



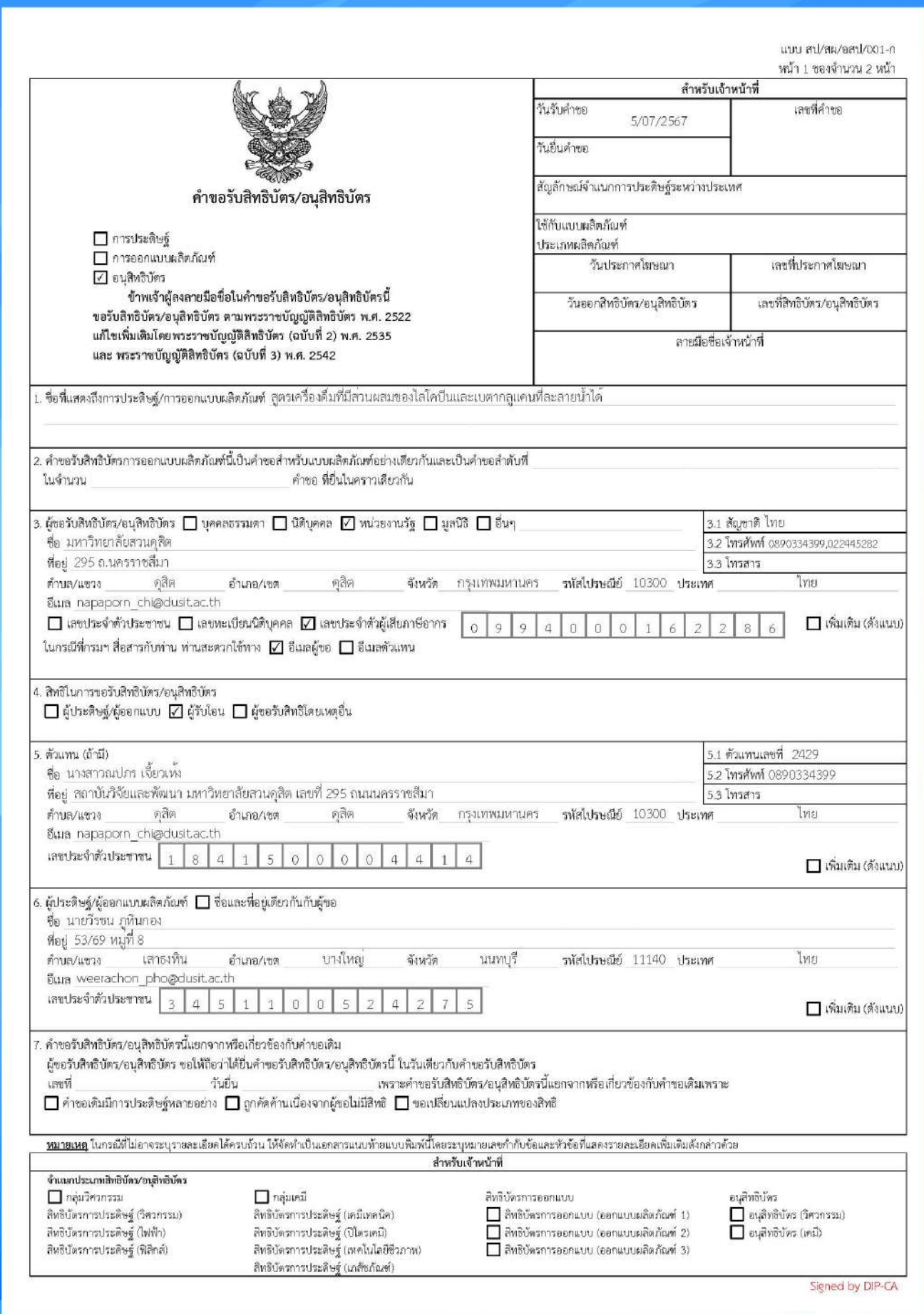
Mixed Fruit Juice Enriched with Lycopene and Beta-Glucan

Jus de fruits mélangés enrichi en lycopène et en bêta-glucane

Thitinat Sukonket¹, Weerachon Phooinkong¹, Tita Foophow², Yotsinee Huadong², Jitwimon Klaysuban³ and Chanasuek Nichanong³

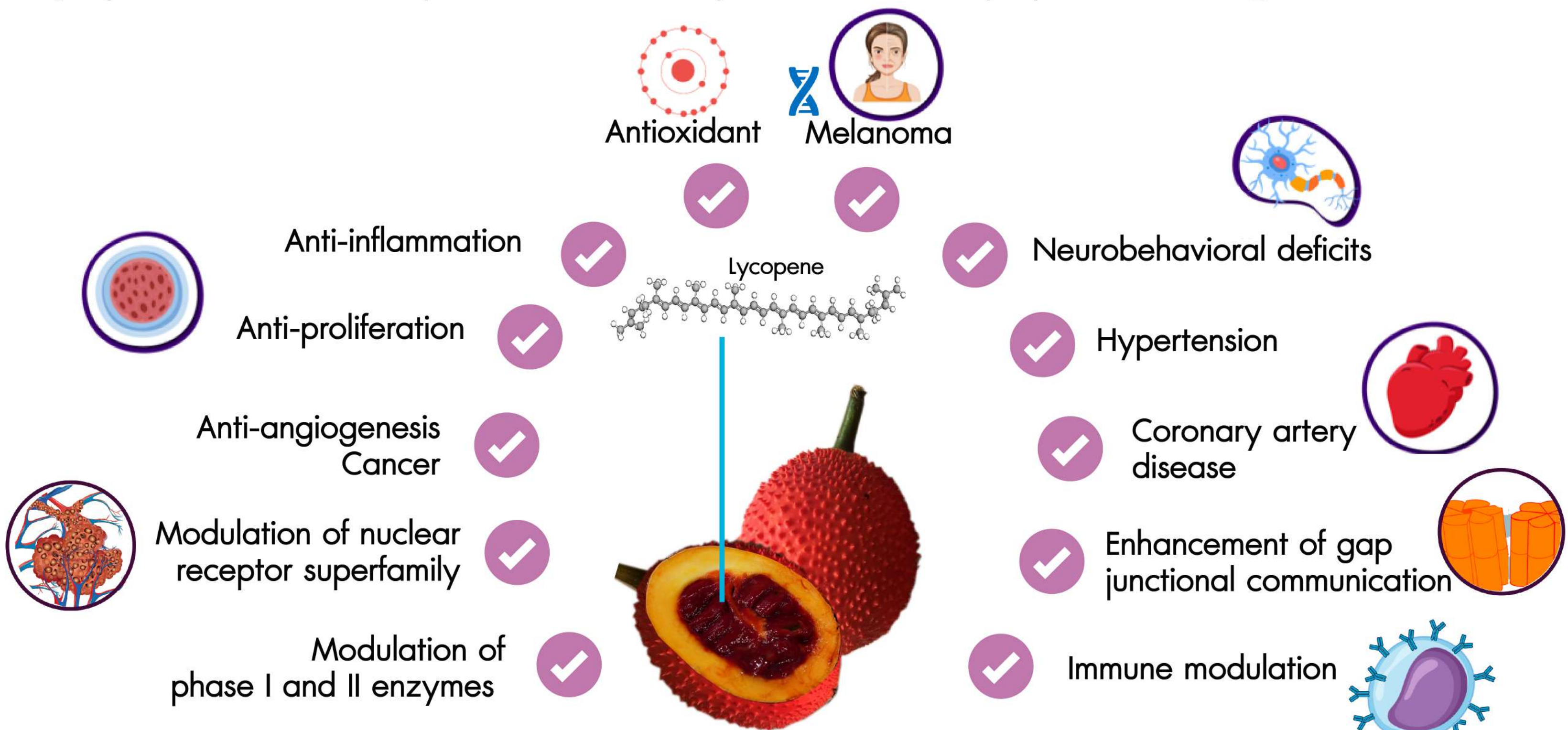
¹Faculty of Science and Technology, Suan Dusit University
²School of Culinary Arts, Suan Dusit University
³Research and Development Institute, Suan Dusit University

IP provisional of petty patent no. 2403002060

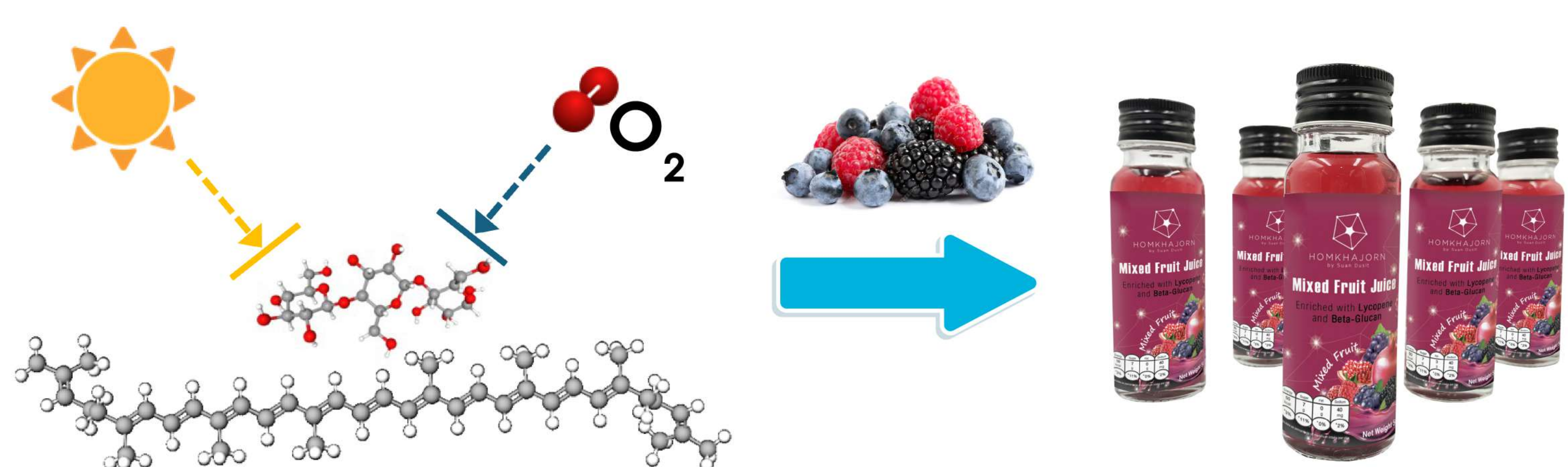


Origin and Significance

Lycopene, a bioactive compound known for its potent antioxidant properties, offers significant health benefits.

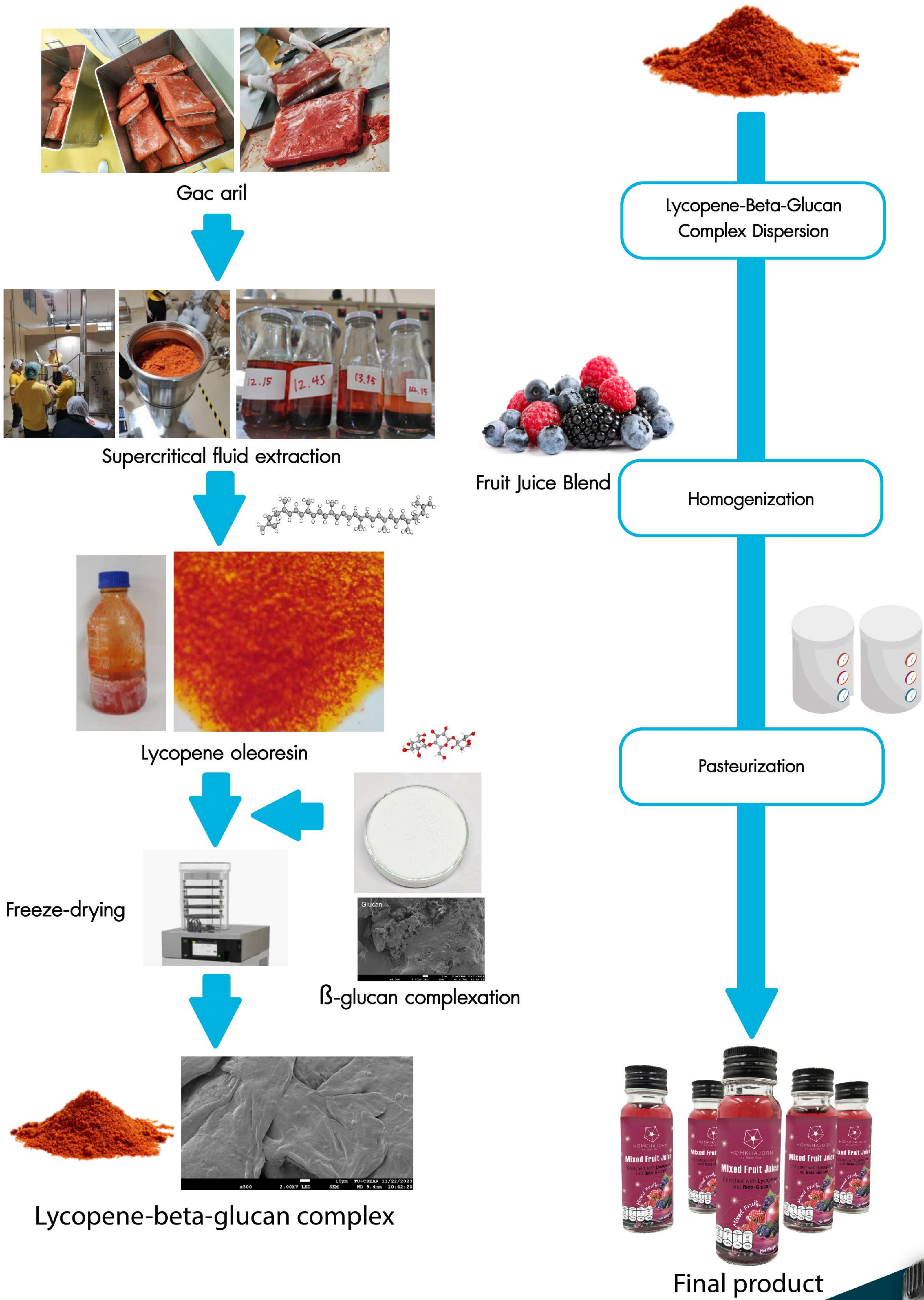


However, its practical application in beverages is limited due to its instability and water insolubility, which diminish its bioactivity during processing and storage¹⁻³. To overcome these limitations, our research team has developed an innovative method that combines lycopene with beta-glucan, a natural biopolymer. This unique structural combination enhances lycopene's stability and water solubility while leveraging the health-promoting properties of beta-glucan.



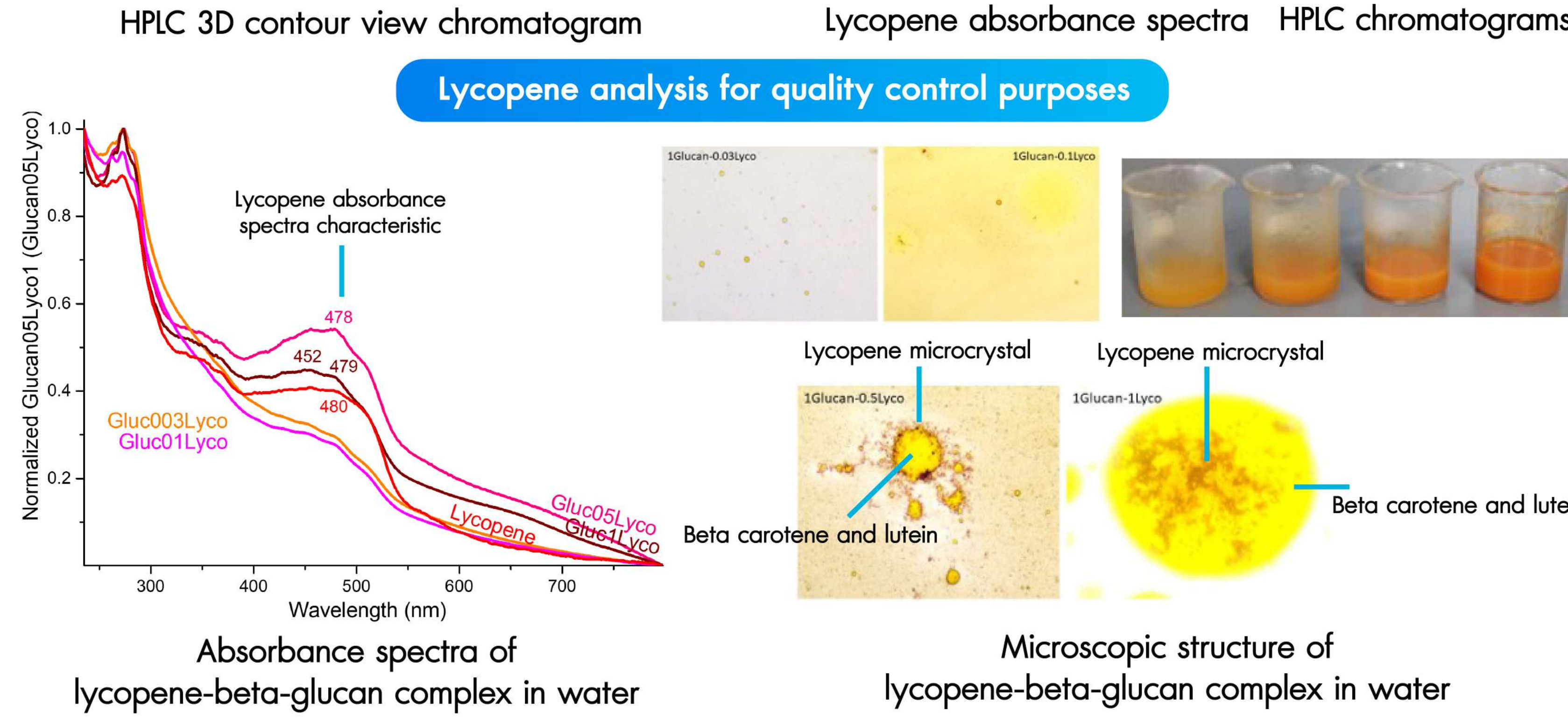
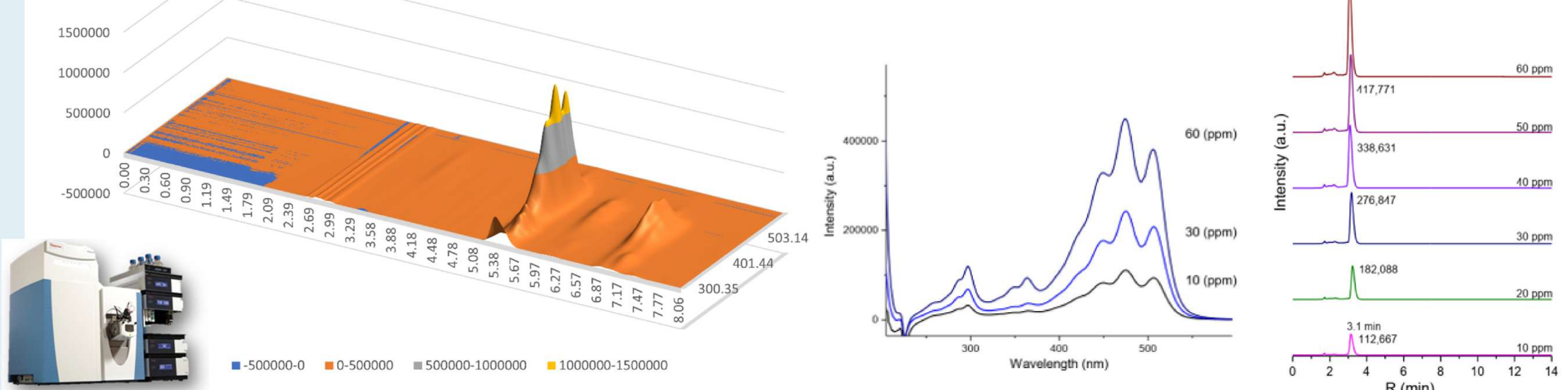
Technology or Process

The lycopene-beta-glucan complex, developed as a functional food ingredient, combines lycopene extract with natural beta-glucan to create a compositionally optimized and structurally advanced compound

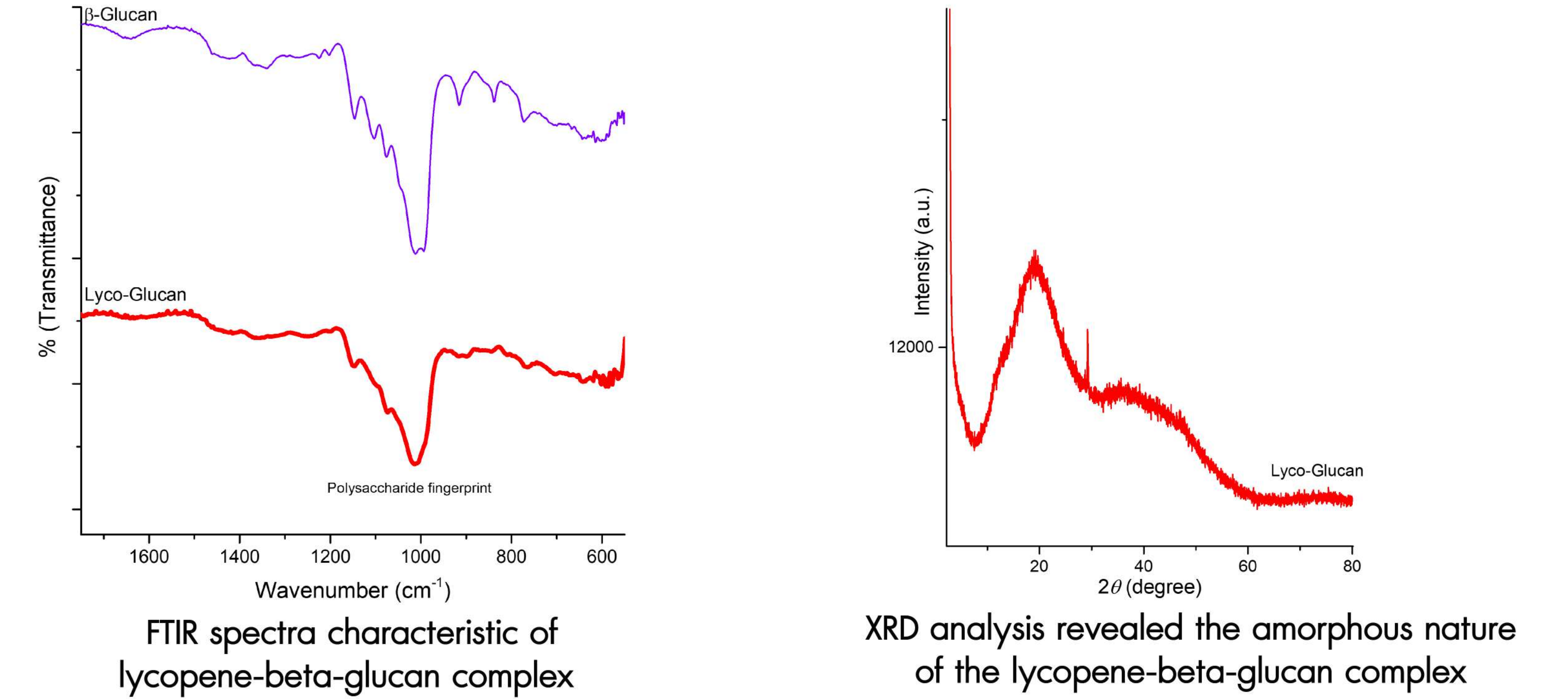


Highlights or Originality of This Research

Lycopene, a natural bioactive compound with significant health benefits and strong antioxidant properties, is costly and prone to rapid degradation when exposed to oxygen and sunlight. The development of a lycopene-beta-glucan complex as a functional food ingredient enhances lycopene's stability in food products and improves its water solubility through the incorporation of beta-glucan.



This formulation significantly improves water solubility and enhances the stability of the active components, particularly lycopene, in beverage formulations.



This innovative approach maximizes lycopene's bioavailability while offering additional health benefits from beta-glucan.

Utilization

This complex possesses significant potential as a functional food ingredient, offering a delivery system for lycopene and beta-glucan benefits while maintaining their stability throughout shelf life. This innovation can cater to a broader consumer base, particularly those seeking the health advantages of lycopene without the inherent taste of tomatoes.



Energy	Sugar	Fat	Sodium
50 kcal	7 g	0 g	40 mg
*3%	*11%	*0%	*2%

* calculate as percentage of maximum intake per day

Nutrition Information			
Serving size	: 1 Bottle (50 milliliters)		
Serving per box	: about 1		
Amount per serving			
Total energy	50 kcal (Energy from fat 0 kcal)		
		Percent Thai RDI*	
Total fat	0 g	0 %	
Saturated fat	0 g	0 %	
Cholesterol	0 mg	0 %	
Protein	0 g		
Carbohydrates	12 g	4 %	
fiber	0 g	0 %	
Sugar	7 g		
Sodium	40 mg	2 %	
		Percent Thai RDI*	
Vitamin A	0%	Vitamin B1	0%
Vitamin B2	0%	Calcium	0 %
Iron	0%		
* Percent Thai Recommended Daily Intake for Population over 6 years of age are based on a 2,000 kcal diet.			
Energy needs vary by individuals. If your activities require energy of 2,000 kcal per day, your daily diet should provide the following nutrients.			
Total fat	less than	65 g	
Saturated fat	less than	20 g	
Cholesterol	less than	300 mg	
Total cabohydrate		300 g	
Dietary fiber		25 g	
Sodium	less than	2,000 mg	
Energy (kcal) per gram : Fat = 9; Protein = 4; Carbohydrate = 4			



References

¹Saini, R. K., A. Bekhit, A. E.-D., Roohinejad, S., Rengasamy, K. R. R., & Keum, Y.-S. (2020). Chemical Stability of Lycopene in Processed Products: A Review of the Effects of Processing Methods and Modern Preservation Strategies. *Journal of Agricultural and Food Chemistry*, 68(3), 712-726.

²Jain, S., Winuprasith, T., & Suphantharika, M. (2020). Encapsulation of lycopene in emulsions and hydrogel beads using dual modified rice starch: Characterization, stability analysis and release behaviour during in-vitro digestion. *Food Hydrocolloids*, 104, 105730.

³Martins, P. F., de Melo, M. M. R., & Silva, C. M. (2015). Gac oil and carotenes production using supercritical CO₂: Sensitivity analysis and process optimization through a RSM-COM hybrid approach. *The Journal of Supercritical Fluids*, 100, 97-104.