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Comparative Study of the Proximate and Phytochemical Composition of Two Varieties of Jute (Corchorus Olitorius and Corchorus Incisifolius) Leaves

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Abstract **Original Research Article**

Leafy vegetables are essential components of the human diet, particularly in Nigeria, where they contribute significantly to the intake of proteins, minerals, and dietary fiber. Among these vegetables, jute leaves—Corchorus olitorius and Corchorus incisifolius—are widely consumed and valued not only for their nutritional content but also for their medicinal applications in traditional practices. Despite the documented health benefits of C. olitorius, limited comparative studies have been conducted to assess the nutritional and phytochemical variations between it and C. incisifolius. Therefore, in this study we address this gap by evaluating and comparing the proximate and phytochemical composition of the two jute varieties. The results showed that C. incisifolius had higher crude protein (30.63%) and ash content (20.91%) than C. olitorius, which recorded higher crude fiber (22.52%) and fat (5.45%) levels. Phytochemical analysis revealed that both species contained all five studied compounds, but their quantities varied: C. incisifolius had higher tannins, alkaloids, and flavonoids, while C. olitorius showed a notably higher saponin concentration. These findings highlight the nutritional and medicinal potential of both jute species and suggest that each variety may offer distinct health benefits depending on its phytochemical and nutrient profile. This comparative evaluation provides valuable insights for dietary planning, ethnobotanical usage, and further pharmacological research.

Keywords: Jute, Proximate, Phytochemicals, Leaves, Incisifolius, Leafy Vegetables.

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INTRODUCTION

Corchorus olitorius (Linn) is a member of the family malvaceae (an angiosperm family) and among the edible vegetables commonly consumed in most African countries especially in Nigeria. The vegetable has various English names, which may include mallow leaves, Jute mallow, Jew's mallow. In Nigeria, it is popularly called Ewedu in Yoruba, Ahihara in Igbo and Malafiya or Rama in Hausa lands (Abdullahi *et al*., 2003). Vegetables are very important as they possess essential food ingredients which can be used to build up our body system. Vegetables are major sources of both macro and micro nutrients in Africa especially in the rural areas of developing countries where starch-based foods are mainly consumed for survival.

In Nigerian cuisine, especially amongst the Yorubas, it is commonly used in a stew known as ewedu, a condiment to other starch-based foods such as amala. The Hausa people of Nigeria and their Fula neighbours call it Malafiya or Rama. They use it to produce soup (taushe) or boil the leaves and mix it with kuli-kuli (groundnut cake) to form a dish known as kwado in Hausa. The Hausa peasant farmers cultivate it beside their corn-stalk constructed homesteads or among their main crops in their farms. The Hausa and Fulbe peoples also use jute leaves to treat some diseases. Various researches have been conducted on the medicinal and biological values of *Corchorus olitorius*, but little investigations have been carried out on the comparative analysis of the varieties of *Corchorus olitorius*, to determine the proximate compositions, and phytochemical compositions of the varieties of *Corchorus*

olitorius for any significant differences or similarities in each variety and to know their individual proximate and phytochemical content. With this information, one can be able to know which among the varieties has more proximate and phytochemical content and also identify their individual health implications to the consumers.
This study aimed at evaluating the proximate and phytochemical composition of two varieties of jute (*Corchorus olitorius and incisifolius*) leaves.

Collection and Preparation of sample

Collect an adequate amount of representative leaf samples from the plant of interest were collected. The collected leaves were cleaned to remove any surface dirt or impurities, using soft rag or hands to gently clean the leaves. Then the leaves were air dried by spreading them in a single layer on a clean surface or using drying racks. It was then placed in a well-ventilated area away from direct sunlight until they became brittle. Once the leaves are completely dry, it was homogenized into a fine powder. The powdered leaf sample was transferred into a clean, airtight container and labeled accordingly. It was then taken for analysis.

PROXIMATE ANALYSIS

Determination of Moisture Content

A crucible (moisture dish) was washed and dried in an oven at 105^{o}C for 2 minutes, and quickly transferred into a desiccator, cooled and weighted as (w1). About 5g of the sample was weighted and transferred into the crucible and the total weight was recorded as (w2). The crucible containing the sample was then transferred into the oven and then dried at 105^{0}C for about 1 hour. It was then removed and cooled in a desiccator. After cooling the crucible (containing the dried sample) was then weighed. The step was repeated until a constant weight (w3) was obtained. The percentage moisture was calculated as follows:

$$\% \text{ moisture} = \frac{W2-W3 \times 100}{W2-W1}$$

Where
W1= weight of empty crucible
W2=weight of crucible +weight of sample before drying
W3=weight of crucible +weight of sample after drying

Determination of Ash Content

A crucible dish was pre-treated in a muffle furnace at a temperature of 55^{0}C for 1 hour and then it was removed and cooled in a desiccator and weighed. About 10g of dried sample was weighed into the crucible and was decarbonizes. It was then transferred into a muffle furnace and the temperature was increased to 550^{0}C for 5 hours until the residue was completely charred. The heating was discontinued and the crucible was curved from the furnace and allowed to cool in the desiccator. The crucible and sample were weighed again. The percentage of ash present in the sample was calculated using Ronald and Ronald (1991) formula

$$\% \text{ ash} = \frac{W2-W3 \times 100}{W2-W1}$$

Where
W1= weight of empty crucible
W2=weight of crucible + sample before ashing
W3=weight of crucible +sample after ash

Determination of Fat (Lipid) Content

35g of the sample was weighed and then transfer into an extraction of known weighed. The opening of the thimble was ploughed with cotton wool and was weighed. The thimble was placed into the Soxhlet extractor and continuously extracting using ethyl ether as the extracting solvent for hours after the thimble containing the residue was dried in an oven at 130^{0}C for 30 minutes and was cooled in a desiccator. It was weighed again. The percentage fat was calculated using Ronald and Ronald (1991)

$$\% \text{ fat} = \frac{W2-W3 \times 100}{W2-W1}$$

Where
W1= weight of empty thimble
W2=weight of thimble + sample before extraction
W3=weight of thimble +sample after Extraction and Drying Test for Tannins

Determination of Crude Fibre Content

5g of the sample was transferred into a conical flask. 50ml of 0.3m H_2SO_4 was added and was boiled for 30 minutes. 20ml of 1.5m NaOH was equally added. It was then transferred into filter paper for filtration. The residue was washed for 5 minutes with distilled water before neutralization with 50ml of 0.03m Hcl. It was later rewashed for 10 times with hot distilled water before washing with 50ml Acetone to dry the residue. The crucible was dried in an oven with the sample at 140^{0}C for an hour, cooled and weighed and then it was later ignited in muffle furnace at 700^{0}C for an hour. It was then cooled and weighed. The percentage crude fibre was calculated using Ronald and Ronald (1991) method

$$\% \text{ crude fiber} = \frac{a-b \times 100}{c}$$

Where
a = weight of crucible + weight of sample drying in the oven
b = mass of crucible + sample after removal from the furnace
c = weight of sample.

Determination of Protein Content

The total nitrogen was estimated by the Kjedhal method. 1g of the sample was weighed and placed in a 5000ml of Kjendal flask. 2g of catalyzed mixture (anhydrous copper sulphate and potassium sulphate) and 2ml of concentrated sulphuric acid (H_2SO_4) were introduced into the flask. The flask was placed in an electric heating mantle. The sample was heated slowly and then boiled more vigorously until there was clear digest.

The sample was then allowed to cool. After cooling, the content was washed and transferred into 100ml volumetric flask and was made to the mark by adding the distilled water. The content was transferred into a distillation flask. The ammonia gas was trapped through the delivery tube to the receiving flask. 20ml of 4% boric acid was added to digest in mixture. The digest was made alkaline by adding 20ml of NaOH during the distillation. The setup was thoroughly corked until no ammonia gas evolved. 25ml of distilled were pipette into 250ml conical flask and titrated with 1m hot to obtain the end point. The procedure was repeated for the blank sample and titration was carried out to determine the end point. The end point was reached when the color of the sample changes from yellow to pink. The percentage crude protein in the sample was calculated using the formula of Ronald and Ronald (1991) method

$$\% \text{ Nitrogen} = \frac{V2-V1 \times \text{molarity of Hcl} \times 100}{W}$$

Where
V1 =Titre value of blank
V2 =Titre value of the sample
V3 = weight of sample.
% created protein =% Nitrogen x 6.25

PHYTOCHEMICAL ANALYSIS

Qualitative Determination of Phytochemical Constituents of Woods

Test for Tannins

About 0.5g of the dried powdered sample was boiled in 20ml of water in a test tube and then filtered. A few drop of 0.1% ferric chloride was added and observed for brownish-green or blue-black coloration. (Harborn, 1979)

Test for Saponin

About 2g of the powdered sample was boiled in 10ml of distilled water bath and filtered. 10ml of the filtrate was mixed with 5ml of distilled water and shaken vigorously for a stable persistent froth. The frothing was mix with 3 drops of olive oil and shaken vigorously then observed for the information of emulsion (Trease and evans, 1980).

Test for Flavonoids

0.15g portion of the powdered sample was heated with 10ml of ethyl acetate over a stream bath for 3 minutes. The mixture was filtered and 4ml of the filtrate was shaken with 1ml of dilute ammonia a solution. A yellow coloration indicates the presence for flavonoids.

Test for Alkaloids

About 0.2g of each sample was warmed with 10ml of H_2SO_4 for 2 minutes. It was filtered and few drops of trangendroffs reagent were added. Orange red precipitates indicate the presence of alkoids (Harborne, 1979).

Test for Steroids

2 ml of acetic anhydride was added to 0.5 g ethanolic extract of the sample with 2 ml H_2SO_4.The colour changed from violet to blue or green in some samples indicating the presence of steroids.

Quantitative Determination of Phytochemical Constituents of vegetables

Tannin.

Analytical method for quantitative determination of tannin was according to Amadi *et al*., (2004) and Ejikeme *et al*., (2014). By dissolving 50g of sodium tungstate (Na_2WO_4) in 37 cm^3 of distilled water, Folin-Denis reagent was made. To the reagent prepared above, 10 g of phosphomolybdic acid and 25 cm^3 of ortho-phosphoric acid (H_3PO_4) were added. Two-hour reflux of the mixture was carried out, cooled, and diluted to 500 cm3 with distilled water. One gram of each wood powder (sample) in a conical flask was added to 100 cm^3 of distilled water. This was boiled gently for 1 hour on an electric hot plate and filtered using number 42 (125 mm) Whatman filter paper in a 100 cm^3 volumetric flask. Addition of 5.0 cm^3 Folin-Denis reagent and 10 cm^3 of saturated Na_2CO_3 solution into 50 cm^3 of distilled water and 10 cm3 of diluted extract (aliquot volume) was carried out after being pipetted into a 100 cm^3 conical flask for colour development. The solution was allowed to stand for 30 minutes in a water bath at a temperature of 25°C after thorough agitation. With the aid of a Spectrum Lab 23A spectrophotometer optical density was measured at 700 nm and compared on a standard tannic acid curve. Dissolution of 0.20 g of tannic acid in distilled water and dilution to 200 cm^3 mark (1 mg/cm^3) were used to obtain tannic standard curve. Varying concentrations (0.2–1.0 mg/cm^3) of the standard tannic acid solution were pipetted into five different test tubes to which Folin-Denis reagent (5 cm^3) and saturated Na_2CO_3 (10 cm^3) solution were added and made up to the 100 cm3 mark with distilled water. The solution was left to stand for 30 minutes in a water bath at 25°C. Optical density was ascertained at 700 nm with the aid of a Spectrum Lab 23A spectrophotometer. Optical density (absorbance) versus tannic acid concentration was plotted.

Determination of Alkaloids

Quantitative determination of alkaloid was according to the methodology by Harborne, (1973). Exactly 200 cm^3 of 10% acetic acid in ethanol was added to each wood powder sample (2.50 g) in a 250 cm^3 beaker and allowed to stand for 4 hours. The extract was concentrated on a water bath to one-quarter of the original volume followed by addition of 15 drops of concentrated ammonium hydroxide drop wise to the extract until the precipitation was complete immediately after filtration. After 3 hours of mixture sedimentation, the supernatant was dis carded and the precipitates were washed with 20 cm^3 of 0.1 M of ammonium hydroxide and then filtered using Gem filter paper (12.5 cm). Using electronic weighing balance Model B-218, the residue was dried in

an oven.

Determination of Flavonoid

Flavonoid determination was by the method reported by Ejikeme *et al*. (2014); Boham and Kocipai, (1994). Exactly 50 cm^3 of 80% aqueous methanol added was added to 2.50 g of sample in a 250 cm^3 beaker, covered, and allowed to stand for 24 hours at room temperature. After discarding the supernatant, the residue was extracted (three times) with the same volume of ethanol. Whatman filter paper number 42 (125 mm) was used to filter whole solution of each wood sample. Each wood sample filtrate was later transferred into a crucible and evaporated to dryness over a water bath. The content in the crucible was cooled in a desiccator and weighed until constant weight was obtained.

Determination of Saponin

Saponin quantitative determination was carried out using the method reported by Ejikeme *et al*. (2014); Obadoni and Ochuko (2002). Exactly 100 cm^3 of 20% aqueous ethanol was added to 5 grams of each wood powder sample in a 250 cm^3 conical flask. The mixture was heated over a hot water bath for 4 hours with continuous stirring at a temperature of 55°C. The residue of the mixture was extracted with another 100 cm^3 of 20% aqueous ethanol after filtration and heated for 4 hours at a constant temperature of 55°C with constant stirring. The combined extract was evaporated to 40 cm^3 over water bath at 90°C. 20 cm^3 of diethyl ether was added to the concentrate in a 250 cm^3 separator funnel and vigorously agitated from which the aqueous layer was recovered while the ether layer was discarded. This purification process was repeated twice. 60 cm^3 of n-butanol was added and extracted twice with 10 cm^3 of 5% sodium chloride. After discarding the sodium chloride layer the remaining solution was heated in a water bath for 30 minutes after which the solution was transferred into a crucible and was dried in an oven to a constant weight. The saponin content was calculated as a percentage:

Determination of Percentage Steroids

Weigh 0.5g of the processed sample into a test tube, add 10ml of ethyl acetate and place in boiling water bath for 3 minutes. Cool and filter. The organic extract mixed with an equal volume of chloroform will form two layers. Pipette 2ml of the chloroform layer into a test tube. Add 5ml of water and adjust to pH 7.0 using 0.1N NH_4OH. Elute (chromatograghic) with sephadex x 100 and measure the absorbance at 240nm

$$\text{Concerntration} = \frac{\text{Abs x df (mg/100g)}}{2550}$$

2550 = extinction coefficient for steriod
Df = dilution factor

Statistical Analysis

All experiments were done in duplicate and the results were expressed as mean ± SD using the Microsoft excel 2019 spreadsheet. Data were subjected to statistical analysis using IBM SPSS statistical package. A one-way analysis of variance (ANOVA) was used to compare the values of proximates and phytochemical component of the two varieties. The means were treated as significantly different at $P< 0.05$.

RESULTS

Proximate Analysis

Table 1 shows the result for proximate analysis of Ttwo varieties of jute (*Corchorus olitorius* and *incisifolius*) leaves, cultivated in Takum. From the result, *Corchorus incisifolius* has lower crude fat content (3.88±0.001%) than that of *Corchorus olitorius* (5.45±0.001%)., While *Corchorus incisifolius* showed higher crude protein content (30.63±0.004%) than corchorus olitorius (17.5±0.007%). Crude fiber was far higher in *Corchorus olitorius* (22.52±0.001%) than in *Corchorus incisifolius* (9.24±0.001%). The percentage value of crude protein in *Corchorus olitorius* (7.81±0.004%) was very close to that of *Corchorus incisifolius* (7.66±0.001%), and also the Ash content of *Corchorus incisifolius* (20.91±0.001) was higher than that of *Corchorus olitorius* (18.39±0.002%).

Table 1 Comparative proximate analysis of Two varieties of jute (*Corchorus olitorius* and *Corchorus incisifolius*) leaves.

Sample	Moisture (%)	Ash (%)	Crude fat(%)	Crude fiber (%)	Crude protein (%)
Corchorus incisifolius	7.66±0.001	20.91±0.001	3.88±0.001	9.24±0.001	30.63±0.004
Corchorus olitorius	7.81±0.004	18.39±0.002	5.45±0.001	22.52±0.001	17.5±0.007

Phytochemical Analysis

Table 2 shows the result for qualitative screening of Phytochemicals in Two varieties of jute (*Corchorus olitorius* and *Corchorus incisifolius*) leaves, cultivated in Takum. From the result,both varieties (*Corchorus incisifolius* and *Corchorus olitorius*) has Tannins, Alkaloids, Flavonoids, Saponins and steroids present.

Table 2 Comparative Qualitative Screening of Phytochemicals of Two varieties of jute (*Corchorus olitorius* and *Corchorus incisifolius*) leaves.

Parameter	*Corchorus incisifolius*	*Corchorus olitorius*
Tannins	+	+
Alkaloids	+	+
Flavonoids	+	+
Saponins	+	+
Steroids	+	+

Note: "+"present "-"Absent

Table 3 shows the result for quantitative analysis of Phytochemicals in Two varieties of jute (*Corchorus incisifolius* and *Corchorus olitorius*) leaves, cultivated in Takum. From the result, the concentration of Tannins in *Corchorus incisifolius* (6.06±0.04mg/100g) is higher than that of *Corchorus olitorius* (4.33±0.04mg/100g). Alkaloids content in *Corchorus incisifolius* (7.27±0.01%) is higher than *Corchorus olitorius* (5.1±0.01%). While flavonoids content in *Corchorus olitorius* (7.49±0.01%) is lower than that of *Corchorus incisifolius* (9.41±0.01%), *Corchorus olitorius* has higher saponin content (11.08±0.03%) than *Corchorus incisifolius* (6.3±0.02%). The concentration of steroids in *Corchorus incisifolius* (0.64±0.01mg/100g) is higher than that of *Corchorus olitorius* (0.33±0.01mg/100g).

Table 3: Comparative Quantitative analysis of Phytochemicals of Two varieties of jute (*Corchorus olitorius* and *incisifolius*) leaves.

Sample	Tannins (mg/100g)	Alkaloids (%)	Flavonoids (%)	Saponins (%)	Steroids (mg/100g)
Corchorus incisifolius	6.06±0.04	7.27±0.01	9.41±0.01	6.3±0.02	0.64±0.01
Corchorus olitorius	4.33±0.04	5.1±0.01	7.49±0.01	11.08±0.03	0.33±0.01

DISSCUSION

Two varieties of jute (*Corchorus incisifolius* and *olitorius*) leaves were analysed, by carrying out proximate and Phytochemical analysis of each variety to compare their nutritional content and value.

The Proximate analysis of *Corchorus incisifolius* and *Corchorus olitorius.* Provides good information about the nutritional content of the leaves, such as crude protein, crude fats, crude fiber, moisture and Ash content. From the analysis carried out, which are given in table 1, *Corchorus incisifolius* contains (7.66±0.001%) moisture content, (20.91±0.001%) Ash content, (3.88±0.001%) crude fats, (9.24±0.001%) crude fiber, (30.63±0.004%) crude protein, While *Corchorus olitorius* contains (7.81±0.004%) moisture content, (18.39±0.002%) Ash content, (5.45±0.001%) crude fats, (22.52±0.001%) crude fiber, (17.5±0.007) crude protein. There was significant ($P<0.05$) difference at $P<0.05$ between the two varieties of the plant, This result indicates that *Corchorus incisifolius* has high amount of protein (30.63±0.004%) and Ash content (20.91±0.001%), than *Corchorus olitorius* which has (17.5±0.007%) protein, and (18.39±002%) Ash content. This result is similar but higher than what was reported by Adesina *et al*. (2022). The high amount of protein signifies that the leave can contributes to building and repairing of body tissues, regulation of body's metabolic processes like protein synthesis, including enzymes, hormones e.t.c. It can also be used to supplement for dietary intake especially when other vegetables are in short supply (paralinghug *et al*., 2022). Ash Content of the leaves (20.91±0.001%) for *Corchorus incisifolius* and (18.39±0.002%) for *Corchorus olitorius*, shows the mineral content present in the leaves which the body requires to perform many different functions such as being cofactors for enzymes, being part of important macromolecules such as DNA and RNA, building of strong bones, transmission of nerve impulse, e.t.c. (Mundy, 2015). The crude fiber content of *Corchorus olitorius* (22.52±0.001%) is higher than that of *Corchorus incisifolius* (9.24±0.001%). This result is similar but higher than what was reported by Andrea *et al*. (2016). Vegetables are generally high in dietary fibre and this quality has greatly assisted in facilitating bowl movement of food and faecal elimination, lower the risk of coronary heart, constipation, diabetes and hypertension, and colon cancer (Ishida *et al* ., 2000). The crude fat content of *Corchorus incisifolius* (3.88+-0.001%) is lower compare to that of *Corchorus olitorius* (5.45+-0.001%). This result is similar but higher than those of SHA'A *et al*. (2019) and Adesina *et al*. (2022). Vegetables are known for their low fat concentration levels, as excess fat consumption leads to cardiovascular disorders such as atherosclerosis, cancer and aging (KrisEtherton *et al*., 2002). There was no significant difference between the moisture content of *Corchorus incisifolius* (7.66+-0.001%) and that of *Corchorus olitorius* (7.81+-0.004%).This result is lower compare to what was reported by SHA'A *et al*. (2019). High moisture content results in rapid deterioration of vegetables and hence reduced shelf-life, while low moisture content increases the shelf-life. High moisture content may induce a greater activity of water soluble

enzymes and co-enzymes involved in metabolic activities of these leafy vegetables, increasing deterioration (Agbaire, 2011).

Phytochemical analysis involves the identification and quantification of bioactive compounds present in plants. From the qualitative analysis carried out which are given in Table 2, *Corchorus incisifolius* and *Corchorus olitorius* were confirmed to contain bioactive compounds such as Tannins, Alkaloids, Flavonoids, Saponins and steroids which provides good understanding about their potential health benefits. Based on the quantitative analysis carried out which are given in Table 3, *Corchorus incisifolius* contains (6.06+-0.04) Tannins, (7.27+-0.01) Alkaloids, (9.41+-0.01) flavonoids, (6.3+-0.02) saponins, and (0.64+-0.01) steroids, While *Corchorus olitorius* contains (4.33+-0.04) Tannins, (5.1+-0.01) Alkaloids, (7.49+-0.01) flavonoids, (11.08+-0.03) saponins, and (0.33+-0.01) steroids. This indicates that *Corchorus incisifolius* has higher amount of Tannins, Alkaloids, Flavonoids but lower amount of saponin than *Corchorus olitorius*. This result is similar but higher than what was reported by SHA'A *et al*. (2019) and Adesina *et al*. (2022). Tannins are known to have potential antiviral activity as well as anticancer agent (Cheng *et al*., 2002). The alkaloid is known to contain antimicrobial agents which accounted for its antimicrobial activity (Usunobun and Okolie, 2016). Flavonoid is believed to contain antioxidant agents and it is reported that it reduce the oxidation of low-density lipoprotein, lower cholesterol level and triglyceride (Erdman, 2007). It is also expressed in plant in respond to microbial attack suggesting their antimicrobial property (Erdman, 2007). Saponins limit the growth and viability of cancer cell by reacting with cholesterol rich membrane of cancer cell (Prohp and Onoagbe, 2012). Pharmacologically, saponin is responsible for most cellular activities related to cell division and growth in human and has incivility effect on inflammation. *Corchorus incisifolius* slightly has high amount of steroids than *Corchorus olitorius*. These plant steroids have structural similarity to cholesterol, and poseses cholesterol absorption inhibition properties. In addition to their cholesterol lowering effect, plant sterols may possess anti-cancer, anti-atherosclerosis, anti-inflammation and anti-oxidation activities (Van Rensburg *et al*., 2000).

CONCLUSION

This research has shown that the Corchorus olitorius varieties investigated contain varied proportions of the parameters determined. The proximate analysis of the Ttwo varieties of jute (*Corchorus incisifolius* and *olitorius*) leaves reveals the nutritional value of the vegetable. The high concentration of crude protein in the two varieties of jute (*Corchorus incisifolius* and *olitorius*) indicates that the plant leaves can be a good source of protein in human and animal foods. The low fat contents in this study signify that *Corchorus spp*. is good vegetables suitable for obese people. The Ash, fibre and moisture content of the two varieties shows that the vegetables are good sources of minerals, helps in bowl movement of food and faecal excretion, and shelf-life. The Phytochemicals analysis of the two varieties of jute (*Corchorus incisifolius* and *olitorius*) leaves reveals health benefits of the vegetable in humans. The presence of bioactive compounds such as tannins, flavonoids, alkaloids, saponins and steroids in the two varieties of jute validates its active use as food or medicine with antioxidant, antimicrobial, and anti-inflammatory properties. This research reveals that the varied proportion of Proximate and Phytochemical content of jute varieties, which means varying the cultivation and consumption, will be much more helpful in human diet.

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