

Normal and defective *mariner*-like elements in *Rhynchosciara* species (Sciaridae, Diptera)

P. Rezende-Teixeira, C. Lauand, F. Siviero and G.M. Machado-Santelli

Departamento de Biologia Celular e do Desenvolvimento,
Instituto de Ciências Biomédicas,
Universidade de São Paulo, São Paulo, SP, Brasil

Corresponding author: P. Rezende-Teixeira
E-mail: paularez@usp.br

Genet. Mol. Res. 9 (2): 849-857 (2010)
Received January 13, 2010
Accepted February 9, 2010
Published May 4, 2010
DOI 10.4238/vol9-2gmr796

ABSTRACT. *Mariner*-like elements are widely present in diverse organisms. These elements constitute a large fraction of the eukaryotic genome; they transpose by a “cut-and-paste” mechanism with their own transposase protein. We found two groups of mobile elements in the genus *Rhynchosciara*. PCR using primers designed from *R. americana* transposons (*Ramar1* and *Ramar2*) were the starting point for this comparative study. Genomic DNA templates of four species: *R. hollaenderi*, *R. millerii*, *R. baschanti*, and *Rhynchosciara* sp were used and genomic sequences were amplified, sequenced and the molecular structures of the elements characterized as being putative *mariner*-like elements. The first group included the putative full-length elements. The second group was composed of defective *mariner* elements that contain a deletion overlapping most of the internal region of the transposase open reading frame. They were named *Rmar1* (type 1) and *Rmar2* (type 2), respectively. Many conserved amino acid blocks were identified, as well as a specific D,D(34)D signature motif that was defective in some elements. Based on predicted transposase sequences, these elements

encode truncated proteins and are phylogenetically very close to *mariner*-like elements of the *mauritiana* subfamily. The inverted terminal repeat sequences that flanked the *mariner*-like elements are responsible for their mobility. These inverted terminal repeat sequences were identified by inverse PCR.

Key words: *Rhynchosciara*; Polytene chromosome; Transposon; *Mariner*-like element; Transposase; Inverted terminal repeat sequence