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Plants, plastic and rivers: Do water hyacinths play a role in riverine macroplastic transport?

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Excess of plastic debris in the environment is a worldwide problem. The origin of the plastic sources is partly land-based, the function of rivers as transportation pathways for plastics is an emerging research field. However, the transportation dynamics of macroplastic in river systems are still poorly understood(Blettler *et al.*, 2018; Schmidt *et al.*, 2017). By studying the interaction of riverine plastic transport and water plants, the transport dynamics can be better understood, which might help with the mitigation of the environmental plastic debris problem.

A field study based in the Saigon river, Vietnam, found a correlation between macroplastic(>5 cm) abundance and organic material, where no other correlations were found(van Emmerik *et al.*, 2019). We hypothesize that water hyacinths have an important role in the spatiotemporal dynamics of riverine macroplastic transport. The organic material in this river was predominantly identified as water hyacinths, an invasive plant common in Southeast Asia. In this study, we developed a method using image analysis, to detect macro plastics and floating vegetation(lab-grown water hyacinths). Image analysis in combination with drone technology creates opportunities to collect field data, with already promising results(Geraeds *et al.*, 2019). We analyzed the images, to obtain an approximation of the amount of plastic and vegetation, visible from the surface. We subsequently use this data to evaluate the relationship between plastic abundance and vegetation in rivers. The method developed in this study can be used to collect data in the field. Targeted observations of plastic entrapment in water hyacinths may shed additional light on the potential of using water hyacinths as a proxy for riverine macroplastic transport dynamics.

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