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**Chemical composition, antioxidant, anti-lipooxygenase, antimicrobial, anti-parasite and cytotoxic activities of *Polyalthia longifolia* seed oil**

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**Abstract**

This work investigates the chemical compositions of *Polyalthia longifolia* Thw. seed oil with the associated antioxidant, anti-inflammatory, anti-parasite and cytotoxicity potentials. The oil of *P. longifolia* seed obtained by soxhlet extraction was trans-esterified and the fatty acid profile characterized using gas chromatography mass spectrometry (GC–MS). The antioxidant activity was evaluated using DPPH and ABTS assays. The anti-bacterial and anti-fungi properties of the oil were determine on clinical isolates of the organisms using agar diffusion method. The anti-inflammatory activities, cytotoxicity and anti-parasite potential were evaluated using lipooxygenase, mammalian cell and *Toxoplasma gondii* assays respectively. *P. longifolia* seed was observed to contain oleic (30.31%), linoleic acid (19.27%) and palmitic acid (15.11%) as the major fatty acids with low proportion of tricosylic acid (6.10) and stearic acid (5.56%). The oil had significant anti-lipooxygenase activity (IC50 = 0.70 ± 0.02 µg/mL) comparable to indomethacin (IC50 = 0.53 ± 0.07 µg/mL). The DPPH (IC50 = 55.91 ± 31.18 µg/mL) and ABTS (IC50 = 16.89 ± 15.50 µg/mL) antioxidant activity of the oil was lower to the ascorbic acid (IC50 = 0.34 ± 0.04 and 0.54 ± 0.04 µg/mL). The oil also showed activities against all the tested bacteria and fungi. The highest inhibition was recorded against *S. aureus* (17 ± 1 mm) at concentration 200 mg/mL. Further, the oils showed strong potential to restrict growth of *Toxoplasma gondii* in vitro, but the parasite growth inhibition was mildly abated in the presence of α-tocopherol. The seed oil of the underutilized *P. longifolia* possesses essential fatty acids which could be responsible for the numerous biological potentials which include anti-lipooxygenase, antioxidant, anti-inflammatory, anti-parasite, anti-microbial and cytotoxic activities. The incorporation of the natural oil into pharmaceuticals or cosmetics may enhance antioxidant, anti-inflammatory, antimicrobial and cytotoxicity potential of such products.

**Keywords**

*Polyalthia longifolia* Oleic acid Drug discovery Medicinal chemistry Medicinal biochemistry *Toxoplasma gondii*

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**Compliance with ethical standards**

**Conflict of interest**

The authors declare that they have no conflict of interest.

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