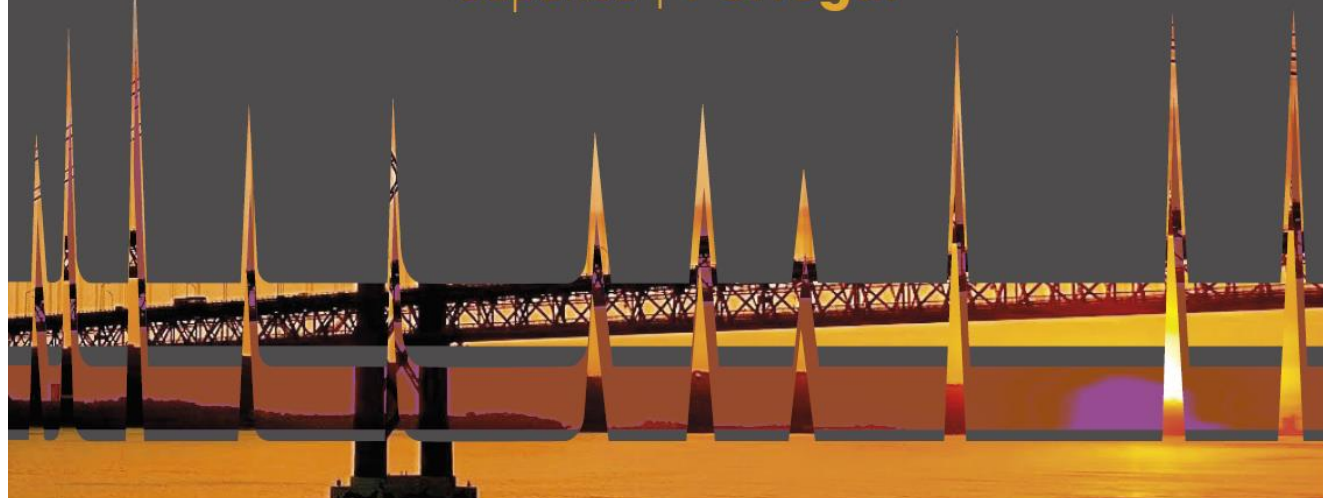


11<sup>o</sup> CONGRESSO  
NACIONAL  
DE CROMATOGRAFIA

20 anos  
CROMATOGRAFIA

# 11<sup>th</sup> NATIONAL MEETING ON CHROMATOGRAPHY

9 | 11 Dezembro 2019  
Caparica | Portugal



Faculdade de Ciências e Tecnologia,  
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## O31 Phytochemical composition and *in vitro* antioxidant and antimicrobial properties of *Aloe vera* leaf tissue extracts

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Over the last decades, *Aloe vera* has been subject of several scientific studies that aimed to characterize compositional and biological properties.<sup>1,2</sup> Despite this, a lack of information on the exact part of the plant analysed or even the species involved is common in many of these works. There are confusing descriptions, mostly about the inner part of the leaf, due to the different terms that have been used interchangeably, such as fillet, pulp, mucilage, gel, and parenchyma, among others.<sup>3</sup> However, these terms do not refer to the same part of the leaf. Therefore, this study was performed to evaluate and compare chemical and bioactive features of *Aloe vera* leaf fillet, mucilage and rind. Freshly cut *Aloe vera* samples of certified organic production were provided by an agricultural company located in Elvas, Portugal. The green rind was separated from the inner fillet and the transparent slippery exudate consisting mainly of gel was collected from the mucilage layer of the outer leaf pulp adjacent to the rind. After lyophilisation, the powdered samples underwent a solid-liquid extraction with an hydroethanolic mixture to obtain the extracts. These were analysed by HPLC-DAD-ESI/MS to characterize their phenolic profile, and *in vitro* screened for antioxidant (by the capacity to inhibit the oxidative haemolysis (OxHLIA), the formation of thiobarbituric acid reactive substances (TBARS), and the  $\beta$ -carotene bleaching) and antimicrobial (against skin-associated pathogenic bacteria and fungi) activities.<sup>4</sup>

Up to seventeen phenolic compounds were identified in the *Aloe vera* leaf extracts and classified into four groups: phenolic acids, flavonoids, chromones, and anthrones. The chromones aloesin and 2'-*p*-methoxycoumaroylloresin and the anthrones aloin A and B, 10-hydroxyaloin A and B, and malonyl aloin A and B were detected in the three leaf extracts. The mucilage contained the highest level (131 $\pm$ 3 mg/g extract) of phenolic compounds, mostly anthrones (62.1%) and chromones (34.6%), followed by two luteolin glucosides (3.3%). The rind was ranked second, with 105 $\pm$ 3 mg/g extract of phenolic compounds, of which 44.9% anthrones and 43.8% chromones; it also contained luteolin and apigenin glucosides and *p*-coumaroylquinic acid. However, the chromone levels found in the rind did not differ statistically from those of the mucilage. Although the phenolic profiles of fillet and mucilage were similar, a significantly lower concentration (11.2  $\pm$  0.2 mg/g extract) of these secondary metabolites was found in fillet. In addition, this leaf part had an equal ratio of anthrones and chromones. The mucilage and rind extracts revealed interesting antioxidant properties. On the other hand, fillet and rind extracts showed a powerful antifungal activity against *Aspergillus flavus*, *A. niger*, *Penicillium funiculosum*, and *Candida albicans*, higher than that of the positive control ketoconazole. This study showed that the three studied extracts of *Aloe vera* leaf have a different content of phenolic compounds and a high antifungal activity. Since the rind of this plant is often discarded as a biowaste, in future studies we intend to evaluate the potential of green solvents with a different number of hydroxyl groups to extract phenolic compounds from this matrix.

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