Rope-based oral fluid sampling of warthogs (*Phacochoerus africanus*): lessons learned from South Africa

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Introduction

Non-invasive sampling of wildlife represents a cost-effective means of determining the disease status at the population level. Pathogen sampling of wild animals by baits (pSWAB) has been successfully applied in the northern hemisphere[1,2,3], however, the utility of this approach for assessing the African swine fever (ASF) status of common warthog (*Phacochoerus africanus*) populations has not been explored. Given that warthogs play an important role in virus amplification in the sylvatic cycle[4] but are difficult to sample, we undertook an assessment rope bait sampling, targeted at this species, in South Africa.

Materials & Methods

Baits were deployed in both a natural setting in Dinokeng Nature Reserve, and at transformed sites where wildlife have become habituated to supplementary. In Dinokeng, baits were deployed along game paths in close proximity to warthog burrows, whereas for transformed sites they were deployed in wildlife feeding areas in close proximity to human residences. Five bait types were tested at both site types, namely: (i) pig-feed wax baits, (ii) truffle-infused pig-feed wax baits, (iii) cotton ball baits with a molasses attractant, (iv) cotton ball baits with a fermented yeast attractant, and (v) traditional maize baits (Fig. 1). Baits were secured to trees and placed on the ground, and all wildlife interactions with the baits were monitored using camera traps.

Results & Discussion

- Warthogs in a natural setting did not interact with the baits in a meaningful manner over a >6 month period of bait deployment, with weekly bait replacement (Fig. 3). Initially, only tree squirrels and ground birds interacted with the baits at natural sites. After a period of two months, black-backed jackals and porcupines began to interact with the baits (Fig. 4).
- At three transformed sites, warthogs habituated to supplementary feeding readily interacted with the baits, within the first two weeks of deployment (Figs. 5-6). As was the case for the natural sites, non-target species (Fig. 7), also interacted with the baits.
- At natural sites, only jackals and porcupines regularly interacted with baits, and primarily with a single bait type, viz, the wax baits. In contrast, all bait types were consumed at transformed sites however, wax baits were still preferred.
- Bait consumption was similar at the three habituated sites evaluated despite notable differences in the species composition, wildlife feeding regimes and the physical separation of these sites. This suggests that wildlife habituation is of greater importance than the type of bait used.

Figure 1 The five baits that were compared at both natural and transformed locations. FLTR is a pig feed wax bait, truffle-infused wax bait, molasses & fermented cotton ball baits, and a maize bait.

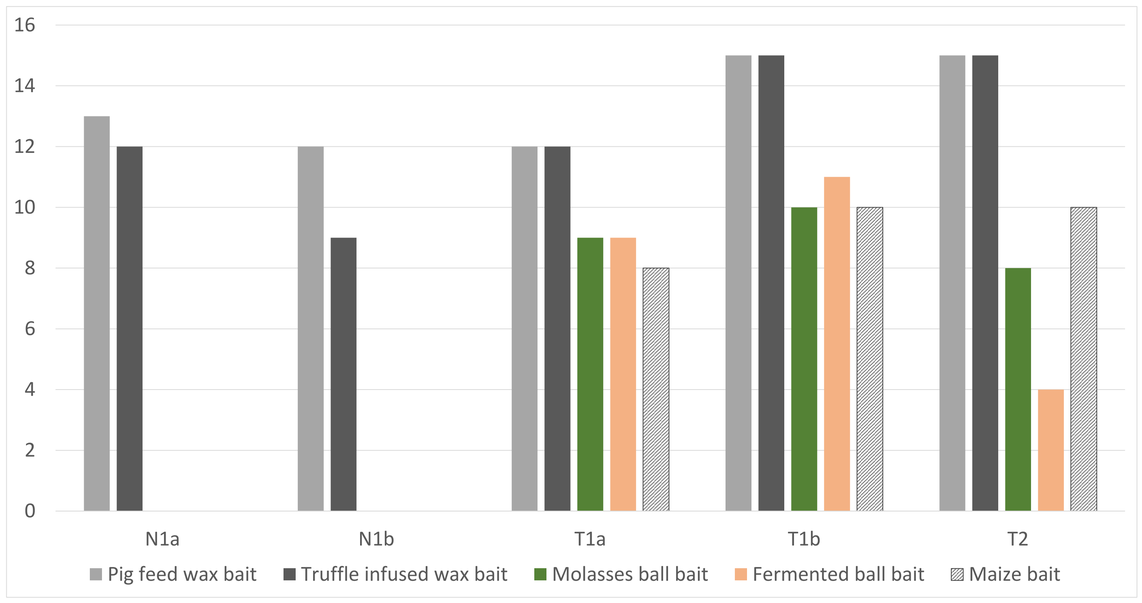

Figure 2 Bait consumption at five baiting sites. Baiting sites were checked weekly (natural sites, N1a and N1b) and daily at transformed/warthog-habituated sites (T1a, T1b and T2) and any consumed or partially consumed baits were replaced.

Figure 3 Warthog encounters with baits in a natural setting were sporadic and brief. Baits interactions (if any) typically involved younger individuals (left), whereas mature warthogs (right) either ignored or actively avoided by the baits.

Figure 4 Black-backed jackals (left) and porcupines (right) began interacting with the baits two months after first deployment at natural sites. Both species continued to interact frequently with the baits for the final four months of the 6-month baiting period.

Figure 5 Warthogs at transformed sites T1a (left) and T1b (right) only interacted with the baits after observing baboons doing so; this occurred 11 and eight days, respectively, after first deployment. Warthog visits to both sites, prior to bait deployment, were infrequent.

Figure 6 Warthogs at transformed site T2 interacted with the baits three days after first deployment. T2 is a property adjacent to the natural/untransformed area in Dinokeng) that warthog visit on a daily basis.

Figure 7 Both transformed sites, T1a and T1b, were frequented by baboons that readily interacted with, and consumed the baits.

Conclusions

Our preliminary results indicate that non-invasive methods for ASF surveillance of warthog populations in sub-Saharan Africa may be of limited utility in natural settings. However, this approach does hold value for sampling habituated wild suids that exploit transformed landscapes. As it is precisely at these active wildlife-domestic interfaces where the risk of ASF transmission is highest, pSWAB represents a rapid and cost-effective means of targeted assessment of ASF status.

References

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