Sweep nets bias in

What is the richness of species of flies in the areas?

How well do bottle traps compare to sweep nets in collecting flies in eateries?

Compare the community structure of the kitchen to Palours

Compare the community structure of Taverns to Restaurants

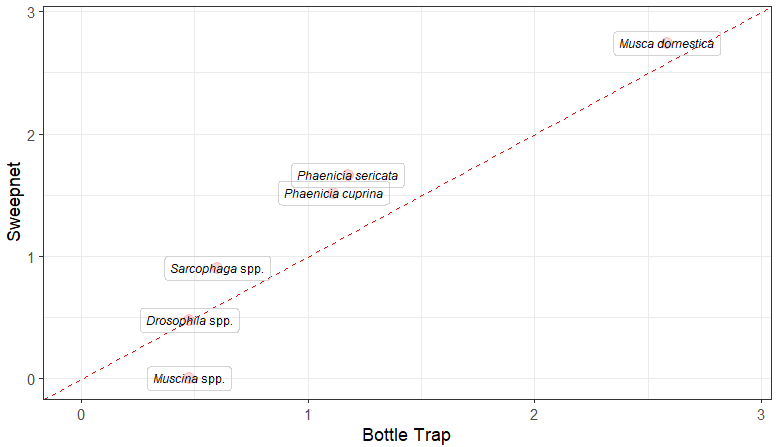
Does the community composition of the fly collection change with distance?

**RESULT**

In total, \_\_\_\_\_\_ individual dipteran (fly) belonging to six (6) genera were collected in this study. These include Musca domestica, Muscina spp., Phaenicia cuprina, Phaenicia sericata, Drosophila spp., Fannia canicularis, and Sarcophaga spp. M. domestica was the most dominant species in both sweepnet and bottle trap collections with abundance of \_\_\_\_ and \_\_\_\_, and relative abundance of \_\_% and \_\_\_%. This was followed by Phaenicia sericata and Phaenicica curpina, and Fannia canicularis very rarely occurring (i.e., just two individuals collected in the entire survey).

For the Taverns, a total of \_\_\_\_ individual flies were collected using sweep nets, while \_\_\_\_ was collected using bottle traps. However, some fly species were occurring more in one collection method than the other (Figure \_ and \_). There was a (non-)significant difference in the proportion of fly species collected in both fly collection methods (Chi-Square X2: \_\_\_\_, p = \_\_\_). This is evident in the fly species such as Phaenicia sericata, Phaenicia cuprina, Musca domestia and Muscina spp. that explicitly falls away from the diagonal line in the Figure X.

Figure \_ is a representation of the proportion of the fly species collected based on just the abundance. Musca domestica, for example was more collected in sweepnet ([input count]) as compared to bottle traps ([input count]), but based on relative abundance in the catch, M. domestica had higher containment in the Bottle trap catches (\_\_%) as compared to the sweepnet’s (\_\_%). This is represented in Figure \_. However the difference between the proportion based on relative abunandce and just raw count did change much, since most species maintain their relative position in the (monotonic) ranking and dichotomal positioning in the plots.



Figure\_: Diagonal chat scaled to 1:1. Sweepneet and Bottle trap are based on Log10 (X +1) transformation of the fly abundance for each species, with the monotonicity of the species preserved. Where species abundance matches a 1:1 ratio for both collection method, the species are seen on the diagonal (broken red) line. *Fannia canicularis* was intentionally not considered for this plot because the sample size is less than 3.

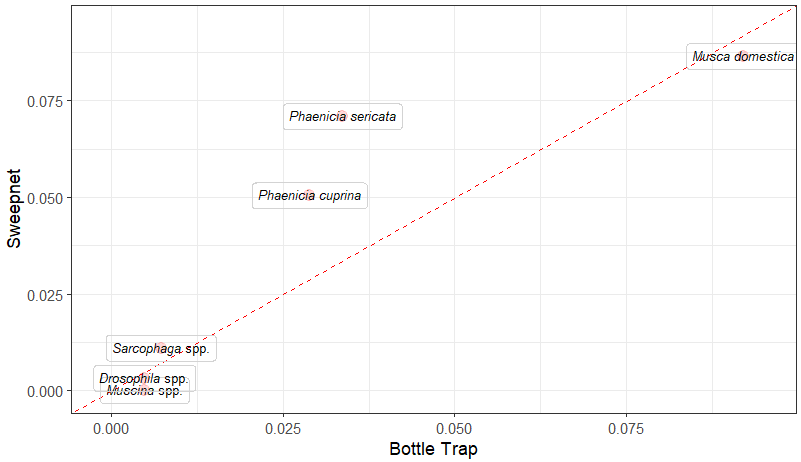


Figure \_: Diagonal chat scaled to 1:1. Sweepneet and Bottle trap are based on the relative abundance (0-1) of the fly species abundance in each collection method. *Musca domestica* was factored by 0.1, due to the high relative abundance it occupies in both the sweepnet and bottle trap samples—monotonicity of the species data is preserved. Where species relative abundance matches a 1:1 ratio in both collection method, the species are seen on the diagonal (broken red) line. *Fannia canicularis* was intentionally not considered for this plot because the sample size is less than 3.

Comparing distance with community composition, there was no significant effect (Mantel statistic r: 0.047, p=0.089), meaning that across distance, the community composition did not change significantly with increasing distance. Longitudinally, there was a non-significant negative relationship between the community similarity and longitudinal distance. Communities become more dissimilar with increasing longitudinal distance, but this was not significant according to Mantel’s test (Mantel statistic: r= -0.071, p= 0.977).

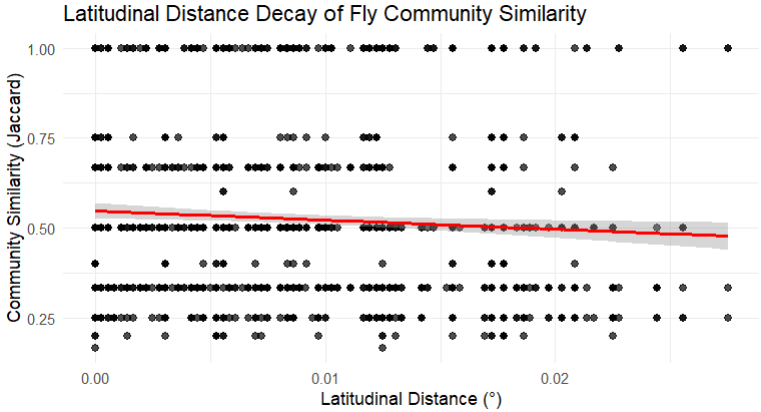
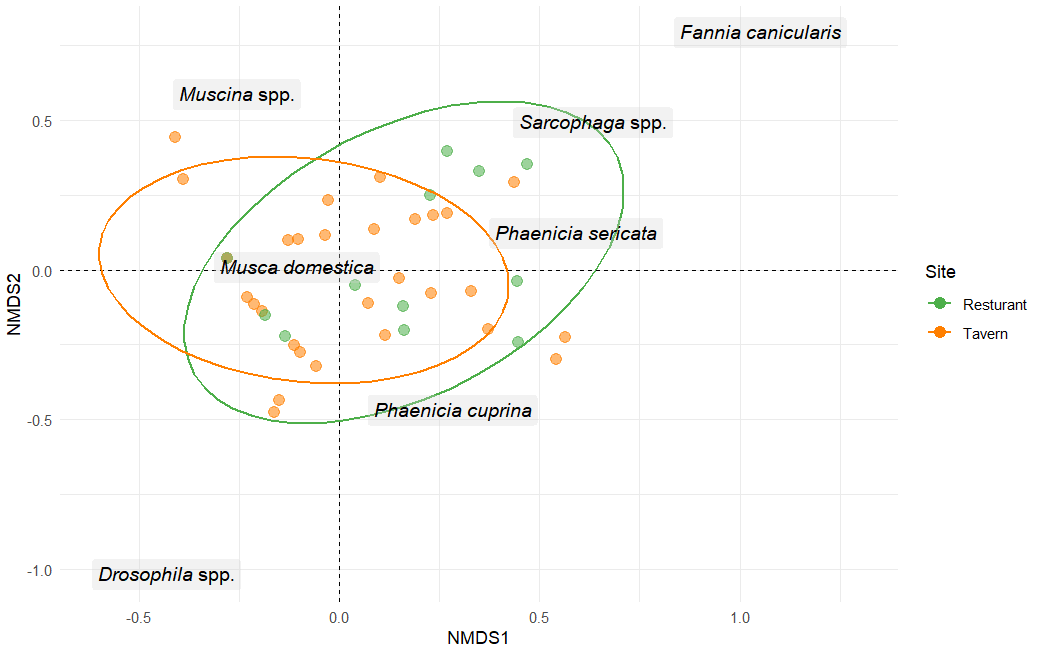


Figure 2: Latitudinal distance decay of fly community (Jaccard) similarity. The red line shows the trend line with 95% confidence intervals.

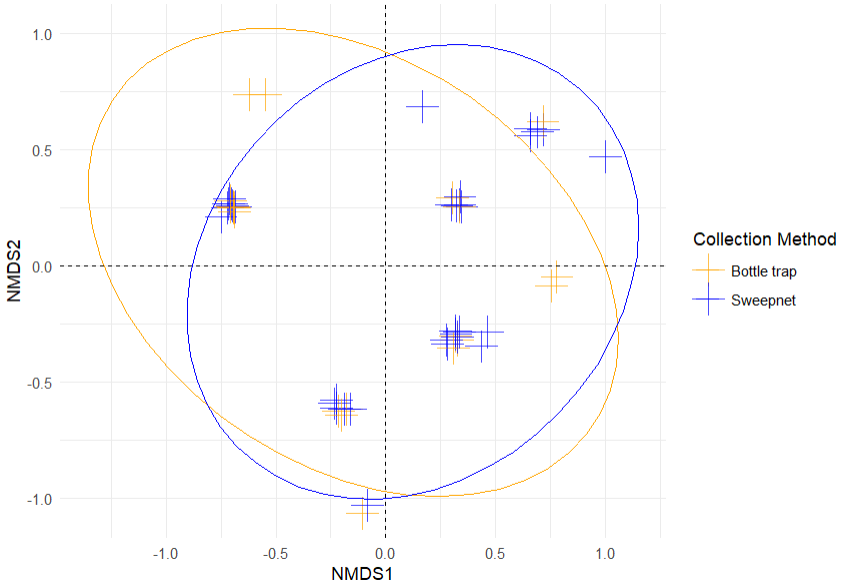


Figure\_: NMDS plot

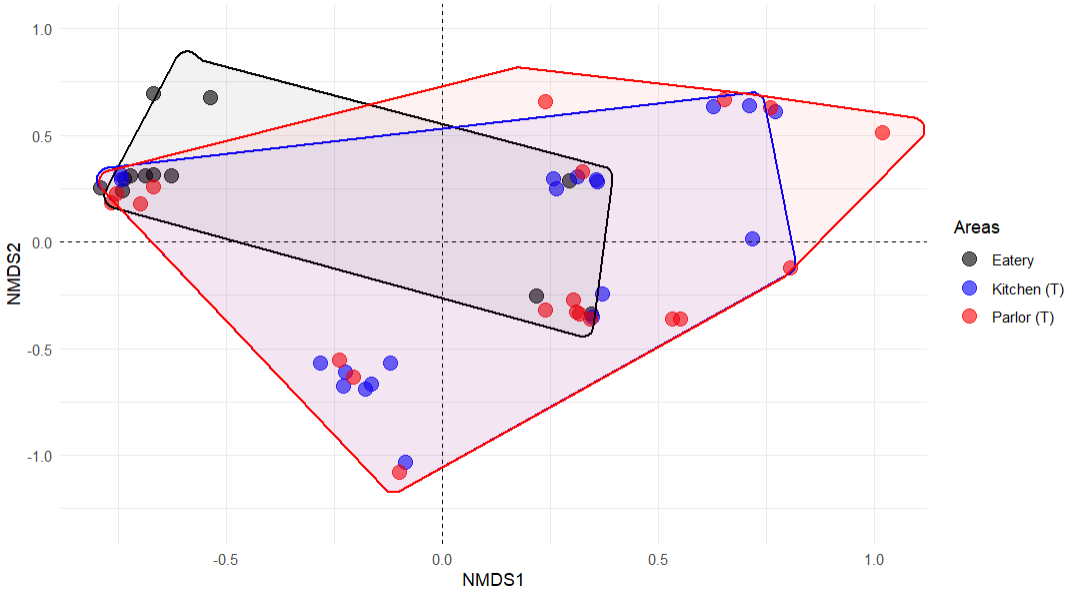
Fly community composition differed significantly across sampling locations categorized by site (Eatery and Tavern). PERMANOVA indicated a highly significant effect (p < 0.001), with site accounting for approximately 30.5% of the total variation in community composition. The non-significant result from the test for homogeneity of group dispersions (PERMDISP; F=0.1068, p = 0.75) suggests that this difference is unlikely to be influenced by variation in within-group dispersion.

Fly community composition differed significantly between collection methods (Bottle trap vs Sweep net), as revealed by PERMANOVA (F=8.2962, p < 0.001), with method accounting for approximately 14.2% of the variation in community structure. The test for homogeneity of multivariate dispersions (PERMDISP) was not significant (F= 0.006, p = 0.94), indicating that this result is not confounded by differences in within-group variability.

Fly community composition did not differ significantly among sampling sites (Eatery, Kitchen, and Parlor) based on Jaccard dissimilarity (PERMANOVA: F = 1.50, p = 0.192), with site explaining approximately 5.8% of the total variation. The assumption of homogeneity of multivariate dispersions was met (PERMDISP: p = 0.678), indicating that within-group variation was comparable across sites. Pairwise comparisons revealed a marginally significant difference in community composition between Eatery and Kitchen (p = 0.049), though this was not significant after adjusting for multiple testing with Bonferroni correction (p.adj = 0.146). No significant differences (p> 0.05) were detected between other site pairs.



**Figure X:** NMDS ordination of hover fly species assemblages based on two collection methods (Bottle traps and Sweep nets), using Jaccard similarity (stress = 0.05; 9,999 permutations). Ellipses represent 90% confidence intervals around groupings by collection method. Each point corresponds to a sampling location (N = 52), with points jittered by 0.04 NMDS units on both axes to improve visual clarity.



**Figure 1:** NMDS ordination of hover fly species assemblages across three sites (Eatery, Kitchen and Parlor of Taverns), based on Jaccard similarity (stress = 0.05; 9999 permutations). Polygons outline groupings of assemblages by site, while individual scatter points represent sampling locations (N = 52). To enhance visibility, points have been jittered by 0.09 NMDS units along both axes.

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