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Simultaneous electrophoretic analysis of a large number of samples. Application to serum esterases of Taterillus (rodent)

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Genetical and biochemical studies have increasingly used electrophoretic techniques these last ten years and it is more specially in population genetics that analysis of a large number of samples is needed. An apparatus has been developed which permits the analysis of as many as 40 samples in the same starch gel run according to Smithies' technics (1955).

This apparatus which has analogies with Manuel's (Creyssel, 1968) has already been described (Baron, 1972) and tested with more than 1 000 sera. The 40 samples, migrating under identical electrophoretical conditions (without any distortion of the front), are directly comparable and can be submitted to three different treatments on the three slices of the gel.

Fig. 1 illustrates the results obtained with 35 *Taterillus* sera after starch gel electrophoresis and esterase staining according to the procedure of Baron (1972).

On the base of electrophoretic mobility and differential substrate (acetyl or propionyl) and inhibitor (dichlorvos, eserine, p-CMB) specifity, the esterases can be divided into 5 groups (Table 1).

Table 1. Different groups of esterases in the sera of *Taterillus*. Ac > Pr: reaction with acetyl substrate is stronger; Ac = Pr: reaction is equivalent.

Group	Mobility	Substrate	Nature
Es I	pre-albumin	Ac > Pr	carboxyl esterase
Es II	albumin	Ac = Pr	acetyl esterase
Es III	post-albumin	Ac > Pr	carboxyl esterase
Es IV	middle	Ac = Pr	carboxyl esterase
Es V	slow	Ac: no reaction with βN propionyl	carboxyl esterase

Polymorphism has been noted for Groups I, II and III. Absence of Es IV coincides with pathologic animals.

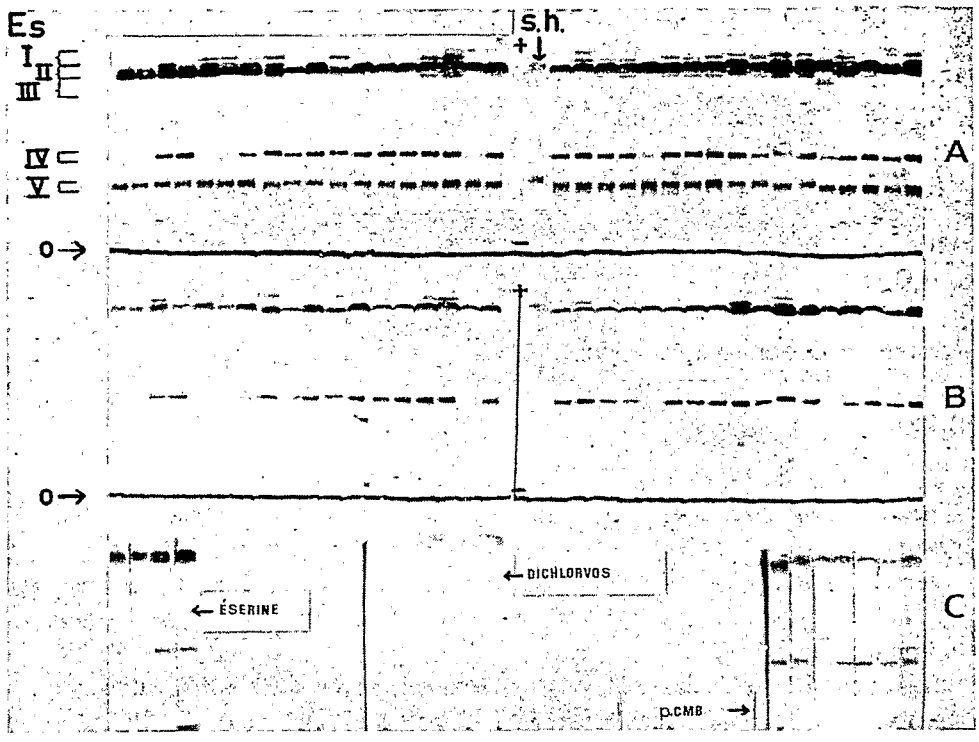

Fig. 1. Zymograms of *Taterillus* serum esterases after horizontal starch gel electrophoresis (concentration 12%) with a voltage gradient of 4.5 V/cm applied for 6½ h at room temperature. Discontinuous buffer: electrode buffer 25 m*M* LiOH and 100 m*M* borate, pH 8.4; gel buffer 50 m*M* tris and 8 m*M* citrate, pH 8.2.

A. Esterases detected with α-naphtyl acetate + β-naphtyl acetate and fast blue BB (tris-HCl buffer 100 m*M*, pH 7.5); s.h. = human serum; O = origin.

B. Esterases detected with β-naphtyl propionate and fast blue BB.

C. Appearance after incubation with the inhibitors: eserine 0.1 m*M*, dichlorvos 0.1 m*M* (procedure A) and *p*-chloromercuribenzoic acid, Na salt 2 m*M* (procedure B).

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