

## Supporting information

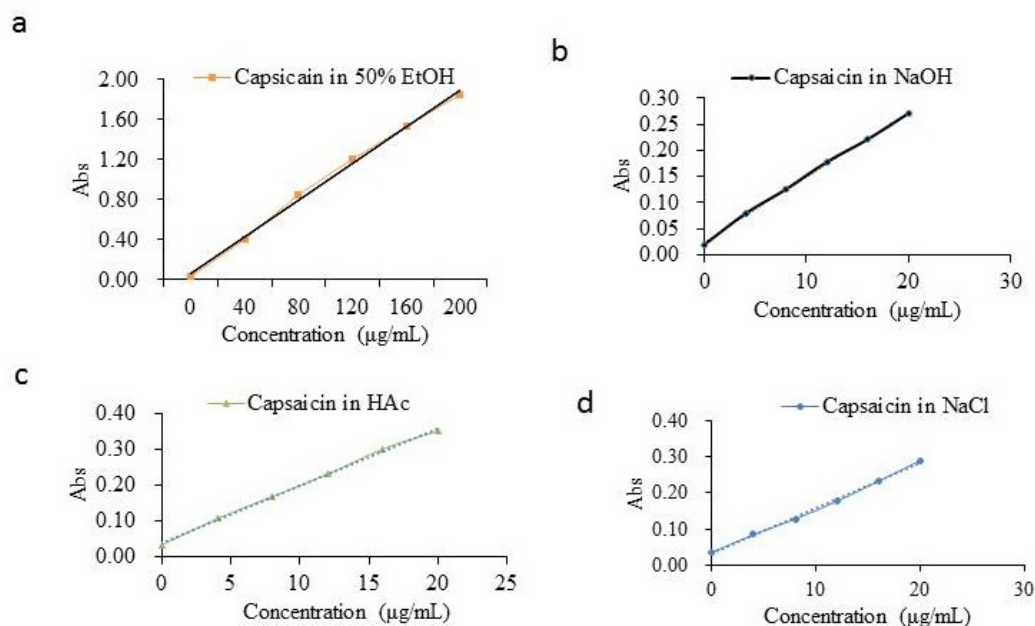


Fig. S1. The release of pure capsaicin in various solutions at different pH values

(a) 50% ethanol solution,  $y = 0.366x - 0.3021$ ,  $R^2 = 0.9963$ ; (b) NaOH solution ( pH 9.94),  $y = 0.0124x + 0.0254$ ,  $R^2 = 0.9983$ ; (c) acetate solution (pH 3.03 )  $y = 0.016x + 0.0379$ ,  $R^2 = 0.9979$ ; (d) NaCl solution ( pH 9.94),  $y = 0.0126x + 0.032$ ,  $R^2 = 0.9973$ .

Table 1S Mortality of *T. castaneum* adults exposed to different concentrations of pure CAP and CCMs

Pesticide	Con(mg/kg flour)	7 days Mortality (%) $\pm$ SD	Slope function(S)	LC <sub>50</sub> $\pm$ SE (mg/kg)	LCL-UCL (mg/kg)	$\chi^2$
CAP	Control	6.67 $\pm$ 0.58a	1.196 $\pm$ 0.335	31.37	22.92-48.54	5.292*
	10	28.57 $\pm$ 1.53b				
	20	37.50 $\pm$ 0.58bc				
	30	53.57 $\pm$ 1.15d				
	40	51.79 $\pm$ 2.00de				
	50	60.71 $\pm$ 1.53e				
CCMs	Control	6.67 $\pm$ 0.58a	1.389 $\pm$ 0.34	29.75	22.59-41.19	6.237*
	10	28.57 $\pm$ 1.15b				
	20	37.50 $\pm$ 1.53bc				
	30	48.21 $\pm$ 1.53bcd				
	40	53.57 $\pm$ 2.08cd				
	50	67.86 $\pm$ 1.00e				

Means followed by different letters are significantly different ( $P < 0.05$ ; one-way ANOVA and Tukey's test). SD, standard deviation; SE, standard error; Con, concentration. LCL, lower confidence limits, UCL, upper confidence limits,  $\chi^2$ , Chi-square test.

Table 2S Mortality of *T. castaneum* adults exposed to 30mg/Kg of pure CAP and CCMs for different time

Pesticide	Exposure time(d)	Mortality (%)± SD	Slope function(S)	KT <sub>50</sub> ±SE (d)	LCL-UCL (d)	χ <sup>2</sup>
CAP	0	0.00	2.404±0.312	5.86	5.10-7.08	13.26*
	1	5.00±1.00a				
	2	10.00±1.73a				
	3	20.34±0.58ab				
	4	35.59±1.53bc				
	5	43.10±2.00c				
	6	49.12±2.52c				
	7	53.57±1.15c				
CCMs	0	0.00	1.442±0.269	8.994	6.70-15.74	7.372*
	1	11.67±0.58a				
	2	11.67±0.58b				
	3	20.34±0.58bc				
	4	23.73±1.00bc				
	5	29.31±1.53cd				
	6	38.60±1.53de				
	7	48.21±1.53e				

Means followed by different letters are significantly different ( $P < 0.05$ ; one-way ANOVA and Tukey's test). SD, standard deviation; SE, standard error; Con, concentration. LCL, lower confidence limits, UCL, upper confidence limits,  $\chi^2$ , Chi-square test.