

**Application and Evaluation of the Immunofiltration  
Assay in the Diagnosis of Human Schistosomiasis**

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# **ABSTRACT**

## **Application and Evaluation of the Immunofiltration Assay in the Diagnosis of Human Schistosomiasis**

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In the trial to reach fast, simple and efficient diagnostic assay for schistosomiasis, Dot dye immunofiltration assay using protein A conjugated gold colloid was applied and evaluated in comparison with Dipstick assay and Enzyme immunoelctrotransfer blot assay (EITB), using both SEA of *S. mansoni* and SEA of *S. haematobium* as capture antigens in each assay. Dot Dye Immunofiltration assay, Dipstick assay and EITB using SEA of *S. mansoni* were found to be more efficient in comparison to Dot Dye Immunofiltration assay, Dipstick assay and EITB using SEA of *S. haematobium*. Dipstick assay using SEA of *S. mansoni* was found to be the most efficient (82.2%) among all performed assays followed by Dot immunofiltration assay using SEA of *S. mansoni* and EITB using the same antigen efficiency (80.5%). Dot Dye Immunofiltration assay was found to be simpler and faster than Dipstick assay and EITB.

**Key words:** Dot Immunofiltration, Dipstick assay, EITB, Schistosomiasis.

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## LIST OF ABBREVIATIONS

<b>Ab:</b>	Antibody
<b>Ag:</b>	Antigen
<b>AWA:</b>	Adult worm antigen
<b>BSA:</b>	Bovine serum albumin
<b>CAA:</b>	Circulating anodic antigen
<b>Calpain:</b>	Calcium-dependent neutral proteases
<b>CCA:</b>	Circulating cathodic antigen
<b>CE:</b>	Cercarial elastase
<b>CEF6:</b>	Cationic exchange fraction 6
<b>CFT:</b>	Complement fixation test
<b>CHR:</b>	Cercarial Hüllen Reaction
<b>CIEP:</b>	Counterimmunoelectrophoresis test
<b>CMI:</b>	Cell mediated immunity
<b>COPT:</b>	Circumoval precipitin test
<b>CT:</b>	Computed tomography
<b>CT-SOD:</b>	Cytosolic superoxide dismutase antioxidant enzyme
<b>Dot- ELISA:</b>	Dot enzyme linked immunosorbent assay
<b>DST:</b>	Digestion-sedimentation technique
<b>DTH:</b>	Delayed type hypersensitivity
<b>EITB:</b>	Enzyme immunoelectrotransfer blot
<b>ELISA:</b>	Enzyme linked immunosorbent assay
<b>FABP:</b>	Fatty acid binding proteins
<b>FD-ELISA:</b>	Fast dot-enzyme linked immunosorbent assay
<b>Fig.:</b>	Figure
<b>FSF:</b>	Fibroblast-stimulating factors
<b>GAPDH:</b>	Glyceraldehyde-3-phosphatedehydrogenase
<b>Gm:</b>	Gram
<b>GP:</b>	Glycoprotein
<b>GST:</b>	Glutathione-S-transferase
<b>HAMA:</b>	<i>S. haematobium</i> adult microsomal antigen
<b>HSPs:</b>	Heat shock proteins
<b>IDT:</b>	Intradermal test

<b>IFAT:</b>	Indirect immunofluorescent antibody test
<b>IFN:</b>	Interferon
<b>Ig:</b>	Immunoglobulin
<b>IHA:</b>	Indirect haemagglutination
<b>IL:</b>	Interleukin
<b>IPSE:</b>	Immunogenic protein of <i>Schistosoma</i> egg
<b>kDa:</b>	Kilo dalton
<b>KKT:</b>	Kato-Katz thick smear technique
<b>KLH:</b>	Keyhole limpet haemocyanin-like glycoprotein
<b>MAMA:</b>	<i>S. mansoni</i> adult microsomal antigen
<b>MAP:</b>	Multiple antigen peptide
<b>MCA:</b>	Monoclonal antibody
<b>Min.:</b>	Minute
<b>ML:</b>	Milliliter
<b>MRI:</b>	Magnetic resonance imaging
<b>PAGE:</b>	Polyacrylamide gel electrophoresis
<b>PCR:</b>	Polymerase chain reaction
<b>PZQ:</b>	Praziquantel
<b>rpm:</b>	Rounds per minute
<b>SDS:</b>	Sodium dodecyl- sulfate
<b>SEA:</b>	Soluble egg antigens
<b>Sm :</b>	<i>Schistosoma mansoni</i>
<b>SOD:</b>	Superoxide dismutase
<b>SWAP:</b>	Soluble adult worm antigen preparation
<b>TEMED:</b>	Tetramethylethylenediamine
<b>Th:</b>	T helper cell
<b>TNF:</b>	Tumor necrosis factor
<b>TPI:</b>	Triose-phosphate isomerase
<b>TSP:</b>	Tetraspanin
<b>µl:</b>	Microliter
<b>µm:</b>	Micrometer

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## **Aim of the present study**

- Apply the Immunofiltration assay as an immunodiagnostic test in the diagnosis of human schistosomiasis.
- Evaluate the Immunofiltration assay as an immunodiagnostic test in the diagnosis of human schistosomiasis in comparison to Dipstick and EITB.

## **Plan of the present study**

1. Collection of serum samples from the following groups:

- Group I:

Including 20 patients with schistosomiasis diagnosed by eggs detection.

- Group II:

Including 20 patients with schistosomiasis and passing no eggs.

- Group III:

Including 20 patients infected with parasitic infections other than schistosomiasis.

- Group IV:

Including 20 apparently healthy individuals free from parasitic infections and with no past history of parasitic diseases.

2. Preparation of soluble egg antigen.
3. Preparation of the device for Immunofiltration assay.
4. Examination of collected serum samples by Immunofiltration assay.
5. Evaluation of the specificity of Immunofiltration assay by testing sera of patients infected with other parasitic infections.
6. Preparation of strips for Dipstick assay.
7. Evaluation of the results of Immunofiltration assay in comparison to the results of Dipstick assay and Enzyme-Linked Immunoelctrotransfer Blot.