Trichomonas vaginalis

Presented by

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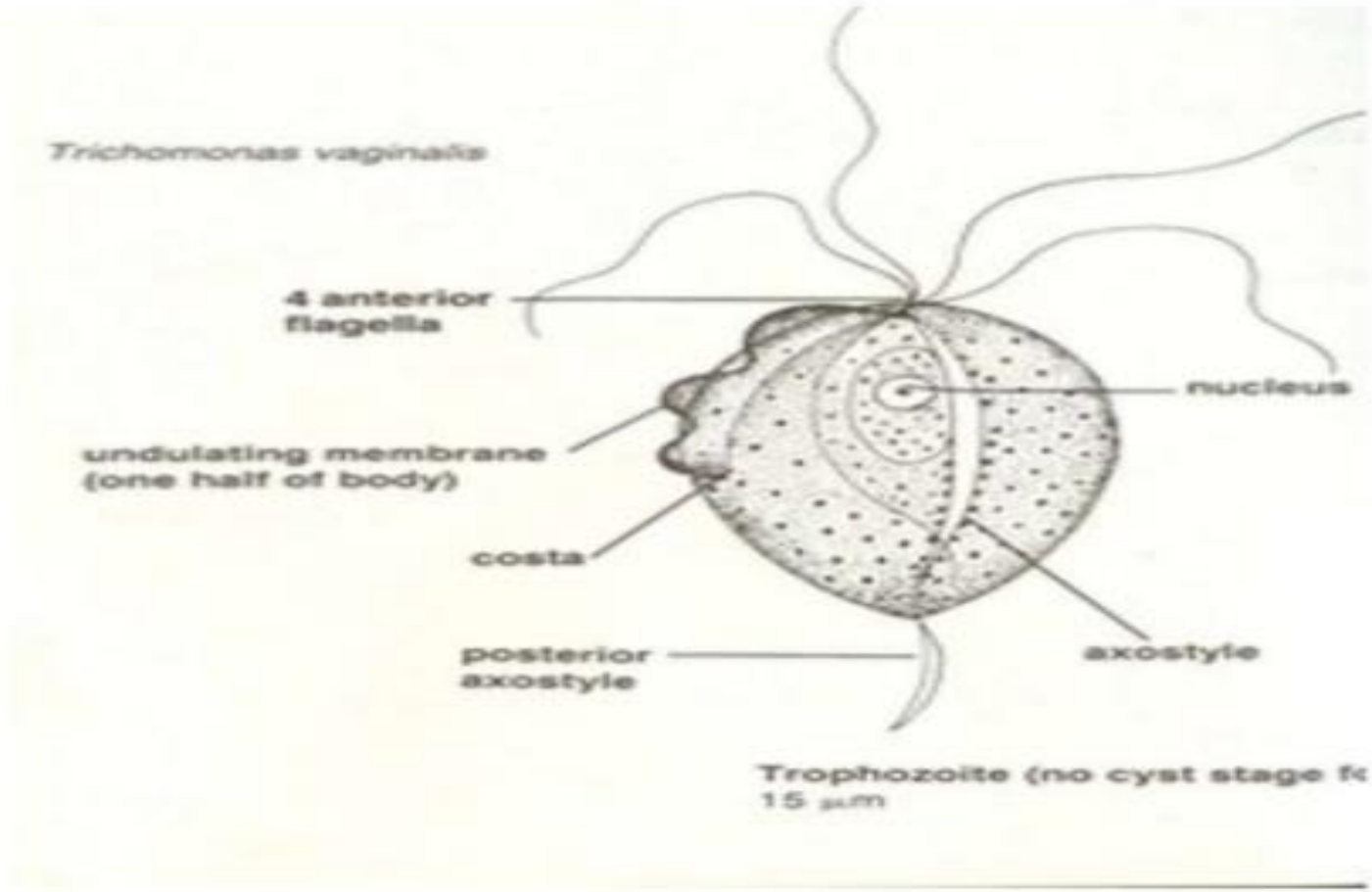
CLASSIFICATION

- **Domain : Eukarya**
- **Kingdom` : Protista**
- **Phylum : Metamonada**
- **Class : Parabasilia**
- **Family : Trichomonadida**
- **Genus : Trichomonas**
- **Species : Trichomonas vaginalis**


Trichomonas vaginalis
4 anterior flagella
nucleus
undulating membrane (one half of body)
costa
posterior axostyle
axostyle
Trophozoite (no cyst stage f
15 µm

GENERAL PROPERTIES

- Characteristically have a cytostome,
- An anterior tuft of flagella,
- Undulating membrane with the recurrent flagellum,
- An axostyle protruding through the posterior end ,
- Only trophozoite stage.

Trichomonas vaginalis

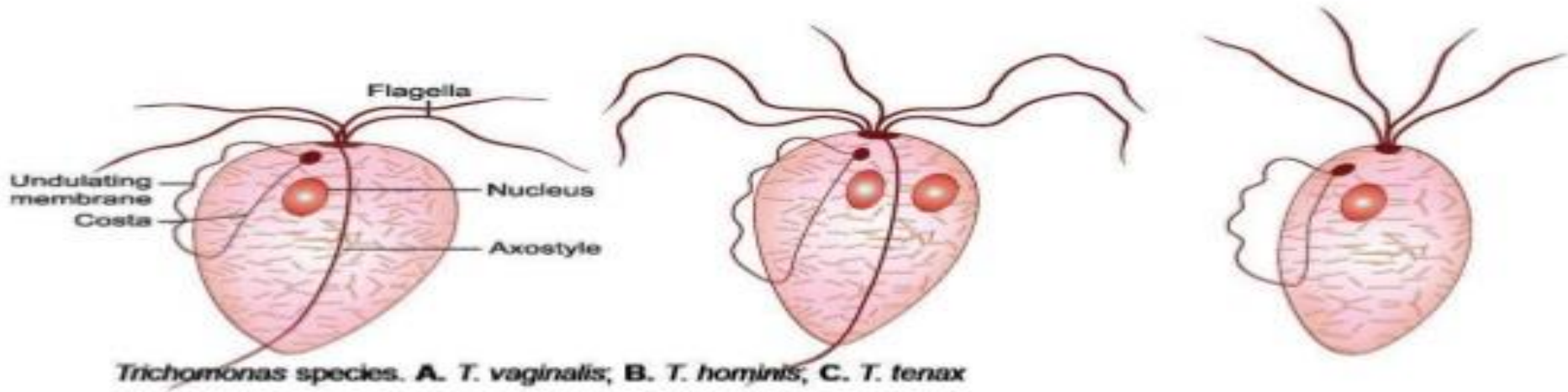
- Important species which causes infection in both male and females.
- Is the causative agent of trichomoniasis, infection is sexually transmitted.
- In 1837 Donne first observed the flagellate.

Genus *Trichomonas* has 3 species, which occur in humans

T. vaginalis

T. hominis

T. tenax



Trichomonas species. **A.** *T. vaginalis*; **B.** *T. hominis*; **C.** *T. tenax*

1. Trichomonas vaginalis : found in vagina, urethra and prostrate, infection is pathogenic.

2. Trichomonas tenax : found in oral cavity occurring particularly in dental cavities and at the gingival margins, infection is non pathogenic.

3. Pentatrichomonas hominis : found in lower GI tract particularly in caecum, non pathogenic.

Trichomonas vaginalis

- Important species which causes infection in both male and females.
- Is the causative agent of trichomoniasis, infection is sexually transmitted.
- In 1837 Donne first observed the flagellate.

- Is an anaerobic organism , produces energy by fermentation of sugars in a structure called hydrogenosome.

- Is modified mitochondria in which the enzyme of oxidative phosphorylation has been replaced by enzyme carrying out anaerobic fermentatiom.

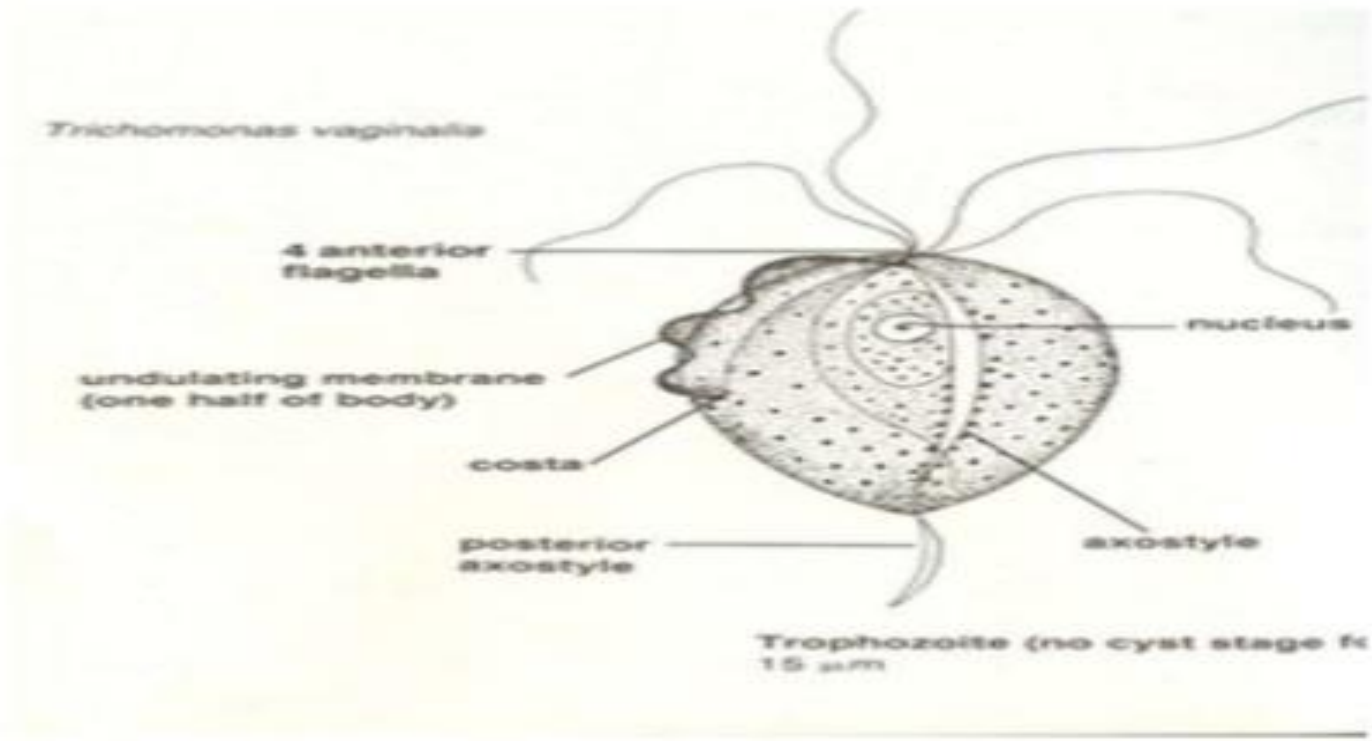
MORPHOLOGY

- Exists only in trophozoite stage, cystic stage is absent.

- **TROPHOZOITE**
- Is pear shaped

- Measures 7 to 23 micrometer in length.

- Twitching motility.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4 anterior flagella
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undulating membrane (one half of body)
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posterior axostyle
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Trophozoite (no cyst stage f
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- Four anterior free flagella, arising from a shallow depression in the anterior end of the body called periflagellar canal.

- Fifth flagellum curve back along the margin of the undulating membrane and is called the recurrent flagellum.

- Costa is the rigid cord, filamentous and support to the undulating membrane.

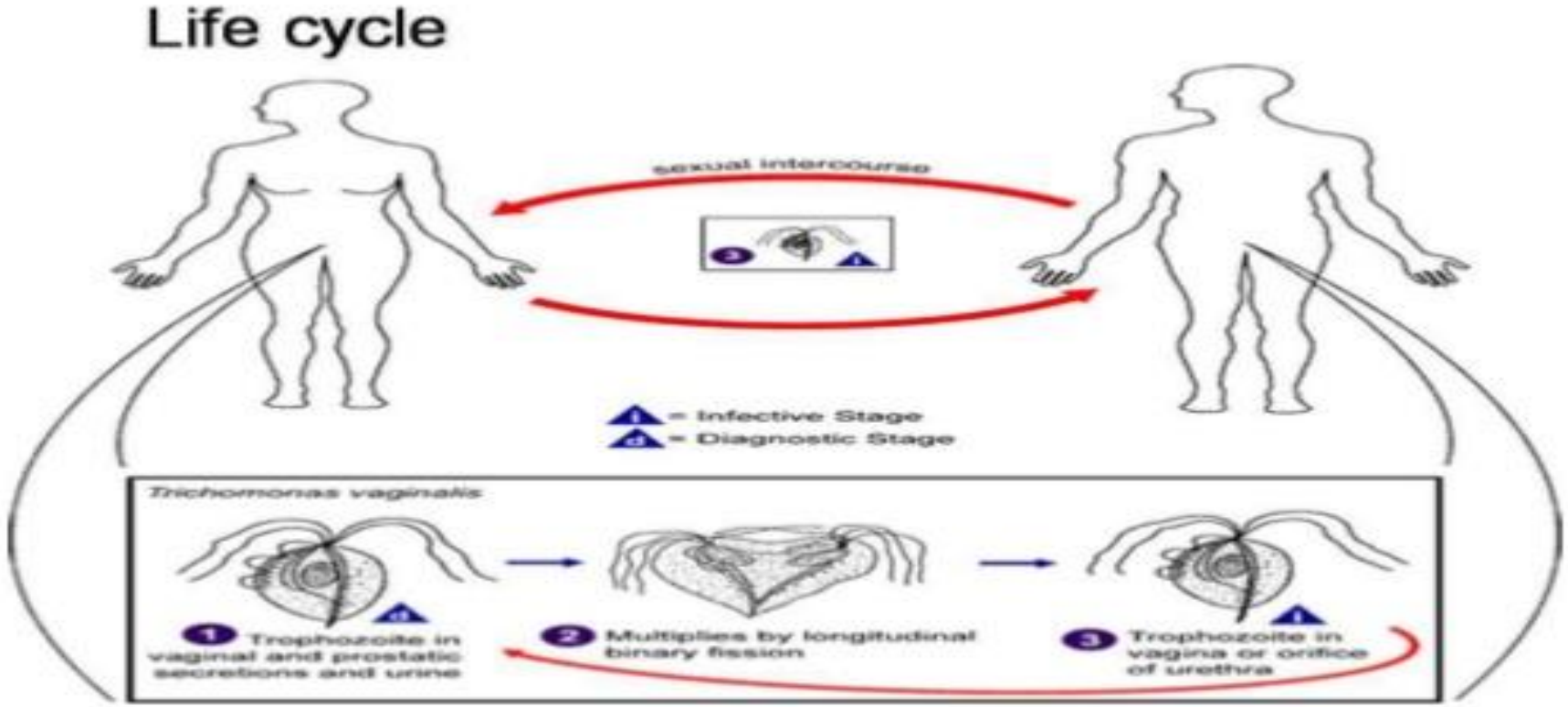
- An axostyle is a hyaline rod like structure that runs through the centre of the body and comes out at the posterior end.
- An axostyle is a part of the endoskeleton.
- The cytoplasm contains a large numbers of siderophilic granules and sometimes viral particles.

MODE OF TRANSMISSION

- Trophozoite cannot survive outeside and so infection has to be transmitted directly from person to person.
- Sexual transmission is the usual mode of transmission.
- Trichomoniasis often coexists with other sexually transmitted diseases; like candidiasis, gonorrhea, syphillis, or human immunodeficiency virus (HIV).

- Babies may get infected during birth.
- Fomites such as towels have been implicated in transmission.
- Trophozoite divides by binary fission.
- Incubation period is roughly 10days.

LIFE CYCLE


Life cycle
sexual intercourse
= Infective Stage
= Diagnostic Stage
Trichomonas vaginalis
1 Trophozoite in vaginal and prostatic secretions and urine
2 Multiplies by longitudinal binary fission
3 Trophozoite in vagina or orifice of urethra

- Life cycle is simple and is completed in single host.
- Infection is transmitted sexually from a woman acting as a reservoir of infection to man.
- In female, the parasites gets nourishment from the mucosal surface of the vagina, and from the ingested bacteria and erythrocytes.
- Reproduces by longitudinal binary fission.

- It begins by division of the nucleus, followed by the division of the neuromotor apparatus and finally, separation of cytoplasm into two daughter trophozoites.

- On sexual contact, trophozoites are transmitted to male and localise in the urethra and prostrate gland.

- Multiplies when vaginal condition become more basic than usual (normal Ph 3.8- 4.2)

VIRULENCE FACTOR

- **Protein liquid and proteases**
  help in adherence of trophozoites to epithelial cells of the GI tract.

- **Lactic and acetic acid**
  lowers the pH of the vaginal fluid , low pH of vaginal pH is cytotoxic to epithelial cells.

- **Enzyme cystein proteases**
  responsilbe for haemolytic activity of the parasite.

CLINICAL MANIFESTATION

- STI
- Common cause of vaginitis in women and urethritis in Men.

- Trichomoniasis presents a wide variety of clinical patterns. The spectrum of clinical trichomoniasis in women ranges from the asymptomatic carrier state to flagrant vaginitis, with 1/3rd of the asymptomatic infected patients becoming symptomatic within 6months.

WOMEN (SYMPTOMATIC)

- Vulvo vaginitis (Trichomonal vaginitis)
- Urethritis

IN MEN (ASYMPTOMATIC)

- Urethritis, epididymis, prostatitis, and superficial penile ulcerations.
- Irritation inside the penis, mild discharge, discharge may be purulent to mucoid or slight burning after urination or ejaculation.
- Mostly self limiting trichomonal action of the prostatic fluid or flushing out of the flagellate during micturation.

COMPLICATIONS

- PID
- Premature birth
- Low birth weight
- Increased risk of transmission of HIV
- Increased chance of cervical cancer

- May also cause Pneumonia, bronchitis, and oral leisons.

- **In men:**
  - Prostatitis
  - Epididymitis
  - Urethral stricture
  - Infertility

EPIDEMIOLOGY

- Most common non viral sexual transmitted disease.
- An estimated 200 million women suffer from trichomoniasis every year worldwide.
- Prevalence of trichomoniasis varies between 5% in patients at hospital to 75% in sexual workers.

GEOGRAPHICAL DISTRIBUTION

- **World**
  - Prevalent world wide.
  - High prevalence of infection, even up to 65% has been documented in pregnant woman in South Africa.
  - The condition is also prevalent in The Europe, The USA and other developed countries.

SPECIMENS

- **IN WOMEN :** vaginal discharge, endocervical specimens.

- **IN MEN:** Prostatic fluid, less commonly semen.

- **common specimens** urethral swab, early morning first voided urine sediment.

LAB DIAGNOSIS

1. MICROSCOPY
2. CULTURE
3. ANTIGEN DETECTION IN VAGINAL SMEARS
4. MOLECULAR DIAGNOSIS
5. OTHER TESTS

1. MICROSCOPY

- Trichomonas in the vaginal discharge can be demonstrated by;
    - Wet mount
    - Acridine orange staining
    - Papanicolau stain (PAP smear)
    - Direct fluorescent antibody (DFA)staining

- Vaginal or urethtral discharge is examined microscopically in saline wet mount preparation for characteristic, jerky and twitching motility and shape. In males trophozoites may be found in urine or prostatic secretions.

- Fixed smears may be stained with acridine orange , Papanicolaou stain.

- DFA is more sensitive.

2. CULTURE

- Consider as gold standard for the diagnosis.
- Is recommended when direct microscopy is negative and is considered as **gold standard** as well as the most sensitive (95%) method for the diagnosis of Trichomonas vaginalis infection.
- Grows best at 35-37degree celsius under anaerobic condition.

- The optimal pH for growth is 5.5- 6.

- Can be grown in a variety of solid or liquid media , tissue culture, and eggs. Cystein-peptone-liver-maltose(CPLM) medium and plastic envelope medium (PEM) are often used.

3. ANTIGEN DETECTION IN VAGINAL SMEARS

- ELISA is used for demonstration of Trichomonas antigen in vaginal specimens.

- ELISA using a monoclonal antibody specific for a 65k Da surface polypeptide of Trichomonas vaginalis is a very specific and sensitive method for detection of parsaite in vaginal secretion.

4. MOLECULAR DIAGNOSIS

- DNA probes

  synthetic oligo nucleotide probes

- PCR

  highly sensitive (97%) and specific (98%) test for the diagnosis of Trichomonas vaginalis.

TREATMENT

- Simultaneous treatment of both patners is recommended.
- Metronidazole 2g orally as a sigle dose or 250nmg three times daily for 7 days.
- Metronidazole is contraindicate in pregnancy due to is mutagenecity, so topical therapy with clotrimazole is applied.

- In patients not responding to treatment with standard regime,
    - The dosage may be increased.
    - Metronidazole may be administered parenterally.
    - Metronidazole may be administered both in the orsl snd vaginal route.

PREVENTION AND CONTROL

- Safe sexual behaviour.
- Avoidance of multiple sex patners.
- Use of condom.
- Detection and treatment of cases either male or female.

Thank you