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## A Microbiologist's Perspective on Anardana Goli - Childrens' Delight

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Anardana Goli, a traditional polyherbal formulation built around dried pomegranate seeds, presents a unique convergence of polyphenol-rich bioactives and spice-derived essential oils. From a microbiological perspective, its therapeutic potential is closely linked to the gut microbiota, which serves as both a biotransformer and a target of its functional ingredients.



Figure 1

### Urolithin A: A Gut-derived neuroprotective metabolite

Ellagitannins and ellagic acid from pomegranate—the central ingredient in Anardana Goli—are metabolized by specific gut microbes such as *Bifidobacterium*, *Clostridium*, and *Eubacterium* into Urolithin A (UA), a postbiotic with potent anti-inflammatory,

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antioxidant, and mitophagy-enhancing effects [1]. These effects are mediated through activation of the PINK1/Parkin pathway, reduction of mitochondrial dysfunction, and suppression of oxidative stress, all of which are implicated in Alzheimer's and Parkinson's disease models [1,2]. Thus, the bioavailability and benefits of UA hinge critically on microbial composition, positioning the microbiota as a key determinant of Anardana Goli's efficacy.

# Polyphenols as duplibiotics: Prebiotic and antimicrobial functions

According to Rodríguez-Daza., *et al.* (2021), dietary polyphenols—such as those in pomegranate, tamarind, and amchur—not only suppress pathogenic bacteria but also selectively promote beneficial bacteria like *Akkermansia*, *Bifidobacterium*, and *Faecalibacterium*. These compounds act as "duplibiotics", exerting both antimicrobial and prebiotic effects, which can rebalance dysbiotic gut microbiota and modulate local and systemic immune responses [3].

### Spices as microbial and immune modulators

The formulation's traditional spice ingredients—fennel, cumin, black pepper, and ginger—are also known to influence the gut microbiome and immune function. As Dahl., *et al.* (2023) outline, such culinary herbs promote gut microbial diversity, stimulate SCFA production, and enhance gut barrier function. These effects are vital in metabolic and neuroimmune regulation, supporting the notion that Anardana Goli acts beyond digestion to influence systemic resilience [4].

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### **Essential Oils Against Inflammation and Pathogens**

Volatile oils extracted from fennel and cumin exhibit antimicrobial action against a spectrum of pathogens (*S. aureus, E. coli, C. albicans*) and suppress neutrophilic inflammation via inhibition of the MAPK pathway (p38, ERK, JNK) and calcium influx [5]. This provides mechanistic insight into their role in modulating immune responses, mitigating oxidative bursts, and contributing to the overall anti-inflammatory potential of Anardana Goli.

In conclusion, Anardana Goli exemplifies how traditional formulations can offer more than nostalgic flavor—they serve as biofunctional agents deeply intertwined with gut microbiology. Through the generation of metabolites like Urolithin A, modulation of microbial diversity by polyphenols and spices, and the antimicrobial properties of essential oils, this age-old remedy demonstrates a diverse potential for supporting gastrointestinal, metabolic, and neuroimmune health. Bridging traditional remedies and modern microbiology, Anardana Goli highlights the importance of exploring cultural dietary practices through a scientific lens, showing how they can still play a valuable role in today's approach to health.

#### **Bibliography**

- Zhao H., *et al.* "Pharmacological Effects of Urolithin A and Its Role in Muscle Health and Performance: Current Knowledge and Prospects". *Nutrients* 15.20 (2023): 4441.
- 2. He F., *et al.* "In vitro conversion of ellagic acid to urolithin A by different gut microbiota of urolithin metabotype A". *Applied Microbiology and Biotechnology* 108.1 (2024): 215.
- Rodríguez-Daza MC., et al. "Polyphenol-Mediated Gut Microbiota Modulation: Toward Prebiotics and Further". Frontiers in Nutrition (2021): 8.
- 4. Dahl SM., *et al.* "Gut microbial modulation by culinary herbs and spices". *Food Chemistry* 409 (2023): 135286.
- Korinek M., *et al.* "Anti-Inflammatory and Antimicrobial Volatile Oils: Fennel and Cumin Inhibit Neutrophilic Inflammation via Regulating Calcium and MAPKs". *Frontiers in Pharmacology* 12 (2021): 674095.