

Entomological training courses in sub-Saharan Africa create a skilled network of African taxonomists, but employment is vital for sustainability

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Taxonomy and the taxonomic impediment

The primary goal of taxonomy is to identify, describe, name, and classify all living organisms. It is central to understanding biodiversity and serves as a foundational aspect of many scientific disciplines. For example, robust taxonomy is essential for scientists addressing global challenges such as the harmful effects of climate change on ecosystems and the impact of the pollinator crisis on food security. Despite its significance, much of the world's species richness remains unknown to science.

One major reason for this knowledge gap is the shortage of well-trained professional taxonomists with strong theoretical and practical expertise. The insufficient and inadequate allocation of resources to support taxonomy is known as the taxonomic impediment.

Diptera taxonomy in sub-Saharan Africa

Two-winged insects - true flies and mosquitoes (Diptera) - have a significant impact on the daily lives of many people in sub-Saharan Africa. Some species transmit diseases, while others are agricultural pests. Additionally, many flies play a crucial role in the pollination of wildflowers and crops. However, there are substantial knowledge gaps in the taxonomy, ecology, and life cycles of these insects. Closing these gaps will contribute to achieving the UN Sustainable Development Goals, particularly SDGs 1, 2, 3, 6, 13, 14, and 15.

A major challenge is the shortage of taxonomic experts in sub-Saharan Africa who can accurately identify Diptera. Increasing the number of entomological training courses in the region is one way to address this issue. Such courses will also help build a sustainable network of sub-Saharan entomologists and foster collaboration between scientific institutions and stakeholders involved in management, policy-making, outreach, and the implementation of legal procedures.




Some important fly families in sub-Saharan Africa (from left to right): hover flies, horse flies, blow flies and true fruit flies. credits: INaturalist: 203739841, 203563443, 203563443, and 180421995

The best-way forward

We organized ten entomological training courses in strategic locations across Africa. Each course spanned ten working days, was conducted in English, and was offered free of charge to both participants and lecturers. The feedback from organizers, lecturers, and participants enabled us to develop a best-practice strategy for organizing similar courses in the future. Detailed guidelines on how to organize such training courses have been published online:

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https://www.sciencedirect.com/science/article/pii/S0738059324000488

Full reference:
Jordaens, K., De Meyer, M., Van Nuffel, M. Kirk-Spriggs, A.H., Sabuni, C., Mwatawala, M., Majubwa, R., Kabota, S., Bellingan, T., Goergen, G., Mansell, M., Manrakhan, A., Sinzogan, A., Schutze, M.K., Thomas-Cabianca, A., Copeland, R., Muller, B., Virgilio, M., Bert, E., November, E. & Midgley, J. 2024. A best way forward to the organization of entomological training courses in sub-Saharan Africa. International Journal of Educational Development, 107: 103026.

Upcoming training courses

We will organize a number of entomological training courses in the forthcoming years. Scan the 2D-barcode on the next page to stay informed!

2025 - South Africa: general entomological training (main focus: pollinating Diptera)
2025 - South Africa: basic training in fruit fly taxonomy and systematics (main focus: fruit flies or Tephritidae)
2026 - Tanzania: basic training in fruit fly taxonomy and systematics (main focus: fruit flies or Tephritidae)
2027 - Rwanda: general entomological training (main focus: pollinating Diptera)
2027 - Mozambique: basic training in fruit fly taxonomy and systematics (main focus: fruit flies or Tephritidae)

Recommendations

While these training courses have started to enhance entomological and taxonomic skills in Africa, further government investment is essential to sustain and expand these efforts and can be achieved in two ways. Utilizing the provided documents, additional training courses can be funded to further increase the available skills. More critically, to retain these skills within Africa, a concerted effort is required to create permanent positions for taxonomic researchers. Taxonomists are crucial for identifying new pest species; for example, the Fall Armyworm in Africa was identified by a taxonomist, and the identification of cryptic mosquito species has enabled more effective control measures.

Government departments, museums, and universities that work with insects should ensure they employ taxonomists. Only with ongoing government investment can we sustainably address the taxonomic impediment in Africa and improve the lives of its people. Tackling the taxonomic impediment is a crucial step towards achieving the Sustainable Development Goals in sub-Saharan Africa.

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https://www.africamuseum.be/en/research/training

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About the projects

The DIPoDIP2 and DISPEST2 projects are a collaboration between the Eduardo Mondlane University (Mozambique), the KwaZulu-Natal Museum (South Africa), the Sokoine University of Agriculture (Tanzania), Stellenbosch University (South Africa), the University of Pretoria (South Africa), the University of Rwanda (Rwanda), the Office Burundais pour la Protection de l'Environnement (Burundi), and the AfricaMuseum (Belgium). The DIPoDIP2 and DISPEST2 projects are financed by the Belgian Development Cooperation.

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