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Removal and fate of silver nanoparticles in lab-scale vertical flow constructed wetland

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1	Removal and fate of silver nanoparticles in lab-scale vertical flow
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11	Abstract:
12	Engineered nanomaterials (ENMs) are increasingly produced and consequently released into the
13	environment. Therefore, there is a strong need to find a valid way to treat the ENMs pollution. In
14	this study, the removal efficiencies of silver nanoparticles (AgNPs) from synthetic wastewater in
15	lab-scale vertical flow constructed wetland (CW) systems with different operations (plant,
16	hydraulic loading rates, bed depth) were investigated. Moreover, the environmental fate and
17	impacts of AgNPs in CWs were also investigated. The results showed that CWs with plants were
18	more effective in removing AgNPs than the unplanted CWs. Hydraulic loading had a significant
19	effect on the performance of CWs in treating AgNPs, however, the influence of bed depth was
20	negligible. AgNPs stopped in the CWs were mainly resided in the wetland substrate, indicating the
21	main mechanism of AgNPs removal in CWs was through substrate adsorption. Although plant
22	biomass, root activity, peroxidase activity of leaves and biofilm biomass were significantly altered

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