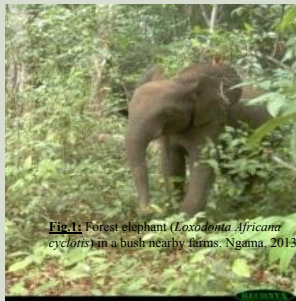


Ecophysiology and conservation of the largest terrestrial mammals : lessons from the first trials on forest elephant (*Loxodonta cyclotis*) crop raiders in Gabon

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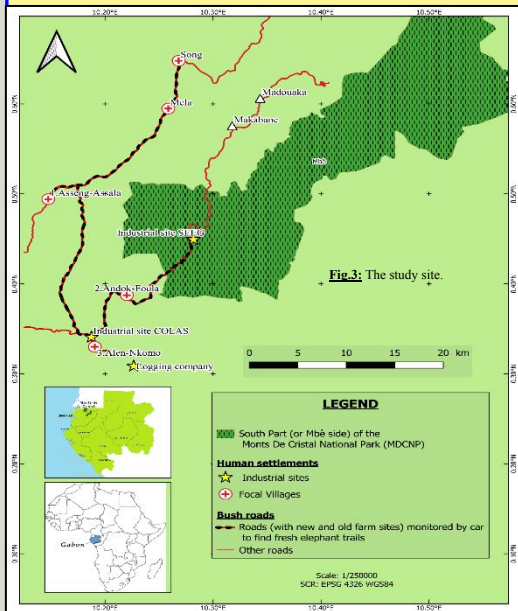


- ### Context
- ❖ Conservation of large wildlife species is a major issue (Ahlering et al., 2013; Clark & Poulsen, 2012).
 - ❖ Elephant (fig.1, fig.3) is both the charismatic largest terrestrial mammal species and the worst crop raider (Walker, 2010).
 - ❖ Crop raiding threatens people livelihoods (fig.4, fig.5) and elephants themselves when hungry farmers shoot or trap them (Ahlering et al., 2013).
 - ❖ Crop raiding drivers related to elephants' ecophysiology remain largely unknown (Ahlering et al., 2013; Jachowski, et al., 2013).



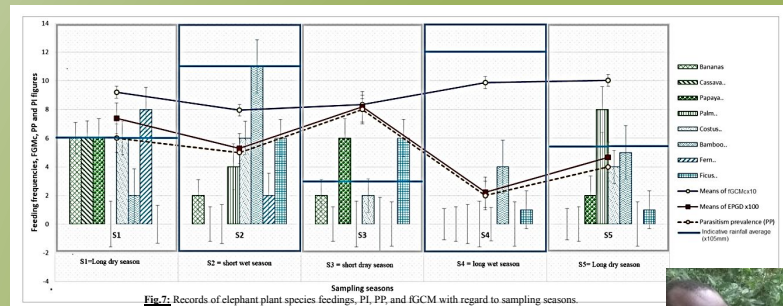
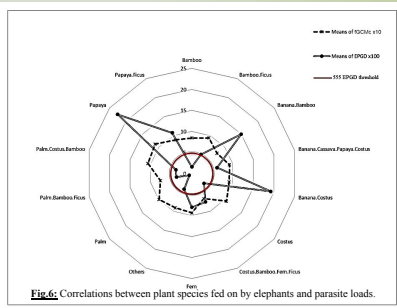
Methods

- Study site: Monts De Christal, Gabon (Fig.3)
- Physiological proxies, gastrointestinal parasite infestations (GPI) and fecal glucocorticoid metabolite (fGCM) concentrations, common in animal ecophysiology, were used to help understand differences or motivations in the preferences of crops by elephant raiders.
- Fresh trails (less than 48 hours old, with mucosa present on elephant boluses) were opportunistically found along the bush road and followed on foot at a distance of 500 m for sample collection. Collected samples included elephant defecation events and surrounding plant materials (leaves, bark, roots, trunks, fruits, flowers) that had evidence of elephant feedings.



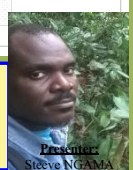
Results

- ❖ Forest elephants may increase the frequency of crop raiding according to GPI, indicating a self-medication behavior.
- ❖ Increases in parasitism prevalence (PP) and parasitism intensity (PI) in sampled boluses led to 28% and 0.16% more intakes of all crops, respectively.
- ❖ Parasitism prevalence (PP) increases in elephant boluses also led to 16% and 25% more bananas and papaya intakes, respectively, while PI increases in boluses led to 0.1% more intakes of both bananas and papaya plants
- ❖ Results highlight a trade-off between the benefit of elephants raiding crops and the danger of encountering farmers by adopting nocturnal crop-raiding behaviours.



Practical implications

Elephants may choose specific plant parts while raiding crops as a self-medication behaviour. Forest elephant conservation are not only forest engineers but also appear to be self-medication specialists, which could possibly help humans cope with present and future health issues. Further understanding can help communities cohabiting with forest elephants to focus on the broader health benefits rather than solely on the immediate issue of crop damage.



From: Steeve Ngama 2,3,4*, Jerome Bindelle1, Janine L. Brown5, John R. Poulsen6,7, Jean-Luc Hornieck8, Annick Lindero9, Lisa Korte10, Jean-Louis Doucet2, Stephen Paris5, Monique Ngama3, Minette Bane1, Auguste Ndioume Ndong1, Jacques François Mavungu1, Philippe L'écuyer2, Cédric Vermeulen2 (2025) Are crop fields pharmacies for megaherbivores? From ecophysiological studies of elephant (*Loxodonta cyclotis*) crop raiders in Gabon. Ecological solutions and evidence. In press.

