Supplementary materials

Title:

Molecular hydrogen improves storage quality of bok choy by reducing water loss and maintaining cell wall integrity

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Table S1 T_2 changes and peak areas in bok choy stored for 0, 1, 3, 6 and 9 d after H_2 MAP.

T_2/ms	Storage time/d	Group	Onset peak/ms	End peak/ms	Peak area
T_{21}	0	Control	0.577	4.513	230.734
	1	Control	0.821	4.786	233.737
		0.01 % H_2	0.774	5.076	243.865
		0.1 % H_2	0.649	4.786	309.851
		1 % H_2	0.688	5.709	240.435
	3	Control	1.825	4.824	97.658
		0.01 % H_2	1.703	5.171	130.799
		0.1 % H_2	1.29	6.368	161.927
		1 % H_2	1.482	13.667	154.024
	6	Control	2.768	6.368	80.085
		0.01 % H_2	2.097	4.824	112.496
		0.1 % H_2	1.825	4.824	88.312
		1 % H_2	2.248	6.826	91.198
	9	Control	5.941	11.098	32.838
		0.01 % H_2	2.967	7.842	55.879
		0.1 % H_2	2.768	6.368	62.335
		1 % H_2	3.181	7.843	55.764
T_{22}	0	Control	4.786	18.493	51.216
	1	Control	6.054	19.613	64.533
		0.01 % H_2	7.659	29.594	57.578
		0.1 % H_2	5.709	17.438	56.179
		1 % H_2	6.054	18.493	47.608
	3	Control	11.895	31.44	46.935
		0.01 % H_2	15.703	41.504	60.349
		0.1 % H_2	6.368	9.011	0.183
		1 % H_2	14.65	38.72	55.569
	6	Control	19.339	44.488	43.033
		0.01 % H_2	15.703	36.123	52.128
		0.1 % H_2	14.65	36.123	40.001
		1 % H_2	12.751	25.529	41.433
	9	Control	18.042	41.504	22.4
		0.01 % H_2	11.098	38.72	67
		0.1 % H_2	13.667	31.44	56.097
		1 % H_2	15.703	47.686	55.633
T_{23}	0	Control	47.357	628.67	4297.924
	1	Control	42.106	468.603	4112.351
		0.01 % H_2	44.654	592.787	4369.362
		0.1 % H_2	44.654	628.67	3980.21
		1 % H_2	39.702	496.968	4257.898
	3	Control	47.686	333.129	2370.429
		0.01 % H_2	62.95	714.943	2301.48
		0.1 % H_2	9.659	38.72	160.199
		1 % H_2	41.504	766.341	2419.846
	6	Control	47.686	766.341	2154.554

		0.01 % H_2	51.114	766.341	2061.073
		0.1 % H_2	41.504	666.992	2139.01
		1 % H_2	27.364	2327.202	2210.681
		Control	58.728	471.375	2407.605
	9	0.01 % H_2	44.488	410.266	2449.817
		0.1 % H_2	54.789	382.75	2454.63
		1 % H_2	62.95	439.76	2377.538

Table S2 Primer sequences used in RT-qPCR for bok choy

Primer name	Accession number	Sequences (5′→3′)
POD31	XM_048745008	F: TCCTCATTCTCCTCGCCTCCAC
		R: GGTCGGGTTGGTGATTTGTTTGC
POD37	XM_048769443	F: GCGAGCATACTTCGTCTTCACT
		R: TCTACGGCAGCCTTCATCC
XET2	XM_013785869	F: CCGCTTCATACCGTGGCTTCAG
		R: GCACCCATCTCATCCGTTCTTGAC
XET3	XM_048750808	F: GACAAATCCTCTGGCTCTGGCTTC
		R: GCTGAGTTTCCAGGGACGAGTTTC
GAPDH	AF536826	F: CAGGTTTGGAATTGTCGAGG
		R: GAGCTGTGGAAGCACCTTTC
Actin	NM_112046	F: TATGCTCTTCCACATGCTATTC
		R: CCTTACGATTTCACGCTCTG

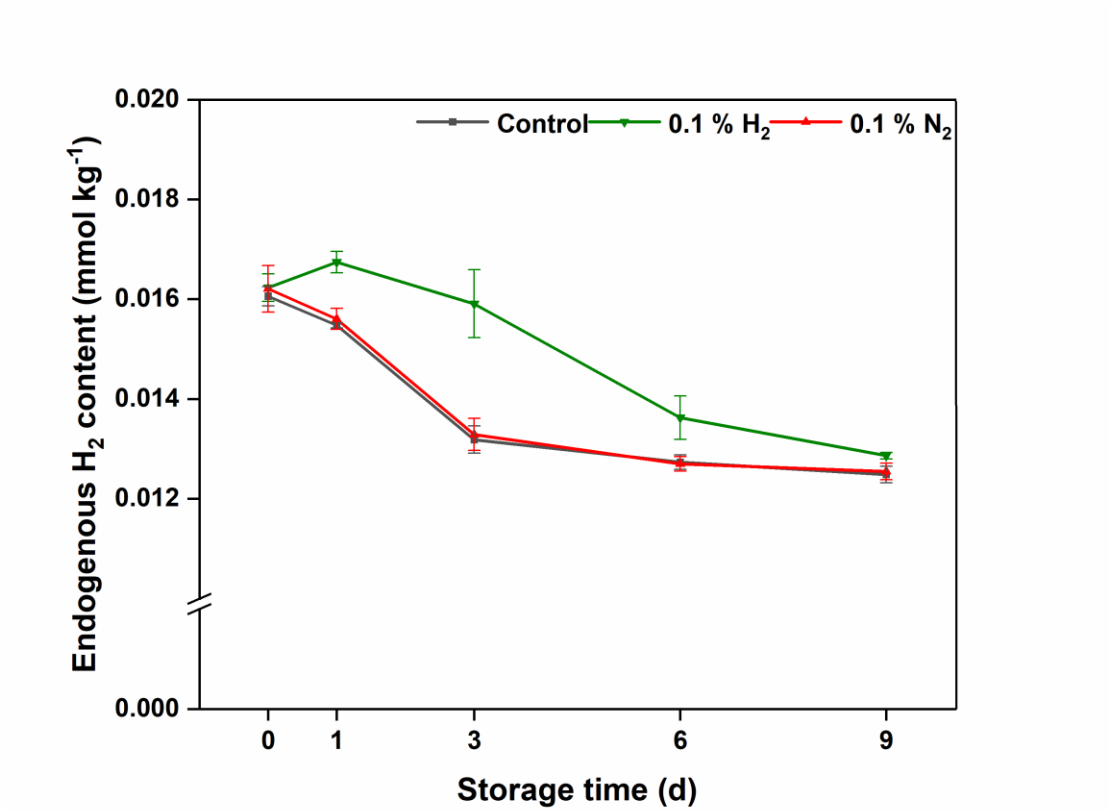


Figure S1. H_2 content of bok choy under control, 0.1 % H_2 MAP, and 0.1 % N_2 (air + 0.1 % N_2) conditions during storage. The value is expressed as mean ± SE.

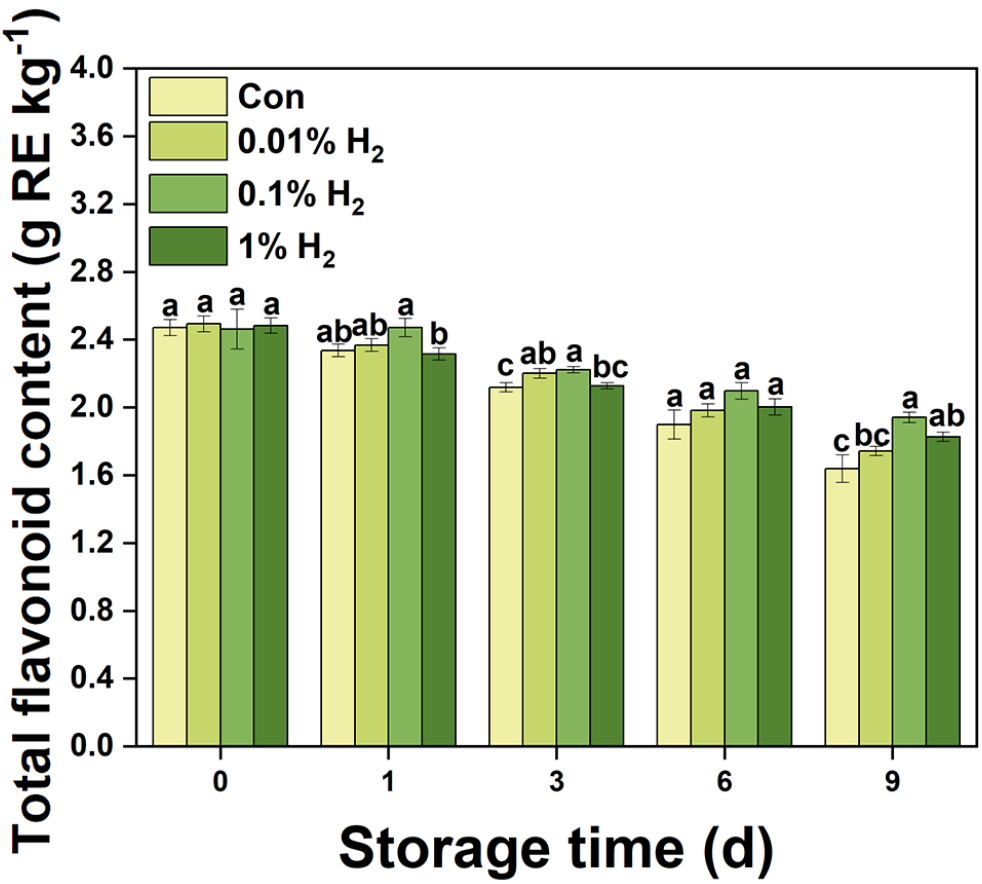


Figure S2. The effect of H_2 MAP on the total flavonoids content of bok choy after 0, 1, 3, 6 and 9 d of storage. The vertical bar represents the standard error (n = 3 replicates). According to Duncan's multiple range test, different letters for each storage time indicate statistically significant difference ($P < 0.05$).

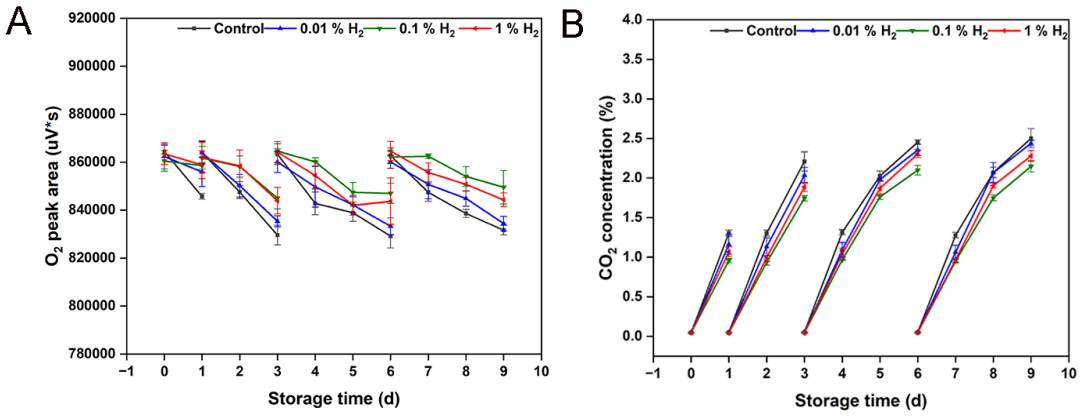


Figure S3. O_2 peak area (A) and CO_2 concentration (B) in sealed plastic boxes. GC and air detectors are respectively used to detect the O_2 peak area and daily concentration of CO_2 in the sealed plastic boxes during storage. The value is expressed as mean ± SE.

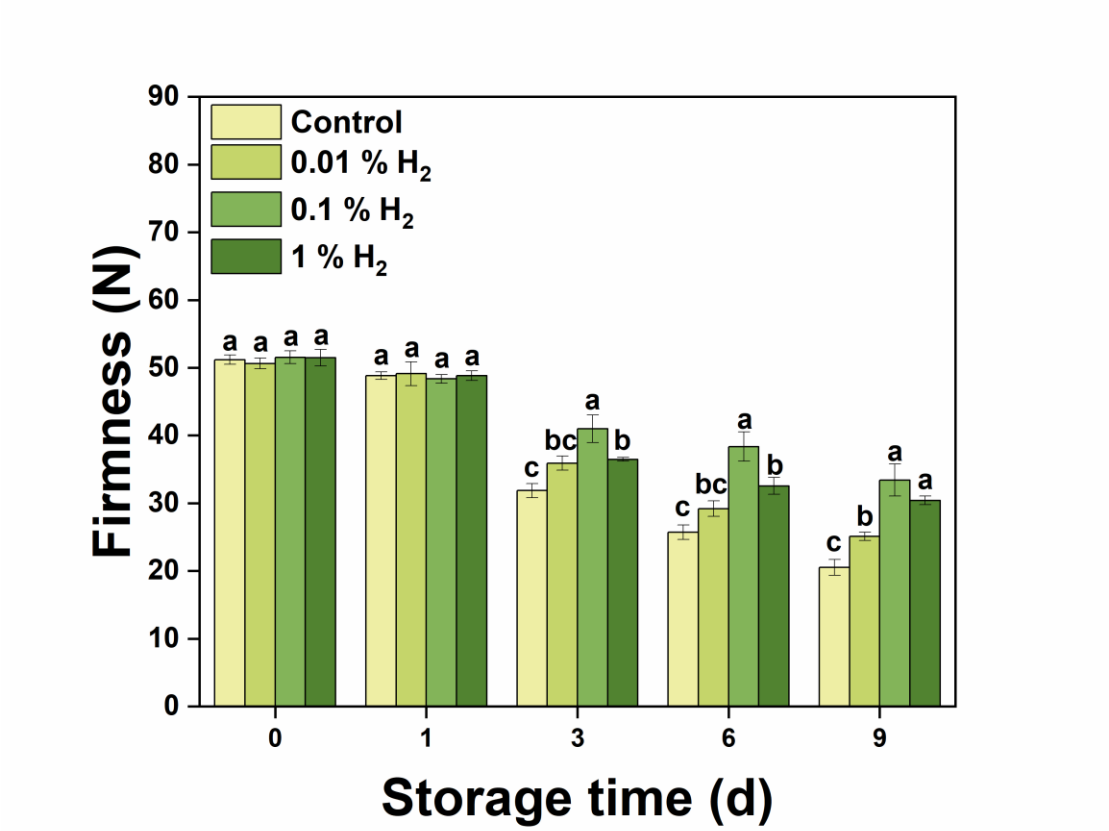


Figure S4. The effect of H_2 MAP on the firmness of bok choy after 0, 1, 3, 6 and 9 d of storage. The vertical bar represents the standard error (n = 3 replicates). According to Duncan's multiple range test, different letters for each storage time indicate statistically significant difference ($P < 0.05$).

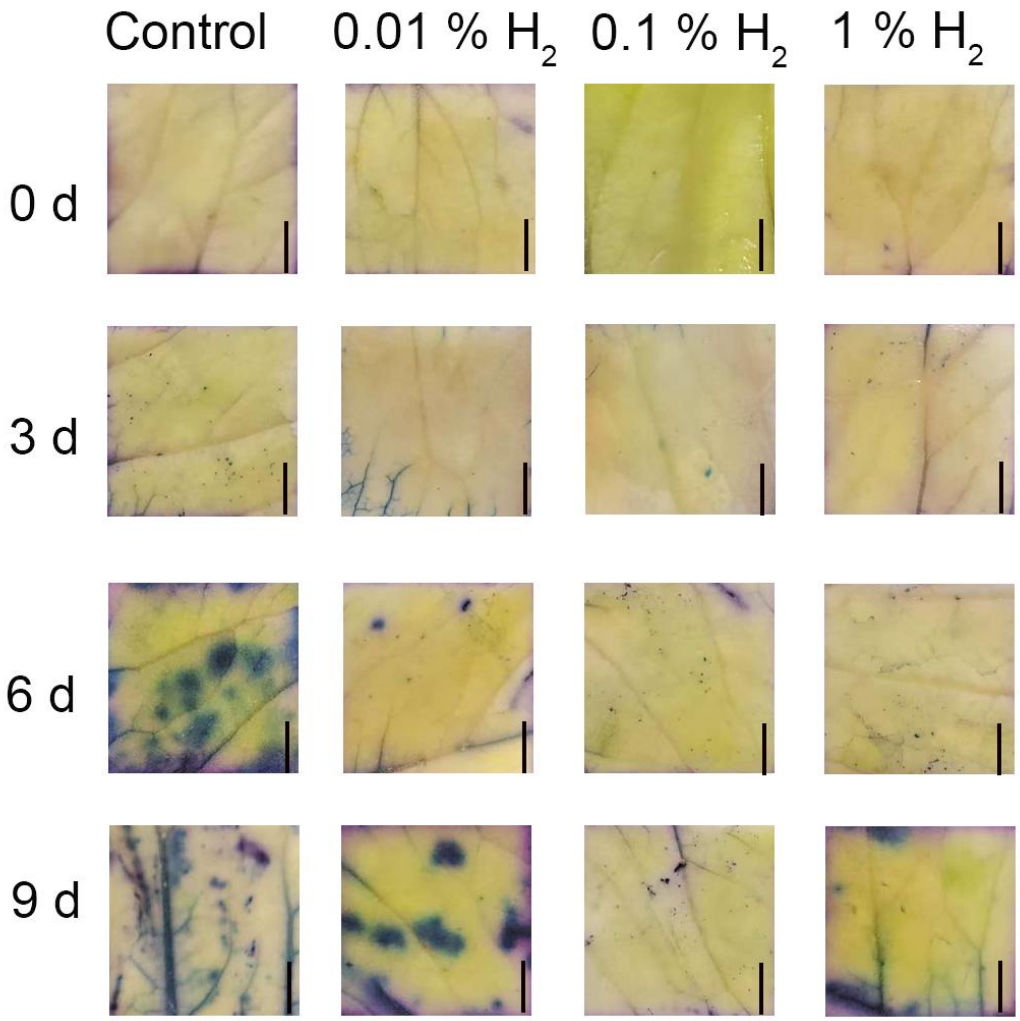


Figure S5. The leaves of the bok choy were stained with Evans blue after 0, 3, 6 and 9 d of storage. Scale bar = 5 mm.

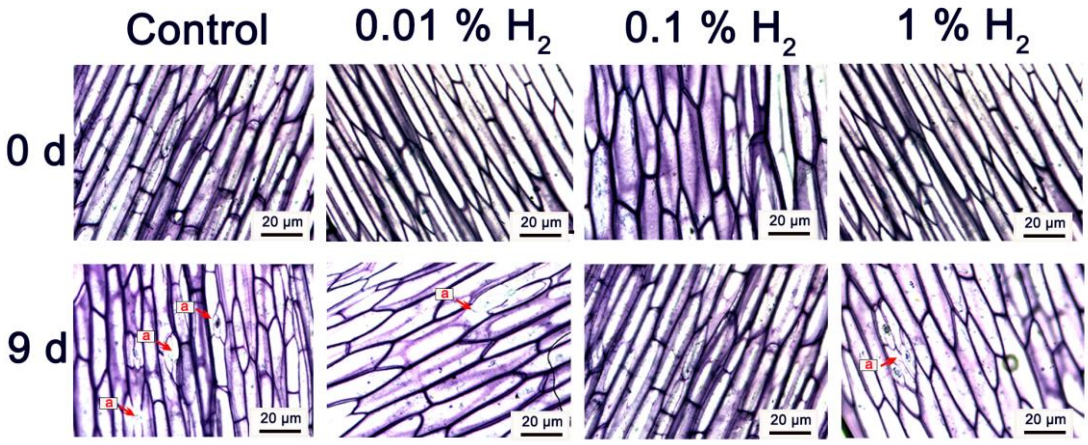


Figure S6. The effect of H_2 MAP on the optical micrographs of bok choy stems at 0 d and 9 d of storage. Scale bar = 20 μm. Red arrow "a": cell wall damage.

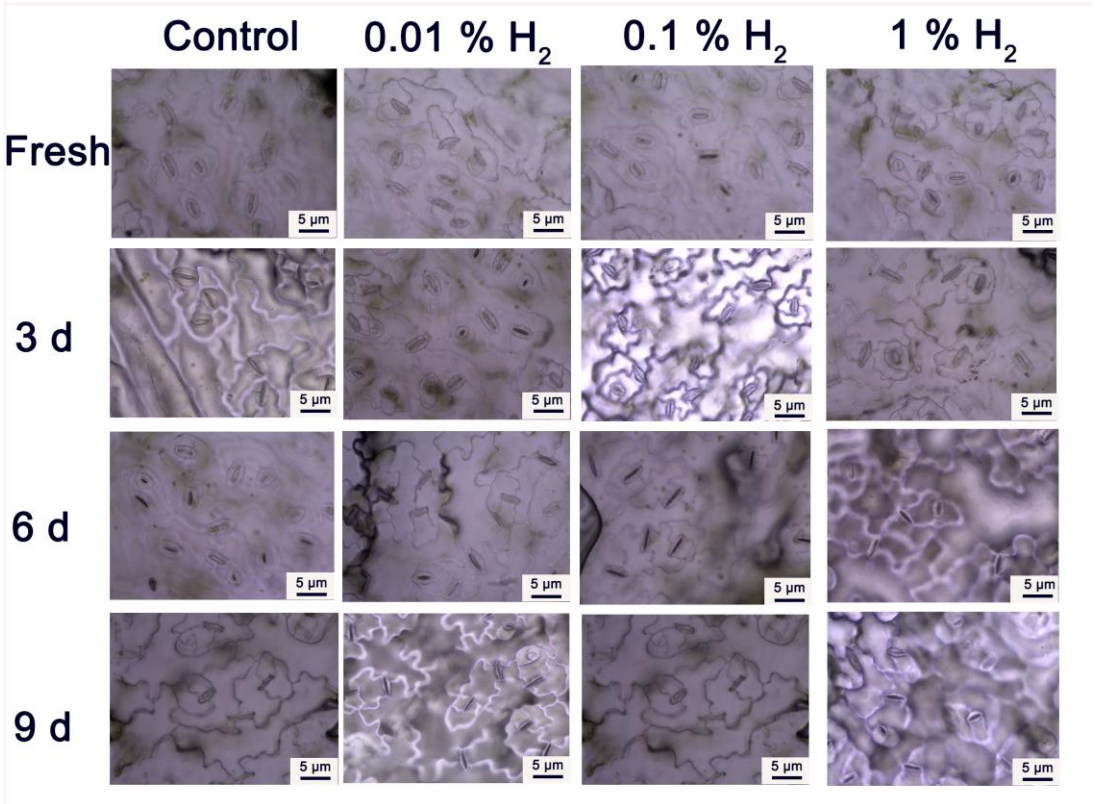


Figure S7. The effect of H_2 MAP on the leaf stomatal status of bok choy under 4 ℃ after 0, 3, 6 and 9 d of storage. Scale bar = 5 μm.

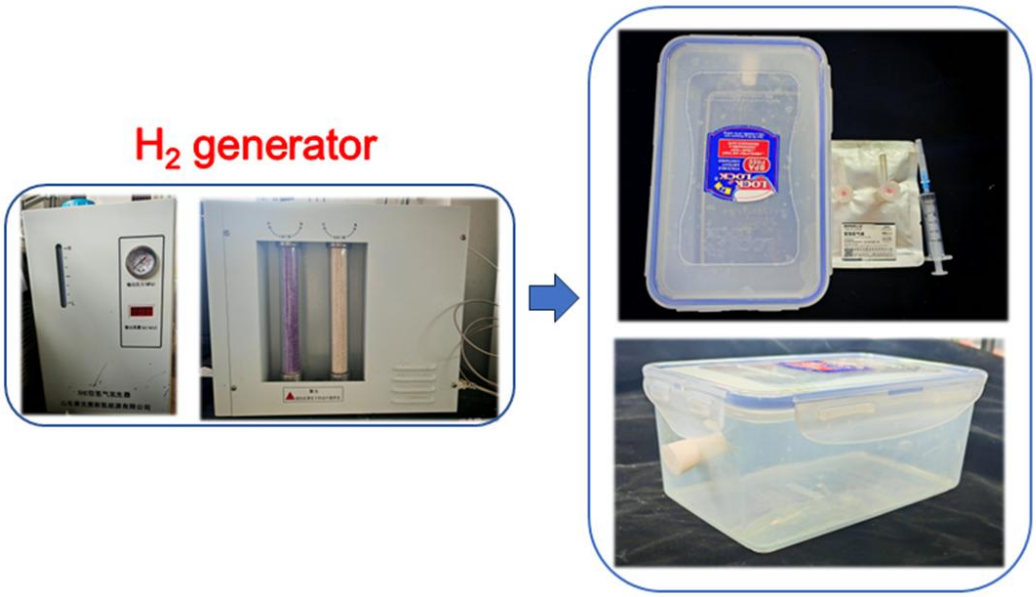


Figure S8. A schematic diagram illustrating the experimental process of H_2 supply and the injection of H_2 into the storage boxes.

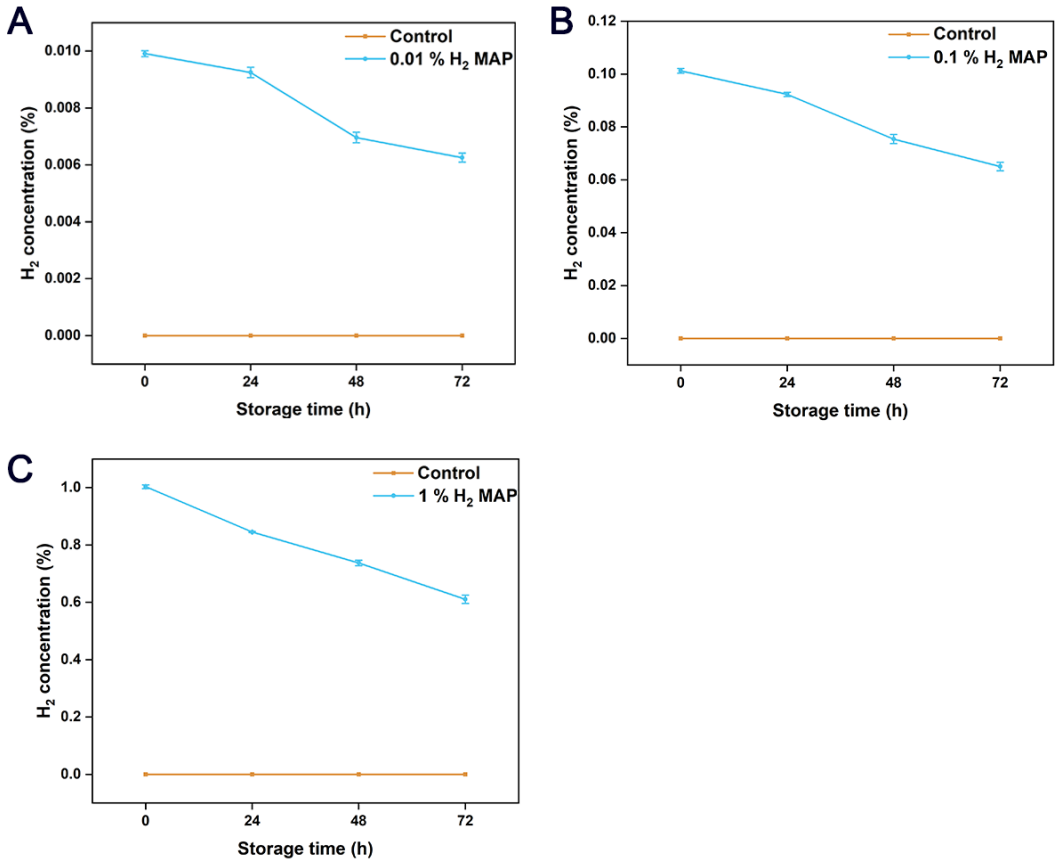


Figure S9. Hydrogen gas concentration in the sealed plastic boxes under control (with air) vs 0.01 % H_2 MAP (A), control (with air) vs 0.1 % H_2 MAP (B), and control (with air) vs 1 % H_2 MAP (C). GC was used to detect the H_2 content at 0, 24, 48 and 72 hours. Values are expressed

as mean ± SE.

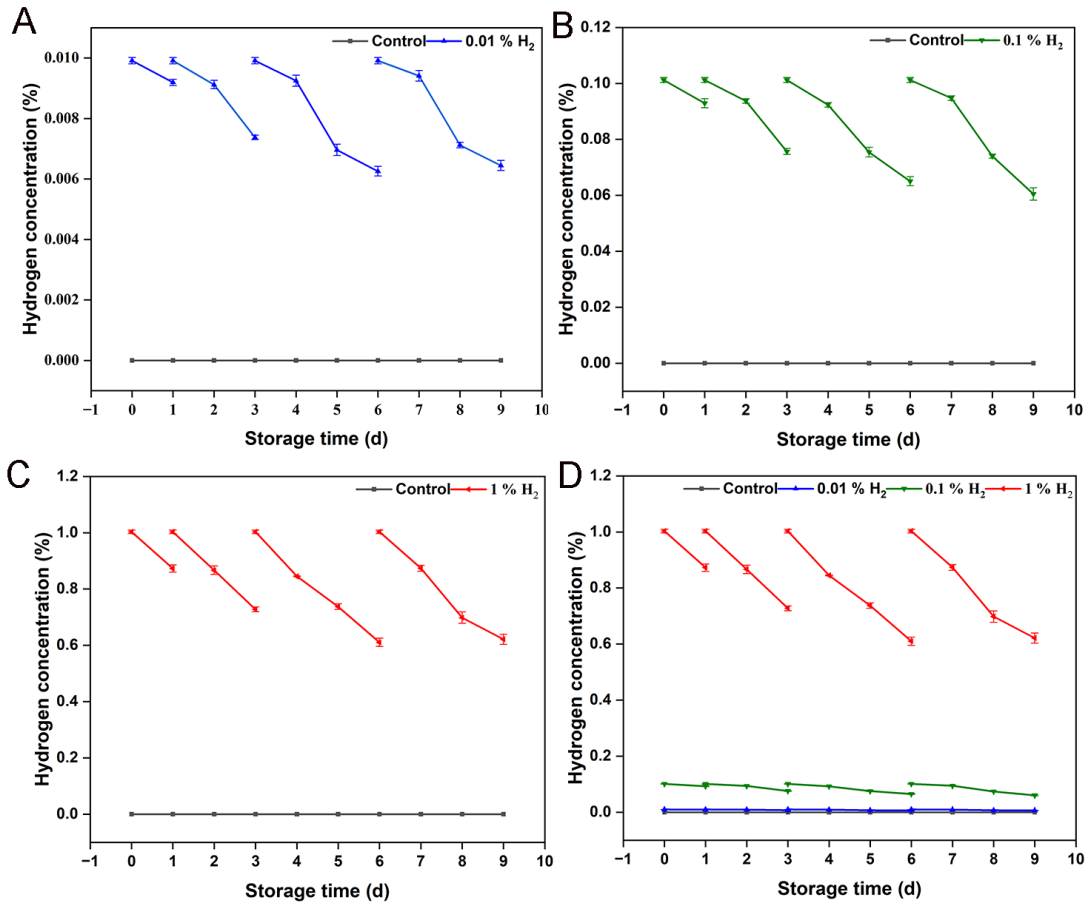


Figure S10. Hydrogen concentration in sealed plastic boxes within nine days under control (with air) vs 0.01 % H_2 MAP (A), control (with air) vs 0.1 % H_2 MAP (B), control (with air) vs 1 % H_2 MAP (C), and control (with air) vs 0.01 % H_2 MAP, or vs 0.1 % H_2 MAP, or vs 1 % H_2 MAP (D). GC is used to detect the daily concentration of H_2 in the sealed plastic boxes during storage. The value is expressed as mean ± SE.