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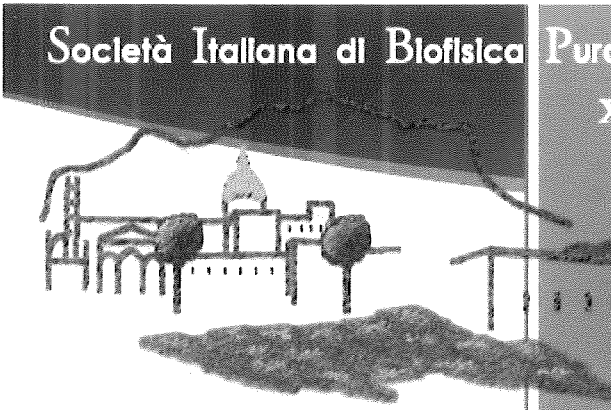

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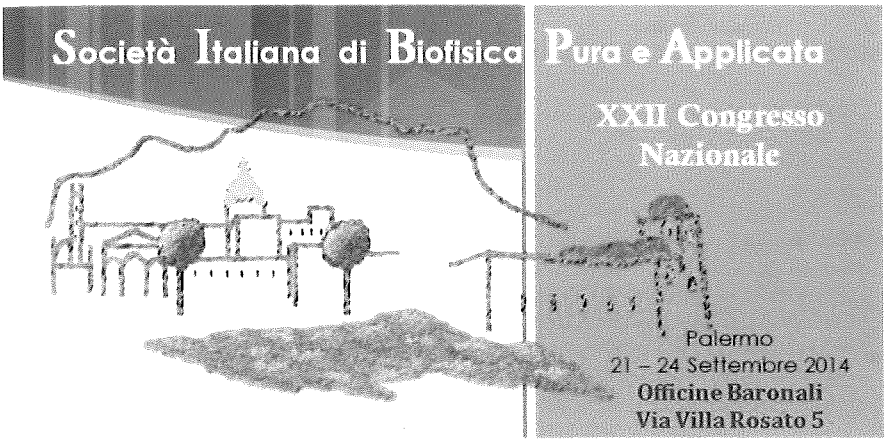

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Biofisica Applicata

ELECTRONIC NOSE TO DETECT OFF-FLAVOR OF DRINKING WATER

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In the last year many works have been conducted to find rapid and simple ways to early detection of water microbial contamination. It is proved that the Electronic Nose (EN) technique can be successfully utilized as a method to detect the presence of some bacteria like cyanobacteria or *Escherichia coli* or *Enterobacter aerogenes*, and for the detection of chemical contamination. Most of the waterborne bacteria are well known and no dangerous for human healthy, but are responsible of some of the most problematic odor contamination in potable water. Most of the bacteria commonly found in water supply networks are generally ubiquitous, due to their simple nutritional requirements and ability to utilize many different organic compounds as energy sources. In fact, they are able to reduce sulfur and selenium, leading to the appearance of off-odors usually described as wet cloth, cockles, butane, rubber and rotten eggs.

In this work a new EN instrument was applied to monitoring the off-flavor of drinking water potentially produced by microbial contamination. Our purpose is to develop a simple and rapid method to assess the degree of pollution. To achieve this objective we simulated water microbial contamination by adding different molecules that smells like the off flavor produced by bacteria. Precisely: dimethyl disulfide, dimethyl trisulfide, dimethyl diselenide, geosmin and a mix of sulfur compounds, were added in two different concentrations. An EN with an array of 32 MOS sensors was used to obtain the discrimination of the samples. The raw data were submitted to three different statistics tests: Bayes Net; RBF Net and Multi-layer Perceptron, the first one is a probabilistic model while the other two are artificial neural network models. This work shows a high rate of sensitivity and selectivity of the instrument that is able to distinguish among the different molecules. The accuracy of the results is closely related to the statistic test: for low concentration the probability model showed the best classification, while for higher concentration the three tests provided the same level of correctly classification