Potential of bitter taste as a therapeutic tool: Integrating Ayurveda principles with modern pharmacology

K. N. A. Dharmasena, N. D. Kodithuwakku

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

Taste is a perception created on substance-receptor interactions. In Ayurveda, taste reflects significant post-digestive therapeutic properties including antipyretic, anti-adiposity, digestive, and detoxifying actions. Recent discoveries of extraoral taste receptors have provided scientific explanations for Ayurvedic taste concepts. However, the correlation of Ayurvedic principles with modern scientific findings remain limited. This study focused on elucidating the *Rogaghnata* (disease curing potency) and *Dosha kopata* (disease causing potency) of bitter tasting substances using novel research findings. Authentic Ayurveda books and scientific evidence published from 2015 - 2025 were retrieved from standard search engines using the words “bitter taste receptors”. After screening, 68 articles were selected out of 370 articles according to inclusion criteria. A comprehensive analysis was made to have the bottom line of this comparative study. According to Ayurveda, *Rasa* alone may assist in the causation of the diseases and its management. Activation of bitter taste in human occurs through 25 members of G protein-coupled receptors and the involvement of G α-gustducin transducer. There are many phytochemicals such as alkaloids, phenols, flavonoids, isoflavones, terpenes, and glucosinolates which have the ability to stimulate oral and extra-oral bitter taste receptors and initiate the T2R signaling cascades; for skin diseases Gα12/13/RhoA/ROCK/p38 MAP kinase/NF-κB pathway of TAS2Rs, for airway obstruction diseases PLC and PKC intracellular signaling pathway of T2Rs, for metabolic disorders PLC pathway of TAS2R38 on enteroendocrine NCI-H716 cells etc. These extraoral T2Rs play a role in processes of modulating pathophysiology of various diseases. After a comprehensive analysis, the study was able to align the therapeutic actions of bitter taste in Ayurveda along with the sites of extraoral bitter taste receptors with their transducing pathways. These findings reveal a new therapeutic target to boost immune responses. However, it does not offer a comprehensive understanding of this ancient wisdom and may warrant in-depth knowledge on extraoral receptor mechanisms supported by comparative clinical studies.

Keywords: *Bitter taste, Extra-oral taste receptors, Rasa, Extraoral T2Rs*