

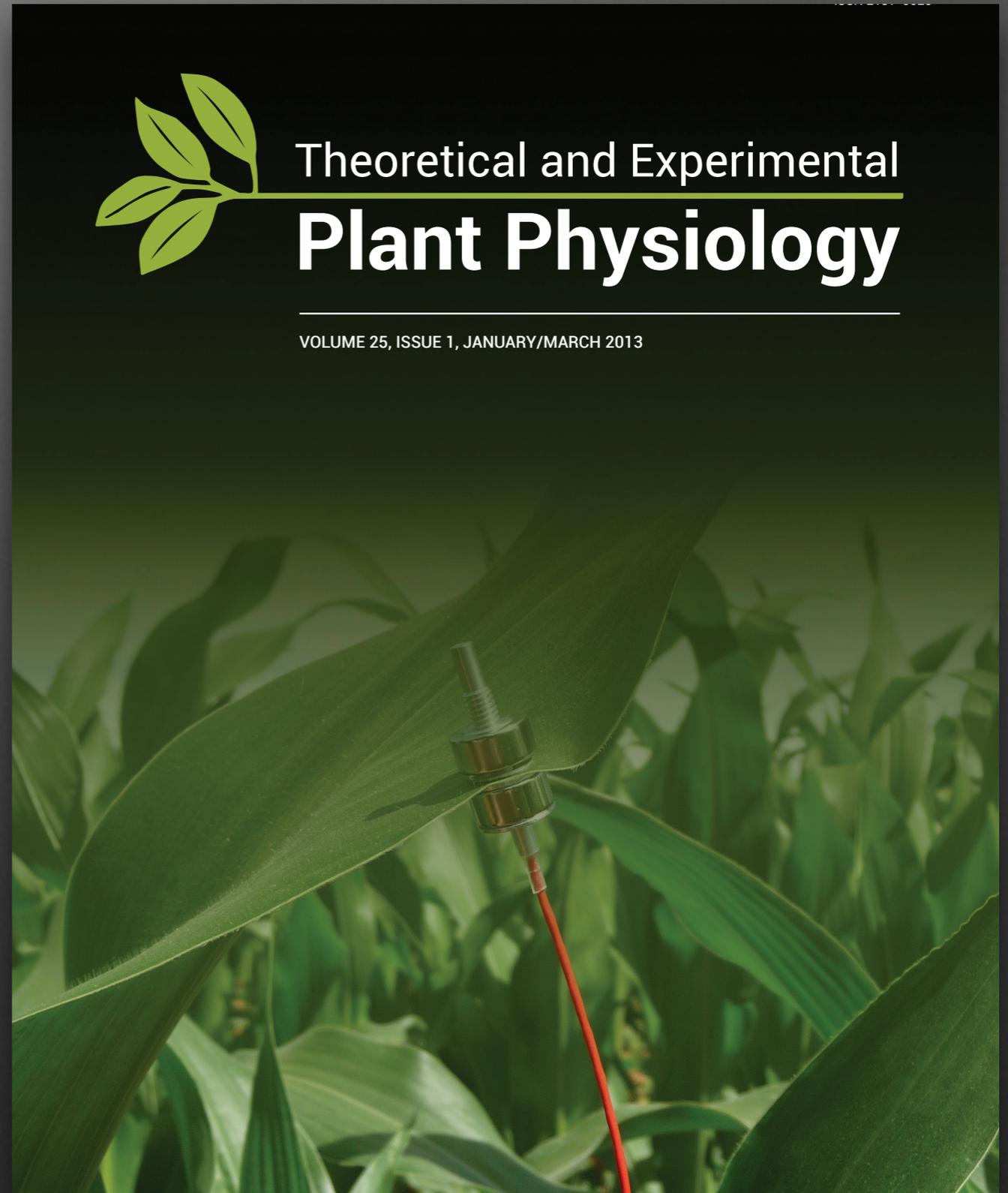
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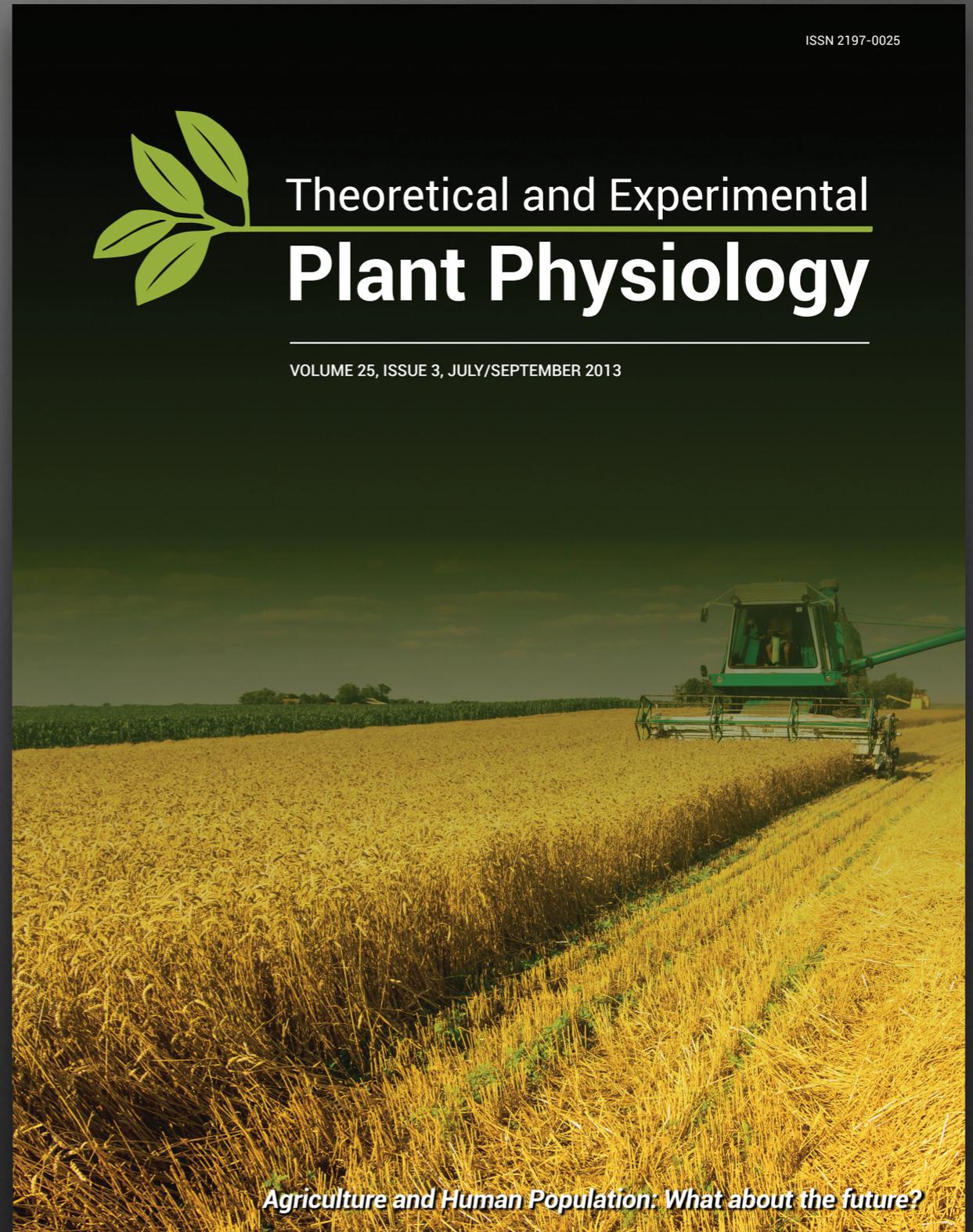
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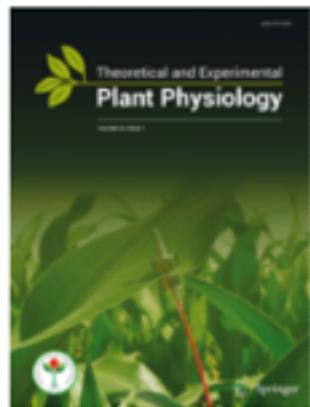


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48
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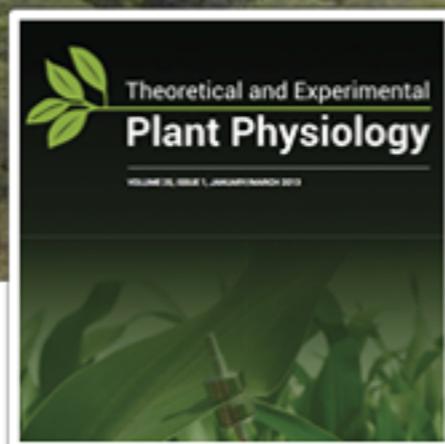
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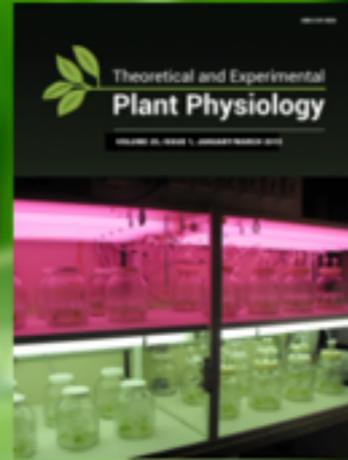
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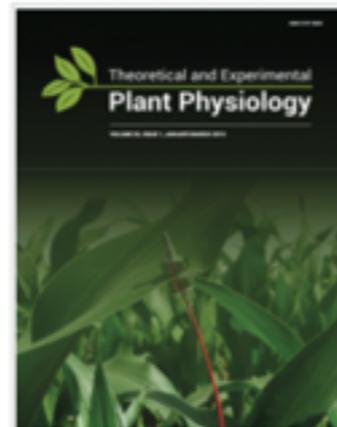


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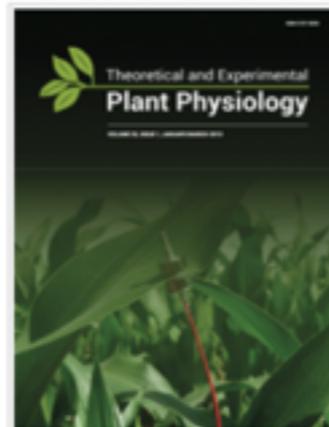
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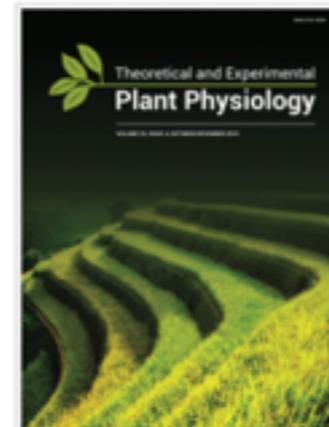
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Changes in soluble amino acid composition during *Canavalia ensiformis* development: responses to nitrogen deficiency

Liliane Santos Camargos · Leandro Ferreira Aguiar · Lucas Anjos Souza · Gilberto Costa Justino · Ricardo Antunes Azevedo

Received: 12 November 2014 / Accepted: 20 May 2015
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Abstract A limited number of studies focusing nitrogen metabolism have been carried out with plants from Cerrado, the second largest biome of Brazil. *Canavalia ensiformis* is a legume native from Cerrado and is considered an important forage crop that contributes to soil nitrogen (N) improvement. There are few studies related to amino acid metabolism and growth capacity under nitrogen deficiency for this plant species. Therefore, the objective of this work was to study the profile of soluble amino acids during

the growth cycle (from vegetative to the reproductive stage) of *Canavalia ensiformis*. Major changes in the concentration and composition of soluble amino acids at the beginning of the reproductive stage were observed indicating important alterations in amino acids metabolism. The data revealed that N-stress conditions led to increased aspartate and decreased asparagine contents in most organs and developmental stages of *C. ensiformis*. A pronounced increase in glutamate concentration during N-stress was also detected. Glutamine, alanine, GABA, threonine, histidine, arginine and glycine metabolisms were probably impaired by N deficiency, which was dependent upon plant developmental stage. The effect of nitrate presence or absence on amino acids metabolism in *C. ensiformis* is discussed.

Keywords Amino acids · Leguminous · Nitrate · N-stress

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1 Introduction

Cerrado is the second largest Biome of Brazil accounting for about 25 % of Brazilian land severely affected by degradation and deforestation (Klink and Machado 2005; Ribeiro et al. 2011). Studies focusing on the physiology of the plants growing on Cerrado conditions such as low availability of nitrogen (N) are scarce. N is one of the most essential nutrients required for all living organisms and is considered a limiting

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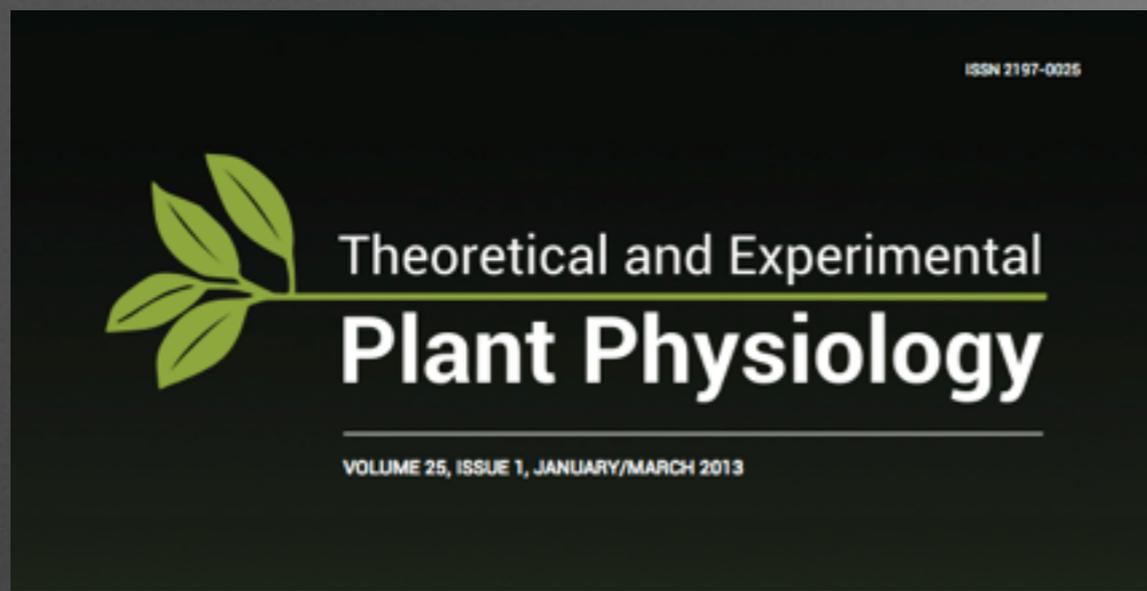
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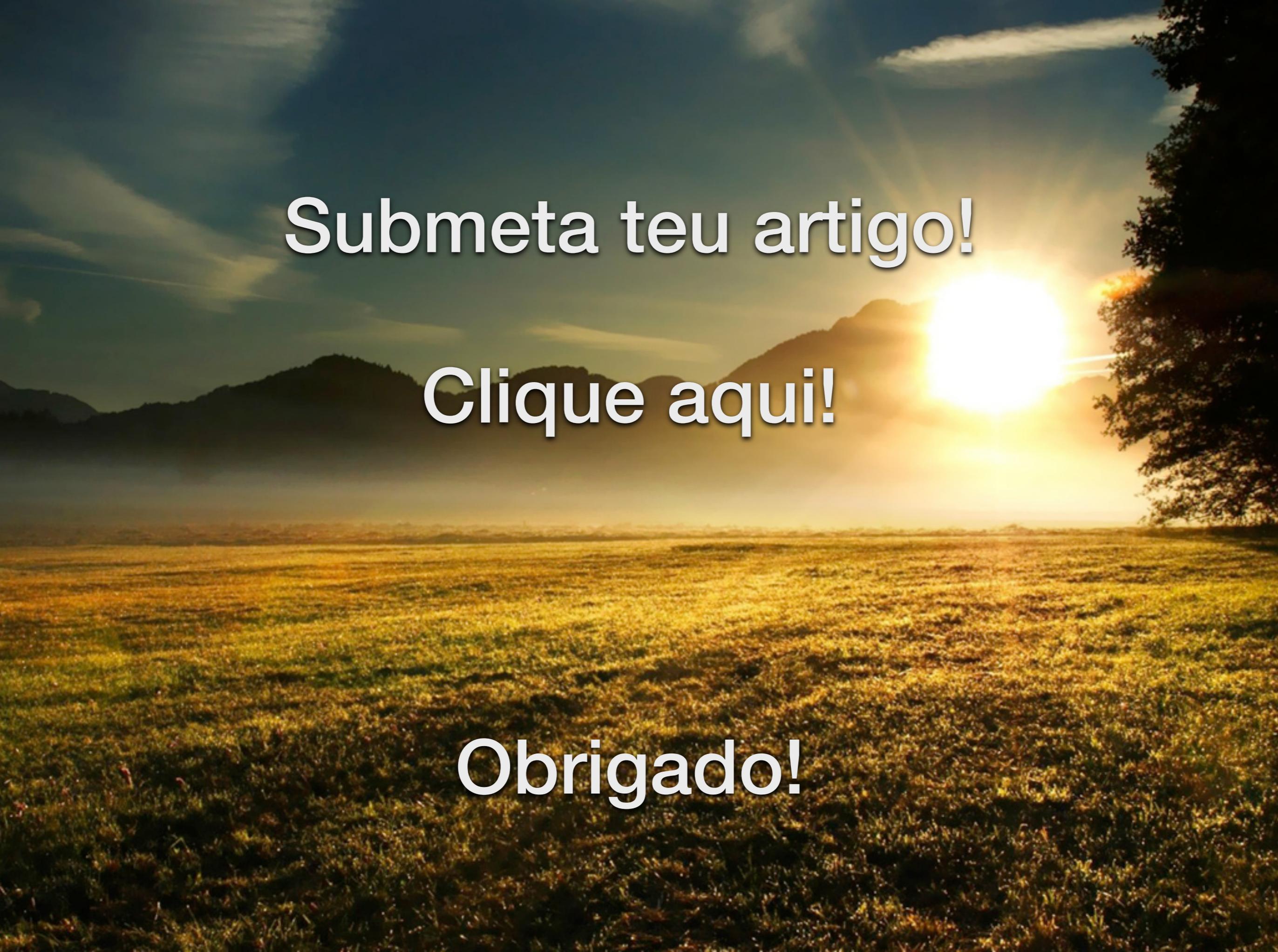
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