

Formulation and physicochemical evaluation of a mucoadhesive gel from *Quercus brantii* L. and *Coriandrum sativum* L. for the treatment of periodontitis

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Background and Aims: Intra-periodontal pocket, mucoadhesive drug delivery systems have been shown to be clinically effective in the treatment of periodontitis. Natural herbs can help stop or reverse the development of periodontitis. The aim of this study was to formulate a mucoadhesive gel from the seed hull (Jaft) of *Quercus brantii* and fruits of *Coriandrum sativum* for the treatment of periodontitis which has antiseptic, anti-inflammatory and analgesic effects and for the control of bleeding on probing.

Methods: In present study, total phenolic content in dry extracts of the seed hull (Jaft) of *Q. brantii* and fruits of *C. sativum* was determined according to the Folin-Ciocalteu method. The semisolid concentrated extracts were incorporated in gel base. Mucoadhesive gel formulations were prepared using the bioadhesive polymers: carbopol 940, sodium carboxy methyl cellulose (sodium CMC) and hydroxyl propyl methyl cellulose (HPMC). Physicochemical tests, mucoadhesive strength measurement and in-vitro drug release study were carried out on two formulations containing carbopol 940 and sodium CMC polymers (F4,F5).

Results: The dry extracts of the seed hull of *Q. brantii* and fruits of *C. sativum*, were found to contain 504.10 and 30.77 mg GAE/g of total phenolic content respectively. Mucoadhesion of F5 (1% carbopol 940 and 3% sodium CMC) was more than F4 (0.5% carbopol 940 and 3% sodium CMC). Drug release from F5 was slower and provides an extended release profile.

Conclusions: The results indicated that increased concentration of carbopol 940 decreased the drug release rate, due to increased viscosity and also enhanced mucoadhesive strength. Based on in-vitro release and mucoadhesion studies, F5 was selected as the best formulation. This formulation shows more mucoadhesion and optimum release profile and it would be expected that this formulation would be useful as an adjunct to scaling and root planning in the treatment of periodontitis.

Keywords: *Quercus brantii*; *Coriandrum sativum*; Polyphenol; Herbal gel; Periodontal pocket