



LLAYTA: THE EDIBLE CYANOBACTERIA **COLONIES OF NOSTOC FROM CHILE SIGNIFICANTLY REDUCE NEUTRAL LIPID CONTENT**





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LNTRODUCTION

Llayta has been part of the Andean feeding practices of the rural communities of Perú and Chile since the pre-Columbian days. It consists in colonies

of cyanobacteria of the genus Nostoc, which are harvested, sun-dried, and sold in the market as ingredient for human consumption. Although it is known for its substantial content in essential amino acids and polyunsaturated fatty acids, little is known about Llayta, with regard to its pharmacological and biotechnological potential. In order to uncover the pharmacological and nutraceutical potential of *Llayta*, we have explored its lipid-reducing capacity, through a bioassay-guided isolation, using the zebrafish. The most active fraction reduced the neutral lipid content by approx. 80%, and is now being subjected to further chemical characterization, in order to find the compound responsible for the biological activity.



COLUMN Chromatography

3. BIOACTIVITY SCREENING

o DPF: egg collection **1 DPF:** larvae (egg water + PTU) **3 DPF:** exposure to test compounds 4 DPF: renew egg water and test compounds 5 DPF: Anesthesia and data collection

10 CASE/

Bahia

Nuest

MODEL: Zebrafish (Nile Red Assay)

Identification of the bioactive Fraction(s)

4. SUB-FRACTIONATION,

Figure 1. Representation of the zebrafish Nile red fat metabolism assay. Zebrafish larvae view under fluorescence microscopy (A and C). Percentage of Nile red fluorescence (MFI, Mean Fluorescence Intensity) in zebrafish larvae after 48h exposure to Nostoc Llayta fractions A-I (B) and HHx₁-HHx₁₂ (D). Resveratrol (REV) was used as positive control, and CTRL is the solvent control (0.1% DMSO). Error bars represent the mean±SD, of the MFI of six to eight individual larvae per treatment group. Statistical significance at *P<0.05, *****P*<0.001 and *****P*<0.0001 (One way ANOVA analysis of variance).



ISOLATION/IDENTIFICATION OF BIOACTIVE COMPOUND(S)



Normal-phase **Column Chromatography**

CKOWLEDGMENTS

87 86 85 84 83 82 81 80 79 78 77 76 75 74 73 72 71 70 69 68 67 66 65 64 63 62 61 60 59 58

evidencing the area of aromatic rings (C)

CONCLUSIONS & FUTURE PERSPECTIVES

> The capacity of *Llayta* fractions to reduce neutral lipid accumulation in zebrafish was superior to that of the reference drug resveratrol, highlighting the potential of this edible biomass to be further explored in the framework of metabolic diseases, with special focus in obesity.

► Further experiments will be taken in order to identify the compounds responsible for the anti-obesity activity of Llayta.

The edible Llayta will be explored for its potential to be used in anti-obesity food supplements.

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