Imbrasia epimethea larvae - © *A. Fogang*

*R*hynchophorus phoenicis larvae - © *A. Fogang*

African insects with huge potential for nutritious human diet

Entomophagy—eating insects—is endorsed by the FAO as a way to address global food security challenges. Our research has demonstrated excellent nutritive potential for human diet in three insects eaten in Cameroon: *Rhynchophorus phoenicis* (Rp) larvae, whether wild or farmed, as an excellent energy supplement, and *Imbrasia truncata* and *Imbrasia epimethea* caterpillars as a good source of diet-boosting essential amino acids and α-linolenic acid.

▸ RESULTS

Rhynchophorus larvae are rich in lipids, and at 225 kcal per 100 g fresh weight (about 20 larvae), they make a good source of food energy. These lipids are mostly triglycerols, and we typed their main molecular species. They contain mostly monounsaturated fatty acids (oleic acid 18:1 ω9) and saturated fatty acids (palmitic acid 16:0) and less than 5% essential fatty acids (linoleic acid, 18:2 ω6 and α-linolenic acid 18:3 ω3) concentrated in the membrane lipids. Their lipid content, tocopherol content, carotenoid content and ω6/ω3 fatty acid ratio all vary with larval morphotype (yellow vs white) and growth environment (farmed vs wild). With nitrogen-to-protein conversion factors ranging from 6.1 to 7.2 and less than 10% non-protein nitrogen, their proteins are rich in essential amino acids and therefore offer good nutritional value. These larvae thus make a potentially good energy supplement. Less lipid-rich but with α-linolenic acid 18:3 ω3 as the main fatty acid, *Imbrasia truncata* and *Imbrasia epimethea* caterpillars are a rich source of high-quality proteins, containing all the essential amino acids. These caterpillars thus make a good option to address protein-energy undernutrition and readjust ω3 fatty acid intakes. The sorption curves put maximum water contents in the range 5.6%–6.1%, making the insect flours microbiologically stable in storage at temperatures of up to 40°C.

▸ FUTURE OUTLOOK

Building on this nutritional characterization effort, development work on farming and/or harvesting these nutritionally-valuable insects should sit parallel with work to determine their storability, processability and ecological sustainability as a food.

*Skewered African palm weevil larvae (*Rynchophorus phoenicis*)* © *C. Genot*

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(2018) Biochemistry Ph-D

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*Growing conditions and morphotypes of African Palm weevil (*Rhynchophorus phoenicis*) larvae influence their lipophilic nutrient but not their amino acid compositions*

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