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Accelerated Germination and Altered Surface Characteristics of *Pisum Sativum* Seeds after Plasma Treatment at Atmospheric Pressure

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In this study, the influence of an air plasma treatment using dielectric barrier discharge at atmospheric pressure on the germination of pea (*pisum sativum*) seeds was investigated. Germination of plasma treated and untreated seeds was tested on filter paper and in pot-soil. For both testing methods accelerated germination of plasma treated pea seeds could be demonstrated. In order to investigate alterations of the pea seed surfaces due to plasma treatment, water uptake, pH-value and nitrate content of both exterior and interior testa surface were determined; scanning electron microscopy revealed changes in surface morphology. The plasma treated seeds showed a higher water uptake compared to the untreated seeds and scanning electron microscopy depicted degradation of the testa surface. PH-value decreases and nitrate content increases with progressing plasma treatment duration at constant electrical power, indicating an acidification of seed surfaces by plasma treatment. In addition, the comparison of a conventional method to accelerate germination by KNO₃-treatment of *pisum sativum* seeds with plasma treatment provided evidence of an optimum of germination at a certain nitrate content of testa surface. Since the nitrate content is directly related to the plasma treatment duration, such an optimum of germination further features a certain dependency on the plasma treatment.

Keywords

seeds

DBD

germination

acidification

nitrate content