Table S1. Body composition data used to calculate energy use in three distinct genetic lineages of *Kryptolebias marmoratus* after 21 d of terrestrial acclimation.

lineage	variable	treatment	mean	SD	n
50.91 (Belize)	glycogen (mg g^{-1} dry mass)	control	61.687	21.35	9
		terrestrial	19.445	5.64	6
	lipid (mg g^{-1} dry mass)	control	109.711	25.84	6
		terrestrial	49.481	28.55	11
	protein (mg g^{-1} dry mass)	control	598.168	19.98	10
		terrestrial	602.463	27.05	9
	body water (proportion)	control	0.762	0.009	6
		terrestrial	0.785	0.013	12
	Δ body mass (final intial^{-1})	n/a	0.819	0.09	10
SLC8E (Florida)	glycogen (mg g^{-1} dry mass)	control	74.838	36.45	8
		terrestrial	17.315	11.25	9
	lipid (mg g^{-1} dry mass)	control	129.411	18.36	6
		terrestrial	89.090	26.84	12
	protein (mg g^{-1} dry mass)	control	598.132	18.68	6
		terrestrial	626.655	26.45	7
	body water (proportion)	control	0.751	0.011	6
		terrestrial	0.779	0.010	12
	Δ body mass (final intial^{-1})	n/a	0.765	0.12	10
HON11 (Honduras)	glycogen (mg g^{-1} dry mass)	control	60.320	21.30	9
		terrestrial	14.627	2.10	9
	lipid (mg g^{-1} dry mass)	control	100.960	17.49	6
		terrestrial	46.069	14.04	12
	protein (mg g^{-1} dry mass)	control	605.562	19.01	10
		terrestrial	607.166	21.29	10
	body water (proportion)	control	0.771	0.005	6
		terrestrial	0.792	0.004	12
	Δ body mass (final intial^{-1})	n/a	0.908	0.05	10

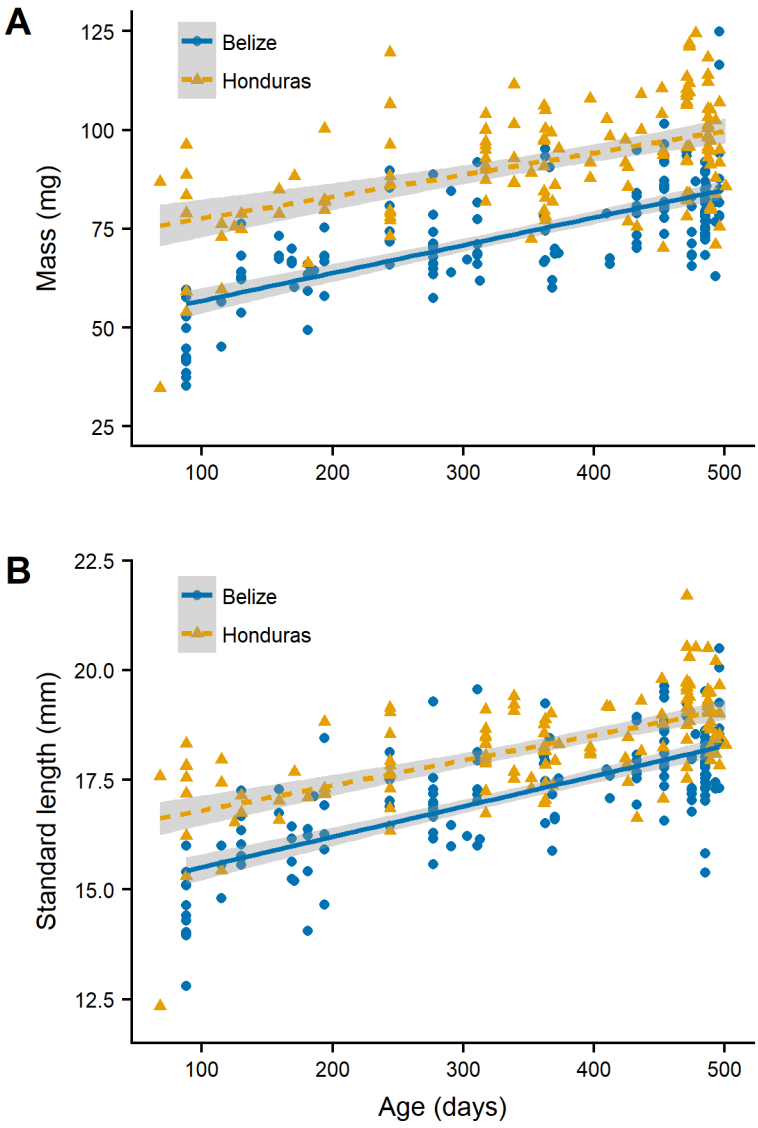

Figure S1. Size at age for two strains of *Kryptolebias marmoratus*. (A) Body mass and (B) standard length. Honduras fish were significantly heavier ($p < 0.0001$) and longer ($p < 0.0001$) than Belize fish at a given age.

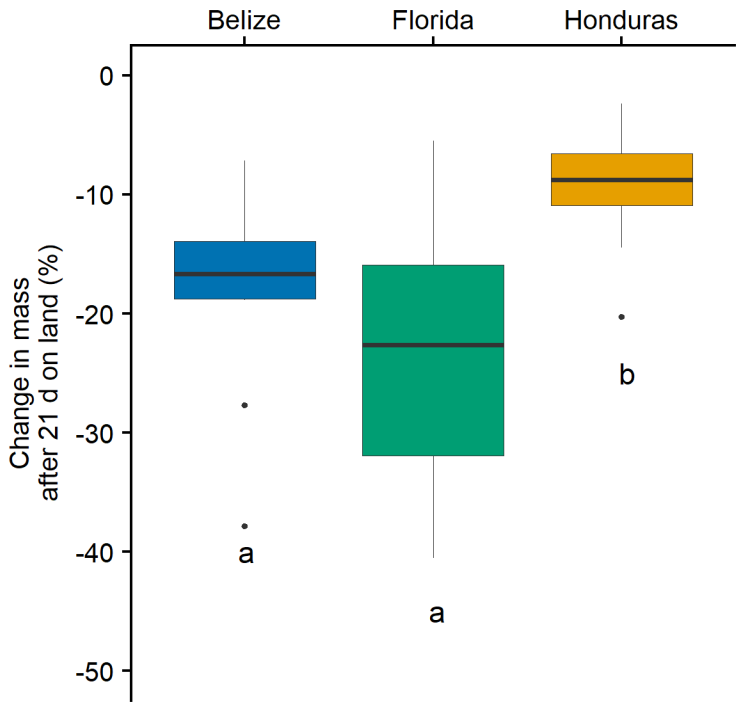

Figure S2. Change in body mass of 3 strains (Belize, Florida, Honduras) of *Kryptolebias marmoratus* after 21 d terrestrial acclimation. The bold horizontal line in the middle of each box represents the median, the top and bottom of the box represent the quartiles (i.e. 25th and 75th percentiles), whiskers show the highest and lowest values within 1.5x the interquartile range, and points show values beyond the range of the whiskers.Different letters represent significant differences ($p < 0.05$) among strains.

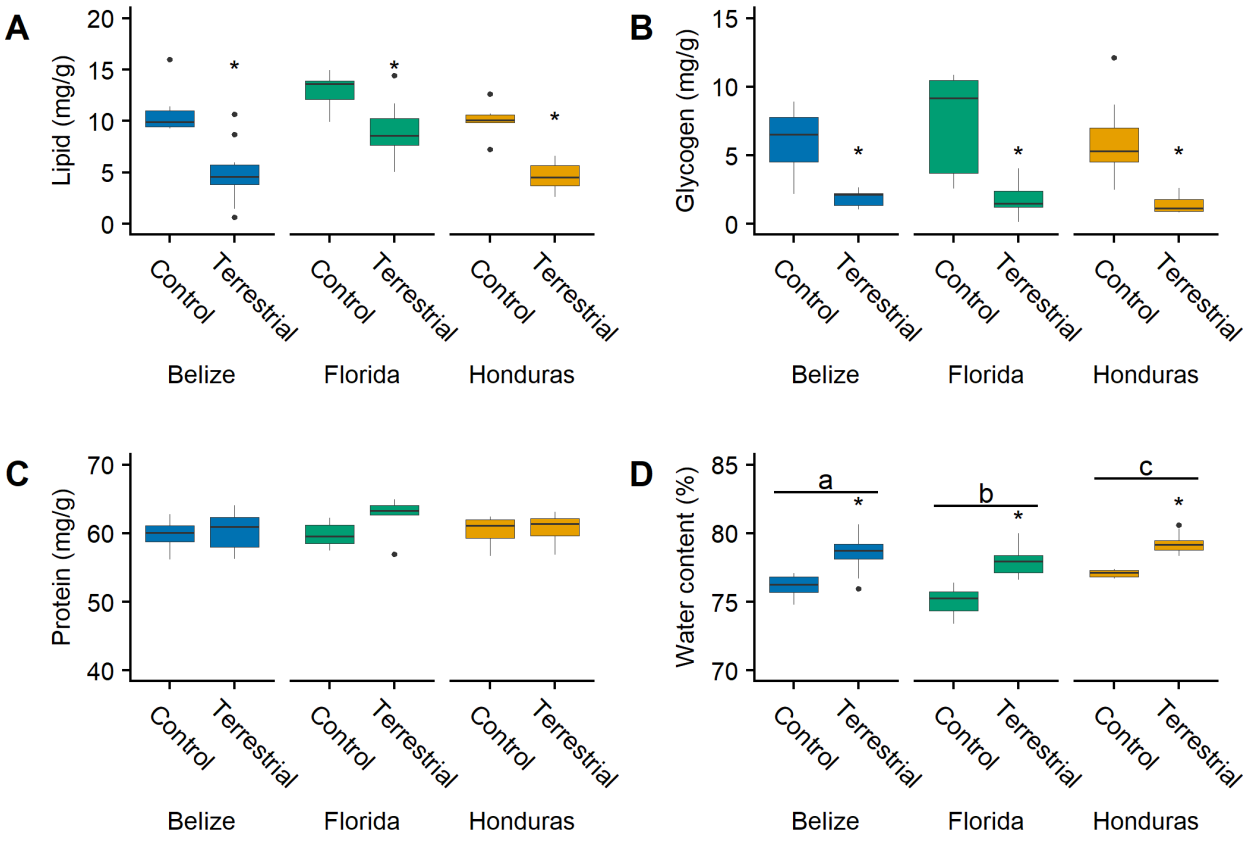

Figure S3. Energy reserves and water content in 3 strains (Belize, Florida, Honduras) of *Kryptolebias marmoratus* under normal housing conditions (control) and after 21 d terrestrial acclimation. (A) lipids, (B) glycogen, (C) crude protein, and (D) water content. All values are relative to wet mass. For each boxplot, the bold horizontal line in the middle of each box represents the median, the top and bottom of the box represent the quartiles (i.e. 25th and 75th percentiles), whiskers show the highest and lowest values within 1.5x the interquartile range, and points show values beyond the range of the whiskers. Asterisks denote significant differences ($p < 0.05$) after terrestrial acclimation, and different letters indicate significant overall differences among strains ($p < 0.05$).

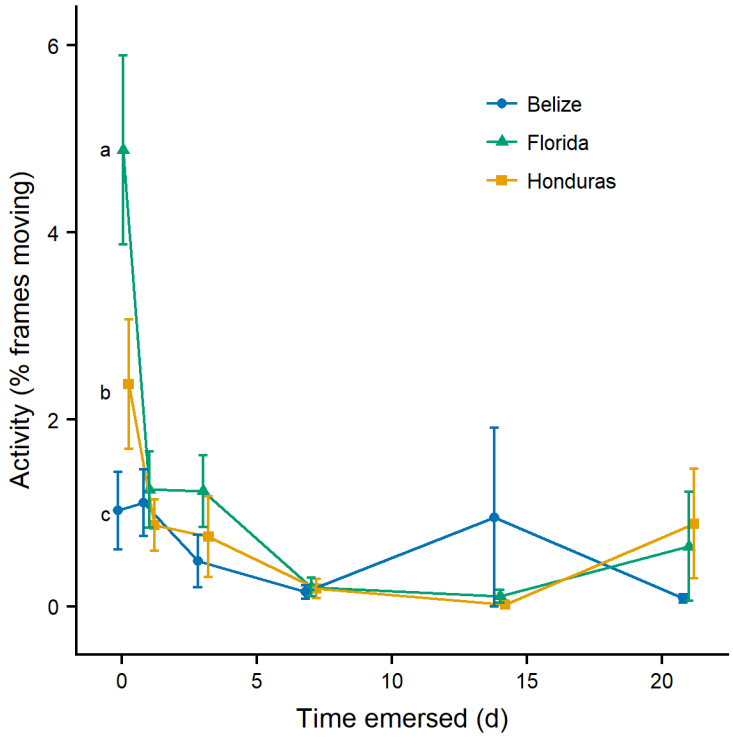

Figure S4. Time spent moving (%) in different strains (Belize, Florida, Honduras) of *Kryptolebias marmoratus* over 21 d of terrestrial acclimation. Different letters indicate significant differences among strains at the 1 h time point ($p < 0.05$). Within the Honduras strain, activity at 1 h is significantly higher than at the 7 d and 14 d timepoints ($p < 0.05$). Within the Florida strain, activity at 1 h is significantly higher than all other timepoints ($p < 0.05$). There were no differences in the Belize strain over time ($p > 0.05$). Data are presented as means ± s.e.m.

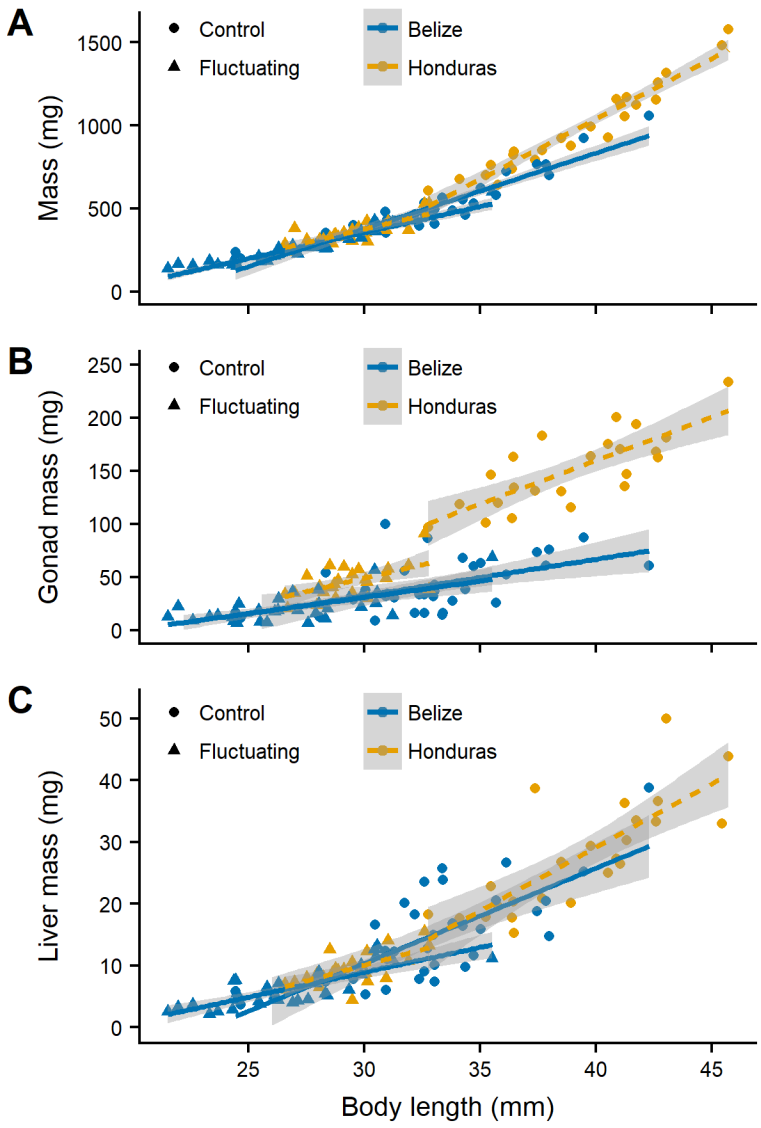

Figure S5. Body and organ mass of Belize and Honduras strains of *Kryptolebias marmoratus* after 12 months in fully aquatic (control) or periodically drained (fluctuating) microcosms. (A) Body mass, (B) gonad mass, and (C) liver mass as a function of body length. Body mass was significantly greater in Honduras than Belize fish ($p < 0.05$), and under control versus fluctuating conditions ($p < 0.05$, interaction $p > 0.05$). Gonad mass was higher in Honduras than Belize fish ($p < 0.05$), and not affected by treatment ($p > 0.05$). Liver mass was not affected by strain or treatment (both $p > 0.05$).

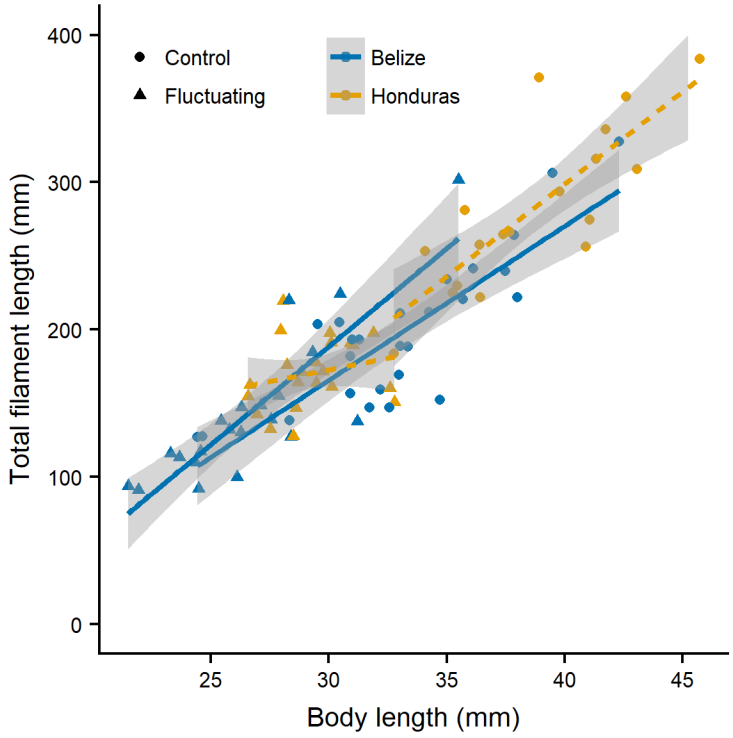

Figure S6. Total length of gill filaments in Belize and Honduras strains of *Kryptolebias marmoratus* after 12 months in fully aquatic (control) or periodically drained (fluctuating) microcosms. There were no significant effects of strain or environment ($p > 0.05$).