SOP

Kato-Katz Technique for Stool Examination

Department of Parasitology
Faculty of Medicine
UWUSL

STANDARD OPERATING PROCEDURE (SOP) on Kato-Katz Technique for Stool Examination

Title
Standard Operating Procedure (SOP) on Kato-Katz Technique for Stool Examination

Issued By
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(1) Purpose
The purpose of this SOP is to describe the standardized procedure for preparation and examination of stool smears using the Kato-Katz technique for the detection and quantification of intestinal helminth eggs.

The Kato-Katz technique is a widely used quantitative method for diagnosing soil-transmitted helminth infections and intestinal schistosomiasis by detecting and counting parasite eggs in stool samples.

(2) Scope
This SOP applies to all academic staff, non-academic staff, and students involved in parasitology practical sessions and diagnostic laboratory work related to stool examination using the Kato-Katz technique.
This SOP includes,
1. Collection and handling of stool samples
2. Preparation of Kato-Katz thick smear
3. Microscopic examination and egg counting
4. Disposal of biological waste

(3) Responsibilities
(3.1) Academic Staff (Lecturer/Demonstrator)

- Supervise and guide students during stool smear preparation and examination
- Ensure adherence to laboratory safety and procedural standards
- Verify proper interpretation of findings

(3.2) Students

- Prepare stool smears according to the standard procedure
- Ensure proper labeling and handling of specimens
- Maintain cleanliness and avoid contamination

(3.3) Technical Officer

- Ensure availability of required materials and reagents
- Maintain quality assurance in laboratory procedures
- Prepare and standardize reagents and templates

(3.4) Laboratory Assistant

- Clean and maintain laboratory equipment
- Arrange materials for practical sessions
- Dispose of waste properly

(4) Principle of the Kato-Katz Technique

- The Kato-Katz technique is a quantitative stool examination method used to detect helminth eggs in fecal samples.
- A measured amount of stool is pressed through a mesh screen and transferred onto a glass slide using a standardized template.
- The stool sample is covered with cellophane soaked in glycerol-malachite green or glycerol-methylene blue solution.
- Glycerol clears the fecal material, making parasite eggs more visible under microscopy.
- The number of eggs observed can be used to estimate the intensity of infection as eggs per gram (EPG) of feces.

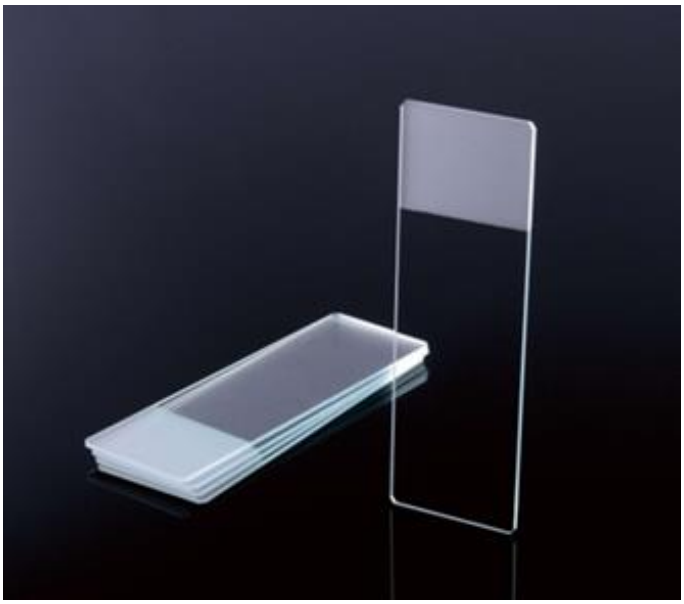
(5) Safety Precautions in Handling Stool Samples

The collection and handling of stool samples present a potential risk of infections.
This risk can be reduced by taking the following precautions:

- Wear protective gloves when handling stool samples
- Avoid direct contact of stool with fingers or hands
- Wash hands thoroughly with soap and water after handling specimens
- Avoid eating, drinking, or touching the face while handling specimens
- Disinfect work surfaces before and after procedures
- Dispose of contaminated materials in appropriate biohazard containers

(6) Materials and Reagents Needed

- Clean glass slides, 25 × 75 mm



- Fresh stool specimen in a clean, leak-proof container

- Kato-Katz template (41.7 mg capacity)

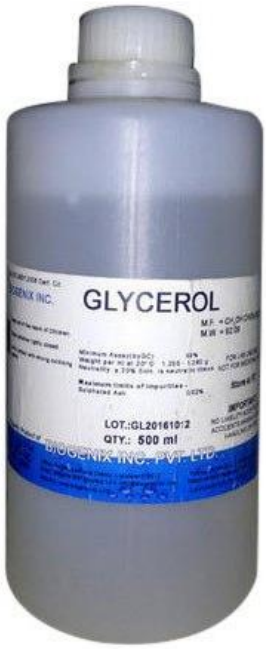
A Kato-Katz template is a small plastic plate with a circular hole of standardized size (6mm in diameter and 1.5 mm in depth – this size holds approximately 41.7 mg of stool) used in the Kato-Katz technique to measure a fixed amount of stool sample.

- Nylon mesh screen

- Applicator sticks or wooden spatula

- Cellophane strips

- Glycerol-malachite green solution or glycerol-methylene blue solution
  (1ml of 3% aqueous malachite green or 3% methylene blue is added to 100ml of glycerol and 100ml of distilled water and mixed well)
- Glycerol clears the faecal material, making helminth eggs more visible
- Malachite green or methylene blue stains background lightly green, improving contrast and visibility of eggs



- Forceps

- Latex gloves

- Tissue paper

- Slide tray

- Waste disposal containers

- Microscope

- Marker pen for labeling slides

(7) Procedure

(7.1) Labeling the Slide

- Label the glass slide using a wax pencil or permanent marker pen.
- The label should contain the patient's name/reference number and date.

(7.2) Preparation of Cellophane Strips

- Soak cellophane strips in glycerol-malachite green solution or glycerol-methylene blue solution for at least 24 hours before use.
- Keep the soaked strips in a covered container to prevent drying.

(7.3) Preparation of Stool Sample

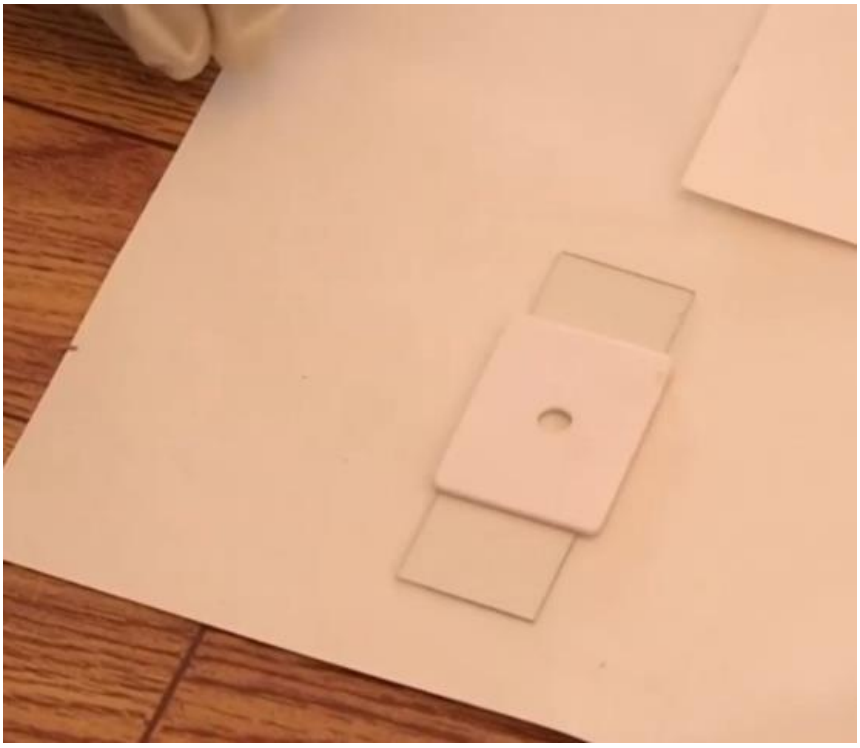
- Place a small amount of fresh stool on a piece of newspaper or absorbent paper, using applicator stick.

- Press the stool through the nylon mesh screen using an applicator stick.

- Collect the sieved (filtered) stool material from the upper surface of the mesh.

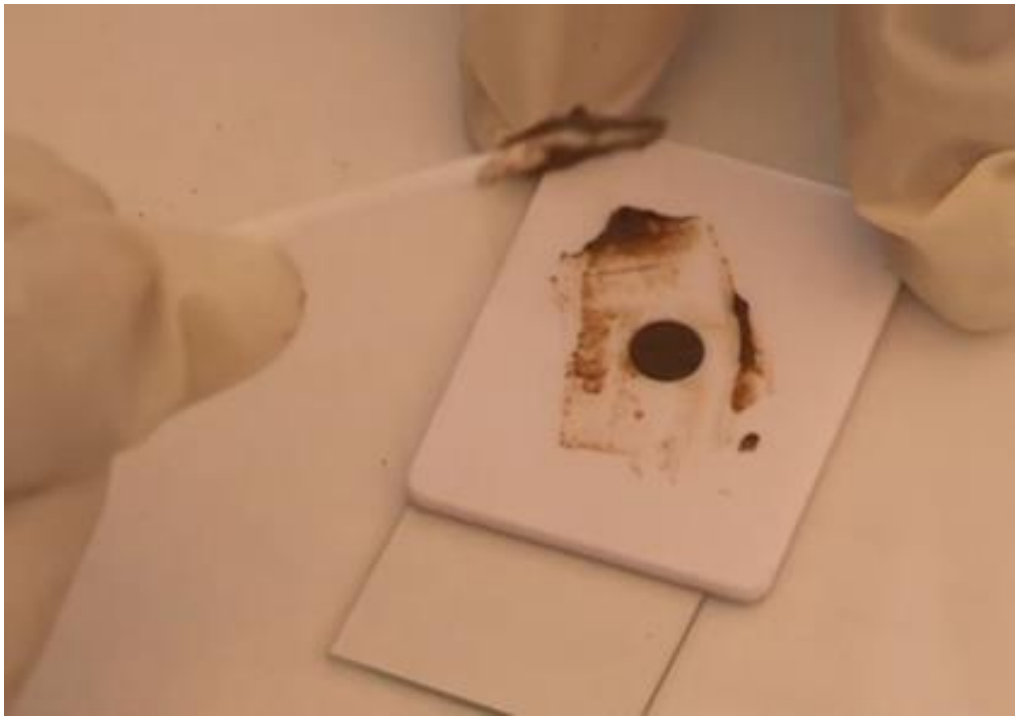
(7.4) Filling the Template

- Place the Kato-Katz template on the center of the labeled glass slide.



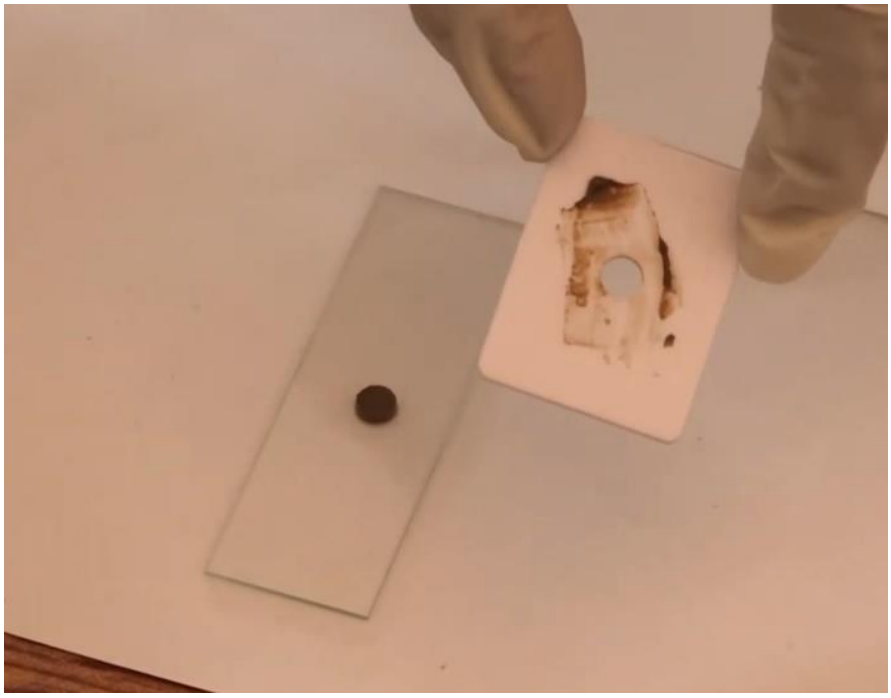
- Fill the hole of the template completely with sieved stool using an applicator stick.

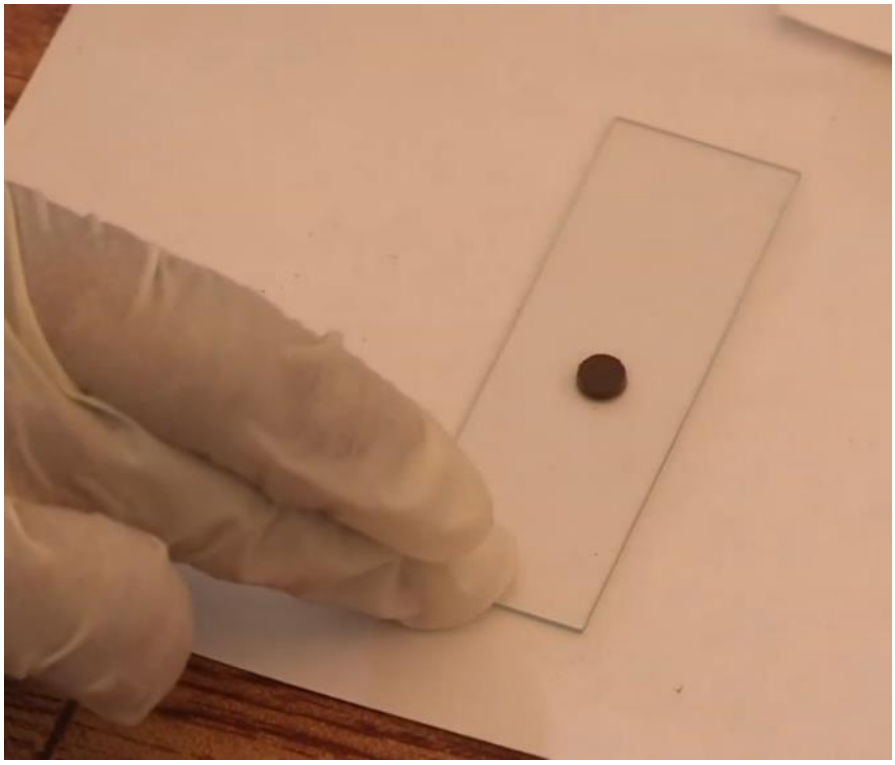
- Remove excess stool from the surface of the template to ensure a standardized amount.



(7.5) Removing the Template

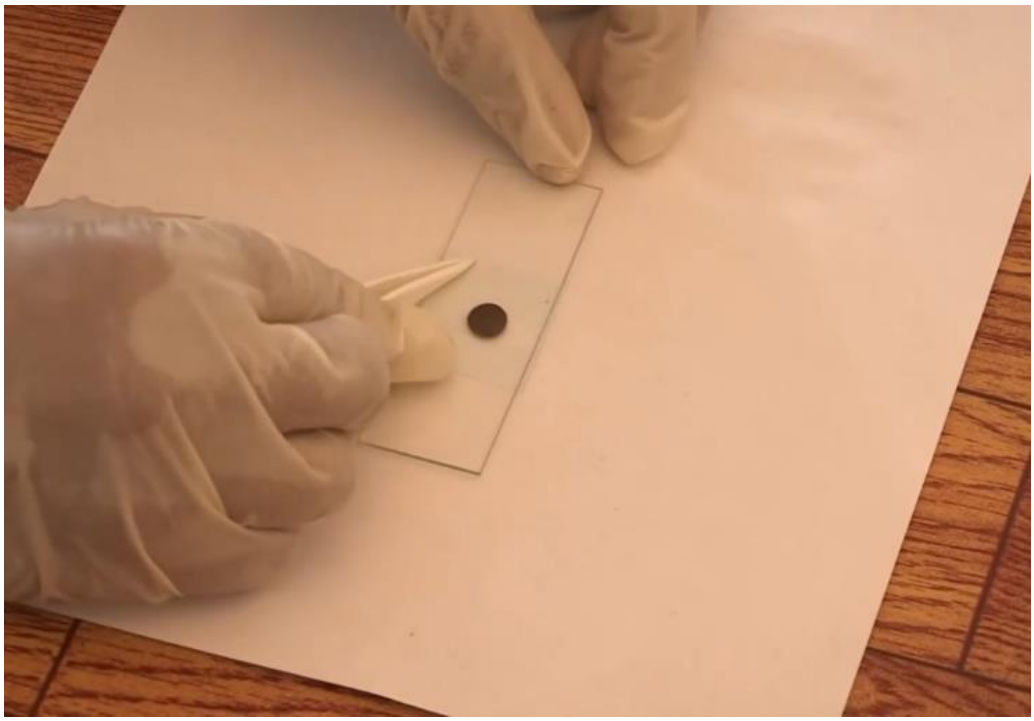
- Carefully lift the template vertically from the slide, leaving the measured stool sample on the slide.



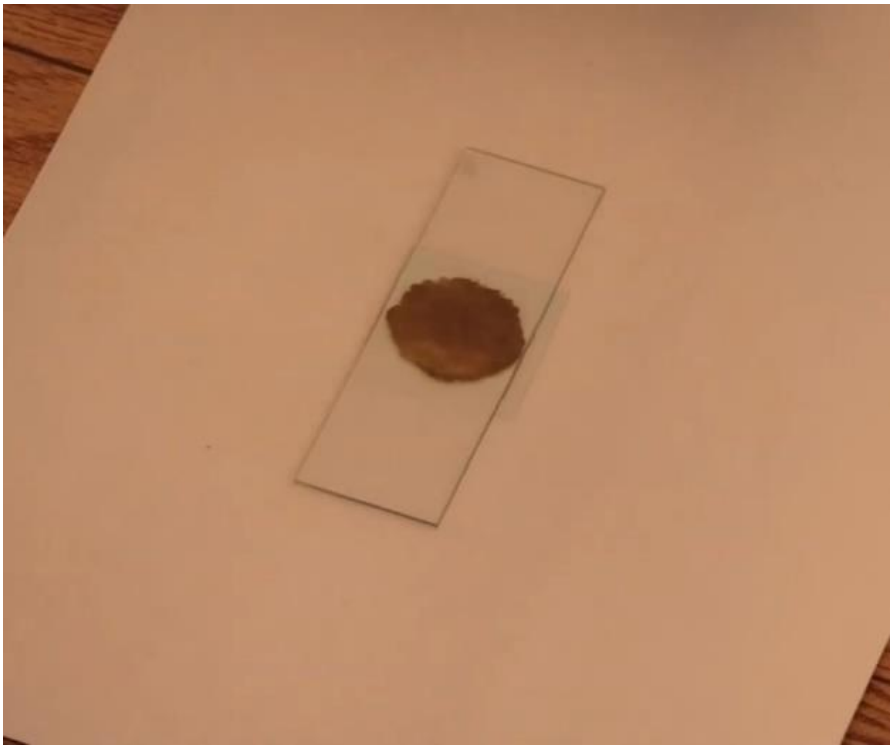


(7.6) Covering the Stool Sample

- Place a pre-soaked cellophane strip (which has been soaked in glycerol-malachite green solution or glycerol-methylene blue solution) over the stool sample.
- Press the cellophane to let it stick properly.



- Using applicator stick spread the stool evenly beneath the cellophane strip
- Avoid excessive pressure that may cause the sample to spread beyond the cellophane strip.

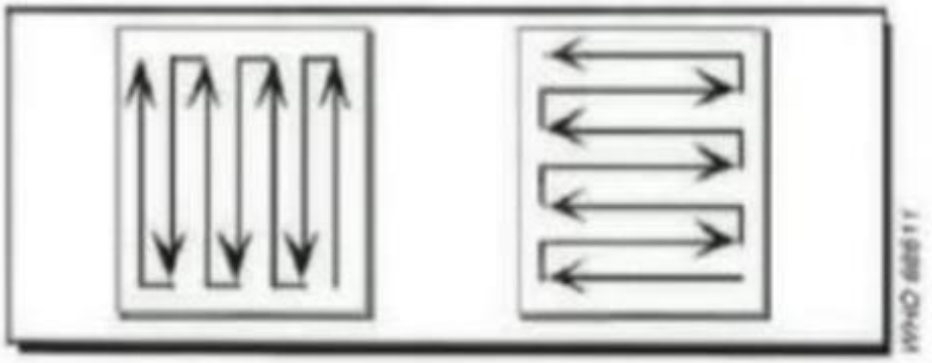


- The slide should be examined within 30-60 minutes because after that, some eggs such as hookworm will disappear

(7.7) Microscopic Examination

- Place the slide on microscope stage
- Examine the smear under the microscope using the low power objective (10×).

- Examine the slide in a systematic manner (either up and down or from laterally)



- Identify and count all helminth eggs observed on the smear.
- Use the high-power objective (40×) when necessary for confirmation of egg morphology.

(7.8) Calculation of Eggs per Gram (EPG)

- When using a 41.7 mg template, multiply the number of eggs counted, by 24 to obtain the number of eggs per gram (EPG) of stool.
- Why 24?
  - 1000mg ÷ 41.7mg ≈24

    Example:

    If 50 eggs are counted on the slide:

    EPG (eggs per gram) = 50 × 24 = 1200 eggs per gram of stool

(8) Interpretation of Findings

- Presence of helminth eggs confirms intestinal helminth infection.
- Egg counts can be used to estimate the intensity of infection.
  - Common helminth eggs detected include:
    - *Ascaris lumbricoides*
    - *Trichuris trichiura*
    - Hookworm species (*Ancylostoma* spp., *Necator americanus*)
    - *Schistosoma mansoni*

(9) Disposal of Waste

- Dispose of used applicator sticks, gloves, and contaminated materials in biohazard waste containers.
- Dispose of broken slides and sharp objects in sharps disposal containers.
- Disinfect working surfaces after completion of the procedure.
- Wash hands thoroughly after removing gloves.

(10) References

- Bench aids for the diagnosis of intestinal parasites https://share.google/RUs7B3eWUpJXpqjot
- https://youtu.be/QMDBbh5WgQw?feature=shared

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Date of Implementation
20/05/2026