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| **Comparative evaluation of the therapeutic composition of ginger derived nanoparticles and ginger rhizome** |
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| **Background:** Plant-derived exosome-like nanoparticles (PENs) are a group of multifunctional nanoparticles that have a wide array of potential uses in formulation development, drug delivery systems and in medicinal applications. Ginger-derived nanoparticles (GDNPs) are one of the more investigated PENs, due to the medicinal properties of the parent plant, ginger (*Z. officinale*). The therapeutic properties of ginger have been attributed to various metabolites, including 6-gingerol and its derivatives. Although 6-shogaol is the most potent of these derivatives, 6-gingerol has however been reported to be largely responsible for the therapeutic properties of ginger, due to its higher percentage concentration in the plant’s rhizome. |
| **Methods:** The aim of this study was to quantify and monitor the stability of 6-gingerol and its corresponding 6-shogaol derivative in GDNPs, and compare the results with fresh ginger. Also, the in vitro antioxidant capacity, the total flavonoid content and the total phenolic content of both GDNPs and fresh ginger were compared. |
| **Results:** GDNPs were isolated using differential centrifugation. A one-month stability study using the defined parameters was performed; with experiments repeated at seven day intervals after the first day. Quantification of 6-gingerol and 6-shogaol was determined using reverse phase high performance liquid chromatography (HPLC), while the antioxidant capacity was determined using the DPPH (1,1-diphenyl-2-picrylhydrazyl) assay. |
| **Conclusions:** Interestingly, our results showed that GDNPs have a higher DPPH scavenging capacity, total flavonoid content, total phenolic content and 6-shogaol concentration than ginger rhizome, at each time-point. This was however not the case for 6-gingerol, even though a large fraction of this compound was present in the nanoparticles. While there were no clear trends in the stability of these phenolic compounds, our results show that reported therapeutic properties of GDNPs may be attributable to these compounds, due to the comparatively large amount of these compounds present in the nanoparticles. |