



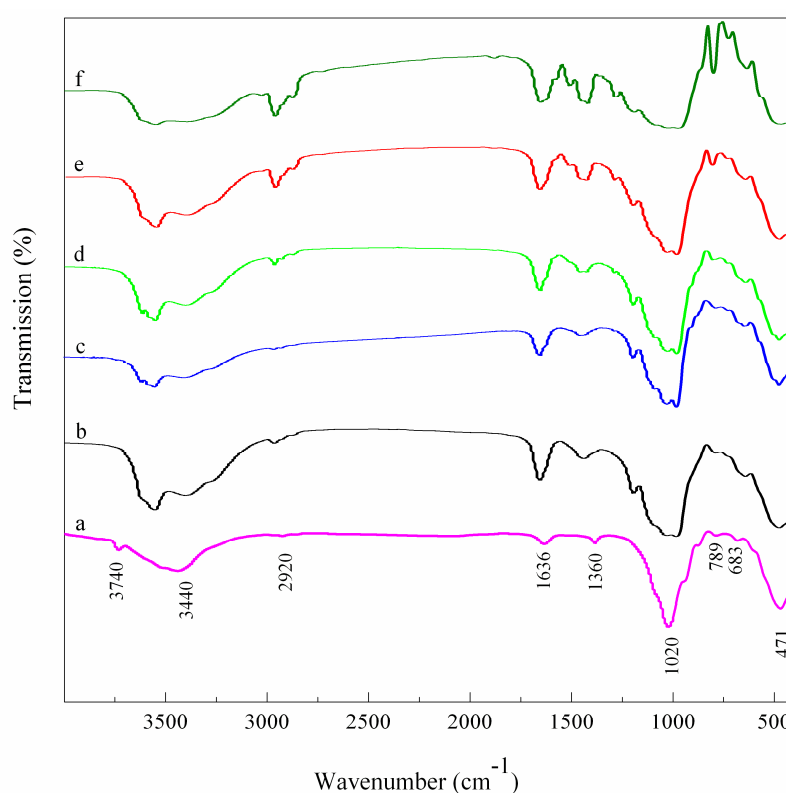
## Supplementary Materials

# Palygorskite-Based Organic–Inorganic Hybrid Nanocomposite for Enhanced Antibacterial Activities

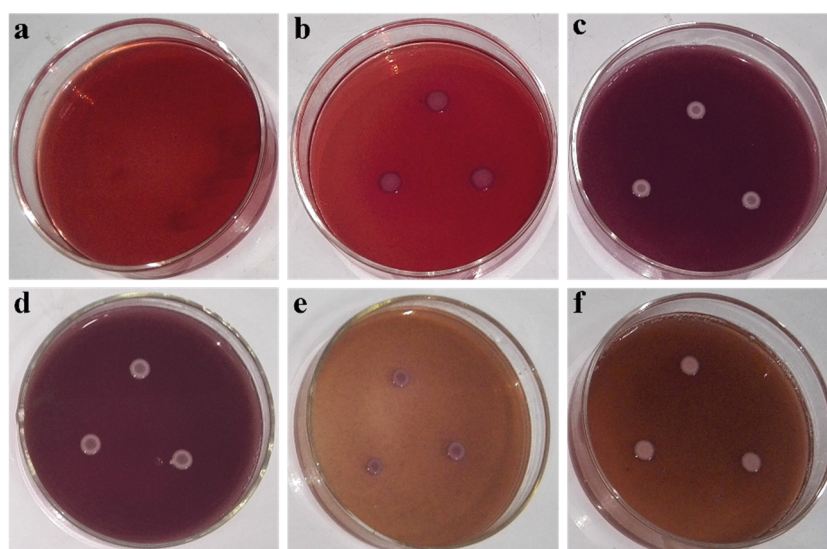
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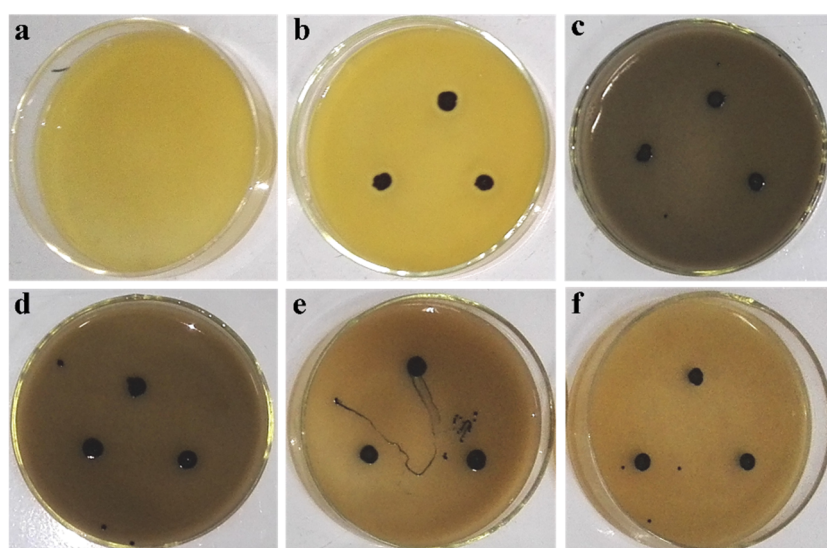
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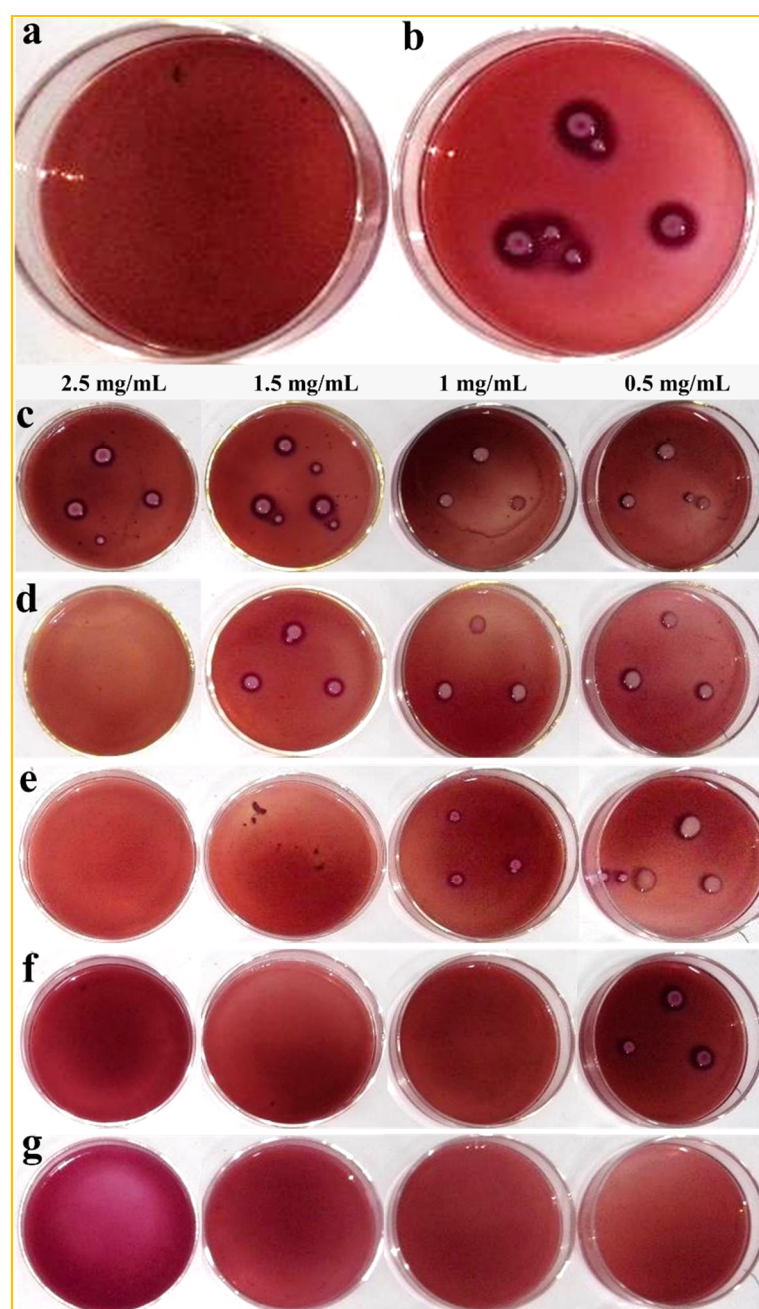
**Figure S1.** FTIR spectra of PAL encompassed by (a) 0%, (b) 1%, (c) 2.5%, (d) 5%, (e) 10%, (f) 20% CAR.



**Figure S2.** (a) Blank control, (b) positive control of *E. coli*, *E. coli* treated by PAL with different concentrations (c) 50 mg/mL, (d) 20 mg/mL, (e) 10 mg/mL, (f) 1 mg/mL.



**Figure S3.** (a) Blank control, (b) positive control of *S. aureus*, *S. aureus* treated by PAL with different concentrations (c) 50 mg/mL, (d) 20 mg/mL, (e) 10 mg/mL, (f) 1 mg/mL.



**Figure S4.** (a) Blank control, (b) positive control, MIC evaluation of PAL encompassed by (c) 1%, (d) 2.5%, (e) 5%, (f) 10%, (g) 20% CAR.

**Table S1.** Effects of preparation parameters on antibacterial activities of ZnO/PAL against *E. coli*.

Factors	Alkali	$n_{Zn^{2+}}/n_{alkali}$	Temperature (°C)	Time (h)	PAL (%)	MIC (mg/mL)
S1	NH <sub>3</sub> ·H <sub>2</sub> O	1:3	450	4	20	5
S2	NaOH	1:3	450	4	20	5
S3	HMTA	1:3	450	4	20	10
S4	Na <sub>2</sub> CO <sub>3</sub>	1:3	450	4	20	10
S5	NaOH	1:1	450	4	20	10
S6	NaOH	1:1.5	450	4	20	10
S7	NaOH	1:2	450	4	20	5
S8	NaOH	1:2.5	450	4	20	5
S9	NaOH	1:3	450	4	20	10
S10	NaOH	1:2	300	4	20	5
S11	NaOH	1:2	350	4	20	2.5
S12	NaOH	1:2	400	4	20	2.5
S13	NaOH	1:2	450	4	20	5
S14	NaOH	1:2	500	4	20	5
S15	NaOH	1:2	600	4	20	10
S16	NaOH	1:2	400	1	20	5
S17	NaOH	1:2	400	2	20	5
S18	NaOH	1:2	400	3	20	2.5
Factors	Alkali	$n_{Zn^{2+}}/n_{alkali}$	Temperature (°C)	Time (h)	PAL (%)	MIC (mg/mL)
S19	NaOH	1:2	400	4	20	2.5
S20	NaOH	1:2	400	6	20	5
S21	NaOH	1:2	400	8	20	5
S22	NaOH	1:2	400	3	10	1.5
S23	NaOH	1:2	400	3	20	1.5
S24	NaOH	1:2	400	3	30	2.5
S25	NaOH	1:2	400	3	40	5
S26	NaOH	1:2	400	3	50	10
S27	NaOH	1:2	400	3	60	10



**Table S2.** The MIC values of PEOs/ZnO/PAL nanocomposites against *E. coli* and *S. aureus*.

Samples	MIC (mg/mL)	
	<i>E. coli</i>	<i>S. aureus</i>
Citral/ZnO/PAL	1.5	5
Thymol/ZnO/PAL	1	2.5
Carvacrol/ZnO/PAL	0.5	1.5
Oregano oil/ZnO/PAL	0.5	2.5
Cinnamaldehyde/ZnO/PAL	1	2.5

**Table S3.** The MIC values of PAL and ZnO/PAL encompassed by different concentrations of CAR against *E. coli*.

wt%	MIC (mg/mL) against <i>E. coli</i>	
	CAR/PAL	CAR/ZnO/PAL
1	5	1
2.5	5	1
5	2.5	1
10	2.5	0.5
20	1.5	0.5