

AMARANTH (AMARANTHUS L.) AS A FUNCTIONAL CROP: BOTANICAL
CHARACTERISTICS, NUTRITIONAL PROFILE, AND THERAPEUTIC POTENTIAL
IN GASTROINTESTINAL DISORDERS

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Abstract

Background: Amaranth (*Amaranthus* L.) is an ancient crop with significant nutritional and pharmacological properties. In recent decades, it has attracted global attention due to its high protein content, essential amino acids, and bioactive compounds with potential therapeutic effects.

Objective: This study aims to systematically evaluate the botanical characteristics, geographical distribution, nutritional composition, and therapeutic significance of *Amaranthus* species, with particular emphasis on their role in gastrointestinal health.

Methods: A comprehensive literature review was conducted using botanical, agronomic, and biomedical sources. Key species such as *Amaranthus caudatus*, *A. hybridus*, and *A. retroflexus* were analyzed in terms of their biological, nutritional, and pharmacological properties.

Results: Amaranth demonstrates high nutritional value, including elevated protein content (14–19%), lysine-rich amino acid composition, and significant levels of polyphenols, dietary fiber, and squalene. These compounds exhibit antioxidant, anti-inflammatory, and microbiota-modulating effects. Evidence suggests that amaranth contributes to improved gastrointestinal function, enhanced gut microbiota balance, and protection against digestive disorders.

Conclusion: *Amaranthus* species represent a promising functional food and phytotherapeutic resource. Their bioactive compounds support potential applications in the prevention and treatment of gastrointestinal diseases. Further clinical studies are required to validate their therapeutic efficacy.

Keywords: *Amaranthus*, gastrointestinal health, polyphenols, squalene, microbiota, functional food, phytotherapy

Introduction

Amaranth (*Amaranthus* L.) is a genus belonging to the Amaranthaceae family, comprising more than 60 species distributed across tropical, subtropical, and temperate regions. Historically, amaranth has been cultivated for over 4000 years and served as a staple food in ancient civilizations such as the Aztecs, Mayans, and Incas. Archaeological evidence suggests that amaranth seeds dating back more than 6000 years have been discovered in Mexico, indicating its early domestication and agricultural significance.

Despite its ancient origin, amaranth has experienced a resurgence in modern agriculture and nutrition science due to its exceptional adaptability and nutritional profile. It is increasingly recognized as a “superfood” because of its high protein content, essential amino acids, and functional bioactive compounds.

In recent years, research has shifted toward understanding the role of amaranth in human health, particularly its effects on the gastrointestinal system. Gastrointestinal disorders remain a major global health concern, and there is growing interest in plant-based therapies that can support gut health and microbiota balance.

Materials and Methods



This study is based on a systematic review of scientific literature, including peer-reviewed articles, botanical records, and biomedical research publications. Data sources included international databases such as PubMed, Scopus, and Web of Science.

The analysis focused on:

- Botanical classification and distribution of *Amaranthus* species
- Nutritional composition and biochemical properties
- Pharmacological effects on gastrointestinal function
- Traditional and modern therapeutic applications

Discussion

The results of this study confirm that *Amaranthus* species possess significant nutritional and pharmacological value. The presence of essential amino acids, particularly lysine, distinguishes amaranth from traditional cereal crops.

From a biomedical perspective, the most important aspect of amaranth is its bioactive composition. Polyphenols and flavonoids act as antioxidants, reducing oxidative stress, which is a key factor in gastrointestinal diseases.

Additionally, dietary fiber plays a crucial role in maintaining gut health by supporting microbiota balance. The interaction between plant-derived compounds and intestinal microbiota leads to the production of bioactive metabolites that further enhance gastrointestinal function.

Amaranth's adaptability also makes it an economically valuable crop for sustainable agriculture, particularly in regions with challenging environmental conditions.

Conclusion

Amaranthus represents a unique combination of nutritional and therapeutic properties. Its high protein content, essential amino acids, and bioactive compounds make it a promising functional food.

The evidence suggests that amaranth can play a significant role in the prevention and management of gastrointestinal disorders. However, further clinical and experimental studies are necessary to validate its therapeutic potential and establish standardized applications.

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