Fall armyworm and associated insect natural enemies in eastern DR Congo

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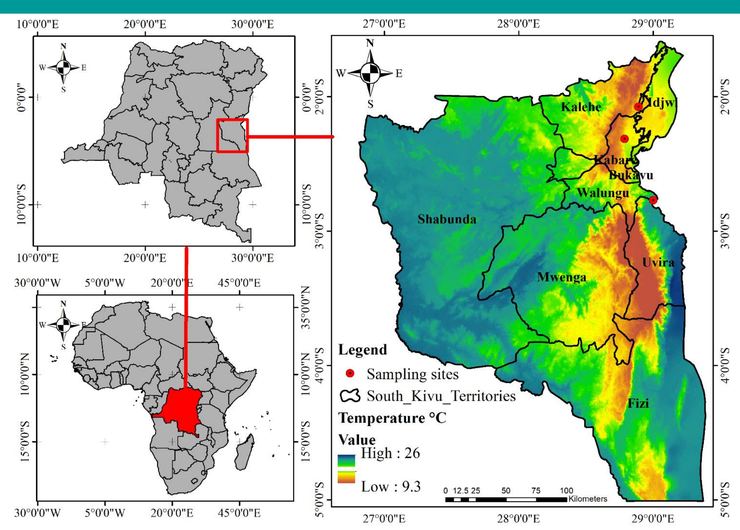
Introduction & Objectives

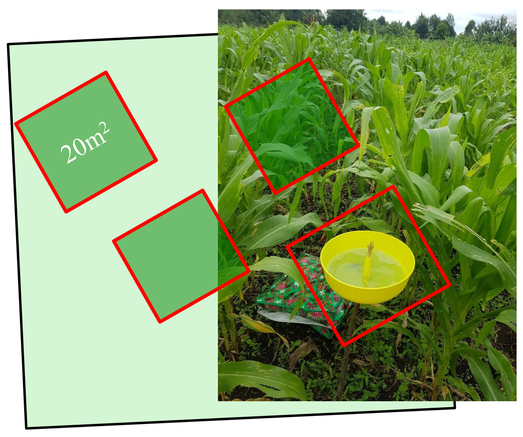
Spodoptera frugiperda (J. E. Smith), commonly known as the fall armyworm (FAW) is a Lepidopteran pest in the Noctuid family. This voracious pest has gained notoriety for its rapid spread and devastating impact on maize crops across the globe.

Objectives:
- Identify natural enemies of FAW categorized as predators and parasitoids;
- Determine natural enemies' abundance in maize fields;
- Determine the relationship between FAW infestation and the abundance of its predatory natural enemies

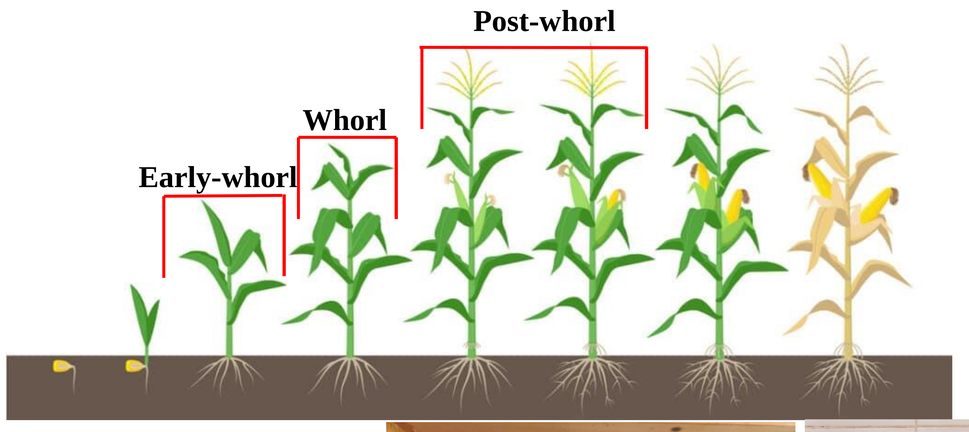
Materials & Methods



South Kivu province, eastern DR Congo



Absolute count method (Quadrat) with yellow pan trap



Maize growth stages

Predators' density $N = \sum_{i=1}^{n} C_p + P$

Relative abundance of predators $RA = \frac{N_i}{N} \times 100$

$Parasitism\ rate\ (\%) = \frac{NPL}{(NCL - NDL)}$

Insect identification: morphologically using various identification keys and insect collections, DNA barcoding

Parasitoids studies

Results

10 parasitoid species, including 2 parasitizing FAW eggs and 8 parasitizing FAW larvae. (**Figure 1**).

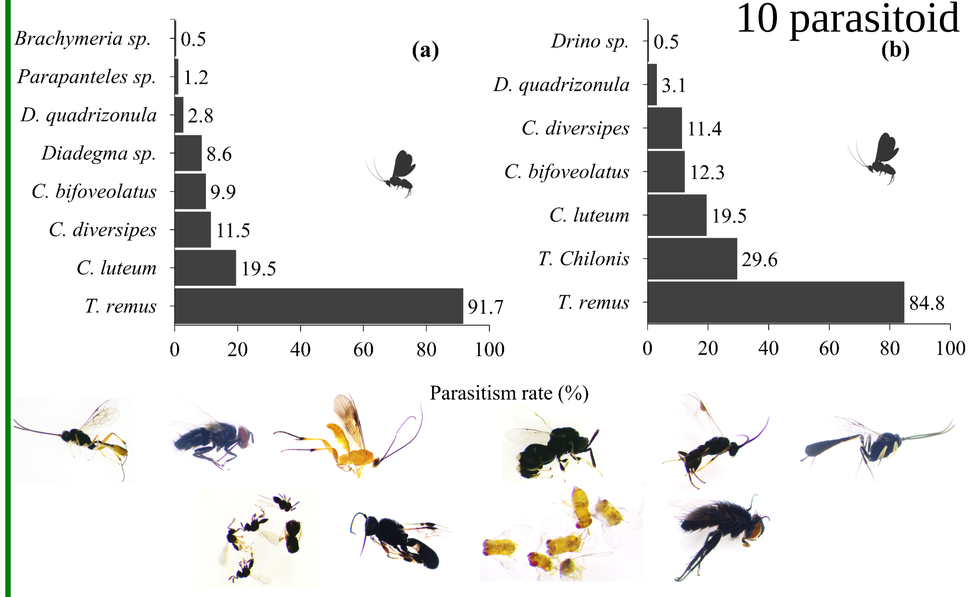


Figure 1. Parasitism rate. (a) Mid-altitude; (b) Low-altitude

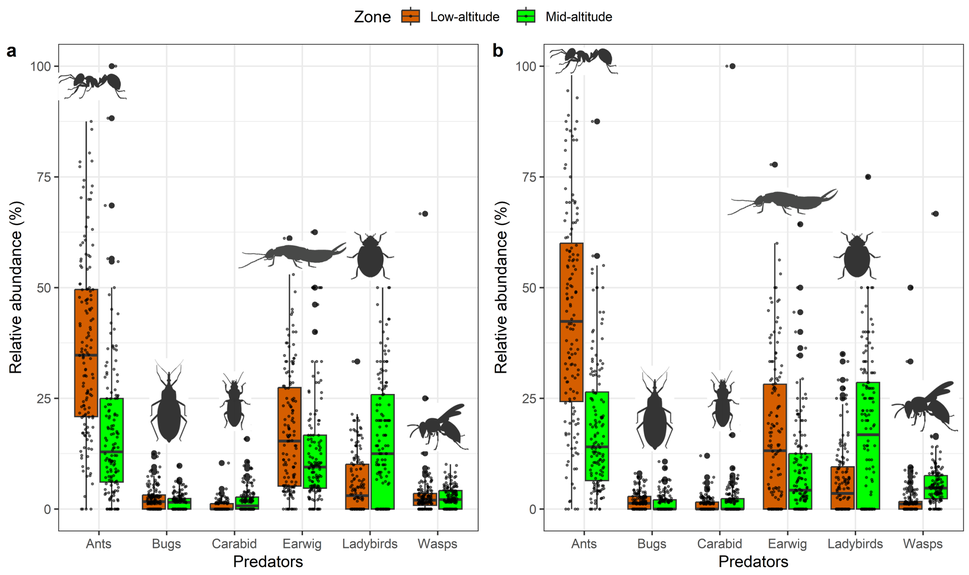


Figure 2. Predators' relative abundance. a. 2021; b. 2023

Six groups of FAW predators (**Figure 2**). Ants were the most abundant of the predator groups. The V4 and R1 maize growth stages were the stage when most predators (ants, earwig, wasps) were abundant in both agro-ecological zones (**Figure 3**).

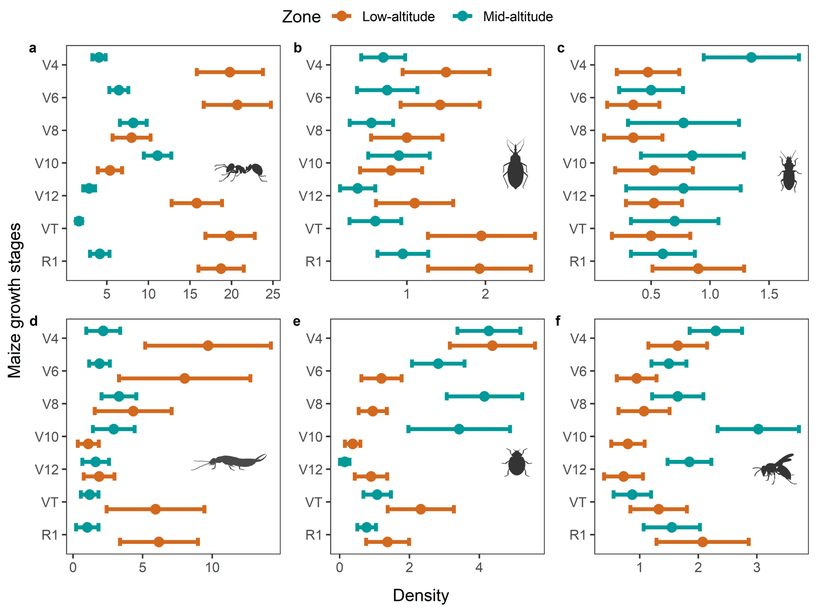


Figure 3. Predators' abundance and maize growth stage

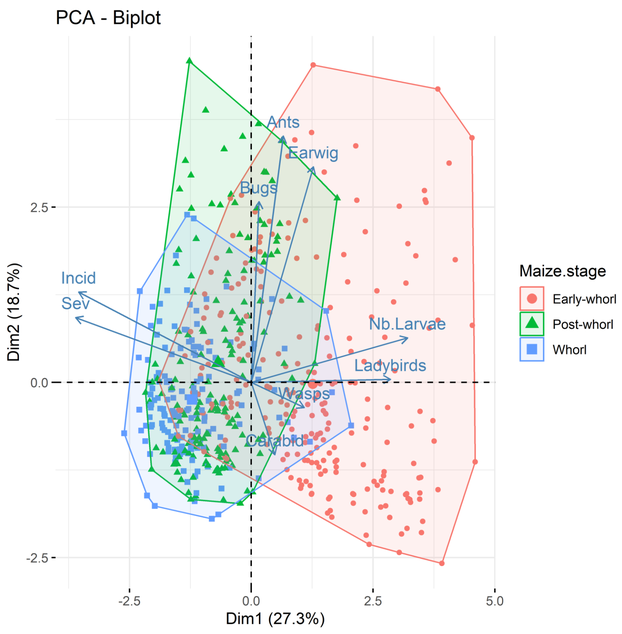


Figure 4. Relation between predators' density and FAW infestation

Early-whorl is the stage of maize where there is a high abundance of FAW larvae and ladybirds, whose abundance is almost independent of that of ants and earwigs

Conclusion & perspectives

Conservation biological control should be developed on smallholder farms in DR Congo through an integrated approach that minimizes plant protection products and diversifies crops to encourage natural enemies.

References

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