

Abstract:

Balsam pear (*Momordica charantia* L.) fruit is cultivated in the warm region of Japan such as Okinawa Prefecture. Recently, the consumption of the fruit has increased sharply because of the interest of consumers in its high vitamin C content, leading to a bitter taste that gives an extra flavor, and a unique surface that is covered with a lot of protrusions. While the fruits are distributed to retailers after harvesting, they are likely to undergo changes in pigment and pulp as the process of ripening progresses. Although the color of the fruit's aril changes from white to red and that of the seeds changes from white to brown during the early stages of ripening, it is difficult to judge this change based on appearance. This difficulty in judgment allows the fruit to ripen before it reaches the market, and it may be sold to a consumer without recognizing the overripe fruit, which can cause discomfort to the consumer. The maturity of the balsam pear fruit is being judged experimentally by observing the shapes of the protrusions on the surface (Okinawa Prefecture, 2001). However, the technique for the discriminant of maturity based on the protrusions requires expert skill, and frequent mistakes occur during the operation to eliminate overripe fruits. Further, the operational speed of this technique cannot much the increase in production. Thus, a machine grading system possessing an automatic discriminant of maturity for balsam pear is necessary to increase the production. In this study, the discriminant method for the selection of overripe balsam pear fruits by using the image processing technique, which is suitable for the machine grading system, was developed.