

duced mainly in Mississippi region. The former absorbs a large quantity of water, "swelling" enormously in the process, and remaining in suspension in thin water dispersion, and the latter absorbs only slightly more water than ordinary plastic clays fuller's earths, and being practically non-gel-forming and non-suspending in water.

These two bentonites when sprinkled as dusts (325 mesh), affect definitely lethal to adult of Azuki bean weevil, *Callosobruchus chinensis* L. The experiment were carried out under the constant temperature of 30°C and 100, 91, 73, 52 % relative humidities. The time-mortality data were summerized by the probit transformation method of Bliss. The median lethal time of these two bentonite dusts to Azuki bean weevil in all cases of sex difference and relative humidities throughout may be regarded as not heterogeneously with in the random sampling error.

And then 2, 4, 8 and 16 per cent of p, p'-DDT powder prepared with these two bentonite carriers dusted to adult of housefly (*Musca domestica* L.). The dusting chamber consists of a glass cylinder, 28 cm in inner diameter and 45 cm high, and two glass plates covering its upper and lower openings. From a round hole, 5 cm in diameter, of the lower plate of the chamber, 0.1 g of the powder was dusted up into the chamber containing houseflies under the pressure of approximately 1.5 kg/cm². The numbers of disable individuals were counted at the intervals in a geometrical time scale and the knock down percentages were calculated. Median knock down time of Volclay DDT powder which are similarly summerized by probit transformation method is shorter than it of Panther Creek DDT powder.

It can be said from the above mentioned facts that the biological assay is indispensable in inspection of insecticides as well as chemical analyses.

18. The Effects of Ultrasonic Wave upon the Fermentation Microorganism

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In the experiments, two types of ultrasonic wave generators with frequency of 560 Kilocycles per second (one of them has cooling system) were used.

A first, with yeasts (Rasse XII and American bakers' yeast) and *Bacillus subtilis* var. *ramie*, the conditions of the ultrasonic treatment upon the mortality of the organisms were investigated. In order to observe high mortality of the cells, malt extract and broth were used for yeart and bacterial suspensions respectively. The distance between the top of the crystal of the generator and the bottom of tube

containing cell suspension was 5.0 cm. For the determination of the mortality, the number of survival cells was counted by plate culture.

It was found that the mortalities of organisms were higher when the cell suspension was taken in flat glass-bottomed container than in round bottom one, that the higher mortalities were again observed when the smaller amounts of suspension was employed, and that the concentration of cells had no effect upon the mortalities. Yeast cells in 20 ml suspension were killed perfectly in 25 minutes, however, more strength of the wave or treating time would be required to kill bacterial cells perfectly, since no remarkable effect was observed with bacteria in 30 minutes. Among the treated yeasts, ruptured cells were detected and resolution of protoplasm from some cells were observed.

Secondly, the enzymatic activities (fermentation of glucose observed by Meissel tube) of the supernatant fluids of the living, pressed and dried yeast suspensions, obtained with the ultrasonic vibration for 25 minutes and centrifuged for 10 minutes, were compared, and it was found that living yeast revealed very much inferior to dried and pressed yeasts.

19. Studies on the Propionibacterium. (I)

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The isolation of propionibacterium from cow-milk has been tried. Many experiments were carried out with various culture media which contain yeast extract or pepton as nitrogen sources. Among them, we recognize the remarkable growth of the bacteria in the following two cultures. Namely, No. 3: yeast water containing 2% of Na-lactate as a carbon source, and No. 11: the mixture of the same amounts of skimmed milk and yeast water, added to 0.5% of CaCO₃.

The amounts of volatile acids produced after two weeks' incubation in the described cultures (*) and in yeast water containing 2% of lactic acid, 1% of pepton and 0.1% of NaCl (***) were as follows.

No. 3	0.130 [*] N	0.151 ^{***} N
No. 11	0.018 N	0.196 N

The determination of Ducleaux Numbers of fermented liquors suggested the presence of propionic acid and acetic acid.

Plate culture containing 2% of glucose was tried to get colonies of propionibacteria. By repeating this method of isolation, four strains of bacteria were obtained, which form pin-head colonies and produce volatile acids, being non-motile and bearing no spores. Each shows an abundant growth in stab culture but a slight