

### **Abstract**

Nowadays there is an intensely usage of natural bioactive material as medicinal agent in pharmaceutical industries, which is reported to have biological activities such as anti-inflammatory, anti-mutagenicity, anti-fungal and anti-tumor activities. Therefore, Chamomile oil was used in the formulation of oral nanoemulsion as self-nanoemulsifying system. Orally nanoemulsion provides several advantages, mainly the significant increase in the absorption which occurs in the gastrointestinal tract. The size of the droplets in an emulsion is critical to the performance of the self-emulsifying system because droplet size determines the rate and extent to which a drug is released and absorbed. In this study, self-nanoemulsifying formulations were prepared for Chamomile oil using different surfactants/co-surfactants (nonionic surfactants) (Tween 80, Tween 20 and Span 80). Finally, the anti-oxidant activity of Chamomile oil was evaluated against Trolox standard using 1, 1- diphenyl-2-picryl hydrazyl (DPPH) method. The optimal Chamomile oil self-nanoemulsifying formulations were prepared using Tween 80/Span 80, producing small droplets size of less than 120 nm, low polydispersity index below 0.3 and relatively good stability with zeta potential lower than -30. In addition, chamomile oil showed the anti-oxidant activity  $IC_{50}$  ( $2.15 \pm 1.31$ ) when compared with Trolox  $IC_{50}$  ( $1.08 \pm 0.31$ ). In conclusion, Chamomile oil showed anti-oxidant activity with promising candidate as self-nanoemulsifying system.