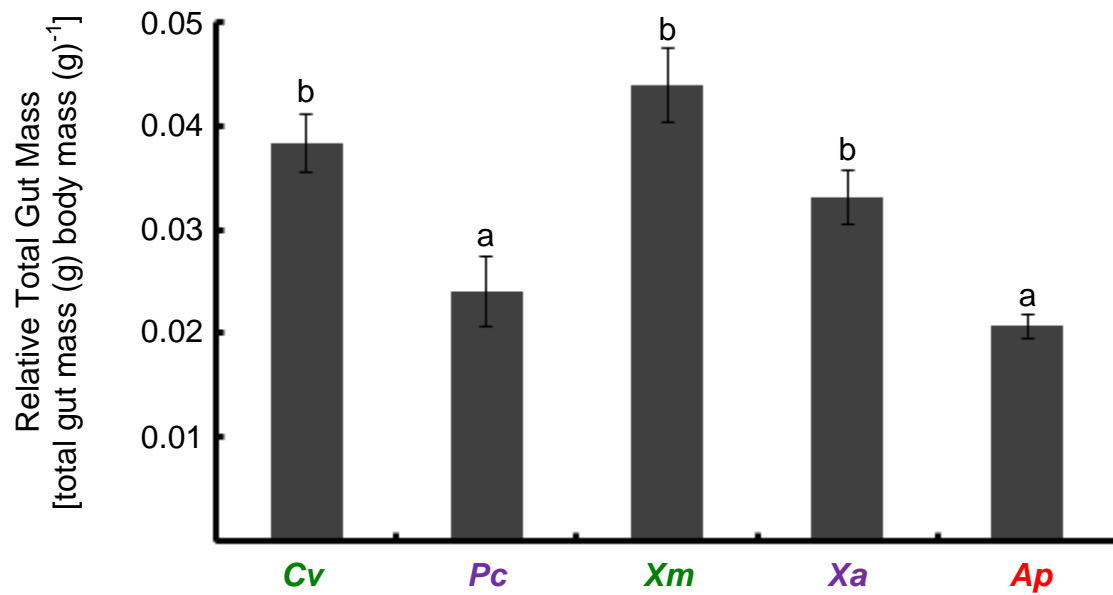


Supplemental Table S1. Digestive enzymes activities in intestinal contents of prickleback fishes.

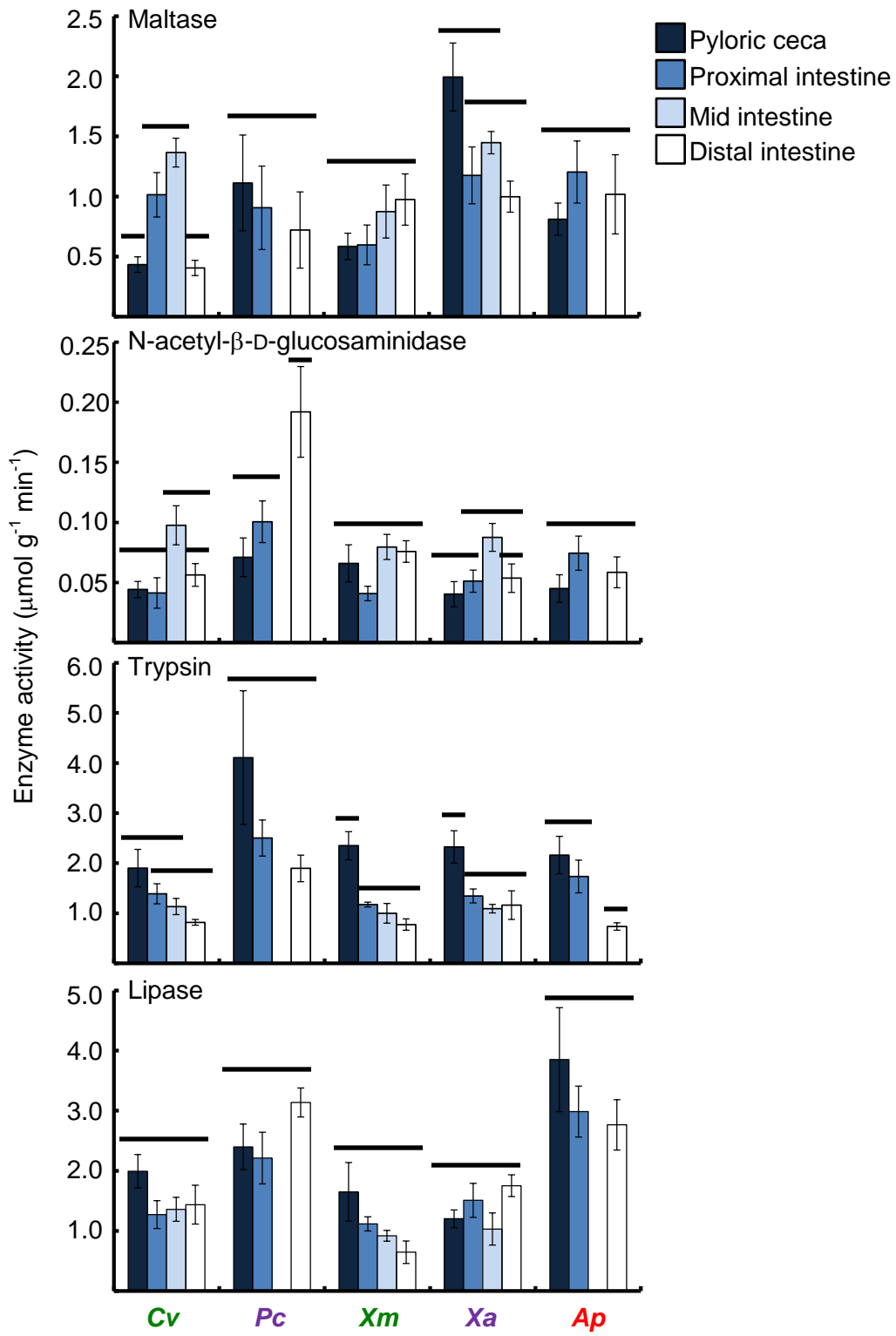
Intestinal Region	Amylase	Maltase	NAG	Trypsin	Aminopeptidase	Lipase
<i>Cebidichthys violaceus</i>						
Proximal	4.81 ± 1.22	0.18 ± 0.08	0.92 ± 0.14	0.78 ± 0.20	0.31 ± 0.10	<b>0.94 ± 0.15<sup>b</sup></b>
Mid	3.68 ± 0.79	0.08 ± 0.02	0.54 ± 0.21	0.66 ± 0.07	0.27 ± 0.08	<b>0.35 ± 0.09<sup>a</sup></b>
Distal	2.27 ± 0.38	0.04 ± 0.01	2.59 ± 1.51	0.51 ± 0.09	0.31 ± 0.04	<b>0.68 ± 0.08<sup>ab</sup></b>
	<i>F</i> <sub>2,17</sub>	2.14	2.82	1.53	1.10	<b>0.22</b>
	<i>P</i>	0.152	0.091	0.249	0.359	<b>0.809</b>
<i>Phytichthys chirus</i>						
Proximal	5.75 ± 1.27	0.30 ± 0.09	44.92 ± 13.41	0.97 ± 0.30	0.28 ± 0.08	1.44 ± 0.26
Distal	3.45 ± 1.07	0.18 ± 0.08	62.82 ± 16.60	0.90 ± 0.23	0.38 ± 0.11	0.99 ± 0.37
	<i>t</i> (df = 16)	1.58	0.96	0.84	0.20	0.73
	<i>P</i>	0.134	0.351	0.414	0.848	0.476
<i>Xiphister mucosus</i>						
Proximal	<b>5.93 ± 0.61<sup>a</sup></b>	<b>0.11 ± 0.03<sup>b</sup></b>	2.37 ± 0.65	0.59 ± 0.06	<b>0.46 ± 0.07<sup>b</sup></b>	0.44 ± 0.13
Mid	<b>16.03 ± 2.82<sup>b</sup></b>	<b>0.02 ± 0.01<sup>a</sup></b>	1.04 ± 0.43	0.57 ± 0.07	<b>0.22 ± 0.03<sup>a</sup></b>	0.52 ± 0.08
Distal	<b>11.91 ± 1.41<sup>ab</sup></b>	<b>0.02 ± 0.01<sup>a</sup></b>	1.04 ± 0.28	0.43 ± 0.07	<b>0.18 ± 0.04<sup>a</sup></b>	0.37 ± 0.09
	<i>F</i> <sub>2,17</sub>	<b>7.53</b>	<b>8.47</b>	2.57	1.64	<b>9.55</b>
	<i>P</i>	<b>0.005</b>	<b>0.003</b>	0.109	0.227	<b>0.002</b>
<i>Xiphister atropurpureus</i>						
Proximal	<b>5.58 ± 0.81<sup>a</sup></b>	0.04 ± 0.02	1.86 ± 0.28	0.54 ± 0.04	0.19 ± 0.03	0.71 ± 0.16
Mid	<b>21.81 ± 6.00<sup>b</sup></b>	0.02 ± 0.01	1.88 ± 0.32	0.47 ± 0.05	0.21 ± 0.07	0.40 ± 0.11
Distal	<b>12.93 ± 1.48<sup>ab</sup></b>	0.03 ± 0.01	3.09 ± 0.86	0.43 ± 0.05	0.14 ± 0.03	0.39 ± 0.08
	<i>F</i> <sub>2,17</sub>	<b>5.08</b>	1.05	1.61	1.85	0.76
	<i>P</i>	<b>0.021</b>	0.380	0.232	0.191	0.483
<i>Anoplarchus purpurescens</i>						
Proximal	1.13 ± 0.51	0.07 ± 0.02	1.05 ± 0.35	0.25 ± 0.11	0.19 ± 0.03	2.23 ± 0.39
Distal	1.00 ± 0.30	0.03 ± 0.01	0.85 ± 0.46	0.21 ± 0.04	0.21 ± 0.04	2.35 ± 0.18
	<i>t</i> (df = 10)	0.39	2.23	0.35	0.34	0.23
	<i>P</i>	0.823	0.061	0.736	0.745	0.823

Note: Activities are μmol product min<sup>-1</sup> g<sup>-1</sup>, except for N-acetyl-β-D-glucosaminidase (NAG), for which the values are nmol product min<sup>-1</sup> g<sup>-1</sup>. Values are mean ± SEM. **Herbivory**, **Omnivory**, or **Carnivory** denoted by colors. Intraspecific comparisons of enzyme activities among intestinal regions were made with ANOVA followed by Tukey's HSD, except for *P. chirus* and *A. purpurescens*, where *t*-tests

were used instead. Significant effects are **bolded**. Enzyme activities for gut regions within a single species that share a superscript letter are not significantly different. n=6 for *C. violaceus*, *X. mucosus*, *X. atropurpureus*, and *A. purpurescens*. n=9 for *P. chirus*.



Supplemental Figure S1. Relative Total Gut Mass of *Cebidichthys violaceus* (Cv), *Phytichthys chirus* (Pc), *Xiphister mucosus* (Xm), *Xiphister atropurpureus* (Xa), and *Anoplarchus purpureus* (Ap). Values are mean  $\pm$  standard error.  $n=6$  for Cv, Xm, Xa, and Ap; and  $n=9$  for Pc. Herbivory, Omnivory, and Carnivory denoted by color. Interspecific comparisons of Relative Total Gut Mass were made with ANCOVA, with body mass as the covariate; bars that share a letter are not significantly different. ANCOVA:  $F_{4,32} = 11.75$ ,  $P < 0.001$ ; Body mass  $F_{1,27} = 0.03$ ,  $P = 0.857$ .



**Supplemental Figure S2.** Maltase, N-acetyl- $\beta$ -D-glucosaminidase, trypsin, and lipase activities in different regions of the digestive tracts of *Cebidichthys violaceus* (**Cv**), *Phytichthys chirus* (**Pc**), *Xiphister mucosus* (**Xm**), *Xiphister atropurpureus* (**Xa**), and *Anoplarchus purpureus* (**Ap**). Values are mean  $\pm$  standard error.  $n=6$  for **Cv**, **Xm**, **Xa**, and **Ap**, and  $n=9$  for **Pc**.

**Herbivory**, **Omnivory**, and **Carnivory** indicated by color. Intraspecific comparisons made with ANOVA, where lines of a different elevation for a given enzyme and species indicate significant differences among the gut regions for that species. Interspecific comparisons were not made. Phylogenetic relationships among species as in Figures 2 and 3. Note that there is no mid intestine section for **Pc** and **Ap**. Statistical results are below.

### **Maltase**

*C. violaceus*:  $F_{3,23} = 15.45$ ,  $P < 0.001$

*P. chirus*:  $F_{2,26} = 0.30$ ,  $P = 0.741$

*X. mucosus*:  $F_{3,23} = 1.17$ ,  $P = 0.348$

*X. atropurpureus*:  $F_{3,19} = 3.91$ ,  $P = 0.029$

*A. purpureus*:  $F_{2,17} = 0.60$ ,  $P = 0.563$

### **N-acetyl- $\beta$ -D-glucosaminidase**

*C. violaceus*:  $F_{3,23} = 4.86$ ,  $P = 0.011$

*P. chirus*:  $F_{2,26} = 6.02$ ,  $P = 0.008$

*X. mucosus*:  $F_{3,23} = 2.61$ ,  $P = 0.079$

*X. atropurpureus*:  $F_{3,23} = 3.57$ ,  $P = 0.032$

*A. purpureus*:  $F_{2,17} = 1.31$ ,  $P = 0.299$

### **Trypsin**

*C. violaceus*:  $F_{3,23} = 4.01$ ,  $P = 0.022$

*P. chirus*:  $F_{2,26} = 1.98$ ,  $P = 0.161$

*X. mucosus*:  $F_{3,23} = 14.94$ ,  $P < 0.001$

*X. atropurpureus*:  $F_{3,23} = 6.18$ ,  $P = 0.004$

*A. purpureus*:  $F_{2,17} = 6.40$ ,  $P = 0.010$

### **Lipase**

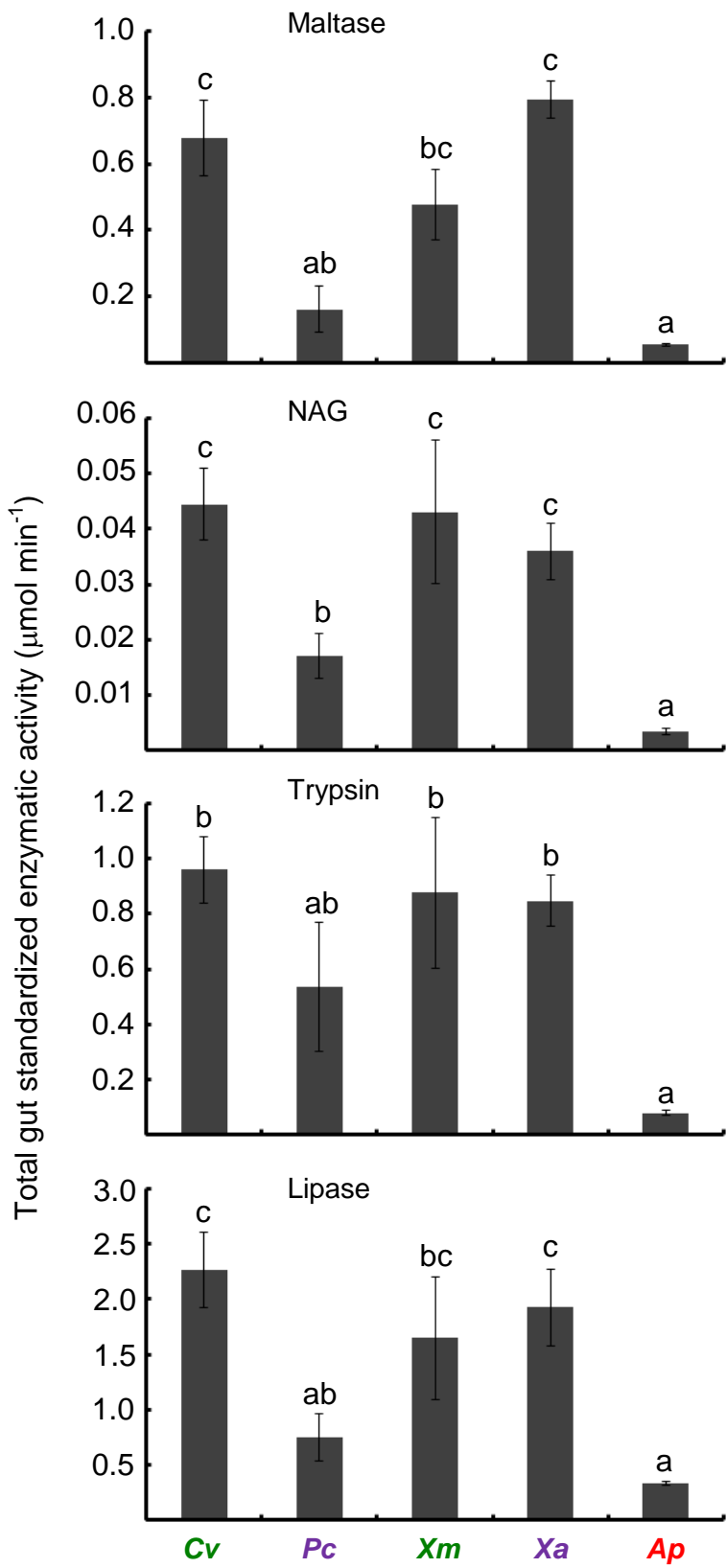
*C. violaceus*:  $F_{3,23} = 1.54$ ,  $P = 0.235$

*P. chirus*:  $F_{2,26} = 1.86$ ,  $P = 0.177$

*X. mucosus*:  $F_{3,23} = 2.46$ ,  $P = 0.092$

*X. atropurpureus*:  $F_{3,23} = 2.00$ ,  $P = 0.147$

*A. purpureus*:  $F_{2,17} = 0.90$ ,  $P = 0.429$



Supplemental Figure S3. Total Standardized Gut Enzymatic Activity of maltase, N-acetyl- $\beta$ -D-glucosaminidase (NAG), trypsin, and lipase in the digestive tracts of *Cebidichthys violaceus* (**Cv**), *Phytichthys chirus* (**Pc**), *Xiphister mucosus* (**Xm**), *Xiphister atropurpureus* (**Xa**), and *Anoplarchus purpureescens* (**Ap**). Values are mean  $\pm$  standard error.  $n=6$  for **Cv**, **Xm**, **Xa**, and **Ap**, and  $n=9$  for **Pc**. **Herbivory**, **Omnivory**, and **Carnivory** denoted by color. Interspecific comparisons of enzyme activity were made with ANCOVA with standard length as the covariate. Bars for a specific enzyme that share a letter are not significantly different. Heterogeneity of slopes tested with the interaction term of species X body length (which was never significant).  
Maltase: Species  $F_{4,32} = 18.02$ ,  $P < 0.001$ ; Body length  $F_{1,27} = 8.28$ ,  $P = 0.008$ .  
NAG: Species  $F_{4,32} = 18.32$ ,  $P < 0.001$ ; Body length  $F_{1,27} = 19.86$ ,  $P < 0.001$ .  
Trypsin: Species  $F_{4,32} = 5.83$ ,  $P = 0.002$ ; Body length  $F_{1,27} = 14.49$ ,  $P = 0.001$ .  
Lipase: Species  $F_{4,32} = 8.93$ ,  $P < 0.001$ ; Body length  $F_{1,27} = 40.38$ ,  $P < 0.001$ .