

**Effects of *Moringa oleifera* seeds on *Escherichia coli*, *Enterobacter aerogenes*, pH,
and turbidity in water from
selected sources in Kitale town**

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M. oleifera.

- Common name: Horse radish tree
- Water purification in traditional settings (dry seeds)
- Medicinal for impotence cure.
- Firewood and charcoal.
- Hedge, wind breaker, fodder

E. Coli & Enterobacter aerogenes

Statement of problem and justification

- Access to safe drinking water in developing countries.
- Water born diseases.
- Need for new & cheap methods of water purification especially in areas lacking access to conventional water treatment options.
- Replace expensive chemical methods of water treatment.

Objectives of study.

- To find out antimicrobial activity of *M. oleifera* seeds against indicator microorganisms in sampled water.
- To study the effects of the seeds on pH of sampled water.
- To determine the effects of seeds on the turbidity of sampled water

Methodology

Study area.

- Kitale, Trans Nzoia county (KARI station).

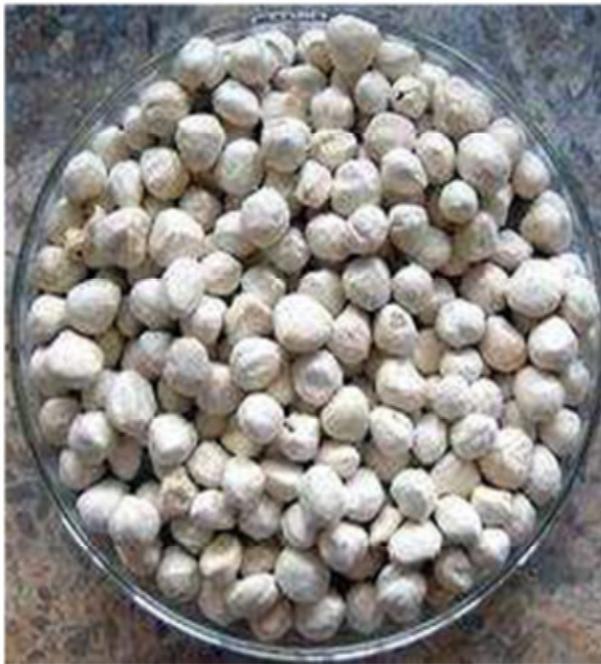
Sampling sources.

- KARI tap.
- KARI dam.
- Kipsongo stream.(slum)

Methodology cont'

- Preparation of *M. oleifera* seed extracts
 - ✓ Collection and drying of seeds
 - ✓ Grinding and sieving
 - ✓ Preparation of stock solution
- Water sample collection.
 - ✓ Clean sterile bottles
 - ✓ Transport and storage

Shelled seeds, pods with seeds and dry unshelled seeds



Bacteriological analysis of water samples by multiple tube method

Serial dilutions of lactose broth

(presumptive test)



37°C for 24 hours

Brilliant Green Lactose Broth(BGLB)

(confirmed test)



44°C for 24 hours

Eosin Methylene Blue(EMB)

(completed test) 37°C for 24 hours

Identification and isolation of bacteria on EMB agar

- *E.coli*: Small colonies, dark with black centre with green metallic sheen.
- *Enterobacter aerogenes*: Large & raised, pinkish mucoid colonies with grey centres.

**Susceptibility testing of isolated
bacteria to *M. oleifera* seed extracts**

Determination of MIC-smallest
volume or greatest dilution of *M.*
oleifera seed extracts that
inhibited growth of isolated
bacteria

Determination of turbidity and pH.

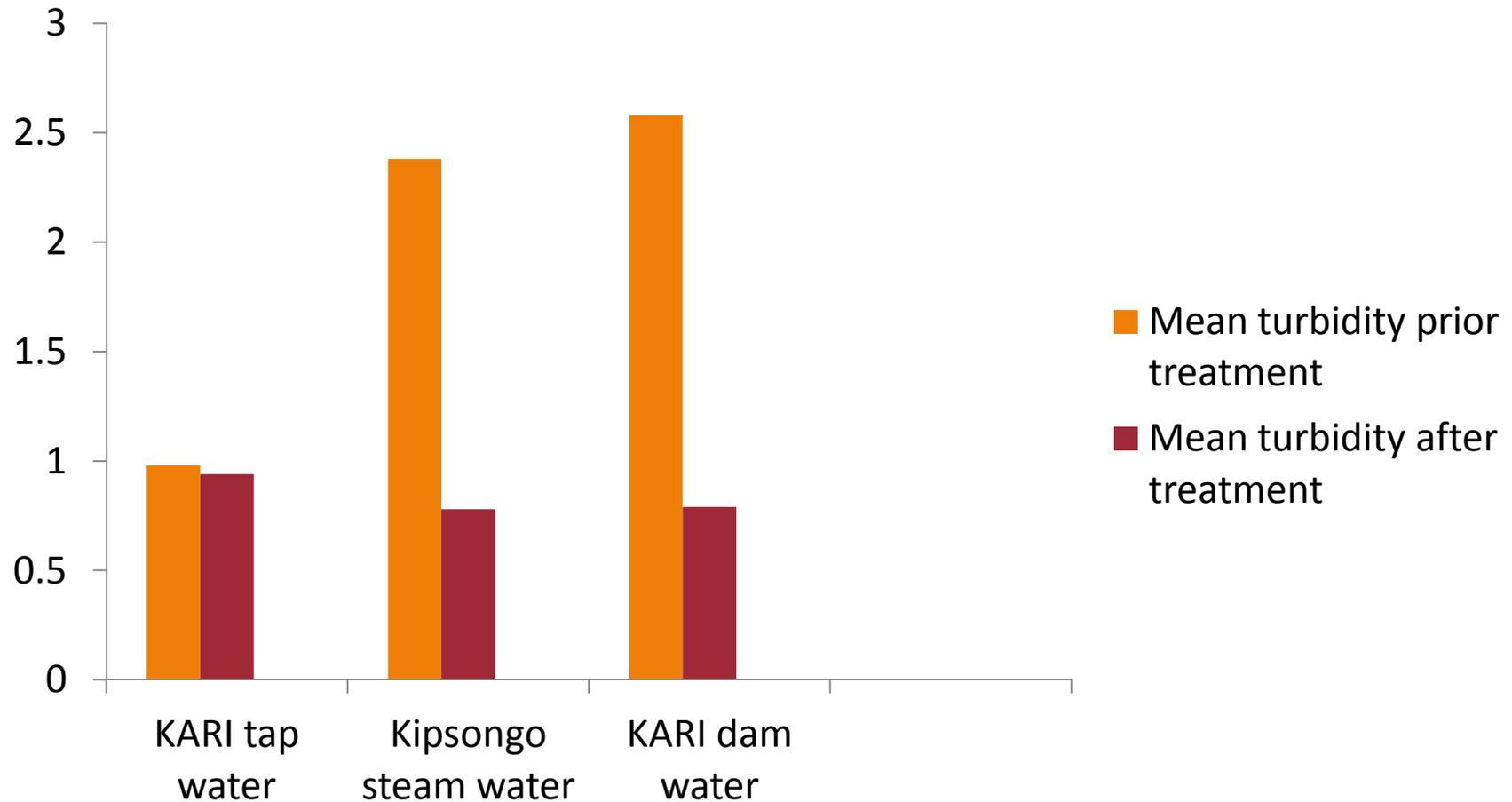
- HACH spectrophotometer and pH meters
- Before treatment with extracts
- 50 mls of water sample + 50 mls of extracts
- Settling for 3 days at room temp
- Decantation
- Analysis after treatment with extracts

Results and discussion

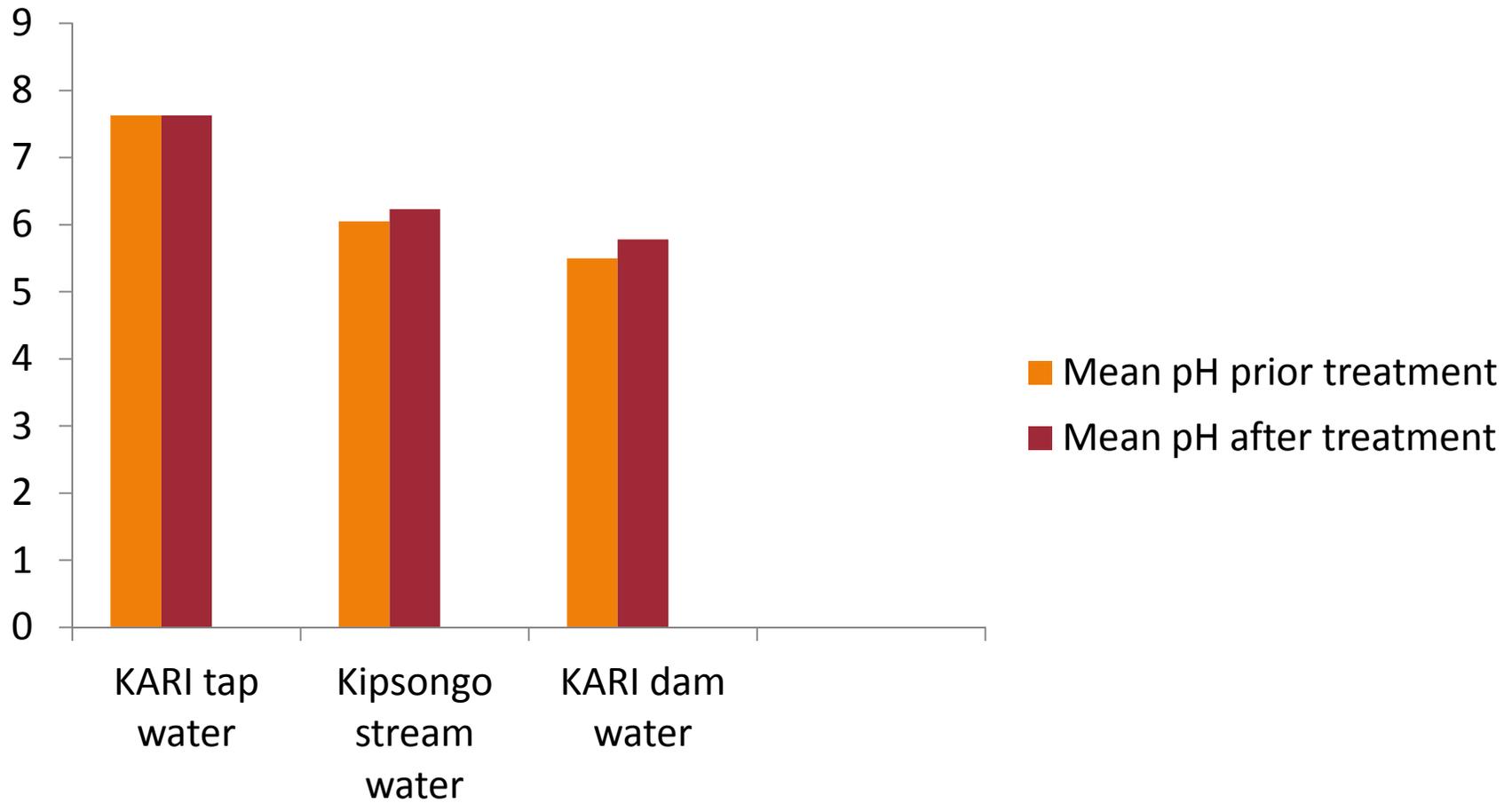
Effect of *M. oleifera* seed extracts on *E. coli* and *Enter. aerogenes*

	Concentration of <i>M. oleifera</i> seed extracts (mg/L)			
Bacteria	Dilution 1	Dilution 2	Control	MIC (mg/L)
<i>E. Coli</i>	9.38	6.25	0	7.29
<i>E. aerogenes</i>	18.75	12.5	0	14.58

Effect of *M. oleifera* seed extracts on turbidity



Effect of *M. oleifera* seed extracts on pH



Conclusion and recommendation

- *M. oleifera* has antimicrobial activity on *E. coli* and *Enter. aerogenes*.
- Extracts reduced turbidity and basicity in highly turbid water samples but little effect on less turbid water.
- The extracts showed remarkable results in water treatment and can successfully be applied.
- Need for further research on isolating and purifying the active agent and toxicological assessment on seeds.