Annals of Phytomedicine 15(1): 434-442, 2026

DOI: http://dx.doi.org/10.54085/ap.2026.15.1.38

Annals of Phytomedicine: An International Journal

http://www.ukaazpublications.com/publications/index.php

Print ISSN : 2278-9839 Online ISSN : 2393-9885



Review Article : Open Access

Phytochemical diversity and therapeutic potential of *Ipomoea batatas* (L.) Lam.

S. J. Imamsaheb◆, K. R. Lingamurthy *, K. H. Yashavantakumar, A. S. Shubha *** and S. M. Kale******

All India Coordinated Research Project on Tuber Crops, Regional Horticultural Research and Extension Centre, Dharwad-580005, Karnataka, India

** Department of Vegetable Science, Kittur Rani Channamma College of Horticulture, Arabavi-591218, Belagavi, Karnataka, India*

*** Department of Vegetable Science, College of Horticulture, Bagalkot-587104, Karnataka, India*

**** Department of Vegetable Science, Gandhi Krishi Vignana Kendra, College of Horticulture, Bengaluru-560065, Karnataka, India*

***** Department of Horticulture, College of Agriculture, Kalaburagi-585103, Karnataka, India*

Article Info

Article history

Received 1 January 2026

Revised 1 March 2026

Accepted 2 March 2026

Published Online 30 June 2026

Keywords

Ipomoea batatas (L.) Lam.

Phytochemical diversity

Anthocyanins

Carotenoids

Antioxidant activity

Therapeutic potential

Abstract

Ipomoea batatas (L.) Lam. commonly known as sweet potato is an agronomically significant tuber crop distinguished by remarkable phytochemical diversity and expanding therapeutic importance. The species demonstrates substantial genotypic and tissue-specific variability in bioactive constituents, including phenolic acids, flavonoids, anthocyanins, carotenoids and structurally complex polysaccharides. Purple-fleshed cultivars are particularly enriched in acylated anthocyanins exhibiting potent antioxidant and anti-inflammatory activities, whereas orange-fleshed genotypes serve as major dietary sources of provitamin A carotenoids that contribute to alleviating vitamin A deficiency. Comparative metabolomic investigations further indicate that sweet potato leaves frequently contain higher concentrations of total polyphenols than storage roots, underscoring the nutraceutical potential of aerial biomass. Pharmacological and experimental evidence suggests that sweet potato phytochemicals exert multifaceted biological effects including attenuation of oxidative stress, modulation of inflammatory mediators such as NF-κB, enhancement of insulin sensitivity and inhibition of tumor cell proliferation. Moreover, polysaccharide fractions have demonstrated immunomodulatory and hypoglycemic activities in both *in vitro* and *in vivo* systems. Advances in chromatographic and spectrometric characterization have strengthened structural elucidation and quantification of anthocyanins and phenolics, thereby improving prospects for functional food standardization and therapeutic translation. Collectively, contemporary evidence positions sweet potato as a functional crop of substantial biomedical relevance, warranting cultivar-specific bioavailability studies and rigorously designed clinical validation.

Scanned with OKEN Scanner