Project Update: November 2023

AIM

The essence of this experiment was to understand the effects of savanna tree shade (*Vauchelia tortilis*) on development and availability of the pasture larvae in Serengeti ecosystem. This experiment design aimed to establish mechanisms and evidence of how tree shade from canopies under different grass height scenarios might create micro-climate conditions that lead to difference in densities of pasture larvae between areas under tree canopy and outside tree canopy.

1.   Monitoring activities

S/N	Activity	Place	Date/Time
01	Supervisor field visit and on ground design of the experiment	Serengeti National Park	22 – 27 September 2023
02	Experiment supervision	Zoom/Email/WhatsApp	September and October 2023

2.   Project progress

   I.   **Tree Shade Experiment protocol development:** The protocol was developed to carry out the tree shade experiment in September 2023 by consideration of the ground situation and targeted tree species (*Vauchelia tortolis*). The protocol included all the methods and steps to be followed by the leading researcher and/or field assistants during the experiment implementation.

   II.   **Tree Shade Experiment carried out;** Tree shade experiment was carried out from 08/10/2023 to 16/11/2023. The experimental design included four treatments; (1) Shaded low grass height (SHALO), (2) Unshaded low grass height (UNLO), (3) Shaded high grass height (SHAHI), and (4) Unshaded high grass height (UNHI) by manipulating the grass heights and/or availability of the shade that represented the tree canopy cover. We established cages using angled bar and chicken wire to create an experimental plot (*see images in table below*). A total of 20 cages were created in five blocks with four cages per block. Each cage included soil sensor and/or weather sensors to record temperature and humidity in each cage (*see images in table below*). We harvested baseline samples on day 0 (i.e., before interventions) we then introduced dung piles in each cage, followed by pasture sampling on day 14 and day 28. On day 14 and day 28 pasture were harvested and processed to establish pasture larvae densities from each treatment (*see images in table below*).

   III.   **Data entry and preliminary analysis;** Data entry and preliminary analysis of the already collected data is currently in progress.

Table 2: Figures Illustrating the experiment design and steps followed in carrying out the experiment.

Figure 1: Established cage that represents/simulates area under tree canopy with short grass.

Figure 2: Dung piles introduced in a cage that represented larvae development under shaded short grass scenario.

Figure 3: Established cages with introduced dung piles and temperature and humidity sensors (covered in white containers and plastic bags.

Figure 4: Pasture clipping in a cage (left), and the harvested pasture sample in plastic sample bag (right).

Figure 5: Soaked pasture samples in buckets for harvesting gastrointestinal larvae from grass to water for further processing prior to counting of pasture larvae.

Figure 6: Filtration of gastrointestinal larvae through funnel filters into test tube for further processing prior to counting of larvae.
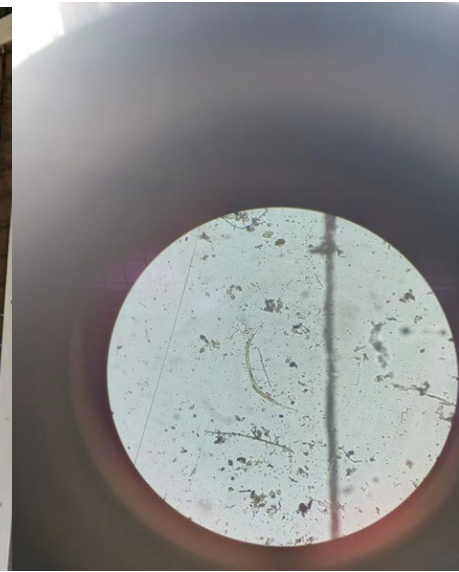
Figure 7: Drying of pasture after soaking stage in buckets. Figure 8: Observed ruminant larvae under electronic microscope during larvae counting stage.

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