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Harnessing Antioxidant Potential: Optimized Extraction of Bioactive Compounds from Yellow Kiwi Peels (*Actinidia chinensis*)

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INTRODUCTION & AIM

With the increasing problem of food waste, research on agro-industrial **by-products** has proven to be an asset in the search for **bioactive compounds with biological activities**, such as antioxidant properties. The **kiwi** industry generates many by-products such as the peel, bringing the possibility of using these residues effectively, recovering target molecules and developing new products, including nutritional supplements, medicines and food additives. **Optimization** plays a crucial role in identifying the "best" conditions and potential interactions among the parameters involved in the extraction process to maximize desired outcomes. This process not only boosts the **circular economy** but also promotes consumer health. The main objective is to evaluate the phenolic acids present in the peel of the species ***Actinidia chinensis*** (yellow kiwifruit) as a potential source of antioxidants, through the optimization of the **heat-assisted extraction (HAE)** technique through the response surface model.

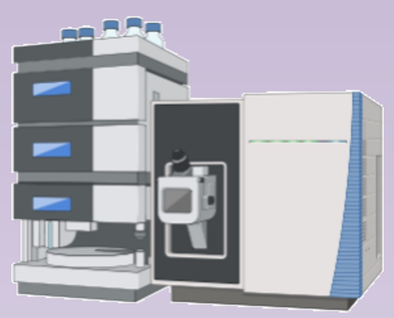
METHOD

Peel

HAE extraction
Response Surface Methodology

VARIABLES:
- Ethanol concentration (0-100%)
- Extraction duration (5-60 minutes)
- Temperature (30-90 ºC)

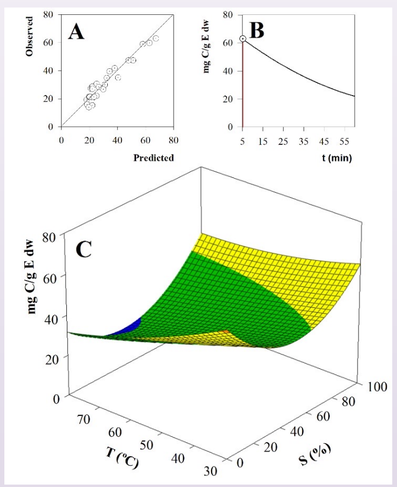
Identification & Quantification



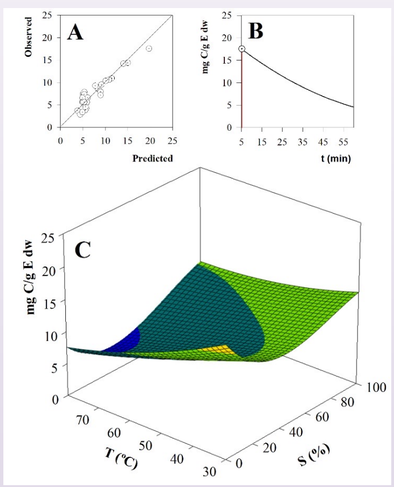
Optimization
Phenolic Acids

RESULTS & DISCUSSION

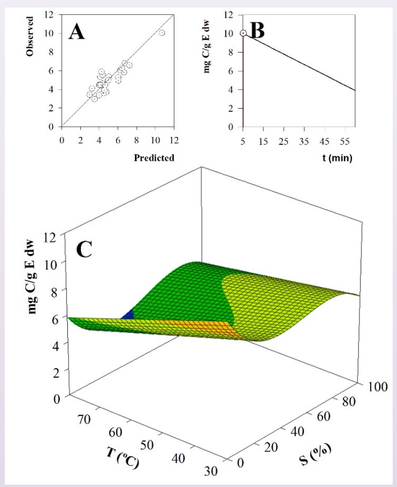
Dihydroferulic acid 4-O-glucur



Quinic acid



5-5-Dehydrodiferulic acid



The peel of A. chinensis was shown to be rich in phenolic acids:

- **Dihydroferulic acid 4-O-glucuronide** (67.32 mg/g E) **>** **quinic acid** (23.15 mg/g E) **>** **5-5-dehydrodiferulic acid** (4.08 mg/g E);
- All of them reported for their **antioxidant power**.
- The conditions that maximized HAE extraction of phenolic acids were **5 min**, **30 ºC** and **100% water**. This suggests that the compounds **degrade** with **time** and **high temperature** and have a **strong affinity for water**.
- All significant parameters were **highly consistent** ($p<0.01$) and the high R2 values also confirmed this hypothesis by indicating the percentage of variability calculated by the model.

CONCLUSION

The high levels of these compounds in yellow kiwifruit waste underscore their **potential for nutraceutical** and **industrial applications**. Additionally, the **antioxidant capabilities** of these residues are directly linked to their phenolic acids content, suggesting that they could be effectively used in **health-promoting products**.

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