

Abstract Submitted
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Spread of pathogens through rain drop impact¹ SEUNGHO KIM, HOPE GRUSZEWSKI, Virginia Tech, TODD GIDLEY, Kings Fork High School, DAVID G. SCHMALE III, SUNGHWAN JUNG, Virginia Tech — Rain drop impact can disperse micron-sized pathogenic particles over long distances. In this study, we aim to elucidate mechanisms for disease dispersal when a rain drop impacts a particle-laden solid surface. Three different dispersal types were observed depending on whether the dispersed glass particles were dry or wet. For a dry particle dispersal, the movement of contact line made the particles initially jump off the surface with relatively high velocity. Then, air vortex was formed due to the air current entrained along with the falling drop, and advected the particles with relatively low velocity. For a wet particle dispersal, the contact line of a spreading liquid became unstable due to the presence of the particles on the substrate. This caused splashing at the contact line and ejected liquid droplets carrying the particles. Finally, we released a drop onto wheat plants infected with the rust fungus, *Puccinia triticina*, and found that nearly all of the satellite droplets from a single drop contained at least one rust spore. Also, we visualized such novel dispersal dynamics with a high-speed camera and characterized their features by scaling models.

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