

Deteksi Molekuler Gen Penyandi Protein ABC Transporter *Trypanosoma evansi* Terhadap Obat *Isometamidium Chloride* pada Kerbau di Brebes, Jenepono dan Nagekeo

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INTISARI

Trypanosoma evansi merupakan parasit protozoa dalam darah dan cairan jaringan tubuh hospes yang menyebabkan penyakit Surra pada kerbau, sapi, kuda, dan unta. *Isometamidium chloride* merupakan obat trypanosidal yang digunakan dalam pengobatan Surra di Indonesia. Penggunaan obat trypanosidal yang terus menerus dan tidak sesuai dosis diduga dapat menyebabkan resisten. Kejadian resistensi pada parasit dipengaruhi oleh penurunan *drug uptake* pada sel target. Hal tersebut dapat terjadi dikarenakan kehilangan daya kenal transporter untuk meng-*uptake* obat. Penelitian sebelumnya telah diketahui sekuen gen penyandi keluarga protein *ATP Binding Cassette Transporter* (ABC Transporter) dan perannya terhadap *uptake* obat *Isometamidium Chloride* pada *T. evansi*. Penelitian ini bertujuan untuk: melihat profil sekuen dari gen penyandi protein keluarga ABC transporter pada isolat *T. evansi* di Brebes, Jenepono, dan Nagekeo. Penelitian ini menggunakan sampel darah yang diambil dari kerbau yang terinfeksi *T. evansi* di Brebes, Jenepono, dan Nagekeo. Deteksi *T. evansi* dilakukan dengan uji konvensional seperti : *Wet Blood*, *Microhematocrit Centrifugation* (MHCT), dan Apus darah. Metode yang digunakan dalam deteksi molekuler ini metode *Polymerase Chain Reaction* (PCR) konvensional dengan primer gen ABC Transporter F1 5' GTA CAA CCC AAC GCT TCG AT-3'; dan R1 5' TGT GGA GCG TTC TCT TCC TT -3' dan gen *Tevabc2* F2 5'- GCT TGT CCG ACC ATC TTG TA -3' dan R2 5' AGG TCC ACT CCC ATG CTA CA -3'. Hasil sekuen dianalisis menggunakan BLAST dan *software* MEGA X. Amplifikasi gen penyandi ABC Transporter *T.evansi* didapatkan 867 nukleotida sedangkan gen penyandi ABC₂ Transporter didapatkan 309 nukleotida. Tidak ada perbedaan nukleotida pada ketiga isolat *T.evansi* Brebes, Jenepono, dan Nagekeo. Apabila dibandingkan dengan *T. brucei brucei* (XM_817911), *T. brucei gambiense* (FN554973.1) dan ABC Transporter isolat Ngawi yang diberi obat Isometamidium (Kontrol) hanya terdapat 1 perbedaan nukleotida.

Kata kunci : *ATP Binding Cassette Transporter* , *Isometamidium Chloride*, PCR, Surra, *Trypanosoma evansi*

**Molecular Detection of ABC Transporter *Trypanosoma evansi* Protein
Encoding Genes on Isometamidium Chloride Drug in Buffaloes
in Brebes, Jenepono, and Nagekeo**

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ABSTRACT

Trypanosoma evansi is a protozoan parasite in the blood and body tissue fluids which causes Surra disease in buffaloes, cattle, horses and camels. Isometamidium chloride is a trypanosidal drug used in the treatment of Surra in Indonesia. The use of trypanosidal drugs continuously and not according to the dosage is thought to cause resistance. The occurrence of resistance in parasites is influenced by a decrease in drug uptake in the target cell. This can occur due to loss of familiarity of the transporter to uptake the drug. Previous studies have identified gene sequences encoding the ATP Binding Cassette Transporter (ABC Transporter) protein family and its role in uptake of the drug Isometamidium Chloride in *Trypanosoma evansi*. The aim of this study is to: look at the sequence profiles of the protein coding gene of the ABC transporter family in *T. evansi* isolates in Brebes, Jenepono, and Nagekeo. This study used blood samples taken from buffaloes infected with *Trypanosoma evansi* in Brebes, Jenepono, and Nagekeo. *T. evansi* detection was done by conventional tests such as: Wet Blood, Microhematocrit Centrifugation (MHCT), and blood smear. Molecular detection method used conventional Polymerase Chain Reaction (PCR) method with primer ABC Transporter F1 5' gene 'GTA CAA CCC AAC GCT TCG AT-3'; and R1 5' 'TGT GGA GCG TTC TCT TCC TT -3' and Tevabc2 F2 gene 5' - GCT TGT CCG ACC ATC TTG TA -3' and R2 5' 'AGG TCC ACT CCC ATG CTA CA-3'. Sequence results were analyzed using BLAST and MEGA X software. Amplification of ABC Transporter *T. evansi* coding gene obtained 867 nucleotides while ABC2 Transporter coding gene obtained 309 nucleotides. There were no nucleotide differences in the three isolate of *T. evansi* Brebes, Jenepono, and Nagekeo. When compared with *T. brucei brucei* (XM_817911), *T. brucei gambiense* (FN554973.1) and ABC Transporter of Ngawi isolates was given Isometamidium (Control) there is only 1 nucleotide difference.

Keywords : *ATP Binding Cassette Transporter* , *Isometamidium Chloride*,
PCR, Surra, *Trypanosoma evansi*