

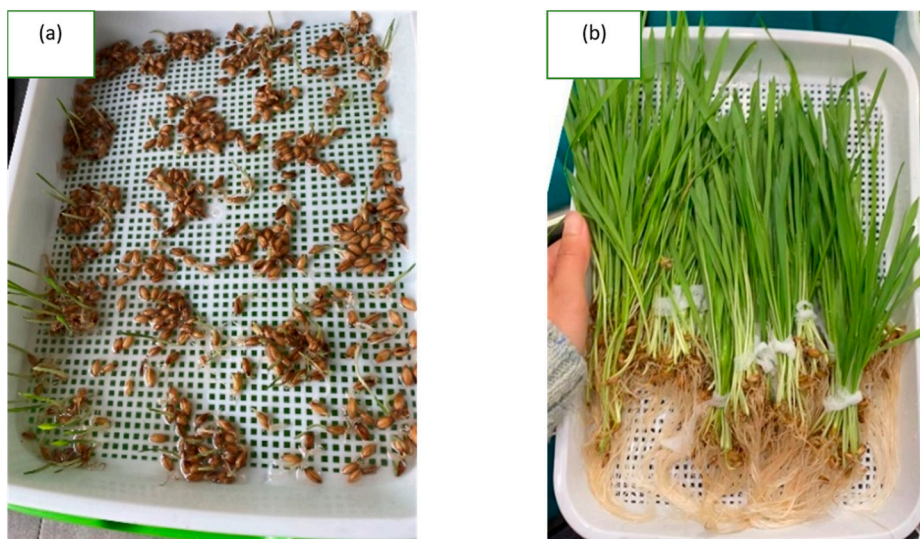
# **A study of Microfiber Phytoremediation in Vertical Hydroponics**

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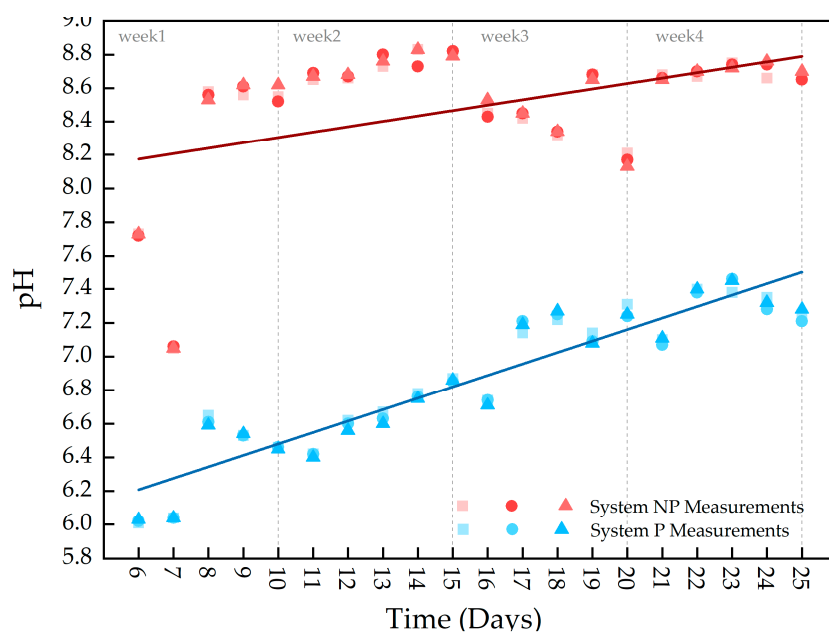
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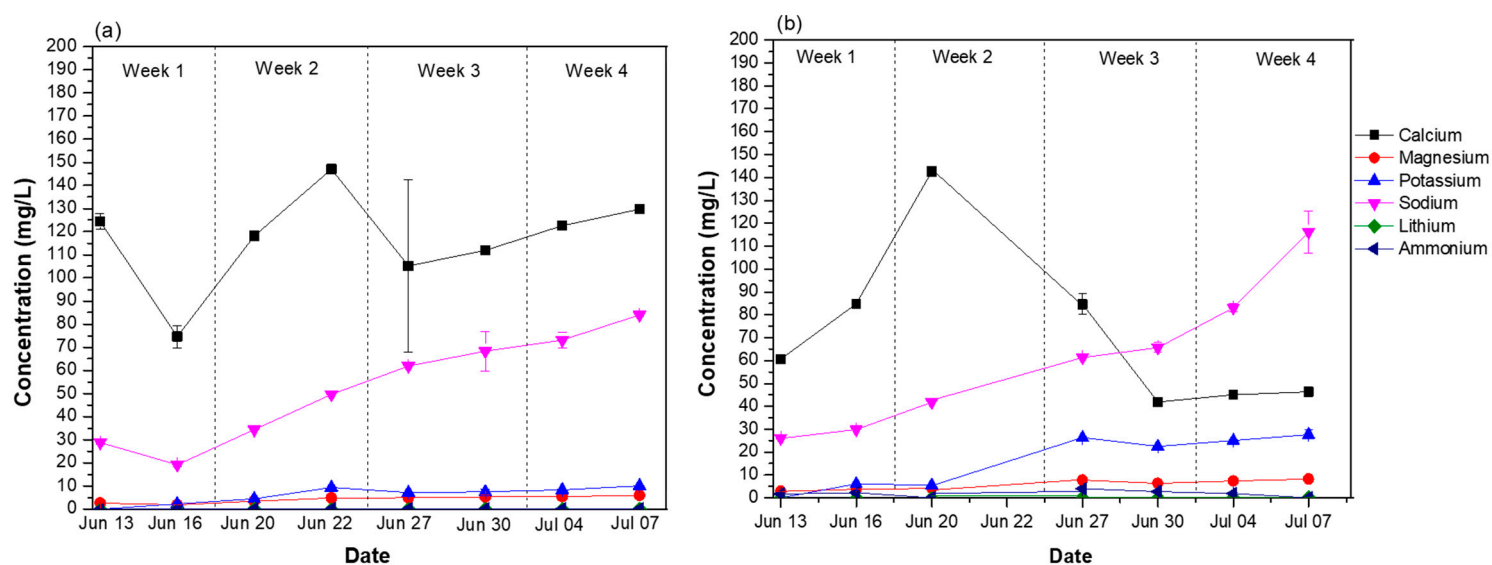
**Figure S1.** Preliminary stage of barley cultivation for phytoremediation experiments: (a) germination stage and (b) grown barley to be used in the study.



**Figure S2.** Apparatus of vertical hydroponics system. System NP: no plants (control), and System P: with plants (barley).






**Figure S3.** Variation in pH ( $n = 3$ ) in the water reservoir of Systems NP and P. Trendlines are added.




**Figure S4.** Variation in cation concentrations ( $n = 2$ ) in the water reservoir of (a) System NP and (b) System P.

**Table S1.** Barley root growth during 4 weeks of vertical hydroponics.

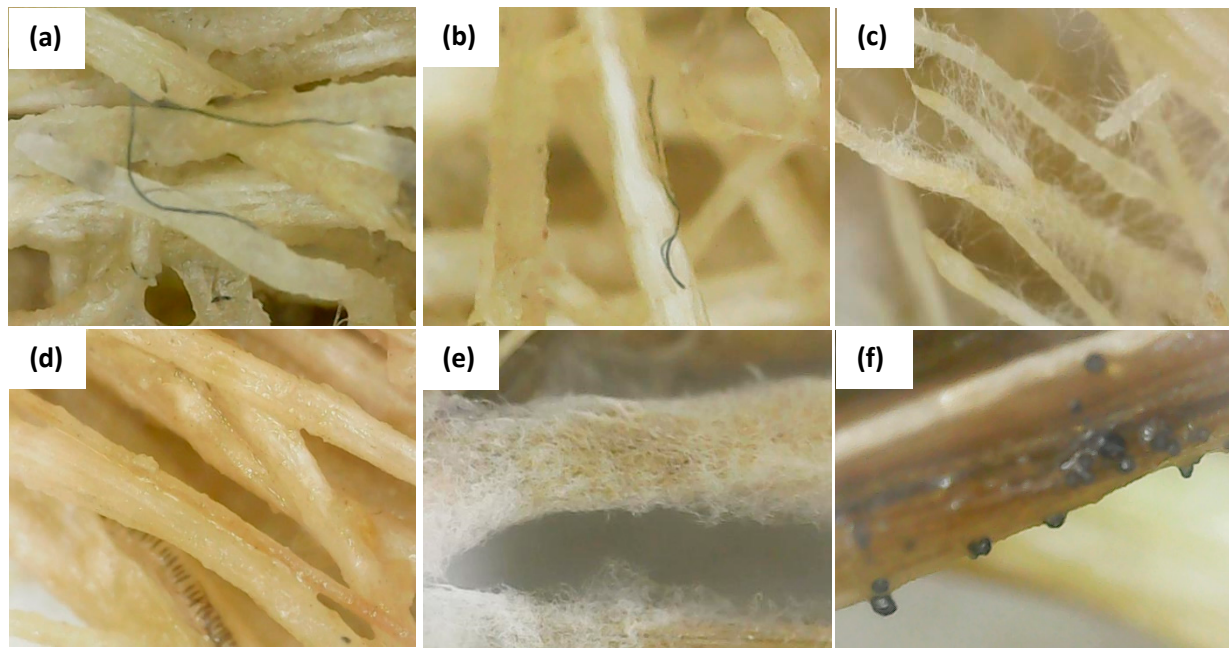
	Roots	Top row	Middle row	Bottom row
Week 1	<p>All roots are firm, white, and numerous, with good root development of lateral roots.</p> <p>The length of the top roots is around 17 cm. The middle roots are slightly shorter (15 cm), and the bottom roots are near 15 cm but less intensive.</p>	 <p>around 17 cm</p>	 <p>around 15 cm</p>	 <p>around 15 cm</p>

<p>Week 2</p>	<p>All roots become slightly dry, and the color is not as white as last week.</p> <p>Top roots grow in good condition, with some lateral roots found at the bottom. The root length remains unchanged.</p> <p>The middle roots grow well with a few lateral roots.</p> <p>The bottom roots are slightly compressed in size, especially in the extremities of their roots.</p>	 <p>around 17 cm</p>	 <p>around 15 cm</p>	 <p>around 14.5 cm</p>
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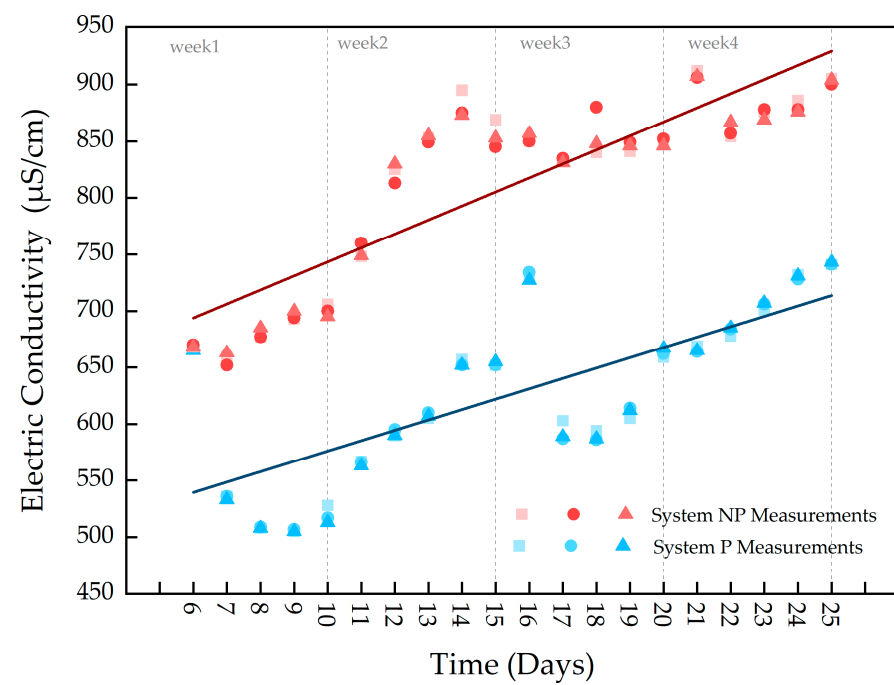
<p>Week 3</p>	<p>All roots are infected with floccule, and root lengths show different degrees of reduction.</p> <p>Top roots start to turn brown. However, the newly grown, neat, lateral roots can be easily distinguished at the end.</p> <p>Middle roots become brown and sparse, with a few new lateral roots.</p> <p>Bottom roots are sparse and brown. There are black spots apparent on the top pattern of the roots.</p>	 <p>around 16 cm</p>	 <p>around 14 cm</p>	 <p>less than 14 cm</p>
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<p>Week 4</p>	<p>The length of roots in all rows shows significant decreases. More floccules adhere to the roots.</p> <p>Top roots are crumbly and dry, with some spots on the top pattern. The new lateral roots become shriveled.</p> <p>Middle roots are also fragile and crumbly.</p> <p>Bottom roots become mushy and black, accompanied by odd odor. The roots have mildew or mold, leading to root rot.</p>	 <p>around 15 cm</p>	 <p>around 13 cm</p>	 <p>around 11cm</p>
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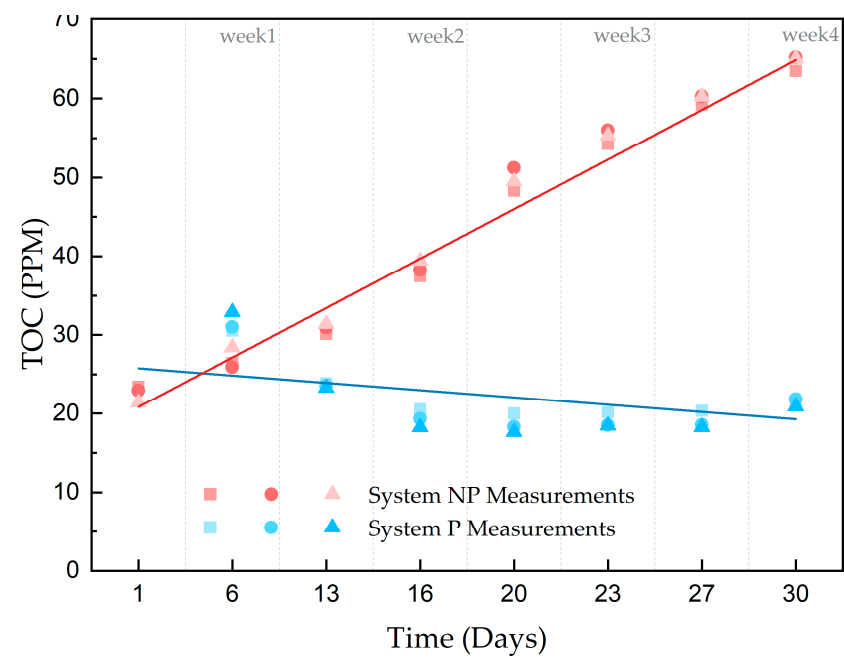


**Figure S5.** (a) MFs captured on roots from the top row; (b) MF are trapped in the healthy and neat roots instead of dying, brown roots; (c) intensive root network; (d) existence of worms; (e) existence of fungi; (f) black spots on roots.

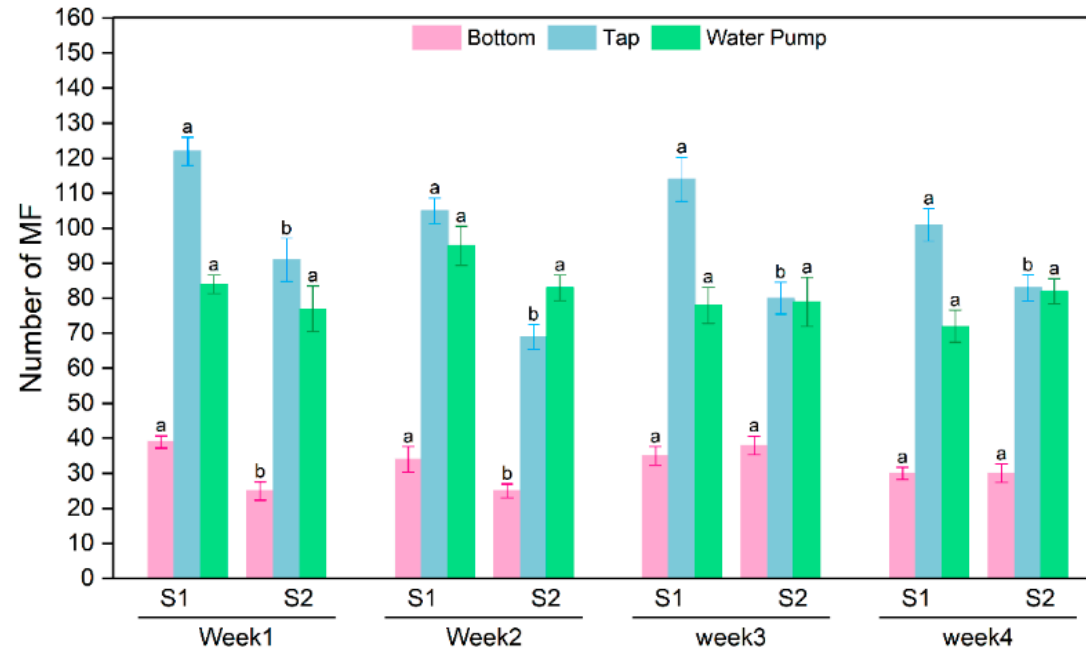




**Figure S6.** Variation in EC ( $n = 3$ ) in the water reservoirs of Systems NP and P. Trendlines are added.



**Figure S7.** Variation in TOC (n=3) in the water reservoirs of Systems NP and P. Trendlines are added.



**Figure S8.** Results of ANOVA analysis ( $n = 3$ ) of MF abundance in the bottom, tap, and pump of the water reservoir, where “a” means significantly different, while “b” means insignificantly different. S1 means System 1 (system without plants: NP) and S2 means System 2 (system with plants: P).