

Ascorbic Acid and Testicular Activity in Heat-Exposed Toad (*Bufo melanostictus*)

The influence of temperature on mammalian spermatogenesis is well established. Application of heat on the scrotal surface of the guinea-pig¹ and the rat², and prolonged cryptorchid state in human beings³, results in spermatogenic arrest. LLAURADO and EIK-NES⁴ have noted a fall of ascorbic acid in the cryptorchid testis of rat. To the best of our knowledge, the effect of heat on the testes in lower group of vertebrates has not been studied. The present work has been taken up to study the testicular activity and its relationship with ascorbic acid in heat-exposed toad.

16 male toads of average weights from 50–60 g were selected for the present experiment during the months of May and June. The animals were divided equally into 2 groups. 1 group of control animals was kept at a 'room temperature' ranging between 30 and 36 °C, the remaining group was exposed to a temperature of 41 °C in a constant temperature incubator. After 120 h of exposure to heat the animals were killed along with the controls. Testes were fixed in 10% formalin for histologic study. Ascorbic acid was estimated in the testes by DNP method developed by ROE and KEUTHER⁵.

The testes of heat-exposed toad showed an increased spermatogenesis, as indicated by the numerous primary spermatogonia, spermatocytes, spermatides and mature sperms.

The concentration of ascorbic acid in the treated testes was increased markedly as compared to controls (Table).

The influence of ascorbic acid on the testicular activity of the rat^{6,7} and the guinea-pig⁸ has been reported previously. On the other hand, ROY and GUHA⁹ observed an increased biosynthesis of this vitamin in the amphibian groups during summer season. So probably the high level of ascorbic acid in the testis of heat-exposed toads is due to increased biosynthesis of this vitamin. But the mechanism through which ascorbic acid regulates testicular activity has not been elucidated. Evidence indicates that ascorbic acid potentiates the effect of gonadotropin¹⁰.

The above evidence suggests that the elevated ascorbic acid enhances gonadotropin action in the testis of the toads and thereby results in testicular hypertrophy at high temperatures¹¹.

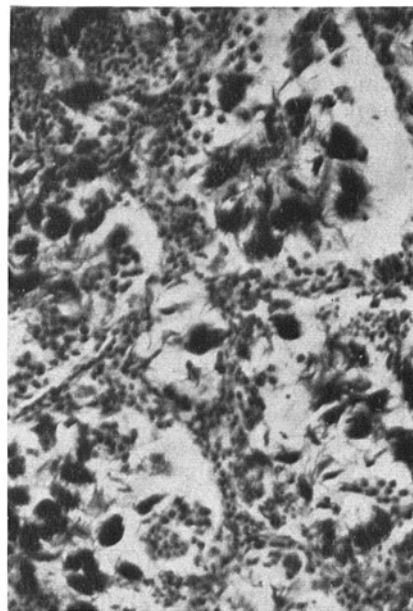


Fig. 2. Testis from heat-exposed toad. Tubular cells are markedly increased. Compare with Figure 1. $\times 96$.

Effect of heat exposure on testicular ascorbic acid of the toad

Group	No. of toads	Body weight g	Ascorbic acid mg/100 g
Control	8	54 \pm 4.09 ^a	53 \pm 3.13
Heat-exposed	8	55 \pm 3.56	67 \pm 5.49

^a Mean \pm standard deviation.

Résumé. On a trouvé que la fonction du testicule et la concentration de l'acide ascorbique dans cette glande ont été augmentées chez les crapauds exposés à la chaleur.

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Fig. 1. Testis from control toad showing all the stages of spermatogenesis. $\times 96$.

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¹¹ Acknowledgment: The authors' thanks are due to Prof. S. R. MAITRA, Head of the Department of Physiology, Calcutta University, for constant encouragements.