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INTRA SUBSPECIFIC HAEMOGLOBIN POLYMORPHISM IN *BANDICOTA BENGALENSIS KOK* (GRAY)

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ABSTRACT

Intra subspecific haemoglobin polymorphism in *Bandicota bengalensis kok* (Gray) is reported. Hb^S is considered a generic feature in the genus *Bandicota*. Presence of both Hb^J and Hb^S haemoglobin in the same sample is noted.

INTRODUCTION

In an attempt to clear the confusions created in Ellerman's (1961) classification of the genus *Bandicota* Agrawal and Chakraborty (1976) reduced the number of the subspecies of *B. bengalensis* from seven to three. The three subspecies (*B. b. bengalensis, B. b. kok* and *B. b. gracilis*), which are now merged under a common subspecies *B. b. bengalensis* were differentiated previously on most controversial overlapping characters, like fur colour, texture, external and osteological measurements. On comparing *B. bengalensis* (*B. b. kok* (*lordi*) (Wroughton) with material present in the Zoological Survey of India, Calcutta all were found only to be the forms with size differences of the same subspecies, *B. b. bengalensis* (Pradhan, in press). The application of new taxonomical techniques like karyology and biochemical taxonomy correlated with those of external morphology and osteology confirms the status of subspecies or species in a genus. The karyological studies carried out in different subspecies of *B. bengalensis* have shown that the species, *B. bengalensis*, possesses same Karyotype in all these subspecies (Avirachan *et al.* 1971, Sharma & Raman, 1971). Though the karyological studies are apparently sufficient to confirm the inclusion of all above mentioned subspecies in a common subspecies *B. b. bengalensis*, any conclusion without reference to biochemical techniques may not be in order. The transferin and haptoglobin patterns of the genus *Bandicota* have already been reported (Deoras and Pradhan, 1976 ; Pradhan, 1975). The present paper deals with another blood protein, haemoglobin, which has a great significance in biochemical taxonomy of the genus *Bandicota*.

MATERIAL AND METHODS

The material for biochemical tests were provided by Bombay Municipal Corporation and for taxonomic studies by Zoological Survey of India, Calcutta. Fresh blood was collected from the live stock of field rats by puncturing the heart. The blood clot containing rich quantity of haemoglobin was separated from the serum and was treated with phosphate buffer (pH 8.9). Haemoglobin oozed out from R.B.C. mass and dissolved in the buffer solution. The haemoglobin concentration was brought close to the dilu-

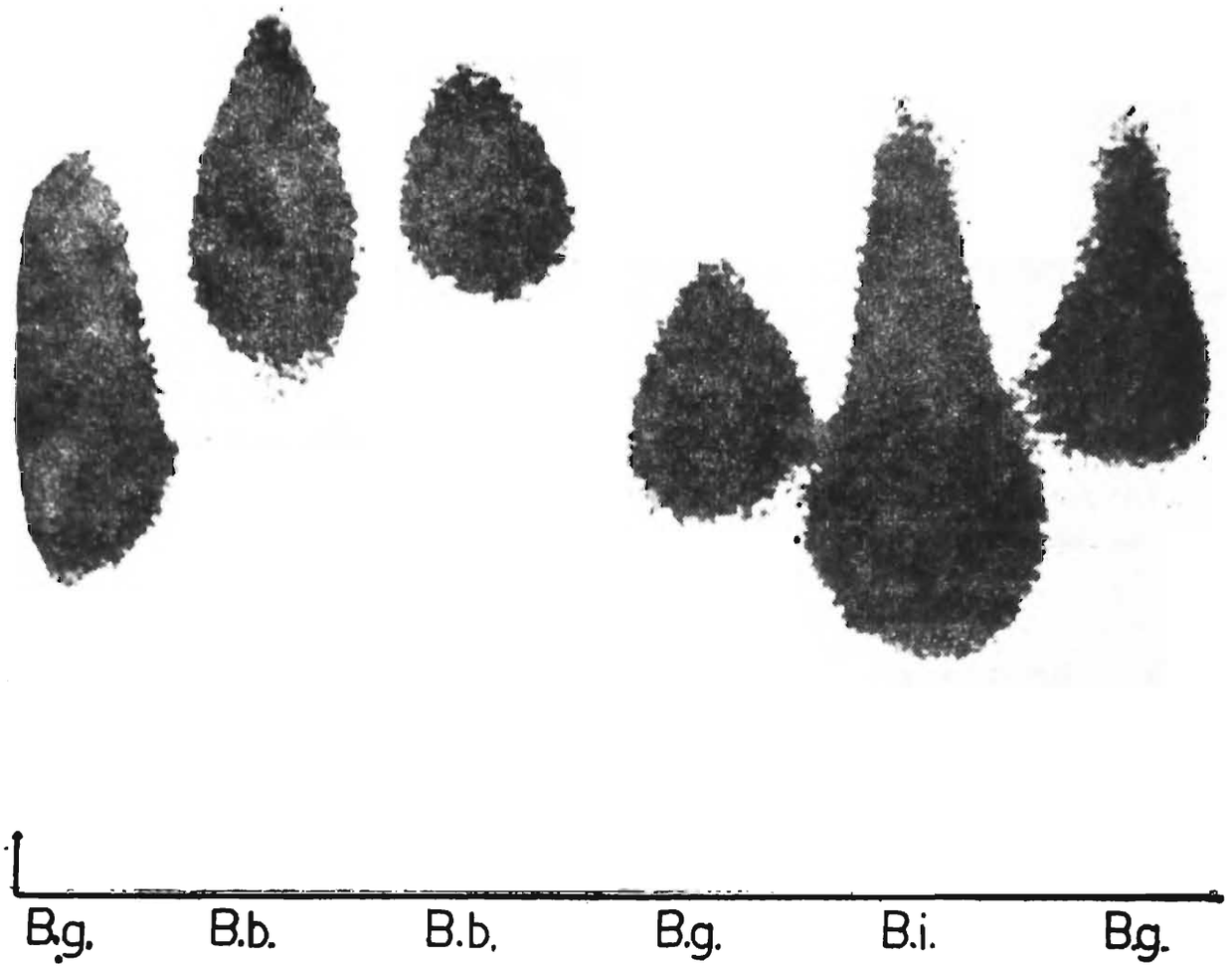

Fig. 1 : *Bandicota* hacmoglobin patterns by paper electrophoresis.

tion of 0.5 gm. / 100 ml. The solution was kept in freeze for 12-24 hours at 4°C. The samples were then run for paper electrophoresis. The electropherograms were then dried in oven and the mobility of bandicoot haemoglobin was studied without giving any post electrophoretic treatments to the strips. The procedure adopted for the present studies was from Pauling *et al.* (1949).

Results and Discussion

Figs. 1 and 2 show the paper electropherograms showing the mobility of bandicoot haemoglobin. Almost all the samples possess 1/1 type of haemoglobin comparable to normal human type. *B. bengalensis* possesses the fastest moving haemoglobin (Hb) while *B. gigantea* possesses slower and *B. indica* has got the slowest moving Hb. But this difference in mobility is not significant to draw any concluding line of specific separation. The difference in the mobility might have been caused by the local differences in the electrical or the ionic field during the electrophoretic run. One sample of *B. bengalensis* shows the presence of an additional Hb band (Fig. 2). The occurrence of the two haemoglobin bands in the same sample was confirmed by repeating the run.

Marchlewska-koj (1967) has shown that rats possess 1/1 type of haemoglobin comparable to the normal human type Hb^A (Anonymous 1964). As the genus *Bandicota* possesses the Hb^S type which is slower than Hb^A, Hb^S is considered a generic feature with regard to the genus *Bandicota.*

The most interesting type of Hb is seen in an exceptional type of *B. bengalensis* possessing two bands. The fastest moving band is comparable to Hb^J. In the present studies a crossbreed between the Hb^S and Hb^J (1/2 type) is being reported. Unfortunately the naturally occurring pure breeds of the Hb^J

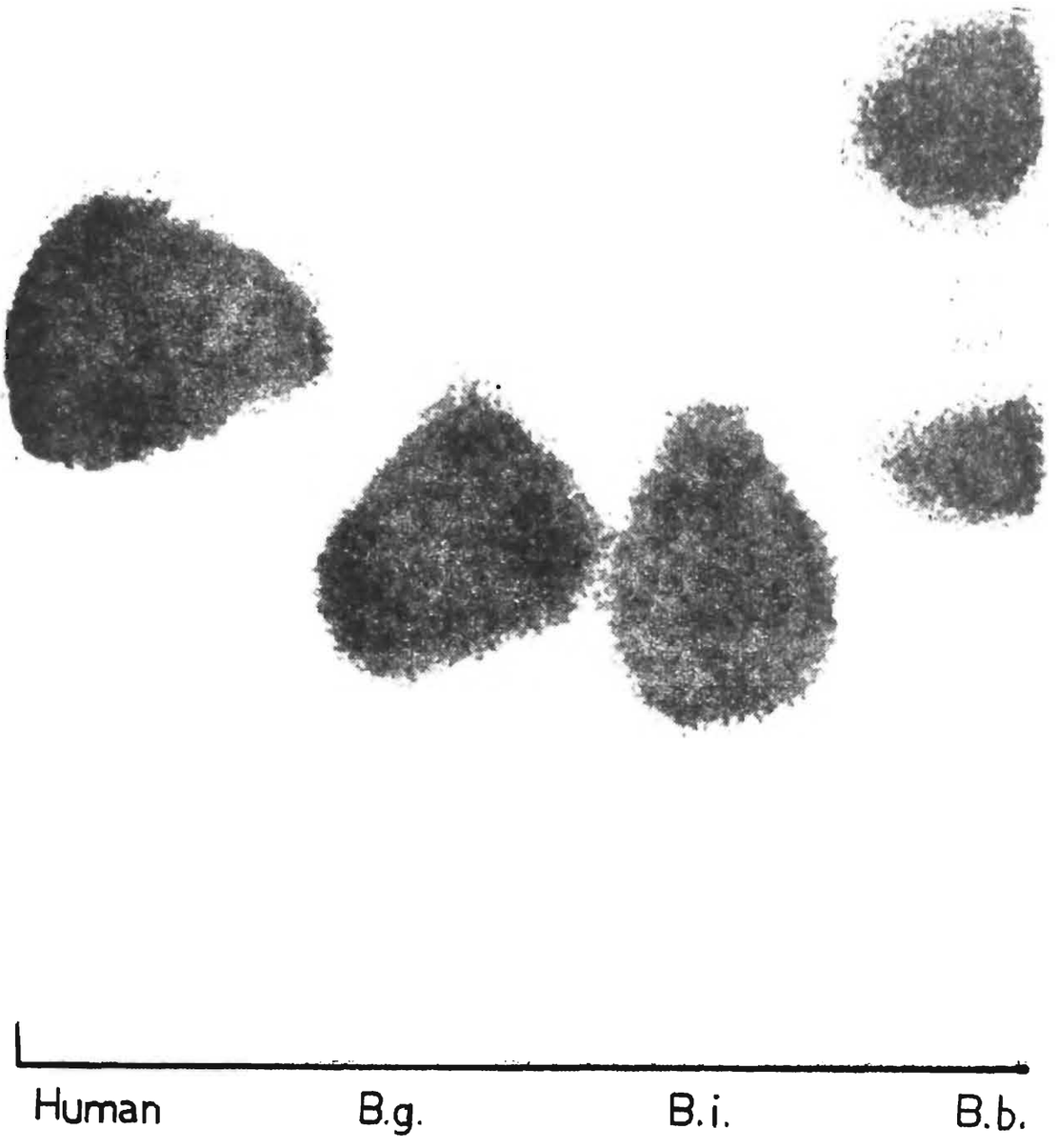

Fig. 2 : *Bandicota* haemoglobin patterns Showing intrasubspecific haemoglobin polymorphism in *B. bengalensis.*

type field rats were not available for external morphological studies. But the occurrence of Hb^J and Hb^S in a single animal itself confirms the intra-subspecific haemoglobin polymorphism. If the homozygous Hb^J and Hb^S types are located separately and if their external morphological and osteological studies are carried out, then the differences, if present, can be pointed out. And if these differences are sufficient to separate these group into separate subspecies, then the subspecies ***B. b. bengalensis*** (comprising ***B. b. bengalensis***, ***B. b. kok*** and ***B. b. gracilis***) will have to be divided into two groups depending upon the length of differences.

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