Measurement of shape features for classification of cucumber fruits using digital image analysis

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Abstract

For agricultural products, size and shape of fruits are important quality criteria. Estimation of shape features of fruits and vegetables has been performed manually and visually. Manual measurement is time-consuming and prone to generating errors. Visual assessment is easily influenced by the interpretation of crop inspectors. Image processing technology is one of the most efficient method to quantify the size and shape of crops such as cucumber fruits in a consistent manner. The objective of our ongoing study was to establish a method to obtain measurement of size and shape of cylindrical fruits using image processing technique. In this study, the size and shape features such as length of the major and minor axes were measured by analyzing the images of cucumber fruits using an image processing software iSolution. The eccentricity of cucumbers was also extracted from the cucumber images using the same software. The relationship between curvature and eccentricity show that the precision of this new method is significantly high (r^2= 91.37). Current results showed that current image processing method exploited in this study is suitable for the classification of curved cylindrical fruits nondestructively, quickly and precisely.

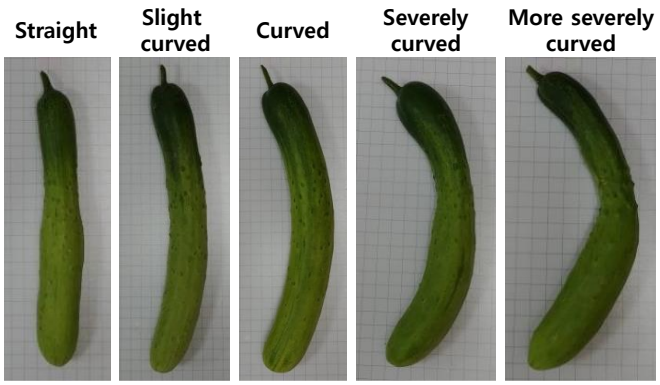


Figure 1. Classification of cucumber fruits using digital image analysis.

Recent Publications (minimum 5)

1. Park J, Kim JY, Choi SK, Kim JY, Kim JH, Jeon WB*, Lee JE*. Thermo-sensitive assembly of the biomaterial REP reduces hematoma volume following collagenase-induced intracerebral hemorrhage in rats. Nanomedicine: Nanotechnology, Biology and Medicine. 2017;13:1353-1862.
2. SK Choi, JK Park, JH Kim, KM Lee, E Kim, KS Jeong, WB Jeon*. Integrin-binding elastin-like polypeptide as an in situ gelling delivery matrix enhances the therapeutic efficacy of adipose stem cells in healing full-thickness cutaneous wounds. J. Cont. Release 2016;237:89-100.
3. E Jin, P.T. Lee, WB Jeon*, WJ Li*. Effect of elastin-like peptide on regulation of human mesenchymal stem cell behavior. Regen. Eng. Transl. Med. 2016;2:85-97.
4. Jeon WB. Application of elastin-mimetic recombinant proteins in chemotherapeutics delivery, cellular engineering and regenerative medicine. Bioengineered 2013;4:1-6.
5. Lee KM, Jung GS, Park JK, Choi SK, Jeon WB*. Effects of Arg-Gly-Asp-modified elastin-like polypeptide on pseudoislet formation via up-regulation of cell adhesion molecules and extracellular matrix proteins. Acta Biomater 2013;9:5600-8.

Biography

Dr. Won Bae Jeon has completed his BSc from Seoul National University and MSc and PhD from the Korea Advanced Institute of Science and Technology. He performed postdoctoral researches in the Department of Biochemistry at the University of Wisconsin-Madison. He is the Director of the Laboratory of Biochemistry and Cellular Engineering and an affiliated professor of the Department of New Biology at the DGIST.

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