

**MICROSCOPIC AND MICROBIAL ANALYSIS OF MARKETED
'TRIPHALA' FORMULATIONS AVAILABLE IN JAFFNA, SRI LANKA.**

¹N.Krishnapillai*, ²S.Thuvaragan and ³S.Vinotha

¹Department of Botany, Faculty of Science, University of Jaffna

²Department of Pharmacy, Faculty of Allied Health Sciences, University of Jaffna

³Unit of Siddha Medicine, University of Jaffna

'Triphala' is a popular ayurvedic formulations used by peoples for different ailments. Many studies reported on inferior quality of marketed herbal products. In this study, microbial contamination, and microscopic powder analysis of marketed 'triphala' formulation were evaluated. Three different marketed 'triphala' formulations in which two formulations were available as tablets (T₁ and T₂) and one formulation was available as capsule form (T₃) were used for the analysis. Different types of cells and tissues were identified by microscopic study of powdered 'triphala' brands prepared by the fruits of three plants such as *Embllica officinalis*, *Terminalia bellerica*, and *Terminalia chebula*. T₃ brand had branched trichome, lignified and pitted tracheid, fiber, glandular trichome, fragmented vessel, scleroids, oil droplets, xylem vessels whereas T₁ brand had scleroids, epidermal cells, starch grains, and fragmented vessels. T₂ brand had porous region of tracheid pits containing torus, oils droplets, crystals in different shapes, stones cells and scleroid. More anatomical structures were identified in T₃ brand followed by T₂ and T₁ brands. All these structures were found in the fruits used for the preparations of 'triphala' brands and there were no specific structures observed from adulteration. Microbial analysis of marketed 'triphala' brands revealed that T₃ brand was free from viable aerobic bacteria and other two brands showed the presence of viable aerobic bacteria. Fungal contamination was absent in all three brands. However microbial contaminations in 'triphala' brands were within the acceptable limit according to the WHO guidelines. Further studies needed to evaluate quality of 'triphala' brands using modern analytical techniques.

Keywords: Microscopy, Powder Analysis, Microbial content, 'triphala' formulations and quality control