carrying *M. avium* in their cytoplasm undergo normal processes of mitotic division and share their mycobacterial inheritence among the daughter amoebae (Fig. 3).

The results with *M. smegmatis*, *M. fortuitum* and *M. phlei* added to cultures of *A. castellanii* were different from those of other mycobacteria reacting with amoeba cultures. The amoebae died out after a 5-day contact with these fast growing mycobacteria. Excessive growth of these mycobacteria in peptone water at 30° C was observed.

Two distinct phenomenon in the relationship between *A. castellanii* and various strains of mycobacteria have been recorded (*i*) Mycobacterial strains comprising *M. avium*, *M. marinum*, *M. ulcerans*, *M. simiae* and *M. habana* could be found in the amoeba cytoplasm causing no apparant injury to the amoebae as observed by light microscopy. No differences in the staining characteristics of the mycobacteria could be seen indicating that the mycobacteria were not affected despite persistence in the cytoplasm of amoebae (*ii*) The mycobacteria comprising of *M. smegmatis*, *M. fortuitum* and *M. phlei* could be observed in very heavy numbers in the amoeba cytoplasm and the trophozoites died out after 5 days. The death of the amoebae in this case may be due to factor(s) attributable to growth of mycobacteria in peptone broth. Studies on amoeba-mycobacteria interrelationship in species of amoebae growing axenically at 37° C and 42° C in minimal medium with virulent strains of mycobacteria are under progress to discern the effect of mycobacteria on amoebae and the possible transmission of mycobacteria to laboratory animals under experimental conditions using infected amoebae.

The authors are thankful to Dr. Nitya Nand, F.N.A., Director, Central Drug Research Institute, for his encouragement and keen interest in this line of work. Thanks are also due to Shri S. K. Chakraborty, Shri Anil Srivastava, Shri Ashok Srivastava and Miss Reeta Srivastava for their technical assistance at various stages of this work.

Division of Microbiology, Central Drug Research Institute, Lucknow 226 001 (U.P.), India,
October 27, 1977.

B. N. KRISHNA PRASAD.
S. K. GUPTA.

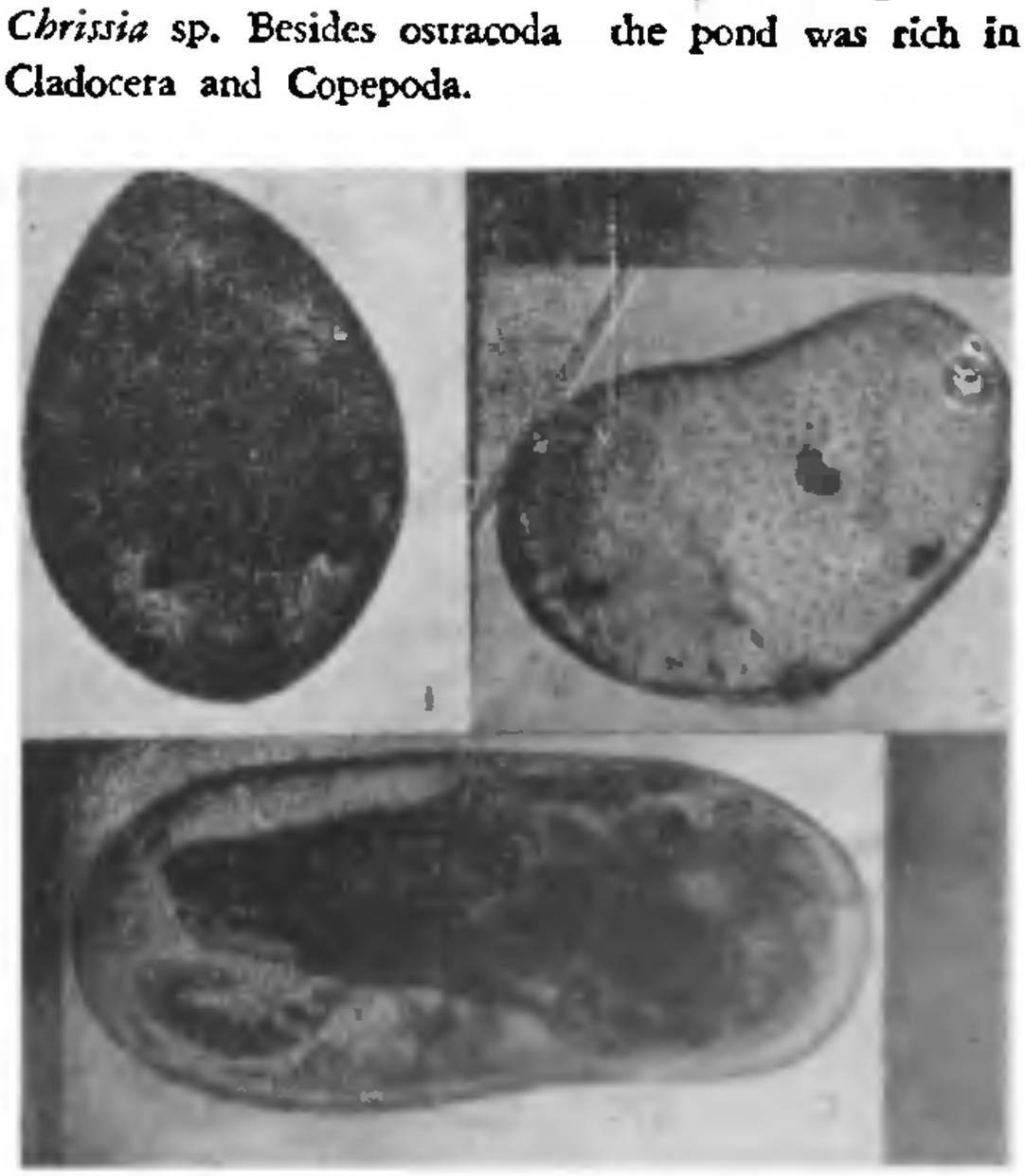
1. Krishna Prasad, B. N. and Gupta, S. K., *Curr. Sci.*, 1977, 46, 710.

RECORDS OF *PSEUDOCYPRETTA* KLIE, 1933 AND *TANYCYPRIS* TRIEBEL, 1959 (CRUSTACEA : OSTRACODA) FROM INDIA

THE present communication reports the occurrence of two recent freshwater Ostracod genera, *viz.*, *Pseudocypretta* Klie, 1933 and *Tanycypris* Triebel, 1959 for the first time from India. Their presence is interesting because they were hitherto known only from Africa[1,3] and Madagascar[2].

Genus *Pseudocypretta* Klie, 1933 is characterised by subovate carapace with pointed extremities in dorsal view, subtriangular in lateral view, dorsum strongly convex, maximum height near the middle, anterior and posterior ends broadly rounded, venter slightly concave valves subequal, right valve slightly larger, inner lamella wide ; marginal area crossed by sharply defined septae in anterior and posterior margins of one valve only ; four conspicuous dark spots on each valve ; appendages well developed ; caudal furcae reduced to the flagellar form.

Specimens were collected from a small pond near Anandpur (Punjab) on November 16, 1975. They closely resemble the type species, *Pseudocypretta maculate* Klie, 1933. Associated orstracod species include *Cypris pubera*, *Strandesia* sp., *Cypretta* sp. and *Chrissia* sp. Besides ostracoda the pond was rich in Cladocera and Copepoda.



FIGS. 1–3. Fig. 1. *Pseudocypretta* sp., dorsal view. Fig. 2. *Pseudocypretta* sp., Rt. valve, outer view. Fig. 3. *Tanycypris* sp. (All figures, × 200.)

Genus *Tanycypris* Triebel 1959, delimited from other genera being elongate-oval in form in lateral view,

anterior and posterior ends broadly rounded, fusiform in dorsal view, width less than height, inner lamella broad; appendage well developed, caudal furcae with strong musculature, furcal support robust.

The specimens were collected from a pond near Ludhiana (Punjab) on August 3, 1976. The water of the pond was green due to predominance of floating flora, *viz.*, *Volvox* sp., *Euglena* sp., *Wolffia* sp., *Azolla* sp., and rooted plants.

Associated ostracod species include *Cypris* sp., *Cyprinotus* spp., *Centrocypris* sp. Besides ostracoda, aquatic insects and gastropod molluscs were common in the pond.

The author is grateful to Dr. S. S. Guraya, Professor and Head, Department of Zoology, Punjab Agricultural University, Ludhiana, for laboratory facilities. The author is also thankful to Dr. K. G. Mckenzie of Riverina College of Advanced Education, Wagga, Australia, for confirmation of genus *Tanycypris*.

Department of Zoology, S. K. BATTISH.
College of Basic Sciences &
Humanities,
Punjab Agricultural University,
Ludhiana, *November* 24, 1977.

1. Klie, W., *Arch. Hydrobiol.*, 1933, Suppl. XI, 447.
2. Muller, G. W., *Abhandl. Senckenberg. Naturforsch. Ges.*, 1899, 1 257.
3. Rome, D. R., *South African Animal Life*, 1965, 11, 9.

EFFECTS OF INSULIN ON BLOOD GLUCOSE LEVEL, GLUCOSE TOLERANCE AND GLYCOGEN CONTENT OF THE FOOT AND HEPATOPANCREAS IN *CRYPTOZONA BELANGERI* (DESHAYES) (MOLLUSCA: GASTROPODA)

THE physiological role of insulin in Deuterostomian and Protostomian invertebrates is not well-understood[1] and in particular the information available in molluscan species is contradictory[2]. In the present study on the terrestrial pulmonate gastropod *Cryptozona belangeri* the influence of varying doses of commercial mammalian insulin (INSULIN, The Boots Company (India) Ltd., Lot No. 341) has been studied. Pilot studies have shown the blood sugar level to be low in this snail and to demonstrate the role of insulin, snails were given a glucose load, an hour following insulin treatment. Blood glucose was estimated following the colorimetric microprocedure of Folin-Malmros as modified by Murrel and Nace[3] and the glycogen content of the foot muscle and hepatopancreas was estimated following the colorimetric micromethod of Kemp and Kits.[4]

The normal blood sugar level is about 4·9 ± 0·4 mg/100 ml and in PBS injected controls (Phosphate Buffer Solution, pH 7·5) no appreciable change in the carbohydrate content is noticed. A low dose of insulin (25 IU/Kg BW) did not elicit any significant alteration in the blood glucose level while the snails were resistant to larger doses of insulin (75 IU/Kg BW). Administration of a low dose of glucose (0·5 gm/Kg BW) elevated the blood sugar level immediately but the glucose content decreased gradually and attained normalcy in about eight hours.

Administration of insulin (25 IU/Kg BW) one hour prior to injection of glucose (0·5 gm/Kg BW) resulted in a sharp increase in the blood glucose level followed by a drop. The values are significant at the 3rd and 4th hour after insulin injection, compared to controls ($P<0·01$). Injection of a higher dose of insulin (50 IU/Kg BW) one hour prior to the same glucose load produced significant decrease at all intervals of times ($P<0·01$), excepting at the eighth hour when normalcy was attained (Fig. 1).

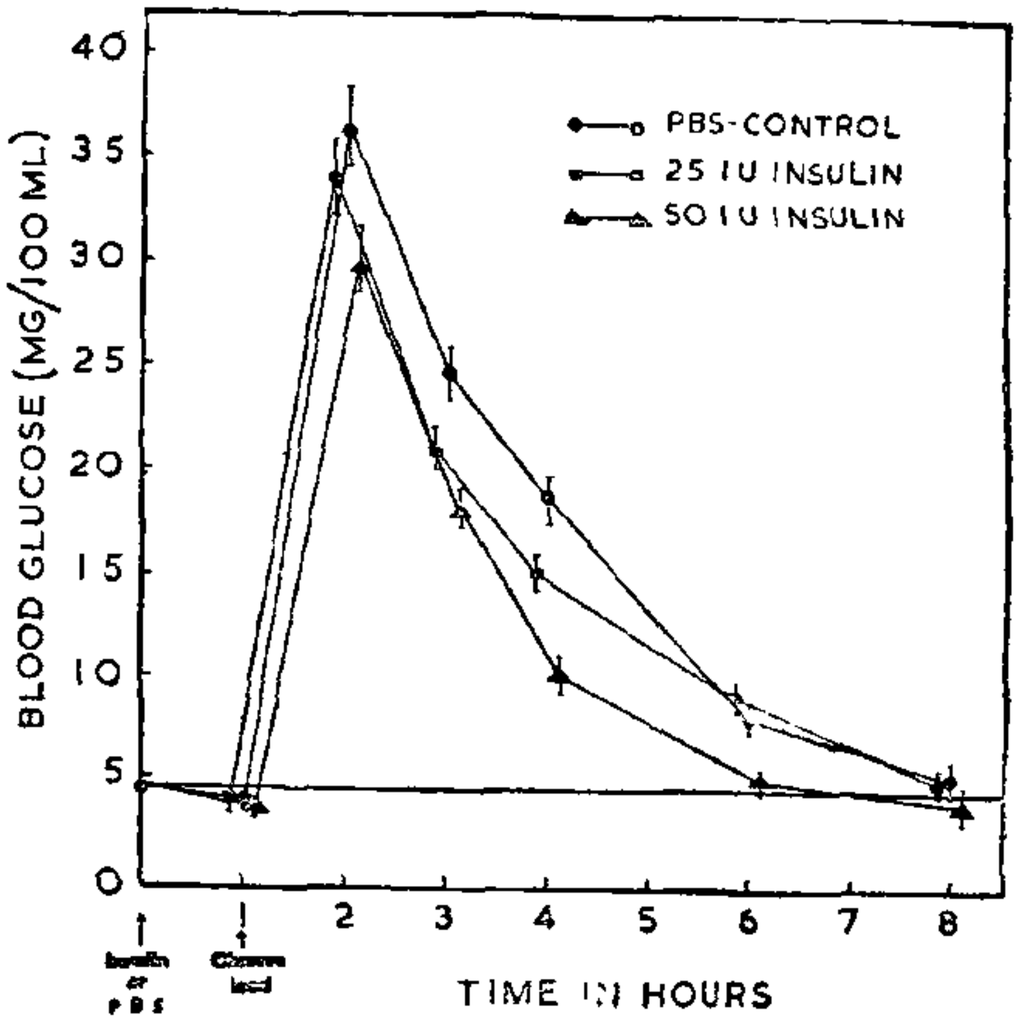


FIG. 1. Effect of insulin (25 and 50 IU/Kg/BW), PBS on a glucose tolerance test (0·5 gm/Kg/BW), started on hour later on *Cryptozona belongeri*. Ten snails were used for each stage of experiment and the values plotted on the graph represents the mean of ten separate estimations.

The normal glycogen content of hepatopancreas (1·18 ± 0·021 mg/100 mg) and foot (0·86 ± 0·034 mg/100 mg) did not appreciably change due to the administration of 25 IU of insulin per Kg BW.