# CONGRESO NACIONAL DE BIOTECNOLOGÍA

# biTEC2017

**Murcia 18-21 junio 2017**

Sociedad Española de Biotecnología

SEBiot Sociedad Española de Biotecnología Regional Branch Office (EFB)

# CONGRESO NACIONAL

# DE BIOTECNOLOGÍA

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# - Libro de Resúmenes -

**ORGANIZA**

Sociedad Española de Biotecnología

UNIVERSIDAD DE MURCIA

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# PÓSTERES

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# PÓSTERES

## 4. BIOTECNOLOGÍA ALIMENTARIA

## P4-1: Chemical composition and bioactive properties of rice bran from different varieties

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**Topic:** Biotecnología alimentaria: alimentos funcionales

**Abstract:** Rice (*Oryza sativa* L.) is an important cereal crop and a staple food for more than half of the world's population[1]. The bran portion corresponds to 5-10% of whole grain rice and being investigated regarding important phytochemicals with bioactive properties that have been related to beneficial health effects[2]. This study aimed to compare five types of rice bran including *Japonica* (Ariete), *Indica* (Gládio) varieties provided by Cotarroz from Salvaterra de Magos, Portugal and commercial colored types (Venere, Black, Orange) in terms of their chemical composition and bioactive properties (antioxidant, antimicrobial and cytotoxic properties). Free sugars and organic acids were determined by high-performance liquid chromatography (HPLC) coupled to a refraction index (RI) and a diode array (DAD) detector, respectively. Phenolic compounds were identified and quantified by HPLC coupled to a DAD and mass spectrometry (MS) using the electrospray ionization interface (ESI). The antioxidant activity was evaluated by four *in vitro* assays measuring DPPH (2,2-diphenyl-1-picrylhydrazyl) radical scavenging activity, reducing power, inhibition of β-carotene bleaching and inhibition of lipid peroxidation using thiobarbituric acid reactive substances (TBARS) assay. Multi-resistant clinical bacterial strains (six Gram-negative and four Gram-positive) were used to screen the antimicrobial activity of the samples. The cytotoxic activity was tested using MCF-7 (breast adenocarcinoma), NCI-H460 (non-small cell lung cancer), HeLa (cervical carcinoma) and HepG2 (hepatocellular carcinoma) cell lines, and also a non-tumor cell line PLP2.

The highest levels of free sugars (sucrose, glucose and fructose) were found in rice Venere rice bran; sucrose was only detected in orange and Ariete rice bran. Oxalic, citric and fumaric acids predominated in black rice bran. The black colored bran presented the highest levels of total non-anthocyanin and anthocyanin phenolic compounds, being luteolin-*O*-pentosyl-hexoside and cyanidin-3-*O*-glucoside the main compounds present (Figure 1). Orange rice bran revealed the highest antioxidant activity in almost all the assays (unless TBARS) as also the highest antimicrobial activity, being more active against the tested Gram-positive bacteria and two Gram-negative bacteria (*Escherichia coli* and *E. coli* spectrum extended producer of β-lactamases). Gládio rice bran inhibited all the tested human tumor cells and none of the samples revealed toxicity for non-tumor cells PLP2. The bioactive properties of rice bran associated with its nutritional and chemical composition can be explored in the development of functional foods.

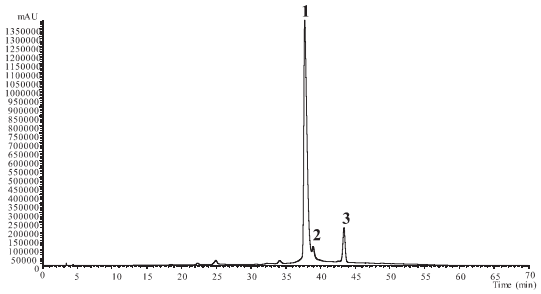


**Fig. 1** Individual profile of anthocyanin compounds of rice Black bran. 1- Cyanidin-3-*O*-glucoside; 2- Cyanidin-*O*-hexoside; 3- Peonidin-3-*O*-glucoside.

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