

## Application of DNA markers to identify the individual-specific hosts of tsetse feeding on cattle

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### Summary

Primer sets for five different ungulate loci were used to obtain individual microsatellite DNA profiles for 29 Mashona cattle from a herd in Zimbabwe. There were 3–13 alleles for each locus and, using the entire suite of five loci, each animal within the herd, including closely related individuals, could be unequivocally distinguished. Wild-caught *Glossina pallidipes* Austen (Diptera: Glossinidae) were fed on specific cattle and the bloodmeal was profiled 0.5–72 h after feeding. The individual specific sources of the bloodmeals, including mixed meals produced by allowing tsetse to feed on two different cattle, were reliably identified up to 24 h after feeding. The technique was used in field studies of host selection by *G. pallidipes* and *G. morsitans morsitans* Westwood (Diptera: Glossinidae) attracted to pairs of cattle. When the pair comprised an adult and a calf, 100% of meals were from the adult. For some pairs of adult cattle, tsetse were biased significantly towards feeding on one animal, whereas for other pairs there was no such bias. In general, feeding was greater on the animal known to have a lower rate of host defensive behaviour. Results suggest that relatively slight differences in the inherent defensive behaviour of cattle produce large differences in host-specific feeding rates when the hosts are adjacent. For flies attracted to pairs of cattle, < 2% contained blood from both hosts. The DNA profiling technique will be useful in studying the epidemiology of vector-borne diseases of livestock.

*Keywords* *Glossina*, bloodmeal, cattle, feeding behaviour, microsatellite DNA, tsetse fly, Zimbabwe.

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