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PHYSICOCHEMICAL PROPERTIES AND PHYTOCHEMICAL SCREENING OF *LAGENARIA SICERARIA* PEEL EXTRACTS

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Abstract

The present study was aimed to see the physicochemical properties and phytochemical screening of *Lagenaria siceraria* peel extract. People in Bangladesh consume every parts of *Lagenaria siceraria* where peel is no exception. The percentage value of foreign matters, total ash, acid insoluble ash and loss on dry were found 2.75, 6.5, 4 and 4.7 respectively. Phytochemical screening showed varied degree of presence of alkaloids, carbohydrate, saponins, flavonoids, phenolic compound, glycosides and terpenes and absence of tannins with different solvents.

Keywords: *Lagenaria siceraria, physicochemical, phytochemical, peel*

Introduction

Lagenaria siceraria is a very healthy vegetable which carry almost all essential nutrient. *Lagenaria siceraria* also known as Lau in Bangladesh is a member of Cucurbitaceae family. It is cultivated around the year but largely cultivated in summer season in Bangladesh. *Lagenaria siceraria* is also used for medicinal purpose because of its physicochemical and phytochemical properties. Every parts including the peel are very utilizable [1].

The common name of *Lagenaria siceraria* is Bottle gourd. It is very common, convenient and favorite vegetable to the people of Bangladesh. People in Bangladesh consume every part of *Lagenaria siceraria* where fruit peel is no exception. Besides its taste and availability it is widely known for its diversified health benefits. Choline which acts as antecedent of neurotransmitter acetylcholine, which in turn is beneficial for intensifying reminiscence is found at its highest amount in *Lagenaria siceraria*[2].

Lagenaria siceraria are used as vegetable and are very rich source of vitamin C, vitamin B complexes, certain amino acids and carbohydrates also [3].

Steroids, tarpenoids, glycosides, flavonoids, phenolic compounds and alkaloids are the most important natural bioactive compounds known as phytochemicals which are produced as secondary metabolite to work with nutrients [4].

The parts of *Lagenaria siceraria* have b.een used traditionally for medicine purpose in South East Asia [5]. Few physicochemical and phytochemical studies have been found regarding fresh fruit, leaves and root of *Lagenaria siceraria* in Asia [6].

Materials and Methods

Lagenaria siceraria was collected from the local market in Dhaka city. After collection *Lagenaria siceraria* was peeled. Dried peels were made into powder. The powdered peel were subjected to various physicochemical properties including foreign matters, total ash, acid insoluble ash and loss on drying [7]. Powdered peel were subjected to screen the presence of secondary metabolite [8].

Dried residue were soaked with methanol for 72 hours under agitation, filtered and concentrated. After treatment with methanol in distilled water, the aqueous extract was prepared by soaking the dry residue. The extracts was filtered and concentrated by using an evaporator. The methyl extract was used with other solvents to increase polarity like chloroform, ethyl acetate and n-butanol. Extracts were concentrated at higher temperature in the oven.

Phytochemical screening were done by standard methods (alkaloids, phenolic compound, flavonoids, saponins, tannins, carbohydrates and terpenes). Alkaloids and tannins were screened using Mayer's and Dragendoff's reagents following the methods from Sofowora [9]. The methods described by Harborne [10] and Trease and Evans (1989) [11] were used for determining flavonoids, phenol and glycosides. Trease and Evans [11] and Safowora [9] described sodium bicarbonate and carbonate tests which were used for saponins. Carbohydrates, sterols and terpenes determination were done using Fehling's reagent following the method described by Harbone [10].

Result and Discussion

The result of the physicochemical properties of *Lagenaria siceraria* are presented in Table 1. The values for total ash and acid insoluble ash were found to be 6.5% and 4% respectively. Foreign matter value was found 1.5% which was found a little bit higher in the studies on *Lagenaria siceraria* leaves [12]. The value of loss on drying was 4.7% which has the similar value in another studies where the value of loss on drying was 4% [12].

The findings of phytochemical screening of chloroform, n-butanol, ethyl acetate, methanol and distilled water extracts are presented in Table 2. Different quantity of alkaloids, carbohydrates, saponins, tannins, flavonoids, phenolic compound, glycosides and terpenes were indicated from the phytochemical screening. Phytochemical screening showed that n-butanol, methanol and water extracts contains slight amount of alkaloids where favorable amount of carbohydrates is seen in methanol, aqueous and n-butanol extracts. Methanol extract showed clear presence of carbohydrates, saponins, flavonoids, phenolic compound, glycosides and terpenes. Tannins were absent in all of the extracts. The variation in presence may be attributed to the nature of the component and the polarity of the

solvent. The presence of carbohydrates, tarpenes and other phytochemicals were also seen in another study [13].

References

1. M.K. Baranowska and W. Cisowski, Natural Drugs, 52, 137 (1995).
2. M. Parle, S. Kaur, "Is bottle gourd a natural gourd?," Int. Res. J. Pharm. 2(6), 13-17 (2011).
3. A. Shirwaikar and K. K. Sreenivasan, Indian J. Pharm. Sci., 58, 197 (1996).
4. Edeoga HO, Okwu DE, Mbaebie BO. Phytochemical constituents of some Nigerian medicinal plants. African Journal of Biotechnology 2005; 4 (7):685-688.
5. Habib-ur-Rahman AS. Bottle gourd (*Lagenaria siceraria)*, a vegetable for good health. Natural Product Radiance 2003; 2: 249-256.
6. Kumar A, Pratap S, Sharma NK, Jha KK. Phytochemical, ethnobotanical and pharmacological profile of *Lagenaria siceraria* : - A review. Journal of Pharmacognosy and Phytochemistry 2012; 1 (3):24-31.
7. Indian Pharmacopoeia, Vol. II, 4th Edn., Ministry of Health and Family Welfare, Govt. of India, Controller of Publication, New Delhi, (1996) p. A-53.
8. S. S. Handa, and V. K. Kapoor, Textbook of Pharmacognosy, 2nd Edn., Vallbh prakshan, Delhi, (2003) p.26.
9. Sofowora A. Medicinal Plants and Traditional Medicine in Africa. Ibadan: Spectrum Books, 1993, 289.
10. Trease GE, Evans WC. Pharmacognosy. Edn. 11, Braillliar Tiridel Can: Macmillian Publishers, 1989, 567-569.
11. Harbourne JB. Phytochemical Methods: A Guide to Modern Techniques of Plant Analysis. Edn 2, New York: Chapman & Hall Publisher, 1973, 85.
12. Badmanaban R., Patel C. N., Sam Daniel P., Modh Kamal: Pharmacognostical studies on *Lagenaria siceraria* (MOL.) Stand Leaves; Int. J. Chem. Sci.:7(4), 2009.
13. Kumar A, Partap S, Sharma NK, Jha KK. Phytochemical, ethnobotanical and pharmacological profile of Lagenaria siceraria: - A review. Journal of Pharmacognosy and Phytochemistry 2012; 1(3): 24-31.

Table 1: Physicochemical Properties of *Lagenaria siceraria* peel extracts

Sl. No.	Parameters	Values (%)
1	Foreign matter	2.75
2	Total Ash	6.5
3	Acid insoluble ash	4
4	Loss on drying	4.7

Table 2: Phytochemical screening of *Lagenaria siceraria* peel extracts

Sl. No.	Tests	Chloroform	n-Butanol	Ethyl acetate	Methanol	Water
1	Alkaloids	-	+	-	+	+
2	Carbohydrate	+	++	+	+++	+++
3	Saponins	+	+++	+++	+++	++
4	Tannins	-	-	-	-	-
5	Flavonoids	-	-	-	+++	++
6	Phenolic compounds	-	+	+++	+++	+
8	Glycosides	+	++	+	+++	+
9	Terpenes	+	+++	+	+++	+

+++ = clearly present, ++ = present, + = slightly present, - = absent