

## ABSTRACTS

### DEPARTMENT OF BIOCHEMISTRY

1. ON THE REACTION OF KETO ACIDS WITH AMINO ACIDS. K. V. Giri, G. D. Kalyankar and C. S. Vaidyanathan, *Naturwissenschaften*, 1954, 41, 14.

Evidence has been presented to show that the mechanism of transamination reaction in presence of cellulose is different in some respects from that of the well-known transamination reaction of Herbst.

2. PHOTOLYSIS OF METHIONINE IN PRESENCE OF PHOTOCATALYSTS. K. V. Giri, G. D. Kalyankar and C. S. Vaidyanathan. *Naturwissenschaften*, 1954, 41, 88.

The products of degradation obtained by exposing methionine to sunlight in the presence of  $TiO_2$ , methylene blue and riboflavin have been identified.

3. NON-ENZYMATIC TRANSAMINATION REACTION BETWEEN  $\alpha$ -AMINO ACIDS AND KETO ACIDS. K. V. Giri and G. D. Kalyankar. *Naturwissenschaften*, 1953, 40, 224.

It has been shown that non-enzymatic transamination reactions take place between  $\alpha$ -amino acids and  $\alpha$ -keto acids when heated on a filter-paper at 60° C.

4. THE EFFECT OF BIOTIN ON THE UTILISATION OF GLUTAMIC ACID BY YEASTS. P. R. Krishnaswamy and K. V. Giri, *J. Sci. Ind. Res.*, 1954, 13 B, 110.

It has been shown that in the case of yeast strain BY2, for which biotin was a critical growth factor, assimilated glutamic acid only in the presence of biotin. In the case of *Rhodotorula glutinis* biotin enhanced the rate of assimilation of glutamic acid.

5. SYNTHESIS OF OLIGOSACCHARIDES DURING ENZYMATIC HYDROLYSIS OF CELLOBIOSE by *Aspergillus flavus*. K. V. Giri, V. N. Nigam and K. S. Srinivasan, *Nature*, 1954, 173, 953.

The enzymes of *Aspergillus flavus* convert cellobiose into glucose and oligosaccharides (1) and (2) which appear in the initial stages and also convert cellobiose into gentibiose, a conversion similar to that of maltose into isomaltose by *Penicillium chrysogenum*.

6. STUDIES ON THE SYNTHESIS OF RIBOFLAVIN BY A MUTANT YEAST, *Saccharomyces cerevisiae*. K. V. Giri and P. R. Krishnaswamy, *J. Bacteriology*, 1954, 67, 309.

The effect of purine and pyrimidine compounds and amino acids on the production of riboflavin by a mutant top yeast BY2 (*Saccharomyces cerevisiae*) are described. Adenine, guanine, xanthine, hypoxanthine, thymine and uracil were effective in increasing riboflavin production, while uric acid exerted an inhibitory action. They did not effect the growth. It is suggested that purines may mediate the synthesis of riboflavin by this organism. Of the amino acids tested, tryptophan, phenylalanine and serine inhibited riboflavin production, while all the others increased the same. Methionine and glycine had more marked effects on riboflavin production. The role of amino acids in riboflavin synthesis by the organism is discussed.

7. ANTIBIOTIC PRINCIPLE FROM *Moringa pterygosperma*. IV. THE EFFECT OF ADDITION OF VITAMINS AND AMINO ACIDS ON THE ANTIBACTERIAL ACTIVITY OF PTERYGOSPERMIN. P. A. Kurup and P. L. Narasimha Rao, *J. Med. Res.*, 1954, 42, 101.

Thiamine and glutamic acid antagonized and pyridoxin enhanced the activity of the antibiotic which was more stable in phosphate buffer than in water.

8. ANTIBIOTIC PRINCIPLE FROM *Moringa Pterygosperma*. VI. MECHANISM OF ANTIBACTERIAL ACTION OF PTERYGOSPERMIN INHIBITION OF TRANSAMINASE BY PTERYGOSPERMIN. P. A. Kurup, P. L. Narasimha Rao and R. Venkataraman. *Indian J. Med. Res.*, 1954, 42, 115.

The specific inhibition of glutamic acid  $\rightleftharpoons$  alanine system by pterygospermin has been shown. A possible mechanism of antibacterial action of pterygospermin has been discussed.

9. ANTIBIOTIC PRINCIPLE FROM *Moringa pterygosperma*. V. EFFECT OF PTERYGOSPERMIN ON THE ASSIMILATION OF GLUTAMIC ACID BY *Micrococcus pyogenes* VAR. *aureus*. P. A. Kurup and P. L. Narasimha Rao. *Indian J. Med. Res.*, 1954, 42, 109.

A slight increase in the growth of *M. pyogenes* culture during the first two hours after addition of the antibiotic was found. Subsequently there is a steady loss of viability. It was also found that in the presence of the antibiotic, glutamic acid was not absorbed.

10. ANTIBIOTIC PRINCIPLE FROM *Moringa pterygosperma*. III. ACTION OF PTERYGOSPERMIN ON GERMINATION OF SEEDS AND FILAMENTOUS FUNGI. K. S. Gopalakrishna, P. A. Kurup and P. L. Narasimha Rao. *Indian J. Med. Res.*, 1954, 42, 97.

Pterygospermin and benzylisothiocyanate exert negligible effect on seed germination. The antibiotic powerfully inhibits many filamentous fungi.

11. ANTIBIOTIC PRINCIPLE FROM *Moringa pterygosperma*. II. CHEMICAL NATURE OF PTERYGOSPERMIN. P. A. Kurup and P. L. Narasimha Rao. *Indian J. Med. Res.*, 1954, 42, 85.

The antibiotic has been isolated in a crystalline state and a structure has been proposed.

12. ANTIBIOTIC PRINCIPLES OF *Garcinia morella*. CONSTITUTION OF MORELLIN. P. L. Narasimha Rao, D. V. Krishna Murthy and S. C. L. Verma. *Naturwissenschaften*, 1954, 41, 66.

On the basis of various reactions and degradation products of morellin, a substituted pyrano-hydroxanthone structure has been proposed for it.

13. ANTIBIOTIC PRINCIPLE FROM *Moringa pterygosperma*: EXCRETION OF BENZYLISOTHIOCYANATE. B. R. Das, P. A. Kurup and P. L. Narasimha Rao, *Naturwissenschaften*, 1954, 41, 66.

14. INFLUENCE ON VITAMIN B<sub>12</sub> ON THE BIOLOGICAL VALUE OF RAW SOYA BEAN. B. R. Baliga and R. Rajagopalan, *Curr. Sci.*, 1954, 23, 51.

It has been shown that vitamin B<sub>12</sub> counteracts the adverse effects of the proteolytic and growth inhibitors present in raw soya bean.

15. INTESTINAL THIAMINE SYNTHESIS AS INFLUENCED BY FATS AND CARBOHYDRATES. S. Balakrishnan and R. Rajagopalan, *Sci. and Culture*, 1954, 19, 359.

From considerations based on the intestinal synthesis of thiamine, it was found that the nutritive value of a fat is profoundly modified by the nature of the carbohydrate in the diet.

16. INFLUENCE OF FEEDING PENICILLIN ON INTESTINAL THIAMINE SYNTHESIS. S. Balakrishnan, R. Rajagopalan and M. Sirsi, *Curr. Sci.*, 1954, 23, 15.

It was shown that oral administration of penicillin resulted in marked growth stimulation, enhanced thiamine excretion and also higher liver store than the control groups. The mode of action of penicillin has also been indicated.

17. SUPPLEMENTARY VALUE OF A MALTED RAGI FOOD. P. B. Rama Rao, S. Balakrishnan and R. Rajagopalan, *Sci. and Culture*, 1954, 19, 561.

It has been shown that malted ragi taken along with milk has a useful supplementary value.

18. STUDIES ON THE CYTOLOGY OF YEASTS. IX. CYTOLOGY OF CELLS FROM A TWO-DAY-OLD GIANT COLONY. T. R. Thiagarajan and M. K. Subramaniam, *Archiv. f. Mikrobiol.*, 1954, 20, 183-200.

Cytological investigations of cells from 2-day-old giant colonies reveal an ascending grade of chromosome complexity. The absence of any synchronization in the reproduction of chromosomes of even the same complement leads to production of cells with odd numbers of Feulgen-positive bodies of varying sizes. The stages leading to the telephasic reconstitution are remarkably regular. There appears to be a primary attraction between pairs of chromosomes and a secondary one between such pairs or groups of pairs. There is somatic synapsis.

Amitosis-like pictures represent merely transitory stages of reconstitution of an endopolyploid nucleus. The occurrence of telophasic nuclei of different sizes suggest that there is a reversion to the resting condition at the end of each doubling of the chromosome complement.

Endopolyploid cells are capable of budding. There is a peculiar type of "somatic reduction" in chromosome number. This appears to be an adaptation for survival.

19. STUDIES ON THE CYTOLOGY OF YEASTS. X. MITOSIS IN THE RIBOFLAVIN EXCRETING TOP YEAST MUTANT. Saraswathy Royan, *Archiv. f. Mikrobiol.*, 1953, 19, 267-86.

The rationale of the use of aerobically growing cultures for elucidating the mitotic behaviour of yeast is presented. Photomicrographic proof for mitosis is offered in a purely aerobic strain of yeast having a pair of unequal chromosomes. The chromatin mass seen at early prophase resolves itself into the pair of unequal metaphase chromosomes. These reproduce and the mother cell and bud regularly receive an unequal pair. Evidence for somatic pairing and synapsis are presented. The reconstitution of the nucleus at telophase is by an exact reversal of the stages leading to metaphase. The cytological behaviour of rare spontaneous auto-tetraploids are illustrated. A pictographic summary is given.

20. THE CHROMOSOME NUMBER OF *Rhodotorula glutinis* AND ITS PROBABLE SIGNIFICANCE. M. K. Subramaniam and T. R. Thiagarajan, *Curr. Sci.*, 1954, 23, 18-19.

Photomicrographs to illustrate the mitotic cycle of *Rhodotorula glutinis* (Fres.) Harrison var. *rubescens* (Saito) Lodder are presented. It has two chromosomes. Since the minimum number of chromosomes necessary for sporulation is only two, *R. glutinis* may be a sterile diploid.

## PHARMACOLOGY LABORATORY

EFFECT OF FLUORINE ON THE COMPOSITION OF BONES: CHANGES IN THE COMPOSITION OF BONES OF RATS—I. T. K. Wadhvani, *Proc. Ind. Acad. Sci.*, 1954, 39 B, 223.

Studies have been carried out on the effect of fluorine on the composition of bones of rats. Though no consistent variations have been observed in the Ca:P ratio of fluorosis bones, these have been found to contain less nitrogen, and more calcium, phosphorus, carbonate and sodium than the corresponding bones of the controls. In rats receiving 2 mgm. of NaF per day for 14 weeks, the magnesium content of the bones has not been found to be altered, whereas, it has been observed to decrease in the case of rats receiving 4 mgm. of NaF per day for 10 weeks. These results have been further confirmed in the rats, placed on diet deficient in (i) nitrogen; (ii) calcium and phosphorus; and (iii) nitrogen, calcium and phosphorus. The changes in composition have been observed in all bones. Though in some cases, the changes in the composition of scapulas and epiphyses are the most marked, it cannot be definitely stated that, in fluorine poisoning, these bones are most affected. Calcium and phosphorus of the diet has been found to exert a protective action against the effect of fluorine on the composition of bones.