

Development and Antimicrobial activity of Nigella Sativa Emulgel

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Abstract:

Nowadays there is an intensely usage of natural bioactive materials as medicinal agent in pharmaceutical industries. Nigella Sativa (N.S) has been reported to have biological activities such as anti-inflammatory, anti-bacterial, anti-fungal and anti-oxidant activities. Therefore, N.S oil was used in the formulation of oral soft gel capsule and in cosmetics as shampoo. In this study, Topical preparations of emulgel formulations were prepared from N.S Oil using different surfactants (Sodium Lauryl Sulphate (S.L.S) and sucrose ester). First of all; we extracted the oil from seeds. Then we mixed the oil, glycerol with sucrose ester or S.L.S to produce pre-emulsion by heat inversion technique. Then emulsion was formed upon the mixing with water by self-emulsification technique. After that Carbopol 940 was added to emulsion to produce the emulgel. The anti-oxidant test for N.S Oil extract was carried using free radical scavenging assay. The Droplet size and size distribution analysis different formulations of emulsion and emulgel were done by SALD-2300 apparatus also the rheological behavior of emulgel was studied using Brookfield instrument. Anti-bacterial studies were conducted for different bacteria types by Agar well diffusion test and the efficacy of both oil and emulgel were reported. The in vitro studies were made after taking Institutional Review Board (IRB) at An-Najah National University, Palestine. It included tests for sensitivity, irritancy and spreadability on healthy volunteers. Viscosity test was done for different gel concentrations. The optimal self-emulsifying formulations were prepared using sucrose ester, producing small droplets size of less than 1 μm . In anti-bacterial tests, for Staphylococcus aureus, it was found that emulgel prepared from N.S Oil made inhibition zone of 2.5 cm in diameter, but the oil alone 1.3 cm. According to MRSA the inhibition zone for emulgel 1.1 cm, but for oil 0.5 cm in diameter. In vitro studies showed that the prepared emulgels do not make any irritations or sensitivity and has a smooth and homogeneous appearance. They were easily spreadable with acceptable bio-adhesion and fair mechanical properties. The pH values of the formulations ranged from 5.5 to 6.6, which are considered acceptable to avoid the risk of irritation upon application to the skin.