

Development of Emulgels including Natural Mucilages and Powders Extracted from Three Selected Plants in Sri Lanka, and Evaluation of Physicochemical Properties, Physical Stability, Lethality, and Drug Release Profile

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Mucilages extracted from plants play a vital role as pharmaceutical excipients. This study aimed to develop emulgels using natural mucilages, their respective powders and combinations of, *Dillenia retusa* (DR), *Aloe vera* (AV), and *Neolitsea cassia* (NC). The 09 emulsions were prepared using the continental emulsification technique, by heating the aqueous phase with Tween 80, methyl paraben, distilled water and adding it to the oil phase containing Span 20 and benzyl benzoate at the same temperature, followed by the addition of respective gelling agents. Then physicochemical properties, physical stability, *in-vitro* brine shrimp lethality assay and release profiles were evaluated. Considering physicochemical properties, NC mucilage emulgel had the lowest viscosity (345cp). Mucilage and powder emulgels of DR, AV, and NC, were brown, white, and green. A mild odor was observed in mucilage and combined DR:NC powder emulgel. The combined powder emulgel had a thicker texture compared to others. All emulgels were within pH 2.7-5. Optical microscopic observations revealed, DR powder emulgel contained larger and uniformly distributed globules. All mucilage and other powder emulgels exhibited an irregular distribution. During long-term stability evaluation, only NC powder, combined powder, and Carbopol 940 emulgels remained stable throughout 90 days. All emulgels remained stable throughout the centrifugation test (28-days), in room (28±5°C) and cold temperatures (4°C), except the AV mucilage emulgel. No changes were observed in any emulgels during cycling test. AV mucilage and powder emulgels (1g) demonstrated 90% and 60% lethality. Emulgel containing combined powder achieved the highest benzyl benzoate (drug) release percentage, reaching 58.25% after 6 hours without variations in release characteristics despite alterations of added gelling agents. Combined and NC powder exhibited acceptable gelling properties and physical stability comparable to Carbopol 940 and could be further analyzed to be commercialized as gelling agents.

Keywords: *excipients, emulgels, mucilages, powders, dillenia retusa, aloe vera, and neolitsea cassia*