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Citizen science, a tool for enhancing knowledge and management of edible insect biodiversity in the Democratic Republic of the Congo (DR Congo)

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Abstract

The DR Congo covers more than 2,345,000 km² and has the second largest forest containing a great animal biodiversity, which unfortunately remains little characterized. This is the case for edible insects that Congolese eat in abundance and which contribute significantly to the fight against food insecurity. Recent studies have shown that 80% of the country's population consumes two different species of insects per week (60 to 150g/person/day). To date, more than 50 species of insects (mainly in 5 families: Saturniidae, Notodontidae, Curculionidae, Termitidae and Gryllidae, respectively two moths, beetles, termites, and crickets) have been identified with protein levels (55-65%), fat content (10-15%) or vitamins.

Faced with a political will shifted to other priorities, no formal program to collect data to characterize this biodiversity has been initiated. For their part, classic studies that provided current data are facing the following main challenges: (i) the national territory is too vast and impossible to cover by these types of studies, (ii) insects are known under several common names (complicated by >240 languages) or only one name is used to identify taxonomically distant species; (iii) historical data are very hard to find (the oral tradition being preferred to writing); (iv) the difficulty of finding geo-referenced data (with the risk associated in its collection); (v) the absence of reference collections and the lack of specialists.

An effective alternative to circumvent these difficulties and to gather data (whose urgency is understandable due to the shrinking of some insect populations or their habitats) is promoting *Citizen Science*. Such research programs involving scientists and the participation of amateurs or interested volunteer citizens within local populations would constitute a set of data across the country and over a longer period than what has been done so far. With the development of free software and mobile applications, non-specialists could, based on standards and protocols validated by scientists, be involved in the digitization of specimens observed or identification of insect species through graphical user interfaces; help clarify the correspondence between vernacular names and scientific names; participate in habitat monitoring of insect species; or help collecting geo-referenced data via mobile phone. These field-based research activities can be conducted without great expense and will offer professionals and non-professionals a collaborative ground to contribute together toward advances in knowledge of edible insects and the implementation of targeted actions for the management of this resource in DR Congo.