



## Variability within a pea core collection of LEAM and HSP22, two mitochondrial seed proteins involved in stress tolerance

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Auteur	Avelange-Macherel, Marie-Hélène [1], Payet, Nicole [2], Lalanne, David [3], Neveu, Martine [4], Tolleter, Dimitri [5], Burstin, Judith [6], Macherel, David [7]
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Mots-clés	gene evolution [8], indel [9], LEA protein [10], mitochondria [11], pea accessions [12], small HSP [13]
Résumé en anglais	<p>LEAM, a late embryogenesis abundant protein, and HSP22, a small heat shock protein, were shown to accumulate in the mitochondria during pea (<i>Pisum sativum</i> L.) seed development, where they are expected to contribute to desiccation tolerance. Here, their expression was examined in seeds of 89 pea genotypes by Western blot analysis. All genotypes expressed LEAM and HSP22 in similar amounts. In contrast with HSP22, LEAM displayed different isoforms according to apparent molecular mass. Each of the 89 genotypes harboured a single LEAM isoform. Genomic and RT-PCR analysis revealed four LEAM genes differing by a small variable indel in the coding region. These variations were consistent with the apparent molecular mass of each isoform. Indels, which occurred in repeated domains, did not alter the main properties of LEAM. Structural modelling indicated that the class A <math>\alpha</math>-helix structure, which allows interactions with the mitochondrial inner membrane in the dry state, was preserved in all isoforms, suggesting functionality is maintained. The overall results point out the essential character of LEAM and HSP22 in pea seeds. LEAM variability is discussed in terms of pea breeding history as well as LEA gene evolution mechanisms.</p>
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