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Received September 13, 1956. P.S.E.B.M., 1956, v93.

Electrophoretic Behavior of Some Animal Hemoglobins. (22768)

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The authors have been unable to find any report of results of paper electrophoresis of hemoglobins other than human. The present communication presents findings in 6 species of animals.

Methods. Electrophoresis was performed on "sandwich" type plate glass apparatus using Whatman 3MM paper in sheets 36 × 16 cm and 36 × 12 cm. Barbiturate buffer at pH 8.6 and M 0.025 was used in all preliminary experiments. Current was applied to 36 × 16 cm sheets at 300 volts and 5 milliamperes for 6 hours and to 36 × 12 cm sheets for 4 hours, constant temperature of 20°C was maintained. Under these conditions normal human hemoglobin (Hb. A) migrated approximately 5 cm during the run. In addition to electrophoresis alkali denaturation tests(1) and solubility tests(2) were carried out on all specimens (Table I). Rat hemoglobin was obtained from the pooled blood of adult Wistar rats killed at the end of experiments. Dog hemoglobin was from mongrel dogs used in experimental surgery. Rabbit

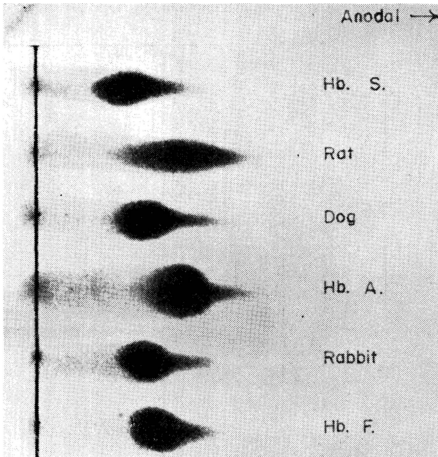


FIG. 1. Patterns of rat, dog and rabbit hemoglobins with Hb. S., Hb. A. and Hb. F. for comparison.

hemoglobin was from albino rabbits used for pregnancy tests. Chicken hemoglobin was from pooled blood obtained from a poultry farm. Turtle hemoglobin was from several specimens of the common land turtle, *Gopherus polyphemus*. Alligator hemoglobin was from a single small specimen of *Alligator mississippiensis*. Hemoglobin solutions were prepared in the usual manner and adjusted to approximately 5%, 3 lambda of the solution were applied to the paper.

Results. As shown in Fig. 1, dog and rabbit hemoglobins move as homogenous compounds at a rate slightly slower than fetal hemoglobin but faster than Hb. S while rat hemoglobin produces a trailing spot suggest-

TABLE I. Resistance to Alkali Denaturation and Solubility as COHb of Animal Hemoglobins.

Species	% alkali resistant	% soluble as carbonmonoxy-hemoglobin
Dog	0	100
Rabbit	36	"
Rat	100	"
Chicken	35	"
Alligator	0	"
Turtle	0	"

ing a mixture of hemoglobins; this we have been unable to resolve by varying the buffer or any other factors.

In Fig. 2, turtle and chicken hemoglobin behave as mixtures, these were fairly well separated by electrophoresis in phosphate buffer at pH 7.4 (Fig. 4). Alligator hemoglobin

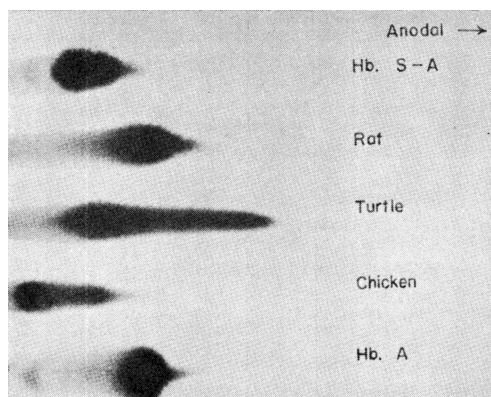


FIG. 2. Patterns of turtle and chicken hemoglobins with rat, Hb. S-A and Hb. A for comparison.

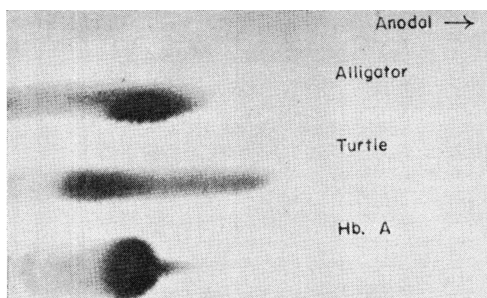


FIG. 3. Patterns of alligator and turtle hemoglobins with Hb. A for comparison.

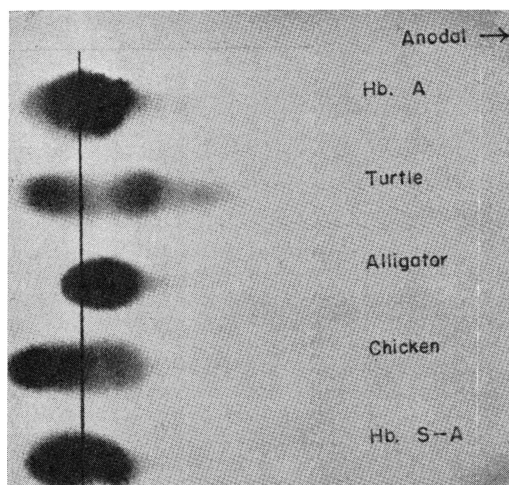


FIG. 4. Patterns of turtle, alligator and chicken hemoglobins run in phosphate buffer at pH 7.4, 150 volts, 5 milliamperes for 6 hr. Hb. A and Hb. S-A for comparison.

(Fig. 3) moves at a slightly more rapid rate than Hb. A and presents a trailing spot which does not resolve into 2 components at pH 7.4.

These observations are preliminary and incomplete in that many methods of examination of hemoglobins have not yet been employed. They are presented in the hope that they may be of interest to zoologists and perhaps phylogenists.

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