The pollinator information network newsletter

October 10, 2024. Vol. 7, Issue 3

Welcome to the third issue of volume 7 of the *Pollinator Information Network Newsletter*

The *Pollinator Information Network Newsletter* is one of the key outputs of the "Diversity of Pollinating Diptera of the Afrotropical Region" (DIPoDIP2) project, funded by the Belgian Development Cooperation in collaboration with the AfricaMuseum (Royal Museum for Central Africa).

In this issue, we shine a spotlight on two South African MSc students, Chloë Kayla Meck and Mihlali Indiphile, who are conducting important research on blueberry pollination. Their work aligns closely with the AGRIMAB project, a collaborative effort between Belgian Science Policy and South Africa's National Research Foundation (introduced in the first issue of the *Newsletter* of this year).

This issue also features a brief report on the latest AGRIMAB network meeting, held in September in Belgium. We also bring you highlights from the 12th International Symposium on Syrphidae (ISS12) in Prague, Czech Republic. Additionally, we cover the recent study visits of John Midgley (KwaZulu-Natal Museum, South Africa) to the Agricultural Research Council, South Africa, and John Midgley and Kurt Jordaens (AfricaMuseum, Belgium) to the Natural History Museum in Dijon, France.

Looking ahead, we are excited to announce that the XXVIII International Congress of Entomology will take place from July 17-21, 2028, in Cape Town, South Africa. More details will be available in the forthcoming issues.

You'll find our newest policy brief, which advocates for increasing the number of trained entomological taxonomists in Sub-Saharan Africa. This brief also introduces upcoming training courses, with dates to be confirmed.

Lastly, the DIPoDIP2 project has launched a call for several PhD and MSc scholarships available for students from the Afrotropical Region. Further details on how to apply are provided at the end of this issue. More information on the calls can also be obtained from the PINDIP website: https://www.pindip.org/

Note below that we are now also on Instagram! We invite everyone interested to contribute to the *Newsletter*. Submit summaries of your research, publications, relevant literature, upcoming conferences, symposia, or opportunities for collaboration and grants related to plant-pollinator networks by December 1, 2024. We hope you enjoy this third issue of Volume 7!

Warm regards - The DIPoDIP Team

Would you like more updates on the DIPoDIP2 project ? follow us on Facebook and Instagram !

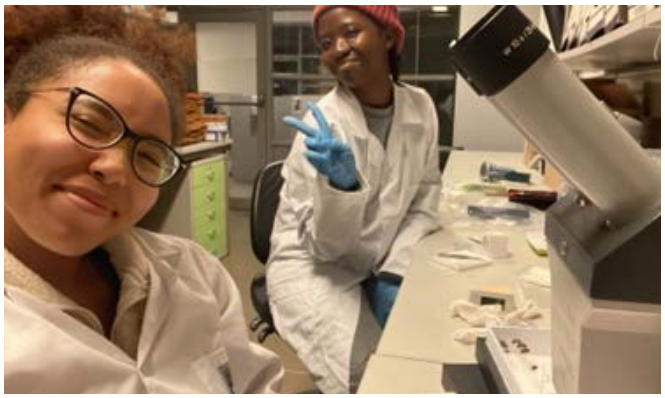
https://www.facebook.com/pollinatingdiptera/

dipodip.africa

Spotlight: MSc student Chloë Kayla Meck - Stellenbosch University, South Africa

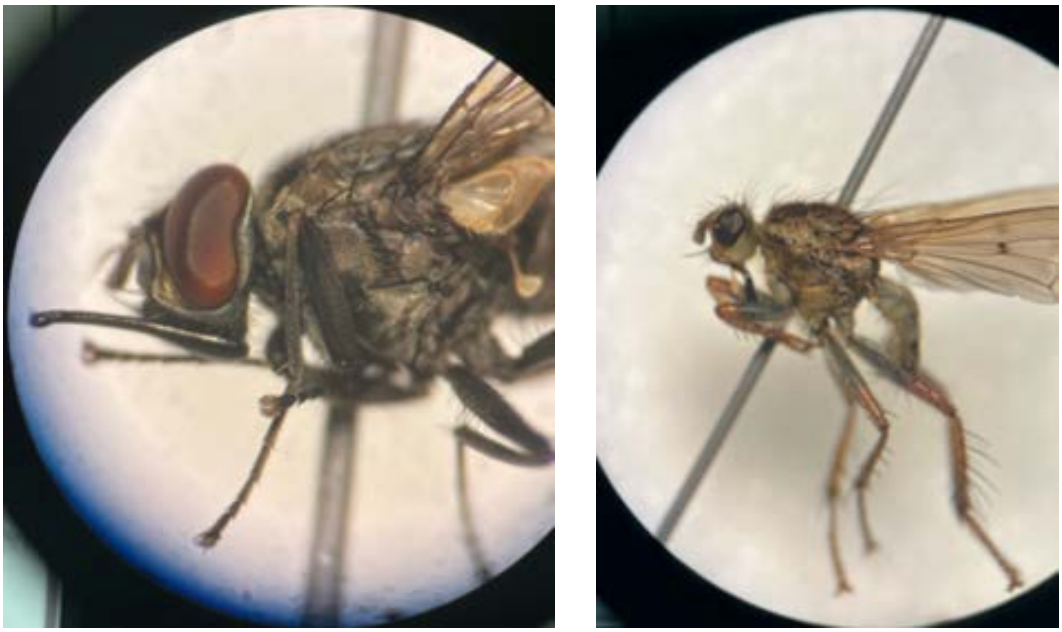
Chloë Kayla Meck

Hello, my fellow ento-explorers! I'm Chloë Kayla Meck, currently studying at the University of the Western Cape (UWC) and completing my BSc Biodiversity and Conservation Biology Honours course. My main research project is about the pollination services provided by non-bee insect pollinators, specifically focusing on the order Diptera (flies!), which I knew nothing about... My honours project is in collaboration with Stellenbosch University (SU) and, thankfully, I had an opportunity to attend a three-day workshop kicking off with a quick orientation consisting of theoretical work, such as the physiology of flies, then fieldwork, pinning, identifying, and labelling of field material. This was a journey and a half...



Chloë (front) and Mihlali (back) in the lab during their MSc thesis. © Chloë Kayla Meck

I only had three days to learn tips and tricks (totally not stressful at all), fortunately, I had not one, but two fly whisperers by my side, John Midgley and Kurt Jordaens. They provided me with all the entomological equipment and tools I would need for my research project, ranging from the nets to the tinniest of pins! My first challenge was attempting to catch flies in the field (keyword being "attempting"), who knew how fast those little guys were? But with the help of Kurt and John, I managed to catch some flies! After overcoming my first challenge, the second one began... patience was an understatement when it came to the task of pinning and identifying! Nevertheless, I not only gained experience but developed a passion and a newfound appreciation for flies that I never thought I would. I'm currently collecting samples for my project, and although I'm no fly expert, I definitely have more experience and skills to take on my research project!



Not all visitors of blueberry flowers are bees. Chloë will inventory the non-bee flower visitors of blueberry, including Diptera as shown above © Chloë Kayla Meck

Spotlight: MSc Student Mihlali Indiphile - Stellenbosch University, South Africa

Mihlali Indiphile

High with excitement and being balls of nerves, the day started with the introduction which eased us into the workshop. It ranged from different sampling techniques, anatomy of the fly, use of dichotomous keys and even being gifted with equipment. After the first few hours in the classroom to fill our minds with knowledge, we were then released to put our expertise to the test.

With the scorching sun shining down on us, we began our adventure venturing around the neighbourhood, in the nature reserve and botanical garden. Needless to say, we struggled at first. It was as if we were babies taking their very first steps. Our uncoordinated and hesitant movements as we moved the nets around, trying to implement the information we've learnt and realizing that we caught nought. Luckily with assistance and a better understanding of our sweeping nets, we miraculously made it through the day with flies of our own.

Pinning the flies was a challenge of its own. Trying to handle the little species with two fingers and inserting the pins through its thorax at an angle was awkward. There were times when you finally got it correct from the dorsal and posterior view, yet the lateral view of the fly appeared as the specimen was taking off for flight. The importance of correct pinning was highlighted when we had to identify our flies. Mathematic equations form in your head while you handle the specimen under the microscope, trying to view its features from your mediocre pinning work. Even while frustration continued to build, it served as a reminder that was very much needed to: correctly pinning the specimen. Not only for your sake, but for others who wish to observe the specimen.

As days went by, there was a sense of sadness. Knowing that the wonderful experience was soon coming to an end and watching time slip through our fingers as we continued to pin our species and identify them. Nonetheless, there was a new appreciation for the critters. I wish to thank Kurt Jordaens and John Midgley for the once-in-a-lifetime experience and profound wisdom they gave us.

Mehlila Indiphile during the entomology crash training course at Stellenbosch University in 2024 . © KMMA.

AGRIMAB Meeting report: 8–13 September 2024, Tervuren, Belgium

Marc De Meyer

The AGRIMAB (Pollination services as a tool to study interactions between agriculture and Man and the Biosphere Reserves in South Africa) network project aims at developing collaborative research on interactions between agriculture and Man and the Biosphere (MAB) in South Africa with respect to pollinating Diptera. From 8-13 September, the project partners Pia Addison (Stellenbosch University, South Africa), Marc De Meyer (AfricaMuseum, Belgium), Zion Jodamus (Stellenbosch University), Kurt Jordaens (AfricaMuseum), John Midgley (KwaZulu-Natal Museum, South Africa), Colin Schoeman (University of Venda, South Africa), and Vanessa Couldridge (University of the Western Cape, South Africa) met at the AfricaMuseum in Tervuren, Belgium.

Aurore Mathys from the AfricaMuseum provides guidance to the AGRIMAB team on utilizing photo-stacking setups. © KMMA.

During the study visit, we explored opportunities for future collaboration in the field of pollination of agricultural commodities in South Africa. The itinerary included field visits to pcfruit, BioBest, and a blueberry farm in Oudsbergen, where we gained insights into pest control and crop pollination practices. Additionally, we visited public and research facilities at the AfricaMuseum, where South African partners presented their research to the Department of Biology. The AfricaMuseum staff also demonstrated their digitization activities, and we held a mid-term reporting meeting with a BELSPO representative. These engagements culminated in the development of ideas for potential research proposals.

BioBest, a company specializing in biological control agents and beneficial insects, is particularly focused on the industrial production of pollinators for horticulture. The focus is mostly on bumblebees but there is also an interest in the use of Syrphidae (hover flies) as pollinators. This emphasis provides valuable insights into the potential applications of pollinator research.

pcfruit, a horticultural research center, serves as a parallel to institutions like HortGro and CRI in South Africa. However, the latter institutions are more closely integrated with universities in the country. The exchange of information regarding research topics and financing models could significantly benefit partners within the network.

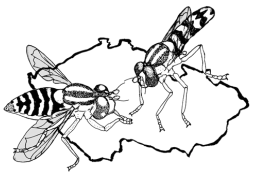
Blueberries are recognized as a primary target crop for the development of research projects. Gaining knowledge of and comparing commercial production methodologies in a temperate climate like Belgium can offer valuable insights for project development.

AGRIMAB project partners during the guided tours at BioBest (left), pcfruit (middle) and the blueberry farm in Oudsbergen (right) © KMMA.

AGRIMAB is a networking project funded by the Belgian Science Policy (BELSPO) and the South African National Research Foundation (NRF)

The 12th International Symposium on Syrphidae, 2-7 September 2024, Průhonice, Czech Republic

Mandisa Ndlela, Kurt Jordaens & John Midgley



12th International Symposium on Syrphidae
Průhonice, Czech Republic
2–7 September 2024

The castle in Průhonice in the Czech Republic served as the ISS12 symposium venue. © KMMA

The 12 International Symposium on Syrphidae was held from 2-7 September in Průhonice, a small town with approximately 2,800 residents, located about 15 km from the center of Prague, the capital of the Czech Republic. Průhonice is best known for its beautiful castle, which served as the conference venue, and the surrounding Průhonice Park. Both the park and castle are recognized as UNESCO World Heritage Sites.

A total of 90 participants attended the symposium, presenting 64 contributions, including 42 oral presentations and 22 poster presentations.

A warm thank you to the organizing committee, Jiří Hadrava, Daniel Čičovský, Klára Daňková, Jan Hadrava, Tereza Hadravová, Antonín Hlaváček, Lucie Holzbachová, Jakub Hrouda, Zuzana Matějkověá, Eva Matouškovšá, Michael Mikát, Vojtěch Miller, Jana Mrázová, Josef Nováček, Ivan Pavle, Jindřiška Peterková, Helena Pijálková, Tadeás Ryšan, Jakub Štenc, Tamara Tot, and Jaco Visser, for their efforts to make it a wonderful and exciting symposium, we enjoyed it very much and look forward to the 2026 symposium in Italy!

The DIPoDIP team was represented by three members at the conference, each delivering an oral presentation. Mandisa (picture right) discussed the description of the first female of hover fly *Mesembrius ingratus*, John presented on the invasion history of *Toxomerus floralis* in the Afrotropical Region, and Kurt covered recent advances in Afrotropical hover fly taxonomy and systematics. Additionally, we showcased two posters: one detailing the DIPoDIP2 project (bottom left) and another focusing on the taxonomy of the hover fly genus *Afroxanthandrus*. The paper revising the genus *Afroxanthandrus* will soon be published in the European Journal of Taxonomy.

Mandisa Ndlela presenting during ISS12 on the first record of the female of the hover fly *Mesembrius ingratus*. © KMMA.

A visit to the National Collection of Insects in Pretoria

John Midgley & Genevieve Theron

"Insects are the unsung heroes of agriculture, silently pollinating the fields that feed the world." - Alison Benjamin

On the 20th - 24th of May 2024 John Midgley visited the National Collection of Insects that is housed in Pretoria at the Agricultural Research Councils' Biosystematics Division. This ~ 140 year old collection serves as a significant reference collection for insects found in areas used for agricultural purposes as well as in natural habitats. This collection houses over 2000 type specimens, many of which were described by Dr. H.K. Munro, a leading fruit fly taxonomist of his time.

The main purpose of this visit was to confirm the identifications of all the Syrphidae specimens in the collection. It was especially important to make sure the IDs of the specimens with associated pupa were correct so that they can be used for an upcoming project at the University of Pretoria. The IDs of all 24 drawers of syrphids were confirmed and ready for further study. Even though it was John's second visit in three years, there were still some surprises as the collection is constantly being sorted out and added to.

The DIPoDIP2 project is not limited to Syrphidae, and a second reason for the visit was a collaborative project on *Africaterphis* (Acroceridae), describing one new species for a gedenkschrift honouring the late Prof Stefan Foord. This manuscript has just been submitted and the gedenkschrift is due to be published in December 2024.

Halfway through the visit, we took some time to meet with Catherine Sole, another DIPoDIP2 partner at the University of Pretoria, to discuss potential student projects for the upcoming year. Apart from the projects at the end of the newsletter, we also discussed a variety of projects to feed into the greater goals of DIPoDIP2.

John and Genevieve in the ARC-PHP National Collection of Insects, Pretoria, examining syrphid drawers.

A section of the Syrphidae collection at the Agricultural Research Council, Biosystematics unit, which was the main focus of the visit

Study visit to the Natural History Museum of Dijon, France

John Midgley & Kurt Jordaens

Dijon, France, boasts a rich architectural heritage, showcasing styles from significant periods of the past millennium, including Capetian, Gothic, and Renaissance. Many of the townhouses in the city's central district, some still inhabited, date back to the 18th century and earlier.

The city's Natural History Museum (Muséum d'Histoire Naturelle) (MHND), founded in 1836, is situated in the picturesque Arquebuse park, adjacent to the Hubert Curien Planetarium and the Botanical Garden. Our recent trip to explore a hidden collection of hover flies was prompted by Gabriel Nève from the Institut Méditerranéen de Biodiversité et d'Ecologie marine et continentale (IMBE), who informed us about an overlooked collection from Pointel. This collection, containing approximately 1,200 hover fly (Syrphidae) specimens from the Afrotropical Region, was reason enough for a visit which took place from 16-18 September 2024.

Stéphane Puissant is the only scientist enrolled at the Natural History Museum of Dijon, he is a taxonomic expert of cicades © KMMA.

From left to right: Monique Prost (former researcher at the MHND), Stéphane Puissant (current scientist at the MHND), John Midgley (KZNM), and Kurt Jordaens (AfricaMuseum)..© KMMA.

During our visit to the Pointel collection, we were assisted by Stéphane Puissant, the only researcher affiliated with the museum. Stéphane is a taxonomic expert on cicadas but has an exceptionally deep knowledge of the history of the collections.

He also gave us a very interesting tour of the collections 'behind the scenes.' It's a shame that these collections are so poorly known among taxonomists, as they include specimens from often remote and difficult-to-access areas.

Furthermore, we were assisted by Monique Prost, a retired researcher who still spends a lot of time maintaining the collections. Stéphane and Monique, thank you very much for the warm welcome and the kind support!

During our short visit, we were able to identify all 1,200 hover flies down to the genus level. This resulted in some very pleasant discoveries, including several specimens of species of the genus *Spheginobaccha*, of which only one sex had been known until now! Furthermore, the collection contains material from Afrotropical countries that are significantly under-sampled, and these data serve as a valuable resource for our catalogue of Afrotropical hover flies that we are currently finalizing.

This collection certainly deserves more attention from taxonomists, and we will definitely return to study the material further.

One of the six drawers with Afrotropical hover flies from the Pointel collection at the MHND. © KMMA.

Congress announcement: XXVIII International Congress of Entomology

About the DIPoDIP and DIPoDIP2 projects

The “Diversity of pollinating Diptera in South African biodiversity hotspots” project (DIPoDIP) was a five year project (2019-2023) financed by the Belgian Directorate-general Development Cooperation and Humanitarian Aid through a framework agreement with KMMA. It is a collaboration between the University of KwaZulu-Natal (UKZN), the KwaZulu-Natal Museum (KZNM), Stellenbosch University (SU), the South African National Biodiversity Institute (SANBI), and the Royal Museum for Central Africa (click on the logos for more information). It will be continued as the “Diversity of pollinating Diptera in Afrotropical biodiversity hotspots“ (DIPoDIP2) project in the following five years (2024-2028) and will have additional partners from Burundi and Rwanda. Read more on the project in the forthcoming PINDIP *Newsletters* and on our Facebook page!
https://www.facebook.com/pollinatingdiptera/

DIP-DIP

Diversity of pollinating Diptera in the Afrotropical Region

On the following pages you will find our newest policy brief in English. The policy brief in French and Portuguese are available upon request. At the end you will find the call for the DIPoDIP scholarships.



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

By: John Midgley (KZNM), Pia Addison (SU), Venuste Nsengimana (UR), Eugène Sinzinkayo (OBPE), Ramadhani Majubwa (SUA), Allan Ellis (SU), Domingos Cugala (EMU), Catherine Sole (UP), Sija Kabota (SUA), Massimiliano Virgilio (RMCA), Marc De Meyer (RMCA), Ella Bert (RMCA), Eva November (RMCA), Kurt Jordaens (RMCA), Muriel Van Nuffel (RMCA)

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:

© RMCA

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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Contact

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

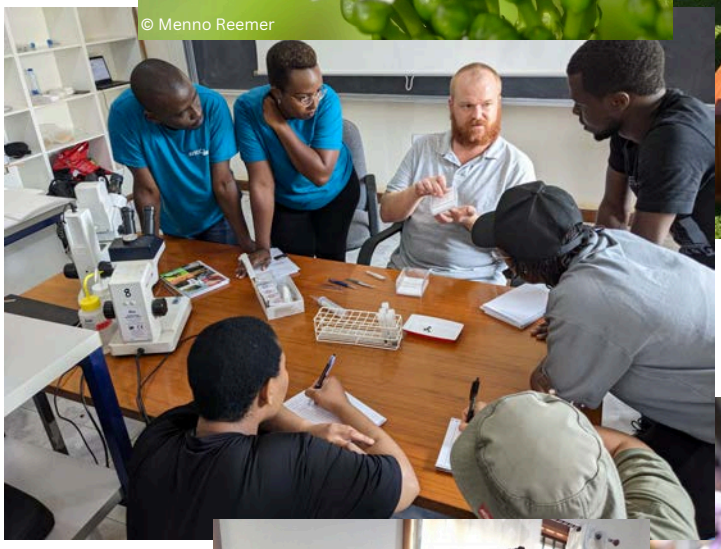
Stay informed

Partners

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.

Belgium
partner in development



Opportunités de bourses de doctorat et de master dans le cadre de DIPoDIP2 au Burundi: La diversité des Diptères pollinisateurs dans les Hotspots de biodiversité afrotropicaux

Le projet DIPoDIP2 (du 1er avril 2024 au 31 mars 2029) est la continuation du projet DIPoDIP (2019–2024) et résulte d'un accord-cadre en partenariat avec la Direction générale de la Coopération au développement et de l'Aide humanitaire (DGD) en Belgique et l'AfricaMuseum (Musée Royal de l'Afrique Centrale ; MRAC) à Tervuren, Belgique. Le projet DIPoDIP2 propose une bourse de doctorat (3 ans) et une bourse de master (2 ans) à partir de 2025 au Burundi.

L'objectif général du projet DIPoDIP2 est le développement d'activités de recherche et la promotion d'activités de formation et d'éducation, en partenariat (entre autres) avec l'Office Burundais pour la Protection de l'Environnement (OBPE) du Burundi. Le projet DIPoDIP2 étudiera la biodiversité des familles de mouches bénéfiques (Diptères pollinisatrices) dans les Hotspots de biodiversité de la Région Afrotropicale (RA). Le projet améliorera la taxonomie et l'identification de ces familles et fournira des données de base sur leur répartition et leur écologie (pollinisation). Cela sera accompli par la formation d'entomologistes, de conservateurs et de fonctionnaires de la RA, y compris des doctorants et des étudiants en master des partenaires du projet, ainsi que par des recherches conjointes. Des ateliers avec les partenaires locaux et les parties prenantes traduiront les résultats en politiques, science citoyenne et éducation. Cela aboutira à des évaluations de la Liste rouge et à des stratégies de conservation améliorées pour la biodiversité des Diptères dans la RA, tandis que des activités de science citoyenne et d'éducation sensibiliseront à l'importance des Diptères dans la pollinisation, la sécurité alimentaire et la conservation de la nature.

Nous proposons les bourses suivantes pour doctorat et master : (Si vous souhaitez obtenir de plus amples informations sur cette opportunité, veuillez nous contacter par e-mail) :

Référence: PhD-1-DIPoDIP2

Titre: Étude phénologique et structure des populations de Syrphidae en zone anthropisée de la région de Mumirwa (commune Isare) au Burundi.

Institut d'accueil : Office Burundais pour la Protection de l'Environnement (OBPE) en collaboration avec l'Université du Burundi, promoteurs principal de thèse : Professeur Nduwarugira Deogratias et Dr Kurt Jordaens

Description du projet :

L'Objectif global de cette thèse est d'évaluer l'influence des perturbations anthropiques et des variations saisonnières sur la diversité et abondance spécifique des mouches à fleurs (Diptera : Syrphidae).

Les objectifs spécifiques seront:

- Inventorier les espèces de Syrphidae présentes dans la zone d'étude et compiler une 'check list' des mouches à fleurs de Burundi.
- Comparer la diversité spécifique des Syrphidae dans des zones soumises à différents niveaux d'activités anthropiques.
- Analyser la variation saisonnière de la diversité des Syrphidae.
- Identifier les plantes hôtes des Syrphidae et décrire les interactions mouches à fleurs et plantes hôtes.
- Finaliser un 'Red List' des Syrphidae de Burundi.

La méthodologie adoptée pour la réalisation de cette étude comprend une revue de la littérature existante sur le sujet, la collecte d'échantillons de Syrphidae dans des sites présentant différents degrés d'anthropisation, tout au long de l'année, et une analyse statistiques des données scientifiques. L'écologie de base de plusieurs espèces sera étudiée. Les outils de recherche incluront la microscopie, la modélisation de la répartition des espèces, les évaluations de la Liste rouge et les techniques moléculaires (isolement de l'ADN, PCR, séquençage de l'ADN), y compris l'analyse statistique des données de séquences d'ADN.

Référence: MSc-1-DIPoDIP2

Titre: Le rôle des vraies mouches (Insecta : Diptera) dans la pollinisation du haricot et de l'avovat au Burundi

Institut d'accueil : Office Burundais pour la Protection de l'Environnement (OBPE) en collaboration avec l'Université du Burundi, promoteur principal du Mémoire de Master : Professeur Nduwarugira Déogratias ; co-promoteurs : Mr Ndayikeza Longin, Mr Eugène Sinzinkayo, Dr Kurt Jordaens

Description du projet : Les plantations de haricot et d'avocat sont parmi les principales formes d'utilisation des terres au Burundi, et ces deux cultures jouent un rôle important dans la sécurité alimentaire et représentent des sources de revenus essentielles pour le pays. Cependant, l'écologie de la pollinisation du haricot et de l'avocat au Burundi est encore mal comprise, et l'impact de ces plantations sur la biodiversité des insectes, en particulier celle des diptères pollinisateurs (vraies mouches), n'est pas bien documenté. L'objectif principal de cette étude est de comparer la diversité et l'abondance des vraies mouches dans les plantations de haricot et

d’avocat au Burundi, et d’examiner les interactions plantes-pollinisateurs dans ces cultures économiquement importantes. La recherche inclura un travail de terrain, avec l’échantillonnage des vraies mouches dans les plantations, ainsi que l’identification des visiteurs floraux du haricot et de l’avocat , afin de reconstruire les réseaux plantes-pollinisateurs.

Cadre d'accueil

- Le projet DIPoDIP2 est dirigé par le Dr Kurt Jordaens, chef d'équipe à l'Unité des invertébrés du Département de biologie de l'AfricaMuseum.
- Les bourses sont gérées et supervisées par Monsieur Ndayikeza Longin, M.Sc. à l’OBPE et Professeur Nduwarugira Déogratias de l’Université du Burundi, et le Dr Kurt Jordaens (AfricaMuseum), dans le cadre d'un protocole d'entente (MoU) et d'accords annuels entre l'AfricaMuseum et l’OBPE. - Pour le doctorant, une session de formation d'un mois en entomologie et biologie moléculaire est prévu dans la section des invertébrés de l'AfricaMuseum au cours de la première année de la thèse.

<u>Conditions de recherche pour le doctorat, éligibilité et profil cible</u>

Conditions de recherche :

Le doctorat sera financé pour une durée de 3 ans à partir du premier trimestre 2025. La thèse sera menée en mode "local", le chercheur passera toute la durée du projet à l'institution partenaire au Burundi, avec un stage d'un mois à l'AfricaMuseum en Belgique au cours de la première année du doctorat.

Critères d'éligibilité :

- Le candidat doit être titulaire d'un diplôme universitaire de deuxième cycle reconnu (niveau Master) dans un domaine pertinent (ex : Entomologie, Zoologie, Écologie, Botanique, Sciences de l’environnement ou de la biodiversité, Agriculture) ou d'une qualification équivalente donnant accès à la recherche doctorale, de préférence avec une solide formation en entomologie.
- Les candidatures des étudiants en dernière année de programme de master seront également acceptées si l'obtention du diplôme de Master est prévue avant le début du projet (janvier-mars 2025).
- Le candidat doit être citoyen d'un des pays suivants : Afrique du Sud, Bénin, Burundi, Kenya , Mozambique, Ouganda, RD Congo, Rwanda , Sénégal ou Tanzanie.
- Le candidat doit être âgé de moins de 45 ans au 1er septembre 2024.

- Les institutions d'accueil s'engagent à promouvoir l'égalité, l'équité en matière d'emploi et la diversité.
- Tous les candidats remplissant les conditions requises pour le poste sont invités à postuler.
- L'institution d'accueil se réserve le droit de ne pas pourvoir les postes annoncés.

Profil Cible :

- Le candidat ou la candidate doit avoir une excellente maîtrise du français, tant à l'oral qu'à l'écrit.
- Il/Elle doit être fortement motivé pour entreprendre des recherches académiques dans un contexte international.
- Il/Elle doit être capable de gérer un projet de manière indépendante, de prendre des initiatives et de respecter les délais.
- Il/Elle doit faire preuve de créativité, notamment face aux éventuels problèmes rencontrés durant la recherche.
- Il/Elle doit être collaboratif et disposé à partager les résultats de son travail au profit du projet et de la communauté scientifique en général.
- Il/Elle doit être sincère, honnête et prêt à respecter l'éthique de la recherche (assurer la confidentialité, le respect de la propriété intellectuelle, etc.).
- Il/Elle doit posséder d'excellentes compétences personnelles et de bonnes capacités d'organisation, avec une attention aux détails pour interagir avec les autres partenaires et parties prenantes du projet.
- Les candidats doivent être prêts et disposés à mener des travaux de terrain pendant des périodes prolongées, parfois dans des conditions logistiques et climatiques difficiles.
- Il/Elle doit démontrer de solides compétences analytiques et rédactionnelles.
- Il/Elle doit être capable de séjourner en Belgique pendant un mois au cours de la première année du doctorat.
- Une bonne connaissance de la zoologie (en particulier en entomologie générale ou dans l'identification des Diptères afrotropicaux) est un atout important.
- La familiarité avec les conditions de travail sur le terrain au Burundi et avec les différents systèmes d'étude est souhaitable.
- L'obtention d'un master avec distinction est un avantage.
- L'auteur de publications scientifiques est un atout.
- Avoir mené une étude sur les diptères pollinisatrices dans le cadre du mémoire de Master constitue un avantage
- Une bonne connaissance de l’anglais, tant à l'oral qu'à l'écrit, est un atout très important.

Conditions de recherche pour le MSc, critères d'éligibilité et profil cible

Conditions de recherche

Le MSc sera financé pour une durée de 2 ans durant la période du projet. - Le mémoire de Master sera réalisé en mode "local", ce qui signifie que le chercheur passera la durée du projet à l'institution partenaire au Burundi, où il sera affilié.

Le candidat sera soumis aux règlements de l'institution d'accueil au Burundi, ce qui inclut le suivi de ses progrès par ses superviseurs burundais et belges. Les superviseurs se rencontreront plusieurs fois par an et fourniront des conseils contraignants. Un manque de progrès entraînera la cessation immédiate du financement.

Critères d'éligibilité

- Le candidat doit être titulaire d'un diplôme de licence ou baccalauréat avec mention distinction ou d'une qualification équivalente, de préférence avec une solide formation en entomologie.
- Le candidat doit être de nationalité burundaise.
- Pendant la formation de Master, le candidat doit être affilié à une institution académique ou de recherche partenaire de DIPoDIP2.
- Sauf exceptions dûment justifiées, le candidat doit avoir moins de 40 ans au 1er septembre 2024.
- Tous les candidats remplissant les conditions requises sont invités à postuler.
- L'institution d'accueil se réserve le droit de ne pas pourvoir les postes annoncés.

Profil cible

- Le candidat doit avoir un diplôme de licence ou baccalauréat avec mention distinction ou équivalent.
- Il doit avoir une excellente maîtrise du français, tant à l'oral qu'à l'écrit.
- Il doit être fortement motivé pour entreprendre des recherches académiques dans un contexte international.
- Il doit faire preuve de créativité, notamment face aux éventuels problèmes rencontrés pendant la recherche.
- Il doit être collaboratif et disposé à partager les résultats de son travail au bénéfice du projet et de la communauté scientifique en général.
- Il doit être sincère, honnête et prêt à respecter l'éthique de la recherche (assurer la confidentialité, le respect de la propriété intellectuelle, etc.).

- Il doit posséder d'excellentes compétences personnelles et organisationnelles, avec une attention particulière aux détails pour interagir avec les autres partenaires et parties prenantes du projet.
- Il doit avoir une bonne aptitude pour le travail de terrain.
- Les candidats doivent être capables et disposés à mener des travaux de terrain pendant des périodes prolongées, parfois dans des conditions logistiques et climatiques difficiles.
- Il doit démontrer de solides compétences analytiques et rédactionnelles.
- Une bonne connaissance de la zoologie (en particulier en entomologie générale ou dans l'identification des Diptères afrotropicaux) est un atout important.
- La familiarité avec les conditions de travail sur le terrain au Burundi est souhaitable.

Procédure de soumission des candidatures pour les bourses de de doctorat et de MSc

La date limite de soumission des candidatures est fixée au **15 Novembre** 2024.

Le dossier de candidature doit comprendre :

- Une lettre de motivation (maximum 1 page) indiquant quel projet est préféré et comment celui-ci s'aligne sur les objectifs professionnels ou académiques du candidat.
- Un curriculum vitae détaillé (maximum 2 pages), incluant une liste des publications (le cas échéant).
- Des copies certifiées des diplômes et relevés de notes universitaires.
- Une lettre de recommandation d'au moins un référent (membre du personnel académique de l'institution scientifique d'origine du candidat et de l'institution partenaire du projet).
- Pour les candidats au doctorat : un résumé du mémoire de master final et, si possible, une copie (PDF) du mémoire.
- Une copie (PDF) des publications clés (le cas échéant).
- Tout autre document témoignant les qualités ci-haut citées

Le dossier de candidature doit être envoyé sous la forme d'un seul fichier PDF portant le nom du candidat et envoyé simultanément à deux destinataires :

- Dr Kurt Jordaens, promoteur du projet DIPoDIP (AfricaMuseum) (kurt.jordaens@africamuseum.be)
- Monsieur Longin Ndayikeza à l'OBPE (ndayilkeza2009@gmail.com)

Funded PhD and MSc scholarship opportunities in South Africa on

DIPoDIP2: The Diversity of Pollinating Diptera in Afrotropical Biodiversity Hotspots

The DIPoDIP2 project (from April 1, 2024, to March 31, 2029) is the continuation of the DIPoDIP project (2019–2024) and is the result of a framework agreement in partnership with the Directorate-General for Development Cooperation and Humanitarian Aid (DGD) in Belgium and the AfricaMuseum (Royal Museum for Central Africa; RMCA) in Tervuren, Belgium. The DIPoDIP2 project offers **three PhD scholarships** (3 years, R200000 per year) and **three MSc scholarships** (2 years, R180000 per year) starting in 2025 in the Republic of South Africa.

The overall objective of the DIPoDIP2 project is the development of research activities and the promotion of training and educational activities, in partnership (among others) with Stellenbosch University (SU), the University of Pretoria (UP), and the KwaZulu-Natal Museum (KZNM).

The DIPoDIP2 project will study the biodiversity of true fly families (Diptera) in Biodiversity Hotspots of the Afrotropical Region (AR). The project will improve the taxonomy and identification of these families and provide basic data on their distribution and (pollination) ecology. This will be achieved through training of entomologists, conservationists and officials from the AR, including PhD and MSc students of the project partners, as well as joint research. Workshops with local partners and stakeholders will translate the results for policy making, Citizen Science and education. This will result in Red List assessments and improved conservation strategies for Diptera biodiversity in the AR, and Citizen Science and education activities will raise awareness on the importance of Diptera in pollination, food security and nature conservation.

We offer the following PhD and MSc scholarships (If you require further information about this opportunity, please contact us via the email addresses on the last page):

Reference: PhD-1-DIPoDIP2

Title: Taxonomic revision, biogeography and distribution modeling of the hover fly genus *Monoceromyia* (Syrphidae, Eristalinae) (host institute: KZNM, registered at UP, primary supervisor: Dr John Midgley)

Project description: The primary goal of taxonomy is to identify, describe, name, and classify all living organisms. It plays a central role in understanding biodiversity and serves as a foundation for many scientific disciplines, including the conservation of Earth's biodiversity. However, the taxonomy of many animal groups remains unclear, particularly in the case of two-winged insects (Diptera) in the Afrotropical Region. A notable example is the family Syrphidae (hoverflies or flower flies), which includes over 650 species in this region, many of which are frequently found on flowers. As such, they may represent an important group of pollinators, contributing to food security and the rich diversity of flowering plants in South Africa. Unfortunately, our understanding of the ecology of these species is limited, primarily due to the difficulty in identifying them. Existing identification keys are either outdated or unavailable. This PhD project aims to revise the taxonomy of the Afrotropical representatives of the wasp-mimicking genus, *Monoceromyia*. This is an enigmatic genus of hover flies since the larvae develop in sap streams of trees where they feed on the bacteria. The taxonomic revision will be the basis for further research in the PhD, focusing on the ecology, distribution and systematics of *Monoceromyia*.

More specifically, the PhD research will involve

- a comprehensive morphological taxonomic revision of the genus;
- the testing of DNA barcoding as a tool for species identification;
- the reconstruction of the phylogeny and biogeography of the genus in the Afrotropical Region;
- the production of an updated identification key for the Afrotropical species; and
- an assessment of the conservation status of the genus by compiling a Red List for the Afrotropical Region.

New material will be collected in South Africa, and the basic ecology of several species will be studied. The research tools will include microscopy, species distribution modelling, Red List assessments, and molecular techniques (DNA isolation, PCR, DNA sequencing), including the statistical analysis of DNA sequence data.

Reference: PhD-2-DIPoDIP2

Title: Taxonomic revision, biogeography and distribution modeling of the nose fly genus *Rhyncomyia* (Calliphoridae, Rhiniinae) (host institute: KZNM, registered at UP, primary supervisor: Dr John Midgley)

Project description: Rhiniinae, or nose flies, are a subfamily of blow flies (Diptera: Calliphoridae). Globally, there are approximately 50 genera and around 370 species. About 160 valid species in 16 genera are found in the Afrotropical region, with over 60 of these species occurring in South Africa. The taxonomy of this group is outdated, as most studies of the South African taxa were conducted 40 to 70 years ago. Although an annotated checklist of species for South Africa has been developed, many of these species remain challenging to identify. This is unfortunate because many nose flies can be found on flowers, suggesting they may represent an important, yet understudied, group of flies. Moreover, many species seem to be associated with termites but basic data on their life-cycle and ecology are missing. This project aims to enhance the taxonomy of one of the nose flies genera in the Afrotropical Region, facilitating more accurate identification of these species. Consequently, this PhD will improve the study of plant-pollinator networks.

This PhD project aims to revise the taxonomy of the Afrotropical representatives of the genus *Rhyncomyia*. More specifically, the research will involve

- a comprehensive morphological taxonomic revision of the genus;
- the testing of DNA barcoding as a tool for species identification;
- the reconstruction of the phylogeny and biogeography of the genus in the Afrotropical Region;
- the production of an updated identification key for the Afrotropical species; and
- an assessment of the conservation status of the genus by compiling a Red List for the Afrotropical Region.

New material will be collected in South Africa, and routes to study the ecology of species in this genus will be explored. The research tools will include microscopy, species distribution modelling, Red List assessments, and molecular techniques (DNA isolation, PCR, DNA sequencing), including the statistical analysis of DNA sequence data.

Reference: PhD-3-DIPoDIP2

Title: The influence of visual system evolution in fly pollinators on flower visiting behaviour and floral evolution in Cape daisies (host institute: SU, primary supervisor: Prof. Allan Ellis)

Project description: Cape daisies are unusual globally in frequently exhibiting complex flower colour patterns and unusual three-dimensional glossy appendages on the ray or disk florets. These floral markings are thought to have evolved in response to selection imposed by aggregation and mating responses of flies and beetles, the most important pollinating groups. Interestingly, our observations suggest that the bee fly and horse fly species associated with the most elaborately marked flowers have unusual eye structures marked by a loss of facet dimorphism in males, a trait that is associated with female detection and mating in many fly groups. This project will use comparative phylogenetic approaches to investigate the timing and pattern of evolution of eye structure across relevant fly lineages in relation to the evolution of floral markings. Field observations and experimentation will be used to understand the influence of eye structure evolution on mating and flower visiting behaviour in the flies and the patterns of selection they impose on floral evolution.

Reference: MSc-1-DIPoDIP2

Title: Taxonomic revision of the hover fly genus *Metadon* (Syrphidae, Microdontinae) (host institute: KZNM, registered at UP, primary supervisor: Dr John Midgley)

Project description: Microdontinae is a subfamily within the Syrphidae family, commonly known as hover flies or flower flies. Hover flies in the Afrotropical Region include over 650 species, many of which are frequently found on flowers, making them potentially important pollinators. However, species in the Microdontinae subfamily are unique in that their adult forms have reduced mouthparts, suggesting they may not feed at all. As a result, these species are not typically associated with flowers. Interestingly, the larvae of Microdontinae exhibit a close relationship with ants, with females laying eggs in or near ant nests. This suggests that the larvae may feed on ant larvae, the food stores within the colony, or possibly even on waste products or bacteria present in the nests. Before we can fully explore this fascinating ecological relationship, it is essential to refine the taxonomy of this subfamily to accurately identify species. This MSc project focuses on revising the taxonomy of *Metadon*, a genus within Microdontinae. The research will encompass a comprehensive morphological and molecular taxonomic study, including DNA barcoding, and will result in the creation of an identification key for species of this genus in the Afrotropical Region. The study will utilize various research tools, including microscopy, DNA isolation, PCR, DNA sequencing, and statistical analysis of DNA barcode data.

Reference: MSc-2-DIPoDIP2

Title: Geographical variation in true fly (Insecta: Diptera) diversity and abundance in backyards across South Africa (host institute: UP, primary supervisor: Prof. Catherine Sole)

Project description:

Most long-term studies on insect biodiversity and information regarding insect declines exists for the Global North, however, only anecdotal evidence of this trend is apparent in Southern Africa. Urbanisation has been one of the leading causes of habitat loss and consequently biodiversity loss for insects. However, losses in biodiversity can be counteracted by providing refugia and microhabitats within the urban environment. Insects are crucial members of ecosystems, thus their presence in our built-up environments serves as a great indication of the quality of the environment and surrounding biodiversity. This study will be a comparative study assessing pollinating Diptera diversity across three locations in South Africa (Future Africa UP campus biodiversity gardens, gardens in KwaZulu-Natal that have both natural vegetation; and ornamental and commercial plants; and the Ingcungcu sunbird restoration project Western Cape Province.

The student will be required to identify the fly species, DNA barcode them, determine degree of biodiversity and statistically analyse the data (i.e. species richness and abundance).

Reference: MSc-3-DIPoDIP2

Title: Diversity and ecology of horse-fly pollinators (*Rhigioglossa*, Tabanidae) in the Cape (host institute: SU, primary supervisor: Prof. Allan Ellis)

Project description: Horse flies in the genus *Rhigioglossa* are frequent visitors on daisy mass flowering displays in the winter rainfall regions of South Africa. They are likely important pollinators, critical to maintenance of this economically and ecologically important biodiversity spectacle in the Western and Northern Cape provinces. Despite their potential importance we know little about their diversity, distributions and contribution to pollination. This project will focus on *Rhigioglossa* subgenus *Rhigioglossa*, which contains the most important pollinating species. The student will employ molecular (barcoding), morphological and distributional data to evaluate the diversity in the group, and establish relationships between species. In addition a combination of field-based observations and experiments, and literature surveys, will be used to investigate the pollination interactions of these flies.

Host Framework

- The DIPoDIP2 project is managed by Dr Kurt Jordaens, work leader in the Invertebrates Unit of the Department of Biology of the AfricaMuseum.
- The scholarships are managed, and supervised, by Prof. Allan Ellis, professor at the Botany and Zoology Department at Stellenbosch University (SU), Prof. Catherine Sole, principal investigator at the Department of Zoology and Entomology of the University of Pretoria (UP), Dr John Midgley, Assistant Director, Natural Science at the KwaZulu-Natal Museum, and Dr Kurt Jordaens (AfricaMuseum), under the framework of a Memorandum of Understanding (MoU) and annual agreements between the AfricaMuseum, SU, UP, and KZNM.
- The PhD/MSc candidate/s will conduct fieldwork in South Africa and will be based at the KwaZulu-Natal Museum (**PhD-1-DIPoDIP2, MSc-1-DIPoDIP2**), the University of Pretoria (**PhD-2-DIPoDIP2, MSc-2-DIPoDIP2**), or Stellenbosch University (**PhD-3-DIPoDIP2, MSc-3-DIPoDIP2**), with regular short exchanges among the three institutions.
- For the PhD candidates, a one-month training session in entomology and molecular biology is foreseen at the Invertebrates Section of the AfricaMuseum during the first year of the PhD.

Finally, the candidate will contribute to forming a growing team of young entomologists trained by the project to identify Afrotropical Diptera. They will become part of a team that will strongly interact with Citizen Scientists who submit pictures for identification requests on iNaturalist.

PhD research conditions, eligibility, and target profile

Research conditions

The three PhDs will be funded at R200.000 per year for a period of 3 years starting in the first quarter of 2025.

The dissertation will be conducted in a "local" mode, whereby the researcher will spend the duration of the project at the partner institution in South Africa, where they are affiliated, with a one-month internship at the AfricaMuseum in Belgium during the first year of the PhD.

The candidate will be subject to the regulations of the host institution in South Africa, which includes monitoring their progress by their South African and Belgian supervisors. Supervisors will meet with students several times a year and provide binding advice. A condition of the scholarships is that candidates need to demonstrate adequate progress to the satisfaction of the advisory team after 12 months of registration. Lack of progress will result in immediate termination of funding.

The selected candidate will work in collaboration with the other PhD/MSc candidates selected under the DIPoDIP2 project, as well as with various northern and southern partners (e.g.,

technicians) involved in the DIPoDIP2 project and other projects conducted by the AfricaMuseum and its collaborators.

Eligibility Criteria

- The candidate must hold a recognized second-cycle university degree (Master's level) in a relevant field (*e.g.*; Entomology, Zoology, Ecology, Botany, Biodiversity Science, Agriculture) or an equivalent qualification granting access to doctoral research, preferably with a strong background in entomology.
- Applications from students in their final year of a Master's program will also be accepted if they can demonstrate that the MSc degree will be completed before a Jan-March 2025 start date.
- The candidate must hold citizenship from one of the following countries: South Africa, Bénin, Burundi, Kenya, Mozambique, Uganda, DR Congo, Rwanda, Sénégal, or Tanzania.
- The candidate must be under 45 years of age as of September 1, 2024.
- The host institutions are committed to equality, employment equity and diversity.
- In accordance with the Employment Equity Plan of the University and its Employment Equity goals and targets, preference may be given, but is not limited to candidates from under-represented designated groups.
- All candidates who comply with the requirements for appointment are invited to apply.
- The host institution reserves the right not to fill the advertised positions.

Target Profile

- The candidate must have a strong command of spoken and written English.
- Must be highly motivated to undertake academic research in an international context.
- Must be able to manage a project independently, take initiative, and meet deadlines.
- Must demonstrate creativity, particularly when facing potential problems during research.
- Must be collaborative and willing to share the results of their work for the benefit of the project and the scientific community in general.
- Must be sincere, honest, and willing to adhere to research ethics (ensuring respect for confidentiality, intellectual property, etc.).
- Must have excellent personal skills and good organizational skills, with attention to detail to interact with other partners and stakeholders of the project.
- Candidates must be able and willing to conduct fieldwork for extended periods, sometimes under challenging logistical and climatic conditions.
- Must demonstrate strong analytical and writing skills.
- The candidate should be capable of independently conducting phylogenetic analyses (in R or specific software).
- Must be able to stay in Belgium for one month during the first year of the PhD.

- A good knowledge of zoology (especially on general entomology or on the identification of Afrotropical Diptera) is a significant asset.
- Familiarity with field work conditions in South Africa and with the various study systems is desirable.
- Attainment of the MSc with distinction is an advantage
- Authorship of scientific publications is an advantage
- Possession of a valid drivers license is an advantage

MSc research conditions, eligibility, and target profile

Research conditions

The three MSc's will be funded at R180.000 per year for a period of 2 years during the project period. The thesis will be conducted in a "local" mode, whereby the researcher will spend the project duration at the partner institution in South Africa, where they are affiliated.

The candidate will be subject to the regulations of the host institution in South Africa, which includes monitoring their progress by their South African and Belgian supervisors. Supervisors will meet several times a year and provide binding advice. Lack of progress will result in immediate termination of funding.

Eligibility Criteria

- The candidate must hold an Honours degree or an equivalent qualification preferably, with a strong background in entomology.
- The candidate must be of South African nationality.
- During the MSc, the candidate must be affiliated with an academic or research institution that is a partner of DIPoDIP2.
- Except for duly justified exceptions, the candidate must be under 45 years of age as of September 1, 2024; candidates over 50 years of age on that date will not be considered.
- The host institutions are committed to equality, employment equity and diversity. In accordance with the Employment Equity Plan of the University and its Employment Equity goals and targets, preference may be given, but is not limited to candidates from under-represented designated groups.
- All candidates who comply with the requirements for appointment are invited to apply.
- The host institution reserves the right not to fill the advertised positions.

Target Profile

- The candidate must have a BSc Honours degree or equivalent.

- Must have a strong command of spoken and written English.
- Must be highly motivated to undertake academic research in an international context.
- Must be able to manage a project independently, take initiatives, and meet deadlines.
- Must demonstrate creativity, particularly when facing potential problems during research.
- Must be collaborative and willing to share the results of their work for the benefit of the project and the scientific community in general.
- Must be sincere, honest, and willing to adhere to research ethics (ensuring respect for confidentiality, intellectual property, etc.).
- Must have excellent personal skills and good organizational skills, with attention to detail to interact with other partners and stakeholders of the project.
- Must have good aptitude for fieldwork.
- Candidates must be able and willing to conduct fieldwork for extended periods, sometimes under challenging logistical and climatic conditions.
- Must demonstrate strong analytical and writing skills.
- A good knowledge of zoology (especially on general entomology or on the identification of Afrotropical Diptera) is a significant asset.
- Familiarity with field working conditions South Africa is desirable.
- Drivers license is an advantage.
- Honours with distinction is an advantage.

Application Submission Procedure for MSc and PhD scholarships

The deadline for submitting applications is **November 1, 2024**. The application file must include:

- A motivation letter (maximum 1 page). The letter should indicate which of the available projects is preferred and how the project aligns with the candidate's professional or academic career plans.
- A detailed curriculum vitae (maximum 2 pages), including a list of publications (if relevant).
- Certified copies of degrees and university transcripts.
- The names and email addresses of two referees (academic staff from the candidate's home scientific institution) and a letter of recommendation from at least one of them.
- For PhD candidates: A summary of the final MSc thesis, and, if possible, a copy (PDF) of the thesis.
- A copy (PDF) of key publications (if relevant).

The application file should be sent as a single PDF file named after the candidate and emailed to four recipients simultaneously:

- Dr Kurt Jordaens, project promoter for DIPoDIP (AfricaMuseum) (kurt.jordaens@africamuseum.be)
- Prof. Allan Ellis, local co-promotor of the DIPoDIP2 project and professor at Stellenbosch University (SU) (agellis@sun.ac.za)
- Prof. Catherine Sole, local co-promotor of the DIPoDIP2 project and professor at the University of Pretoria (UP) (catherine.sole@up.ac.za)
- Dr John Midgley, local co-promotor of the DIPoDIP2 project and Assistant Director, Natural Science at the KwaZulu-Natal Museum (KZNM) (jmidgley@nmsa.org.za)

Selection procedure

- A preliminary selection will be carried out in partnership with the relevant partner institution(s) based on the application files.
- Candidates shortlisted for an interview will be informed by the first of December 2024, at the latest; the nature and location of the interviews will be communicated on the same date.
- Interviews will take place during December 2024.
- Candidates will receive a response shortly after the interviews, following deliberations with the various southern and northern supervisors.
- The PhD and MSc positions will start in the first quarter of 2025.

(Version française ci-dessous – French version below)

MSc scholarship opportunities on

DIPoDIP2: The Diversity of Pollinating Diptera in Afrotropical Biodiversity Hotspots

The DIPoDIP2 project (from April 1, 2024, to March 31, 2029) is the continuation of the DIPoDIP project (2019–2024) and is the result of a framework agreement in partnership with the Directorate-General for Development Cooperation and Humanitarian Aid (DGD) in Belgium and the AfricaMuseum (Royal Museum for Central Africa; RMCA) in Tervuren, Belgium. The DIPoDIP2 project offers one MSc scholarship (2 years), starting in 2025, in the Republic of Rwanda.

The overall objective of the DIPoDIP2 project is the development of research activities and the promotion of training and educational activities, in partnership (among others) with the University of Rwanda.

The DIPoDIP2 project will study the biodiversity of true fly families (Diptera) in Biodiversity Hotspots of the Afrotropical Region (AR). The project will improve the taxonomy and identification of these families and provide basic data on their distribution and (pollination) ecology. This will be achieved through training of entomologists, conservationists and officials from the AR, including PhD and MSc students of the project partners, as well as joint research. Workshops with local partners and stakeholders will translate the results for policy making, Citizen Science and education. This will result in Red List assessments and improved conservation strategies for Diptera biodiversity in the AR, where Citizen Science and education activities will raise awareness on the importance of Diptera in pollination, food security and nature conservation.

We offer one MSc scholarship at the University of Rwanda (If you require further information about this opportunity, please contact us via email):

Reference: MSc-1-DIPoDIP2-Rwanda

Title: The role of true flies (Insecta: Diptera) in coffee and banana pollination in Rwanda

host institute: University of Rwanda, primary supervisor: Dr Venuste Nsengimana; secondary supervisor: Dr Kurt Jordaens

Project description: Coffee and banana plantations are the predominant land use in Rwanda, and both crops represent key sources of income for the country. However, the pollination ecology of coffee and banana in Rwanda remains poorly understood, and the impact of these plantations on insect biodiversity—particularly that of pollinating Diptera (true flies)—is not well documented. The primary objective of this study is to compare the diversity and abundance of true flies in coffee and banana plantations across Rwanda and to investigate plant-pollinator interactions in these economically significant crops. The research will involve fieldwork, including the sampling of true flies in plantations, and the identification of flower visitors to coffee and banana plants in order to reconstruct plant-pollinator networks.

Host Framework

- The DIPoDIP2 project is managed by Dr Kurt Jordaens, work leader in the Invertebrates Unit of the Department of Biology of the AfricaMuseum.
- The scholarship is managed, and supervised, by Dr Venuste Nsengimana, senior lecturer at the University of Rwanda, and Dr Kurt Jordaens (AfricaMuseum), under the framework of a Memorandum of Understanding (MoU) and annual agreements between the AfricaMuseum and the University of Rwanda.

Finally, the candidate will contribute to forming a growing team of young entomologists trained by the project to identify Afrotropical Diptera. They will become part of a team that will strongly interact with Citizen Scientists who submit pictures for identification requests on iNaturalist.

<u>MSc research conditions, eligibility, and target profile</u>

Research conditions

The three MSc's will be funded at R180.000 per year for a period of 2 years during the project period. The thesis will be conducted in a "local" mode, whereby the researcher will spend the project duration at the partner institution in South Africa, where they are affiliated.

The candidate will be subject to the regulations of the host institution in South Africa, which includes monitoring their progress by their South African and Belgian supervisors. Supervisors

will meet several times a year and provide binding advice. Lack of progress will result in immediate termination of funding.

Eligibility Criteria

- The candidate must hold an Honours degree.
- The candidate must be of Rwandese nationality.
- During the MSc, the candidate must be affiliated with an academic or research institution that is a partner of DIPoDIP2.
- Except for duly justified exceptions, the candidate must be under 45 years of age as of September 1, 2024; candidates over 50 years of age on that date will not be considered.
- The host institutions are committed to equality, employment equity and diversity. In accordance with the Employment Equity Plan of the University and its Employment Equity goals and targets, preference may be given, but is not limited to candidates from under-represented designated groups.
- All candidates who comply with the requirements for appointment are invited to apply.
- The host institution reserves the right not to fill the advertised positions.

Target Profile

- The candidate must have a BSc Honours degree or equivalent.
- Must have a strong command of spoken and written English.
- Must be highly motivated to undertake academic research in an international context.
- Must be able to manage a project independently, take initiatives, and meet deadlines.
- Must demonstrate creativity, particularly when facing potential problems during research.
- Must be collaborative and willing to share the results of their work for the benefit of the project and the scientific community in general.
- Must be sincere, honest, and willing to adhere to research ethics (ensuring respect for confidentiality, intellectual property, etc.).
- Must have excellent personal skills and good organizational skills, with attention to detail to interact with other partners and stakeholders of the project.
- Must have good aptitude for fieldwork.
- Candidates must be able and willing to conduct fieldwork for extended periods, sometimes under challenging logistical and climatic conditions.
- Must demonstrate strong analytical and writing skills.
- A good knowledge of zoology (especially on general entomology or on the identification of Afrotropical Diptera) is a significant asset.
- Familiarity with field working conditions in Rwanda is desirable.

- Drivers license is an advantage.
- Honours with distinction is an advantage.

Application Submission Procedure for MSc scholarship

The deadline for submitting applications is **November 15, 2024**. The application file must include:

- A motivation letter (maximum 1 page). The letter should indicate which of the available projects is preferred and how the project aligns with the candidate's professional or academic career plans.
- A detailed curriculum vitae (maximum 2 pages), including a list of publications (if relevant).
- Certified copies of degrees and university transcripts.
- A letter of recommendation from at least one referee (academic staff from the candidate's home scientific institution).
- A copy (PDF) of key publications (if relevant).

The application file should be sent as a single PDF file named after the candidate and emailed to two recipients simultaneously:

- Dr Venuste Nsengimana, local co-promotor of the DIPoDIP2 project and senior lecturer at the University of Rwanda (UR) (venusteok@gmail.com)
- Dr Kurt Jordaens, project promoter for DIPoDIP (AfricaMuseum) (kurt.jordaens@africamuseum.be)

Selection procedure

- A preliminary selection will be carried out in partnership with the relevant partner institution(s) based on the application files.
- Candidates shortlisted for an interview will be informed by the first of December 2024, at the latest; the nature and location of the interviews will be communicated on the same date.
- Interviews will take place during December 2024.
- Candidates will receive a response shortly after the interviews, following deliberations with the various southern and northern supervisors.
- The MSc position will start in the first quarter of 2025.

Opportunités de bourse de master dans le cadre de DIPoDIP2 au Rwanda: La diversité des Diptères pollinisateurs dans les Hotspots de biodiversité afrotropicaux

Le projet DIPoDIP2 (du 1er avril 2024 au 31 mars 2029) est la continuation du projet DIPoDIP (2019–2024) et résulte d'un accord-cadre en partenariat avec la Direction générale de la Coopération au développement et de l'Aide humanitaire (DGD) en Belgique et l'AfricaMuseum (Musée Royal de l'Afrique Centrale ; MRAC) à Tervuren, Belgique. Le projet DIPoDIP2 propose une bourse de master (2 ans) à partir de 2025 au Rwanda.

L'objectif général du projet DIPoDIP2 est le développement d'activités de recherche et la promotion d'activités de formation et d'éducation, en partenariat (entre autres) avec l'Université du Rwanda. Le projet DIPoDIP2 étudiera la biodiversité des familles de mouches bénéfiques (Diptères pollinisatrices) dans les Hotspots de biodiversité de la Région Afrotropicale (RA). Le projet améliorera la taxonomie et l'identification de ces familles et fournira des données de base sur leur répartition et leur écologie (pollinisation). Cela sera accompli par la formation d'entomologistes, de conservateurs et de fonctionnaires de la RA, y compris des doctorants et des étudiants en master des partenaires du projet, ainsi que par des recherches conjointes. Des ateliers avec les partenaires locaux et les parties prenantes traduiront les résultats en politiques, science citoyenne et éducation. Cela aboutira à des évaluations de la Liste rouge et à des stratégies de conservation améliorées pour la biodiversité des Diptères dans la RA, tandis que des activités de science citoyenne et d'éducation sensibiliseront à l'importance des Diptères dans la pollinisation, la sécurité alimentaire et la conservation de la nature.

Nous proposons les bourses suivantes pour doctorat et master : (Si vous souhaitez obtenir de plus amples informations sur cette opportunité, veuillez nous contacter par e-mail) :

Référence: MSc-1-DIPoDIP2-Rwanda

Titre: Le rôle des vraies mouches (Insecta : Diptères) dans la pollinisation du café et du bananier au Rwanda.

Institut d'accueil : Université du Rwanda, promoteurs principal de thèse : Dr Venuste Nsengimana, co-promoteur : Dr Kurt Jordaens

Description du projet : Les plantations de café et de bananes constituent l'utilisation prédominante des terres au Rwanda, et les deux cultures représentent des sources de revenus

clés pour le pays. Cependant, l'écologie de la pollinisation du café et du bananier au Rwanda reste mal comprise, et l'impact de ces plantations sur la biodiversité des insectes – en particulier celle des diptères pollinisateurs (vraies mouches) – n'est pas bien documenté. L'objectif principal de cette étude est de comparer la diversité et l'abondance des vraies mouches dans les plantations de café et de bananes à travers le Rwanda et d'étudier les interactions plantes-pollinisateurs dans ces cultures économiquement importantes. La recherche impliquera des travaux de terrain, notamment l'échantillonnage de vraies mouches dans les plantations, et l'identification des fleurs visitant les plants de café et de bananier afin de reconstruire les réseaux plantes-pollinisateurs.

Cadre d'accueil

- Le projet DIPoDIP2 est dirigé par le Dr Kurt Jordaens, chef d'équipe à l'Unité des invertébrés du Département de biologie de l'AfricaMuseum.
- La bourse est gérée et supervisée par le Dr Venuste Nsengimana, maître de conférences à l'Université du Rwanda (UR) et le Dr Kurt Jordaens (AfricaMuseum), dans le cadre d'un protocole d'entente (MoU) et d'accords annuels entre l'AfricaMuseum et l'UR.

<u>Conditions de recherche pour le MSc, critères d'éligibilité et profil cible</u>

Conditions de recherche

La thèse sera menée en mode "local", le chercheur passera toute la durée du projet à le Centre d'excellence en Biodiversité et Gestion des Ressources naturelles/Campus Huye au Rwanda , où il sera affilié pour une durée de 2 ans.

Le candidat sera soumis aux règlements de l'institution d'accueil au Rwanda, ce qui inclut le suivi de ses progrès par ses superviseurs rwandais et belges. Les superviseurs se rencontreront plusieurs fois par an et fourniront des conseils contraignants. Un manque de progrès entraînera la cessation immédiate du financement.

Critères d'éligibilité

- Le candidat doit être titulaire d'un diplôme de licence ou baccalauréat avec mention distinction ou d'une qualification équivalente, de préférence avec une solide formation en entomologie.
- Le candidat doit être citoyen d'un des pays suivants :Rwanda.
- Pendant la formation de Master, le candidat doit être affilié à une institution académique ou de recherche partenaire de DIPoDIP2.

- Sauf exceptions dûment justifiées, le candidat doit avoir moins de 40 ans au 1er septembre 2024.
- Tous les candidats remplissant les conditions requises sont invités à postuler.
- L'institution d'accueil se réserve le droit de ne pas pourvoir les postes annoncés.

Profil cible

- Le candidat doit avoir un diplôme de licence ou baccalauréat avec mention distinction ou équivalent.
- Il/Elle doit avoir une excellente maîtrise de l'anglais, tant à l'oral qu'à l'écrit, une bonne connaissance du français, tant à l'oral qu'à l'écrit, est un atout.
- Il/Elle doit être fortement motivé pour entreprendre des recherches académiques dans un contexte international.
- Il/Elle doit faire preuve de créativité, notamment face aux éventuels problèmes rencontrés pendant la recherche.
- Il/Elle doit être collaboratif et disposé à partager les résultats de son travail au bénéfice du projet et de la communauté scientifique en général.
- Il/Elle doit être sincère, honnête et prêt à respecter l'éthique de la recherche (assurer la confidentialité, le respect de la propriété intellectuelle, etc.).
- Il/Elle doit posséder d'excellentes compétences personnelles et organisationnelles, avec une attention particulière aux détails pour interagir avec les autres partenaires et parties prenantes du projet.
- Il/Elle doit avoir une bonne aptitude pour le travail de terrain.
- Il/Elle doit être capables et disposés à mener des travaux de terrain pendant des périodes prolongées, parfois dans des conditions logistiques et climatiques difficiles.
- Il/Elle doit démontrer de solides compétences analytiques et rédactionnelles.
- Une bonne connaissance de la zoologie (en particulier en entomologie générale ou dans l'identification des Diptères afrotropicaux) est un atout important.
- La familiarité avec les conditions de travail sur le terrain au Rwanda est souhaitable.

Procédure de soumission des candidatures pour les bourses de de doctorat et de MSc

La date limite de soumission des candidatures est fixée au **15 Novembre** 2024.

Le dossier de candidature doit comprendre :

- Une lettre de motivation (maximum 1 page) indiquant quel projet est préféré et comment celui-ci s'aligne sur les objectifs professionnels ou académiques du candidat.
- Un curriculum vitae détaillé (maximum 2 pages), incluant une liste des publications (le cas échéant).

- Des copies certifiées des diplômes et relevés de notes universitaires.
- Une lettre de recommandation d'au moins un référent (membre du personnel académique de l'institution scientifique d'origine du candidat et de l'institution partenaire du projet).
- Une copie (PDF) des publications clés (le cas échéant).
- Tout autre document témoignant les qualités ci-haut citées

Le dossier de candidature doit être envoyé sous la forme d'un seul fichier PDF portant le nom du candidat et envoyé simultanément à deux destinataires :

- Dr Venuste Nsengimana, promoteur local du projet DIPoDIP2 et maître de conférences à l'Université du Rwanda (UR) (venusteok@gmail.com)
- Dr Kurt Jordaens, promoteur du projet DIPoDIP2 (AfricaMuseum) (kurt.jordaens@africamuseum.be)

Procédure de sélection

- Une présélection sera effectuée en partenariat avec la ou les institutions partenaires concernées, sur la base des dossiers de candidature.
- Les candidats présélectionnés pour un entretien seront informés au plus tard le 1er décembre 2024 ; la nature et le lieu des entretiens seront également communiqués à cette date.
- Les entretiens auront lieu en décembre 2024.
- Les candidats recevront une réponse peu de temps après les entretiens, suite aux délibérations avec les divers superviseurs du Nord et du Sud.
- La poste de master commencera au cours du premier trimestre 2025.