

Position title	PhD position in Neotropical palm fiber biomechanics (F/M)
Application Deadline	15 June 2022
Research field	Biological sciences > Plant biomechanics Biological sciences > Biological engineering Environmental science > Historical Ecology
Organization/company	Institut de Recherche pour le Développement (IRD)
Location	Kourou, French Guiana Montpellier, France
Duration	3 years
Offer Starting date	01 September 2022
Researcher profile	First Stage Researcher (R1)
Research framework program	Horizon Europe / ERC
Job status	Full-time
Type of contract	Temporary (CDD)

Context.

The ERC-funded research program DOPAMICS, coordinated by Louise Brousseau, aims to evaluate how pre-Columbian societies have shaped the diversity of the Amazonian rainforest through subsistence farming and palm domestication. DOPAMICS focuses on emblematic archaeological sites of French Guiana (the so-called “ring ditches”) and relies on an interdisciplinary methodology at the frontier between life (plant biology, bioengineering, ecology, evolution), human (archaeology), and computational sciences (biostatistics, bioinformatics, modeling) to retrace the recent history of Amazonian landscapes and to evaluate the impact of pre-Columbian societies on the diversity and evolution of five palm species of the genera *Astrocaryum*, *Euterpe* and *Oenocarpus*.

Ph.D. project description.

Neotropical palms constitute a highly valuable resource in Amazonia where they are traditionally used as building and handicraft materials since pre-Columbian times thanks to the high stiffness and elasticity of their fibers. They are thus choice models to investigate the domestication process by focusing on fiber biomechanical properties as a potential target of domestication. This Ph.D. project aims to:

- (1) Develop a standardized methodology to evaluate the structural and mechanical properties of palm fibers;
- (2) Characterize inter- and intra-specific variability in fiber properties;
- (3) Analyze spatial variations in fiber properties and related ecosystem services along gradients of pre-Columbian disturbances, from formerly domesticated populations established at ring ditch sites to surrounding wild populations.

Responsibilities.

The successful applicant will participate in extensive field missions in the Amazonian rainforest of French Guiana and will be responsible of:

- Carrying out palm leaf sampling, conditioning and fiber extraction
- Characterizing fiber biomechanical properties (tensile tests) and microstructure
- Carrying out statistical analyses
- Publishing state-of-the-art research articles
- Disseminating scientific knowledge and discoveries through oral communications at international conferences and towards the society in French Guiana

Host laboratories.

Under the supervision of Julie Bossu (CNRS, UMR EcoFoG), Louise Brousseau (IRD, UMR AMAP, coordinator of DOPAMICS) and Thierry Fourcaud (HDR, CIRAD, head of UMR AMAP), the Ph.D. candidate will integrate an interdisciplinary team and interact with experts from different scientific disciplines (biomechanics, ecology, evolution, botany, anthropology).

He or she will be hosted at the Wood Science lab of UMR EcoFoG (Kourou, French Guiana) and at the UMR AMAP (Montpellier, France), two permanent lab members of the Excellence Laboratory "Center of the study of Biodiversity in Amazonia" (LabEx CEBA). He or she will also have the opportunity to visit external platforms to carry out the experiments and acquire additional skills and complementary experience.

Profile

Qualifications.

A Master or Engineer's degree in plant biomechanics and/or wood science and/or plant science

Skills.

- A good background in statistical analyses (statistical testing, multivariate analysis) and a good command of R software
- A good knowledge of data management tools and IT tools (MS Word, Excel, etc.)
- The willingness to participate in extensive field missions in the Amazonian rainforest and to contribute to interdisciplinary research capacity building in intertropical regions
- Good teamwork skills
- A good physical condition
- Languages: English, French appreciated
- A driving licence (B) would be appreciated

Application

Applications include: (1) curriculum vitae, (2) a cover letter outlining the applicant's motivations and research experience (single page), and (3) 1 or 2 name(s) of references or recommendation letter(s) with full contact information.

Applications must be sent to julie.bossu@cnrs.fr and louise.brousseau@ird.fr.

More information

Host laboratories:

- UMR AMAP (eng): <https://amap.cirad.fr/en/index.php>
- UMR EcoFoG (fr): <http://www.ecofog.gf/>

DOPAMICS project:

- <https://louisebrousseau.wixsite.com/louisebrousseau/dopamics>
- https://amap.cirad.fr/fr/edit-projet.php?projet_id=283

Coordinator website: <https://louisebrousseau.wixsite.com/louisebrousseau>