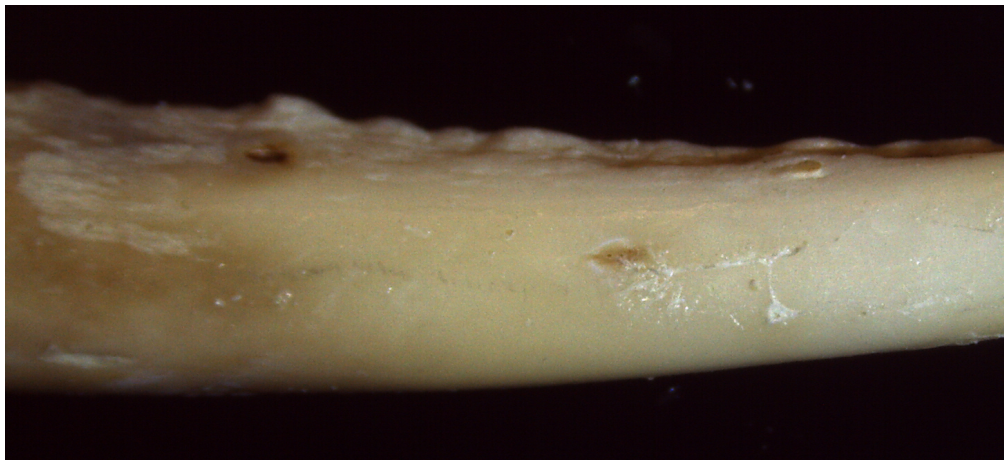
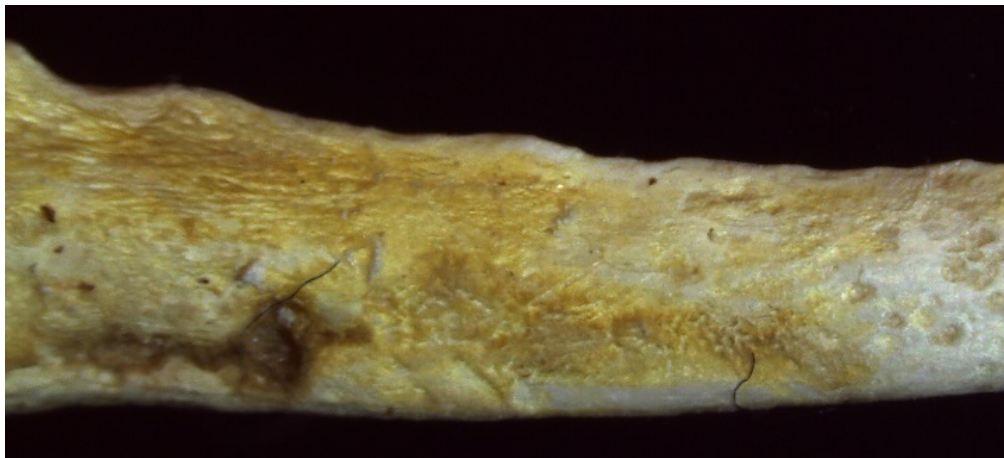


1 - Minimal damage. Denticles distinct and clearly visible. Little to no pitting and erosion. Surface mostly smooth and even.



2 - Moderate damage. Denticles chipped or worn, but visible. Pitting and erosion limited to specific areas of the pollex surface. Surface mostly smooth and even.



3 - Extensive damage. Denticles missing or severely damaged. Extensive pitting and erosion of most of the pollex surface. Surface is rough and uneven.

Fig. S1. Scoring definitions for pollex samples. Each sample was scored by four independent evaluators without knowledge of the pH treatment.

Table S1. Summary statistics for assessments for cuticle microhardness (VHN) of Tanner crab, *Chionoecetes bairdi*.

	8.1		7.8		7.5	
	Mean \pm s.e.m.	<i>N</i>	Mean \pm s.e.m.	<i>N</i>	Mean \pm s.e.m.	<i>N</i>
<i>Carapace</i>						
Dry	29.7 \pm 2.2	10	30.5 \pm 2.5	10	22.0 \pm 2.8	6
Wet	11.1 \pm 0.8	10	9.3 \pm 0.8	10	9.6 \pm 0.6	6
<i>Claw</i>						
Dry	121.5 \pm 8.2	7	104.9 \pm 5.7	10	69.0 \pm 9.2	7
Wet	105.2 \pm 10.6	7	88.8 \pm 10.2	10	71.8 \pm 8.9	7

Table S2. Summary statistics and statistical comparisons for cuticle assessments of Tanner crab, *Chionoecetes bairdi*.

Parameter	8.1		7.8		7.5		ANOVA (F) or Kruskal-Wallis (H)
	Mean ± s.e.m.	N	Mean ± s.e.m.	N	Mean ± s.e.m.	N	
<i>Carapace</i>							
Thickness (μm)	577 ± 22 ^A	10	564 ± 16 ^{AB}	10	488 ± 35 ^B	7	F ₂₆ =3.7, p=0.040
Carapace erosion (%)	0 ± 0 ^A	10	22.2 ± 13.8 ^B	9	57.1 ± 18.7 ^C	7	(see text)
v ₂ peak position (cm ⁻¹)	866.3 ± 1.3 ^A	10	866.8 ± 1.3 ^A	10	872.4 ± 0.1 ^B	5	H ₂ =11.2, p=0.004
<i>Claw</i>							
Thickness (μm)	638 ± 60 ^A	7	516 ± 27 ^{AB}	10	439 ± 50 ^B	7	F ₂₃ =4.6, p=0.022
Pollex damage	1.67 ± 0.12 ^A	10	2.34 ± 0.12 ^B	10	2.75 ± 0.09 ^B	7	H ₂ =16.1, p=0.000
v ₂ peak position (cm ⁻¹)	871.8 ± 0.1 ^A	7	871.7 ± 0.2 ^{AB}	9	872.2 ± 0.1 ^B	7	H ₂ =9.1, p=0.010

Means \pm standard errors (s.e.m.), sample sizes, and ANOVA results are shown. For carapace erosion, the best-fit maximum-likelihood estimates are presented. Groups marked with different letters are significantly different as shown by Tukey HSD post-hoc analysis or model AICc comparison (Carapace erosion; see main text for details). Pollex damage was scored on a scale of 1–3 with 1 indicating minimal damage and 3 indicating extensive damage (see Fig. S1). Units for all other parameters are listed.