

SCANNING ELECTRON MICROSCOPE OBSERVATION OF MICROSTRUCTURAL CHANGES IN RICE GRAIN DURING STORAGE

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Soon after harvesting, three samples of rough rice were prepared for study and were dried using either ambient, dehumidified or heated air during October, 1991. The dried samples were then put in one-liter glass bottles and stored in air in chambers maintained at 10, 15, 20 and 30°C for one month. The husks were then removed before continuing the storage of the resulting brown rice for five months.

Observation of an aleurone cell with a scanning electron microscope, at a magnification 10^4 times the original size, revealed many aleurone grains and lipid bodies inside a thin transparent membrane cover. After Au sputtering to make observations easier and to strengthen the membranous tissue the stability and naturalness of the membrane were found to be reciprocal to each other as sputtering thickness increased.

Particular changes were not recognized in the appearance of aleurone grains and starch tissues. These observations traced particular changes occurring in lipid bodies which are considered to have a marked effect on the taste of boiled rice.

Microscopic observations revealed fusion of lipid bodies in many samples even though changes initially considered to be caused by artificial treatment were insignificant. The damage on the cell membrane tended to increase with higher storage temperatures for every sample.

The brown rice grains did stick together when stored at 10 and 15°C. The samples stored at 20°C stuck together and those stored at 30°C formed a mass

which was difficult to separate. These changes were also accompanied with increasing intensity of a foul smell.