



HAL
open science

From cultivated biodiversity to human health prevention: a cross-disciplinary research-action project

Audrey Ringot, Romain Lan, Emmie Goetz, Maeva Piton, Lama Basbous, Anne Lastmann, Laurence Mayaud, Camille Vindras, Laurie Fraticelli, Fabien Dutertre, et al.

► To cite this version:

Audrey Ringot, Romain Lan, Emmie Goetz, Maeva Piton, Lama Basbous, et al.. From cultivated biodiversity to human health prevention: a cross-disciplinary research-action project. Shape Med LYON, May 2024, Lyon, France. hal-04748804

HAL Id: hal-04748804

<https://hal.science/hal-04748804v1>

Submitted on 22 Oct 2024

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

Copyright

BIOQUALIM

From cultivated biodiversity to human health prevention:
a cross-disciplinary research-action project

Audrey Ringot, Romain Lan, Emmie Goetz, Maeva Piton, Lama Basbous, Anne Lastmann, Laurence Mayaud, Camille Vindras, Laurie Fraticelli, Fabien Dutertre, Marie Préau, Nathalie Bernoud-Hubac, Yohan Fayet, Marie-Thérèse Charreyre*, Florence Carrouel*

Centre de Coordination en Cancérologie (3C, HCL)
Laboratoire Pôle de Psychologie Sociale (POPS, Lyon2)
Laboratoire de Mécanique des Contacts et des Structures (LAMCOS, INSA)
Laboratoire Territoires (UCA)
Laboratoire Ingénierie des Matériaux Polymères (IMP, Lyon1)
Laboratoire Parcours Santé Systémique (P2S, Lyon1)

CONTEXT

Food consumption, especially meat consumption, stands a critical nexus between human health and environmental sustainability. The increase in meat production has serious consequences on the environment, such as deforestation and greenhouse gases (GHG) emissions. Moreover, intensive breeding practices have a deep influence on the quality of food, thereby directly impacting human health. Addressing one of Earth's primary nutritional challenges, especially in industrialized countries, involves reducing animal proteins while increasing plant proteins in daily diets (Rubio et al., 2020). In addition, adopting a plant protein-enriched diet could prevent the dysbiosis of intestinal and oral microbiota, hence prevent non-communicable diseases (NCDs) such as periodontal diseases and cancers (Martinon et al., 2021). However, the alarming decline in cultivated biodiversity, with a 75% loss in the last century, severely limits the variety of available plant protein sources (mainly composed of cereals and legumes) required to cover recommended daily amino acid intake (FAO report, 2010). The BIOQUALIM project will contribute both to increase cereal biodiversity in Lyon region and to the prevention of NCDs, more particularly to cancer prevention, with two complementary primary and tertiary prevention approaches, organized around four Work Packages, as presented below.

WP1 : nutritional analyzes of local cereals



OBJECTIVES: to compare the contents in some nutrients and anti-cancer bioactive molecules in ancient wheats (einkorn, emmer, spelt) and common wheat (soft wheat).

METHODOLOGY: the samples are: 7 varieties of einkorn, 8 varieties of emmer, 8 varieties of spelt and 8 varieties of soft wheat, grown organically at the CRBA (Charly, 69). The quantitative analyses will be carried out by ICP-MS and GC-MS/MS.

Ancient wheat species:
- einkorn = "petit épeautre"
- emmer = "moyen épeautre"
- spelt = "grand épeautre"
have several agronomical advantages (Moudry et al., 2011) and higher nutritional quality compared to soft wheat "blé tendre" (Dinu et al., 2018).



Organic local cereals (farmer partners and "Centre de Ressources de Botanique Appliquée" partner, PhD of Sofia Correa, 2023)



Culinary preparations from the different ancient wheat species



Rubio et al., 2020
Martinon et al, *J Clin Med.*, 10(2):197 (2021).
Moudry et al, *Scientific Res. Essays*, 6, 4273 (2011).
Dinu et al, *J. Nutritional Biochem.*, 52, 1 (2018).

WP2 : Populational-based behavioral study regarding vegetable-based food consumption



OBJECTIVES: To investigate the perceived behavior captured in a general population sample, regarding plant-based food consumption.

METHODOLOGY: 3 cohorts (the farmers' customers, and HCL professionals and patients).
-Survey online (35 items)
-Semi-structured interviews

WP4 : Supportive Care in oncology : peer support and culinary workshops



OBJECTIVES: to evaluate the impact of peer-support culinary workshops (animation by a former patient) teaching plant protein-enriched diet, on the intention to change culinary behavior and the dietary quality of life of post-therapy cancer patients.

METHODOLOGY: Patients
-post-therapeutic cancer
-Semi-structured interviews

WP3 : Clinical study investigating the influence of plant protein-enriched diet on oral microbiota



OBJECTIVES: To evaluate the impact of plant protein-enriched diet on i) oral microbiota dysbiosis, a risk factor of NCDs such as cancer, and on ii) quality of life, in a general population.

METHODOLOGY: General population:
consumption -meat +einkorn cereal, during three months, with monitoring of:
-Interdental microbiota => qPCR
-Oral and general health
-Quality of Life

