

***Lagenaria siceraria* (bottle gourd) as a functional food: A systematic review of its nutritional composition, bioactive constituents, and therapeutic potential**

F. A. Jamaldeen¹, N. D. Kodithuwakku², A. P. A. Jayasiri²

¹*Central Ayurvedic Dispensary, Alayadivembu, Sri Lanka*

²*Department of Ayurveda Pharmacology, Pharmaceutics and Community Medicine, Faculty of Indigenous Medicine, University of Colombo, Sri Lanka*

Lagenaria siceraria (bottle gourd) is a widely cultivated vegetable known for its nutritional and medicinal value. Recent research highlights its potential as a functional food due to its rich phytochemical profile and therapeutic properties. This systematic review focuses on the nutritional content, bioactive compounds, and health benefits of *L. siceraria*, with its potential applicability in functional food development. The systematic review was conducted following PRISMA guidelines across electronic databases including PubMed, Scopus and Google Scholar from 2020 to 2025, using predefined search terms related to *Lagenaria siceraria* and functional food. Inclusion criteria encompassed original research articles, in vitro, in vivo, and human studies that focused on nutritional composition, bioactive constituents, and health benefits. A total of 280 articles were found, and after screening 25 articles were selected for the study. Nutritionally, besides 17 different amino acids, *L. siceraria* contains moisture, protein, fat, carbohydrate, fibre, ash, and energy in approximate amounts of 94.5±0.06; 1.2±0.06; 0.2±0.02; 3.75±0.03; 0.7±0.01; 0.5±0.01; 15±0.12 %, respectively, and vitamin C (10–12 mg/100g), potassium (170–210 mg/100g), ascorbic acid, β-carotene, and choline. Phytochemically, it contains flavonoids, saponins, terpenoids, cucurbitacins B, D, G, H, flavone-C glycosides, sterols such as fucosterol and campesterol, and the ribosome-inactivating protein lagenin. Pharmacologically, DPPH scavenging: 52%–87%, anti-inflammatory, diuretic, cardioprotective, hepatoprotective (up to 65% restoration in CCl₄-induced liver damage), purgative, antihyperlipidemic, and antidiabetic effects (30–55% reduction in blood glucose in diabetic models). It contains high choline levels, metabolic/metabolites precursors desirable for the functions of the brain, as well as amino acids, vitamins, and minerals that help in synthesizing neurotransmitters with neuroprotective benefits. Traditionally, it has been used to manage jaundice, ulcers, diabetes, epilepsy, and hypertension. Given its diverse bioactive profile, *L. siceraria* demonstrates strong potential as a functional food. Further clinical validation and standardization are needed to support its dietary integration.

Keywords: *Lagenaria siceraria*, Bottle gourd, Functional food, Phytochemicals