

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

J. C. Baron

Office de la Recherche Scientifique et Technique Outre-Mer (ORSTOM), Dakar, Senegal

Received: 4 December 1972.

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 (Creysse, 1968) has already been described (Baron, 1972) and tested with more than 1 000 sera. The 40 samples, migrating under identical electrophoretic 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) specificity, 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 $\beta$ N propionyl	carboxyl esterase

- 3 MARS 1977

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

O. R. S. I. O. M.

52 Collection de<sup>49</sup> Référence  
n° 8555 Bio. Sols.

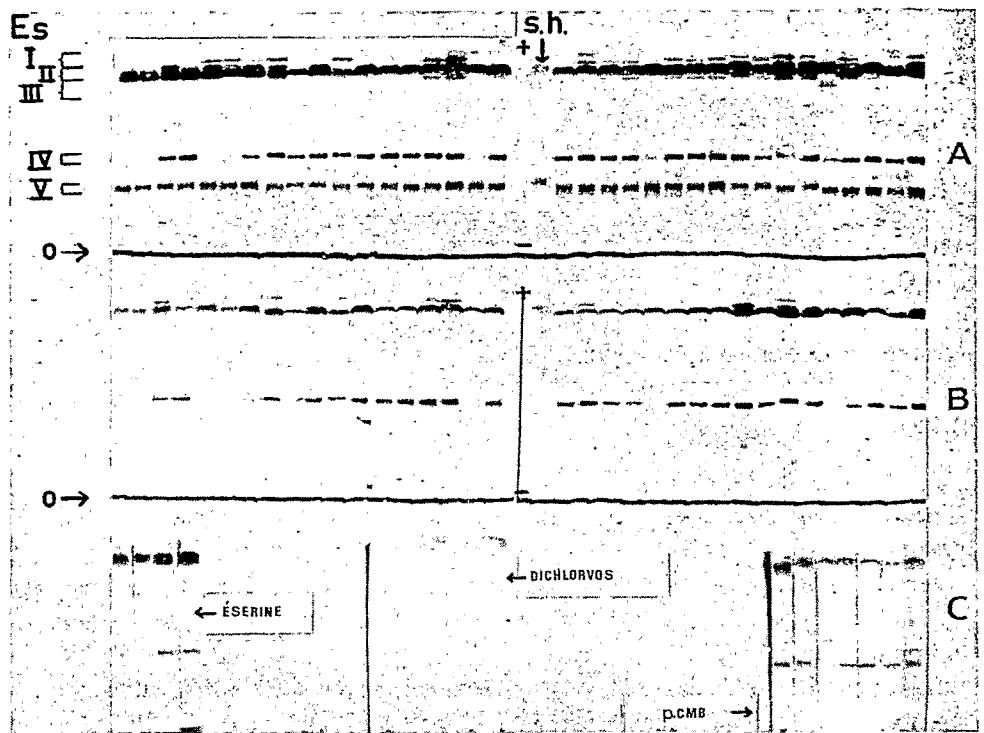


Fig. 1. Zymograms of *Taterillus* serum esterases after horizontal starch gel electrophoresis (concentration 12%) with a voltage gradient of 4.5 V/cm applied for 6½ h at room temperature. Discontinuous buffer: electrode buffer 25 mM LiOH and 100 mM borate, pH 8.4; gel buffer 50 mM tris and 8 mM citrate,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

A. Esterases detected with  $\alpha$ -naphthyl acetate +  $\beta$ -naphthyl acetate and fast blue BB (tris-HCl buffer 100 mM, pH 7.5); s.h. = human serum; O = origin.

B. Esterases detected with  $\beta$ -naphthyl propionate and fast blue BB.

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

### References

- Baron, J. C., 1972. Note sur un nouvel appareil d'électrophorèse horizontale pour gel d'amidon. *Cah. ORSTOM, Sér. Océanogr.* 10 (3):251-262.
- Baron, J. C., 1972. Étude préliminaire des estérases du sérum de *Sardinella aurita*. Doc. Sc. Prov. No 001, Centre ORSTOM de Dakar, pp. 44, multigr.
- Creyssel, R., 1968. Appareillage simple d'électrophorèse préparative sur support. In: *Techniques d'électrophorèse de zones*. Ed. de la Tourelle, St. Mandé, pp. 283.
- Fine, J. M., 1968. Electrophorèse en gel d'amidon. In: *Techniques d'électrophorèse de zones*. Ed. de la Tourelle, St. Mandé, pp. 283.
- Holmes, R. S., C. J. Masters & E. C. Webb, 1968. A comparative study of vertebrate esterase multiplicity. *Comp. Biochem. Physiol.* 26: 837-852.
- Holmes, R. S. & C. J. Masters, 1967. The developmental multiplicity and isoenzyme status of rat esterase. *Biochim. biophys. Acta* 146: 138-150.
- Smithies, O., 1955. Zone electrophoresis in starch gels: group variation in the serum proteins of normal human adults. *Biochem. J.* 61: 629-641.