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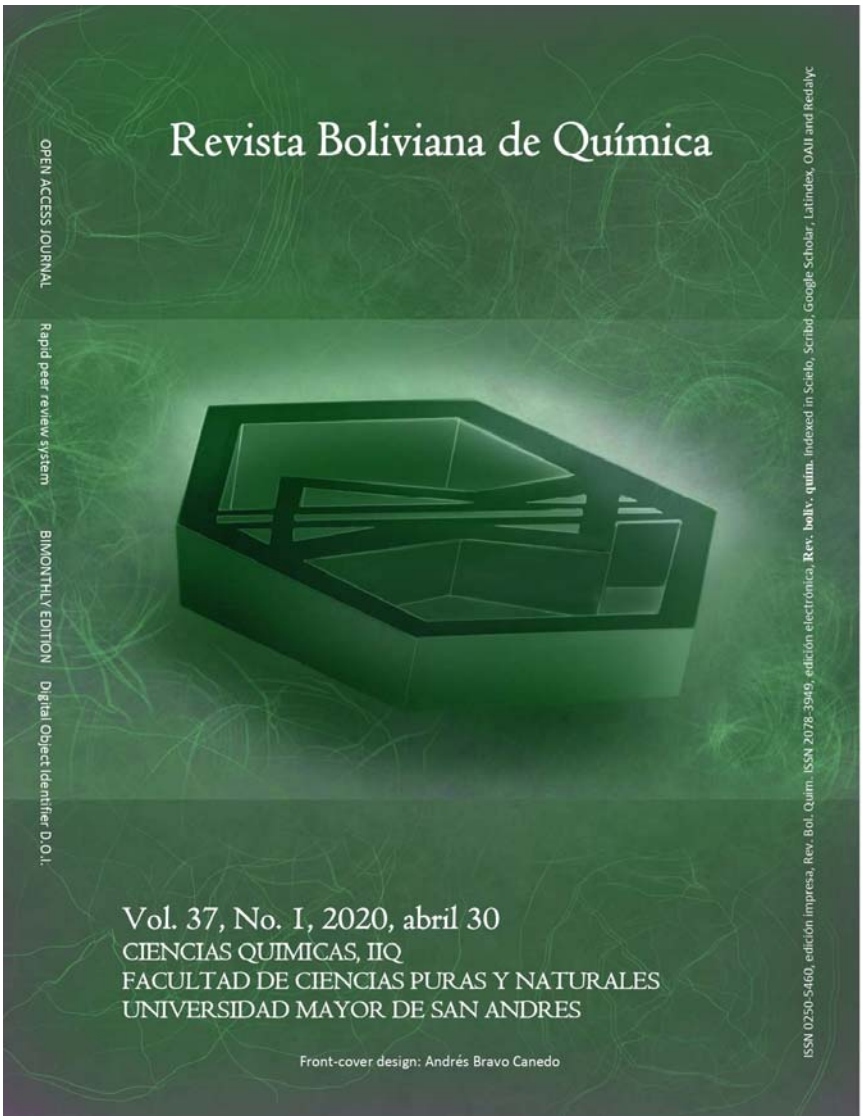
Abstracts



COMPARATIVE CHARACTERIZING ANALYSIS OF ESSENTIAL OILS OF FIVE SPECIES OF THE GENUS *BACCHARIS*, COLLECTED IN THREE COUNTIES AT LA PAZ, BOLIVIA

ANÁLISIS COMPARATIVO DE CARACTERIZACIÓN DE ACEITES ESENCIALES DE CINCO ESPECIES DEL GÉNERO *BACCHARIS*, COLECTADAS EN TRES CONDADOS DE LA PAZ, BOLIVIA

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Full original article *Peer-reviewed*

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Keywords: *Monoterpenes, Sesquiterpenes, Essential oil, Baccharis, B. boliviensis, B. densiflora, B. latifolia, B. papilllosa, B. tola.*

Palabras clave: *Monoterpenos, Sesquiterpenos, Aceite esencial, Baccharis, B. boliviensis, B. densiflora, B. latifolia, B. papilllosa, B. tola.*

ABSTRACT

The essential oils from the leaves of five species of the genus *Baccharis*, namely *Baccharis boliviensis*, *B. densiflora*, *B. latifolia*, *B. papilllosa* and *B. tola* collected in three counties, Cota-Cota, Mecapaca and Carpani at La Paz, Bolivia, were extracted using hydrodistillation procedures and subsequently analyzed by GC/MS. Four of the species were collected in two places of the La Paz valley, in order to establish the changes in composition in function of the place of origin. *B. densiflora* was collected only in one place because of the scarcely availability of the plant material in the other collecting sites. The essential oils obtained from the five species are composed mainly by monoterpenes, and a less percentage of sesquiterpenes, in addition, few non terpenic components were detected. The only exception was *B. latifolia* that showed almost the same amount of sesquiterpenes and monoterpenes. The samples of a same species collected at two different sites showed, as a rule, similar GC/MS profiles with the exception of *B. tola* that showed higher amounts of hydrocarbon sesquiterpenes and lower quantities of cyclic monoterpenes from Carpani to Cota Cota. The analysis of the identified compounds showed that some of them were present in good quantities in all the samples of essential oils examined, like for instance, β-myrcene, D-limonene, α-thujene, D-α-pinene, sabinene, L-β-pinene and α-muurolene.

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DETERMINATION OF THE PHENOLIC CONTENTS, AND EVALUATION OF THE ANTITYROSINASE ACTIVITY, AND THE ANTIOXIDANT INDEXES OF FOUR BOLIVIAN QUINOA VARIETIES

DETERMINACIÓN DEL CONTENIDO FENÓLICO, Y EVALUACIÓN DE LA ACTIVIDAD ANTITIROSINASA, Y DE LOS ÍNDICES ANTIOXIDANTES DE CUATRO VARIEDADES DE QUINOA BOLIVIANA

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Keywords: *Quinoa, Chenopodium quinoa, Antityrosinase, Antioxidant, Total Phenolic Contents, Mauritianin.*

Palabras clave: *Quinoa, Chenopodium quinoa, Antitirosinasa, Antioxidante, Contenidos fenólicos totales, Mauritianin.*

ABSTRACT

Four varieties of Bolivian quinoa (QJG Quinoa Jacha Grano, QRB Quinoa Real Blanca, QRN Quinoa Real Negra and QRR Quinoa Real Roja) have been studied in order to valorize them through the establishment of the phenolic contents and consequently by their antioxidant indexes. In addition, and in this pathway, the antityrosinase activity of the four varieties was measured. One important quinoa-endemic glycosylated flavonoid, mauritianin **1** (Kaempferol-3-O-(2,6-di-O-α-ramnopyranosyl-β-galactopyranoside) was isolated, and identified by cromatographic and spectroscopic methods and it was quantified. The four quinoa samples were treated by means of solid-liquid extractions with hydro-alcoholic 8:2 solvents. Quantifications and evaluations were done in the samples of the four varieties of quinoa and in phenolic rich fractions from the extract of QJG, and in compound **1**, coming from the QJG extract. In a series of *in vitro* tests, antioxidant indexes, by means of the total phenolic content and ABTS methods, and antityrosinase activities, by using the fungal tyrosinase method, of phenolic rich fractions and of the pure compound **1** were evaluated, **1** showed an important antityrosinase activity (74.73% I at 1.67 mg/mL) and antioxidant (826.68 mg GAE/g and 1141.38 µM Trolox/g), as well as the phenolic rich fraction from the extract of QJG named as EEW-1 that showed 69.89% I of the enzyme tyrosinase and significant antioxidant activity (246.08 mg GAE/g and 569.21 uM trolox/g), suggesting that these products could have a potential application in dermatology, cosmetics and food processing.

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BIOREMEDIATION OF CHROMIUM VI BY APPLYING *RHODOPSEUDOMONAS PALUSTRIS* IN INDUSTRIAL EFFLUENTS COMING FROM TANNERY

BIORREMEDIACION DE CROMO VI MEDIANTE EL USO DE *RHODOPSEUDOMONAS PALUSTRIS* EN EFLUENTES INDUSTRIALES PROVENIENTES DE CURTIEMBRES

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Full original article *Peer-reviewed*

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Keywords: *Bioremediation, Chrome VI, Rhodopseudomonas palustris.*

Palabras clave: *Biorremediacion, Cromo VI, Rhodopseudomonas palustris.*

ABSTRACT

The effects of chemical substances when considered as pollutants are of major interest since they are translated as alterations of the functionality of organs or systems in living beings, organisms are very sensitive to the presence of exogenous elements coming from environmental pollution. In this investigation we boarded the study of the removal of chromium Vl by means of the bacterium *Rhodopseudomonas palustris* when applied to contaminated waters. Chromium treatments (5 mg/L and 3 mg/L) were applied into bacterial solutions (400 mL and 300 mL) for times of 19 and 23 days periods in bioreactors. The elimination of chromium VI by bacteria was evaluated. On the basis of the results obtained we concluded that the level of concentration of chromium VI was reduced to below the maximum permissible limits of 0.5 mg/L. This research showed that inocula with tolerant bacteria can be used efficiently for the removal of chromium with characteristic concentrations of industrial and mining effluents.

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DETERMINATION OF TOTAL PHENOLIC COMPOUNDS AND EVALUATION OF THE ANTIOXIDANT ACTIVITY OF COMMERCIAL AND ARTISANAL GREEN TEA TRADED IN MARACAY, VENEZUELA

DETERMINACIÓN DE COMPUESTOS FENÓLICOS TOTALES Y EVALUACIÓN DE LA ACTIVIDAD ANTIOXIDANTE DE TÉ VERDE COMERCIAL Y ARTESANAL COMERCIALIZADOS EN MARACAY, VENEZUELA

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Short report *Peer-reviewed*

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Keywords: *Polyphenols, Flavonoids, Infusions, FRAP, DPPH.*

Palabras clave: *Polifenoles, Flavonoides, Infusiones, FRAP, DPPH.*

ABSTRACT

Tea is considered one of the most consumed beverages in the world, due to its pleasant sensory properties, extensive health benefits and unique socio-cultural characteristics. The present study aimed to determine and compare the concentration of total phenolics, flavonoids and antioxidant capacity of green tea infusions. Two commercial brands of green tea and an artisanal or non-commercial green tea from China were used. Colorimetric methods were used for the determination of total and flavonoid and phenolics and the DPPH and FRAP methods for antioxidant activity. Of the three infusions, the highest concentration of total phenolics, flavonoids and antioxidant capacity was observed in the infusion of artisanal green tea from China, with a statistically significant difference ($p \leq 0.05$). Its accessibility makes tea a good alternative for the consumption of substances with functional properties.

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IMPACT OF *AZOSPIRILLUM BRASILENSE*, A RHIZOBACTERIUM STIMULATING THE PRODUCTION OF INDOLE-3-ACETIC ACID AS THE MECHANISM OF IMPROVING PLANTS' GROW IN AGRICULTURAL CROPS

IMPACTO DE *AZOSPIRILLUM BRASILENSE*, UNA RIZOBACTERIA QUE ESTIMULA LA PRODUCCIÓN DEL ÁCIDO INDOL-3-ACÉTICO COMO EL MECANISMO DE MEJORA DEL CRECIMIENTO DE LAS PLANTAS EN LOS CULTIVOS AGRÍCOLAS

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Short review *Peer-reviewed*

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Keywords: *Indole-3-acetic acid, Inoculation with rhizobacteria, Azospirillum brasilense, Metabolic pathway, Phytohormones.*

Palabras clave: *Ácido-3-indol acético, Inoculación con rizobacterias, Azospirillum brasilense, Ruta metabólica, Fitohormonas.*

ABSTRACT

Azospirillum is a rhizobacteria capable of promoting the plant growth of different crops of agronomic interest. Up to now, 21 species are known, the most studied being *Azospirillum brasilense*. The effect of the use of the bacterium in corn crops has been reported, having been determined in parameters such as plant height and chlorophyll content, including an increase in the amount of fixed nitrogen from the atmosphere. Similarly, in soybean and wheat crops, a significant benefit has been reported in the increase in chlorophyll content related to the increase in grain yield per hectare. The main mechanism by which *Azospirillum* improves plant growth is through the production of phytohormones, mainly the indole-3-acetic acid (IAA), which is generated in the plant, but in nanomolar quantities, participating in various functions. It is known that the main route to the production of IAA is through the amino acid tryptophan (TRP) by means of four routes: 1) indole-3-acetonitrile (IAN), 2) indole-3-acetamide (IAM) 3) indole-3-pyruvic acid (IPyA) and 4) Tryptamine (TAM). Through various studies, it is known that there is an independent TRP route but, until now, the metabolites involved in the route, the levels of expression and the environmental circumstances in which it is expressed are not known.

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ELONGATION OF SHELF LIFE OF FRUITS BY THE USE OF BIOFILMS

ALARGAMIENTO DE LA VIDA DE ANAQUEL DE LAS FRUTAS POR EL USO DE BIOPELÍCULAS

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Short review *Peer-reviewed*

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Keywords: *Biofilms, Edible covers, Types of biofilms.*

Palabras Clave: *Biopelículas, Cubiertas comestibles, Tipos de biopelículas.*

ABSTRACT

One of the main problems in fruit preservation is its short shelf life, a detrimental fact that causes incalculable losses to the food industry. Take, for example, strawberries, blackberries and raspberries, time-labile fruits with a high market demand due to their nutritional properties (antioxidants, minerals and organic acids). One of the alternatives that exist to extend the shelf life of fruits is the use of edible covers or biofilms. These can be composed of hydrocolloids, proteins, lipids or a combination of all three, each material gives specific properties to these coatings. The qualities of biofilms, when applied in the perpetuation of shelf life of fruits, are the reduction of water loss, the loss of phenolic compounds and the retardation of enzymatic oxidation, in addition to allowing the addition of antioxidants or antimicrobial, without affecting the organoleptic properties of the fruit.

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HYDROBORATION, A BRIEF HISTORICAL REVIEW THROUGH MECHANISTIC VIEWS, PART I: ALKYL- AND ARYL-SUBSTITUTED OLEFINS, AS ADDITION-SUBSTRATES; THE ORGANIC CHEMISTRY NOTEBOOK, Nº 15

HIDROBORACIÓN, UNA BREVE REVISIÓN HISTÓRICA A TRAVÉS DE VISTAS MECANICISTAS, PARTE I: OLEFINAS ALIFÁTICAS Y AROMÁTICAS COMO SUSTRATOS DE ADICIÓN; EL CUADERNO DE QUÍMICA ORGÁNICA, Nº 15

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Short review *Peer-reviewed*

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Palabras clave: *Química orgánica, Reacción de adición, Enlaces múltiples, Organoboranos, Hidroboración, Mecanismos de reacción.*

ABSTRACT

The Organic Chemistry Notebook Series, a Didactical Approach, is the series designed with educational purposes in the organic synthesis field. With the present paper we add to a total of fourteen contributions so far in the series.

This series of studies is designed to help students when getting started in the synthesis subject. The method of learning includes many fully and explicitly designed reactions step by step. The best manner to understand a synthesis is by means of graphical views, in this case, the ones proposed by the authors of this series, and, when in most of the cases they are accompanied by illustrative comments that describe the graphical mechanistic proposals and add some criteria deduced from the different mechanistic steps. During the past 14 chapters we have taken a series of reactions compiled by W. Carruthers in 'Some modern methods of organic synthesis', and we have proposed didactical and mechanistic views for them. Now we are boarding another important compiling source in the synthesis studies: 'Advanced Organic Chemistry, Part B: Reaction and Synthesis' by Francis A. Carey and Richard J. Sundberg. This theme is included in the chapter "Electrophilic additions to carbon-carbon multiple bonds", and references therein.

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