ABSTRACT

An Olfactory Biosensor was developed. It could differentiate the volatile odorants. The data was analyzed by running all of parameters on multivariate statistics computer software program to execute numerical taxonomy. The results have showed that samples could classify into several odorants. The members of each group were similar to each other in human sense to odor. The attribution of each group demonstrated that the olfactory biosensor had the capability of recognition. The response of olfactory biosensor to odorant such as ethyl butyrate, ethyl octanoate, ethyl hexanoate, ethyl heptanoate, ethyl propionate, ethyl acetate, cis-3-hexanyl acetate, trans 2-hexenel, 3-hexanol, 2-nonanone, 4-methyl, 2-pentanoate, 2-decanone and 2-undecanone showed a good correlation to human threshold values. Furthermore, the PCA results showed a linear relationship between the concentration of aromatic flavor and the response of olfactory biosensor. Thus, the olfactory biosensor possessed not only a capability of recognition, but also a capability of quantification. The olfactory biosensor was used to measure the headspace gas of Chinese tea. It was found that the sixgonal profiles could distinguish the different kinds of tea and could also discriminate the grades of tea. With the additional measurement on conductivity, electromotive potential, and color difference meter, the quality of tea would quantified more precisely. In conclusion, an effective and rapid method was developed to analyze odorants and to quality of tea by using the olfactory biosensor.

Key words: olfactory biosensor, human sense, PCA, threshold value, aromatic flavor, sixgonal profiles.

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