Preventing the spread of aquatic invasive species: what is the efficacy of decontamination practices for recreational watercraft?

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The spread of aquatic invasive plant and animal species are a threat to freshwater ecosystems. Recreational boating activities are known to facilitate the overland dispersal of aquatic invasive species (AIS) among disconnected lakes. Invertebrate and plant AIS can become attached to or caught on watercraft and equipment used in invaded waterbodies, and they can survive transport aboard fouled watercraft. To inhibit this mode of secondary spread to new environments, the Ontario Ministry of Natural Resources and Forestry recommends that recreational anglers and boaters decontaminate boats, trailers, and fishing or watersports gear by washing with water at a pressure of 250 psi, rinsing with hot water at >50°C, or allowing all parts to air-dry for two to seven days, before use at another site. However, there is limited scientific support for these methods due to the lack of studies assessing their efficacy. We performed a systematic literature review on decontamination methods and determined that there was no clear consensus on best practices due to the variation in methods and species studied. We also conducted field and laboratory experiments on several invertebrate and plant AIS present in Ontario to evaluate the performance of hot water, air-drying, the combination of both, and pressure washing. Overall, high water pressures of 900-1200 psi removed the most biological material from surfaces, whereas small invertebrates had high mortality after exposure to water at approximately 50°C or air-drying for approximately 60 hours. Our findings can help inform future management practices in the province via effective and easily-implemented decontamination measures.