

# Abstract

This thesis investigates the intra-specific host selection carried out by a variety of biting fly species using microsatellite markers to determine the source of insect bloodmeals.

Four microsatellites were required to identify all 39 cattle available in Zimbabwe and all 13 in Ethiopia. These markers were capable of detecting as little as 2ng of DNA, even after four days of digestion and from flies that had fed for only 10 seconds. The markers were less effective at detecting multiple meals, part meals had to make up at least 20% of the total meal for identification and multiple meals could not be detected after 2 days of digestion. This level of sensitivity was considered adequate for the identification of bloodmeals.

All of the species studied fed from adults more frequently than calves although the proportion varied between species. Tsetse showed the strongest selection with 100% of flies feeding from adults compared to 87-92% of stable flies and 57% of mosquitoes. The selection of adults may be due to the reduced level of irritability observed in calves, and the variation between species due to differences in feeding behaviour and reproductive rate. Landing rate was also seen to vary between locations on a host with the legs being the most popular sites despite being the most irritable, indicating that defensive reactions are density dependent.

The position of an animal within a herd effected its probability of being fed from. In some cases the placement of an adult within a herd reduced the number of biting flies feeding from the rest of the herd. The position of a host relative to the wind was also important as more flies feed from downwind animals. These results were discussed in relation to the use of insecticide treated cattle to control biting fly numbers.