ABSTRACTS

DEPARTMENT OF BIOCHEMISTRY

1. Clinical Biochemistry

1. A Blood Anticoagulant Factor from the Latex of *Carica papaya*—II. Its Nature and Mode of Action. N. C. Pillai, C. S. Vaidyanathan and K. V. Giri, *Proc. Indian Acad. Sci.*, 1956, **43**, 46.

A detailed investigation on the mode of action of the anticoagulant factor and its reactions with iodoacetate has been made. The drug has been found to act both as an antiprothrombin and an anti-thrombin, the latter activity being more pronounced.

2. Cytogenetics

2. Variations in the Structure of the Nucleus in Living Yeast. Miss Saraswathy Royan, *Proc. Indian Acad. Sci.*, 1956, **44 B**, 47–55.

The nucleus could be observed in the living cells from 96–120 hr. culture of a strain of *Saccharomyces cerevisiæ*. It could be followed up during the processes of fixation, hydrolysis, staining and dehydration. In its staining reactions it is identical with the nucleus described by the early investigators. Under the phase contrast microscope there is no uniformity in the architecture of the resting nucleus in living cells.

3. Structures Revealed by Dark Ground Illumination in Living Yeast. Miss Saraswathy Royan, *Proc. Indian Acad. Sci.*, 1956, **44 B**, 171–176.

Observations under dark ground illumination supplement those made with the phase contrast microscope. When the nucleus is visible in a non-budding cell, the vacuole and the nucleus are delimited from each other by well formed membranes. Considerable variation in its structure is exhibited by the nucleus in cells of a population.

4. Relation between the Nucleus and the Vacuole in Yeast. Miss Saraswathy Royan, *Curr. Sci.*, 1956, **25**, 397–98.

On stimulation of cells with visible nuclei by fresh media the cytoplasm encroaches into the original vacuolar space. The nucleus is therefore an extra vacuolar structure. There is no relation between the vacuole and the nucleus.

5. Phenomena Preceding Sporulation in *Schizosaccharomyces octosporus*. Miss Saraswathy Royan, *Proc. Indian Acad. Sci.*, 1956, **44**, 311–15.

Schizosaccharomyces octosporus sporulates in both solid and liquid media. The morphological changes that precede sporulation show considerable variation. Rare instances of the dissolution of the septum separating two cells—as a

prelude probably to conjugation are illustrated. The origin of cells within a cell during sporulation is a possible example of differentiation-in-time.

6. Some Observations on the Living Cells of *Saccharomyces carlsbergensis* from Twenty-four-Hour Agar Slants with Phase Contrast and Dark Ground Illumination. T. R. Thyagarajan, *Proc. Indian Acad. Sci.*, 1956, **44 B**, 278–88.

The majority of the cells in a population are non-budding, vacuolated and contain variable numbers of granules. The various cell types are described and illustrated. The multivacuolate condition arises as a result of septation of a single vacuole. There are no canals connecting the vacuoles in a cell. Evidence for the existence of a vacuolar membrane is adduced from observations under dark ground illumination. The vacuole encloses a dancing body. The glycogen areas are located outside the vacuole. The nucleus though not visible in living cells is revealed after fixation in dilute Lugol's solution. It appears as a homogeneous body situated outside the vacuole.

7. The Structure of the Nucleus in *Saccharomyces carlsbergensis*. T. R. Thyagarajan and M. K. Subramaniam, *Naturwiss.*, 1957, **44**, 68–69.

In 5–10% of cells from 160–90 hr. wort cultures the nucleus is clearly visible. A well-formed nuclear membrane encloses formed structures inside and delimits the nucleus from the cytoplasm as well as the vacuole. The presence of a nuclear membrane enables a clear distinction of the structures lying inside and outside the nucleus.

3. Electrophoresis

8. Agar Electrophoresis of Hæmoglobins. K. V. Giri and N. C. Pillai, *Curr. Sci.*, 1956, **25**, 188.

The technique of agar electrophoresis has been successfully applied to detect the sickling trait in the humans. The presence of two hæmoglobins in chicken has also been observed employing the same method.

9. Multiple Hæmoglobins in the Blood of Animals. K. V. Giri and N. C. Pillai, *Nature*, 1956, **178**, 1057.

The hæmoglobins of different animal species have been examined electrophoretically and the buffalo blood was found to contain two hæmoglobins occurring in different concentrations. Rat blood, in addition to the hæmoglobin band, indicated the presence of two more protein bands having an electrophoretic mobility similar to that of λ-globulin.

4. Enzymes

10. Glutamic Acid Decarboxylase in *Rhodotorula glutinis*. P. R. Krishnaswamy and K. V. Giri, *Biochem. J.*, 1956, **62**, 301.

Glutamic acid decarboxylase has been detected in a yeast, *Rhodotorula glutinis*, and its properties were studied. Decarboxylation was quantitative at

pH 4·5 and 30°. The Michælis constant was $2{\cdot}75 \times 10^{-3}$ M. Pyridoxal phosphate restored the activity lost on dialysis and reversed the inhibition due to hydroxylamine.

5. Food and Nutrition

11. Vitamin A_2 in Indian Fresh-water Fish Liver Oils. S. Balasundaram, H. R. Cama, P. R. Sundaresan and T. N. R. Varma, *Biochem. J.*, 1956, **64**, 150.

The analysis of Indian fresh-water fish liver oils for the vitamins A_1 and A_2 was spectrophotometrically carried out. Some species of fresh-water fishes, *Callichrous bimaculatus*, *Ophiocephalus striatus* and *Wallago attu* showed the highest amounts of vitamin A_2 in their liver oils as compared to those previously reported in the literature ($A_2/A_1 = 9/1$). Chromatographic investigations on these high potency oils showed that vitamin A_2 was present mostly in the ester form while vitamin A_1 occurred as the alcohol. The occurrence of small amounts of B-carotene and lutein in the liver oils of *Wallago attu* was of interest.

12. Spectrophotometric Determination of Vitamin A in Indian Marine Fish Liver Oils. S. Balasundaram, H. R. Cama, P. R. Sundaresan and T. N. R. Varma, *J. Sci. Ind. Res.*, 1956, **15 C**, 23.

High and low potency Indian marine fish liver oils were analysed for their vitamin A_1, vitamin A_2 and neovitamin A contents. They contained on an average about 25% neovitamin A_1, and about 10% of vitamin A_2.

6. Sanitation Biochemistry

13. Preparation of Ion Exchange Materials from Some Organic Wastes for Use in the Treatment of Certain Waters—I. Efficiency of the Materials as Cation Exchangers. C. Anandeswara Sastry, P. V. R. Subrahmanyam and S. C. Pillai, *J. Industr. Eng.*, 1956, **1**, 76–80.

Materials possessing ion exchange properties were prepared from organic wastes, such as tea waste, jute waste, sawdust, bagasse, coir fibre, groundnut shell, paddy husk and paper waste, by suitable treatment with sulphuric acid and sodium chloride. Quantitative observations on the efficiency of the sulphonated carbons in removing calcium from 0·1% calcium chloride solution were made.

14. Preparation of Ion Exchange Materials from Some Organic Wastes for Use in the Treatment of Certain Waters—II. Efficiency of the Materials in Removing Fluorine from Water. C. Anandeswara Sastry, P. V. R. Subrahmanyam and S. C. Pillai, *J. Industr. Eng.*, 1957, **1**, 76–79.

The carbons prepared from some of the waste materials were treated with alum, and then they were examined for their efficiency in removing fluorine from tap water to which a known amount of sodium fluoride was added. The possible utilisation of such carbons in the treatment of fluoride-bearing waters is indicated.

15. ACTION OF FLUORINE ON THE TEETH IN RATS. S. C. Pillai and T. K. Wadhwani, *Surgical & Med. News*, 1957, **3**, 9–12.

The effect of intraperitonial injection of fluorine on the teeth in rats and the effect of oral administration (along with water and diet) of varying concentration of fluorine and on stopping its administration were studied. The observations indicated that fluorine had a local as well as a systemic action on the incisors. The disappearance of the symptoms of mottled enamel in the rats, on changing over to fluoride-free water and diet, was apparently brought about by the continuous and fairly rapid growth of the incisors.

16. SELF-PURIFICATION OF SEWAGE-POLLUTED WATERS. S. C. Pillai, G. J. Mohanrao and C. Anandeswara Sastry, *J. Indian Med. Profession*, 1957, **3**, 1513–20.

The literature that has accumulated on the subject during the last hundred years is reviewed and fresh evidence on the process of self-purification is presented. The recent work on the natural purification of flowing sewage at Bangalore is considered particulalry useful in understanding the mechanism of self-purification of sewage-polluted waters.

17. EXTENT OF REMOVAL OF AMINO ACIDS FROM SEWAGE DURING TREATMENT BY DIFFERENT METHODS. C. Anandeswara Sastry, P. V. R. Subrahmanyam, N. V. Raju and S. C. Pillai, *Curr. Sci.*, 1957, **26**, 53–54.

The amino acid composition of the effluents from the following systems of sewage treatment was studied: septic tank; chemical clarification; mechanical and biological filters containing filtering materials of different sizes; the activated sludge process; and natural sewage channels at Bangalore. While the effluents from the activated sludge process and from natural purification of flowing sewage were practically free from amino acids, the other effluents contained varying amounts of amino acids.

18. TREATMENT AND UTILISATION OF WASTE WATERS FROM COTTON TEXTILE MILLS. R. Rajagopalan and S. C. Pillai, *J. Industr. Eng.*, 1956, **1**, 39–41.

The results of studies on the action of the highly alkaline waste liquid on hume pipes used for carrying the liquid, its pre-treatment with chemicals prior to biological treatment along with domestic sewage and on the utilisation of the treated material with sewage for crop production are briefly described.

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