mash seeds it goes on increasing during germination. Allantoin, urea and urease are absent from resting as well as germinating groundnut seeds; these constituents, however, are present in soya bean. Allantoin is present in mung-bean and mash seeds, but urea and urease are absent from these seeds. The amount of allantoin stays constant in mung bean and mash during germination, but goes on increasing in soya bean during this period. The amount of urea and urease activity stay constant during the germination of soya bean.

The systemic fungicide Vitavax (5-carboxyanilido-2,3-dihydro-6-methyl-1,4-oxathiin) has been found to decrease the allantoinase activity of mung-bean and mash seeds at 50 p.p.m. This concentration does not effect the allantoinase activity of groundnut and soya bean but decreases the urease activity of soya bean.

In the presence of cycloheximide the allantoinase activity as well as the urease activity of germinating groundnut, soya-bean, mung-bean and mash seeds are decreased.

Tannins in Black-Plum (*Syzygium cumini* L.) Seeds

By I. S. BHATIA and K. L. BAJAJ (*Department of Chemistry and Biochemistry, Punjab Agricultural University, Ludhiana, India*)

Ethanollic extracts of black-plum seeds have been shown to contain gallic acid, ellagic acid, chebulic acid, corilagin and related ellagitannins, 3,6-hexahydroxydiphenoylglucose and its two isomeric forms, galloylglucose and quercetin, by chemical and enzymic studies with tannase. From acetone extracts 3,3',4-tri-*O*-methylellagic acid has been isolated. A possible conversion of quercetin into toxifolin by the use of the antioxidant sodium metabisulphite has been observed.

The tannin complex was obtained by extraction of the seeds with acetone. The presence of gallic acid, hexahydroxydiphenic acid, chebulic acid and iso-hexahydroxydiphenic acid as the building blocks of the tannins in the seeds has been confirmed from chromatographic studies of the tannin hydrolysates. The phenolic acids and some of the minor tannins detected in the ethanollic extract arise by ethanolysis of the three major tannins observed in the acetone extract. Chebulic acid, a constituent of tannins, has been observed to undergo isomeric change to an unidentified phenolic compound on prolonged storage under acidic conditions.

A Comparative Study of Soluble Sugars and Nitrogenous Constituents of the Seeds of Members of the Cucurbitaceae Family

By MOINUDDIN, MAJID SIDDIQI and MUZAFFER ALAM (*Biochemistry Division, Department of Chemistry, Aligarh Muslim University, Aligarh, U.P., India*)

Certain members of Cucurbitaceae family, namely *Cucumis melo*, *Citrullus vulgaris*, *Langeria vulgaris* and *Cucumis utilisimus*, grow luxuriantly in Northern India, but their seeds are mostly wasted, except for a limited quantity that is used in an indigenous system of medicine, for nutritive purposes.

A preliminary study of the nutritional constituents indicated a high percentage of protein and phosphorus in the whole seed meal of these plants (Moinuddin & Siddiqi, 1970). Attempts were made to identify the free amino acids and soluble sugars present in the defatted seed meals. The seed proteins were extracted for their albumin, globulin, prolamine and glutellin fractions and the nitrogen distribution was studied. In order to devise a simple method for isolating proteins of high purity, the effect of pH variation on minimum and maximum extraction of nitrogenous constituents was studied. The amino acid composition, protein efficiency ratio and biological value of these protein were also studied.

Moinuddin & Siddiqi, M. (1970) *Proc. 39th. Annu. Meet. Soc. Biol. Chem. India*, p. 21

Effect of Pesticides Applied to the Soil on the Biological Activity of the Soil

By T. K. SIDDARAME GOWDA and R. B. PATIL (*Department of Microbiology, University of Agricultural Science, Bangalore-24, India*)

Persistence of non-degradable pesticides, though a desirable property as far as the protection it gives to the plants is concerned, is an undesirable property from the point of view of their harmful biological effects on the environment.

Two herbicides, simazin [2-chloro-4,6-bis(ethyl-amino)-6-chloro-*sym*-triazine] and Tok E-25 (2,4-dichlorophenyl *p*-nitrophenyl ether), and two fungicides, Benlate (methyl-1-butylcarbamoyl-2-benzimidazole carbamate) and Lannate (*S*-methyl-*N*-[(methylcarbamoyl)oxy]thioacetimidate), were studied at two concentrations for their effect on microbial population, soil respiration, ammonification and nitrification when applied to the sandy soil of Bangalore.

The results indicated that at either concentration none except Benlate had any effect on bacteria. Benlate stimulated the bacterial numbers during the

last 2 weeks of a 4-week incubation period. Simazin depressed the actinomycete population in the beginning and stimulated it during the last 2 weeks. The others did not have any effect on actinomycete population. Fungal population was stimulated by Tok-E-25, whereas Benlate depressed it initially and stimulated it during the last 2 weeks of incubation.

Simazin drastically decreased the soil respiration initially and thereafter it had no effect. The others did not affect the respiration. The effect of Benlate at two concentrations on soil ammonification and nitrification rates was studied, with media containing peptone or ammonium sulphate or nitrite. In peptone medium, ammonification and nitrite formation were unaffected but nitrate formation was drastically depressed, resulting in accumulation of nitrite. In ammonium sulphate medium and nitrite medium Benlate at both concentrations did not have any marked effect initially, but during the latter half of incubation period nitrification was gradually depressed or it remained steady at a low rate. The implications of these effects will be discussed.

Influence of Growth Hormone on Thymus Metabolism *in vivo* and *in vitro*

By M. R. PANDIAN and G. P. TALWAR (*Department of Biochemistry, All India Institute of Medical Sciences, New Delhi-16, India*)

Administration of bovine growth hormone leads to an enhancement of DNA synthesis in lymphoid organs and recovery of the immune response in hypophysectomized rats. Similar effects of the hormone are observed in 'plateaued' rats (i.e. rats which have attained maximum weight). Injection of rabbit anti-(bovine growth hormone) globulins, in contrast with normal rabbit globulins, over 5 days causes a decrease in the weight of the thymus and in the rate of DNA synthesis in this organ. Thymus is also the organ in which stimulation of DNA synthesis is observed at a time earlier than that in spleen and lymph nodes after a single injection of bovine growth hormone. The hormone stimulates not only the incorporation of [³H]thymidine into DNA in the cortical cells, but also the incorporation of [³⁵S]sulphate into trichloroacetic acid-insoluble biopolymers reported to be elaborated in the medullary area of the thymus.

A system for study of the action of bovine growth hormone on thymus *in vitro* has been devised. There is an obligatory requirement for Ca²⁺, but not for foetal calf serum, in the medium for the hormone effect. An early action of the hormone is the enhanced incorporation of [³H]uridine into RNA in thymocytes, this being followed by a stimulation of the synthesis of proteins and DNA. The stimulatory action of the hormone on RNA synthesis is not due to

a facilitated uptake of the radioactive uridine by the cells under hormonal influence.

Mechanism of Regulation of the Immune Response

By R. KRISHNARAJ and G. P. TALWAR (*Department of Biochemistry, All India Institute of Medical Sciences, New Delhi-16, India*)

It is currently believed that in the development of the immune response the interaction with specific 'receptors' on the surface of lymphocytes is the first event leading to the proliferation and differentiation of these cells. The proliferation of lymphocytes can also be triggered by general mitogens such as phytohaemagglutinin.

On the premise that the initial interaction takes place at the membrane, we have studied the adenylate cyclase activity in the primary T&B lymphoid cells, as well as in lymphocytes present in secondary lymphoid organs. Incubation of cells with phytohaemagglutinin stimulates the adenylate cyclase activity of thymocytes and thymus-derived lymphocytes. The obvious implication has been tested by the ability of cyclic AMP (adenosine 3':5'-cyclic monophosphate) to cause blast transformation. Some information is also available on the probable sites affected by cyclic AMP that ultimately lead to the replication of these cells.

Studies on some Aspects of Ascorbate Metabolism in Adrenalectomized Rats

By MAHESH G. NATHANI, IDREES BHAI, N. NATH, H. F. DAGINAWALA and M. C. NATH (*Department of Biochemistry, University of Nagpur, Nagpur, India*)

Male albino rats were adrenalectomized and the ascorbate, dehydroascorbate and dioxogulonate contents in liver and urine, but only the total ascorbate in blood, were determined at the intervals of 4, 8 and 12 days after adrenalectomy. The activities of ascorbate-synthesizing enzymes (D-glucurono- δ -lactone hydrolase, L-gulonon- γ -lactone hydrolase and L-gulonon- γ -lactone oxidase) in liver were measured, as were the activities of ascorbate-degrading enzymes (dehydroascorbate and 2,3-dioxoaldonate decarboxylase) in liver and kidney.

In adrenalectomized rats there was a slight decrease in the ascorbate content and an appreciable decrease in the dehydroascorbate content of the liver. On the other hand there was about a twofold increase in the dioxogulonate content of liver. The ascorbate and dehydroascorbate contents in the