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NOTE

ON THE VALIDITY OF *TRICHIURUS RUSSELLI* DUTT AND THANKAM, 1967

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ABSTRACT

Comparison of specimens of *Trichiurus lepturus* and *T. russelli* from Visakhapatnam (type locality of latter species) has confirmed that *T. russelli* is a valid species. The two species show consistent differences in electropherograms of muscle myogen proteins : there are ten bands in *T. lepturus* and eleven bands in *T. russelli*. The bands of the two species also show differences in width and in rate of mobility.

Key-words : *Trichiurus*, electrophoresis, chemotaxonomy, myogen proteins.

Dutt and Thankam (1967) erected a new species of ribbonfish *Trichiurus russelli* on the basis of a holotype and twentynine other specimens. They showed that it can be clearly distinguished from the closely related *Trichiurus lepturus* (Linnaeus) mainly on the basis of characters such as (i) position of anal origin below dorsal rays, (ii) number of vertebrae, (iii) pectoral fin — body depth ratio and (iv) colour of body.

They also showed that the two species show some differences in regard to seven other characters, although there is overlap in the range of each of them. At the same time, Gupta (1967) erected two new species of *Trichiurus*, one of which was named as *Trichiurus pantului*. James (1969), after examining the holotype and six paratypes of *T. pantului*, Gupta considered it as a synonym of *T. lepturus*. He assumed that *russelli* also is a synonym of *lepturus*, without objective comparison of data and specimens.

In view of this confusion it was felt that it would be worthwhile to compare the muscle myogen patterns of *T. russelli* and *T. lepturus* through electrophoresis.

In recent years, it has been increasingly realised that chemotaxonomic techniques like electrophoresis constitute an important tool in taxonomic studies especially of tropical fishes, because each of the many common and widely distributed genera includes a few or more closely related species with considerable overlap in many biometric characters so that it is not always easy to distinguish them. In such cases, the patterns of the muscle myogen proteins play a crucial role in confirming the validity or otherwise of a nominal species.

The study is based on a total of 32 specimens of T. *lepturus* (244 mm to 540 mm TL) and 34 specimens of *T. russelli* (302 mm to 464 mm TL) collected at Visakhapatnam during the period from February 1980 to August 1981. The pattern of muscle myogen proteins was determined by polyacrylamide disc gel electrophoresis, carried out by a modification of the method

described by Mackie (1969). Care was taken to compare samples of muscles of the two species from specimens in the same length range. A sample of muscle was taken from the left side of the body of fresh or frozen fish after removing the skin. About 3 g of the muscle was homogenised with an equal weight of distilled water in a chilled glass homogeniser. The homogenate was then centrifuged at 14,000 rpm for 15 minutes. The supernatant protein extract solution was diluted with an equal volume of 40% sucrose solution and stored at —5°C until required for electrophoresis.

The separating gel was standard 7.5% polyacrylamide gel. The myogen extract was applied to the top of the gel column and a current of 3 mA per tube was released through a DC power supply unit. The protein fractionation was completed in 90 minutes by the myogen proteins migrating down through the gel towards the anode.

After removing the gel columns from the tubes, the columns were fixed in 12.5% trichloro-acetic acid (TCA) for 20 minutes for denaturation of the proteins, before being stained in 0.2% Kenacid Blue R for twelve minutes. After staining, the gel columns were kept again in 12.5% TCA for 24 hours and then stored in 8% acetic acid for examination and photography. The advantage of this method of staining is that the resolution of the bands, including the lighter bands, is quite clear.

Fig. 1 shows the muscle myogen pattern of the two species of *Trichiurus*.

Fig. 1. Photograph of gel columns of *T. lepturus* (left) and *T. russelli* (right), to show muscle myogen bands.

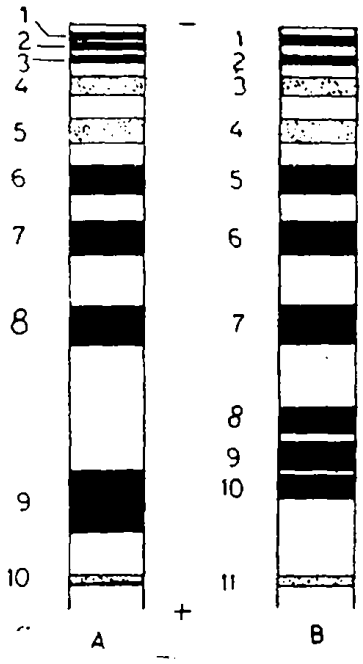

Fig. 2. Diagram to show separation pattern of muscle myogen in *A—T. lepturus*, *B—T. russelli*.

There are 10 bands in *T. lepturus* and 11 in *T. russelli.* The individual bands can be readily recognised (Fig. 2). The patterns of the two species differ in (i) number, (ii) width and (iii) rate of mobility of the bands.

T. lepturus has seven dark bands and three pale bands, whereas *T. russelli* has eight dark bands and three pale bands. The two species differ from each other particularly in regard to the number and width of the bands at the two ends.

The electrophorograms confirm that the two species are distinct. The species-specificity and reproducibility of the myogen protein pattern is such that a single analysis is often sufficient to confirm the identity of a species. This is particularly valuable in studies on closely related species which show considerable overlap in body measurements and meristic characters. The band pattern is consistent in specimens of both sexes and in different sizes in the observed length groups, in each of the two species.

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