BOOK OF ABSTRACTS

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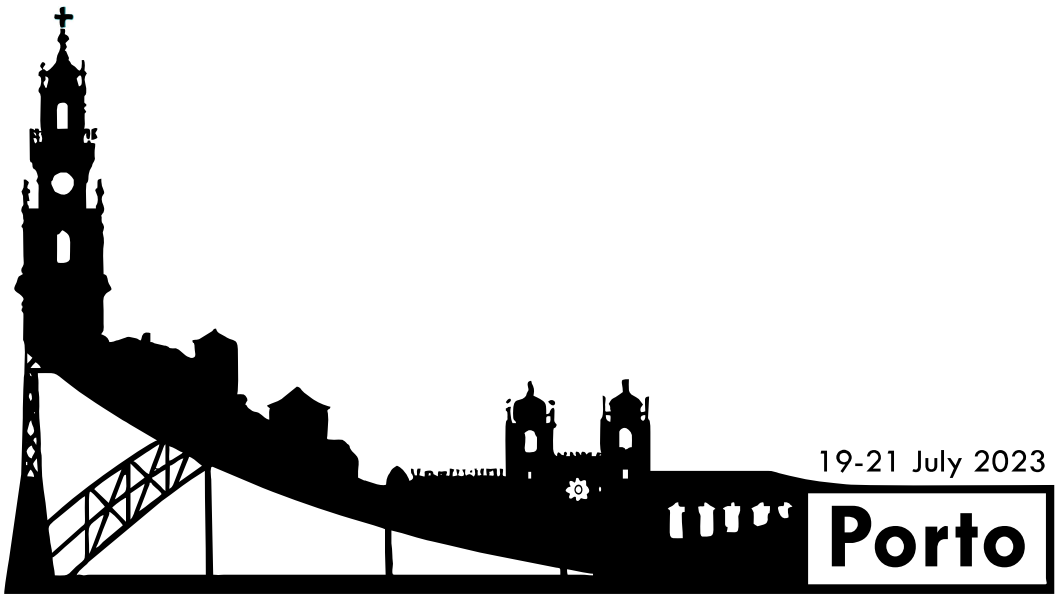

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Effects of seed germination on cowpea β-vignin native structure: a calorimetric and thermodynamic investigation

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β-vignin is the most represented storage protein in cowpea seeds (*Vigna unguiculata*, L. Walp) and belongs to the 7S globulin or vicilin-like family [1]. It is synthesized during seed development and, like other storage proteins, it is traditionally considered the nitrogen reserve that supports seedling growth during the first steps of germination [2]. Literature reports that several biological activities are exhibited upon a regulated and selective proteolytic breakdown by which some transient intermediate peptides are formed and have been shown to possess specific bioactivities [3].
β-vignin consists of two main differently glycosylated isoforms. Moreover, it exists as monomeric and trimeric forms with an equilibrium mechanism that depends on the environment pH: the higher the pH value, the greater the trimer-to-monomer ratio [4]. The full understanding of cowpea β-vignin physicochemical properties is crucial to reveal possible biological roles and to approach applicative uses in various fields, including eco-friendly plant defense, nutrition and nutraceutics.
In this frame, purified β-vignin was subjected to a limited proteolysis by using cowpea proteases extracted from germinating seeds [4] to simulate the early germination process, and a calorimetric investigation was performed through high-sensitivity DSC on both the undigested and digested β-vignin in different buffered environments (pH 9.0, 8.5 and 6.5). A thermodynamic analysis was also accomplished on the β-vignin undigested form to assess the protein stability and thermal denaturation mechanism. The results revealed that the storage protein behavior is rather peculiar if compared to proteins with other biological functions.

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