

Morphometrics, molecular, and reproductive parameters of *Rhynchophorus* morphotypes F. (Coleoptera: Curculionidae) in Ghana

Original Research Article Published: 06 March 2025

Volume 45, pages 657–667 (2025) [Cite this article](#)



International Journal of Tropical Insect Science

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Abstract

Palm weevils are widely distributed throughout Ghana causing severe economic injuries to palm plantations. However, the description and categorisation of palm weevil species based on the morphology in Ghana are lacking. This study sought to identify and determine the morphometrics and reproductive parameters of different *Rhynchophorus* morphotypes in Ghana. Out of 2367 larvae that were sourced from infested plantation sites by handpicking in the Middle Belt (Kobedi, Diabaa, Asuhyaie, Nsuta, Tanoso, Bomaa, and Akrodie) and Southern Ghana (Fumesua, Kubease, and Donyina), one thousand and two hundred (1200) larvae each weighing 5 g were used for the study. These larvae were allowed to cocoon and pupate, and the adults that emerged were described and categorised into different morphotypes using morphological description keys of *Rhynchophorus* species. Three *Rhynchophorus* morphotypes were identified and described; rusty red weevil with black spots on the pronotum (RRW), black weevil with two red

stripes on the pronotum (BWS), and black weevil without a longitudinal stripe on the pronotum (BW). The fecundity and female longevity of morphotypes of BWS and BW were superior to mature RRW female morphotype. The RRW morphotype may require more generations to adapt to the conditions in Ghana to improve on its life history parameters. The lowest fecundity of the RRW morphotype could be an advantage to limiting its spread across palm plantation sites in Ghana.

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Data availability

Data will be available upon request.

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Acknowledgements

This research was financially supported by HEALTHYNSECT Project (DFC File No. 19-08-KU), DANIDA, and the University of Copenhagen, Department of Nutrition, Exercise and Sports Science. We are thankful to all who provided expertise that greatly assisted the research and improved the manuscript significantly. We thank Raphael Mongare for producing the distribution map of the sampling sites.

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Contributions

JPA conceptualisation, writing of the second draft, and funding. SKD (formal analysis, writing of the first draft, conceptualisation, methodology, and project management), AS (writing seconding draft and visualization), and DOO (writing second draft and visualization), JPE (writing second draft, sequencing, and visualization) SN (writing second draft, sequencing, and visualization), and KF (writing second draft, sequencing, and visualization).

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Ethics declarations

Competing interest

The authors report that they have no conflict of interest.

Additional information

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Cite this article

Anankware, J.P., Debrah, S.K., Asomah, S. *et al.* Morphometrics, molecular, and reproductive parameters of *Rhynchophorus* morphotypes F. (Coleoptera: Curculionidae) in Ghana. *Int J Trop Insect Sci* **45**, 657–667 (2025). <https://doi.org/10.1007/s42690-025-01458-y>

Received

17 August 2024

Accepted

09 February 2025

Published

06 March 2025

Version of record

06 March 2025

Issue date

April 2025

DOI

<https://doi.org/10.1007/s42690-025-01458-y>

Keywords

[*Rhynchophorus* species](#)

[Fecundity](#)

[Pronotum spots](#)

[Morphotype](#)