# PARASITOLOGY
## Easy to Learn

T Jaya Chandra



JAYPEE

*Foreword*
**Ganni Bhaskara Rao**

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# 4 Protozoa Synopsis

## LIST OF PROTOZOAN PARASITES

1. *Entamoeba histolytica, E. coli, E. gingivalis*
2. *Naegleria fowleri*
3. *Acanthamoeba species*
4. *Giardia lamblia*
5. *Trichomonas vaginalis*
6. *Leishmania donovani*
7. *Leishmania tropica*
8. *Leishmania braziliensis*
9. *Trypanosoma cruzi*
10. *Trypanosoma brucei complex*
11. *Plasmodium*
12. *Babesia*
13. *Toxoplasma gondii*
14. *Cryptosporidium parvum*
15. *Isospora belli*
16. *Sarcocystis hominis*
17. *Sarcocystis suihominis*
18. *Balantidium coli*

### Mode of Transmission

1. *Ingestion of*
   a. Contaminated food and water:

| Parasite | Infective stage |
|---|---|
| *i. E. histolytica* | cysts |
| *ii. G. lamblia* | cysts |
| *iii. C. parvum* | thick walled oocysts |
| iv. *T. gondii* | cat feces containing sporulating oocysts |

v. *I. belli* cysts
vi. *B. coli* cysts

b. Raw or improperly cooked:
- Beef
  i. *S. hominis:* sarcocysts
- Pork
  ii. *S. suihominis:* sarcocysts

2. Sexual route:
   i. *T. vaginalis:* Trophozoites
3. Inhalation of dust or aspiration of water:
   i. *N. fowleri:* Trophozoites or cysts
4. Inhalation of dust or eye trauma or contact lens:
   i. *Acanthamoeba spp:* Trophozoites or cysts
5. Mosquito bite:
   i. *L. donovani:* Sand fly (Phlebotomus) promastigote forms
   ii. *L. tropica*
   iii. *L. braziliences:*
   iv. *T. cruzi:* Tse tse fly feces having metacylic trypomastigote
   v. *T. brucei complex*
   vi. *P. falciparum:* Anopheles sporozoites
   vii. *Babesia:* Ticks sporozoites
6. Blood transfusion:
   i. *T. cruzi:* Trypomastigote
   ii. *P. falciparum:* Trophozoite
   iii. *Babesia:* Trophozoite
7. Congenital:
   - *T. cruzi, P. falciparum, T. gondii*

## Life Cycle

*Single host:*

- *E. histolytica, N. fowleri, Acanthamoeba species, G. lamblia, T. vaginalis, C. parvum, I. belli, B. coli*

*Intermediate host*

1. Sand flies (phlebotomus)
   - *L. donovani, L. tropica, L. braziliensis*
2. Reduviid bug (Tse tse fly)
   - *T. cruzi, T. brucei complex*
3. Man
   - *P. falciparum, Babesia, T. gondii*

4. Pig
   - *S. suihominis*
5. Cattle
   - *S. hominis*

## Clinical Features

1. Dysentery
   - *E. histolytica, B. coli*
2. Diarrhea
   - *E. histolytica, G. lamblia, C. parvum, I. belli, B. coli*
3. Anemia
   - *L. donovani, Plasmodium, B. microti*
4. Skin infection:
   - *L. tropica, L. braziliensis*
5. Eye infection:
   - *Acanthamoeba species, T. cruzi, T. gondii*
6. CNS:
   - *E. histolytica, Acanthamoeba species, N. fowleri, T. cruzi, T. brucei complex, P. falciparum, T. gondii*

## Laboratory Diagnosis

I. Stool
   - *Entamoeba:* trophozoites or cyst
   - *G. lamblia:* trophozoites or cyst
   - *C. parvum:* oocyst
   - *I. belli:* sporocyst
   - *B. coli:* trophozoites or cyst

II. Blood
   - *L. donovani:* amastigotes
   - *T. cruzi:* motile trypomastigote forms
   - *P. falciparum:* ring forms, gametocytes
   - *Babesia:* parasite
   - *T. gondii:* tachyzoites

III. CSF
   - *N. fowleri:* trophozoites
   - *Acanthamoeba:* trophozoites (aspiration from skin lesion)
   - *L. tropica:* amastigote forms
   - *L. braziliensis:* amastigote forms
   - *T. brucei:* motile trypomastigote forms
   - *T. brucei complex* motile trypomastigote forms

IV. Vaginal swab or discharge fluid:
- *T. vaginalis:* trophozoites

V. Corneal scraping
- *Acanthamoeba:* trophozoites

## Serology

I. IHA, IFA, ELISA:
- *E. histolytica*
- *L. donovani:* (in addition to the above-CFT, Direct agglutination test)
- *T. cruzi:* (in addition to the above – Xenodiagnosis)
- *T. brucei complex*
- *P. falciparum:* (in addition to the above DNA, RNA probes, QBC)
- *T. gondii:* (in addition to the above latex agglutination test, direct agglutination test, Sabin Feldman dye test)

II. Direct fluorescent antibody test, ELISA:
- *T. vaginalis*

III. IFA, ELISA:
- *C. parvum, L. braziliensis, S. hominis, S. suihominis*

IV. IFA:
- *Babesia*

❖ *Serology is not useful: L. tropica, N. fowleri*

## Antigen Detection

- CIEP, ELISA: *G. lamblia*

## Concentration Techniques

- Formal ether: *E. histolytica*
- Formal ether and zinc sulfate: *G. intestinalis, C. parvum, I. belli*

**Autoinfection:** *C. parvum* by thin walled oocysts
**In HIV patients:** *C. parvum, I. belli, T. gondii*
**Zoonotic infections:** *Babesia, C. parvum, T. gondii, S. hominis, S. suihominis*

## Treatment

- Amoebic liver abscess: Metronidazole
- Amoebic dysentery: Metronidazole
- *Naegleria fowleri:* Amphotericin B
- *Acanthamoeba species:* Drugs are less used
- *G. lamblia:* Tinidazole or Metronidazole
- *T. vaginalis:* Metronidazole
- *L. donovani:* Pentavalent antimonials
- *L. tropica:* Pentavalent antimonials
- *L. braziliensis:* Pentavalent antimonials
- *T. cruzi:* Nifurtimox
- *T. brucei complex:* Pentamidine
- *P. falciparum:* Chloroquine
- *Babesia bovis:* Unsuccessful
- *B. microti:* Clindamycin
- *T. gondii:* Sulfadiazine, pyrimethamine
- *C. parvum:* Spiramycin
- *I. belli:* Cotrimoxazole
- *S. hominis:* Specific drugs not available
- *S. suihominis:* Specific drugs not available
- *B. coli:* Tetracycline

# PARASITOLOGY
## Easy to Learn

This handy book has been envisaged and designed keeping in mind the mindset, understanding capabilities and the reading methods of undergraduate medical students. The rich teaching experience, the in-depth knowledge of the students' needs and the vast experience of conducting practical and viva examinations helped the author in bringing out an absolutely useful book in an easy-to-understand and concise form. The synopsis helps the readers to revise the entire course in a short time frame helping them to face theory, practical and viva with confidence. This *Parasitology Easy to Learn* book would surely be a boon to not only the undergraduate medical students but also be useful to postgraduate students.



**T Jaya Chandra** has teaching experience of 12 years. He has published seven scientific papers in national journals and has been selected twice for research fellowship by Government of India. His research paper on Tuberculosis has been selected as best of top 20. He has also written Microbiology questions and answers books separately benefiting MBBS, BSc (Nursing), BSc (MLT) final year and BSc (MLT) second year students.

Shelving Recommendations
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