

With the medium composed of glucose and wheat bran Koji extract, a strain of *Gluconobacter* isolated from fruit was chosen as the best among twelve strains of *Acetobacter*. 1~1.5 L of the medium was put in a cylinder (10 cm diameter, 60 cm depth), mounted with a glass filter (No. 4) near the bottom and fermentation was carried out under aeration of 1~1.2 L air per minute. Alcoholic solution of Cetyl alcohol was used as anti-effervescent, and the changes of pH and titration acidity were observed every 5~6 hours.

Various kinds of experiments were carried out, in order to ascertain suitable conditions for fermentation, and a successful result was obtained when the medium contained 5 % wheat bran Koji extract and 10 % glucose. Fermentation was accelerated when 0.1 % urea and 2.5 % wheat bran Koji were used as the source of nitrogen. The optimum pH of the medium was found to be 3.8, although pH value did not reveal any remarkable effect upon the fermentation up to 5.5. Suitable amount of bacterial inoculation was found to be 10 % of the medium, and commercial glucose was available for industrial fermentation, while better yield was obtained with purified glucose.

The maximum yield of gluconic acid was observed to be 101.7 % of the glucose employed, under the above experimental conditions.

When the yield of bacterial cells and the amount of nitrogen assimilated by the bacteria were observed every 1~5 hours during the fermentation, it was found that velocities of propagation of the bacteria and assimilation of nitrogen were accelerated by aeration.

36. On the Antibacterial Properties of Retting Bacteria.

Hideo Katagiri and Shinzo Kohno.

The general industrial process of fermentation-retting of ramie fiber materials has been carried out with open vessel, and yet fermentation has been smoothly going without any troublesome contamination.

This fact suggests that the retting bacteria for ramie fiber materials, *Bacillus subtilis* var. *ramie* would produce some antibiotics as were pointed out with other spore-bearing aerobes, such as *B. subtilis*, *B. mesentericus*, *B. mycoides*, *B. simplex*, *brevis B.* etc.

The antibacterial action of the retting bacteria on *Staphylococcus aureus* (Tera-shima strain) and *Escherichia coli* was detected by (1) method of plate culture on bouillon agar, and (2) cup method with bouillon added by fiber materials of wild ramie plant.

The antibacterial powers varied according to the kinds of cultural solutions; the retting bacteria produced antibiotics with the extract of ramie fiber materials while a maximum antibacterial action was observed with glucose bouillon culture.

The retting bacteria revealed antibacterial action on eleven strains of bacteria among fourteen strains isolated from a naturally fermented solution composed of peptone water and fiber materials of wild ramie plant, especially on a strain showing the most similar nature as *B. subtilis*.

From the above experimental results, the fermentation retting by *B. subtilis* var. ramie would be concluded to be carried out safely without any troublesome contamination.

No satisfying effect on retting of fiber materials of cultivated and wild ramie plants was ever observed with the known strains of *B. subtilis* and natto-bacilli by which remarkable amount of antibiotics was produced. Therefore, *B. subtilis* var. ramie was found to reveal an excellent nature on the retting of ramie fiber materials.

37. Studies on the Alcoholization of Cellulose Materials. (VII)

On Pentose-assimilable Yeasts.

Chuji Tatsumi, Eiichi Horino and Hideo Katagiri.

In the previous papers,¹⁾ Alcoholization of saccharified solution of cellulose materials by Scholler's method was reported by us.

Pentose-assimilable yeasts were isolated with spent wash obtained from the saccharified solution of Mulberry-tree added by d-xylose with and an artificial medium containing d-xylose as the only source of carbon.

Among various kinds of materials including corn, waste parts of vegetables, potato, rice hulls, barley straw, rice straw, stable manure and soil, the most useful strains of yeast No. 100, 103 and 107 were isolated from the former three materials respectively, which gave better results compared with the known yeast *Torula utilis*.

No peculiar chemical constituents were found in these yeast cells, therefore these yeasts would be useful for foodstuff.

From their characteristics, these yeasts were all found to belong to new strains of *Torulopsis* according to Lodder's classification, and we named the yeasts, No. 100, 103 and 107 *Torulopsis xylinus* a, b and c respectively.

1) Katagiri and Tatsumi: This Bulletin, 15, 39 (1946); 16, 46 (1947); 17, 145 (1949); 18, 43 (1949); 19, 62 (1949); and 20, 66 (1950).