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Loquat Leaf Extract as a Natural Antioxidant for Food Applications: Phytochemical Profiling and Bioactivity Assessment

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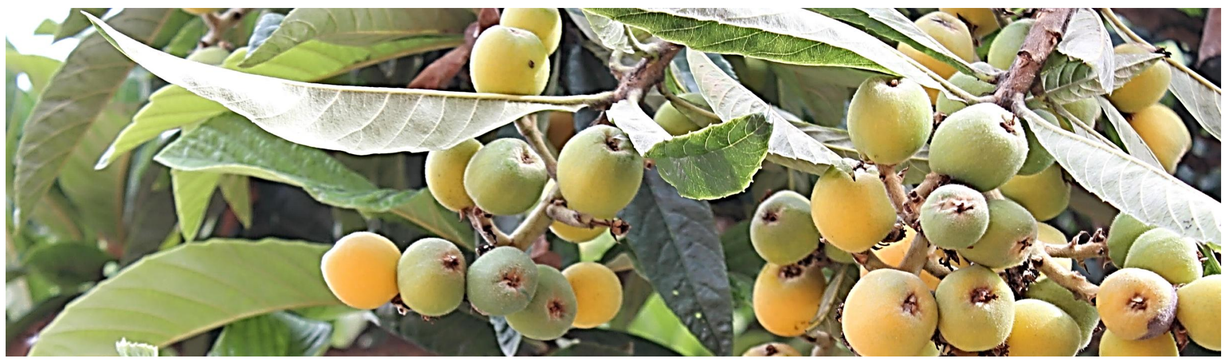
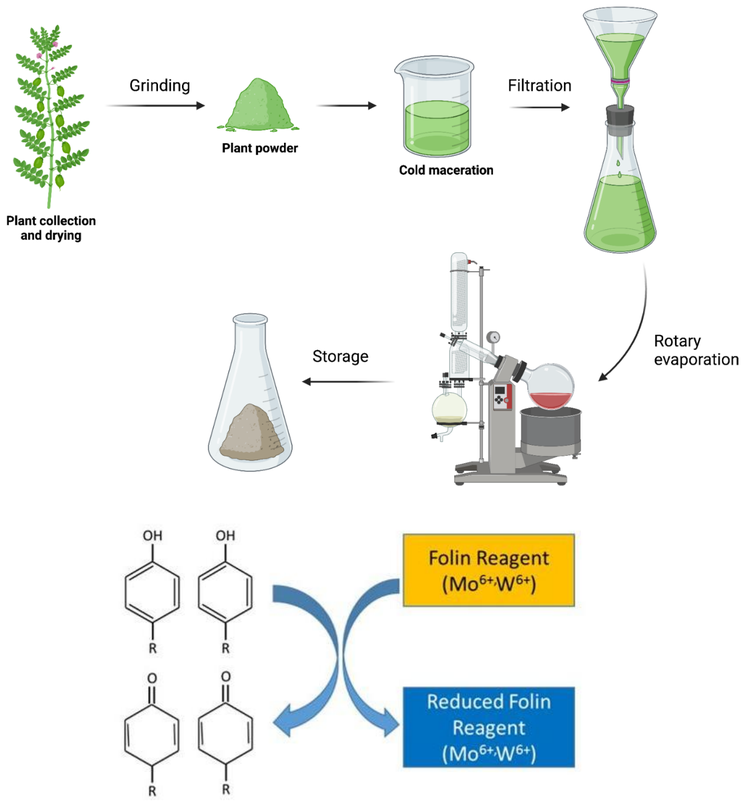
INTRODUCTION & AIM

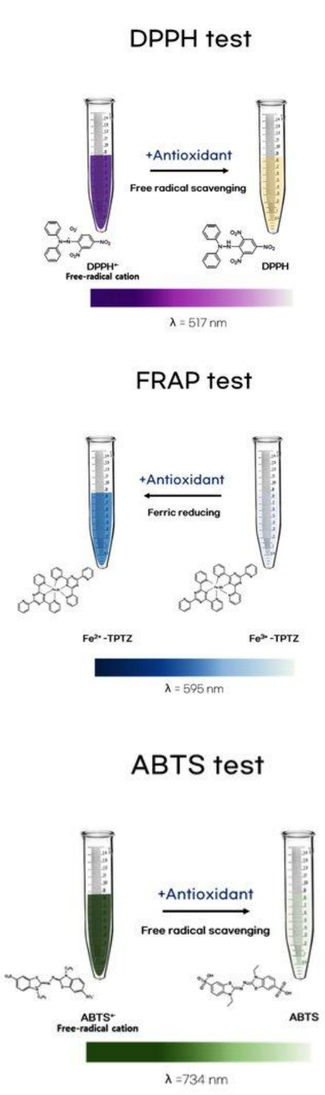
Medicinal plants are a critical source of bioactive molecules, particularly phenolic compounds, known for their powerful antioxidant properties. Given the pharmaceutical and nutraceutical demand for natural antioxidants to combat oxidative stress, this study sought to systematically evaluate the potential of *Eriobotrya japonica* (loquat) leaf extract. The Aim was to determine the extract's Total Phenolic Content and assess its antioxidant activity using four standard *in vitro* assays (DPPH, ABTS, FRAP, and phenanthroline) to test its efficacy.



METHOD

Leaves of *Eriobotrya japonica* were collected during their optimal growth period, then dried and ground into a fine powder. The crude extract was obtained via the Maceration technique using ethanol as a solvent, followed by rotary evaporation to remove the excess ethanol.





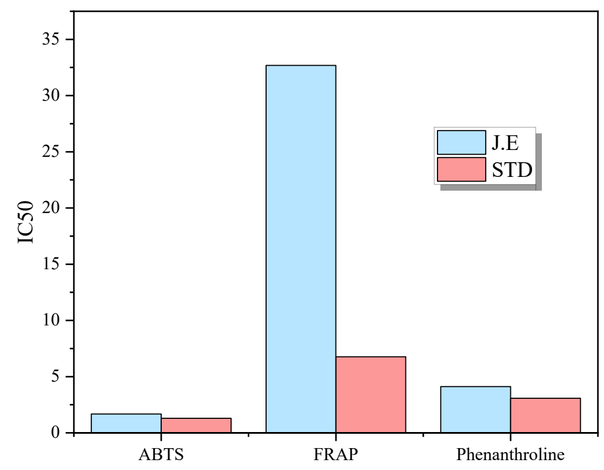
The resulting J.E extract was then subjected to chemical analysis to determine its Total Phenolic Content (TPC). Finally, the antioxidant activity was comprehensively assessed using four standard in vitro assays: DPPH, ABTS, FRAP, and phenanthroline, with results compared against BHA and Ascorbic acid standards.

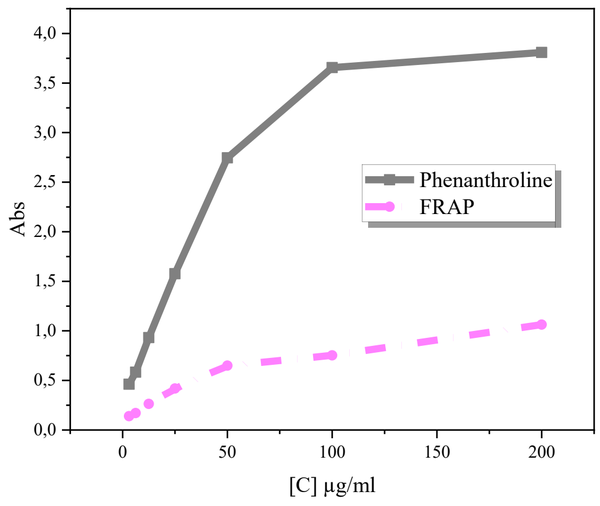
RESULTS & DISCUSSION

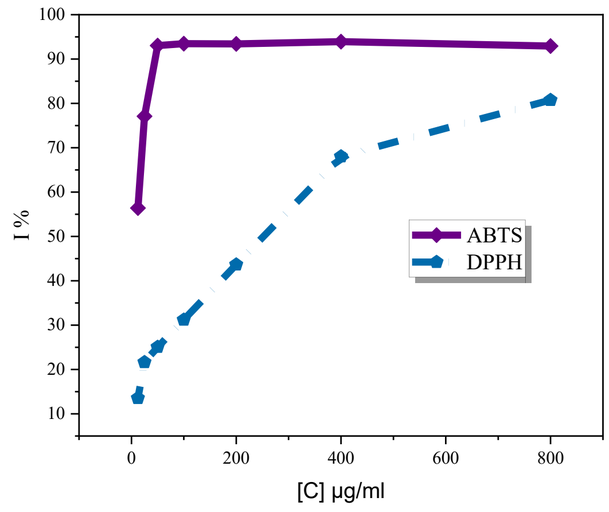
The results highlight that the *Eriobotrya japonica* extract is rich in phenolic compounds and demonstrates powerful antioxidant potential across multiple mechanisms.

Total Phenolic Content (TPC)	0.384 (GAE / g)

The *Eriobotrya japonica* extract shows great antioxidant activity in DPPH and FRAP assays but performs even more strongly in ABTS and metal-chelating tests. Its ABTS (1.68 µg/mL) and phenanthroline (4.11 µg/mL) IC_{50} values are close to those of the synthetic standard, indicating that despite being a natural extract, it demonstrates competitive antioxidant efficiency.







CONCLUSION

In summary, the results position the *Eriobotrya japonica* extract as a highly potent natural source for health-related applications. The comprehensive in vitro assessment reveals that the extract possesses strong antioxidant capabilities across diverse mechanistic pathways (radical scavenging and reducing power). Given its proven efficacy, which rivals that of synthetic standards, *Eriobotrya japonica* is a promising candidate for development and incorporation as a natural functional ingredient in the pharmaceutical, food preservation, and cosmetic industries.