

Development and Evaluation of a Topical Antibacterial Gel from *Rhizophora apiculata* Blume Leaves: Standardization, Phytochemical Quantification, and Bioactivity Assessment



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Table S1. Physical characteristics of *R. apiculata* Blume leaf extract gel (Ra-leg) formulations.

Test Type	Formulation	Measurement
Spreadability (cm)	Ra-leg 3%	4.90 ± 0.14
	Ra-leg 5%	4.58 ± 0.08
	Ra-leg 7%	4.36 ± 0.08
Adhesion (s)	Ra-leg 3%	31.67 ± 1.37
	Ra-leg 5%	35.17 ± 1.17
	Ra-leg 7%	38.50 ± 1.05
pH	Ra-leg 3%	6.36 ± 0.05
	Ra-leg 5%	6.56 ± 0.03
	Ra-leg 7%	6.70 ± 0.05
Viscosity (Pa·s)	Ra-leg 3%	125.83 ± 3.76
	Ra-leg 5%	153.33 ± 5.16
	Ra-leg 7%	175.00 ± 3.16

Note: Data are presented as mean ± standard deviation (SD). Ra-leg: *R. apiculata* Blume leaf extract gel; cm: centimeter; s: second; Pa·s: Pascal second.

Table S2. Quercetin equivalent flavonoid (QEF) content of Ra-leg formulations.

Formulation	QEF (mg QE/g gel)
Ra-leg 3%	0.5082 ± 0.0015
Ra-leg 5%	0.5288 ± 0.0074
Ra-leg 7%	0.5898 ± 0.0025

Note: Data are presented as mean ± SD (n = 5). Ra-leg: *R. apiculata* Blume leaf extract gel; QEF: quercetin equivalent flavonoid; QE: quercetin equivalent.

Table S3. Gallic acid equivalent phenolic (GAEP) content of *R. apiculata* Blume leaf extract gel (Ra-leg) formulations.

Formulation	GAEP (mg GAE/g gel)
Ra-leg 3%	0.3175 ± 0.0075
Ra-leg 5%	0.3681 ± 0.0025
Ra-leg 7%	0.4395 ± 0.0067

Note: Data are presented as mean ± SD (n = 5). Ra-leg: *R. apiculata* Blume leaf extract gel; GAEP: gallic acid equivalent phenolic; GAE: gallic acid equivalent.

Table S4. Tannic acid equivalent tannin (TAET) content of Ra-leg formulations.

Formulation	TAET (mg TAE/g gel)
Ra-leg 3%	0.2316 ± 0.0014
Ra-leg 5%	0.2662 ± 0.0024
Ra-leg 7%	0.2845 ± 0.0025

Note: Data are presented as mean ± SD (n = 5). Ra-leg: *R. apiculata* Blume leaf extract gel; TAET: tannic acid equivalent tannin; TAE: tannic acid equivalent.

Table S5. Antibacterial activity of *R. apiculata* Blume leaf extract gel (Ra-leg) formulations.

Bacteria	Treatment	Inhibition Zone Diameter (mm)
<i>E. coli</i>	Negative Control (gel base)	0.00 ± 0.00
	Ra-leg 3%	4.98 ± 0.23
	Ra-leg 5%	11.48 ± 0.39
	Ra-leg 7%	18.02 ± 0.41
	Positive Control (Bioplacenton® gel)	30.62 ± 0.72
<i>S. aureus</i>	Negative Control (gel base)	0.00 ± 0.00
	Ra-leg 3%	4.26 ± 0.15
	Ra-leg 5%	8.68 ± 0.31
	Ra-leg 7%	14.94 ± 0.30
	Positive Control (Bioplacenton® gel)	28.96 ± 0.15
<i>S. epidermidis</i>	Negative Control (gel base)	0.00 ± 0.00
	Ra-leg 3%	5.40 ± 0.10
	Ra-leg 5%	6.60 ± 0.07
	Ra-leg 7%	13.82 ± 0.27
	Positive Control (Bioplacenton® gel)	30.02 ± 0.16
<i>P. aeruginosa</i>	Negative Control (gel base)	0.00 ± 0.00
	Ra-leg 3%	18.44 ± 0.13
	Ra-leg 5%	21.04 ± 0.25
	Ra-leg 7%	24.76 ± 0.21
	Positive Control (Bioplacenton® gel)	30.92 ± 0.60

Note: Inhibition zone diameter data are presented as mean ± standard deviation (SD). Ra-leg: *R. apiculata* Blume leaf extract gel; mm: millimeter.