

Cylicostephanus asymmetricus

50 μ m

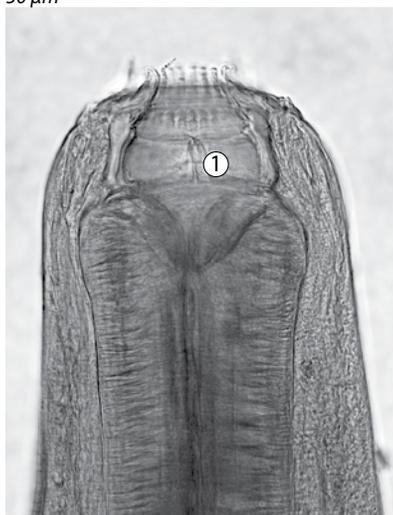


Figure 19a
Head
1. dorsal gutter

50 μ m

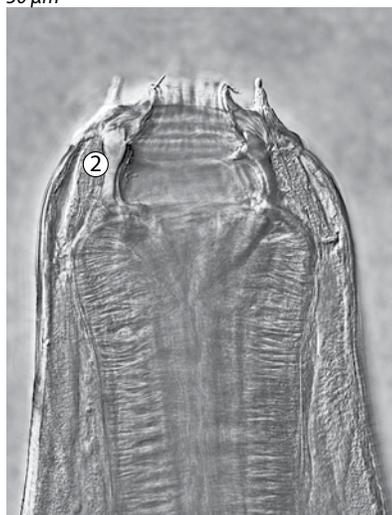


Figure 19b
Head
2. arms and hands

200 μ m

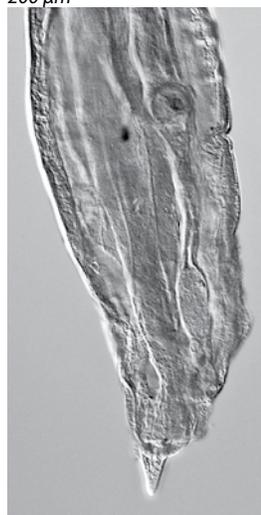


Figure 19c
Female tail

200 μ m



Figure 19d
Male tail

This species is uncommon in Kentucky. It is almost identical to *Cylicostephanus bidentatus*. The major difference is that this species **does not have two big teeth protruding into the buccal capsule** like *Cys. bidentatus*. However, *Cys. asymmetricus* does have **three small teeth below the buccal capsule** that do not extend into the buccal capsule. The walls are bowed when viewed laterally but appear straighter when viewed dorsally. The dorsal gutter is very long and prominent, almost extending upward throughout the entire buccal capsule; whereas the dorsal gutter in *Cys. bidentatus* extends only about halfway into the buccal capsule. The **walls of the buccal capsule are thinner at the base but thicken at the anterior end**. The walls resemble two arms and hands reaching upward.

The male tail has a long dorsal ray in its bursa and is very straight.

The female tail tapers slightly and is pointed on the end but is not as sharply pointed as the female tail of *Cys. bidentatus*.

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

Walls of the Buccal Capsule:

- Thinner at the base but thicken anteriorly
- Walls resemble two arms and hands reaching upward

Other Distinguishing Characteristics:

- Three small teeth below buccal capsule; do not protrude into buccal capsule
- Male tail has long dorsal ray
- Female tail tapers and is pointed on the end

Cylicostephanus bidentatus

50 μ m



Figure 20a
Head
1. hands

25 μ m

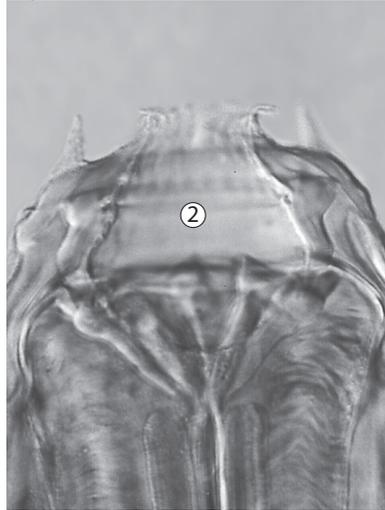


Figure 20b
Head
2. teeth

200 μ m

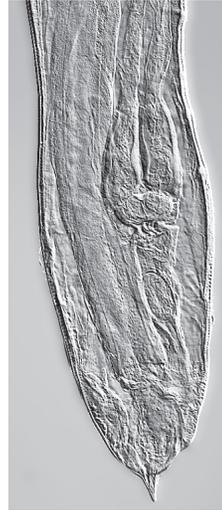


Figure 20c
Female tail

200 μ m



Figure 20d
Male tail

This species resembles *Cylicostephanus asymmetricus*. The major difference between the two species is that *Cys. bidentatus* **has two big teeth that protrude prominently into the buccal capsule**. *Cys. asymmetricus* has three small teeth situated on three sectors of the buccal capsule but they do not protrude into the buccal capsule. Also, the **dorsal gutter** in *Cys. asymmetricus* extends anteriorly and throughout the buccal capsule. The walls of the buccal capsule in *Cys. bidentatus* are shorter and thicker than those in *Cys. asymmetricus* and are straighter than those in *Cys. asymmetricus*, which are slightly bowed. The buccal capsule in *Cys. bidentatus* is not as deep as in *Cys. asymmetricus*.

The male tail of *Cys. bidentatus* has a **short dorsal ray** in its bursa and the other rays of the bursa splay out horizontally.

The female tail of *Cys. bidentatus* **remains fat** almost to the end, where it **tapers slightly** and has a definite **sharp point on the end**.

Walls of the Buccal Capsule:

- Walls are short, thick, and straight

Other Distinguishing Characteristics:

- Two big teeth protrude prominently into the buccal capsule
- Dorsal gutter extends anteriorly throughout buccal capsule
- Male tail has a short dorsal ray
- Female tail remains fat to the end and tapers to a point

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

Cylicostephanus calicatus

30 μm

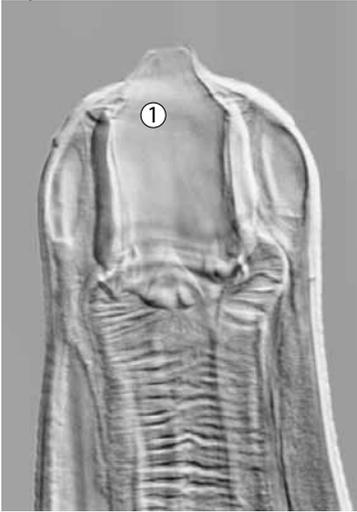


Figure 21a
Head
1. mouth open

30 μm



Figure 21b
Head
2. mouth shut

50 μm



Figure 21c
Female tail

100 μm



Figure 21d
Male tail

I will discuss *Cylicostephanus calicatus* and *Cylicostephanus minutus* (page 23) together because when I first began learning the cyathostomes, I had trouble distinguishing them; that is, until I stopped trying to take measurements, count the crown's leaf elements, etc. These two species are very small, especially *Cys. minutus*, which is the smallest species of the known North American cyathostomes.

The *Cylicostephanus calicatus* species may appear with its **mouth "wide open,"** which is confusing for a beginner because most of the time its **mouth is "shut."** This species is supposed to be larger than *Cys. minutus*, but I have seen some pretty small specimens. The tails are distinctive, but sometimes the posteriors are absent, so I have had to rely on the buccal capsules for identification. The walls of *Cys. calicatus* are not knobby at the base; they are flat and rise up straight toward the mouth opening; they are wider at the base and taper anteriorly. As they taper, they usually **move closer together** at their tips.

The *Cylicostephanus calicatus* female tail is quite tapered compared to that of *Cys. minutus*, and the dorsal ray of the *Cys. calicatus* **male tail** is **very long** compared to *Cys. minutus*.

Size: small
Preferred site: cecum
Resistant in Kentucky
Represents 2% of population

Walls of the Buccal Capsule:

- not knobby at the base
- flat and rise up straight toward the mouth opening
- wider at the base and taper anteriorly

Other Distinguishing Characteristics:

- has distinctive tails, but if they are absent, the buccal capsule is the key to identification
- may appear with its mouth "wide open," but most often is "shut"
- supposed to be larger than *Cys. minutus*, but small specimens possible

Cylostephanus minutus

30 μm

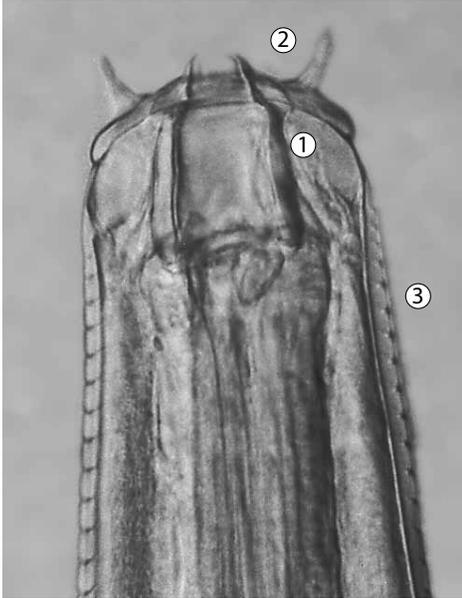


Figure 22a

Head

1. straight, symmetrical walls
2. snail antennae
3. serrated cuticle

50 μm

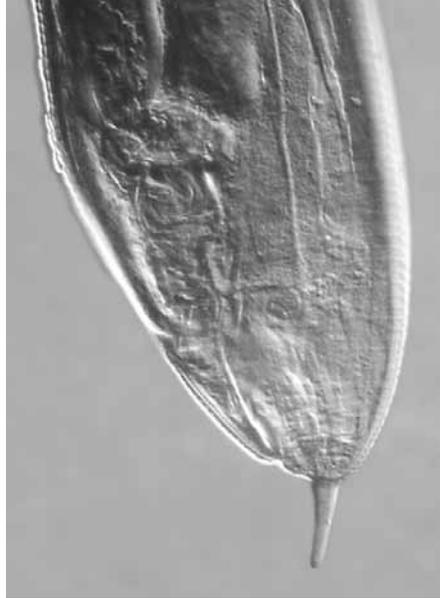


Figure 22b

Female tail

50 μm



Figure 22c

Male tail

This is the smallest known cyathostome in the United States. Its buccal capsule walls seem completely symmetrical and are straight up and down without tapering. Also, the *Cys. minutus* cuticle is slightly constricted at the “neck,” and the cuticle shows striations not evident on *Cys. calicatus*. *Cylostephanus minutus* appears to have a pair of tiny forked antennae (leaf elements/papillae) on the top of its head that resemble those of a snail.

The *Cylostephanus minutus* female tail gets fatter on the end and has a small teat that goes off at an angle. The male of this species has a little bursa that is about as wide as it is long.

Size: small

Preferred site: ventral colon

Resistant in Kentucky

Represents 3% of population

Walls of the Buccal Capsule:

- seem completely symmetrical
- straight up and down
- do not taper

Other Distinguishing Characteristics:

- smallest known cyathostome in the United States
- cuticle is slightly constricted at the “neck” and shows striations not evident on *Cys. calicatus*
- has a pair of snail-like antennae

Cylicostephanus spp.
Cylicostephanus goldi

30 μ m

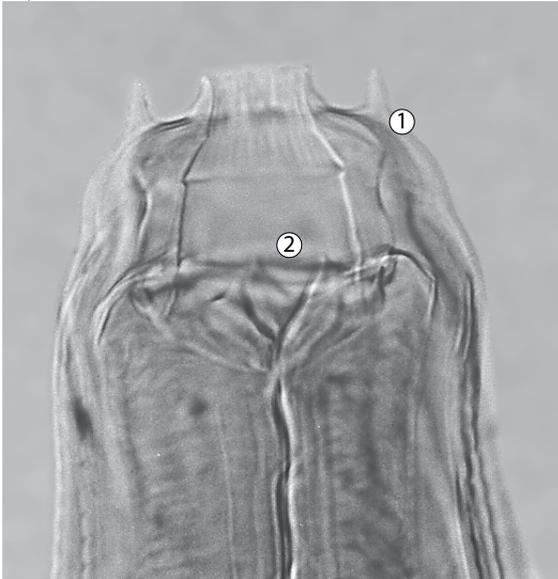


Figure 23a

Head

1. baby birds
2. teeth

100 μ m



Figure 23b

Female tail

100 μ m



Figure 23c

Male tail

This is the species that started my substituting everyday objects for certain anatomical features of these parasites. This worm has two separate faces, **one roundish** and the **other square**. This makes me think that two species may be involved here, or this species may be in some kind of transition, or that some change occurs as it dies. Regardless, I had to focus on some feature that would allow me to identify it. Despite its tendency to be **square-headed** sometimes and **round-headed** at others, one characteristic is always the same: the walls of the buccal capsule look like **two baby birds** facing each other, waiting for a worm. Their heads are upturned, and they have **sharp, curved beaks**. This effect is caused by the way the walls of the buccal capsule merge with the leaves of the external crown. It is the only species that presents this image so prominently that it always catches my eye. *Cylicostephanus goldi* also usually shows its teeth protruding into the buccal capsule.

The **female tail** looks like a **foot**, and the dorsal ray of the **male bursa** is quite **long**.

Walls of the Buccal Capsule:

- look like two baby birds with sharp, curved beaks facing each other

Other Distinguishing Characteristics:

- has two separate faces, one roundish, one square
- usually shows its teeth protruding into the buccal capsule

Size: small

Preferred site: dorsal colon

Resistant in Kentucky

Represents 8% of population

Cylicostephanus hybridus

50 μ m



Figure 24a
Head
1. square buccal capsule

50 μ m



Figure 24b
Head
2. thick at base

100 μ m



Figure 24c
Female tail

200 μ m



Figure 24d
Male tail

This species is small and very **rare in Kentucky**. The buccal capsule of *Cys. hybridus* is square and seems more shallow when viewed dorsoventrally. The walls are thicker at the base and taper anteriorly. The dorsal gutter extends throughout the buccal capsule. When viewed laterally, the buccal capsule resembles *Cylicostephanus goldi* in the way the buccal capsule walls merge with the exterior leaf crowns. As with *Cys. goldi*, I get the impression of two baby birds facing each other. The dorsal gutter is not evident when viewed laterally.

The male bursa is stocky with a short dorsal ray. The female tail remains fat to the end, where it tapers to a point.

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

Walls of the Buccal Capsule:

- Walls thicker at the base but taper anteriorly
- Buccal capsule is almost square
- Where walls meet leaf crowns, look like two baby birds in a nest

Other Distinguishing Characteristics:

- Rare in Kentucky
- Elongate dorsal gutter extending halfway into buccal capsule
- Male tail has long dorsal ray
- Female tail is fat but is pointed on the end

Cylicostephanus longibursatus

30 μ m

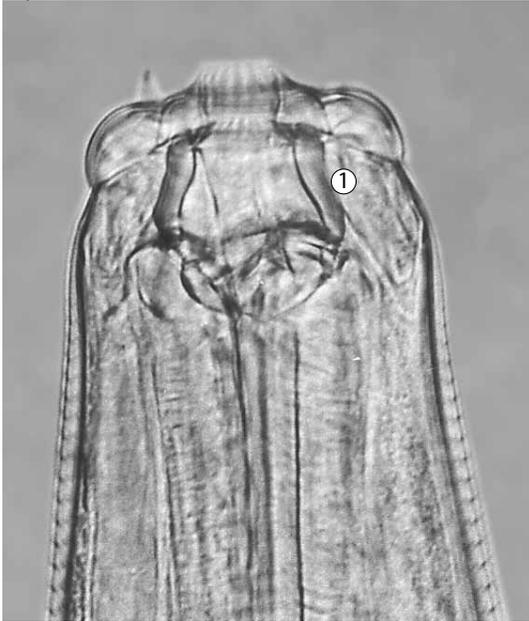


Figure 25a
Head
1. parentheses

50 μ m

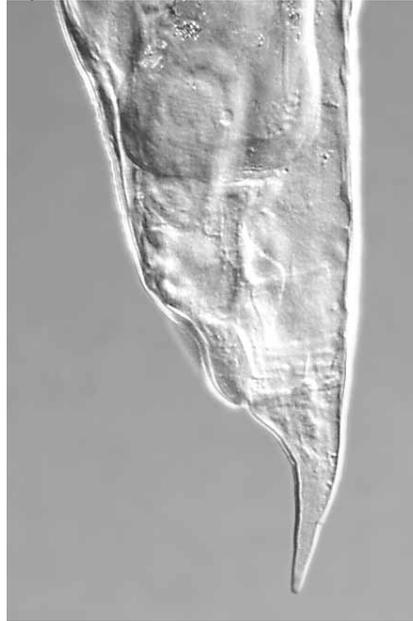


Figure 25b
Female tail

100 μ m

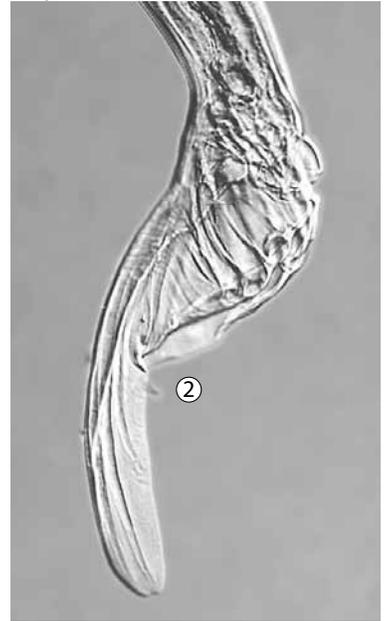


Figure 25c
Male tail
2. very long bursa

This is the most prevalent species in Kentucky, comprising about 40 percent of the small strongyle population in most equids. It is resistant to all of the parasiticides on the market except for the macrocyclic lactones. It is also a very small worm. The walls of its buccal capsule look like a **set of parentheses**.

The female tail tapers and suddenly ends in a point, but the most striking feature of this species is how it got its name *longibursatus*: the **male bursa is extremely long**.

Walls of the Buccal Capsule:

- walls of its buccal capsule look like a set of parentheses

Other Distinguishing Characteristics:

- a very small worm
- male bursa is extremely long

Size: small
Preferred site: dorsal colon
Resistant in Kentucky
Represents 40% of population