**LEMBAR**
**HASIL PENILAIAN SEJAWAT SEBIDANG ATAU *PEER REVIEW***
**KARYA ILMIAH: JURNAL ILMIAH**

Judul Jurnal Ilmiah (Artikel) : Modification of glucomannan of *Amorphophallus oncophyllus* as an excipient for iron encapsulation performed using the gelation method

Jumlah Penulis : 4 orang

Status Pengusul : Penulis pertama/ ~~penulis ke - 3~~/ penulis korespondensi

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a. Nama Jurnal : Acta Scientiarum Polonorum, Technologia Alimentaria
b. Nomor ISSN : ISSN:1644-0730 e-ISSN:1898-9594
c. Volume, nomor, bulan, tahun : Vol. 18, No. 02, pp.173-184, 2019
d. Penerbit : Polish Universities of Agriculture
e. DOI Artikel : 10.17306/J.AFS.2019.0651
f. Alamat Web
JURNAL : https://www.food.actapol.net/volume18/issue2
ARTIKEL : https://www.food.actapol.net/pub/7_2_2019.pdf
g. Terindeks : Scopus/Scimagojr/SJR=0,352 (2018) dan Q3

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Semarang, Februari 2021

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NIP. 197306211997021001
Unit Kerja : Departemen Teknik Kimia FT UNDIP

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Prof. Andri Cahyo Kumoro, S.T., M.T., Ph.D.
NIP. 197405231998021001
Unit Kerja : Departemen Teknik Kimia FT UNDIP

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| Jumlah Penulis | : | 4 orang |
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Semarang, 17 Desember 2020
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| | | f. Alamat Web |
| | | JURNAL : https://www.food.actapol.net/volume18/issue2 |
| | | ARTIKEL : https://www.food.actapol.net/pub/7_2_2019.pdf |
| | | g. Terindeks : Scopus/Scimagojr/SJR=0,352 (2019) dan Q3 |

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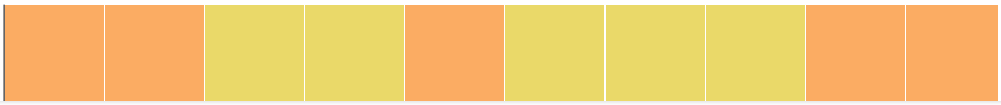

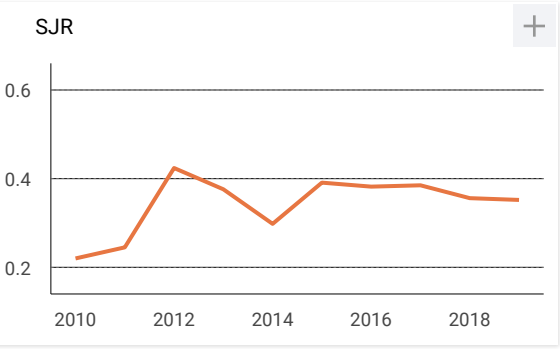
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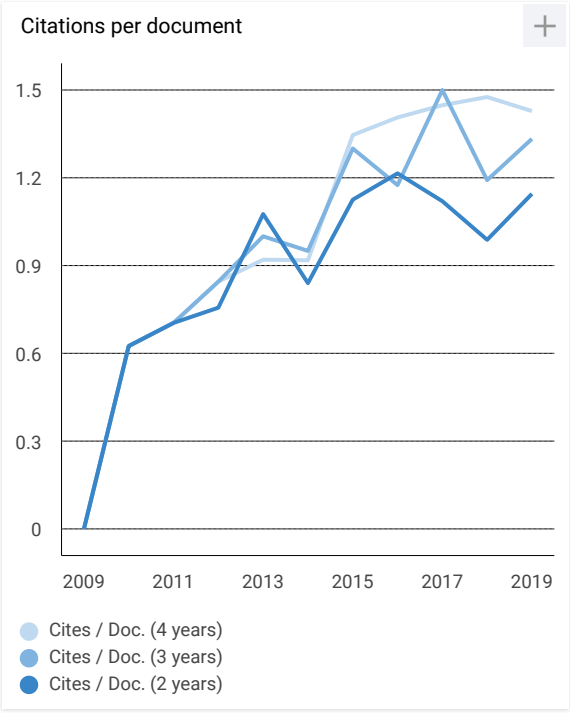
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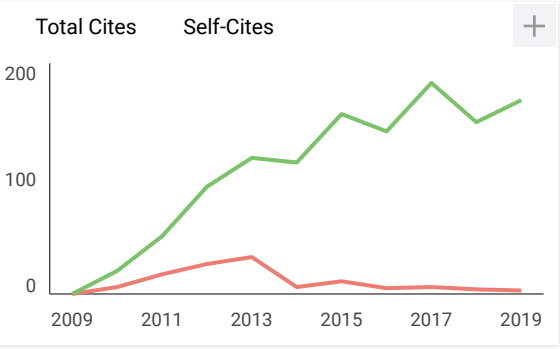
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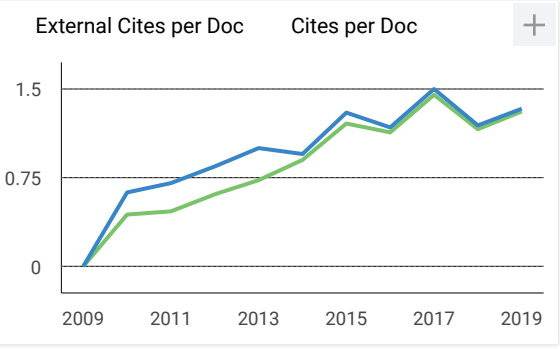
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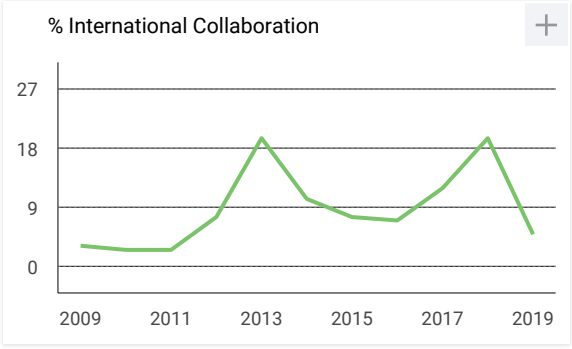
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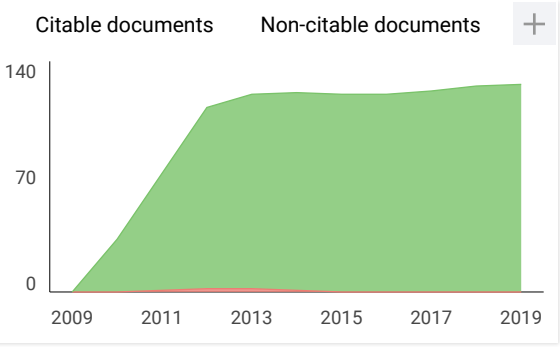
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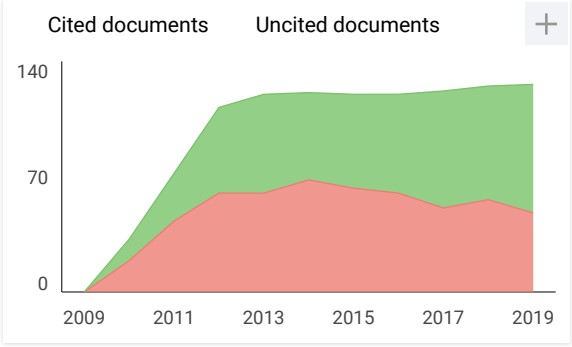
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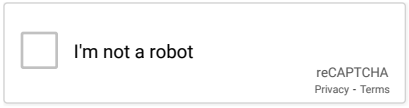


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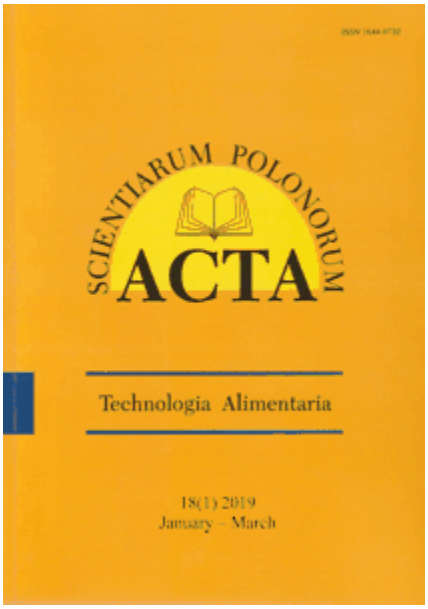
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ACTA
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18(1) 2019
January – March

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## Issue 18 (2) 2019

**April - June 2019**

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www.food.actapol.net pISSN 1644-0730 eISSN 1898-9594 http://dx.doi.org/10.17306/J.AFS.2019.0597

ORIGINAL PAPER

Received: 5.08.2018
Accepted: 28.09.2018

# MICROENCAPSULATION OF NATURAL POLYPHENOLIC COMPOUNDS EXTRACTED FROM APPLE PEEL AND ITS APPLICATION IN YOGHURT

Tamer Mohammed El-Messery[1]✉, Marwa M. El-Said[1], Evren Demircan[2], Beraat Ozçelik[2]

[1]Dairy Department, National Research Centre, **Egypt**
[2]Food Engineering Department, Istanbul Technical University
Maslak, 34469, Istanbul, **Turkey**

## ABSTRACT

**Background.** Apple peel is a by-product of fruit processing and a rich source of natural antioxidants, especially of polyphenolic compounds. Although it has many health benefits, the microencapsulation of polyphenolic compounds protects it from reactions with milk components during manufacturing or storage of dairy products which reduce the bioavailability and total acceptability of these products.

**Materials and methods.** Polyphenolic compounds (PC) were extracted from apple peel using ethanol (80%). Polyphenolic compounds extract powder (PCEP) was encapsulated by physical methods (spray and freeze dryer) using maltodextrin, whey protein concentrate (8:2), and Gum Arabic mixture (6:4) as coating materials, which were homogenized by ultraturrax and ultrasonication. Encapsulated PCEP was used in supplementing yoghurt. Phenolic content (PC), physiochemical and texture properties of yoghurt samples were evaluated during storage (fresh, 7 and 15 days).

**Results.** The microencapsulation by freeze dryer method for PCEP which was homogenized by ultrasonication was the best treatment, while encapsulation efficiency using the spray dryer method, which was homogenized by ultraturrax, was the worst. Encapsulated PCEP in yoghurt samples didn't have any significant influence on the physiochemical and texture properties of these samples.

**Conclusion.** Yoghurt samples maintained on the polyphenolic compounds until the end of storage overall, our results revealed that adding encapsulated PCEP into yoghurt gave closer characteristics to the control sample.

**Keywords:** apple peel, polyphenolic compounds, microencapsulation yoghurt, spray and freeze dryer

## INTRODUCTION

Apples (*Malus pumila*) are used commonly in human nutrition due to their availability throughout the year and a pleasant taste. They also contain many nutrients, such as vitamins, minerals and other bioactive components. Peels and seeds are the major by-products of fruit processing and they contain high amounts of phenolic compounds (PC), flavonoids and antioxidants compared to whole fruit (Ajila et al., 2007; Vieira et al., 2009). Natural phenolic compounds are receiving a lot of attention due to their potential beneficial health properties (Bueno et al., 2012). An apple has 80% of its PC concentrated in the peel, and five-to-six-fold the antioxidants in the apple peel than in the flesh (Leccese et al., 2009). The increasing health awareness of consumers has created a great demand for functional foods containing PC (Sun-Waterhouse

✉tmelmessery@yahoo.com, phone 00201009266969

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www.food.actapol.net pISSN 1644-0730 eISSN 1898-9594 http://dx.doi.org/10.17306/J.AFS.2019.0628

REVIEW PAPER

Received: 4.12.2018
Accepted: 28.12.2018

# CORNELIAN CHERRY (*CORNUS MAS* L.) – CHARACTERISTICS, NUTRITIONAL AND PRO-HEALTH PROPERTIES

Maciej Kazimierski, Julita Regula✉, Marta Molska

Institute of Human Nutrition and Dietetics, Poznań University of Life Sciences
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**ABSTRACT**

The cornelian cherry *Cornus mas* L. belongs to the Cornaceae family (*Cornaceae*). It can be found naturally in the central and south-eastern regions of Europe. Its fruits are characterized by oval or oval-oblong shape, with colours ranging from light yellow to dark cherry. The taste of fruits is usually considered to be tart-sweet, sour and in some cases sweet-pineapple. All cultivars of the cornelian cherry have a high biological value, which is mainly connected with their antioxidant activity, as well as with their phenolic compound and ascorbic acid content. The main pro-health properties of the cornelian cherry are related to the large amount of anthocyanins. The basic raw material is fruits; however, leaves, flowers and seeds are also used as a source of active ingredients. The chemical composition of cornelian cherry fruits is diversified and depends to a large extent on the cultivar, as well as on cultivation, and the environmental and climatic conditions.

**Keywords:** polyphenols, anthocyanins, antioxidant substances, vitamin C

## INTRODUCTION

In recent years, nutrition has been believed to play a very important role in preventing many diseases. Widespread pro-health awareness, as well as the constantly increasing consumer interest in healthy lifestyles and healthy diets, induces food manufacturers to search for little-known plant species whose edible parts have specific pro-health properties. One such plant is the cornelian cherry (*Cornus mas* L.), which was already being used universally in ancient times, as evidenced by excavations from that period, where objects made of cornelian cherry wood (exceptionally hard and durable) were found (Tarko et al., 2007). The cornelian cherry (*Cornus mas* L.) is a plant of vast natural range that has been known in garden cultivation for 400 years. Its fruits, flowers, leaves and bark have been known and appreciated in folk medicine for years, especially in Asia. According to historical reports, Hippocrates wrote that cornelian cherry leaves can be used for preparing a decoction for treating stomach diseases, whereas Ovid provided the recipe for cornelian cherry jam in his poem 'The Golden Age'. Even before the discovery of America, Native Americans would use cornelian cherry bark extracts for treating malaria. At the beginning of the 19th century, there were discussions in America concerning the reason why certain citizens had healthy white teeth, which was ultimately attributed to chewing cornelian cherry shoots (Gasik and Mitek, 2008).

### Plant characteristics and occurrence

The cornelian cherry is a shrub or a small tree with a height from 3 m to 9 m. It belongs to the Cornaceae family (*Cornaceae*). There are approximately 50 species of cornelian cherry in the world (Kucharska,

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ACTA SCIENTIARUM POLONORUM
Acta Sci. Pol. Technol. Aliment. 18(1) 2019, 35–41
www.food.actapol.net pISSN 1644-0730 eISSN 1898-9594 http://dx.doi.org/10.17306/J.AFS.2019.0619

ORIGINAL PAPER

Received: 29.10.2018
Accepted: 8.01.2019

# ANALYSIS OF COFFEE ADULTERATED WITH ROASTED CORN AND ROASTED SOYBEAN USING VOLTAMMETRIC ELECTRONIC TONGUE

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## ABSTRACT

**Background.** Coffee samples adulterated with roasted corn and roasted soybean were analyzed using a voltammetric electronic tongue equipped with a polypyrrole sensor array.
**Materials and methods.** Coffee samples were adulterated in concentrations of 2%, 5%, 10% and 20% of roasted corn and roasted soybean; 5 replicates of each were used. The discrimination capacity of a voltammetric electronic tongue elaborated with a polypyrrole sensor array, was evaluated by principal component analysis and cluster analysis, while the capacity to perform quantitative determinations was carried out by partial least squares.
**Results.** The results obtained by the application of principal component analysis showed an excellent ability to discriminate adulterated samples. Additionally, the classifications obtained by cluster analysis was concordant with those obtained by principal component analysis. On the other hand, the evaluation of the ability to quantitatively analyze the adulterated samples showed that the polypyrrole sensor array provides sufficient information to allow quantitative determinations by partial least squares regression.
**Conclusion.** It could be concluded that the voltammetric electronic tongue used in this work allows the sufficient analysis of coffee samples adulterated with roasted corn and roasted soybean.

**Keywords:** electronic tongue, voltammetry, polypyrrole, coffee, adulteration

## INTRODUCTION

Coffee is one of the most consumed beverages worldwide and its commercialization in international markets represents the movement of millions of dollars per year (International Coffee Organization, 2017). The commercial importance of coffee and the value acquired by good quality coffee makes it the object of adulterations by some producers and marketers who want to increase their earnings. One of the most common practices in the adulteration of coffee, is the addition of toasted grain products such as soybean, rice,

Funding agency: University of Sucre and the Administrative Department of Science and Technology (Colciencias).
The authors acknowledge the University of Sucre and the Administrative Department of Science and Technology (Colciencias) for the financial support of this research.

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