

# Supplementary material

## Artificial intelligence assisted ultrasonic extraction of total flavonoids from *Rosa sterilis*

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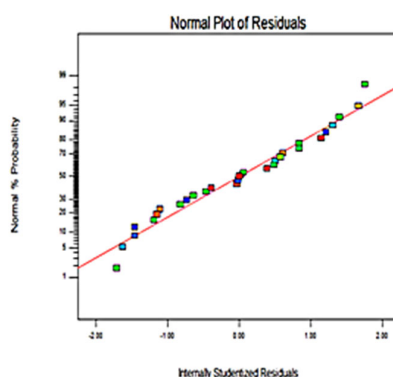


Figure S1. The normal probabilities versus internally studentized residuals.

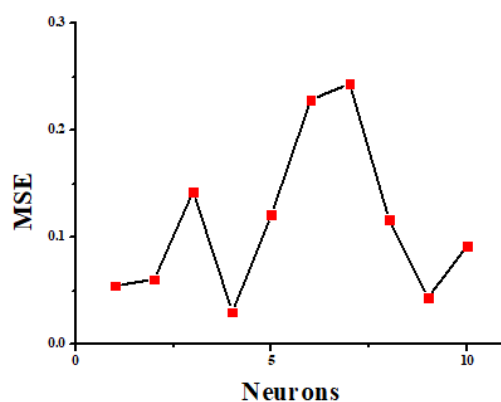


Figure S2. Mean square error (MSE) of neurons in the BP-ANN model.

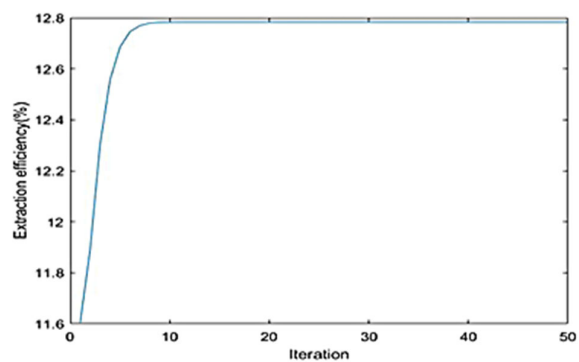


Figure S3. Extraction efficiency versus iteration.

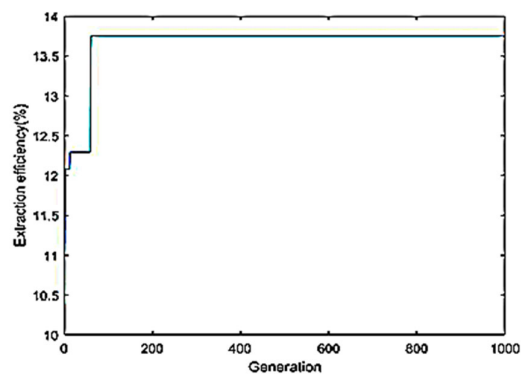


Figure S4. Decontamination efficiency versus generation.

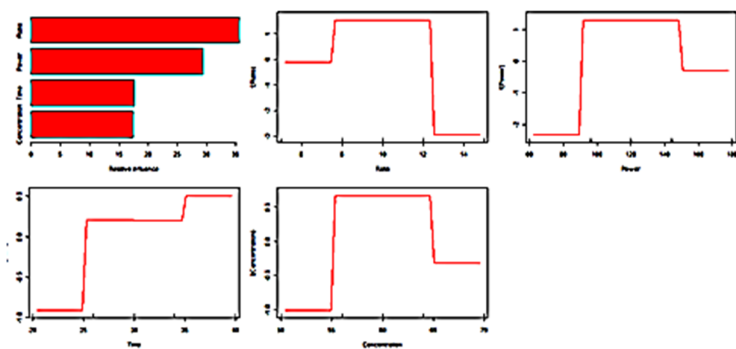


Figure S5. Importance ranking of single factor in GBRT.

Table S1. Relative influence of input variables.

Variables	Relative Significance (%)	Order
Extraction time	23.64%	3
Ethanol concentration	5.71%	4
Material liquid ratio	78.15%	1
Extraction power	48.43%	2

**Table S2.** Relative influence of variables.

Variables	Relative Significance (%)	Order
Extraction time	28.57%	4
Ethanol concentration	30.49%	3
Material liquid ratio	45.03%	1
Extraction power	36.43%	2

**Table S3.** The relative importance of GBRT.

Input variables	Relative significance (%)	Order
Extraction time	17.65561%	3
Ethanol concentration	17.39120%	4
Material liquid ratio	35.58806%	1
Extraction power	29.36513%	2

**Table S4.** The relative importance of Garson formula.

Input variables	Relative significance (%)	Order
Extraction time	12.99%	3
Ethanol concentration	20.89%	4
Material liquid ratio	31.53%	2
Extraction power	34.60%	1

**Table S5.** Extraction efficiency of flavonoids under different extraction time.

Extraction time (min)	$\ln[C_{\infty}/(C_{\infty}-C)]$
60	0.214
70	0.327
80	0.419
90	0.655
100	0.736