PROXIMATE COMPOSITION AND FREE SUGAR AND FATTY ACID PROFILES OF ASIAN HORNET LARVAE: AN ALTERNATIVE FOOD SOURCE?

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INTRODUCTION

Asian hornet (*Vespa velutina nigrithorax*) is an invasive species native to Southeast Asia that unintentionally found its way into Europe in 2004.[1,2] It was first reported in France and rapidly spread across the country and later into other European nations, including Portugal in 2011.[2] Asian hornet larvae are believed to be rich in nutrients, but further research is required to determine their potential as an alternative food source. Although entomophagy is recognized as a sustainable dietary practice for replacing animal protein and promoting food security, it has not received the deserved attention in many Western countries.[3] Therefore, this study aimed to characterize the proximate composition and individual profiles of free sugars and fatty acids in Asian hornet larvae from nests collected in Northern Portugal.

METHODOLOGY

For nest collection, Asian hornet populations were immobilized with cold CO_2. After that, four nests were dissected to remove the larvae (Fig. 1), which were analyzed for moisture, ash, protein, crude fat, and dietary fiber contents following official food analysis procedures.[4] The carbohydrate content was estimated by difference, and the energy value was calculated according to current regulations.[5] Furthermore, HPLC-RI and GC-FID techniques were employed to characterize the individual profiles of free sugars and fatty acids, respectively.[6]

Fig. 1 Desiccation of an Asian hornet nest to collect the larvae.

RESULTS

Proteins and carbohydrates were the most abundant macronutrients in Asian hornet larvae, followed by crude fat and dietary fiber. A 100 g portion of dehydrated larvae provided 446 kcal of energy. Furthermore, 2 free sugars and 25 fatty acids were identified in the samples, as shown in the chromatograms in Figs. 2 and 3, respectively.

Table 1 Proximate composition (g/100 g dw) and energy (kcal/100 g dw) of Asian hornet larvae from four nests.

Sample	Dry matter	Protein	Fiber	Fat	Ash	Carbs	Energy
Nest 1	42 ± 1	33.7 ± 1.3	4.4 ± 0.2	11.9 ± 0.6	2.8 ± 0.1	36 ± 1	421 ± 18
Nest 2	49 ± 1	35.8 ± 0.3	18.6 ± 0.8	14.4 ± 0.4	2.8 ± 0.1	28 ± 1	424 ± 2
Nest 3	40 ± 1	33.9 ± 1.8	14.4 ± 0.2	19.8 ± 1.4	2.5 ± 0.1	30 ± 1	460 ± 5
Nest 4	29 ± 1	34.3 ± 0.2	11.7 ± 0.3	22.6 ± 1.4	2.7 ± 0.1	29 ± 1	479 ± 5
Average	40 ± 7	34.4 ± 0.8	12.3 ± 5.2	17.2 ± 4.2	2.7 ± 0.1	31 ± 3	446 ± 25

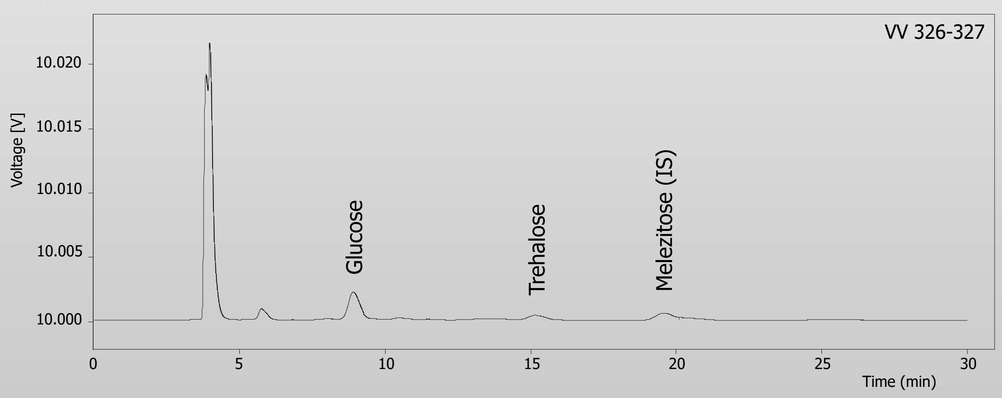

Fig. 2 Chromatogram of free sugars detected in Asian hornet larvae.

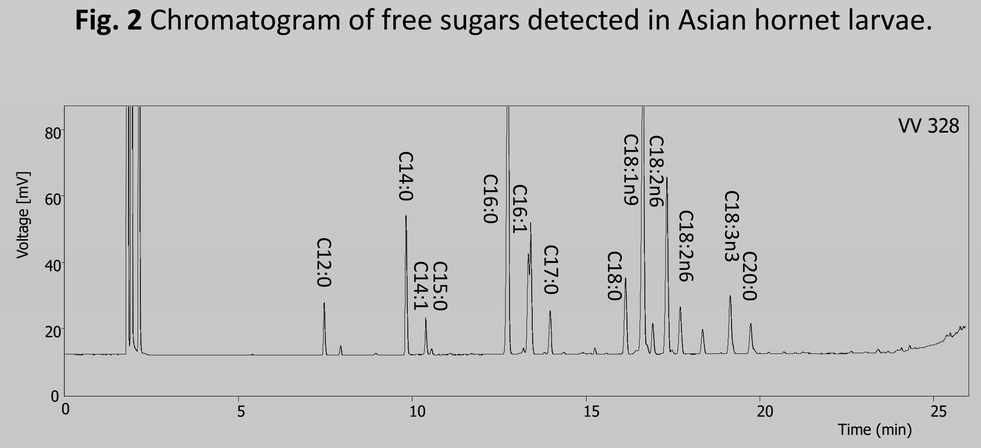

Fig. 3 Chromatogram of fatty acids detected in Asian hornet larvae.

CONCLUSIONS

Overall, these findings contribute to a more detailed characterization of the nutritional value of this invasive species' larvae. In future works, it will be important to perform other chemical analyses and promote the consumer's perception and attitude toward the inclusion of insects into sustainable contemporary diets.

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