

Cylicocyclus spp.



Figure 8a
Cylicocyclus ashworthi



Figure 9a
Cylicocyclus auriculatus



Figure 10a
Cylicocyclus brevicapsulatus



Figure 12a
Cylicocyclus elongatus

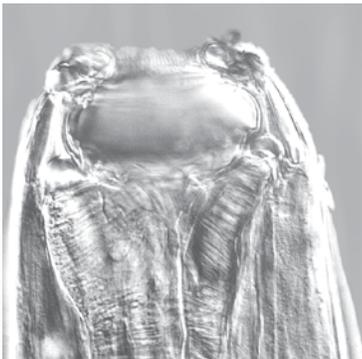


Figure 13a
Cylicocyclus insigne



Figure 14a
Cylicocyclus radiatus



Figure 15a
Cylicocyclus leptostomus



Figure 16a
Cylicocyclus nassatus

All species in the *Cylicocyclus* (*Cyc.*) genus have two things in common: the **shape of the buccal capsules** and the **shape of the walls**. Most of the buccal capsules of this genus are rectangular; those that vary somewhat will be described with that species. The walls look like a **chicken leg bone** after the meat has been eaten. The **base** of the walls is **rounded** and then shoots upward into **thin walls**. Most of the walls bow out to some degree, some more than others; only a few are straight. The walls of this genus also have been described in our lab as “**Mickey Mouse**” feet and legs.

Walls of the Buccal Capsule:

- look like a chicken leg bone after the meat has been eaten
- base is rounded and then shoots upward into thin walls
- most bow out to some degree; only a few are straight
- look like “Mickey Mouse” feet and legs



Figure 17a
Cylicocyclus ultrajectinus

Cylicocyclus ashworthi

50 μ m

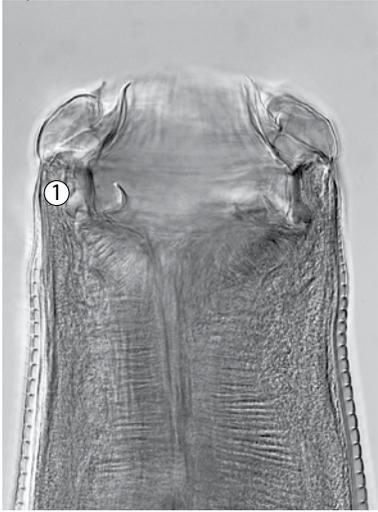


Figure 8a
Head
1. pipes

50 μ m



Figure 8b
Head
2. shallow buccal capsule

100 μ m



Figure 8c
Female tail

200 μ m

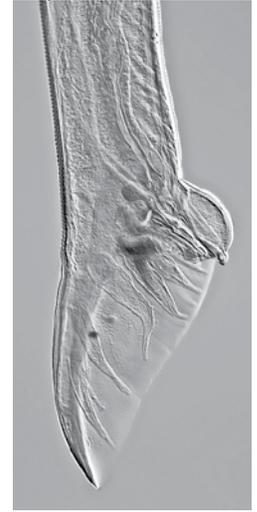


Figure 8d
Male tail

This species is very **similar to** *Cylicocyclus nassatus*, both in size and the shape of the buccal capsule. However, it rarely has been seen in Kentucky; whereas *Cyc. nassatus* is one of the most prevalent species in our state. The buccal capsule of *Cyc. ashworthi* is rectangular like *Cyc. nassatus* but unlike *Cyc. nassatus*, there is **no ledge or fold running horizontally through the buccal capsule** and its buccal capsule is more shallow than *Cyc. nassatus*. Also, the buccal capsule walls of *Cyc. ashworthi* are shorter and thicker than those in *Cyc. nassatus*. The walls do not taper anteriorly like those in *Cyc. nassatus*. The **walls of *Cyc. ashworthi* look like two little short, thick, symmetrical pipes**. The dorsal gutter in *Cyc. ashworthi* is triangular and prominent at the dorso-ventral projection.

The bursa of the male tail of *Cyc. ashworthi* is broad with the dorsal ray ending in a point. It is very similar to *Cyc. nassatus* except there doesn't appear to be lateral supporting rays in the bursa of *Cyc. ashworthi*. In fact, the **bursa looks almost transparent**. The bursa of *Cyc. ashworthi* is twice as large as that of *Cyc. nassatus*.

The female **tail tapers smoothly to a point**; whereas the female tail of *Cyc. nassatus* appears wrinkled and the tip curves backward ventrally.

Size: medium

Preferred site: ventral colon

Represents <1% of population

Walls of the Buccal Capsule:

- Look like two little short, thick, symmetrical pipes
- Buccal capsule very shallow

Other Distinguishing Characteristics:

- Closely resembles *Cylicocyclus nassatus*
- No ledge or fold running horizontally through the buccal capsule
- Male tail is broad, ending in a point
- The bursa looks almost transparent
- Female tail tapers smoothly to a point

Cylicocyclus auriculatus



Figure 9a
Head
1. horns or feedsack-tied corners

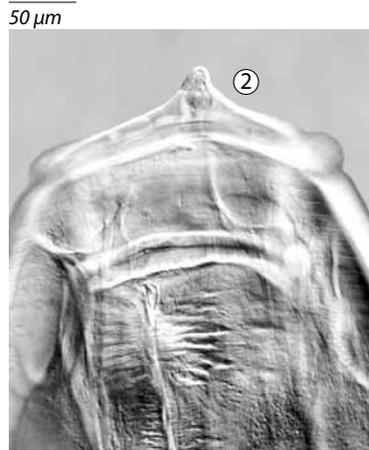


Figure 9b
Head
2. mountain



Figure 9c
Female tail



Figure 9d
Male tail

This is a very easy species to identify. Its size eliminates most other species because the majority are small. First of all, it fits into this genus because its buccal capsule walls look like chicken leg bones, and the buccal capsule is rectangular. This species also loves donkeys. The worm has **hornlike papillae** that look like a **pair of giant ears**, or as one colleague said, like the way old-fashioned **sacks of chicken feed used to be tied at the corners**.

This species, like some of the larger species, sometimes likes to lie on its side, which presents a lateral view. If this is the case, the worm appears to have a **mountain rising out of the top of its head**.

The female tail is **not tapered** and is blunt on the end. The male bursa is quite large as befits the size of the worm; however, the dorsal ray is not exceedingly long.

Walls of the Buccal Capsule:

- look like chicken leg bones

Other Distinguishing Characteristics:

- rectangular buccal capsule
- has hornlike papillae that look like a pair of giant ears
- when the worm presents a lateral view, it appears to have a mountain rising out of the top of its head

Size: large
Preferred site: ventral colon
Represents <1% of population

Cylicocyclus brevicapsulatus

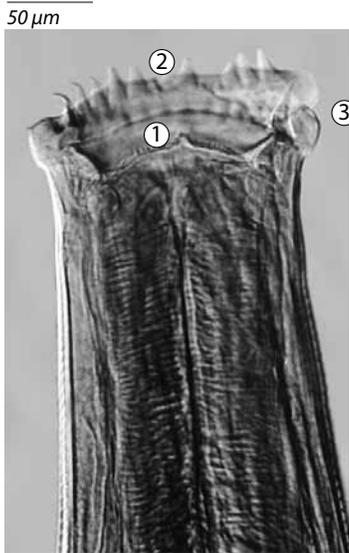


Figure 10a
Head
1. inconspicuous, shallow buccal capsule
2. heavy external leaf elements
3. square head

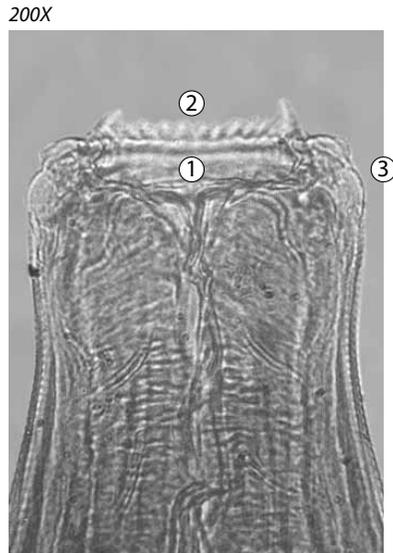


Figure 10b
Head
1. inconspicuous, shallow buccal capsule
2. heavy external leaf elements
3. square head



Figure 10c
Female tail

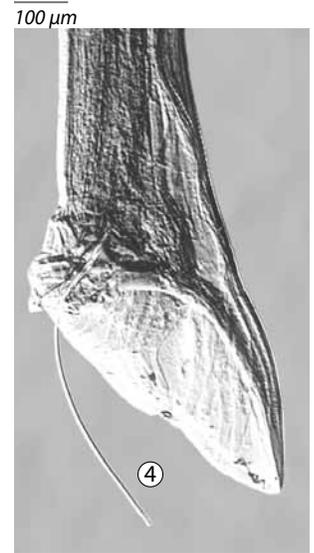


Figure 10d
Male tail
4. spicules usually extended

This species is easy to identify because, quite simply, there is **very little to identify**. The worm has a square head, and the **buccal capsule** is very **shallow and inconspicuous**; hence, its name. However, this species has very **broad elements extending from the external crown** that are quite obvious.

The **female tail** comes down to a **fat bump** and then ends in a **good-sized pointed spike**. There is nothing special about the male bursa; the dorsal ray is not long. Spicules are usually extended.

Distinguishing Characteristics:

- has a square head
- buccal capsule is very shallow and inconspicuous
- has very broad elements extending from the external crown

Size: small
Preferred site: ventral colon
Represents <1% of population

Cylicocyclus elongatus, *Cylicocyclus insigne*, and *Cylicocyclus radiatus*

100 μ m

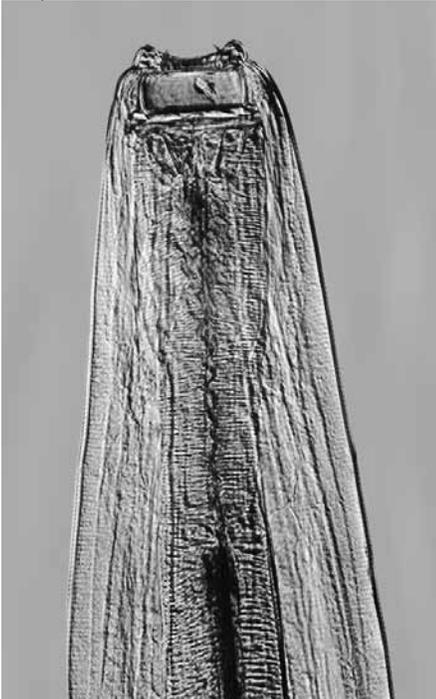


Figure 11a
Cylicocyclus elongatus—long and straight esophagus

100 μ m

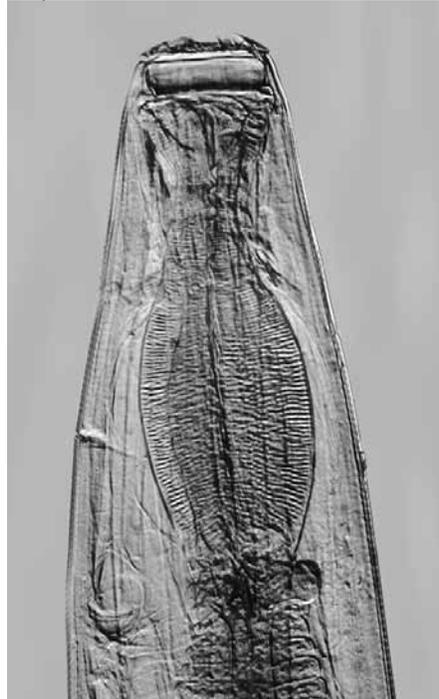


Figure 11b
Cylicocyclus insigne—pear-shaped esophagus

100 μ m

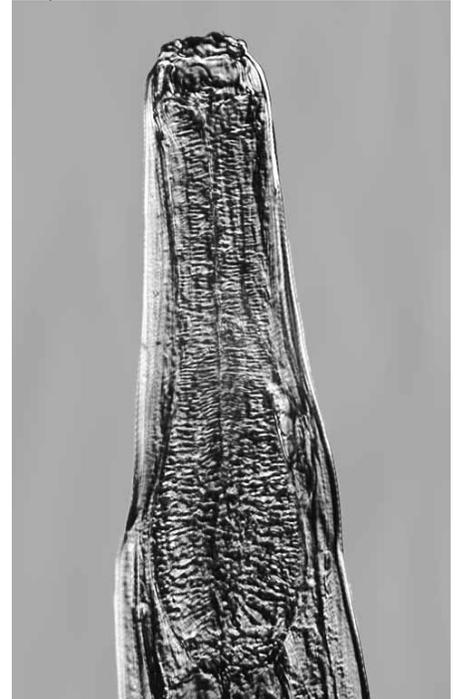


Figure 11c
Cylicocyclus radiatus—straight esophagus, becoming pear-shaped

I will discuss these three species together—getting a little bit out of alphabetical order—because even some experienced “cyathostome identifiers” have trouble with *Cyc. radiatus*. Because these are medium-sized worms, this should eliminate the really large ones and the small ones. So, it is very easy to distinguish one of the following three species from the others because each has some feature that eliminates the other two. First of all, *Cyc. elongatus* could never be confused with *Cyc. insigne* or *Cyc. radiatus* because of the one feature that gives it its name: its esophagus (Figure 11a). *Cylicocyclus elongatus* has an **esophagus** that is **twice as long** as the esophagi of the other two species, and it is **very straight**; the other two have pear-shaped esophagi (Figures 11b and 11c).

Cylicocyclus elongatus

50 μ m



Figure 12a

Head

1. chicken leg bone walls slightly bowed
straight esophagus (see Figure 11a)

100 μ m



Figure 12b

Female tail

400 μ m

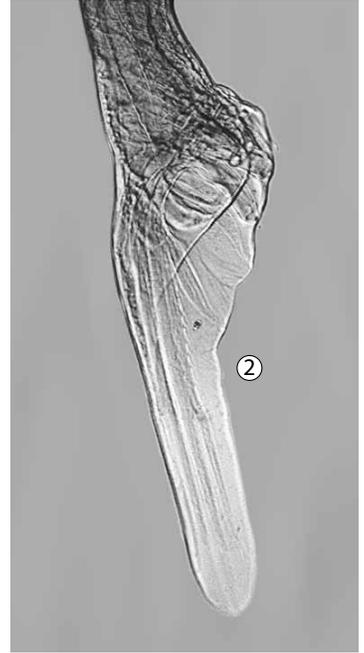


Figure 12c

Male tail

2. long bursa

This species has a **long, straight esophagus** (see Figure 11a, page 12). It has a fairly large buccal capsule, and its chicken leg bone walls are slightly bowed.

The female tail ends bluntly and **has a spike** at the end; however, the male tail has a very **long dorsal ray**. This species is longer than the other two but not as stout as *Cyc. insigne*.

Size: medium
Preferred site: cecum
Represents <1% of population

Walls of the Buccal Capsule:

- chicken leg bone walls are slightly bowed

Other Distinguishing Characteristics:

- has a long, straight esophagus
- has a fairly large buccal capsule

Cylicocyclus spp.
Cylicocyclus insigne



Figure 13a

Head

1. chicken leg bone walls bowed outward
pear-shaped esophagus (see Figure 11b)



Figure 13b

Female tail



Figure 13c

Male tail

This species has a **short, pear-shaped esophagus** (see Figure 11b, page 12) that begins to bulge almost immediately and a good-sized buccal capsule. The walls resemble chicken leg bones and really bow outward in the middle.

The female tail tapers and turns footlike at the posterior end, but the foot is not as fat as some of the species in *Cyathostomum*. The angle of the female foot is turned down like a ballet dancer's; the male bursa is quite broad with a medium-length dorsal ray. This species is the stoutest of the three, but not as long as *Cyc. elongatus*.

Size: medium
Preferred site: dorsal colon
Represents 1% of population

Walls of the Buccal Capsule:

- resemble chicken leg bones
- really bow outward in the middle

Other Distinguishing Characteristics:

- has a short, pear-shaped esophagus that begins to bulge almost immediately
- has a good-sized buccal capsule

Cylicocyclus radiatus

50 µm



Figure 14a

Head

1. chicken leg bone walls
straight esophagus becoming pear-shaped
(see Figure 11c)

100 µm

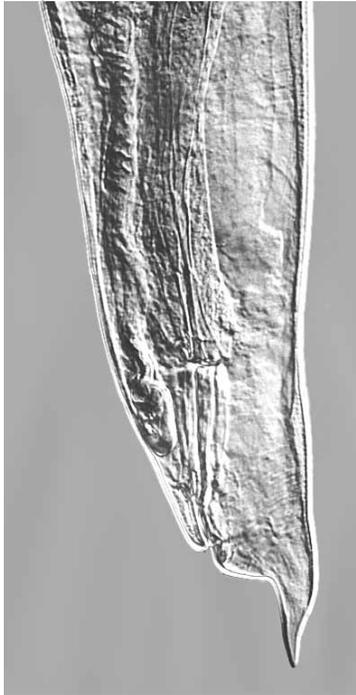


Figure 14b

Female tail

100 µm

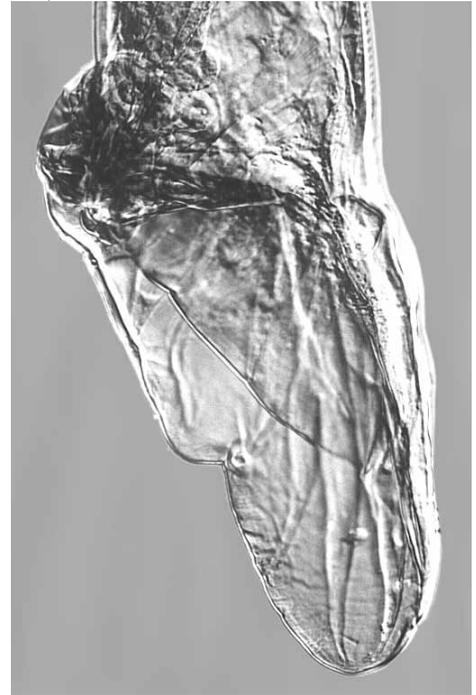


Figure 14c

Male tail

I think of this parasite as looking like a *Cyc. insigne* whose head has been run over sideways. The worm itself is not as large as the other two species, either in length or width. It also has very few distinguishing features and really is quite homely compared to some of the other cyathostome species. The buccal capsule is smaller than *Cyc. elongatus* and *Cyc. insigne*, and the **walls of the buccal capsule are very thin**, and they **do not bow out** at all; instead, they **stand straight up**. The esophagus is pear-shaped (see Figure 11c, page 12), but does not begin to bulge until about halfway down.

The female tail tapers to a definite point. The male tail has no distinguishing characteristics, but it seems to be broader and longer than it needs to be, considering the size of the worm.

Size: medium
Preferred site: ventral colon
Represents <1% of population

Walls of the Buccal Capsule:

- very thin
- do not bow out at all

Other Distinguishing Characteristics:

- buccal capsule is smaller than that of *Cyc. elongatus* and *Cyc. insigne*
- esophagus is pear-shaped but does not begin to bulge until about halfway down

Cylicocyclus leptostomus

30 μ m

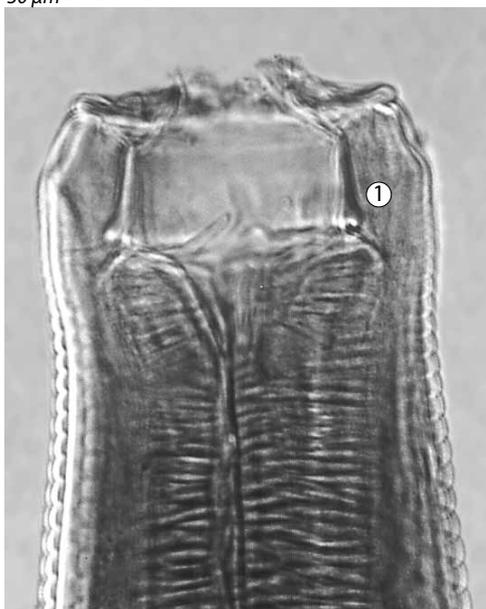


Figure 15a
Head
1. straight, thin walls

50 μ m



Figure 15b
Female tail

100 μ m

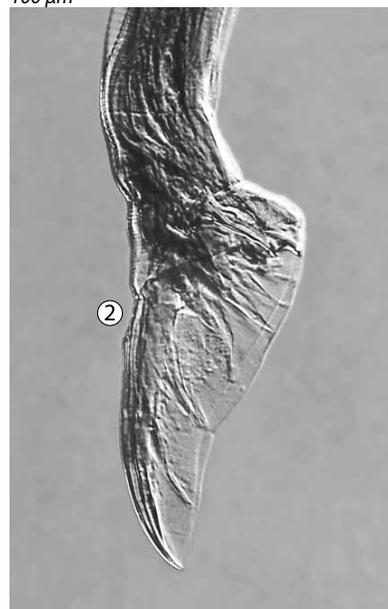


Figure 15c
Male tail
2. very long bursa

Cylicocyclus leptostomus and *Cylicocyclus nassatus* (page 17) are grouped together because of the similarity in their buccal capsules; both species have walls that resemble chicken leg bones without meat.

Cylicocyclus leptostomus is my favorite species, probably because of the male, who looks handsome and polished. Because this is a small species, the buccal capsule is **not so spread out** and is **more square** instead of rectangular like the other species in this genus. The capsule walls are not as rounded at the base but are blunt and very thin.

The female has a trim tail, tapering to a point. However, *Cyc. leptostomus* male has what I like to call a “**struttin**” tail; that is, its tail is **very long and streamlined** for the size of the worm.

Walls of the Buccal Capsule:

- walls are blunt at the base and very thin

Other Distinguishing Characteristics:

- buccal capsule is not so spread out and appears more square than rectangular

Size: small
Preferred site: ventral colon
Represents 2% of population

Cylicocycclus spp.
Cylicocycclus nassatus

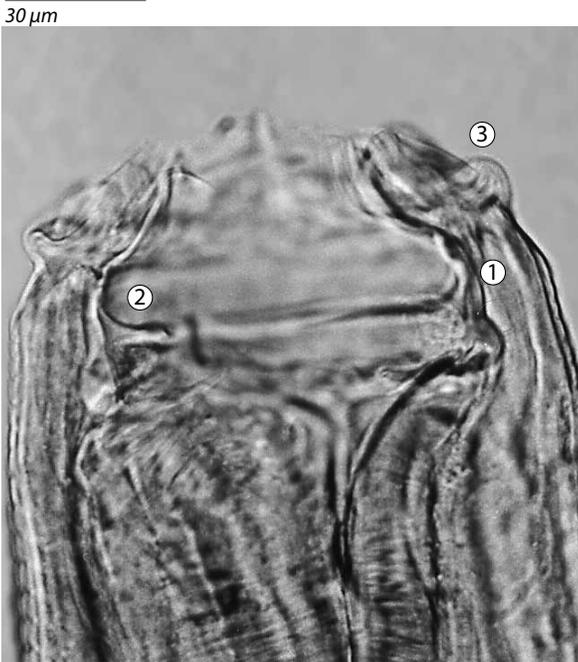


Figure 16a
Head
1. chicken leg bone walls
2. ledge
3. ears

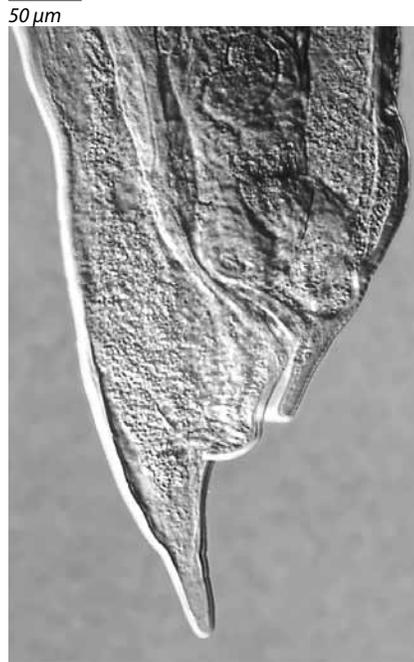


Figure 16b
Female tail

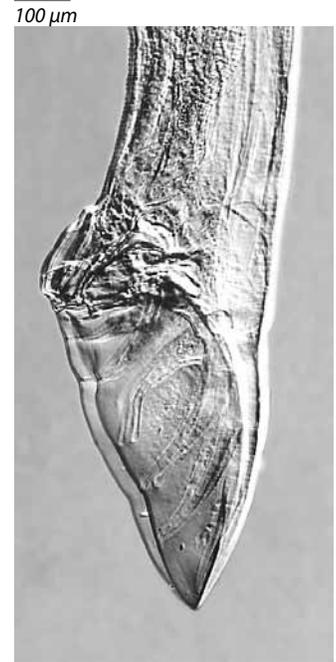


Figure 16c
Male tail

I call the male of the *Cylicocycclus nassatus* species “the old man” because he is not very pretty, and he always dies hard. The walls of the buccal capsule are thicker than those of *Cyc. leptostomus*. *Cylicocycclus nassatus* has a **rectangular buccal capsule** with a **ledge running through its middle**. Also, *Cyc. nassatus* has “ears” (actually lateral papillae that give the appearance of ears).

The female of *Cyc. nassatus* has a very **ugly, tapered tail** that is wrinkled, fat, and usually lies every-which-way. The male has a **symmetrical tail** with an average-length dorsal ray that seems to “hold up” better than the rest of the worm; it is almost always intact and looks the same.

Walls of the Buccal Capsule:

- thicker than those of *Cyc. leptostomus*

Other Distinguishing Characteristics:

- has “ears”
- ledge running through middle of buccal capsule
- rectangular buccal capsule

Size: small
Preferred site: ventral colon
Resistant in Kentucky
Represents 12% of population

Cylicocyclus ultrajectinus

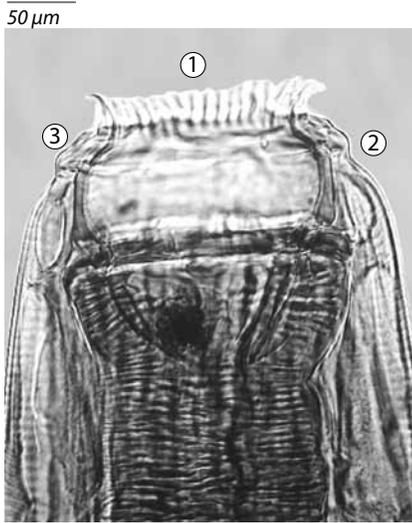


Figure 17a
Head
1. heavy leaves
2. woodpeckers
3. V's



Figure 17b
Head
3. V's



Figure 17c
Female tail



Figure 17d
Male tail

This is also another species that really likes donkeys. This species cannot be confused with another because the walls of the buccal capsule are distinctive. This species has the **chicken leg bone look** to its walls, but the base of the buccal capsule walls is thin and slanted before the “bone” appearance starts. **Anteriorly**, the **walls** of the buccal capsule actually **fork into definite “V’s”** (sometimes, it may be necessary to roll this worm to see the “V’s”). Also, this species has **very, very heavy leaves extending from the external crown**. The way the buccal capsule walls merge with the crown elements presents an image of two pileated woodpeckers (“**Woody Woodpecker**”) facing each other at the mouth opening; the beaks are upturned, and they look as if they are smiling.

The tail of the female is **downright ugly**; it resembles a **really big fat foot** with a tip on the end. The male tail is very short considering the size of this worm; the **dorsal ray is so short** that the bursa is nearly as wide as it is long.

Walls of the Buccal Capsule:

- base is thin and slanted before the chicken leg “bone” appearance starts
- anteriorly, fork into definite “V’s”

Other Distinguishing Characteristics:

- has very, very heavy leaves extending from the external crown
- merger of walls and crown resembles two “Woody Woodpeckers” facing each other

Size: medium
Preferred site: ventral colon/dorsal colon
Represents <1% of population