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The use of digital tools for larval surveys in vector control: Experiences from Anambra and Ondo states, Nigeria

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Digital tools used in larval surveys for resistance tests can serve as data sources for mapping and profiling *Anopheles* breeding sites for larval source management.

Introduction

Malaria Consortium is conducting studies to assess the impact of insecticide-treated net campaigns in Ondo and Anambra states, Nigeria. In this study, we explored the feasibility and effectiveness of employing digital tools in vector control research, specifically for larval surveys related to insecticide resistance studies, as well as the potential use of similar tools in vector control programmes. The study involved the use of a digital tool during larval collection for insecticide resistance tests. We reported observations from using the digital tool and explored its potential for mapping larval habitats to inform the targeting of vector control interventions.

Methods

- The digital tool was developed using SurveyCTO to collect data on breeding sites and capture various attributes of larval habitats.
- The tool was implemented using mobile phones during the collection of mosquito larvae for insecticide resistance tests.

Results

- The digital tool allowed monitoring of field activities and mapping of survey sites.
- *Anopheles* larvae data were collected alongside images of the sites and their geocoordinates, types and characteristics, as well as timestamps of data collection using the digital tool.
- Although the primary use of the data was to locate the sources of mosquitoes used in resistance tests, the findings also indicated the potential use of the tool to link *Anopheles* species – after rearing and identification of the adult stage – with the collection sites.

Acknowledgements

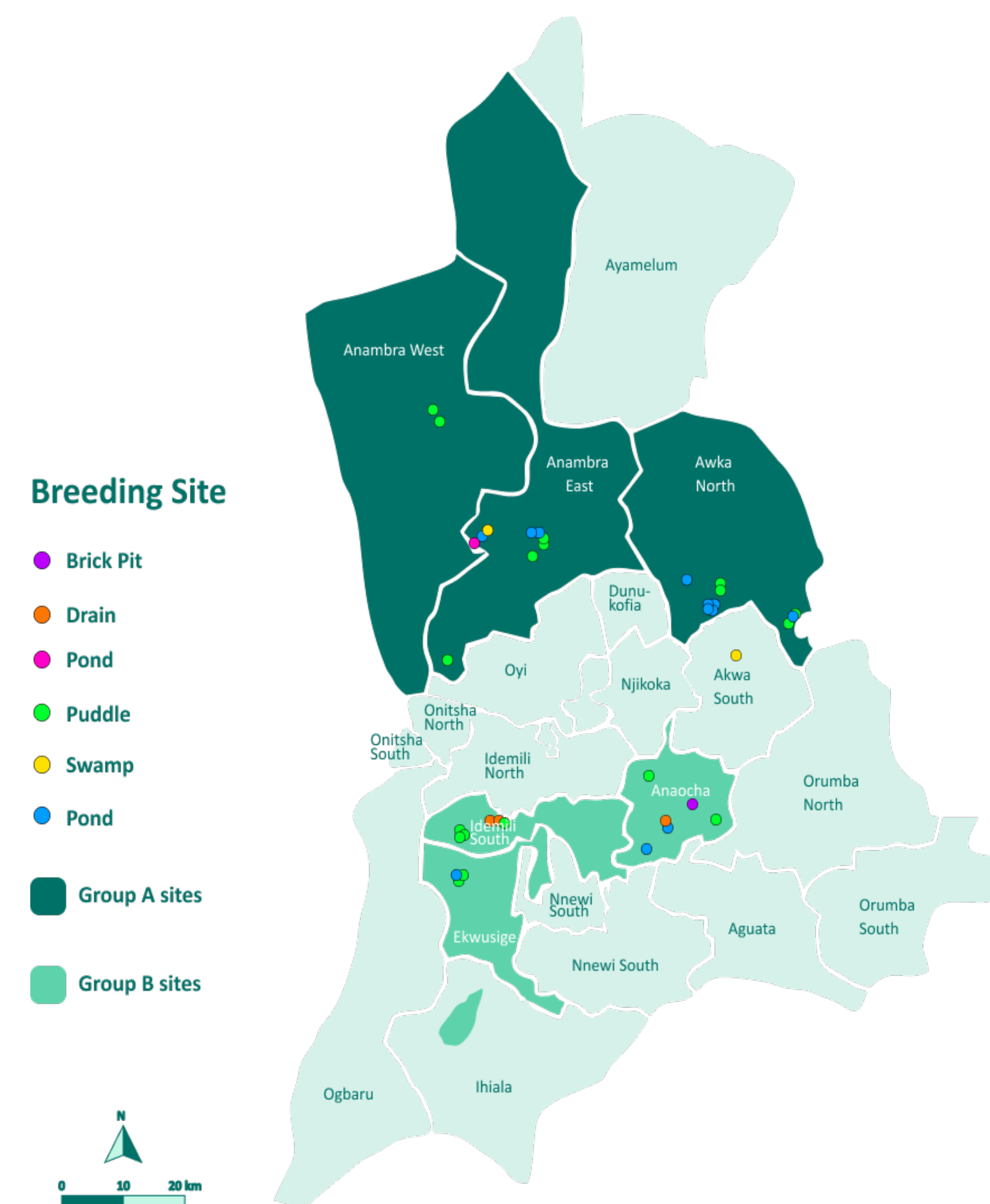
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Figure 1. Larvae collection in Ondo state



Figure 2. Electronic data collection tool for larval surveys

Figure 3. Locations of breeding sites in Anambra state



Conclusion

Digitisation of larval surveys for resistance monitoring or other entomological studies could enable mapping of important breeding sites for vector control, beyond the primary purposes of the sample collection. In several African countries, insecticide resistance monitoring activities are based on larval collection and rearing. If information on larval habitats is gathered during such activities using similar digital tools, it could facilitate real-time monitoring of transmission foci by integrating the data into the surveillance system for visualisation and analysis, enabling swift responses. A similar approach could also be used at community levels for mapping of breeding sites for local larval control measures. Feedback from the mosquito collectors highlights the flexibility and user-friendliness of the digital tool in larval survey and data collection.