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Predation on *Dorylus* army ants (Hymenoptera: Formicidae: Dorylinae) by *Agama agama* (Squamata: Agamidae) in Gabon

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Abstract

We report the first documented observations of predation on *Dorylus* (*Anomma*) *congolensis* Santschi, 1910 by the agamid lizard *Agama agama* (Linnaeus, 1758), the only reptile known to predate on this aggressive army ant. We also report two other observations of predation by Gabonese *Agama agama* on *Dorylus* sp. These observations confirm the extreme dietary adaptability of *Agama agama*.

Keywords: Africa, ants, ant-reptile interactions, natural history, predation.

Dorylus army ants are a noteworthy component of the Old World (Africa, Mediterranean Basin, Middle East and tropical Asia) entomofauna, especially in Africa where their species diversity is the highest (GOTWALD, 1995; KRONAUER, 2009). Species of the subgenus *Anomma* Shuckard, 1840 are particularly remarkable as their colonies can contain over ten million of adult individuals which predate a large array of prey[1], mostly invertebrates, during massive swarm raiding on the soil surface and up into the vegetation (LEROUX, 1979; GOTWALD, 1995; KRONAUER, 2009). Although the sting of *Dorylus* is reduced and not functional (HERMANN, 1969; BOLTON, 1990), these ants possess a caste of large and aggressive workers with powerful disproportionate mandibles, which effectively defend the colony by the infliction of painful bites. Nonetheless, because colonies are conspicuous and composed of millions of nutrient- and protein-rich individuals (DEBLAUWE & JANSSENS, 2008; O'MALLEY & POWER, 2012), they represent an attractive food source for a wide diversity of animals.
The most studied predator of *Dorylus* is the chimpanzee, *Pan troglodytes* (Primates: Hominidae), which is renowned for using culturally transmitted harvesting techniques and tools to avoid being bitten (*e.g.* MÖBIUS *et al*., 2008; RAUBENHEIMER & ROTHMAN, 2013; KOOPS *et al.*, 2015; and references therein). *Dorylus* also enters in the diet of various other African mammals (*e.g. Gorilla gorilla* (Primates: Hominidae) (DEBLAUWE & JANSSENS, 2008), *Manis* spp. (Pholidota: Manidae), *Bdeogale nigripes* (Carnivora: Herpestidae) (BEQUAERT, 1922), birds (*e.g. Alethe castanea* (Passeriformes: Muscicapidae), *Neocossyphus poensis* (Passeriformes: Turdidae)), skinks (*Trachylepis albilabris* (Squamata: Scincidae)), frogs (*e.g.*: *Amietophrynus* spp. (Anura: Bufonidae), *Hoplobatrachus occipitalis* (Anura: Dicroglossidae)) (BEQUAERT, 1922), and insects (*e.g.*: *Bengalia* spp. (Diptera: Calliphoridae), *Oecophylla longinoda* (Latreille, 1802) (Hymenoptera: Formicidae),

[1] We take this opportunity to mention here that the ants observed by PAUWELS *et al*. (2002) predating on the lamprophiid snake *Buhoma depressiceps* belonged to the genus *Dorylus*.

Fig. 1. Predation by a subadult and a female *Agama agama* (lower and upper individual, respectively) on workers of *Dorylus* (*Anomma*) *congolensis* on 13 June 2006, at Pointe Wigombé, Pongara National Park, Gabon (photo Y. Braet).

other species of *Dorylus* (BEQUAERT, 1922; LEROUX, 1979)), sometimes as staple as indicated by the study of stomach contents of all the birds, frogs and mammals studied by BEQUAERT (1922). Here, we report a case of predation on *Dorylus* (*Anomma*) *congolensis* by *Agama agama* (Agamidae).

On 13 June 2006 at 10h40 at Pointe Wigombé, in Pongara National Park, Estuaire Province, northwestern Gabon, Yves Braet observed an adult female and a subadult agamas repeatedly catching workers from a large swarm of *Dorylus* (*Anomma*) *congolensis*, which was raiding along the bank of a lagoon (Fig. 1). The reptiles remained relatively still, even between prey catches, only a few centimeters away from the ant column. Vouchers of the ants collected at the Pointe Wigombé were deposited at the Oxford University Museum[2]. Subsequently, Jean-Pierre Vande weghe observed another *Agama agama* individual preying on *Dorylus* sp. in November 2012 in Minkébé National Park, Woleu-Ntem Province, northeastern Gabon. In the latter case, the agama was very cautious however, and after each catch it retreated about half a meter back. In both cases, the cost for the prey was certainly negligible as only a relatively tiny amount of workers was taken. The disappearance of the single queen of the *Dorylus* colony as a result of vertebrate predation is indeed exceptional (LEROUX, 1979).

Agama agama is widespread in West and Central Africa and feeds opportunistically on insects, small vertebrates (including cannibalism), flowers, fruits or human food reliefs (LOWES, 1954; HALSTEAD, 1970; BEIER, 1974; CLOUDSLEY-THOMPSON, 1981; PAUWELS *et al.*, 2004a, 2004b; PAUWELS & DAVID, 2008; LEACHÉ *et al.*, 2014). Faecal and stomach content analyses always confirmed that ants constitute an important part of its diet but, unfortunately, genera and species of the prey were in most cases not identified beyond the family level (SCHMIDT, 1919; HARRIS, 1964; CLOUDSLEY-THOMPSON, 1981; GUPTA, 1982; PAUWELS *et al*., 2004a, 2004b; LUISELLI *et al*., 2011; AKANI *et al*., 2013). However, GRAMENTZ (1999) reported Gabonese *Agama agama* feeding on ‘‘Wanderameisen’’, without specifying the generic identity of these ants; however he was actually referring to *Dorylus* (D. Gramentz, pers. comm.). These observations confirm *Agama agama* as an opportunistic, very adaptable predator, which explains its remarkable colonization abilities (PAUWELS *et al.*, 2004a, 2004b).

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[2] http://antsofafrica.org/ant_species_2012/dorylus/dorylus_congolensis/dorylus_congolensis.htm

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