# The slowing down of water movement in capillary tubes under microgravity.

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The international deep space gateway is going to be built on the moon orbit from early 2020s. As manned space missions may get farther and longer, the importance of food production in space increases. For food production by growing crops in space, water by the crops plays an important role; however, few workers have conducted research on water movement in porous media under microgravity. It was reported that a water infiltration rate in porous media was slower under microgravity than under 1G. The objective of this study is to reveal what makes water move slower in porous media under microgravity. Capillary rises in capillary tubes, which were simpler pores, were observed under microgravity induced by a free-fall tower. The measured rates of capillary rise were slower than theoretical values calculated by Lucas-Washburn equation for 1G condition. The slower rates could be explained if either surface tension, contact angle, or viscosity are the function of gravity. Previous research reported that larger viscosity was observed under microgravity than under 1G although surface tension and contact angle were not changed by gravity. Slower water flows in capillary tubes under microgravity may be explained by changes in viscosity as a function of gravity.

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