Genetic compatibility exceeds possible ‘good genes’ effects of sexual selection in lake char

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Abstract

Mating is rarely random in nature, but the effects of mate choice on offspring performance are still poorly understood. We sampled 47 wild lake char (Salvelinus umbla) during two breeding seasons and used their gametes to investigate the genetic consequences of different mating scenarios. In a first study, 1,464 embryos that resulted from sperm competition trials were raised singly in either a stress- or non-stress environment. Offspring growth turned out to be strongly reduced with increased genetic relatedness between the parents while male coloration (which reveals aspects of male health) was no significant predictor of offspring performance. In a second experiment one year later, block-wise full-factorial in vitro breeding was used to produce 3,094 embryos that were raised singly with sublethal exposures to a pathogen or water only. Offspring growth was again strongly reduced with increased genetic relatedness between the parents while male coloration was no significant predictor of offspring performance. We conclude that the genetic benefits of mate choice would be strongest if females avoided genetic similarity, while male breeding colors seem more relevant in intra-sexual selection.

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