## Fruit flies in central Virginia: Capstone research projects at a community college & partnership with a university genomics lab

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Biology capstone research students at Piedmont Virginia Community College have partnered with a University of Virginia lab studying the evolutionary biology of fruit flies living in orchards. PVCC students pursuing an A.S in Science are required to complete a semester-long independent mentored research project prior to graduation. These independent projects require students to develop a hypothesis, plan a research study, collect and analyze data, and present their findings within an academic semester. PVCC students interested in biological sciences have the option to design a study in which the primary focus is collecting fruit flies at a local apple orchard. Students have control over the framing of the study: unique questions are posed, and students develop methodologies for collection allowing them to address their research question. Once PVCC students have collected fruit flies and analyzed the flies for the purpose of their capstone project, the flies are preserved and shared with the university researchers. Fly samples are incorporated into a larger collection effort around the state aimed at identifying evidence of rapid adaptation across seasons and between habitat types. Genome sequencing will be performed, and the data will be incorporated into a large database of fly genomes from samples collected around the globe for over ten years as part of a worldwide consortium. This partnership has allowed for an extension of field biology opportunities at the community college, increased the breadth of the university lab's collection efforts, while also enhancing opportunities for the community college students to establish connections at the university. Given the simple mechanics of collection in these studies, this type of student project could easily be adapted to other institutions that have nearby orchards or other locations where Drosophilidae are prevalent. Methodologies for collection and examples of capstone projects will be presented.

Keywords: undergraduate research, fruit flies, capstone, independent research, genetics

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