

# *Malva sylvestris* L. as a Natural Bioactive Agent for Innovative Functional Dairy Products

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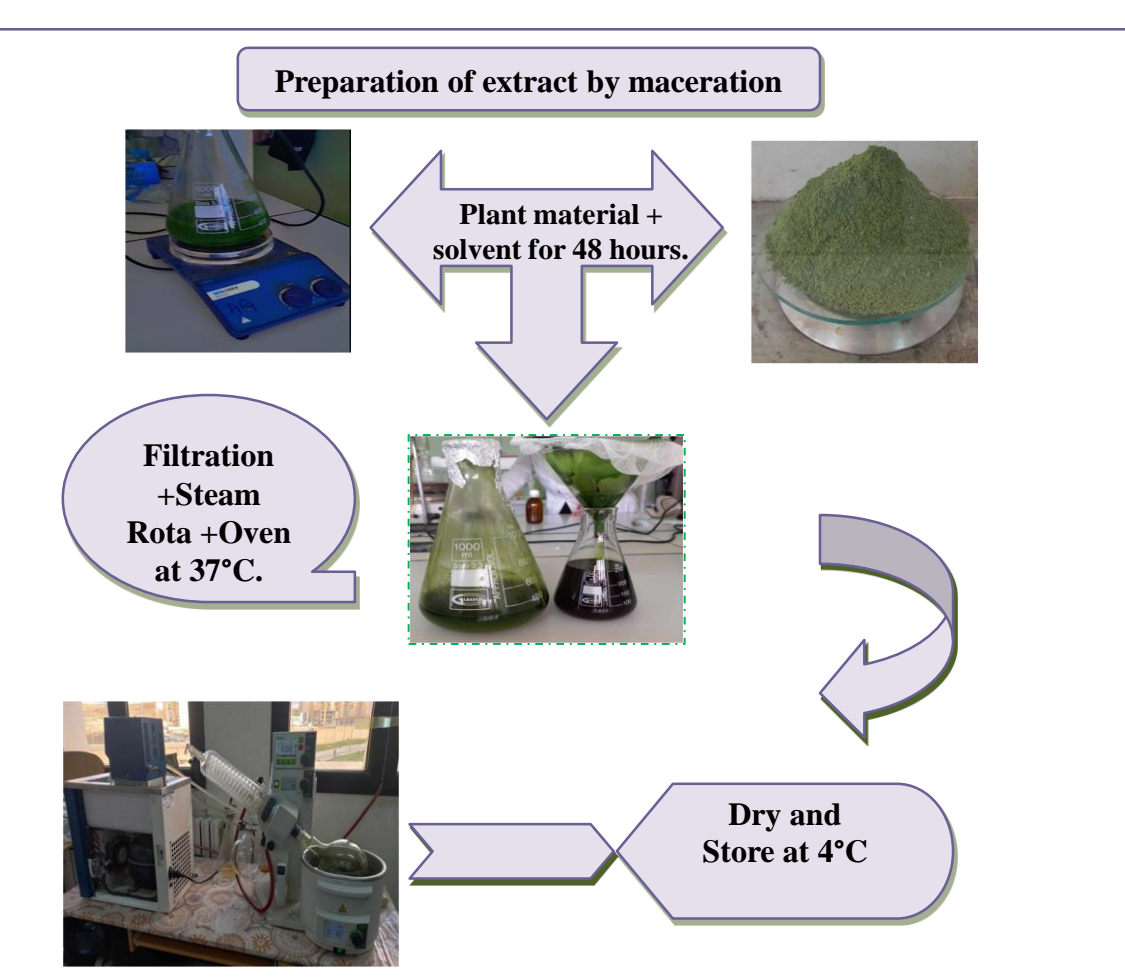
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## INTRODUCTION & AIM

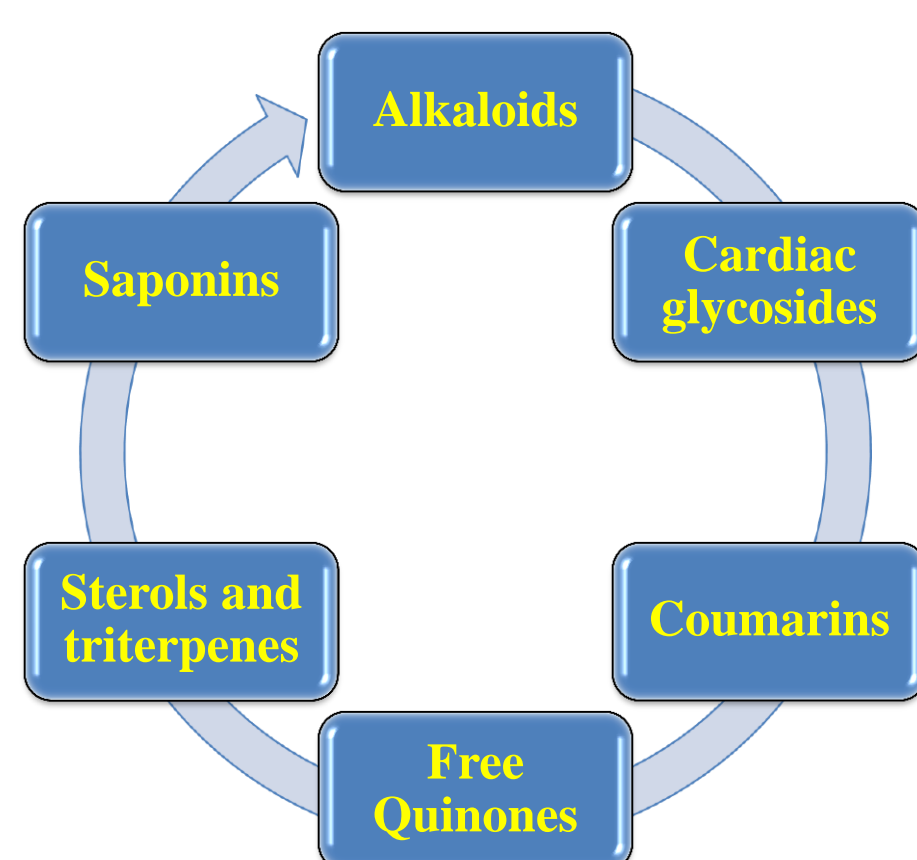
Growing consumer interest in functional foods drives the need for novel, natural additives that can enhance both the nutritional and preservative qualities of common food matrices, such as yogurt. This study focused on exploring the potential of *Malva sylvestris* L. (common mallow), a plant rich in polyphenols and sugars, to serve this role. The Aim was to first comprehensively characterize the extract's phytochemical profile and antioxidant capacity *in vitro* (via DPPH, ABTS, FRAP, and Phenanthroline assays). Subsequently, the study aimed to successfully incorporate the extract into yogurt and rigorously assess the fortified product's resulting physicochemical properties, sensory attributes, and antimicrobial effects to confirm its viability as a health-promoting dietary product.



## METHOD



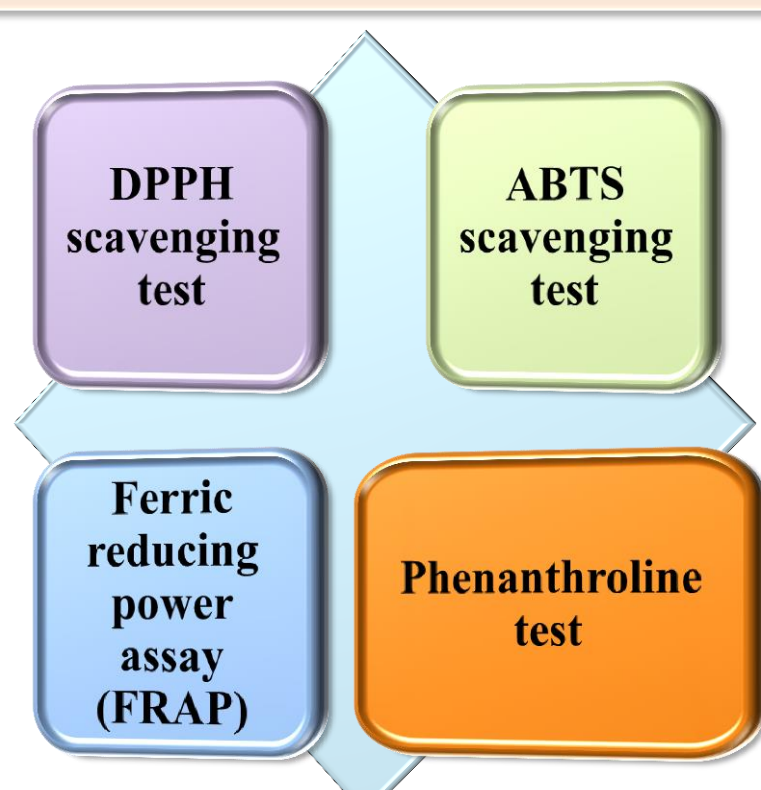
### 2. Phytochemical screening



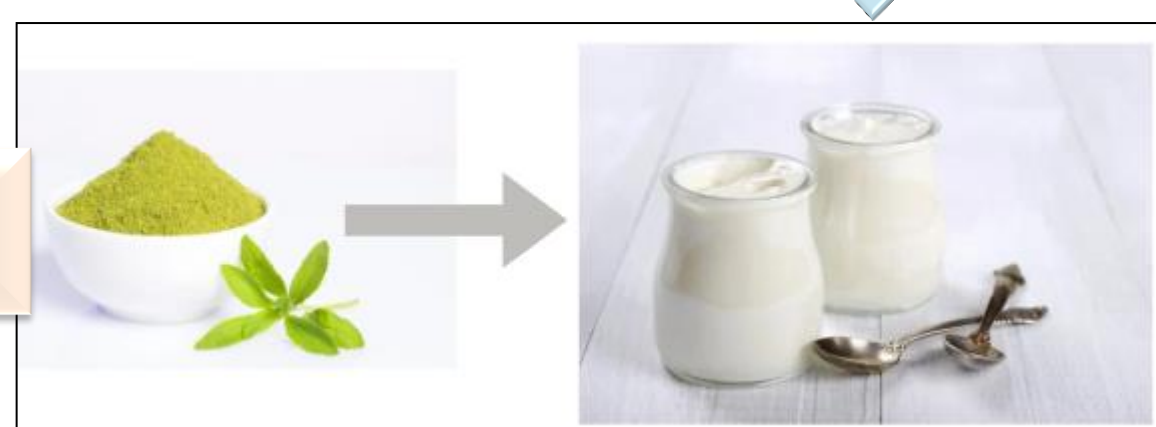
### 3. Chemical composition Quantitative analysis

Total Phenolic contents (TPC)
Total Flavonoids contents (TFC)
Sugars contents (TSC)
Total tannins contents (TTC)

### 4. Assesment of anti-oxidant activity



### 5. Plant extracts use as food additives



## RESULTS & DISCUSSION

### Phytochemical screening

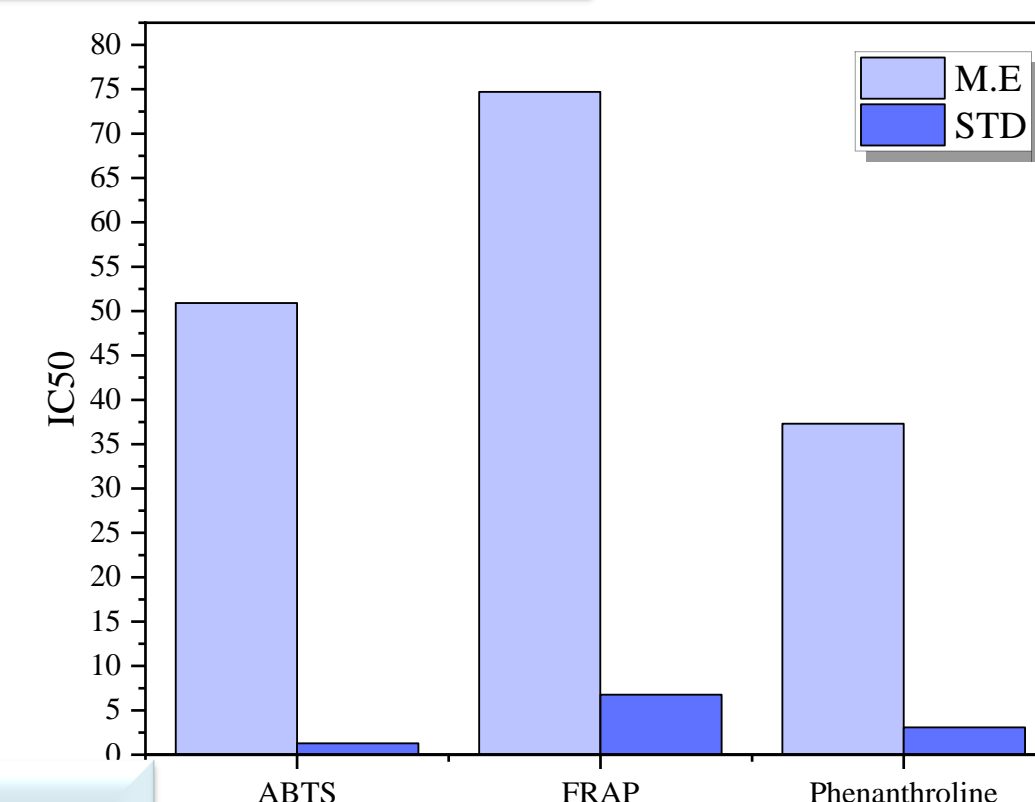
Compounds	Occurrence
Alkaloids	++
Cardiac glycosides	-
Saponins	+
Sterols and triterpenes	++
Coumarins	-
Free Quinones	-

### Chemical composition

Total phenolic contents (µg GAE/ml)	Total flavonoids contents (µg QE/ml)	Total tannins contents (µg TAE/ml)	Total Sugars contents (µg GE/ml)
217	206,37	74,33	131,59

### Antioxidant activity

*Malva sylvestris* extract demonstrates robust antioxidant activity, as evidenced by its low IC<sub>50</sub> values across multiple assays: 50.9 µg/mL (ABTS), 74.7 µg/mL (FRAP), and 37.3 µg/mL (Phenanthroline). While inactive in the DPPH test, these results confirm its strong overall antioxidant potential for combating oxidative stress.



### Yogurt fortification

The incorporation of the *Malva sylvestris* extract into the food matrix demonstrated excellent stability and compatibility. Fortification did not significantly alter the overall sensory or physical characteristics of the final yogurt product.

	0.2%	0.6%	1%
Color	light green	green	dark green
Odor	+++	++	++++
Cohesion	liquid	Beginning of precipitation	Coagulation

The product maintained quality, with lactic acid bacteria counts within safety limits (< 10<sup>7</sup> CFU/mL). While a slight, dose-dependent pH increase occurred, the extract proved fully compatible with yogurt, demonstrating suitability for functional product development.

	Witness	<i>Malva sylvestris</i> L
pH	4,5	6,7
TDE(%D) of (0,2%)	22,86	22,86
Enumeration (St, Lb) of (0,2%)	340000	15506

## CONCLUSION

This research successfully confirmed *Malva sylvestris* L. as a potent source of natural bioactive compounds, rich in polyphenols and sugars. The extract demonstrated strong antioxidant activity across multiple *in vitro* assays (ABTS, FRAP, and Phenanthroline), validating its health-promoting potential. Crucially, the successful fortification into yogurt did not negatively impact the product's sensory or physical quality, and safety standards were maintained. These findings unequivocally confirm *Malva sylvestris* L. as a promising, viable ingredient for developing functional food and nutraceutical products with enhanced nutritional and preservative value.