

Table S1. Ionic Composition of Culture Water

Parameter	mg L ⁻¹
Alkalinity, Total (as CaCO ₃)	12
Calcium	5
Chloride	3
Magnesium	0.2
Potassium	0.2
Sodium	2
Sulfate	1

Table S2. Graduated severity index scores (Holm et al. 2005; Rudolph et al. 2008).

Score	Skeletal	Craniofacial	Finfold	Edema
0	normal backbone	normal eyes, jaw, and head	all fins present and of normal size and shape	no fluid accumulation in head or pericardial cavity
1	slight scoliosis, lordosis, or kyphosis; unlikely to significantly impair fish movement	slightly reduced or malformed eye or jaw; unlikely to significantly reduce feeding ability or sight	one or two fins slightly reduced in size or slightly malformed; unlikely to significantly impair fish movement	slight fluid accumulation in eyes or pericardial cavity; unlikely to significantly impair fish sight, movement, or feeding
2	moderate scoliosis, lordosis, or kyphosis; likely to impair fish movement	moderately reduced or malformed jaw or eyes; likely to reduce feeding ability and sight	more than 2 fins slightly reduced or malformed, or 1 or 2 moderately deformed fins; likely to impair fish movement	moderate fluid accumulation in eyes or pericardial cavity; likely to impair fish sight, movement, or feeding
3	severe scoliosis, lordosis, or kyphosis; movement likely to cease or be greatly impaired	missing or severely malformed eyes or jaws; sight and feeding severely impaired	one or more missing fins or more than 2 deformed fins; severely reduced swimming capacity	severe fluid accumulation in eyes or pericardial cavity; greatly reduced fish sight, movement, or feeding

Table S3. Summary of Experimental Water Quality

Parameter	Range
Temperature (°C)	6.5-8.0
pH	6.5-7.3
Conductivity (µS cm ⁻¹)	34-42
Dissolved Oxygen (mg L ⁻¹)	11.6-12.8
Total Ammonia (mean, mg L ⁻¹)	0.02