Heritable variation for vegetative growth rate in ten distinct genotypes of hybrid watermilfoil

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Previous studies of hybrid watermilfoil (*Myriophyllum spicatum* x *sibiricum*) demonstrate that they can exhibit unique traits such as fast vegetative growth and reduced response to herbicide. However, molecular genetic studies also demonstrate that hybrid watermilfoils are genetically diverse, and we have few data about how different hybrid watermilfoil genotypes grow and respond to commonly used herbicides, such as 2,4-D. Here, we asked whether vegetative growth rate, including in the presence of 2,4-D, is a heritable trait that differs between hybrid genotypes. We compared the vegetative growth rate of 10 different hybrid genotypes collected from across the northern tier of the United States and covering a range of the overall genetic diversity exhibited by hybrid watermilfoils. Our results demonstrate that variation in vegetative growth rate, including when exposed to 2,4-D, is due in part to genetic differences (i.e., is heritable). Although vegetative growth differed between genotypes, we observed a clear trend for higher vegetative growth rates in hybrid watermilfoil genotypes compared to two Eurasian watermilfoil (*Myriophyllum spicatum* L.) reference genotypes. Two hybrid genotypes exhibited unusually fast vegetative growth rates relative to the other hybrid and Eurasian watermilfoil genotypes. A comparison of microsatellite markers to Eurasian, northern (*Myriophyllum sibiricum* Komarov), and hybrid watermilfoils collected across North America demonstrated that the two fast-growing genotypes are not closely related, but have arisen from independent hybridization events involving two different biotypes of Eurasian watermilfoil. Based on these data, we suggest that relatively faster vegetative growth may be a common, but not universal, phenomenon in hybrid watermilfoils.