

Supporting Information

Ultraviolet Restrains Marine Biofouling of Uranium Extraction from Seawater

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Table S1. Curve fitting results of XPS O 1s spectra.

	Peak	BE ^a (eV)	FWHM ^b (eV)	%
PAO	N-O	530.14	2.23	28.4
	C-O	531.51	1.71	42.2
	C=N-OH	532.61	1.80	29.4
U(VI)-laden PAO under UV irradiation	N-O	530.04	2.11	27.7
	C-O	531.60	1.98	27.3
	C=N-OH	532.69	2.04	44.7

^aBinding energy. ^bFull width at half-maximum.

Table S2. Curve fitting results of XPS N 1s spectra.

	Peak	BE (eV)	FWHM ^b (eV)	%
PAO	N-H	399.30	1.99	46.7
	C=N	400.64	1.60	53.3
U(VI)-laden PAO under UV irradiation	N-H	399.36	1.67	60.1
	C=N	400.74	2.03	39.9

Table S3. Curve fitting results of XPS C 1s spectra.

	Peak	BE (eV)	FWHM (eV)	%
PAO	C=C	284.25	1.63	43.6
	C-C	285.60	1.24	30.8
	-C-OH	286.50	1.39	18.0
	C=O	287.60	1.05	3.02
	-COO ⁻	288.60	2.08	4.58
U(VI)-laden PAO under UV irradiation	C=C	284.35	1.70	6.70
	C-C	285.68	2.41	16.3
	-C-OH	286.51	1.75	29.5
	C=O	287.66	1.48	20.3
	-COO ⁻	288.70	2.11	27.2

Table S4. Parameters calculated from Langmuir and Freundlich models for U(VI) adsorption on *V. alginolyticus*/PAO before and after UV irradiation. pH = 8.2 ± 0.1, T = 298 ± 1 K.

UV irradiation	Langmuir model			Freundlich model		
	C _{s,max} (mg/g)	b (L/mg)	R ²	K (mg/g)	1/n	R ²
Before	74.8	0.036	0.976	11.1	0.352	0.956
After	97.7	0.081	0.973	24.4	0.275	0.964

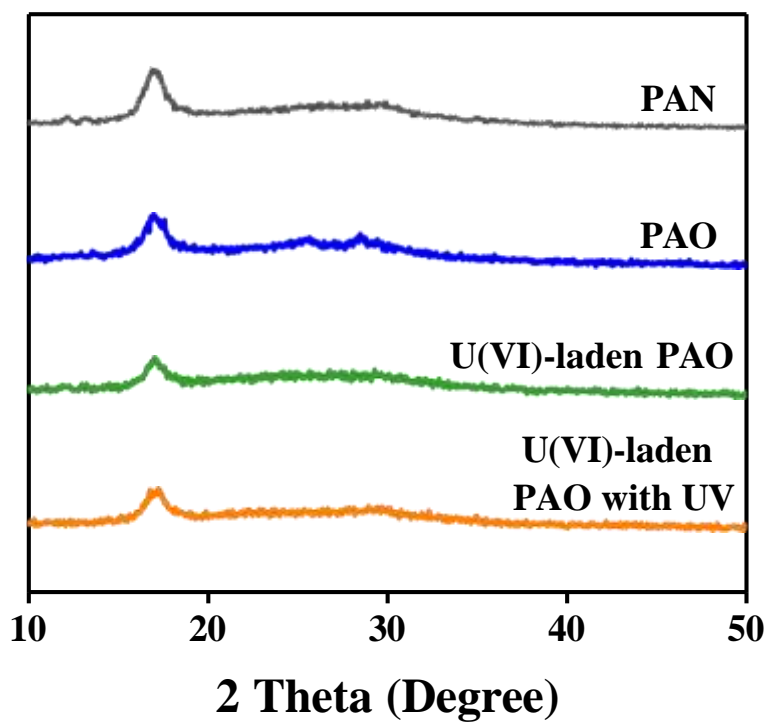


Fig. S1. XRD patterns of PAN, PAO, U(VI)-laden PAO.

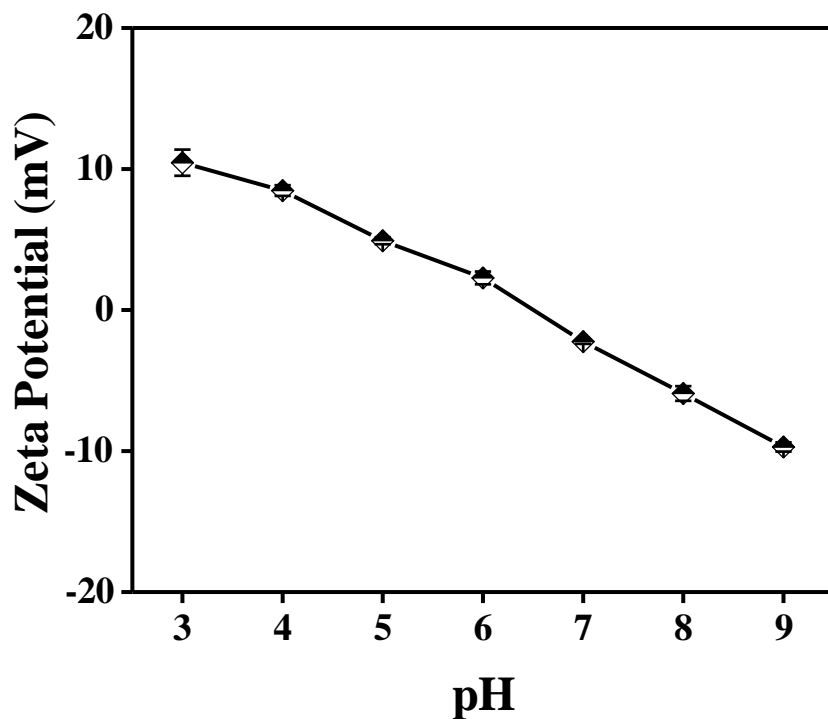


Fig. S2. Zeta potential of PAO at different pH values.

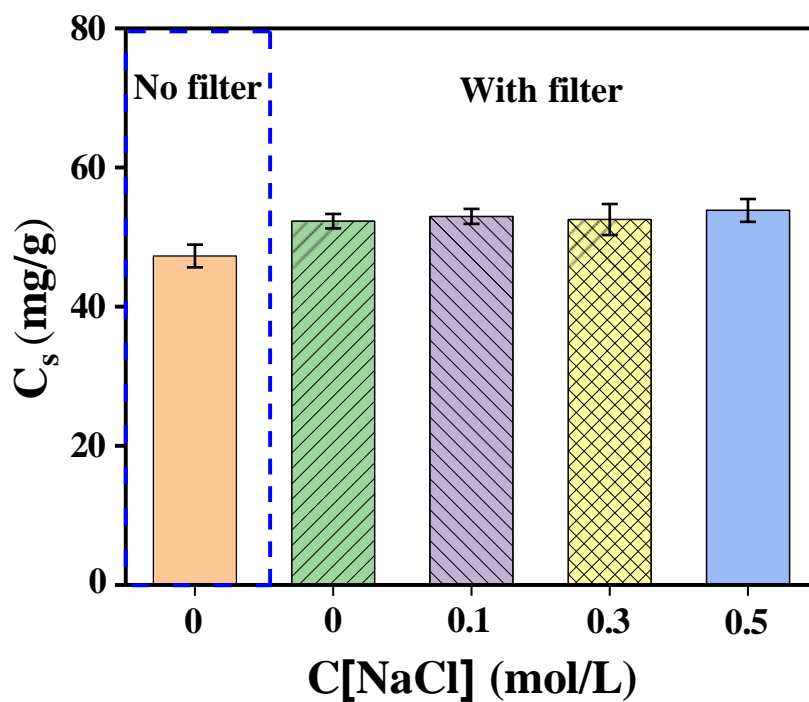


Fig. S3. Effect of NaCl concentration on U(VI) extraction by PAO under UV irradiation condition. $m/V = 0.1$ g/L, $T = 298 \pm 1$ K, $C[U(VI)]_{\text{initial}} = 20$ mg/L, contact time: 24 h, $\text{pH} = 8.2 \pm 0.1$.

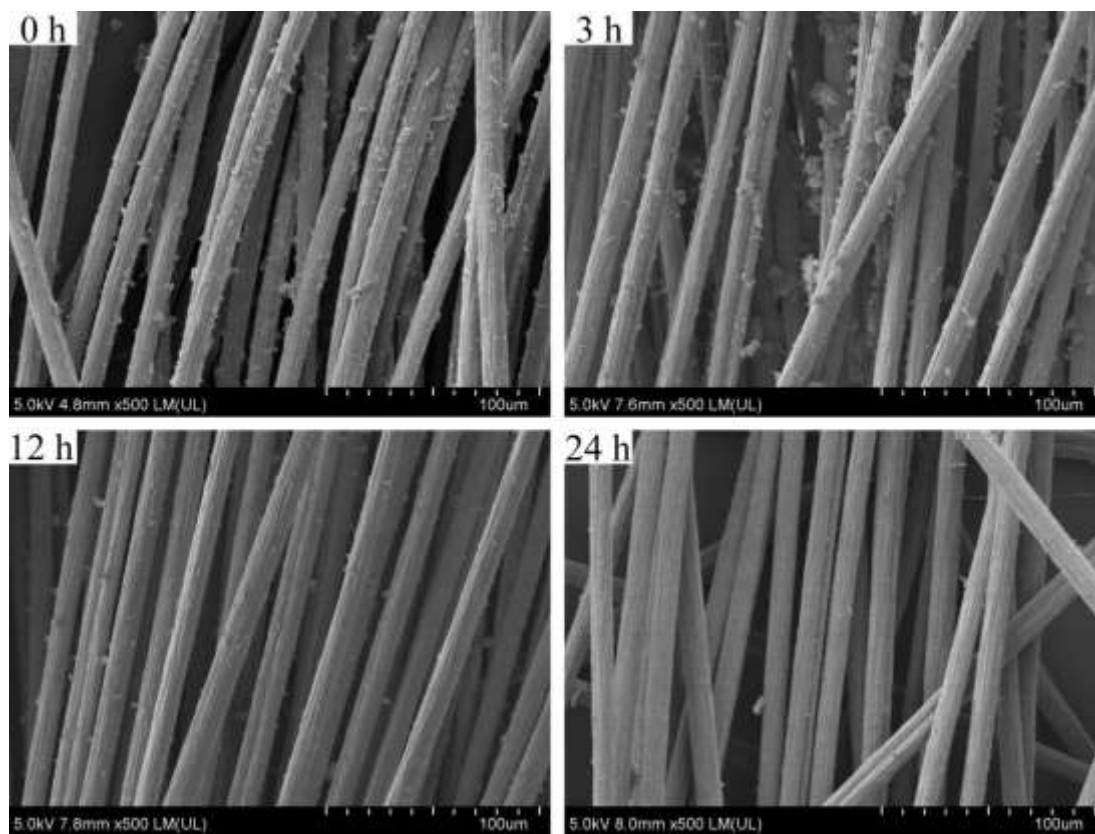


Fig. S4. SEM images of *V. alginolyticus* on PAO surface after UV irradiation.

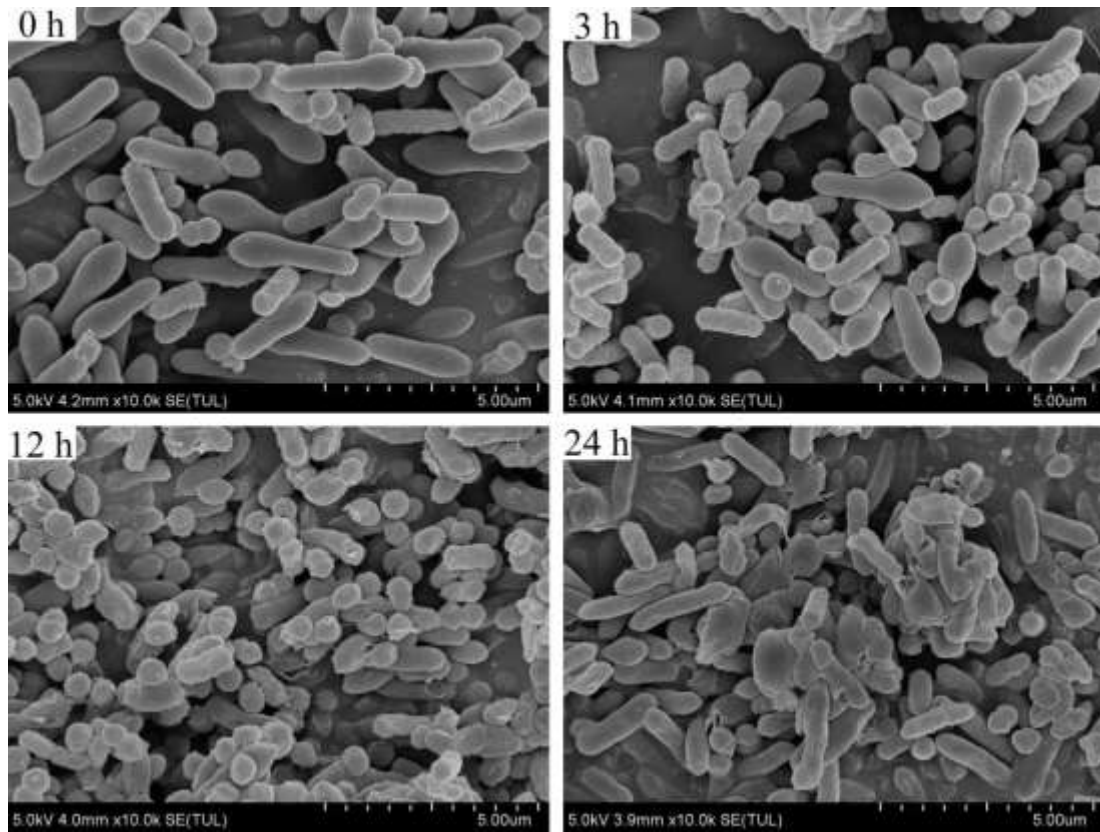


Fig. S5. SEM images of *V. alginolyticus* in PBS solution after UV irradiation.

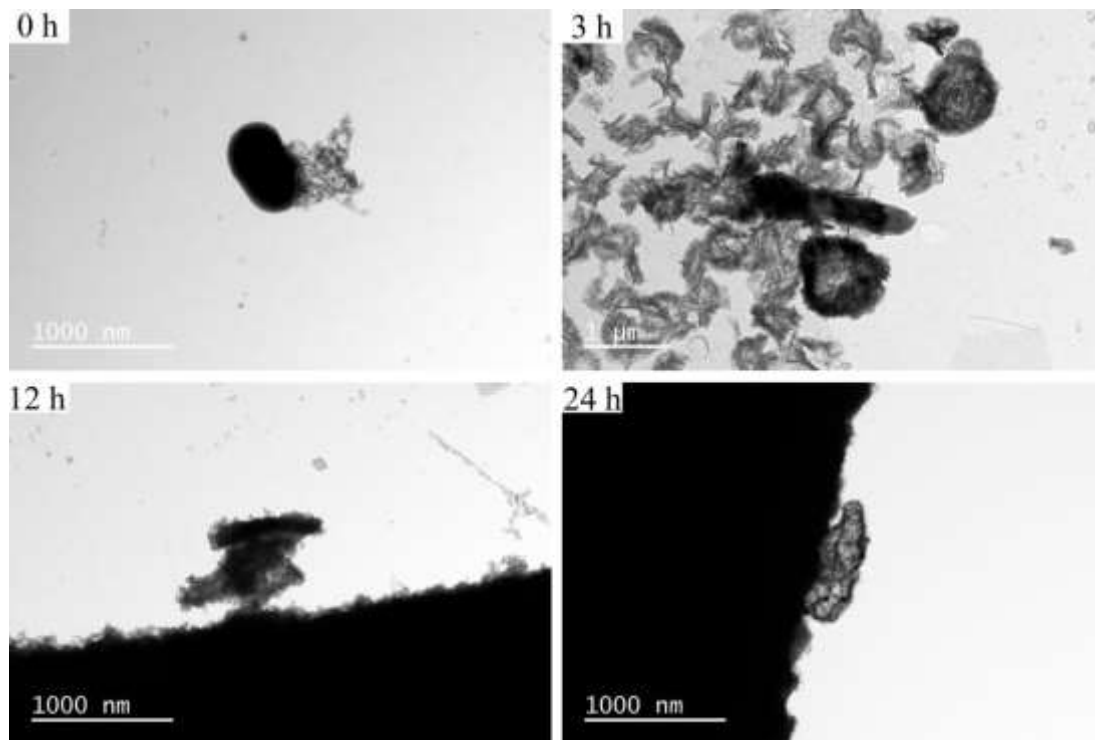


Fig. S6. TEM images of *V. alginolyticus* after UV irradiation.

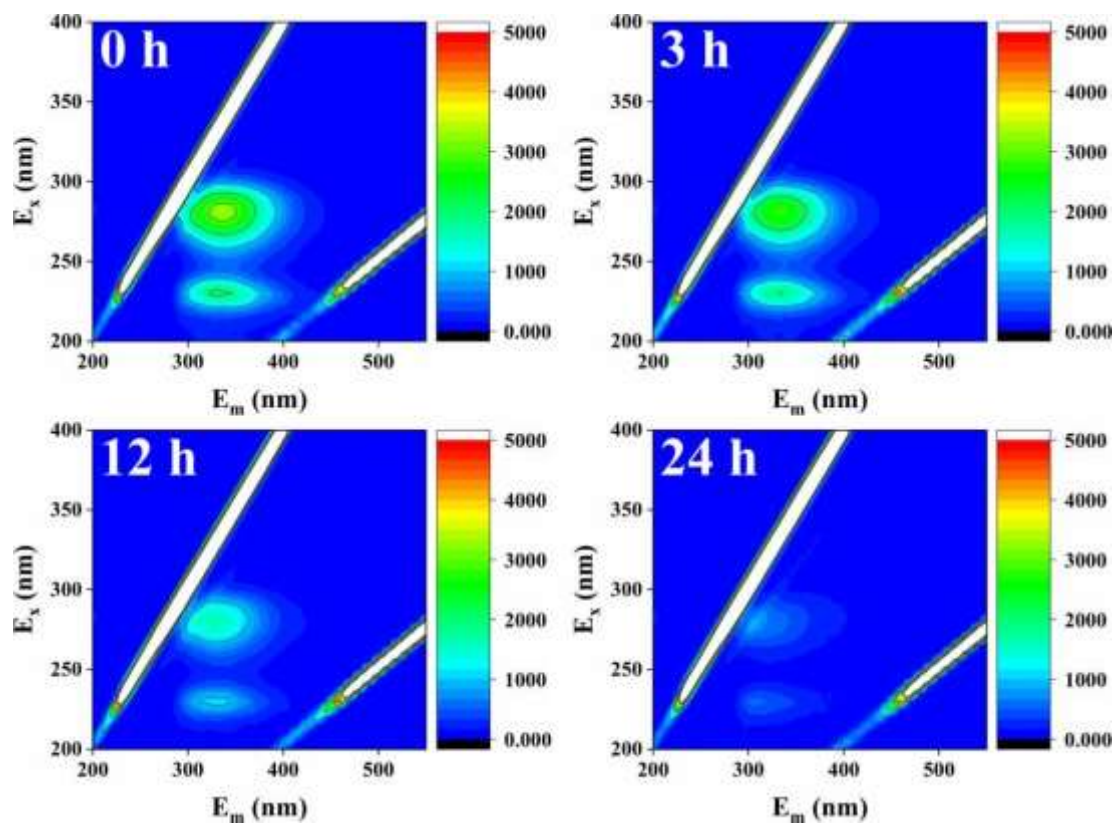


Fig. S7. EEM spectra of *V. alginolyticus* in U(VI) solution after UV irradiation.

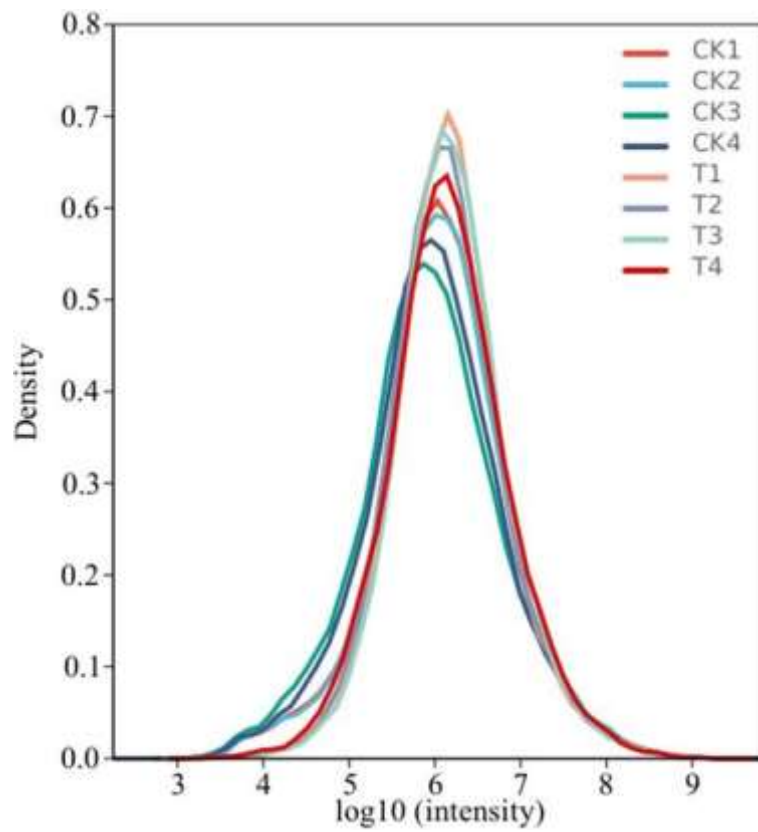


Fig. S8. Expression of *V. alginolyticus* abundance density before (CK sample) and after (T sample) UV irradiation for 24 h.

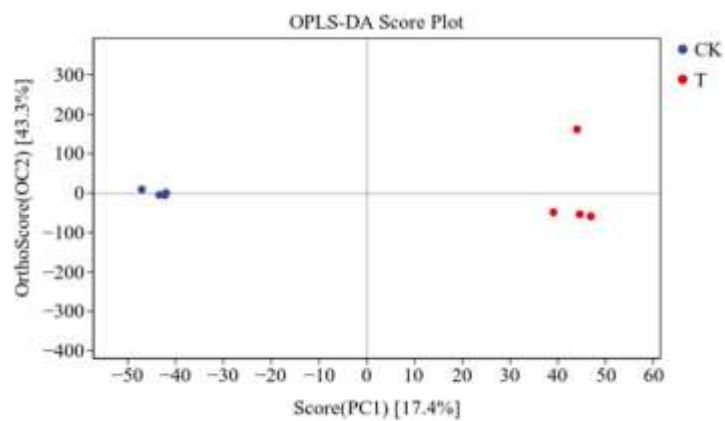


Fig. S9. OPLS-DA models of *V. alginolyticus* before (CK sample) and after (T sample) UV irradiation for 24 h.

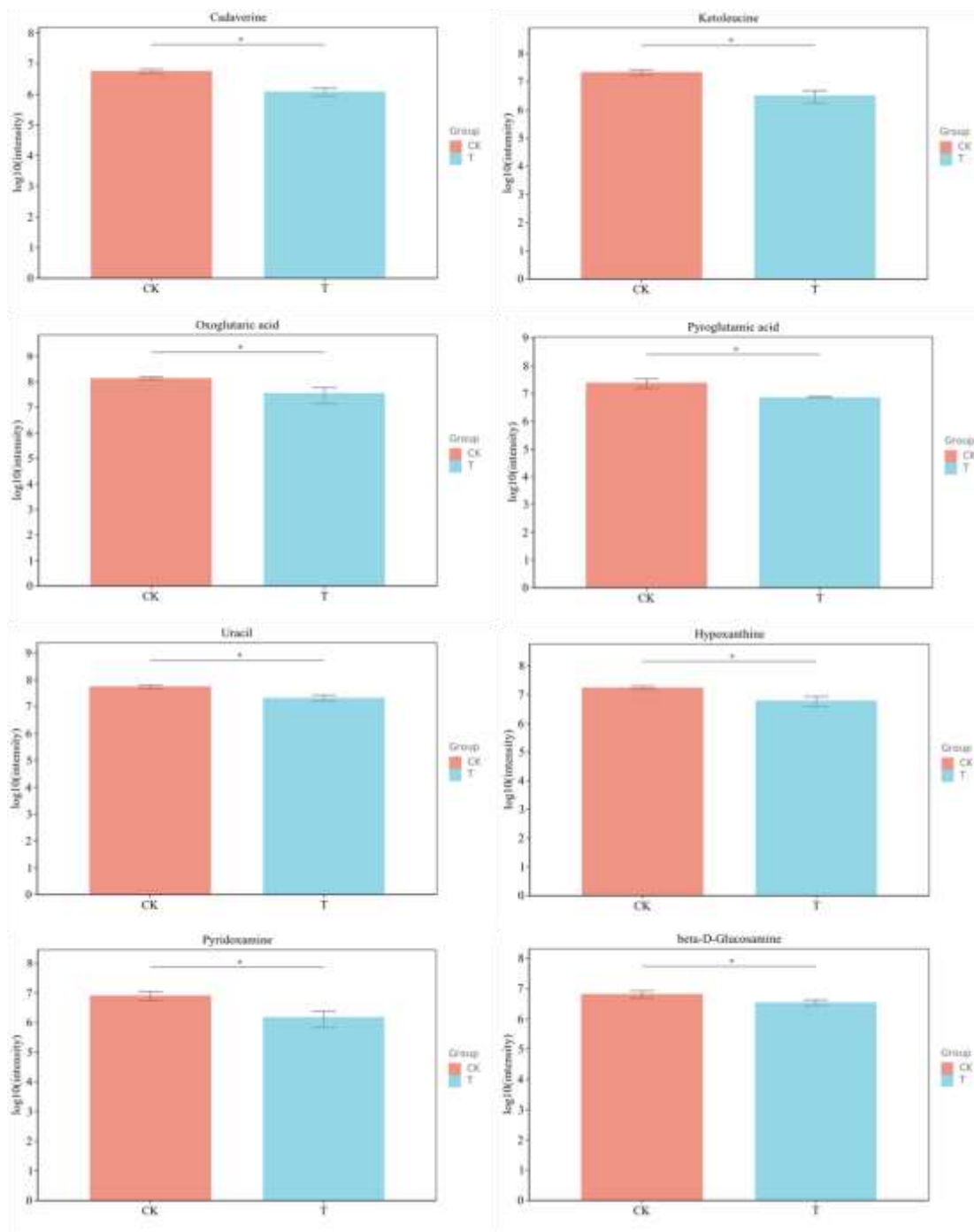


Fig. S10. Metabolites of *V. alginolyticus* before (CK sample) and after (T sample) UV irradiation for 24 h.

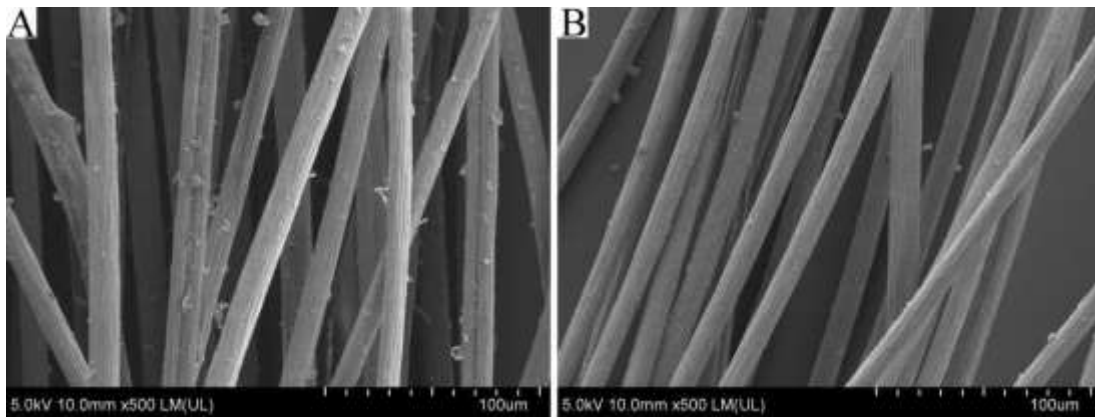


Fig. S11. SEM images of microorganisms on PAO surface in seawater before (A) and after (B) UV irradiation for 24 h.

References

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