



Mulberry Mocktail with Capsaicin

Mocktail de mûre avec de la capsaïcine

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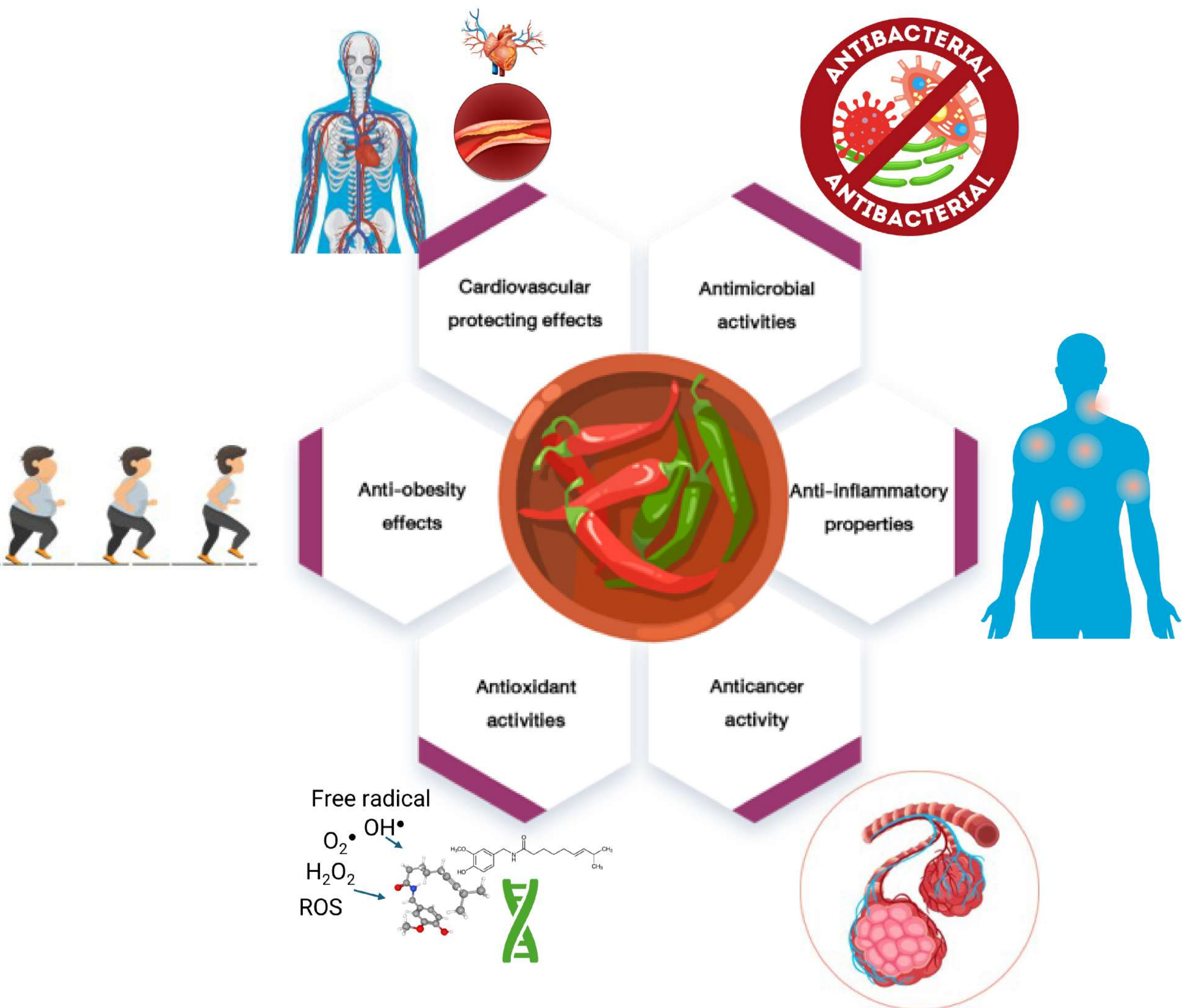
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Form for petty patent registration, including fields for applicant information, invention details, and legal representation.

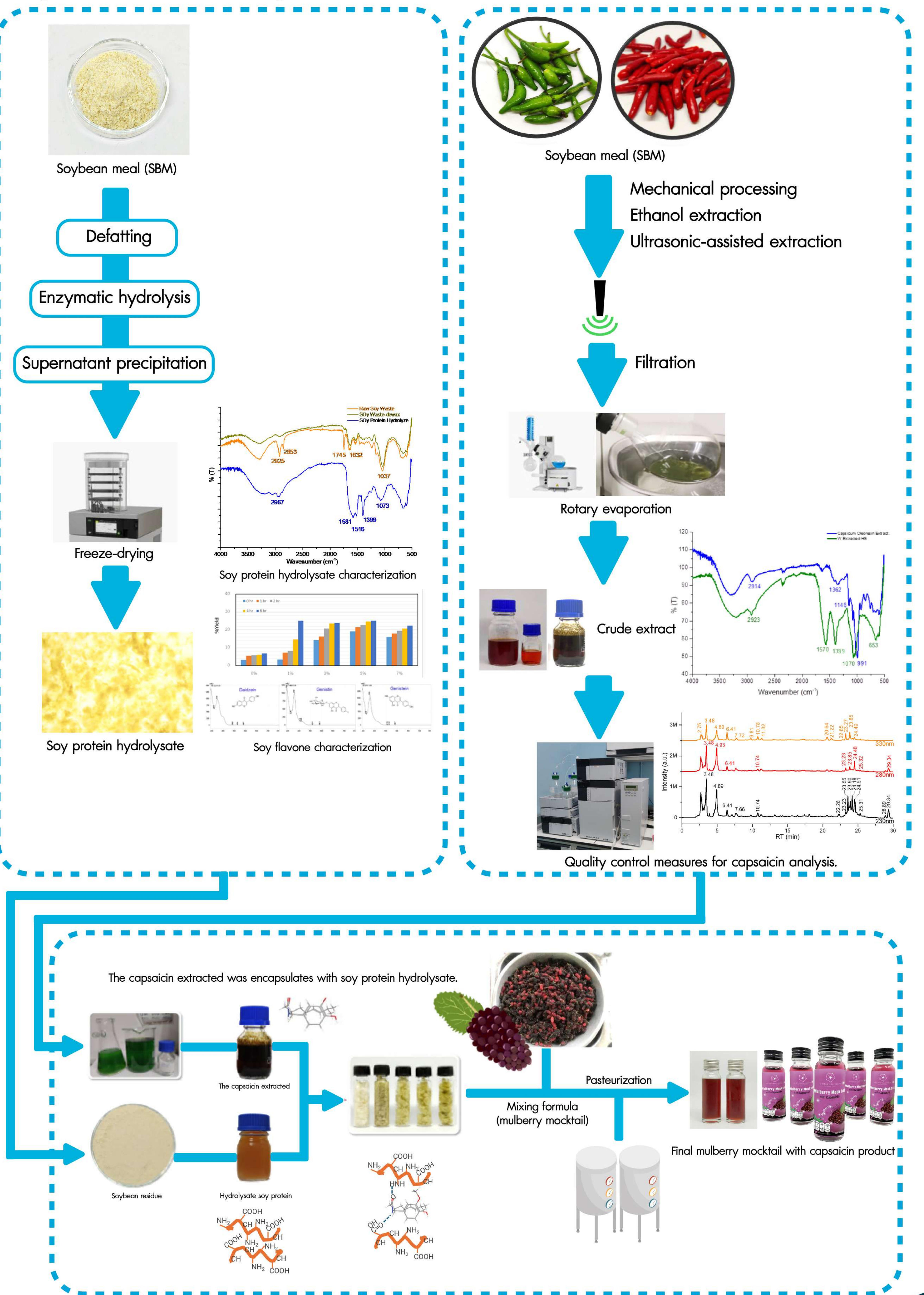
Origin and Significance

Capsaicin, the active compound in chili peppers, offers several health benefits¹. However, its low solubility in water limits its application in products requiring water solubility. Encapsulating capsaicin with hydrolyzed soy protein is a method used to improve its stability, enhance its solubility, and reduce its immediate spicy sensation upon consumption. This research has developed a capsaicin encapsulation agent using protein, which can be incorporated into product formulations such as dietary supplements or functional foods.



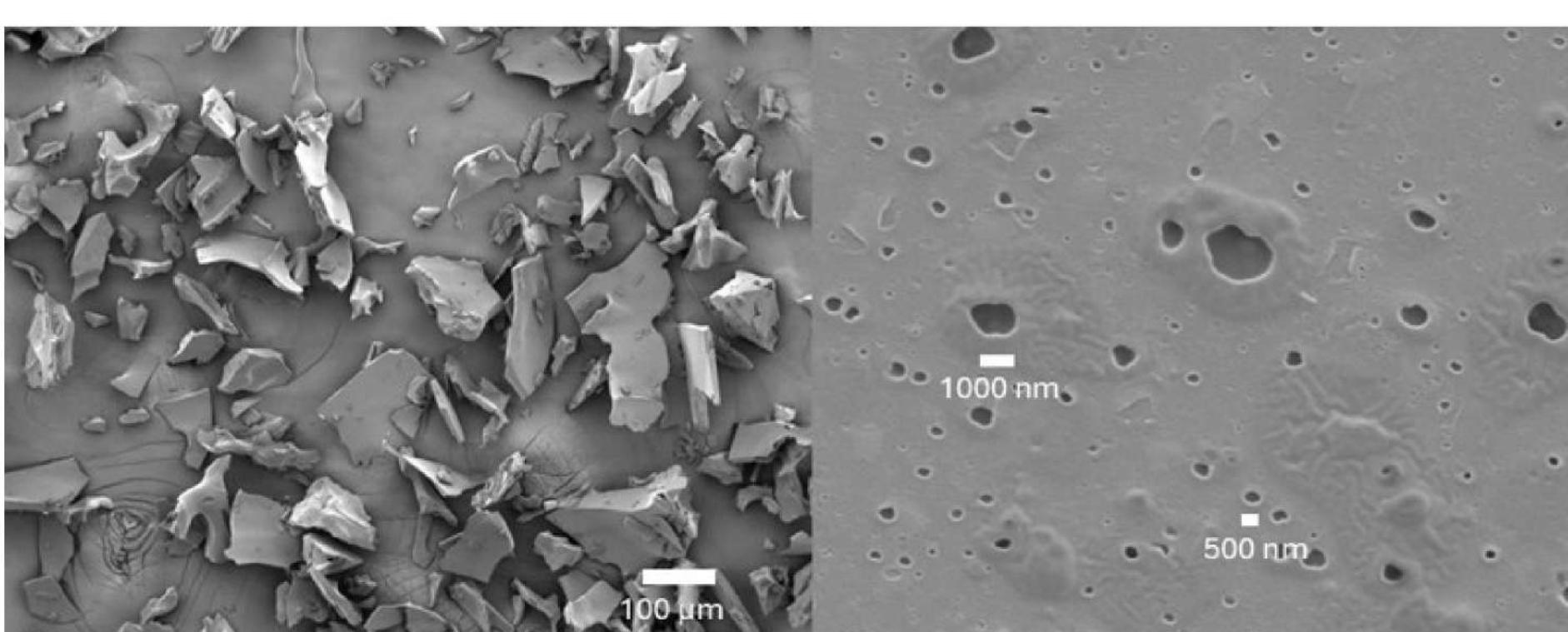
Technology or Process

In the development of capsaicin encapsulation using soy protein, capsaicin molecules interact with the protein through hydrophobic forces. The outer structure of the protein enhances the solubility and dispersion of the capsaicin extract. This leads to increased stability and higher bioavailability, improving absorption while reducing the spiciness of the chili extract^{2,3}. This method can be applied to create more palatable healthy drink formulations with a longer shelf life for the active ingredients

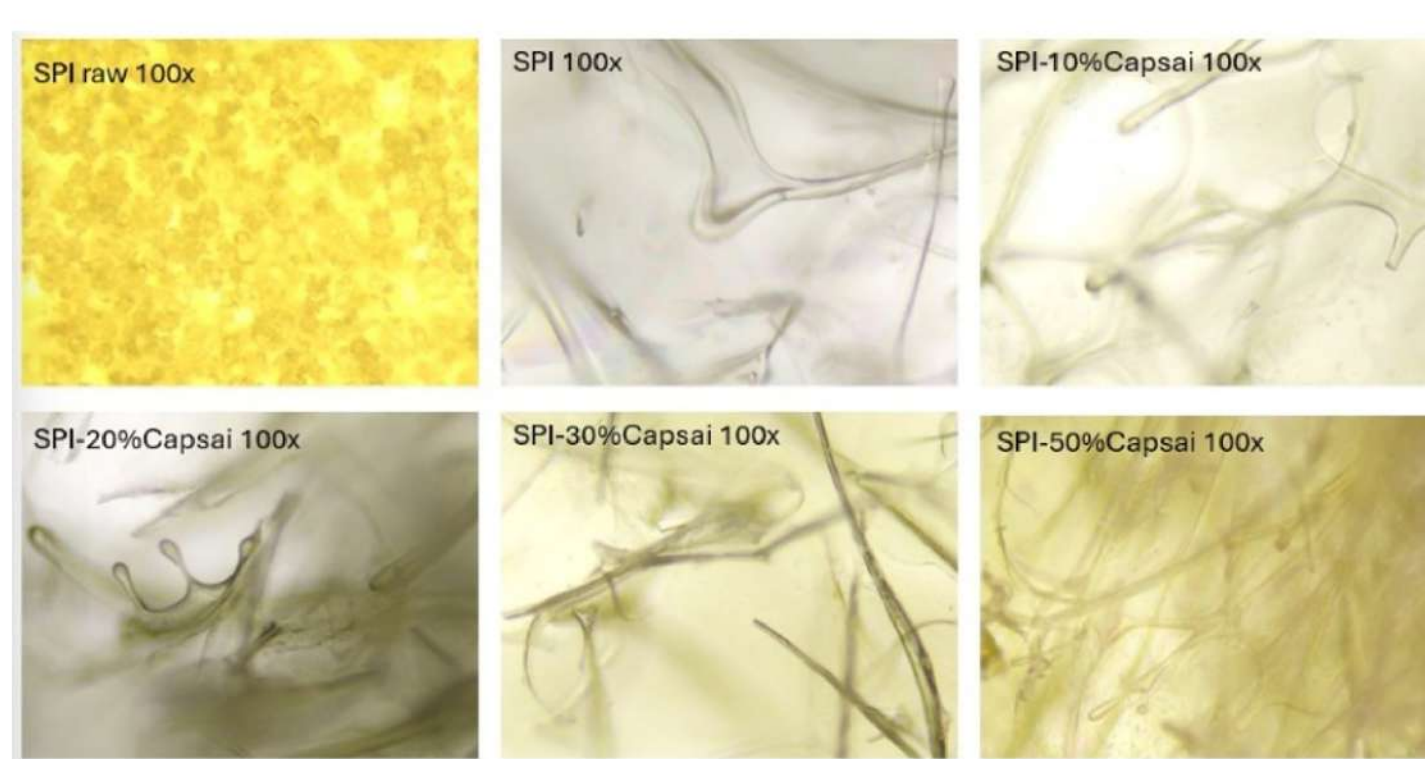


Highlights or Originality of This Research

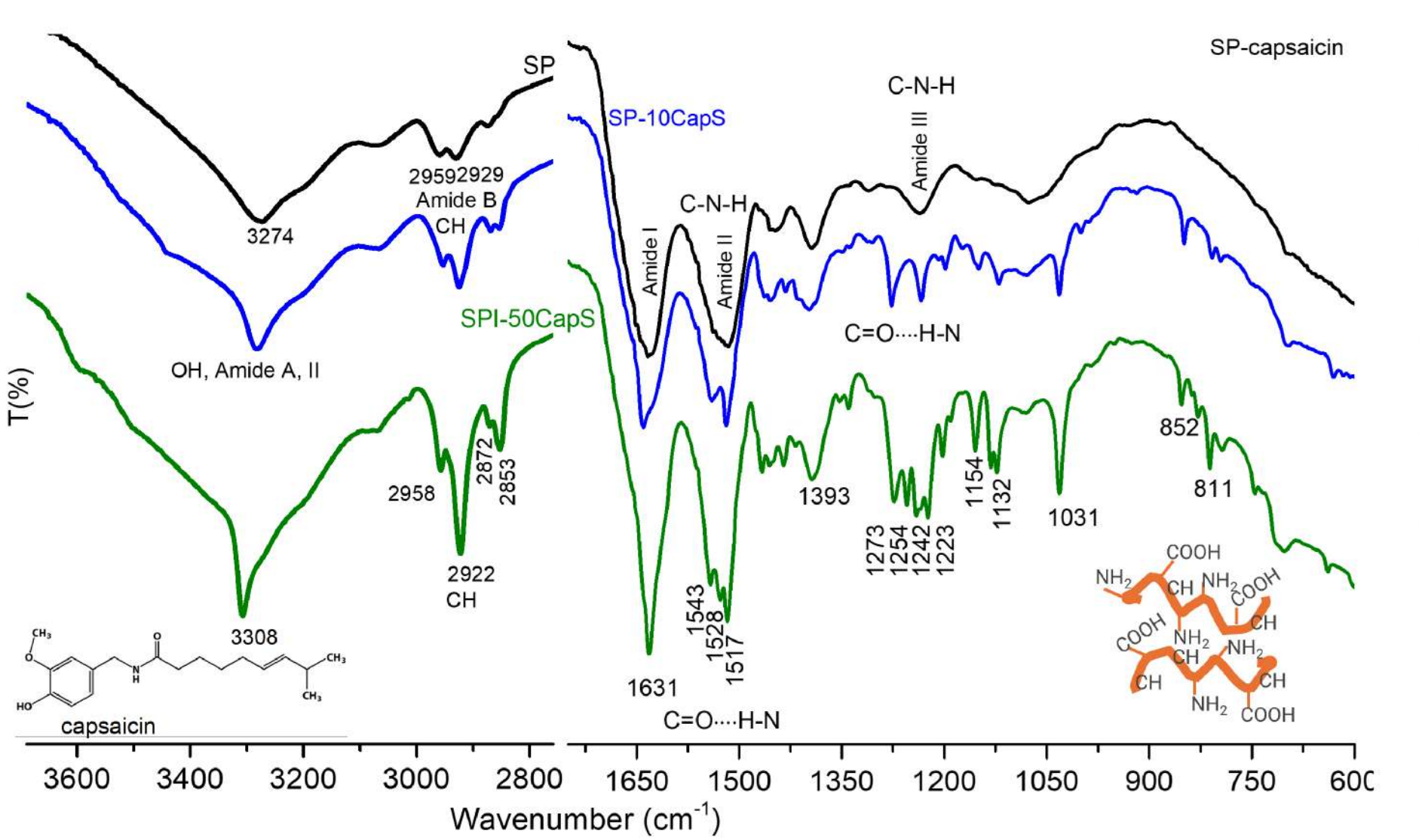
The mulberry mocktail with capsaicin is a healthy drink featuring a unique blend of sweet mulberries and the mild spiciness of capsaicin extract from chili. The innovative encapsulation of capsaicin with soy protein reduces the spiciness, making the drink more palatable. This mocktail supports metabolism, helps lower cholesterol levels, and provides antioxidants, appealing to health-conscious consumers.



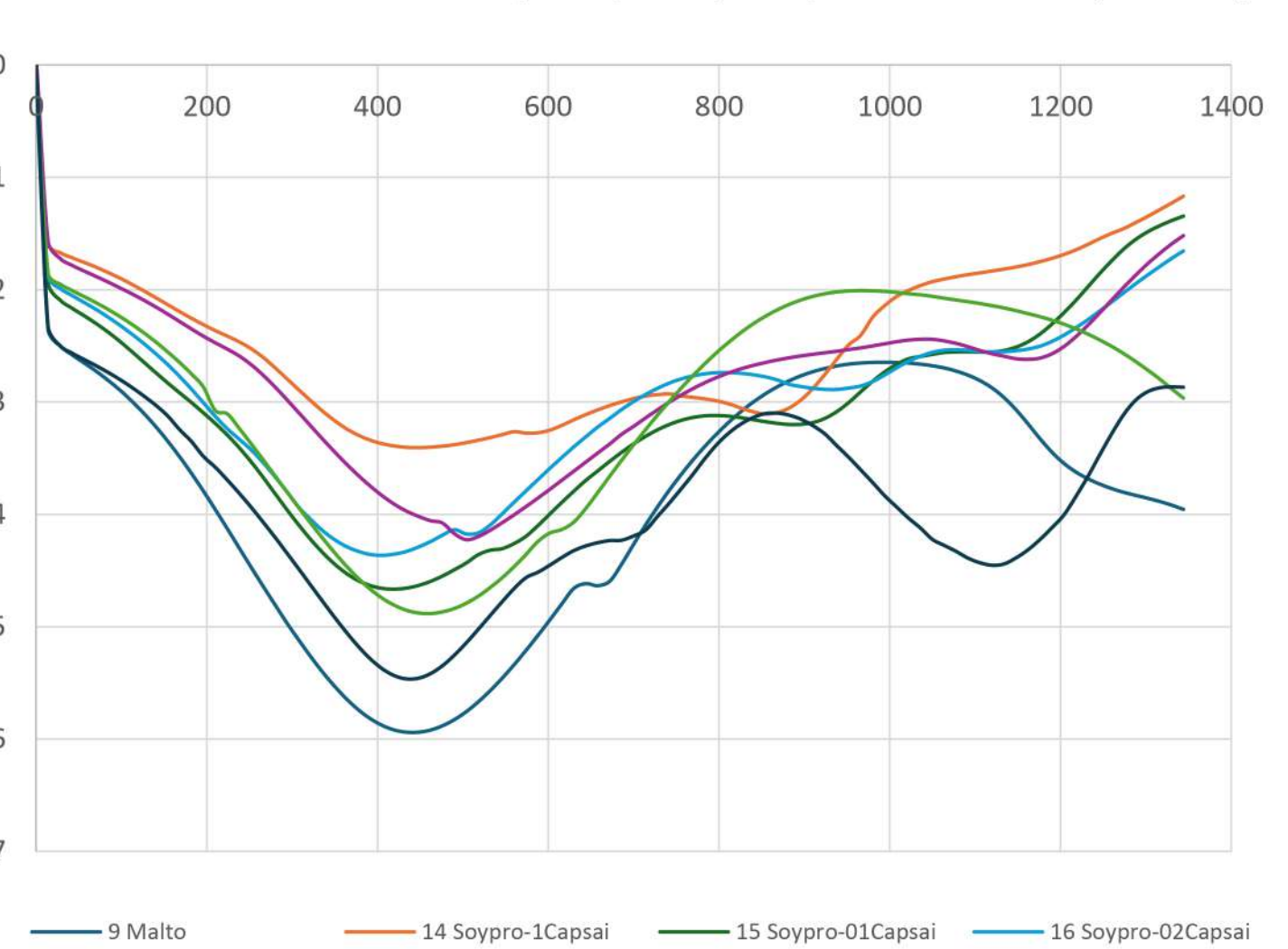
FESEM image of encapsulated capsaicin in soy protein



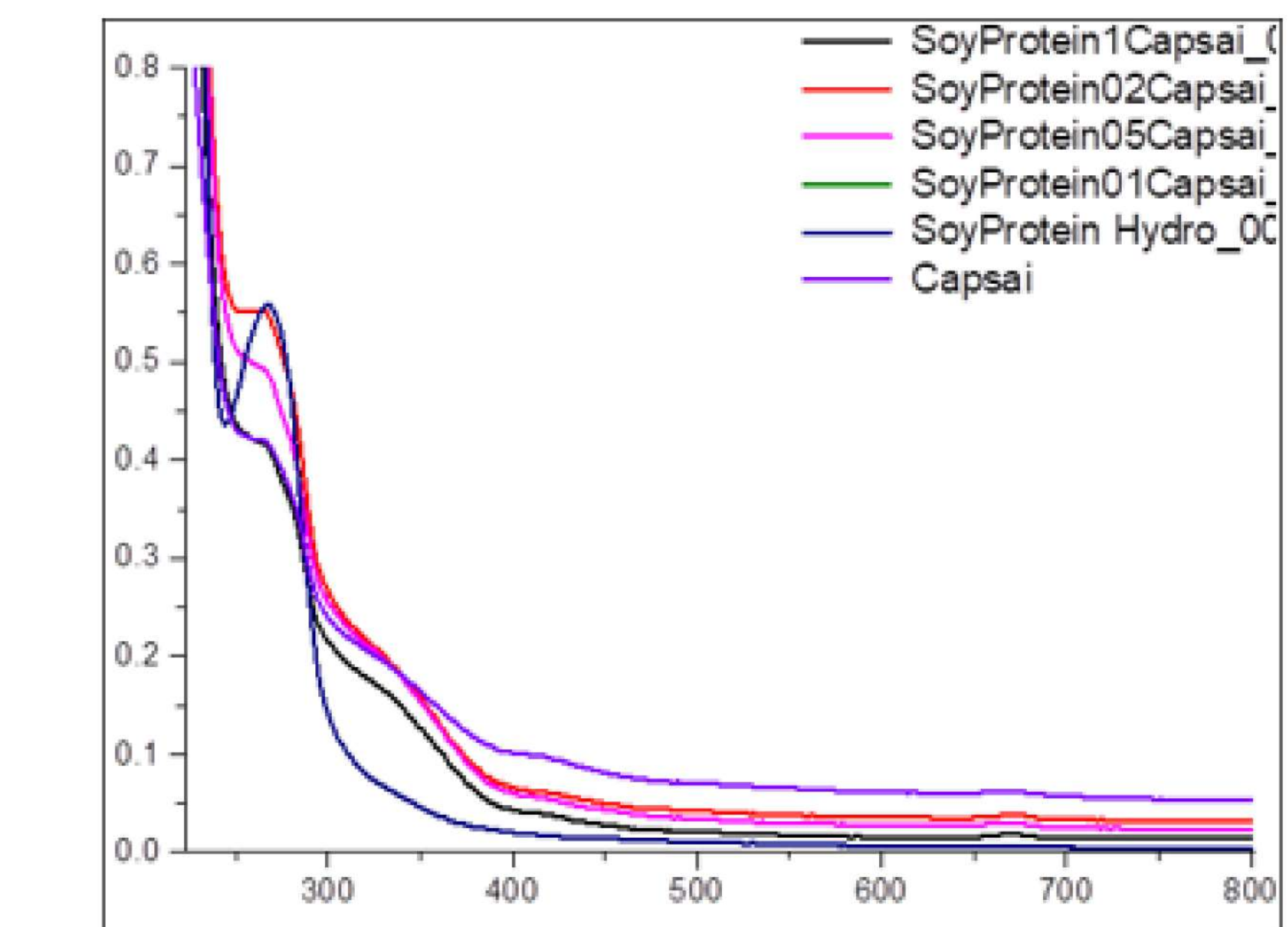
Morphological and microscopic characterization of Suphan chili pepper extract complexes with soy protein was conducted at chili extract concentrations of 0, 10, 20, 30, and 50% (w/w).



FTIR spectra of encapsulated capsaicin in soy protein isolate



Thermogravimetric analysis (TGA) results provided evidence for the interaction between chili extract and soy protein, which was not observed in the control groups containing only maltodextrin in conventional method or prepared using conventional methods.



Absorption spectra of protein hydrolysate solution and sweet chili extract in water



Sample of chili extract and prototype of the mulberry mocktail with capsaicin

Utilization

This innovative advances domestic technology for producing capsaicin nano-capsules encapsulated with soy protein. Supplement manufacturers can use this capsaicin mocktail product to develop healthy drink products, offering more options for health-conscious consumers and fitness enthusiasts.

Energy	Sugar	Fat	Sodium
30 kcal	2 g	0 g	33 mg
*2%	*3%	*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	30 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			
fiber	0 g		0 %
Sugar	2 g		
Sodium	35 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 carbohydrate		300 g	
Dietary fiber		25 g	
Sodium	less than	2,000 mg	
Energy (kcal) per gram : Fat = 9; Protein = 4; Carbohydrate = 4			



References

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²Li, H., Li, F., Sun, Y., & Li, Y. (2021). A feasible strategy of fabricating hybrid drugs encapsulated polymeric nanoparticles for the treatment of gastric cancer therapy. *Process Biochemistry*, 109, 19-26.
³Rollyson, W. D., Stover, C. A., Brown, K. C., Perry, H. E., Stevenson, C. D., McNeese, C. A., . . . Dasgupta, P. (2014). Bioavailability of capsaicin and its implications for drug delivery. *Journal of Controlled Release*, 196, 96-105.



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