

Electronic Nose for Monitoring Fungal Deterioration of Stored Rapeseed

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Abstract : Investigations were performed to examine the possibility of using an electronic nose to monitor the development of fungal microflora during the first eighteen days of rapeseed storage. The Cyranose 320 device with polymer-composite sensors was used. Each sample of infected material was divided into three parts, and the degree of spoilage was measured in three ways: analysis of colony forming units (CFU), determination of ergosterol content (ERG), and measurement with the eNose. Principal component analysis (PCA) was performed on the generated patterns of signals, and six groups of different spoilage levels were isolated. The electronic nose with polymer-composite sensors under laboratory conditions distinguished between species of spoiled and unspoiled seeds with 100% accuracy. Despite some minor differences in the CFU and ergosterol content, the electronic nose provided responses correctly corresponding to the level of spoilage with 85% accuracy. Therefore, the main conclusion from the study is that the electronic nose is a promising tool for quick and non-destructive detection of the level of oil seed spoilage. The research was supported by the National Centre for Research and Development (NCBR), Grant No. PBS2/A8/22/2013.

Keywords : colony forming units, electronic nose, ergosterol, rapeseed

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