

Brèves communications – Kurze Mitteilungen – Brevi comunicazioni – Brief Reports

Les auteurs sont seuls responsables des opinions exprimées dans ces communications. – Für die kurzen Mitteilungen ist ausschliesslich der Autor verantwortlich. – Per le brevi comunicazioni è responsabile solo l'autore. – The editors do not hold themselves responsible for the opinions expressed by their correspondents.

Free Amino Acids in the Testes of *Gryllotalpa africana* Beauvois (Orthoptera, Gryllidae)

The amino acid composition of tissues other than the hemolymph of insects is not very well known. In a few insects only, both the hemolymph and certain other tissues have been analysed. For example, KERMACK and STEIN¹ have demonstrated the presence of 17 amino acids in the flight muscles of *Locusta migratoria migratorioides*, although its blood contains only 16 amino acids (DUCHATEAU, SARLET, and FLORKIN²). The hemolymph and the ovaries of *Schistocerca gregaria* have been studied by BENASSI, COLOMBO, and PERETTI³, and certain amino acids, e.g. B-alanine, cysteine and cystine, have been reported only in the ovaries. The hemolymph of larvae (PRATT⁴) and the brain of the adult (CARTA et al.⁵) of *Apis mellifica* have also been analysed and differences have been reported. The differences in the amino acid constituents of various tissues found in the same insect suggest that, although blood circulates in all the organs and tissues of the insect, their amino acid constituents are varied, probably due to their intermediary metabolism.

The testes of *Gryllotalpa africana* were studied with a view to obtaining some concept of the metabolism in this insect, as both its hemolymph (SINGH⁶) and urine (SINGH⁷) have already been analysed.

Material and methods. After washing the insects with distilled water, the testes were excised. Three pairs of testes were enough for preparing one chromatogram. They were dipped in distilled water to remove the traces of adhering blood, and then dried over a piece of blotting paper. They were then crushed on a strip of chromatographic paper Whatman No. 1. The spot on the strip was

dried, cut and its ethanolic extraction was prepared as described earlier (SINGH⁶). The extract was applied to chromatographic paper Whatman No. 1, and two-dimensional chromatograms were prepared in *n*-butanol-acetic acid-water (120:30:60) and phenol-water (4:1). The amino acids were identified by spraying the paper with 0.2% ninhydrin in water-saturated *n*-butanol and comparing it with the chromatogram of known amino acids.

Results and discussion. The amino acids identified in the testes of *G. africana* are: leucines, valine, proline, tyrosine, alanine, histidine, glycine, serine, glutamic acid, and aspartic acid. The concentration of proline is highest, and that of tyrosine, aspartic acid, and serine are lower than the rest.

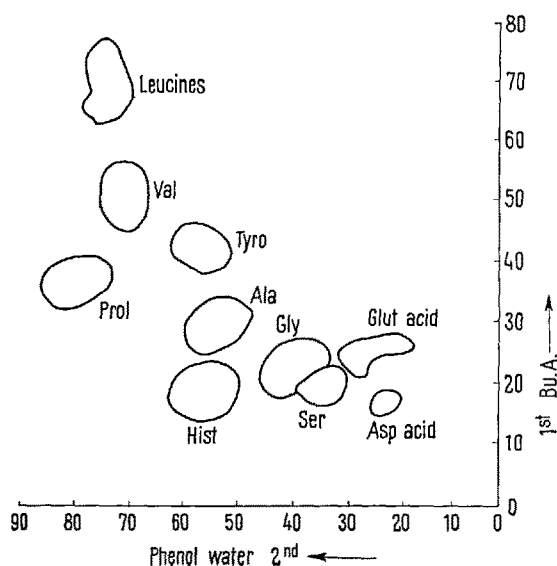
Lysine and arginine, which have been identified both in the hemolymph and urine (SINGH^{6,7}) of *G. africana*, are absent in the testes. KILBI and NEVILLE⁸ have demonstrated in *Schistocerca gregaria* that arginine is concerned in the synthesis of urea by the 'Ornithine Cycle' and acts as an energy store in muscles as phosphagen arginine phosphate. The absence of arginine in the testes of *G. africana* might be due to its being stored up in the muscles or being used up during the metabolism of the insect.

The absence of lysine in the testes of *G. africana* is not well understood. Its absence suggests that probably it is used up in the formation of sperm in the testes⁹.

Zusammenfassung. Zweidimensionale Chromatographie der Hoden von *G. africana* ergibt das Vorkommen von elf Aminosäuren: Leucin (Isoleucin), Valin, Prolin, Tyrosin, Alanin, Glycin, Serin, Glutaminsäure und Asparaginsäure. Höchste Konzentration fand sich bei Prolin und Asparaginsäure, niedrigste bei Serin und Tyrosin.

A. SINGH

Department of Zoology, Lucknow University, Lucknow (U.P. India), August 25, 1964.



- 1 W. O. KERMACK and J. M. STEIN, *Biochem. J.* 71, 648 (1959).
- 2 G. H. DUCHATEAU, M. FLORKIN, and H. SARLET, *Arch. int. Physiol. Biochem.* 60, 539 (1952).
- 3 C. A. BENASSI, G. COLOMBO, and G. PERETTI, *Biochem. J.* 80, 332 (1961).
- 4 J. J. PRATT JR., *Ann. ent. Soc. America* 43, 573 (1950).
- 5 S. CARTA, NORA FRONTALI, and G. VIVALDI, *Estratto Dai Rendiconti* 24, 407 (1961).
- 6 A. SINGH, *Indian J. Ent.*, in press.
- 7 A. SINGH, *Curr. Sci.* 33, 52 (1964).
- 8 B. A. KILBI and E. NEVILLE, *J. exp. Biol.* 34, 276 (1957).
- 9 Acknowledgment. I wish to express my thanks to Dr. R. RAKSHPAL for advice and constructive criticism.