



Revista Boliviana de Química

Rev. Bol. Quim. ISSN 0250-5460
Rev. boliv. quim. ISSN 2078-3949

Bolivian Journal of Chemistry
Vol. 31, No. 1, 2018

Abstracts

REVISTA BOLIVIANA DE QUÍMICA

ISSN 0250-5460 Rev. Bol. Quim. Paper edition
ISSN 2078-3949 Rev. boliv. quim. Electronic edition
Ortiz et al. RBQ Vol. 35, No.1, pp. 1-5, 2018



**MOLECULAR KITCHEN
CHEMISTRY;
BOLIVIAN TRADITIONAL
GASTRONOMY;
MOLECULAR CHUFLAY**

**QUÍMICA DE LA COCINA
MOLECULAR;
GASTRONOMÍA TRADICIONAL
BOLIVIANA;
CHUFLAY MOLECULAR**

Received 12 06 2017
Accepted 04 06 2018
Published 04 30 2018

Vol. 35, No.1, pp. 1-5, Ene./Abr. 2018
Revista Boliviana de Química

35(1), 1-5, Jan./Apr. 2018
Bolivian Journal of Chemistry



Short report

Peer-reviewed

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Keywords: *Molecular Kitchen Chemistry, Bolivian Gastronomy, Chuflay.*

ABSTRACT

This is a brief experimental description and theoretical approach to preparation of "chuflay", a Bolivian drink socially widely diffused under a spherification process. The physical presentation of the beverage is under the form of spherical capsule obtained through the gelification of alginate molecules (alginic acid salt) and calcium ions, by the spherification process of the alcoholic chuflay.

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**DAMSIN, CORONOPILIN AND
SANTAMARIN, SESQUITERPENE-
LACTONES THAT MANIFEST A
CYTOTOXIC ACTIVITY, DNA DAMAGE
CAPABILITY AND APOPTOSIS
CAPABILITY ON CANCER CELLS
LINES A549, HELA AND PANC-1**

**DAMSINA, CORONOPILINA Y
SANTAMARINA, SESQUITERPEN-
LACTONAS QUE MANIFIESTAN
ACTIVIDAD CITOTÓXICA,
CAPACIDAD DE DAÑO DEL ADN Y
CAPACIDAD DE APÓPTOSIS EN
CÉLULAS CANCEROSAS LINEAS
A549, HELA Y PANC-1**

Received 12 14 2017
Accepted 03 11 2018
Published 04 30 2018

Vol. 35, No.1, pp. 6-14, Ene./Abr. 2018
Revista Boliviana de Química

35(1), 6-14, Jan./Apr. 2018
Bolivian Journal of Chemistry



Full original article

Peer-reviewed

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Keywords: *Sesquiterpene-lactones, Cancer, Damsin, Coronopilin, Santamarin, DNA damage, Apoptosis.*

ABSTRACT

Cancer represents a group of diseases characterized by abnormal cell proliferation, currently represents major health problem. It is in this sense that derivatives of natural products are an important source of investigation as possible treatments. In the present research antiproliferative capacity, DNA damage and apoptotic effects of three sesquiterpene lactones (damsin, coronopilin and santamarin) were assayed in the following cancer cell lines: A549 (non-small cell lung cancer), HeLa (cervical cancer) and Panc-1 (pancreatic cancer).

In A549 cell line all molecules showed antiproliferative effect at every concentration without presenting DNA damage, santamarin and coronopilin increased the amount of apoptotic cells at high concentrations. Damsin and santamarin showed antiproliferative effect on HeLa cells at all concentration but coronopilin only at high, similarly DNA damage and apoptotic effect was observed for coronopilin and santamarin. For Panc-1 cell line, damsine and santamarin showed antiproliferative effect, DNA damage was observed at high concentrations of the three molecules, without effect on apoptosis induction.

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**CRITICAL REVIEWS ON STABILITY
AND PHOTSENSITIZER POTENTIAL
OF METAL FERROCYANIDES: A
POSSIBLE PREBIOTIC MINERAL;
PART (II)**

**REVISIONES CRÍTICAS SOBRE LA
ESTABILIDAD Y EL POTENCIAL
FOTOSENSIBILIZANTE DE LOS
FERROCIANUROS METÁLICOS: UN
POSIBLE MINERAL PREBIOTICO;
PARTE (II)**

Received 01 01 2018
Accepted 04 20 2018
Published 04 30 2018

Vol. 35, No.1, pp. 15-30, Ene./Abr. 2018
Revista Boliviana de Química

35(1), 15-30, Jan./Apr. 2018
Bolivian Journal of Chemistry



Full original article

Peer-reviewed

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Keywords: *Metal ferrocyanides, Stability, Oxidizer, Photosensitizer.*

ABSTRACT

Aluminum, barium, chromium, indium, platinum, stannous and vanadium ferrocyanides were synthesized and characterized by elemental analysis and spectral studies. Stability of synthesized metal ferrocyanides were recorded in heat, light (UV, VIS), various concentrations of acids (HCl, H₂SO₄), various concentrations of bases (NaOH, KOH, NH₄OH), sea water and from faucet at room and boil temperature. Stability of synthesized metal ferrocyanides was also recorded in organic solvents (ether, acetone, ethanol, formaldehyde) at room temperature. The oxidizing and photosensitizing potential of synthesized metal ferrocyanides were tested using potassium iodide and freshly prepared starch solution. The hexacyanoferrate (II) complexes of chromium, indium and platinum were found to be possible oxidizer and photosensitizer during the course of chemical evolution on primitive earth.

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**AN ANTIPLASMODIAL DEPSIDE
FROM A NIGERIAN LICHEN
DIRINARIA PICTA,
EPIPHYTIC ON THE OIL PALM
*ELAEIS GUINEENSE***

**UN DÉPSIDO ANTIPLASMODIAL
DE UN LIQUEN NIGERIANO
DIRINARIA PICTA,
EPÍFITO EN LA PALMA DE ACEITE
*ELAEIS GUINEENSE***

Received 01 06 2018
Accepted 04 25 2018
Published 04 30 2018

Vol. 35, No.1, pp. 31-39, Ene./Abr. 2018
Revista Boliviana de Química

35(1), 31-39, Jan./Apr. 2018
Bolivian Journal of Chemistry



Full original article

Peer-reviewed

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Keywords: Lichens, Depside, Anti-plasmodial, Cytotoxicity, Drug discovery.

ABSTRACT

This study investigated the anti-plasmodial and cytotoxic potentials of the chloroform (LCE) and ethanol (LEE) extracts from the foliose lichen *Dirinaria picta* with the view of isolating anti-malarial drug lead compound(s). *In vitro* anti-plasmodial and cytotoxicity assays were done using the plasmodium lactate dehydrogenase assay and human HeLa cervica cell lines respectively. The structure of the isolated compound was elucidated using spectroscopic techniques. The LCE yielded a novel antiplasmodial depside **1** (antiplasmodial IC₅₀ ≈ 37 μg/mL; cytotoxicity (IC₅₀ >100 μg/mL; Selectivity index >2.7) and an impure fraction LC2 (antiplasmodial IC₅₀ ≈ 79 μg/mL; cytotoxicity (IC₅₀ >100 μg/mL; Selectivity index <1.3). The LEE (antiplasmodial IC₅₀ ≈ 17 μg/mL; cytotoxicity (IC₅₀ ≈ 62 μg/mL; Selectivity index ≈ 3.7) showed a significantly (p < 0.05) better anti-plasmodial activity though more cytotoxic compared to depside **1** and LC2. The depside **1**, LC2 and LEE were less cytotoxic compared to emetine (cytotoxicity (IC₅₀ = 0.02 μM ≈ 0.013 μg/mL) though not as active as the reference drugs chloroquine (antiplasmodial IC₅₀ = 0.031 μM ≈ 0.016 μg/mL). This is the first time report on the anti-malarial potential of Nigerian lichens and the isolation of a novel anti-plasmodial depside **1**.

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**USE OF BACTERIA OBTAINED
FROM WHEY AND ITS POTENTIAL
USE AS PROBIOTICS IN THE FOOD
INDUSTRY. A SHORT REVIEW**

**USO DE BACTERIAS OBTENIDAS A
PARTIR DE SUERO DE LECHE Y SU
USO POTENCIAL COMO
PROBIÓTICOS EN LA INDUSTRIA
ALIMENTARIA**

Received 01 07 2018
Accepted 04 25 2018
Published 04 30 2018

Vol. 35, No.1, pp. 40-45, Ene./Abr. 2018
Revista Boliviana de Química

35(1), 40-45, Jan./Apr. 2018
Bolivian Journal of Chemistry



Short review

Peer-reviewed

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Keywords: Milk, Whey, Lactic acid bacteria, Probiotic, Characterization, Gen 16.

ABSTRACT

Some antimicrobial agents, as well as hormones, enzymes and antibodies can be found in whole milk. The two most abundant fractions of the protein content in bovine milk are casein and whey proteins. Due to whey properties, it is considered as a functional food, that is to say, in addition to having its intrinsic nutritional value, it has a benefic effect on one or more functions of the organism. In this way, it is suitable for health improvement and well-being and for the reduction of risk of certain diseases. Whey contains more than half the solids present in whole milk, including 20% of the proteins (lactalbumins and lactoglobulins) and 80% of dry matter in the form of lactose, mineral salts and water-soluble vitamins. The identification of lactic acid bacteria (LAB) is currently performed by biochemical tests like API 38 CHL, API 20 STREP and API 50 CHS strips. It has been shown that fraction A2 of milk protein decreases the incidence of cardiovascular diseases and diabetes type I. Finally, the knowledge currently generated about the genetics of lactic acid bacteria is interesting for the development of new foods with nutraceutical properties (functionality), texture or conservation.

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