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CRID awarded $5.5M from Gates Foundation to Launch Malaria Vector Control Hub

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A programme to control *Anopheles stephensi* in Cameroon

- The main goal of this training was to provide community health workers from nine regions of Cameroon with the skills to identify *Anopheles stephensi* mosquitoes and their larval habitats.

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The NIH-funded EMERGENTS ICEMR project launched

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CRID and CPC join forces to eradicate vector-borne diseases

- **Both institutions agreed to set up a memorandum of understanding to accelerate collaboration with a view of fostering scientific research in Cameroon.**

On September 26, 2024, in Yaoundé, CRID welcomed Mirdad Kazanji, General Director of the "Centre Pasteur du Cameroun" (CPC) and Dr. Sara Irène Eyangoh, HDR, Scientific Director of CPC. The visit, hosted by Prof Charles Wondji, CRID's Executive Director, included department heads and senior researchers.

During their tour of CRID's state-of-the-art laboratories and insectaries, Dr. Kazanji and his delegation gained valuable insights into the advanced facilities enabling CRID to conduct high-quality research. For Dr. Kazanji, "The goal of this working visit is to establish a consortium or an agreement in the future, as we unite our strengths in advancing research by combining all the experience that CRID has in entomology, parasitology, and genomics, along with the infrastructure at the CPC. Our efforts will truly lead to constructive and conclusive projects for the benefit of Cameroon and its populations". Both parties agreed to develop a memorandum of understanding to accelerate their collaboration. Prof. Wondji highlighted the complementary skills of both institutions, stating, "We have complementary skills that we need to put together inorder to apply for more funding, train students, and enhance our efforts to combat various infectious diseases in Cameroon".

The partnership between CPC and CRID represents a significant advancement in fostering South-South collaboration, an essential strategy for Africa's mission to eradicate vector-borne diseases. This collaboration marks a promising step forward, with much more to come.

PAMCA CONFERENCE

Four ladies from CRID awarded

- The Pamca conference, co-organized with the AMMNet Cameroon chapter, saw strong participation from CRID.

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ACoMVeC symposium at 3rd Pamca Cameroon scientific conference

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OUR STATISTICS

- 52 Women
- 76 Men
- 44 Students
- 40 Administration
- 17 Technicians
- 27 Scientists

STORY TELLING

The Mango Malaria Myth Part III

Dr. Tchouakui nodded gravely, acknowledging his freedom but saddened by the loss of the chief's son. "In your prison, there are so many *Anopheles* mosquitoes. Look, my mosquito net has kept them away from me. You can enjoy your mangoes, but you must not sleep without mosquito nets," he noted in a calm tone. He knew that dispelling these deeply ingrained superstitions would be an ongoing challenge, but he was determined to continue educating the community about the true causes and prevention of malaria. With renewed purpose, Dr. Tchouakui resolved to organize a community meeting at the stadium, where CRID would hold a major campaign to distribute mosquito nets and provide factual information about the disease. Mangoes are a gift from the earth, not a curse. He promised the supreme chief Tollambo that he would do everything in his power to ensure that everyone in Elende understood the difference.

TRAINING

Introducing CRID's scientist to FACSCalibur

CRID hosted a capacity-building workshop supported by the FlowAfrica Project, aiming to develop Flow Cytometry in Africa.

The training focused on the FACSCalibur instrument, covering its main components: optics and electronics, as well as panel design, antibody titration, sample preparation, and its applications in biomedical research. Sixteen participants explored topics such as cells, antigen density, antibody labeling, and the use of specialized fluorophores along with their spectral properties.

Practical sessions provided more experience with the FACSCalibur, enabling CRID researchers to increase their skills in using this advanced analytical tool for better public health research and diagnostics throughout Africa. The training emphasized practical experience, which will strengthen the institution's flow cytometry capabilities.

As part of this initiative, CRID received a FACSCalibur Flow Cytometer from the FlowAfrica Team, led by Prof Oscar Fornas, Head of the Flow Cytometry Unit at Pompeu Fabra University and Centre for Genomic Regulation in Barcelona, Spain. This donation was coordinated by TReND in Africa, which also funded the shipping of the equipment and the training course to ensure effective technology transfer to CRID.

A programme to control *Anopheles stephensi* in Cameroon

The main goal of this training was to train Health and sanitation engineers from various regions of Cameroon with the skills to identify Anopheles stephensi mosquitoes and their larval habitats.

CRID hosted from August 26th to 30th a Centers for Disease Control and Prevention (CDC) training course on *Anopheles Stephensi* surveillance at the health district level in Cameroon. The first session of the day began with the official launch of the training by Dr. Joel Ateba, Permanent Secretary of the National Malaria Control Program (NMCP), followed by a welcome speech by Prof Wondji Charles, CRID's Executive Director. The main goal of this training was to equip health and sanitation Engineers, representing 09 regions of Cameroon, on how to recognize *Anopheles stephensi* mosquitoes in order to detect their presence across the country. The 5-day agenda was divided into two phases. First, a theoretical phase focusing on general knowledge of epidemiology and malaria vectors, with particular attention to *Anopheles stephensi* ecology. Then followed a practical phase involving the field collection of Anopheles larvae in the preferred breeding sites of this species (Man-made breeding sites including used tires, discarded tanks…) in Yaoundé, and an introduction to the molecular technics for the identification of An. stephensi. This was done under the supervision of Dr Armel Tedjou and supported by CRID Laboratory technicians. At the end of the workshop, participants felt increasingly empowered by the knowledge acquired.

During the closing ceremony, presided over by Prof. Wondji Charles, CRID's Executive Director, participants were encouraged to share the skills they obtained in their respective workplaces. They received certificates, along with all the facilitators who contributed to this workshop, which was the first of its kind at CRID. The experience will be renewed in the future.

MASTER DEFENSE

Fotso Bebert earned a Master's degree in Animal Biology

On Wednesday, June 26,2024, Fotso Kongne Bebert, a student at the University of Yaoundé 1, defended with distinction his Master dissertation in Animal Biology ; option: Parasitology and Ecology.

His study focused on «Investigating the cross-resistance between pyrethrinoid and chlorfenapyr insecticides in the primary African malaria vector *Anopheles gambiae*». It aimed at evaluating the effectiveness of chlorfenapyr on *Anopheles gambiae* populations in the Central and Western regions of Cameroon, as well as determining the existence of potential cross-resistance with other insecticides. The results revealed a reduction in the susceptibility of this vector to the insecticide. Although a negative association was observed between the resistance markers to pyrethroids and the mosquito's ability to survive exposure to chlorfenapyr (CFP), chlorfenapyr-based vector control tools, particularly the Interceptor G2, demonstrated better efficacy on the tested populations. This indicates that CFP could contribute to improved control of pyrethroid-resistant mosquitoes. However, it would be prudent to establish the molecular bases of the resistance to CFP detected in various mosquito populations in order to preserve the effectiveness of this tool.

Djiemo Ornella defended her Master's dissertation with distinction

This thesis was presented in partial fulfillment of the requirements for the award of a Master's Degree in Animal Organismal Biology, with specialization in Parasitology and Ecology.

Djiemo Richelle Ornella, a student at CRID, successfully defended her Master's dissertation on July 25, 2024, at the Faculty of Science, University of Yaoundé I. The examination panel, chaired by Professor Njiokou Flobert, evaluated her study and awarded it with distinction. Her research focused on «Study of the influence of metabolic resistance to insecticides caused by Cytochrome P450 oxidases on the life traits and vector competence of Anopheles funestus Giles, 1900, a Major Vector of Malaria.» Djiemo conducted this research under the co-supervision of Prof Abraham Fomena from the University of Yaoundé I and associate Prof Ndo Cyrille from the University of Douala, who is also the Head of Parasitology and Microbiology department at CRID; which provided essential laboratory facilities and technical support to facilitate her work. Congratulations to Djiemo Richelle Ornella on this outstanding achievement!

Ngong Amy Futela ended her Master's journey

Her study focused on «Allelic Variation in Glutathione-S-Transferase Epsilon4 (GSTe4) and Pyrethroid Resistance in Anopheles gambiae in Mangoum and Nkolondom, Cameroon.»

University of Buea, July 24, 2024. Miss Ngong Amy Futela successfully defended her Master's dissertation with distinction. Her study focused on «Allelic Variation in Glutathione-S-Transferase Epsilon4 (GSTe4) and Pyrethroid Resistance in *Anopheles gambiae* in Mangoum and Nkolondom, Cameroon.»

She submitted this dissertation to the Department of Biochemistry and Molecular Biology, Faculty of Science, University of Buea, in partial fulfillment of the requirements for a professional Master's degree in Molecular and Biotechnology. Her study was co-supervised by Dr. Ayiseh Rene Bilingwe, a Lecturer in Biochemistry, and Dr. Mersimine Kouamo, a Post-Doctoral Researcher at CRID.

WORKSHOP

Assessment of arbovirus situation in Cameroon

A workshop assessing national preparedness for escalating arbovirus threats in Cameroon took place in Soa, a municipality in the Centre Region, from July 4-5, 2024. Organized by Malaria Consortium through CRID, the event was part of the Resilience Against Future Threats (RAFT) project, funded by the Foreign, Commonwealth & Development Office (FCDO).

The workshop brought together 25 participants, including the Directors and Deputy Directors of the Ministry of Health, as well as health agents from Cameroon municipalities, NGOs, and health districts.

Empowering community health workers

CRID staff facilitated a workshop in Garoua aimed at equipping community field agents with the necessary skills to effectively carry out the 24-month streamlined monitoring of the durability of Long-lasting insecticidal nets (LLINs).

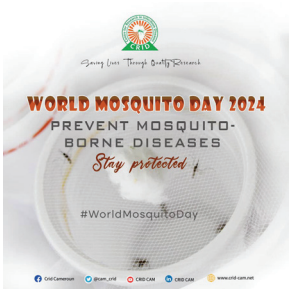
It was a field activity organized in the North Region of Cameroon by CRID, Population Services International (PSI), and the Evolving Vector Control to Fight Malaria Project (PMI Evolve) from July 22-25, 2024. The four-day workshop aimed at equipping community field agents with the skills needed for a 24-month follow-up on LLINs durability. The training was hybrid, some participants attended online. Jacky Raharinjatovo from PSI facilitated the Training of Trainers, while CRID staff led the training of field agents. Topics covered included LLINs durability monitoring, previous cycle summaries, hands-on training in hole assessment, LLINs cohort sampling, household localization using OsmAnd, and questionnaire administration. Participants also engaged in interactive role-playing exercises to enhance their skills.

«This training is crucial for strengthening the capacity of Community Health workers to effectively monitor the durability of LLINs, which is a critical component of malaria control efforts,» said Dr. Tabue Raymond, Head of National Malaria Control Program (NMPC) Vector Control Unit at the NMCP. The training team from CRID was composed primarily of CRID researchers and experts, including Nnamdi Dum-Buo (social scientist), Yvan Fotso Toguem, Sonia Yipmo, and Achille Binyang (all Ph.D students). This collaborative initiative between CRID, PSI and PMI Evolve highlights the commitment to strengthen the capacity of community health workers and advancing the understanding of LLINs durability, a crucial aspect of malaria vector control in Cameroon.

INTERNATIONAL CELEBRATIONS

MOSQUITO DAY 2024

Every August 20th, CRID joins the rest of the world to celebrate World Mosquito Day.



August 20th highlights the need to prevent and fight against mosquitoes, which spread serious diseases like malaria. The female Anopheles mosquito is the main carrier of plasmodium. Malaria is a deadly disease that affects many parts of the world. World Mosquito Day (WMD) reminds us to raise awareness, take preventive steps, and put in place effective programs to control these mosquitoes and protect vulnerable populations. The theme of the WMD this year is « Accelerating the fight against malaria for more equitable world. » Many experts believe that it is together that people should fight to reduce the impact of mosquitoes and the diseases they carry. Dr. Magellan Tchouakui, Principal Investigator at CRID, stated that « Accelerating the fight is vital to expand the toolbox for vector control (e.g. new interventions like Spatial Repellents) and implement an effective insecticide resistance management (IRM) plan to slow down the development of resistance in the vectors. Among these IRM strategies, rotation of insecticides is one of the most effective approaches ». He added that, his current project at CRID and LSTM aims at supporting control programs implementing the most effective rotation plan of insecticides to accelerate malaria elimination and continue saving lives. WMD is a worldwide health-contingency event observed for the past 127 years.

PROJECT

ACOMVEC provides $20,000 USD for five Operational Research Projects

The selected candidates attended a meeting to discuss the project's objectives and vision, and to formally sign their one-year grant contracts.

On August 19, 2024. The five recipients of the $20,000 USD African Consortium in Modeling for Effective Vector Control (ACoMVeC) Operational Research Projects (ORPs) signed their contracts. The five grantees will work on specific projects. David Jaures Fotsa Mbogné, will work on «Modeling the impact of the level of coverage of LLIN use on malaria transmission». Djouda Sonkoue Byliole, will deal with «Modeling the cost-effectiveness of Indoor Residual Spraying (IRS) compared with impregnated mosquito nets». Jean Claude Kamgang, will focus on «Modeling the impact of the distribution of a single type of Long-Lasting Insecticide Treated Nets (LLINs) across the country». Huguette Laure Wamba Makeng, will study how to «Model the risks of emergence of resistance to Artemisinin-based combination therapies (ACTs) in Cameroon». Franklin Platini Agouanet, will be working on «Modeling the optimization of seasonal malaria chemoprevention (SMC) in Cameroon». Each project will be funded to the amount of $4,000 USD.

The ceremony was held in the CRID conference room. The recipients were present to discuss the project's objectives and vision, and to formally sign their one-year grant contracts.

EVENT

CRID represented at Grand Challenges Africa Meeting 2024

Prof Charles Wondji attended the Grand Challenges Africa Meeting (GCAM Tz).

This event focused on vector control innovation for malaria. The meeting took place at the Johari Rotana Hotel in Dar es Salaam, Tanzania from Wednesday, September 11 to Friday, September 13, 2024. During his stay, he had the privilege to meet Dr Philip Welkhoff, Director of Malaria Program at the Gates Foundation and Dr Corine Karema from African Leaders Malaria Alliance (ALMA). This major event convened top scientific partners and experts dedicated to malaria control and research development, with a particular focus on low- and middle-income countries.

COLLABORATION

The NIH-funded EMERGENTS ICEMR project launched

Monday, 16th September 2024 was the launching of the National Institutes of Health (NIH)-funded EMERGENTS ICEMR five-year Program at African Centre of Excellence for Genomics of Infectious Diseases (ACEGID) in Ede, Nigeria. This project is a partnership between University of Florida represented by Prof Rhoel Dinglassan, CRID by Prof Charles Wondji and ACEGID by Prof Christian Happi. EMERGENTS aims at boosting malaria control in West and Central Africa by generating new tools to accelerate the control of all malaria parasites and vectors. We will tell you more soon.

PAMCA CAMEROON CONFERENCE

Four ladies from CRID awarded

The Pamca conference, co-organized with the AMMNet Cameroon chapter, saw strong participation from CRID.

The 2024 Panafrican Mosquito Control Association (Pamca) Cameroon Scientific Conference took place from 24-25, September 2024, at the Yaoundé Conference Centre under the theme « Community engagement for the elimination of vector-borne diseases : use of one health approach and new technologies». The opening ceremony was chaired by Dr Nko'Ayissi George, representative from the Ministry of Public Health. CRID attended this event, which fosters high-level discussions and the sharing of research findings to effectively fight against malaria in Cameroon.

One of the final activities was the competition for the top three presentations (posters, oral, and booster talks). At the end of these, Raissa Manyaka, a Ph.D student at CRID, received the first prize for her oral presentation, while Tatiane Assatse and Sonia Ngongang secured the second and third prizes, respectively. Additionally, Vanessa Nganang, also a Ph.D student, was awarded the first prize for her booster talk. This clearly demonstrates that CRID remains committed to empowering its female researchers to compete at the highest level alongside their male counterparts. Congratulations to all the awardees !

ACoMVeC symposium at 3rd Pamca scientific conference

During the second session of the conference, ACoMVeC, a research unit at CRID, held a symposium on modeling and vector control.

African Consortium in Modeling for Effective Vector Control (ACoMVeC) Symposium was held under the theme: « Catalysing vector control with mathematics: predicting outcomes, enhancing strategies, and saving lives «. Prof Njiokou Flobert, Prof Mimpfoundi and M. Ivan Misonge moderated this activity. During this period, four speakers from CRID took the floor: Bruno Essame, ACoMVeC's Project Administrator, delivered a presentation on « Malaria modeling capacity building Request for Proposal (RFP): ACoMVeC «; Chadrac Ntembue, researcher, on « The spread of pyrethoid resistant mosquitoes and their predicted malaria burden in Democratic Republic of Congo (DRC)»; Manuela Metsadong, Ph.D student, on «Evolution, emergence and optimal control of the quantitative resistance of antimalarial drugs: a dynamic system approach « and finally Sylvere Kezeta on «Spread of insecticide resistance within a mosquito population: a mathematical modeling approach».

CRID Researchers delivered a series of insightful presentations

They presented key studies on malaria vector resistance and control strategies in order to highlight their contributions in the fight against malaria in Cameroon.

During the conference, CRID researchers delivered a series of insightful presentations. Prof. Cyrille Ndo, Head of the Parasitology and Microbiology Department at CRID, presented on « The Resistance of *Anopheles* to insecticides: threats or opportunities for malaria control ?» In the fourth session, Ngongang-Yipmo Emilie Sonia, a PhD student at CRID, shared her research on the «Long-term impact of exposure to Royal Guard®, a Pyriproxyfen-based bed net on pyrethroid-resistant malaria vectors from Cameroon using resistance markers». Vanessa Ngannang-Fezeu, Ph.D student focused on «Elucidating the role of Agininosuccinate Lyase in conferring Pyrethroid Resistance in the Major African vectors *Anopheles funestus*».

Manyaka Raissa, also a PhD student, followed with her study titled « The 4.3 Kb-CYP6P9b structural variant imposes high fitness cost on key life traits of *Anopheles funestus* mosquitoes from central region of Cameroon.» Next, Tagne Darus discussed « Exploring the impact of glutathione S-transferase-mediated resistance to insecticides on vectorial capacity of *Anopheles funestus*.» Finally, Ntadoun Stevia presented her research on «bioassay and molecular monitoring of insecticide resistance in the malaria vector *Anopheles funestus* from Gounougou, Northern Cameroon.» These presentations highlighted the ongoing efforts and research developments within CRID aimed at tackling malaria and its challenges.

AWARDS

CRID honored during CDC Cameroon 20th anniversary

The Centers for Disease Control and Prevention (CDC) Cameroon celebrated its 20th anniversary this September 10, 2024, in Yaoundé.

CRID was invited to the celebration of this milestone at Hilton hotel in Yaoundé. The opening ceremony was chaired by Dr. Manaouda Malachie, Minister of Public Health. During the ceremony, partners supporting the CDC in its mission across the country were honored and encouraged. CRID was among those recognized, for its contribution to innovative malaria-related research. The second phase of this celebration was an open house, during which university students had the opportunity to understand the expertise needed to work in public health, and observe how the US has contributed to public health in Cameroon through its partners over the past 20 years.

Nelly Tatchou received the best poster presentation award at GEM 2024 conference

Nelly Manuela Tatchou-Nebangwa, Ph.D student at CRID received the esteemed travel award to participate in the 2024 Genomic Epidemiology of Malaria (GEM) conference.

It took place from 18th to 20th September 2024 at the Wellcome Genome Campus, United Kingdom. The three-day conference was incredibly insightful, offering valuable understanding of ongoing research concerning the genomic epidemiology of the disease host, vector, and parasite. It served as an excellent platform for networking with scientists globally engaged in vector and malaria parasite genomics. During the event, Nelly presented her research findings titled « Two highly selected mutations in the tandemly duplicated CYP6P4a and CYP6P4b genes drive pyrethroid resistance in *Anopheles funestus* in West Africa, and reduce the efficacy of pyrethroid bed nets » through a pitch talk and a poster display, culminating in the honor of receiving the best poster presentation award. Well-done!

EMPLOYEES MILESTONE

DEPARTURE

1. **Dr Tchotet Michel :** Postdoc
2. **Bougna Landrine :** Communication Assistant
3. **Tchawa Thierry :** Technician
4. **Tchoupo Micareme :** Technician
5. **Dr kegne Jonas :** Postdoc
6. **Tehna Felix :** Biomedical Stock
7. **Dr Kemngo Francis:** Postdoc
8. **Sone Bertrand :** Master Student
9. **Djiemo Ornéla:** Master Student
10. **Dounya Evita :** Master Student

NEW STAFF RECRUITED

1. **Fossouo Paul:** Finance Officer
2. **Dr Nguetsa Frank:** Thérapeutic Study Monitor
3. **Djorandi:** Microscopist Technician
4. **Kowa Edith:** Communication Assistant
5. **Tchekounang Yanick:** Investment Analyst
6. **Sakam Williams:** Research Technician
7. **Dongmo Charlin:** Biomedical Engineer
8. **Bianda Josiane:** IT Officer
9. **Kongnyu Brandon:** Master Student
10. **Ojong Reine:** Master Student

SCIENTIFICS PUBLICATIONS

Magellan Tchouakui, *Sulaiman S. Ibrahim & al; Substrate promiscuity of key resistance P450s confers clothianidin resistance while increasing chlorfenapyr potency in malaria vectors.* Published on July 31st, 2024 in Cell Repports.

Riccado F Thiomela, Magellan Tchouakui & al; *Indoor residual spraying of experimental huts in Cameroon highlights the potential of Fludora® Fusion to control wild pyrethroid-resistant malaria vectors.* Published in BMC Infectious Diseases, July 2024.

Leon M. J. Mugenzi, Theofelix A. Tekoh, & al; *Association of a rapidly selected 4.3kb transposon-containing structural variation with a P450-based resistance to pyrethroids in the African malaria vector Anopheles funestus.* Published in PLoS Genet journal, on July 29, 2024.