

Abstract Submitted
for the DFD17 Meeting of
The American Physical Society

The flight of *Ruellia ciliatiflora* seeds ERIC COOPER, MOLLY MOSHER, DWIGHT WHITAKER, Pomona College — Fruits of *Ruellia ciliatiflora* explosively launch seeds at velocities over 10 m/s, reaching distances of over 7 m. Through high speed video analysis of the seeds flight, we have observed high rates of backspin of up to 1660 Hz, one of the fastest known rotational rates in the natural world. Analytical calculations that model the torques on the seeds as those of a Rayleigh Disk and incorporate the effects of gravity of the seeds angles of attack, show that the seeds backspin orientation is stable under gyroscopic precession. This stable backspin orientation maintains a small area in direction of motion, decreasing drag force on the seeds and thus increasing dispersal distance. From careful analysis of high-speed video of the seeds flight we experimentally determine the seeds drag coefficients and find that they are consistent with drag predicted for the streamlined orientation. By using backspin to ensure a streamlined orientation, the seeds are able to reduce the energy costs for seed dispersal by up to a factor of ten.

Eric Cooper
Pomona College

Date submitted: 01 Aug 2017

Electronic form version 1.4