



## IV CONGRESO IBEROAMERICANO DE INGENIERÍA DE LOS ALIMENTOS



# HARVEST SEASON INFLUENCES PRESSURIZED LIQUID EXTRACTION (PLE) OF PHENOLIC COMPOUNDS FROM GRUMIXAMA FRUIT

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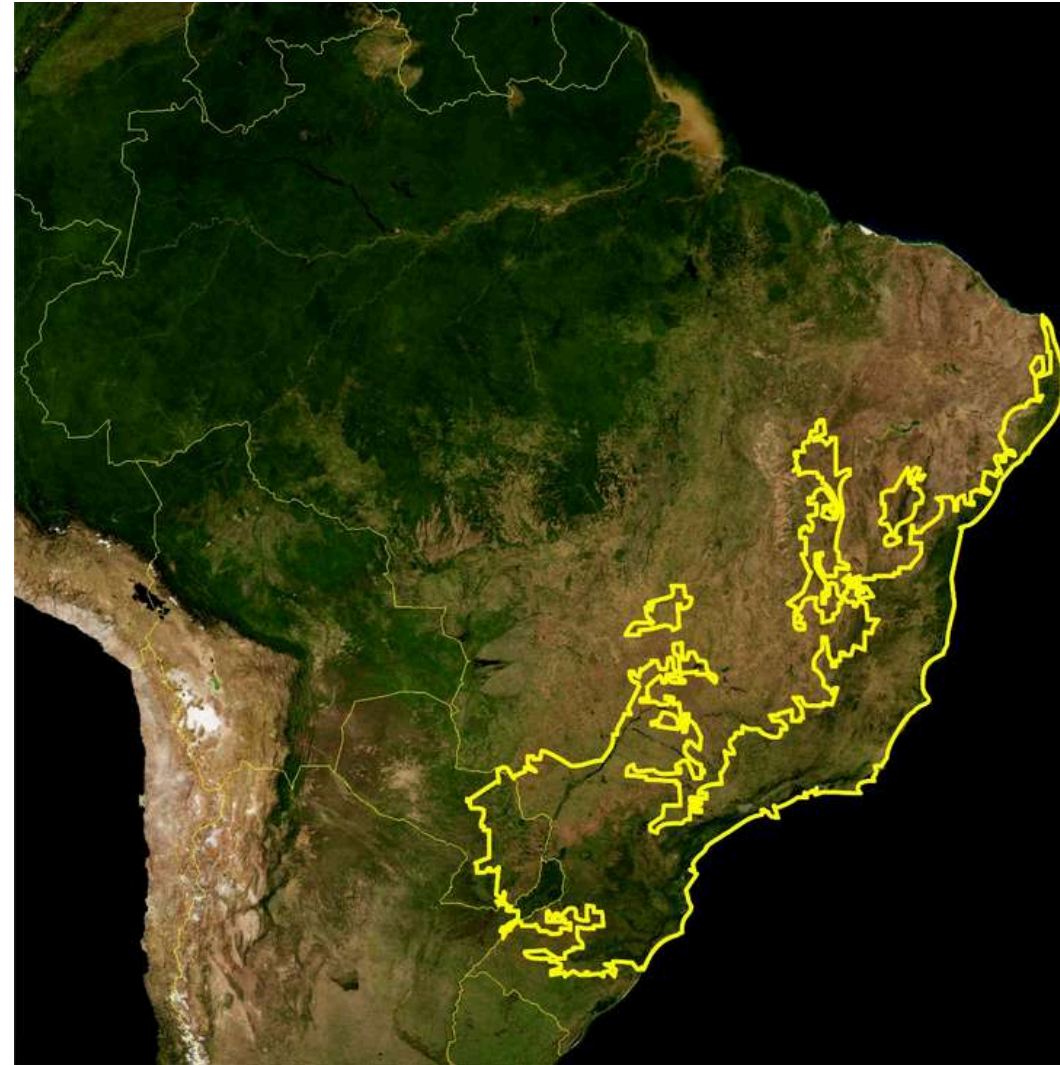


EXTRA E





# Study context



**Brazilian Atlantic Forest**



**Grumixama (*Eugenia brasiliensis*)**

**Pressurized liquid extraction (PLE)**





# Objective



**To evaluate the impact of harvest time on the recovery of phenolic compounds and anthocyanins in freeze-dried grumixama (*Eugenia brasiliensis*) flour extracts from two different harvests (2019 and 2023).**





# Collection, treatment and characterization of raw material



**Paulínia, SP, Brazil**

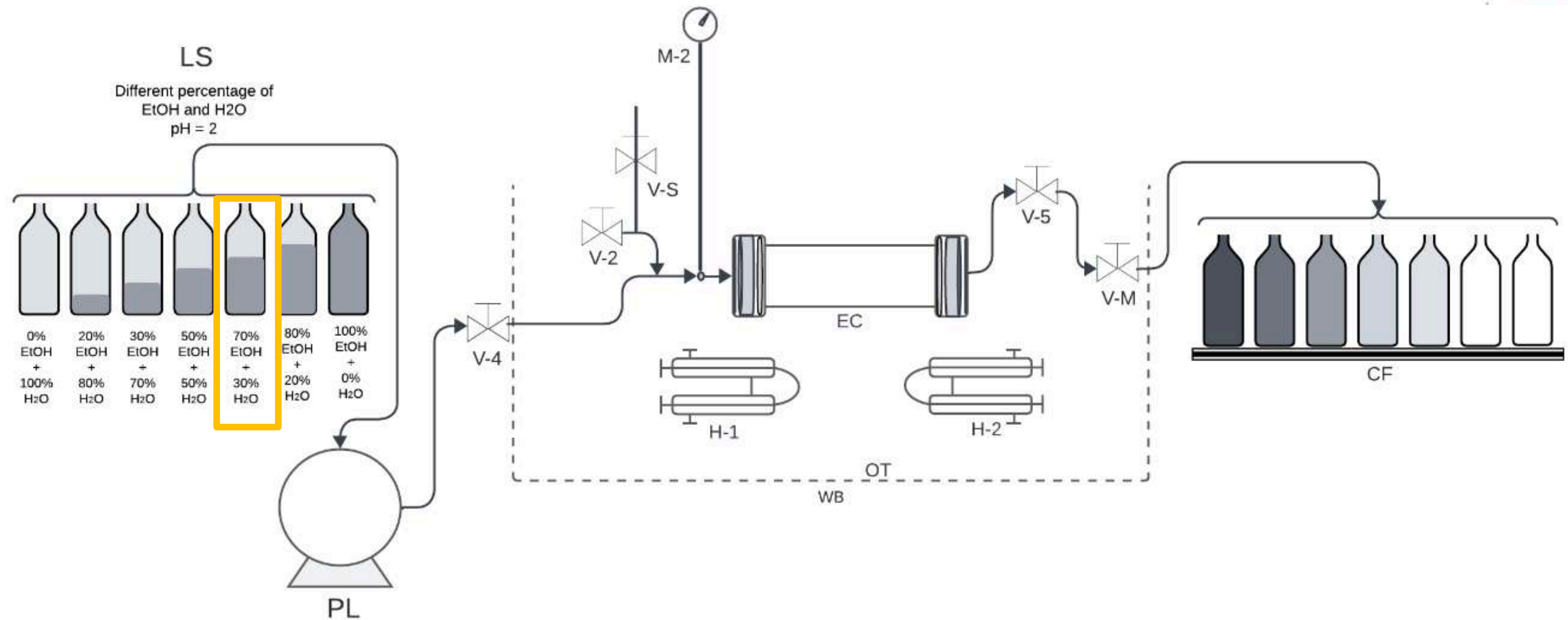


Remaining moisture  
Protein  
Minerals  
Lipids  
Carbohydrates and Fiber





# Obtaining the extracts: Pressurized Liquid Extraction Unit (PLE)



**Figure 1.** Schematic illustration of the PLE facility. V-2 and V-4: block valves; H-1 and H-2: heaters; V-M: micrometric valve; V-S: safety valve; M-2: pressure gauges; PL: pump for liquids (at room conditions); EC: equilibrium cell; LS: liquid solvents; CF: collection flask.





# Analysis of extracts

## Extracts - 2019 harvest



## Extracts - 2023 harvest



*Total polyphenols (TPC)*

*Monomeric anthocyanins (TMA)*

- Delphinidin-3-O-glucoside (DI-3-Glu)
- Cyanidin-3-O-glucoside (Cy-3-Glu)
- Pelargonidin-3-O-glucoside (Pg-3-Glu)

*Antioxidant capacity*

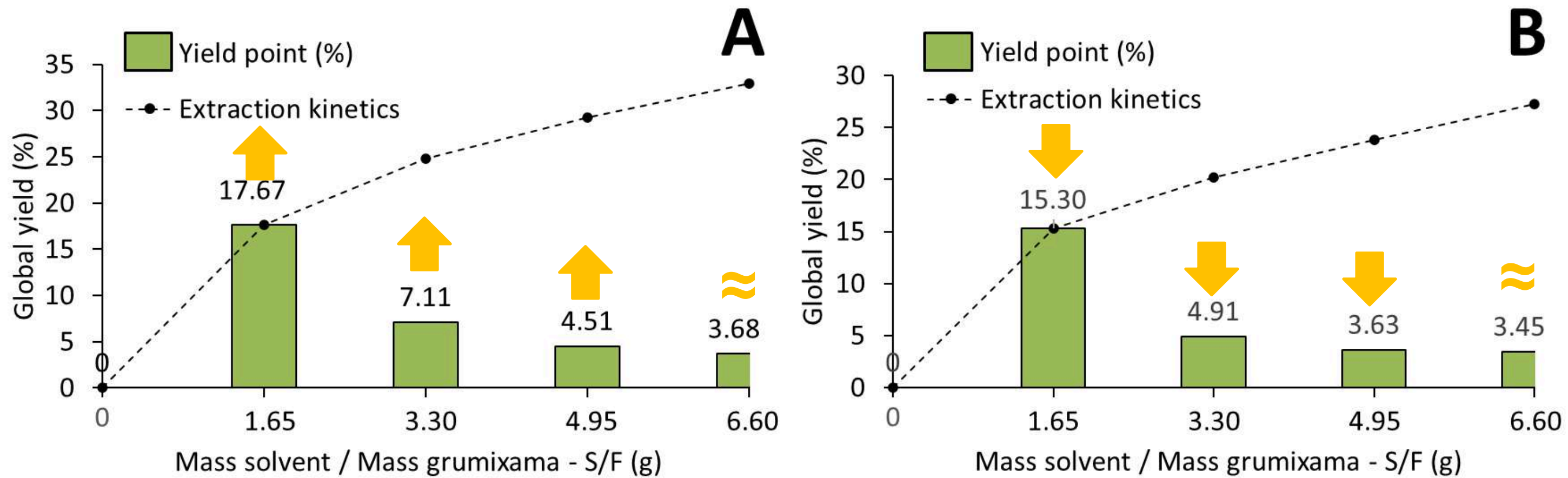
- ORAC
- FRAP







# Extraction yield and kinetics



**Figure 2.** Extraction kinetics for the 2019 (A) and 2023 (B) grumixama harvests.





# Bioactive compounds and antioxidant capacity of grumixama extracts



**Table 1.** Bioactive compounds and antioxidant activity of grumixama extracts.

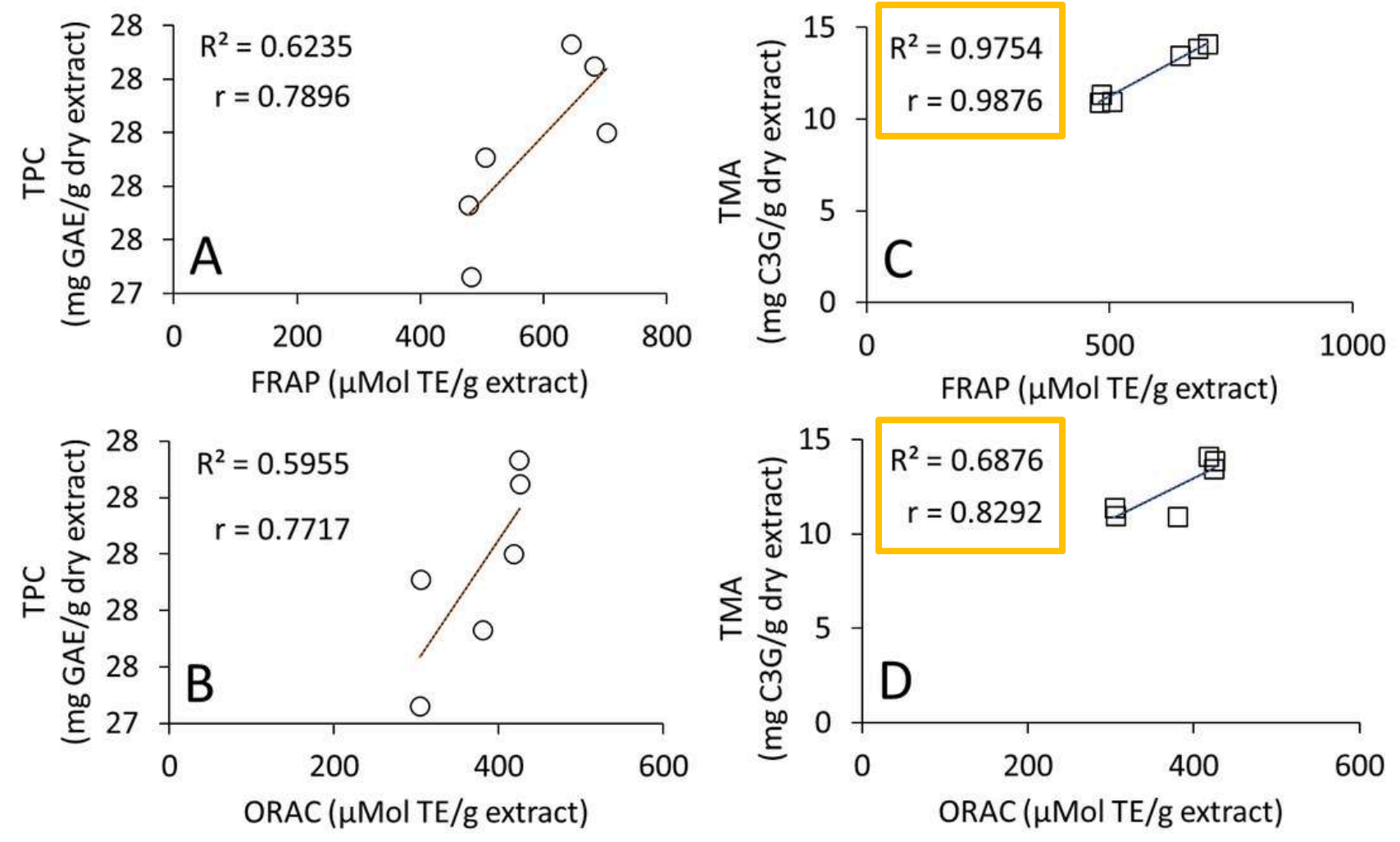
| Parameter                | Grumixama harvest year |              | <i>p</i> -value |
|--------------------------|------------------------|--------------|-----------------|
|                          | 2019                   | 2023         |                 |
| TPC (mg/g extract dried) | 27.70±0.23             | 28.19±0.17   | 0.039           |
| TMA (mg/g extract dried) | 11.08±0.25             | 13.80±0.32   | <0.001          |
| FRAP (μMolTe)            | 498.32±22.32           | 676.66±23.57 | <0.001          |
| ORAC (μMolTe)            | 329.95±43.63           | 422.25±4.35  | 0.022           |







# Bioactive compounds and antioxidant capacity of grumixama extracts - *Correlations*



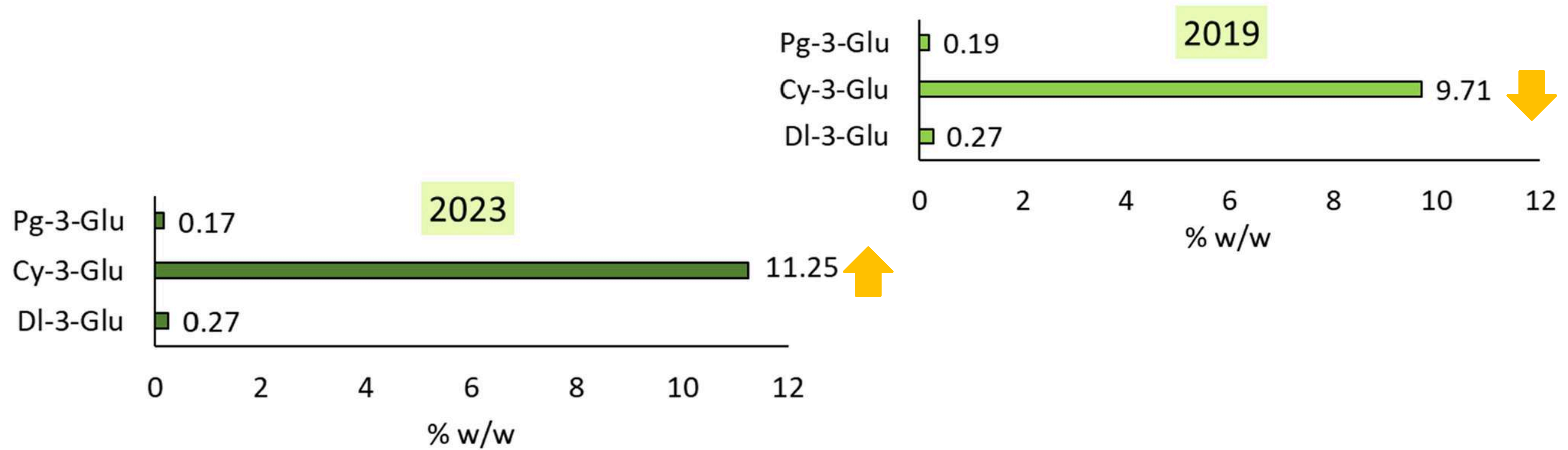
**Figure 3.** Correlation of antioxidant activity measured by FRAP and ORAC with TPC and TMA.







# Identification and individual quantification of anthocyanins



**Figure 4.** Identification and individual quantification of anthocyanins in grumixama extracts.







# Conclusions



**The time of harvest significantly influences the extraction yield and the quality of the bioactive compounds present in the fruit.**

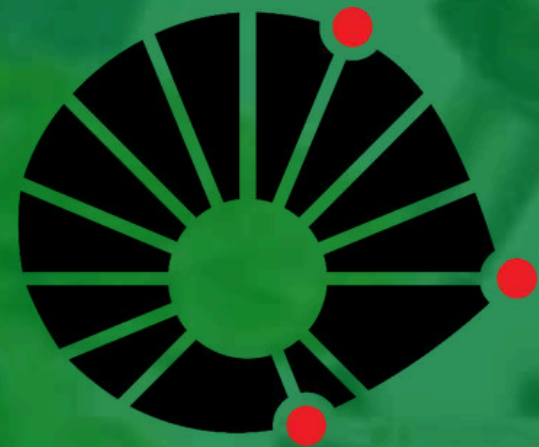
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# Acknowledgements



**UNICAMP**

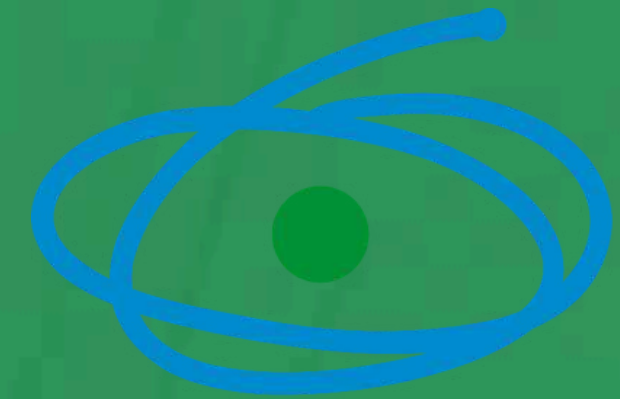
EXTRA<sup>E</sup>



LABORATÓRIO DE EXTRAÇÃO,  
TERMODINÂMICA APLICADA  
E EQUILÍBRIO



SÃO PAULO RESEARCH FOUNDATION



**CAPES**

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