

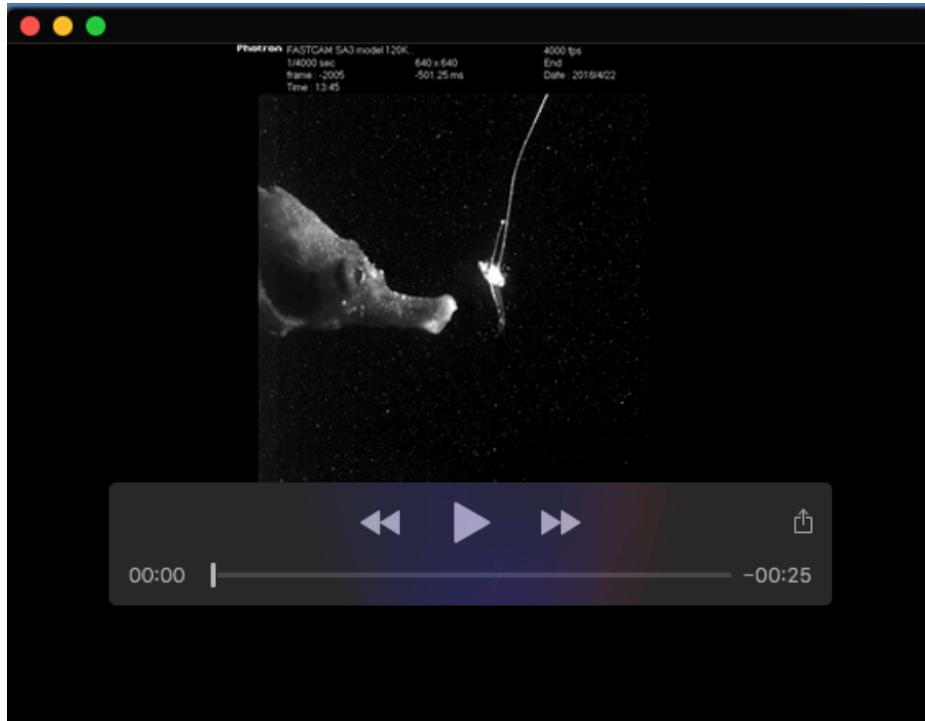
**Fig. S1.** Species averaged timing of kinematic events during suction feeding showing the differing temporal patterns between non-LaMSA actinopterygians (blue symbols) and dual LaMSA system in seahorses (red, turquoise, purple, and green symbols). All timings of events are significantly shorter in seahorses. (A) Time to peak hyoid depression (B) time to peak flow and (C) time to peak head rotation represent the major events during a feeding strike. Data present species means, for 50 individuals belonging to 16 species. Full species names are provided in Table S2. Error bars depict standard errors.

**Table S1.** The coefficients (and their standard errors) from the Mixed-effect model featuring the effect of species, gape size and presence of LaMSA system on flow speed.

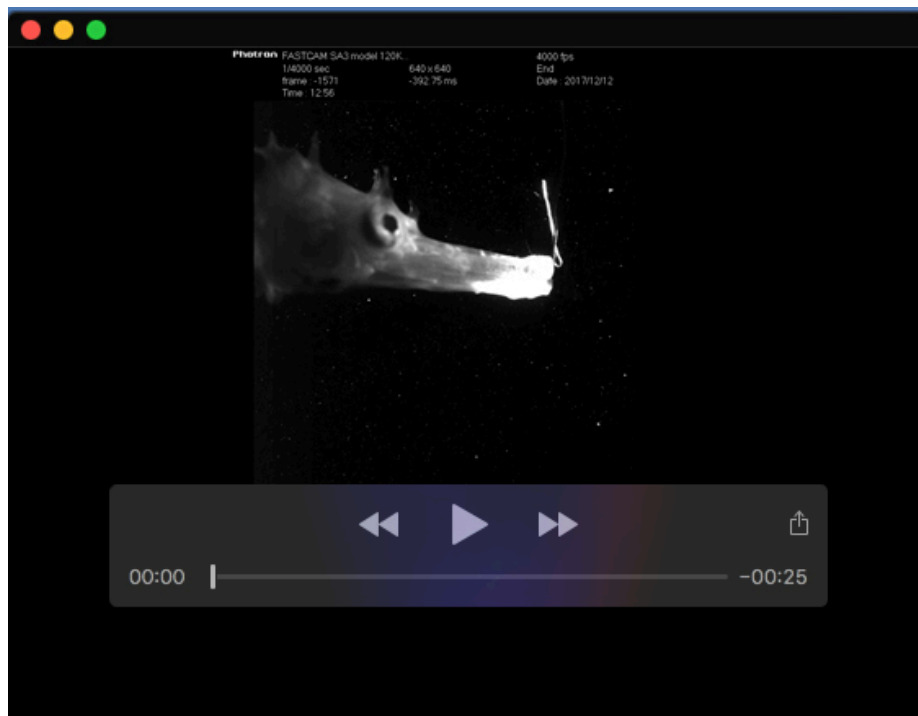
Intercept	LaMSA	Peak Gape	LaMSA: Peak Gape
49.26 ± 57.63	-547.68 ± 64.78	24.91 ± 1.04	89.78 ± 7.65

**Table S2.** The coefficients of both fixed (upper row) and random effects (bottom rows) from the Mixed-effect model featuring the effect of LaMSA, the distance from the mouth, and their interaction (LaMSA: Distance from mouth) on flow decay.

Intercept	LaMSA	Distance from mouth	LaMSA: Distance from mouth
1.39 ± 0.011	-0.043 ± 0.020	-0.739 ± 0.010	0.068 ± 0.017
Species		Intercept	
<i>Astronotus ocellatus</i>		0	
<i>Apteronotus albifrons</i>		0.0093	
<i>Carassius auratus</i>		-0.0128	
<i>Chromis pelloura</i>		0.0141	
<i>Chromis viridis</i>		0.0235	
<i>Danio rerio</i>		0.0152	
<i>Dascyllus marginatus</i>		-0.0153	
<i>Hemigrammus pulcher</i>		-0.0104	
<i>Hippocampus fuscus</i>		-0.0002	
<i>Hippocampus hippocampus</i>		0.0112	
<i>Hippocampus jayakari</i>		-0.0013	
<i>Hippocampus jayakari fry</i>		-0.010	
<i>Lepomis macrochirus</i>		0.010	
<i>Nimbochromis venustus</i>		-0.033	
<i>Pimelodus pictus</i>		-0.008	
<i>Poecilia sphenops</i>		0.0002	
<i>Polypterus endlicheri</i>		0.0136	



**Movie 1.** A suction feeding strike by *H. hippocampus* with the water flow visualized by particle imaging velocimetry.



**Movie 2.** A suction feeding strike by *H. jayakari* with the water flow visualized by particle imaging velocimetry.