

ABSTRACT

Rainbow trout (*Oncorhynchus mykiss*) is among the most widely translocated fish species in the world. The current study evaluated the spawning interactions between naturalized and wild rainbow trout from two high-altitude second-order streams, in Kenya. Data on total length, weight, condition factor, fecundity, fertilization, egg diameter and fry survival were collected on spawning rainbow trout between March and December 2021. Length–weight relationship showed parabolic equations as $W = 0.0144L^{2.900}$, $W = 0.0069L^{3.0285}$ and $W = 0.00027L^{3.175}$ for wild fish stock, hatchery-reared and wild \times hatchery-reared rainbow trout, respectively. Total fecundity differed significantly among the hatchery-reared, wild fish and the cross of the two ($p < 0.05$). The fertilization rate showed significant differences ($p < 0.05$), with no discernable difference observed between the hatchery-reared and crossed (wild \times hatchery-reared). There was a positive correlation among the total fecundity to female egg weight, female body weight, fertilization rate and eyed egg survival in all the populations. Relative fecundity was significantly different among the three groups of fish ($p < 0.05$), but the differences between the hatchery and the crossed (wild \times hatchery-reared) fish showed no significant differences. We recommend the use of crossed (wild \times hatchery-reared) populations for fry production for use in aqua-culture as they presented the highest fecundity and gave the best outcome of fry with high survival.