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# Development and Evaluation of Naringenin Nanosuspension to Improve Antioxidant Potential

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**Abstract :** Naringenin (NAR), is a naturally occurring plant flavonoid, found predominantly in citrus fruits, that possesses a wide range of pharmacological properties including anti-oxidant, anti-inflammatory behaviour, cholesterol-lowering and anticarcinogenic activities. However, despite the therapeutic potential of naringenin shown in a number of animal models, its clinical development has been hindered due to its low aqueous solubility, slow dissolution rate and inefficient transport across biological membranes resulting in low bioavailability. Naringenin nanosuspension were produced using stabilizers Tween® 80 by high pressure homogenization techniques. The nanosuspensions were characterized with regard to size (photon correlation spectroscopy (PCS), size distribution, charge (zeta potential measurements), morphology, short term physical stability, dissolution profile and antioxidant potential. A nanocrystal PCS size of about 500 nm was obtained after 20 homogenization cycles at 1500 bar. The short-term stability was assessed by storage of the nanosuspensions at 4 ◦C, room temperature and 40 ◦C. Result showed that naringenin nanosuspension was physically unstable due to large fluctuations in the particle size and zeta potential after 30 days. Naringenin nanosuspension demonstrated higher drug dissolution (97.90%) compared to naringenin powder (62.76%) after 120 minutes of testing. Naringenin nanosuspension showed increased antioxidant activity compared to naringenin powder with a percentage DPPH radical scavenging activity of 49.17% and 31.45% respectively at the lowest DPPH concentration.

**Keywords :** bioavailability, naringenin, nanosuspension, oral delivery
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