

Title: Entomological indicators of *Plasmodium* species transmission in Goma Tsé-Tsé and Madibou health districts, in the Republic of Congo

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ABSTRACT (250-300 words)

Background: Malaria remains a major public health problem in the Republic of Congo, with *Plasmodium falciparum* being the deadliest malaria species.

Objective: To determine the *Anopheles* fauna and the entomological indices of malaria transmission in the rural and urban areas in the south of Brazzaville

Methods: Indoor household mosquitoes capture using electric aspirator was performed in rural and urban areas during raining and dry seasons in 2021. The identification of *Anopheles* species was done using binocular magnifier and nested-PCR. TaqMan and nested-PCR were used to detect the *Plasmodium* species in the head/thorax and abdomens of *Anopheles*. Some entomological indices including the sporozoite infection rate, the entomological inoculation rate and the man biting rate were estimated.

Results: A total of 832 culicidae mosquitoes were collected in all studies sites predominate by *Anopheles* genus 84.0% (699/832) followed by *Culex* genus 13.2% (110/832) and *Aedes* genus 2.8% (23/832). Three *Anopheles* species group were captured in the 699 *Anopheles* mosquitoes collected: *Anopheles gambiae sensu lato* (s.l.) (90.7%), *Anopheles funestus* s.l. (6.9%), and *Anopheles moucheti* (2.4%). Three species of *An. gambiae* s.l. were identified including *Anopheles gambiae sensu stricto* (78.9%), *Anopheles coluzzii* (15.4%) and *Anopheles arabiensis* (5.7%). The overall sporozoite

infection rate was 22.3% with a predominance of *Plasmodium falciparum*, followed by *Plasmodium malariae* and *Plasmodium ovale*. *Anopheles* aggressiveness rate was higher in households from rural area (1.1 bites/night) compared to that from urban area (0.8 ib/p/n). The overall entomological inoculation rate was 0.13 ib/p/n. This index was 0.17 ib/p/n and 0.092 ib/p/n in rural and urban area respectively, and was similar during the dry (0.18 ib/p/n) and rainy (0.14 ib/p/n) seasons.

Conclusion: Conclusion

These findings highlight that malaria transmission remains high in rural and urban area in the south of Republic of Congo despite the ongoing control efforts, thereby indicating the need for more targeted interventions.

Keywords Malaria, *Anopheles* vectors, Transmission, Rural and urban areas, Republic of Congo

BIOGRAPHY (100-150 words)

Dr Jacques Dollon Mbama Ntabi is a young scientist with more than two years of experience in medical entomology. He obtained his Ph.D in Bio-ecology and Animals Physiology, Specialty Entomology and Parasitology at the Faculté des Sciences et Techniques (FST) of the Université Marien Ngouabi (UMNG) of Congo Brazzaville in December, 20th 2023 under the direction of Professor Arsène Lenga.

He carries out his research work at the Laboratory of the Christophe Mérieux Infectious Diseases Research Center (CeRMI) of the Fondation Congolaise pour la Recherche Médicale (FCRM) under the co-supervision of Prof. Francine Ntoumi, the General Director of the FCRM. He became familiar with cutting-edge techniques in medical entomology, parasitology and molecular biology, and conducts these experimental studies on mosquitoes and the human population in malaria. He completed his training in malaria entomology at the Center for Research in infectious Diseases (CRID) in Yaoundé, Cameroon under the supervision of Prof. Charles Sinclair Wondji. His research focuses on the evaluation of co-infections of Plasmodium species in the population of Anopheles mosquitoes and the human population: a pilot study of vector-parasite interaction that defines the transmission of malaria in Africa. In addition, Dollon Mbama supervises interns and a Master, he participates in several research projects on infectious diseases such as: malaria, Chikukunia and Covid-19.

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