Plan Overview

A Data Management Plan created using DMPonline.be

Title: Comprehensive analysis of the impact of post-harvest handling practices on volatile aroma compounds of long-horned grasshopper (Ruspolia differens) in Uganda

Creator: Raymond Paul Nanseera

Principal Investigator: Ilse Fraeye, Raymond Paul Nanseera

Data Manager: Raymond Paul Nanseera

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Template: KU Leuven BOF-IOF

Principal Investigator: Ilse Fraeye, Raymond Paul Nanseera

Data Manager: Raymond Paul Nanseera

Project abstract:

Edible insects play a significant role in the traditional diets of people in many parts of the world. Moreover, aroma plays a vital role in influencing their overall flavor and palatability. Long-horned grasshoppers (*Ruspolia differens*) are the most commercialized and widely consumed edible insects in Uganda. They contain high amounts of unsaturated fatty acids, amino acids, peptides and proteins, which are precursors for a spectrum of volatile aroma compounds through various mechanisms. Each of these aroma compounds possesses distinct olfactory thresholds which contribute to the diverse aromatic characteristics observed in foods including insects. Notably, these chemical reactions are highly influenced by the different postharvest handling conditions. Nevertheless, there is scant information about the evolution of *R. differens*' volatile compounds under different postharvest handling conditions, and the contribution of the identified volatile compounds to the overall aroma of processed *R. differens*. Therefore, this research shall investigate,

- The impact of plucking and storage temperature on the volatile aroma profile of raw *R. differens.*
- The impact of selected oven-roasting conditions on the type and amount of the volatile compounds formed and their contribution to overall aroma, color development and sensory acceptability.
- The impact of selected packaging conditions and cold storage time on the evolution of the aroma of processed *R. differens.*

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Comprehensive analysis of the impact of post-harvest handling practices on volatile aroma compounds of long-horned grasshopper (Ruspolia differens) in Uganda

Research Data Summary

List and describe all datasets or research materials that you plan to generate/collect or reuse during your research project. For each dataset or data type (observational, experimental etc.), provide a short name & description (sufficient for yourself to know what data it is about), indicate whether the data are newly generated/collected or reused, digital or physical, also indicate the type of the data (the kind of content), its technical format (file extension), and an estimate of the upper limit of the volume of the data.

Dataset name / ID	Description	New or reuse	Digital or Physical data	Data Type	File format	Data volume	Physical volume
		Indicate: ***N****(ew data) or* ***E****(xisting data)*	Indicate: **D**(igital) or **P**(hysical)	Indicate: **A**udiovisual **I**mages **S**ound **N**umerical **T**extual **M**odel **SO**ftware Other (specify)		Indicate: <1GB <100GB <1TB <5TB >5TB NA	
Work package 1	Samples	N	P	Other: edible insects			12 kg
	Volatile profiles and precursors	N	D	N	.xlsx	<1 GB	
	Proximate composition	N	D	N	.xlsx	<1 GB	
Work package 2	Samples	N	P	Other: edible insects			12 kg
	Volatile profiles and precursors	N	D	N	.xlsx	<1 GB	
	Colour	N	D	N	.xlsx	<1 GB	
	Sensory analysis	N	D	N/T	.xlsx/.docs	<1 GB	
	Olfactometry	N	D	N/T	.xlsx/.docs	<1 GB	
	Samples	N	P	Other: edible insects			6 kg
Work package 3	Volatile profiles and precursors	N	D	N	.xlsx	<1 GB	
	Microbiology	N	D	N	.xlsx	<1 GB	
	Oxidation	N	D	N	.xlsx	<1 GB	

If you reuse existing data, please specify the source, preferably by using a persistent identifier (e.g. DOI, Handle, URL etc.) per dataset or data type:

- No data will be reused.

Are there any ethical issues concerning the creation and/or use of the data (e.g. experiments on humans or animals, dual use)? If so, refer to specific datasets or data types when appropriate and provide the relevant ethical approval number.

- No

Will you process personal data? If so, please refer to specific datasets or data types when appropriate and provide the KU Leuven

or UZ Leuven privacy register number (G or S number).

- No

Does your work have potential for commercial valorization (e.g. tech transfer, for example spin-offs, commercial exploitation, …)? If so, please comment per dataset or data type where appropriate.

- No

Do existing 3rd party agreements restrict exploitation or dissemination of the data you (re)use (e.g. Material or Data transfer agreements, Research collaboration agreements)? If so, please explain in the comment section to what data they relate and what restrictions are in place.

- No

Are there any other legal issues, such as intellectual property rights and ownership, to be managed related to the data you (re)use? If so, please explain in the comment section to what data they relate and which restrictions will be asserted.

- No

Documentation and Metadata

Clearly describe what approach will be followed to capture the accompanying information necessary to keep data understandable and usable, for yourself and others, now and in the future (e.g. in terms of documentation levels and types required, procedures used, Electronic Lab Notebooks, README.txt files, codebook.tsv etc. where this information is recorded).

Physical data:

- Samples will be properly labelled, indicating their code name, weight and date.
- A descriptive map indicating where each sample or material generated is stored will be maintained as a .xlsx or .docx file.
- Notes on daily laboratory activities will be recorded in hard copy lab notebooks.

Digital data:

- Information (metadata) about the sampling plan used, meanings of sample code names, sample pre-treatments, storage conditions, analysis protocols used, experimental variables, and output units of measure will be recorded and maintained as .xlsx.
- Protocols/experimental and evaluation procedures will be clearly written and maintained in Standard Operating Procedures in .docx format.
- Meaningful and descriptive data file names will be used for raw and analyzed data.
- For each work package, a separate folder will be used where all documentation (result files, methodology and protocols) will be stored.
- Where initial raw data is exported into a new format, reference to initial data (location) will be made.

Will a metadata standard be used to make it easier to find and reuse the data?
If so, please specify which metadata standard will be used.

If not, please specify which metadata will be created to make the data easier to find and reuse.

- No
- No metadata standard will be used.

Data Storage & Back-up during the Research Project

Where will the data be stored?

- OneDrive (KU Leuven)
- Sharepoint online
- Other (specify below)
- Large Volume Storage
- Physical samples (both raw and processed edible insects) will be stored in a freezer at -80°C until the end of the project.
- Laboratory notebooks will be stored in locked cabinets.

How will the data be backed up?

- Standard back-up provided by KU Leuven ICTS for my storage solution

Is there currently sufficient storage & backup capacity during the project?

If no or insufficient storage or backup capacities are available, explain how this will be taken care of.

- Yes

How will you ensure that the data are securely stored and not accessed or modified by unauthorized persons?

- All data will be stored on the personal OneDrive cloud service provided by KU Leuven and accessed by only the researcher. This storage space is very secure, with automatic backups and advanced protections such as multi-factor authentication.
- Sharing of data to authorized persons will be done via TEAMS, which is also a secure platform.
- After the end of the project, final data files will be archived on the Archive/'K:' network drive, which has restricted access (only professors and postdocs of the research group).
- Samples will be stored in lockable freezers.
- Laboratory notebooks will be stored in locked cabinets.

What are the expected costs for data storage and backup during the research project? How will these costs be covered?

- None

Data Preservation after the end of the Research Project

Which data will be retained for 10 years (or longer, in agreement with other retention policies that are applicable) after the end of the project?

In case some data cannot be preserved, clearly state the reasons for this (e.g. legal or contractual restrictions, storage/budget issues, institutional policies...).

- All data will be preserved for 10 years according to KU Leuven RDM policy
- Certain data cannot be kept for 10 years (explain below)
- Physical samples (edible insects) will be disposed off at the end of the project.

Where will these data be archived (stored and curated for the long-term)?

- Large Volume Storage (longterm for large volumes)

What are the expected costs for data preservation during the expected retention period? How will these costs be covered?

- None

Data Sharing and Reuse

Will the data (or part of the data) be made available for reuse after/during the project?
Please explain per dataset or data type which data will be made available.

- Yes, as restricted data (upon approval, or institutional access only)

If access is restricted, please specify who will be able to access the data and under what conditions.

- Only the researcher and supervising team, participating in the project will have access to the data prior to data publication.
- Access of data will be through peer reviewed journals, conference presentations and proceedings, repositories.

Are there any factors that restrict or prevent the sharing of (some of) the data (e.g. as defined in an agreement with a 3rd party, legal restrictions)?

Please explain per dataset or data type where appropriate.

- No

Where will the data be made available?

If already known, please provide a repository per dataset or data type.

- Other (specify below)
- KU Leuven RDR (Research Data Repository)
- Data of completed work will be published in academic peer reviewed journals and will as such be available in existing and

relevant repositories (e.g. KU Leuven repository: Lirias).
- Unpublished data will be available on network drives with restricted access (Archive/'K:' network drive).

When will the data be made available?

- Upon publication of research results

Which data usage licenses are you going to provide?

If none, please explain why.

- Other (specify below)
- Data usage licenses will be provided according to the requirements for reuse defined by the original publisher.

Do you intend to add a persistent identifier (PID) to your dataset(s), e.g. a DOI or accession number? If already available, please provide it here.

- No

What are the expected costs for data sharing? How will these costs be covered?

- None

Responsibilities

Who will manage data documentation and metadata during the research project?

- The PhD student, Raymond Paul Nanseera.

Who will manage data storage and backup during the research project?

- The PhD student, Raymond Paul Nanseera.

Who will manage data preservation and sharing?

- During the PhD project: the PhD student (Raymond Paul Nanseera), and the promoter (Prof. Ilse Fraeye).
- After the PhD project: the promoter (Prof. Ilse Fraeye).

Who will update and implement this DMP?

- The PhD student, Raymond Paul Nanseera.