

**Physicochemical, fatty acid and antioxidant properties of passion fruit
(*Passiflora* species) seed oil**

ABSTRACT

Background and objective: the passion fruit industry uses half of the fruit mass for juice extraction, while the rest represents an agricultural by-product that consists of rinds and seeds. Generally, the seeds are disposed of after being crushed, causing a substantial burden on the environment. Thus, efforts have been made to utilize the seeds for useful resources. This study focused on the physicochemical characteristics, fatty acid and antioxidant properties of seed oil extracted from three *Passiflora* species [*P. edulis* Sims (Purple), *P. quadrangularis* and *P. maliformis*]. Materials and methods: *Passiflora* seed oil was extracted using petroleum ether as a solvent and analysed for its physicochemical properties: refractive index, specific gravity, iodine value, saponification value, non-saponification matter, acid value, peroxide value and free fatty acid content. The fatty acid composition and antioxidant properties were also analysed. Results: *Passiflora* seeds were rich in oil content, yielding 24-30%. The *Passiflora* seed oil also possessed high values of iodine (124.67 ± 0.67 - 131.00 ± 0.58 g I₂ 100 gG₁) and peroxide (1.43 ± 0.12 - 3.23 ± 0.12 meq kgG₁) similar to other edible seed oils, e.g., sunflower. The seed oil contained essential fatty acids with a higher proportion of unsaturated fatty acids (>80%), mostly comprising linoleic and oleic acid. *Passiflora edulis* (Purple) seed oil had a comparatively higher total phenolic content (570.74 ± 0.78 mg kgG₁) and stronger antioxidant activity (33.63 ± 1.46 mg mLG₁). Based on principle component analysis (PCA), the biplot generated showed that *Passiflora* seed oils possessed characteristics similar to those of sunflower and soybean oils. Conclusion: the present findings revealed that the oil of *Passiflora* seeds, an agro by-product, is valuable and can be extracted for nutraceutical and pharmaceutical uses.

Keyword: Fatty acids; Iodine; *Passiflora* seeds; Peroxide; Phenolic content; Seed oils