300 ml of distilled water and 700 ml of methanol for 24 hours. The extract was then filtered with a filter paper. Phytochemical analysis for major constituent's presents in the husk was carried using standard methods (Okwu and Omodamiro, 2005; Trease and Sofowora, 1990).

Test for Tannins

5cm^3 of *Cocos nucifera* husk extract was mixed with two drops of 5 % iron (III) chloride, a dark green solution was observed indicating the presence of tannin.

Test for Flavonoids

A few drops of 1 % NH_3 solution is added to the methanol extract of *Cocos nucifera* husk in a test tube. The presence of yellow colouration show**ed** the presence of flavonoids.

Test for Terpenoids

5cm^3 of methanolic extract of *Cocos nucifera* husk were mixed with 2cm^3 of chloroform in a test tube. 3cm^3 of concentrated tetraoxosulphate (VI) acid was carefully added to the mixture to form a layer. The formation of a reddish-brown colouration was formed at the interphase to show the presence of terpenoids.

Test for Cardiac glycosides

5cm^3 of methanolic extract of *Cocos nucifera* husk of the sample is mixed with 2cm^3 of glacial acetic acid containing one drop of concentrated tetraoxosulphate (VI) acid. This mixture is carefully added to 1cm^3 of concentrated tetraoxosulphate (VI) so that the concentrated H_2SO_4 is underneath the mixture. The presence of cardiac glycoside in the sample will produce a brown ring in the mixture.

Test for Saponins

To 0.5cm^3 of the husk extract, 10cm^3 of distilled water was added. The test tube was stopped and shaken vigorously for about 30 seconds. It was allowed to stand for 30minutes. Honey comb froth is an indication of presence of saponins.

Test for Phenol

2cm^3 of the *Cocos nucifera* extract was diluted with distilled water in the ratio of 1:4 and few drops of 10 % Iron (III) chloride solution was added. A greenish colour observed indicates the presence of phenols**.**

Acute Toxicity Study

Plant extract (*Cocos nucifera* husk) was tested for its acute and short term toxicity in normal rats. Different doses of the drug (2000-4000 mg/ kg body weight) were administered. The dose progression were done using logarithm of 3.2 until the dose level of 4000 mg/ kg were reached This was done using up and down method as described by OEDC (2001) with little modifications. Parameters observed were: grooming, mood, hyperactivity, sedation, respiratory rate and convulsion.

The LD_{50} of **hydro-**methanolic extract *Cocos nucifera* husk was determined for both upper and lower limit as follows,
For upper limit dose,

= 1/10 x 4000
= 400 mg/kg

For lower limit dose,

= 1/100 x 4000
= 40 mg/kg

Therefore, 400 mg/kg and 40 mg/kg of plant extract were used as upper and lower dosage for administration.

Animals

Thirty – five (35) male wistar rats that weighed 160-180 g were purchased from College of Health Sciences, Animal House Unit of the College of Medicine, Benue State University Makurdi, Nigeria. The rats were acclimatized to the laboratory environment for 14 days before the study. The animals were fed vital feed and water *ad libitum*. The rats were

handled according to the recommendation of the animal care and use of laboratory animals (Department of Health and Human Resources, DHIS, 1985).

Induction of Diabetes in Experimental Animals

The animals were fasted for 18 hours after which diabetes was induced intraperitonially using alloxan (Etuk and Muhammed, 2010).

Experimental Protocol

The animals were divided into 7 groups. i.e. (5 rats in each group)
Group I (Normal control) were administered with 0.5 ml distilled water/day.
Group II (Normal) were administered with lower dosage 40 mg/ kg of plant extract/day.
Group III (Normal) were administered with higher dosage 400 mg/ kg of plant extract/day.
Group IV (Diabetic control) were administered with 0.5 ml distilled water/day.
Group V (Diabetic) were treated with lower dosage 40 mg/ kg of plant extract/day.
Group VI (Diabetic) were treated with higher dosage 400 mg/ kg of plant extract/day
GroupVII (Diabetic) were treated with standard drug 5 mg/ kg/day of Glibenclamide.

Fasting Blood Glucose Estimation

Fasting blood glucose was measured prior to and after alloxan dosing. Blood samples were collected from tail veins and estimated using accu - check glucometer. The results were expressed in terms of mg/dl of blood.

Measurement of the Body Weight (Kg) of Normal and Alloxan-Induced Wistar Rats

Measurement of the body weight (kg) of normal and alloxan-induced wistar rats was determined using an analytical balance.

Oral Glucose Tolerance Test

Prior to an oral glucose tolerance test, all rats were fasted for 16 hours. Distilled water, Glibenclamide and plant extract were administered orally to respective groups. 30 minutes later, glucose (3 g/ kg) were orally administered to each rat. Blood sample were estimated at 30 (just before extract and glibenclamide administration), 30, 60, 90 and 120 after glucose load.

Statistical Analysis

Results were presented as a mean ± standard error of mean (SEM) of four determinations. Statistical analysis was carried out using one way analysis of variance (ANOVA). Difference were statistically significant at $_P$ <0.05.

Results

Table 1: Phytochemical Screening Test Result of *Cocos nucifera L.* Husk Extract

Phytochemicals	**Methanol (70% v/v)**
Alkaloids	+ +
Terpenoids	+
Flavonoids	-
Saponins	+
Tannins	+++
Phenols	+
Glycosides	++

Key: present = +; moderate = ++; abundant = +++, absent = -

Table 2: Acute Toxicity Result of Hydro-Methanolic Extract *of Cocos nucifera L.* Husk

LD_{50}	Body weight (kg)	Dosage (mg/ml)	Result
2000	150	1.2	No sign of toxicity
3000	160	1.9	No sign of toxicity
4000	180	2.9	No sign of toxicity

Table 3: Effect of **Hydro-Methanolic Extract of *Cocos nucifera*** Husk on Fasting Blood Glucose (FBG) Level of **Normal and** Alloxan Induced Diabetic Rats on (0) Day to 14 Day of Treatment

Treatment	Initial (0 day)	After Induction	3 Day	7 Day	14 Day
Normal control	94.50 ± 14.58	94.50 ± 14.58	95.00 ± 14.10^{defg}	83.50 ± 6.65^{dfg}	81.75 ± 4.73^{df}
Normal + 40 mg/Kg plant Extract	102.25 ± 1.25	102.22 ± 1.25	101.00 ± 1.08^{defg}	90.75 ± 3.35^{df}	91.50 ± 2.02^{dg}
Normal + 400 mg/Kg plant Extract	110.25 ± 5.73	110.25 ± 5.73	101.00 ± 3.10^{efg}	91.25 ± 1.31^{def}	88.50 ± 2.90^{dg}
Diabetic not treated	96.25 ± 3.47	433.75 ± 6.96	455.50 ± 13.76^{ac}	459.50 ± 18.21^{abc}	485.50 ± 21.08^{abcefg}
Diabetic + 40 mg/Kg plant Extract	90.75 ± 4.49	565.75 ± 19.82	482.50±53.74^{abc}	199.75 ± 56.17^{df}	103.75 ± 7.19^{dg}
Diabetic + 400 mg/Kg plant Extract	97.00 ± 10.15	511.75 ± 40.87	466.50±67.69^{abc}	353.00 ± 56.96^{abc}	144.75 ± 20.71^{ad}
Diabetic + 5 mg/kg of Glibenclamide	90.75 ± 5.36	467.50 ± 56.06	516.76±83.25^{abc}	280.00 ± 80.08	165.75 ± 41.40^{bcde}

Values are presented as Mean ± SEM of four replica determinations.
Values that do not have the same superscript between the group and across the group are significantly different at $p<0.05$.
Key:
Group 1: Normal control
Group 2: Normal + 40 mg/kg of **Hydro-Methanolic** Extract of *Cocos nucifera L.* Husk
Group 3: Normal + 400 mg/kg of **Hydro-Methanolic** Extract of *Cocos nucifera L.* Husk
Group 4: Diabetic control
Group 5: Diabetic + 40 mg/kg of **Hydro-Methanolic** Extract of *Cocos nucifera L.* Husk
Group 6: Diabetic + 400 mg/kg of **Hydro-Methanolic** Extract of *Cocos nucifera L.* Husk
Group 7: Diabetic + 5 mgkg of glibenclamide
SEM = Standard Error of Mean.

Table 4: Effects of **Hydro-Methanolic Extract of *Cocos nucifera* Husk** on the Body Weight (Kg) of Normal and Alloxan-Induced Wistar Rats

Treatment	Initial (0 day)	After Induction	3 Day	7 Day	14 Day
Normal control	126.35±2.69^{fg}	126.35±2.69^{fg}	139.87±2.91^{bdef}	150.35±2.60^{bd}	170.80±4.13^{bdfg}
Normal + 40 mg/kg plant Extract	122.52±7.23^{fg}	122.52±7.23f^{g}	186.52±7.02^{acdefg}	193.80±5.06^{acdefg}	194.85±4.78^{acdefg}
Normal + 400 mg/kg plant Extract	134.90±8.39^{g}	134.90±8.39^{g}	140.00±7.40^{bdef}	143.17±7.35^{bd}	160.97±4.13^{bd}
Diabetic not treated	132.82±3.68^{g}	102.02±4.39^{g}	102.52±3.82^{abcg}	101.90±3.98^{abceg}	98.80±2.69^{abcefg}
Diabetic + 40 mg/kg plant Extract	132.97±8.15^{g}	92.82±7.27^{f}	94.32±9.95^{abcfg}	135.82±5.33^{bdf}	170.32±5.73^{bdfg}
Diabetic + 400 mg/kg plant Extract	145.72±4.62^{ab}	116.67±5.83^{e}	120.00±5.29^{abe}	133.72±5.37^{ba}	153.95±4.92^{abde}
Diabetic + 5 mg/kg of Glibenclamide	156.97±7.07^{abcde}	122.15±6.60^{d}	129.00±6.90^{bde}	141.90±9.38^{bd}	154.67±6.57^{abde}

Table 5: Effect of Hydro-Methanolic Husk Extract of *Cocos nucifera* on Oral Glucose Tolerance Test (OGTT)

Treatment Group	-30 min	0 min	30 min	60 min	900 min	120 min
Normal control	94.97±0.50^{def}	136.10±0.38^{bcdefg}	135.37±0.21^{bcdefg}	117.32±0.86^{bcdef}	112.60±0.26^{bdefg}	103.15±0.34^{bdefg}
Normal + 40 mg/kg plant Extract	94.20±0.38^{def}	462.07±0.41^{acdefg}	455.37±0.21^{acdefg}	120.57±0.27^{adefg}	106.40±0.20^{acdefg}	96.15±0.37^{acdefg}
Diabetic not treated	516.20±0.34^{abcefg}	600.15±0.64^{acdefg}	517.40±0.33^{abcefg}	516.15±0.34^{abcefg}	516.15±0.34^{abcdefg}	516.40±0.20^{abcefg}
Diabetic + 40 mg/kg plant Extract	101.85±2.04^{abcdfg}	207.15±0.38^{acdefg}	170.17±0.06^{abcdfg}	160.32±0.22^{abcdg}	121.12±0.36^{abcdfg}	108.40±0.54^{abcdfg}
Diabetic + 400 mg/kg plant Extract	115.10±1.07^{abcdeg}	480.55±0.51^{acdefg}	264.37±0.24^{abdeg}	160.32±0.22^{abcdg}	137.37±0.20^{abcdeg}	127.10±0.04^{abcdeg}
Diabetic + 5 mg/kg of Glibenclamide	93.07±0.39^{def}	262.15±0.34^{acdefg}	207.12±0.39a^{bcdef}	117.37±0.88^{bcdfg}	110.37±0.27^{abcdef}	112.55±0.29^{abcdef}

DISCUSSION

From the result of the oral toxicity study obtained, the oral minimum lethal dose (LD_{50}) of **hydro-**methanolic extract of *Cocos nucifera* husk was calculated to be > 4000 mg/kg body weight of rats, showing that the extract has no toxicity. This result is in accordance with the estimate given by OECD (2001). They stated that any substance with LD_{50} estimate greater than 2000 mg/kg body weight by oral route could be considered of low toxicity and safe in human. Therefore, this extract could be administered with some degree of safety, especially through the oral route, where absorption might not be complete due to inherent factors limiting absorption in the gastro-intestinal tract.

In this study, phytochemical screening of hydro-methanolic husk extract of *Cocos nucifera* revealed the presence of saponin, phenols, terpenoids with high amount of tannins and moderate amount of alkaloids and cardiac glycoside, while the test for flavonoids showed negative result. In addition to these (Komala *et al*., 2011) reported the presence of alkaloids in the ethanolic root extract of the same plant. The presence of these various chemical compounds might be responsible for the physiological/biological activity of the plant. Plant alkaloids have the tendency to release insulin from pancreatic beta cells and also have the potential to protect islets from hyperglycemia mediated oxidative stress (Odetola *et al*., 2006). This may be the reason while the plant is used as an herbal remedy in the treatment of *Diabetes mellitus.*

Tannins are organic substances of diverse composition with pronounced astringent properties that promote the healing of wounds and inflamed mucous membranes (Okwu, 2004). Tannins reduce the risk of coronary heart diseases and exhibit diuretic property (Okwu, 2004). The phenolic constituents of the plant has shown to exhibit efficient antioxidant property or free radical scavengers by serving in plant defense mechanisms to counteract deleterious action of reactive oxygen species (Wollgast and Anklam, 2000). Plants that contain phenols could be used as anti-inflammatory, immune enhancers and hormone modulators (Okwu, (2004). Saponins, present in plants, have been suggested as possible anti-carcinogens. Phytochemicals in plants has being implicated to be responsible for their antidiabetic effect. Earlier studies have established that saponin in plant exhibit antidiabetic effect by increasing insulin release from pancreatic beta cells, increasing peripheral glucose uptake and by reducing glucose absorption (Saravanan and Pari, 2008). Tannins and phenols are insulin like substances ((Saravanan and Pari, 2008) and they mimic the effect of insulin on glucose metabolism and enhance its secretion. Interestingly, these above mentioned phytochemicals were found present in the hydro-methanolic husk extract of *Cocos nucifera* husk. Another possible reason by which *Cocos nucifera* might exert its antidiabetic effect may be by buttressing the body's antioxidant system. Photochemical like tannins are known to scavenge free radicals (Berenguer *et al*., 2006) and build up immunity respectively, thus taking care of the stimulation of free radicals and oxidative stress as a result of high glucose levels.

Intraperitoneal administration of 150 mg/kg b.wt of Alloxan monohydrate induced diabetes in rats after 72 hours. Alloxan has been reported to induce *Diabetes mellitus* by forming highly reactive superoxide radicals which destroy the insulin producing beta cells in the pancreas (Szkudelski, 2001). The fasting blood glucose of the rats in all the groups was normal at 94.50 ± 14.58 to 110.25 ± 5.73 on the first day of the experiment (Table 3). But upon induction, the blood glucose level of the rats from diabetic not treated group to diabetic treated extract groups increased, 433.76 ± 19.82 for the diabetic control; 565.75 ± 19.82 for rats treated with 40 mg/kg plant extract; 511.72 ± 40.87 for rats treated with 400 mg/kg plant extract while Glibenclamide 5 mg/kg treated rats increased to 467.50 ± 56.06 upon treatment on the third day, the sugar level continued to rise in all the groups except the rats treated with Glibenclamide which reduces to 466.50 ± 67.69^{abc} This is attributed to the fact that, most pharmacological agents when taken don't elicit an immediate response. However the results of the fasting blood glucose on day 7 after treatment continues to decrease with a correspondence increase in the diabetic control group which do not receive any further treatment.

The results of the treated groups on the 14 day showed that, there were reduction in blood sugar levels in all the treated groups, but the reduction was mostly observed in rats treated with 40 mg/kg of the plant extract which reduced to 103.75 ± 7.19^{dg} as compared to rats treated with 400 mg/kg of the plant extract which reduced to 144.75 ± 20.71^{ad} and the rats treated with 5 mg/kg Glibenclamide also reduced to 165.75 ± 41.40^{bcde}

Similar effects have been documented in other studies using the flowers of the same plant (Saranya *et al*., 2014). Several mechanisms have been proposed by which plant extracts are able to exert their antidiabetic effect which include; stimulation of insulin release from beta cells (Kawano *et al*., 2009), decreasing hepatic glucose production (Edduoks *et al*., 2003), decreasing the utilization of ingested carbohydrate (Musabayane *et al*., 2006) and increasing peripheral tissue utilization of glucose (Zambare *et al*., 2011). More so Glibenclamide is amongst the group of antidiabetic drugs called insulin sensitizers as a result of its ability to stimulate insulin release (Karam, 1998). Furthermore, it was reported that plants exert their antidiabetic effect by interfering with carbohydrate absorption (Nelson *et al*., 1991).

The result presented in (Table 4) showed that the body weight of the test rats (the diabetic treated and untreated) except for the normal control were found to decrease significantly upon induction and increases when compared throughout the duration of the experiment. Also previous studies have reported that the use of different plant extracts in

the treatment of diabetes led to weight gain which is in agreement to the result obtained from this study (Stalin *et al*., 2012).

The oral glucose tolerance test is a more sensitive measure of early abnormalities in glucose regulation than fasting plasma glucose or glycosylated haemoglobin (Stalin *et al*., 2012). Impaired glucose tolerance reflects hepatic gluconeogenesis and reduced uptake of glucose from blood into skeletal muscles and adipose tissue following a meal (Robertson, 2007). Impaired glucose tolerance serves as a marker for the state of insulin resistance and predicts both large and small-vessel vascular complications. (Tominaga,1999).

In alloxan induced diabetic rats, the blood glucose level increased to peak at 0 min and remained high over the next 30 minutes. Hydo-methanolic extract of *Cocos nucifera* husk treated diabetic rats showed an increase at another 60 minutes and then a reduction in peak was observed in at 90 minutes in diabetic rats treated with 40 mg/kg of plant extract at 121.12 ± 0.36^{abcdfg} which exhibited the near normal range. The final reduction in peak to a normal range 108.40 ± 0.54^{abcdfg} was observed at 120 min observed in diabetic rats treated with 40 mg/kg plant extract and 5 mg/kg Glibenclamide (112.55 ± 0.29^{abcdef}). However the normal control groups reduced to a normal range 117.32 ± 0.86^{bcdef} at 60 min. The results obtained from GTT indicate the improved glycemic control in diabetic rats treated with hydo-methanolic extract of *Cocos nucifera* husk.

CONCLUSION

The finding of the present study indicated that the hydo-methanolic extract of coconut (C*ocos nucifera*) husk can be a source of potent antidiabetic agent and was able to ameliorate the metabolic abnormalities associated with *Diabetes mellitus.* Phytochemical screening indicated the presence of pharmacologically active ingredients in the husk. The results of OGTT clearly indicate the improved glycemic status upon treatment with husk extract. The change in body weight gain indicated the beneficial effect of the husk extract in controlling muscle wasting. The observed antidiabetic property of hydo-methanolic extract of *Cocos nucifera* husk provides a scientific rationale for the use of husk in the traditional medicine for the treatment of various ailments.

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Conflict of interest: The authors declare that there are no conflicts of interest.

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