

2. Examine *Trichonympha* under a compound microscope. You will first have to separate the *Trichonympha* (Figure 3.6) from the termite with which it lives in a symbiotic relationship. *Trichonympha* and other organisms occupy the gut of the termites, where they digest wood particles eaten by the insect. Termites lack the enzymes necessary to digest wood and are dependent on *Trichonympha* to make the nutrients in the wood available to them. *Trichonympha* has become so well adapted to the environment of the termite's gut that it cannot survive outside of it.

To obtain a specimen:

- Place a couple of drops of **insect Ringers** (a saline solution that is isotonic to the internal environment of insects) on a clean microscope slide.
- Using forceps or your fingers, transfer a termite into the drop of Ringers.

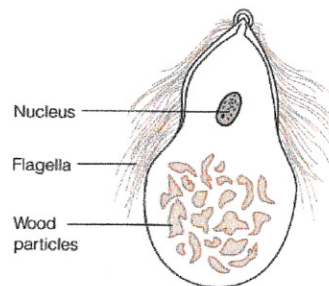


Figure 3.6.

Trichonympha. A community of microorganisms, including *Trichonympha*, inhabits the intestine of the termite.

Following the procedure in Exercise 3.5, Lab Study A, disperse the microorganisms and locate the cellular structures in *Trichonympha*. (See Color Plate 2.)

- c. Place the slide under the dissecting microscope.
- d. Place the tips of dissecting needles at either end of the termite and pull in opposite directions.
- e. Locate the long tube that is the termite's intestine. Remove all the larger parts of the insect from the slide.
- f. Using a dissecting needle, mash the intestine to release the *Trichonympha* and other protozoa and bacteria.
- g. Cover your preparation with a clean coverslip.
- h. Transfer your slide to the compound microscope and scan the slide under low power. Center several *Trichonympha* in the field of view and switch to higher powers.



Several types of protozoans and bacteria will be present in the termite gut.

- i. Locate the following structures under highest power:

Flagella are the long, hairlike structures on the outside of the organism. The function of the flagella is not fully understood. Within the gut of the termite, the organisms live in such high density that movement by flagellar action seems unlikely and perhaps impossible.

The **nucleus** is a somewhat spherical organelle near the middle of the organism.

Wood particles may be located in the posterior region of the organism.

Lab Study B. Aggregate and Colonial Organisms

Materials

microscope slides
dissecting needles
forceps
coverslips

broken glass chips
cultures of *Protococcus*,
Scenedesmus, and *Volvox*

Introduction

Unlike unicellular organisms, which live independently of each other, colonial organisms are cells that live in groups and are to some degree dependent on one another. The following organisms show an increasing degree of interaction among cells.

Procedure

1. Examine *Protococcus* under the compound microscope. *Protococcus* (Figure 3.7) is a terrestrial green alga that grows on the north sides of trees and is often referred to as "moss."

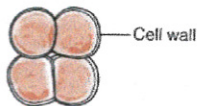


Figure 3.7.
Protococcus. *Protococcus* is a terrestrial green alga that forms loose aggregates on the bark of trees. (See Color Plate 3.)