Post mortem diagnosis of chicken coccidiosis

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Post mortem diagnosis of chicken coccidiosis

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Pathogenesis, Sequential Pathology & Clinical signs of chicken coccidiosis
Postmortem diagnosis
Caecal coccidiosis
Intestinal coccidiosis (Fore gut / Mid gut / Hind gut coccidiosis)
Microscopical demonstration of stages of chicken coccidia

PATHOGENESIS Eg. *E. tenella*

- Pathogenesis is mainly due to second-generation schizonts during rupture and release of its merozoites from the host cell.
- Caecal coccidiosis is found most frequently in young birds especially those aged 4 weeks.
- Severity depending on the infective dose of oocysts, the pathogenic strain, breed and age of the bird, nutritional status, concurrent infection and stresses.
- Clinical caecal coccidiosis is produced only when heavy infections are acquired over relatively short period of time not exceeding 72 hours.
- 2,00,000 oocysts produce mortality in 1-2 weeks
- 50,000 – 1,00,000 oocysts in 3-4 weeks old birds

Sequential Pathology of E. tenella

- On a flock, coccidiosis is first become noticeable at about **72 hours after infection (ai) ie. 3 DPI,** Birds droop, cease feeding and huddle together to keep warm.
- By 96 hours ai (4 DPI) blood appears in the droppings at this time bird's appear listless, eat tittle and still drink.
- The greatest haemorrhage occur in **5 – 6 DPI.** The bird will die off or recover. Death due to excessive loss of blood.
- By **7 days onwards** oocysts appear in the droppings, if the birds are live that long, oocysts increase in **peak at 10 DPI** and then decline. The prepatent period is ~ 7days
- Mortalities is higher in between 4-6 DPI, if the bird survive to 8 or 9 DPI, they generally recover, since **coccidiosis is self-limited in the absence of reinfection.**
- The birds recovered from the disease, chronic illness may develop as a result of a persistent **'caecal core or caecal plug'** (yellow whitish consolidated caseous plug with tissue debris and lot of oocysts) may usually expelled **in about 14 days a.i in dropping.**

Days after infection	PM Lesions and stages found for *E. tenella*
1-3 days	Petechial haemorrhage in caeca
4 day	Marked haemorrhagic spot in caeca
5 day	Caeca dilated and have unclotted/partly-clotted blood with schizonts / merozoites. (Death of bird)
6-7 day	Gametogenous stages in mucosa; Caecal content consolidated, casseous and adhere to m.m. Oocysts can be found in the content.
8 day	Consolidated caseous plug completely fills the lumen of the caecum.
9 – 10 days	Caecal core detach from m.m.
10 –14 days	Caecal core shed in droppings.
14 days after	Caecal wall thickened, regeneration of mucosa, wall contracts with some degree of fibrosis, loss of blood in recovered bird causes anaemia

COCCIDIAL INFECTIONS MAY BE

Clinical coccidiosis

- Mortality and morbidity

Sub-clinical coccidiosis

- Reduced feed conversion efficiency
- Reduction in weight gain
- Loss of pigmentation

Mild infection with no adverse effects

- Perpetuates the organism in the environment

Clinical signs

- Diseased birds sit huddled up with their eyes half closed.
- Wings droop and feathers are dirty and rough.
- Comb and wattle are pale and atrophied.

  Crowding of droopy birds against a side wall while pecking at the wall
- Bloody droppings and decrease in food and waterconsumption.

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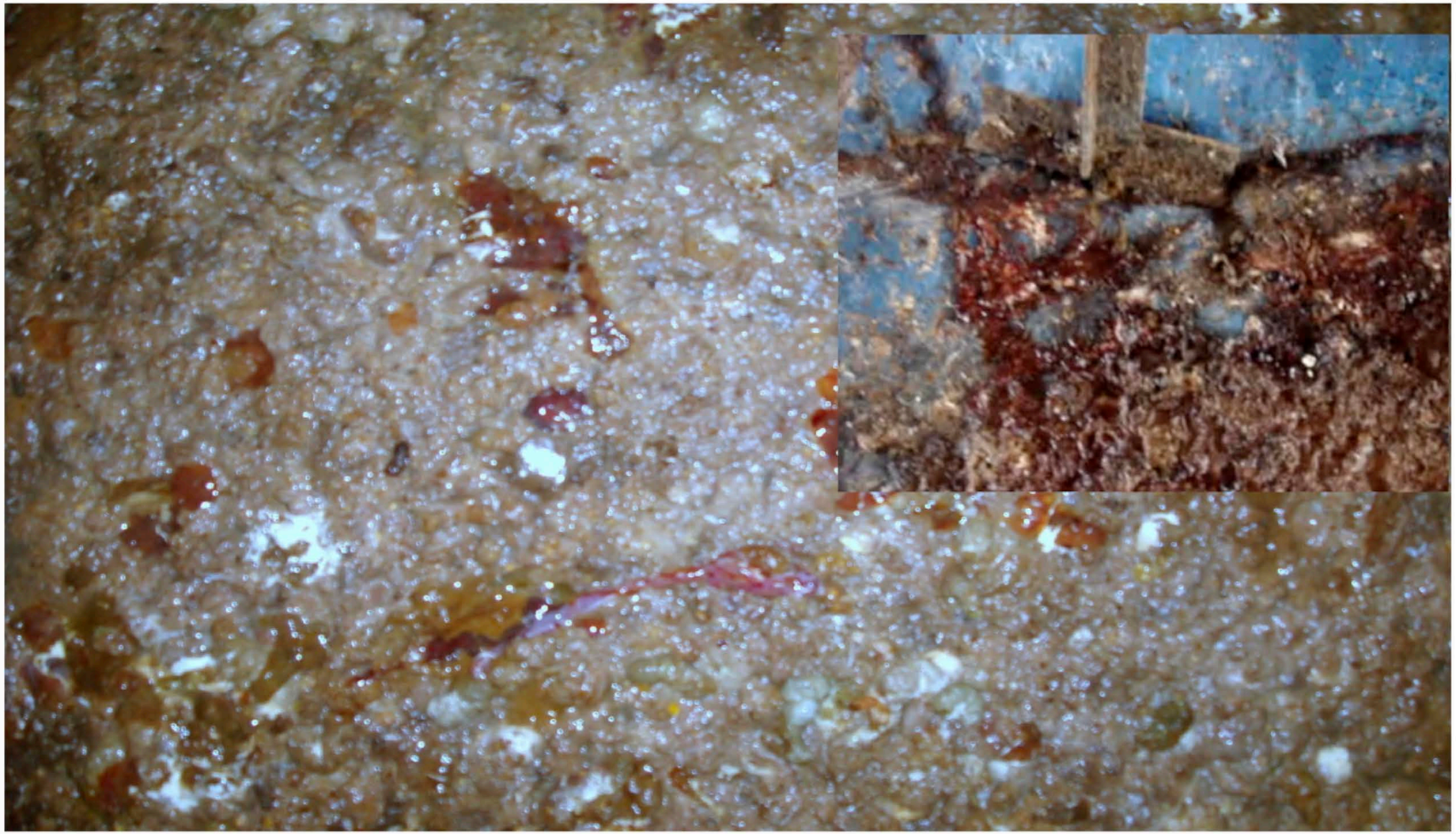
Chicken coccidiosis - Bloody droppings



Classification of Coccidiosis

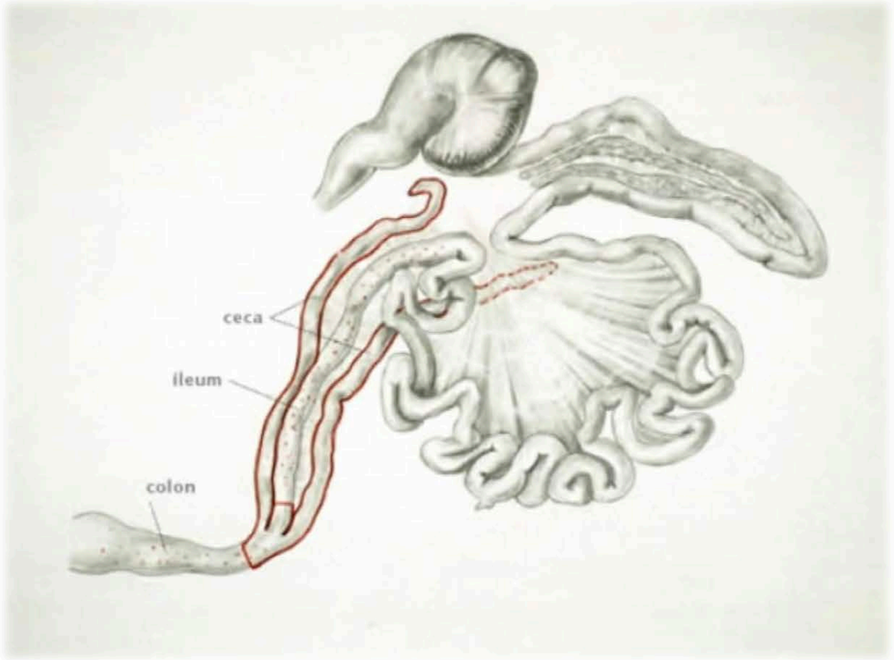
- Foregut or Duodenal coccidiosis
- Midgut or Mid intestinal coccidiosis
- Hindgut or Ileo-rectal coccidiosis
- Caecal coccidiosis

Caecal Coccidiosis

E. tenella

- Most pathogenic, most common
- Young chicks, 4-6 wks old
- Occurs only in Caecal pouches
- Gross distension of caeca with blood, caecal wall thickened
- Contents clotted/unclotted blood
- Later hardened caecal core, yellowish, cheesy, eroded epithelium
- Mucosal scrapings – 2nd Gen. meronts, gamonts, oocysts depending on the stages of development

Caecal Coccidiosis – *Eimeria tenella* Site



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Caecal core

Midgut or Mid Intestinal Coccidiosis

- ***E. necatrix and E. maxima***
- ***E. necatrix***
- **Highly pathogenic, common in 8-18 wks, poor oocyst producer**
- **Merogony in small intestine**
- **Gamogony in caeca**
- **Midintestine *"Salt and Pepper"* like appearance (colonies of 2nd Gen. Sch)**
- **Intestine markedly swollen, filled with clotted / unclotted blood, ballooning and sausaged appearance.**

Mid intestinal coccidiosis - *Eimeria necatrix*

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Pinpoint haemorrhages

Mid intestinal coccidiosis - *Eimeria necatrix*

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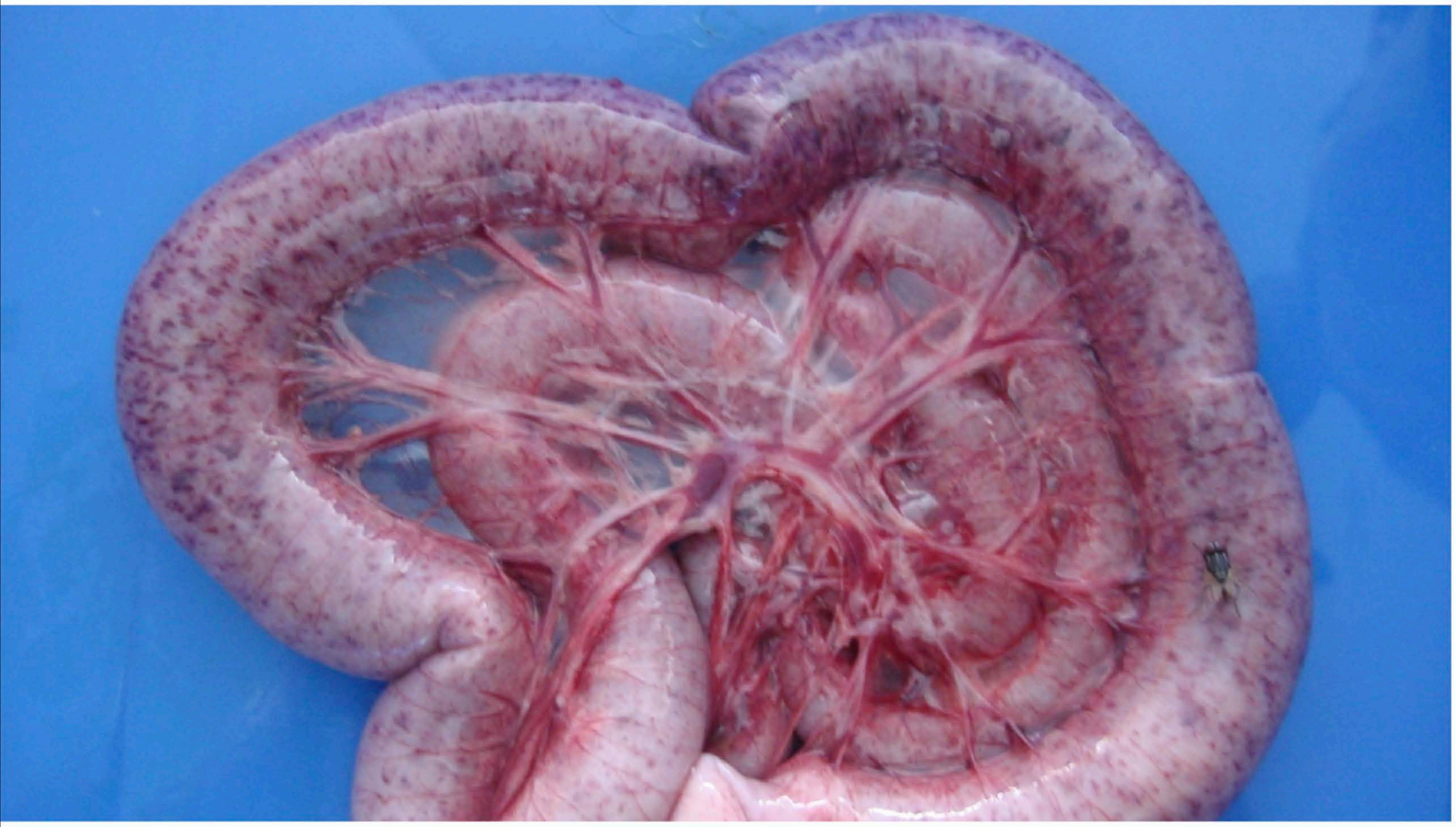
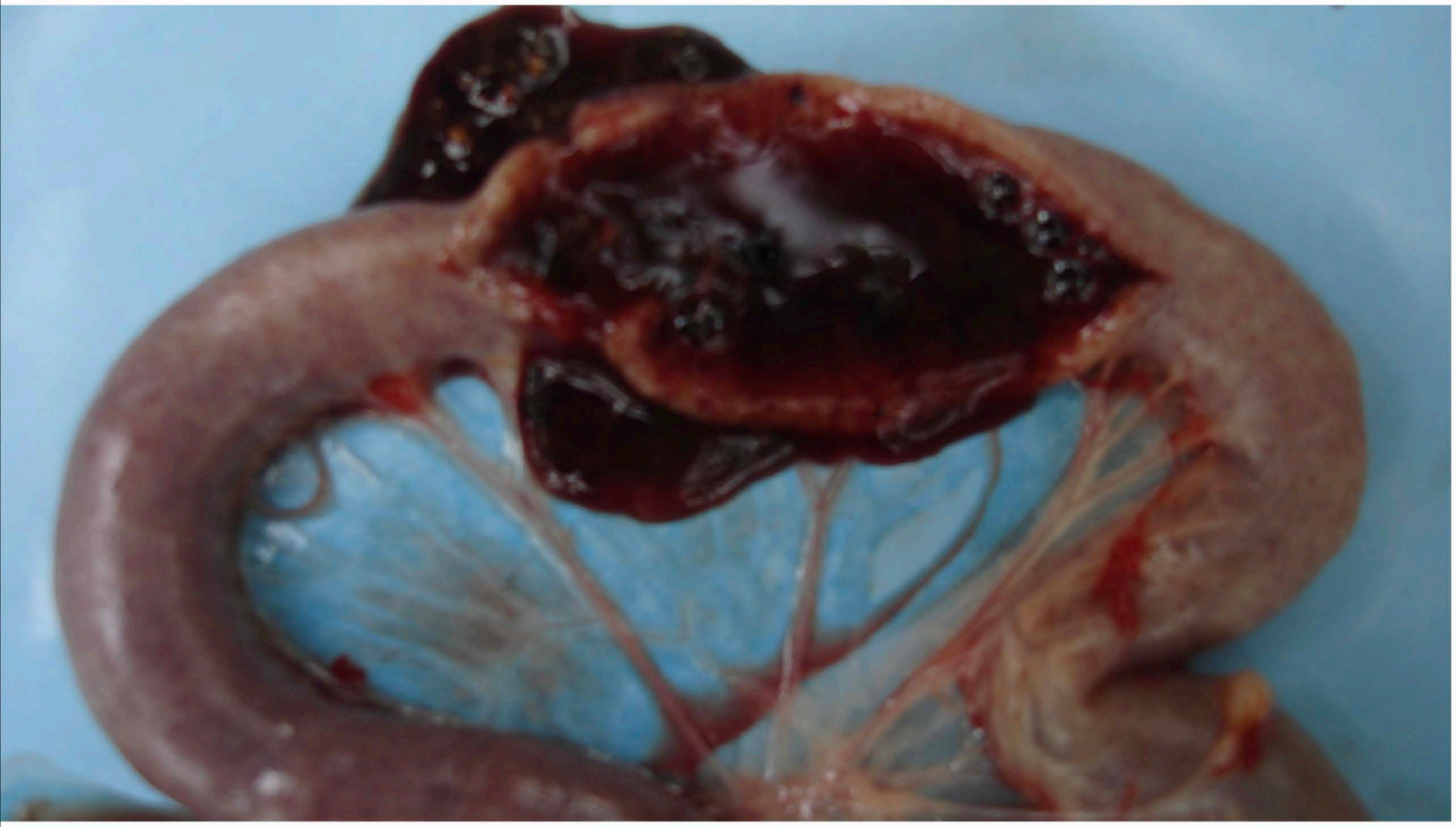
Mid intestinal coccidiosis - *Eimeria necatrix*



Mid intestinal coccidiosis - *Eimeria necatrix*



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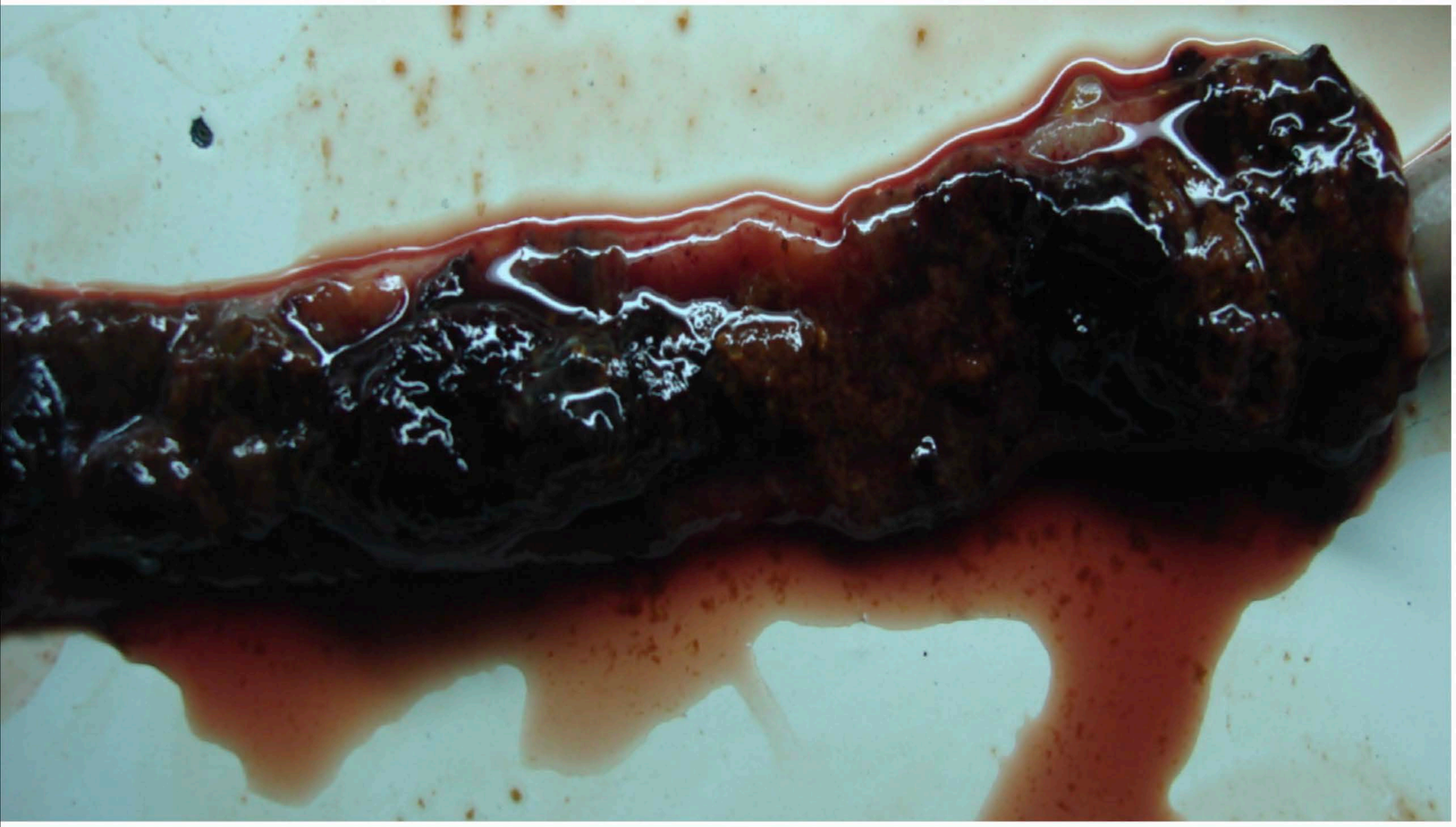

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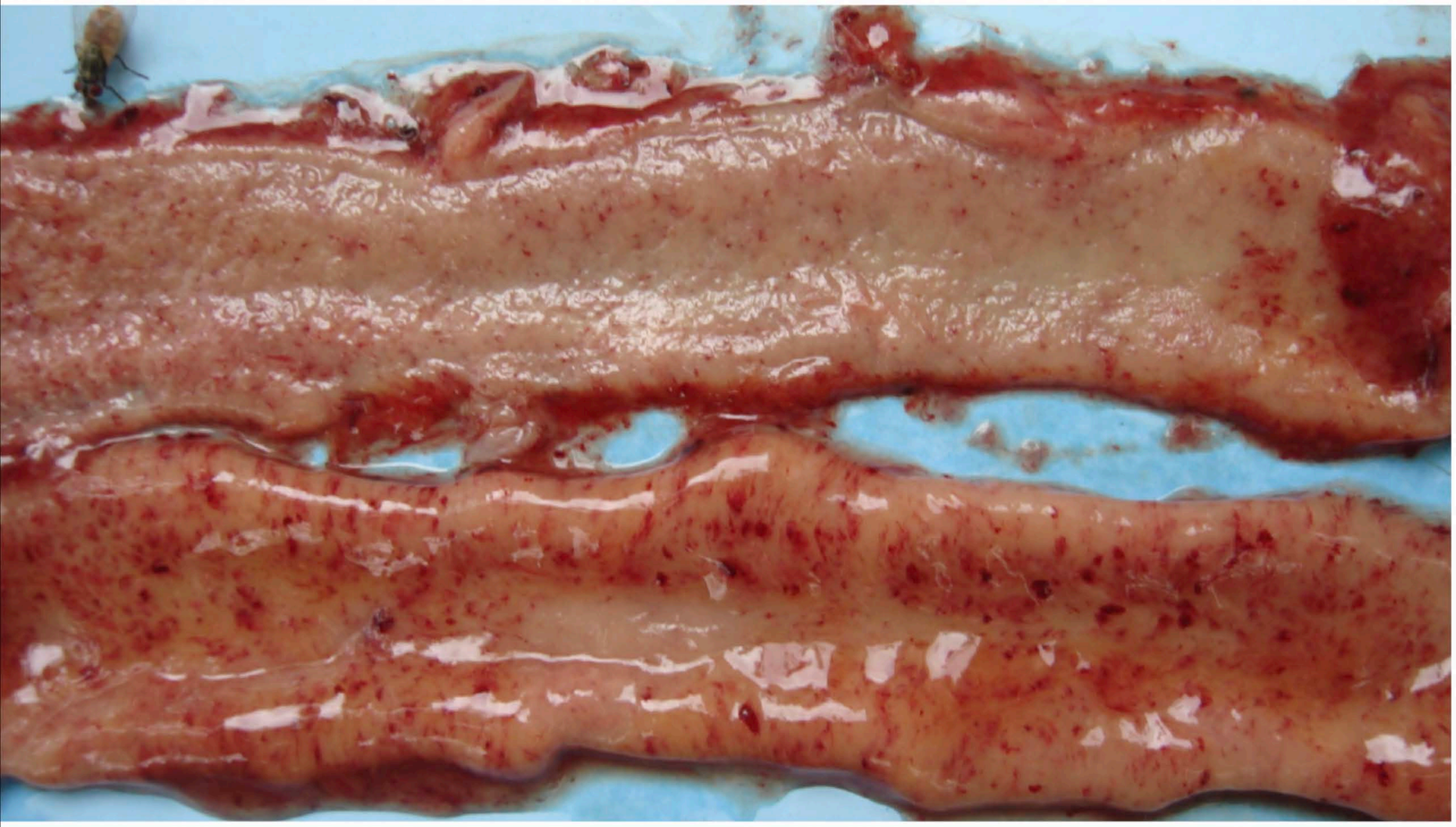

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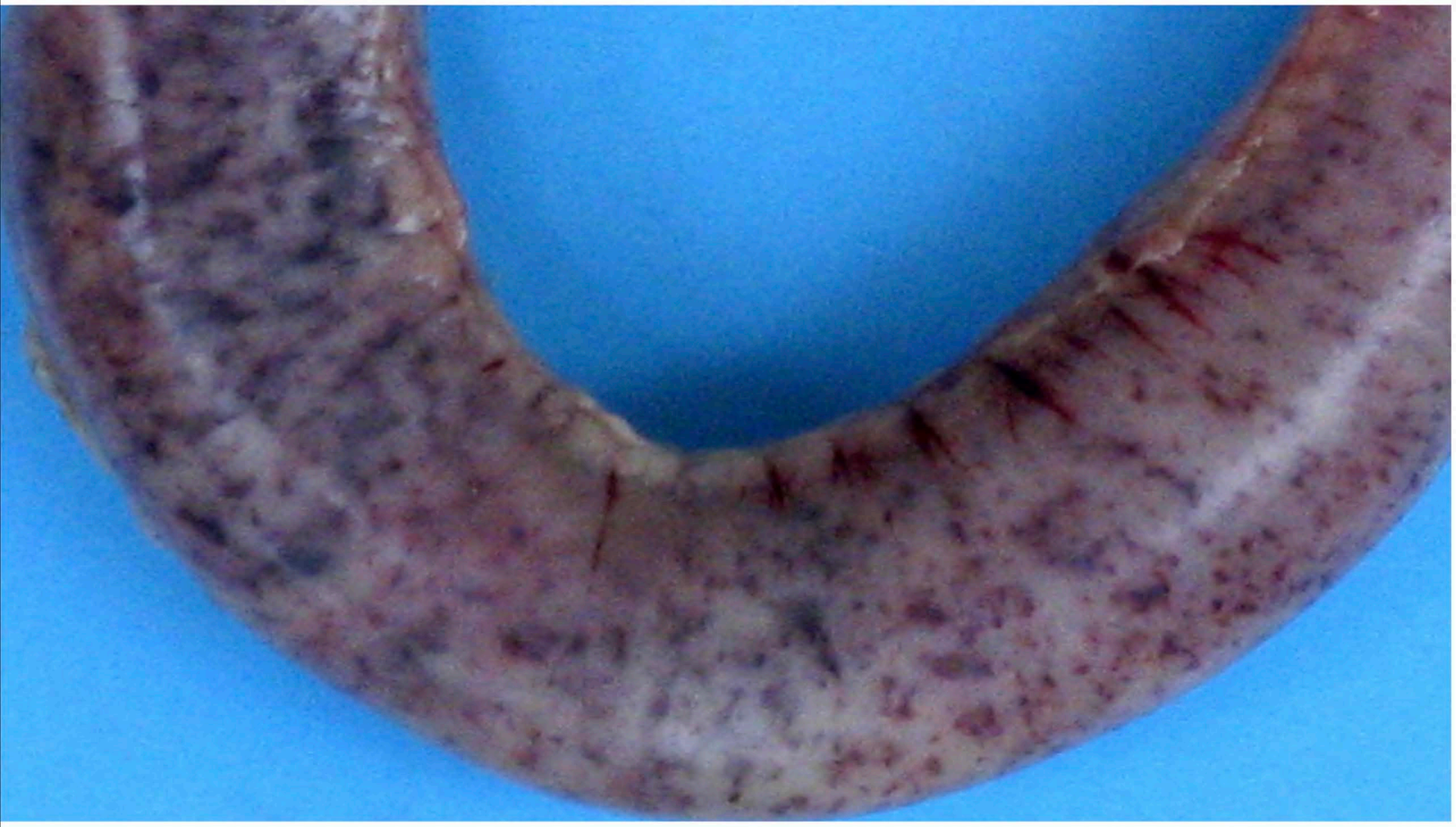

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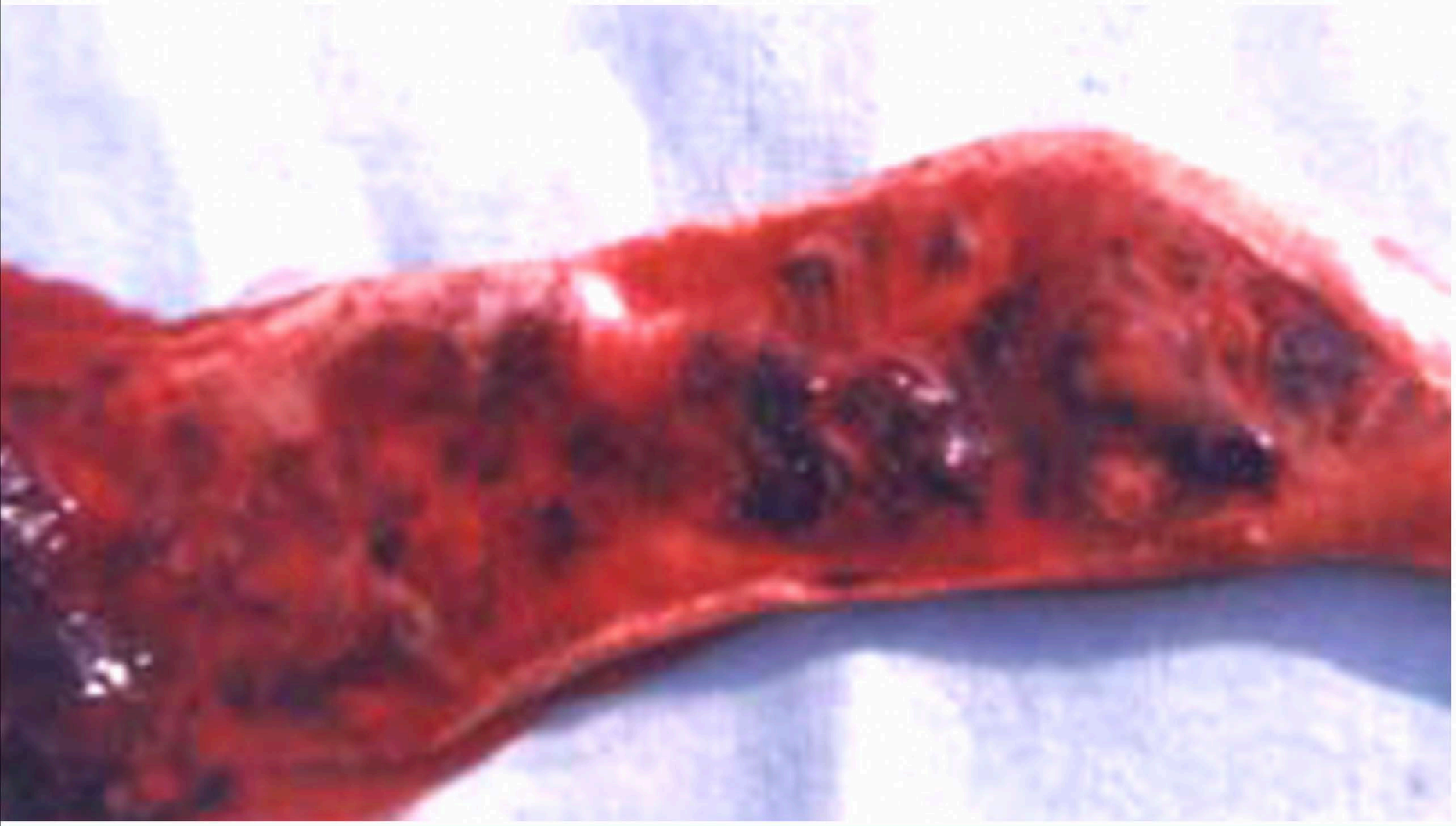

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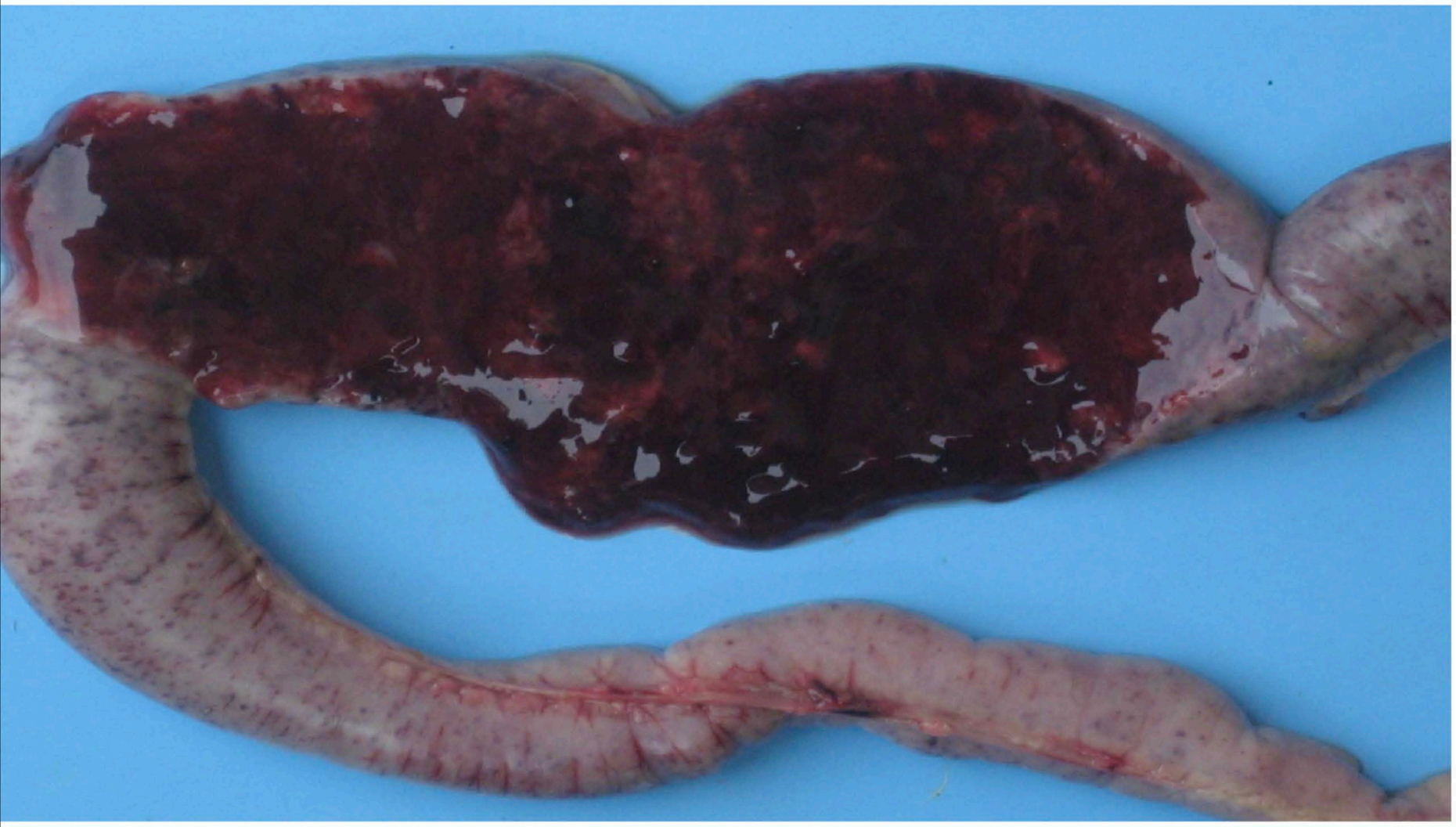
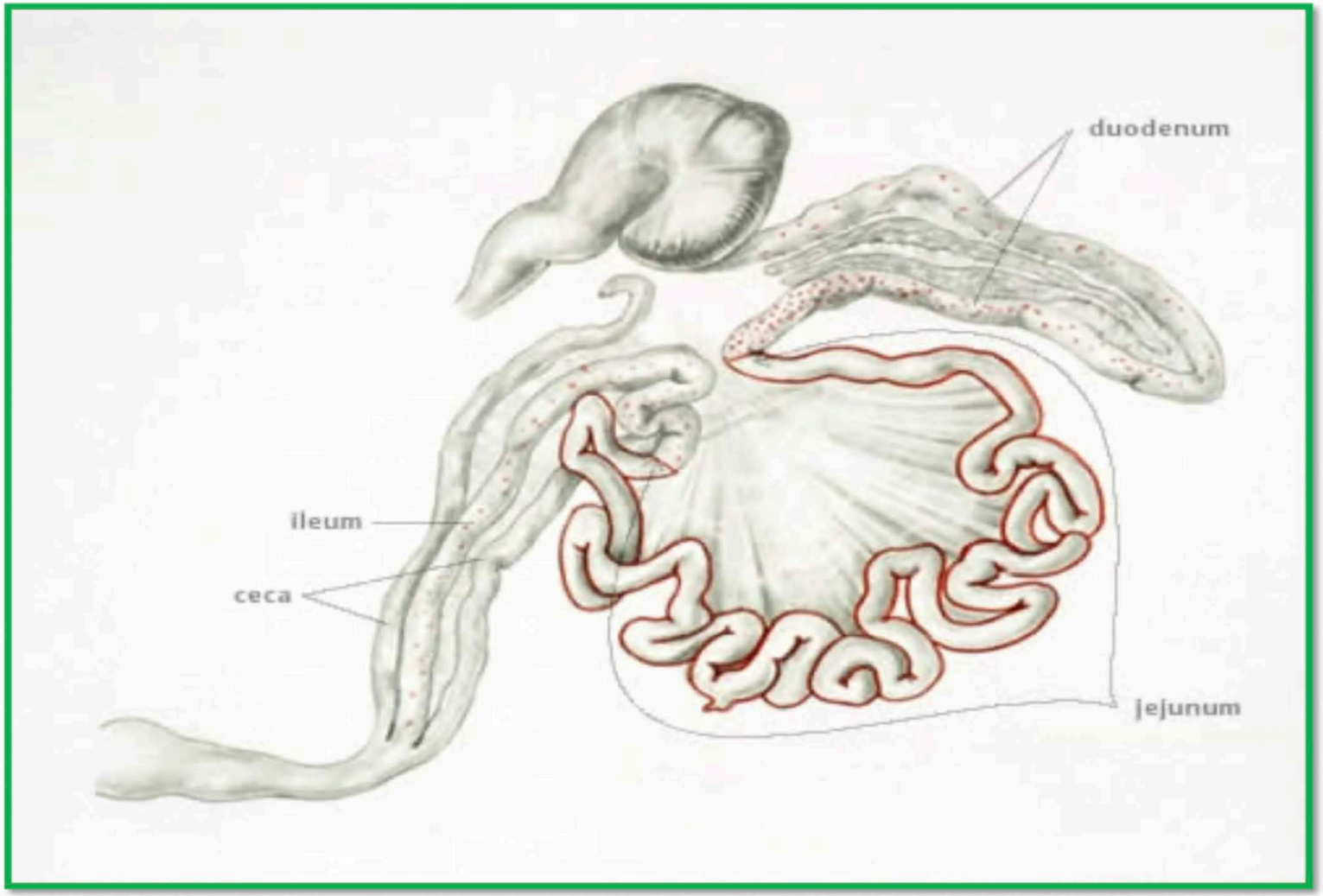


Midgut or Mid Intestinal Coccidiosis

E. maxima

- Slightly to moderately pathogenic
- Common in adult
- Lesion due to sexual (gamonts)
- Intestine flaccid & dilated – lacks muscle tone
- Wall thickened, short fine hair like haemorrhages
- Contents orange/pinkish flecks of blood

Mid intestinal Coccidiosis - Eimeria maxima Site



Mid intestinal Coccidiosis - *Eimeria maxima*

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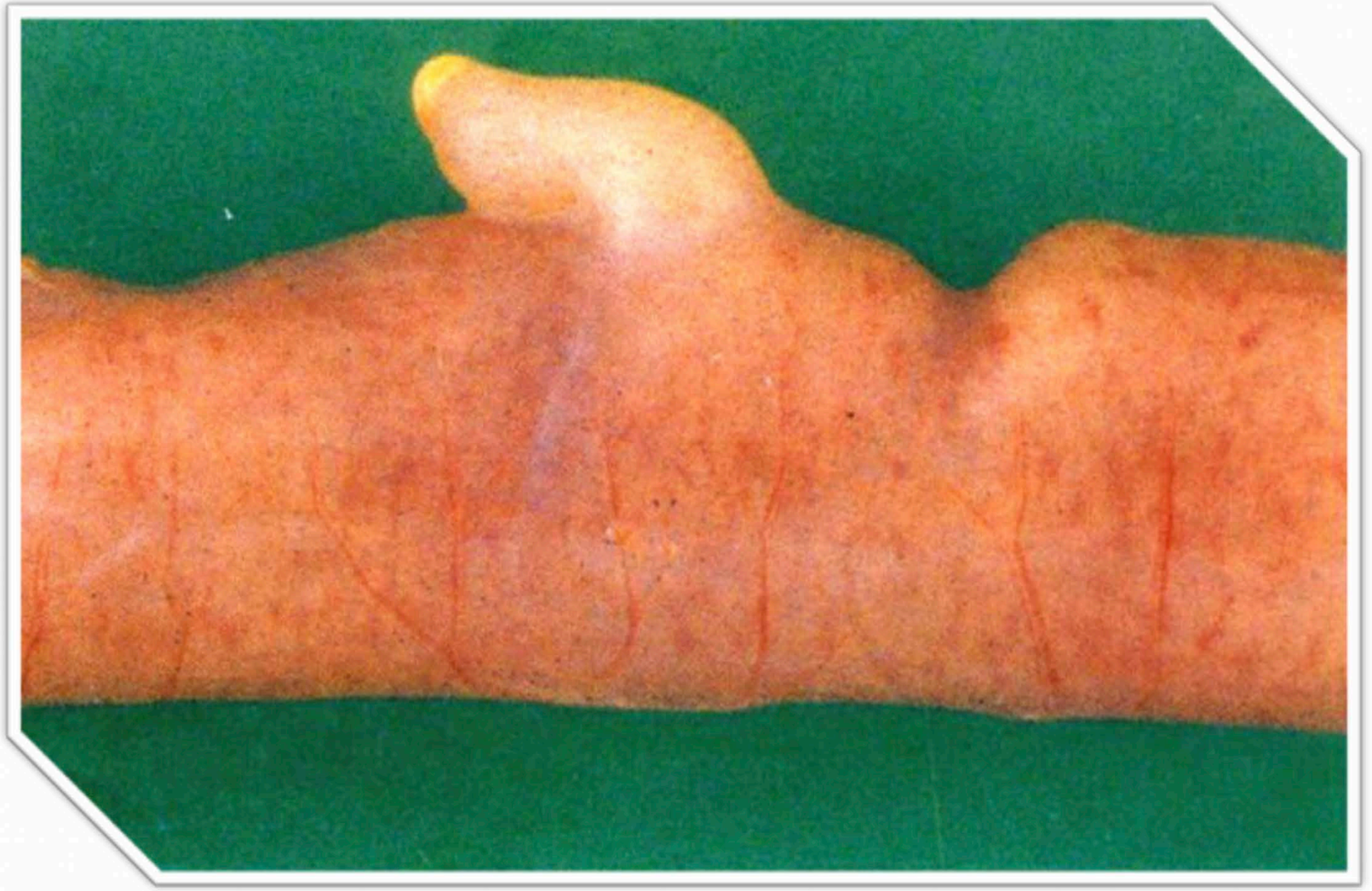
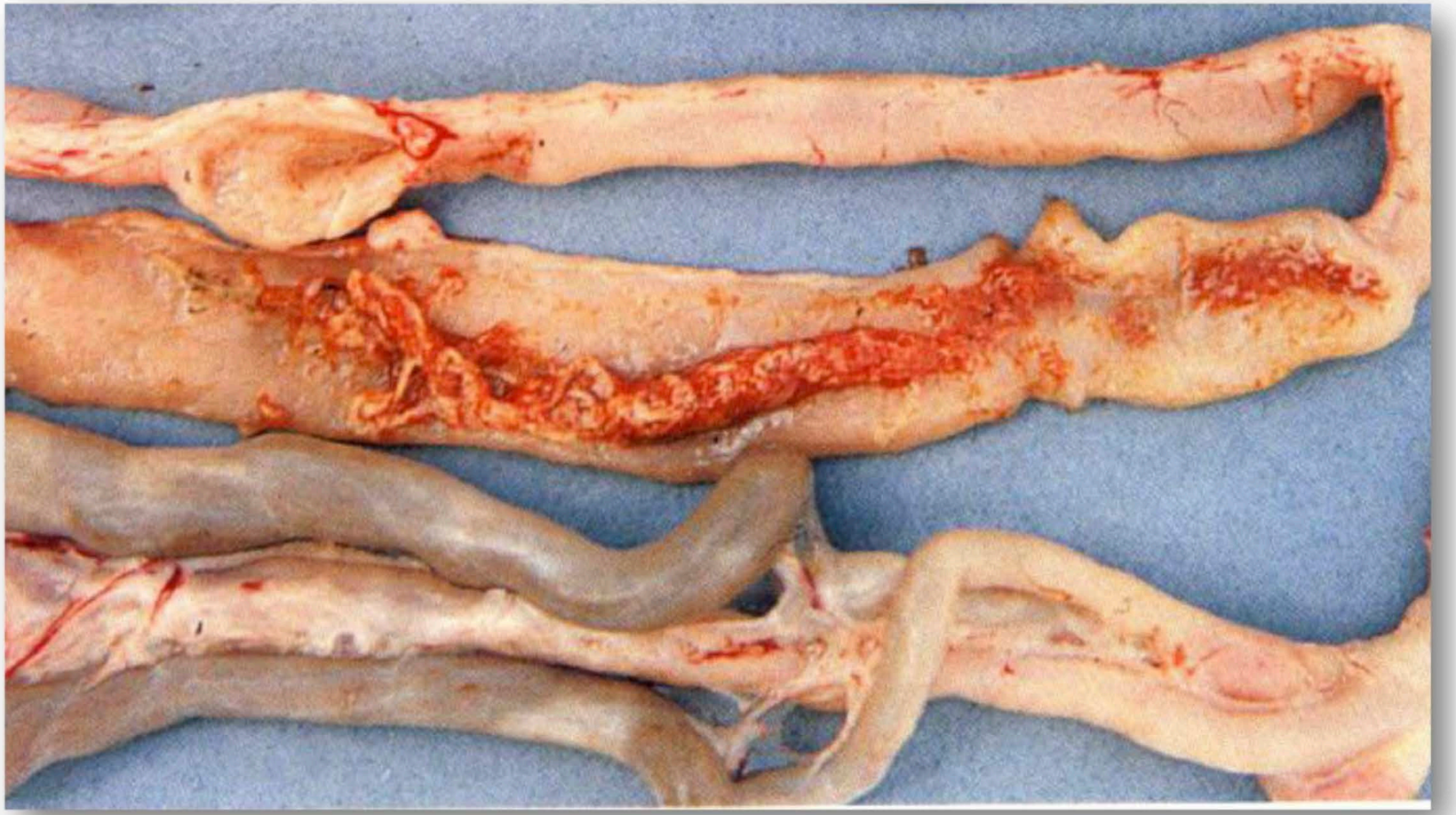
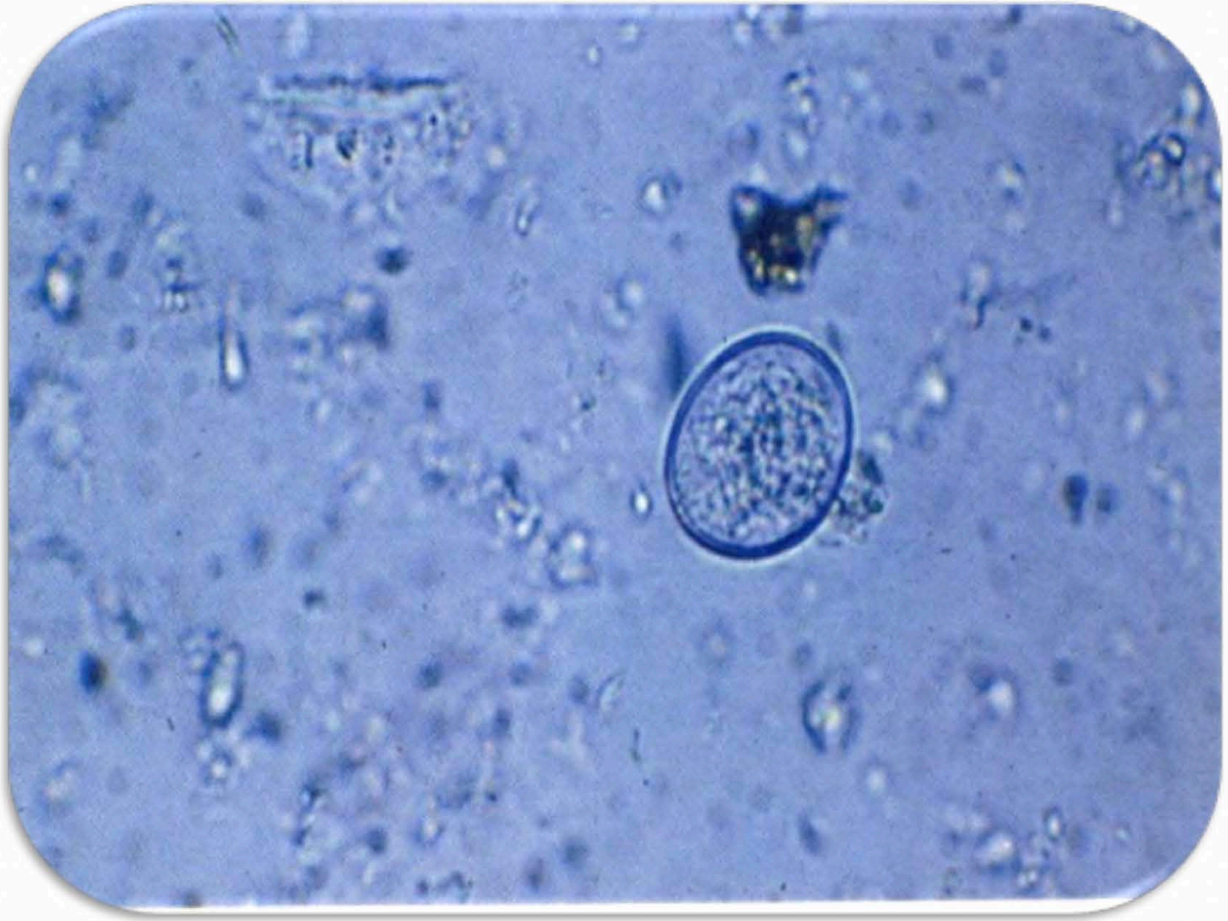


Mid intestinal Coccidiosis - *Eimeria maxima*

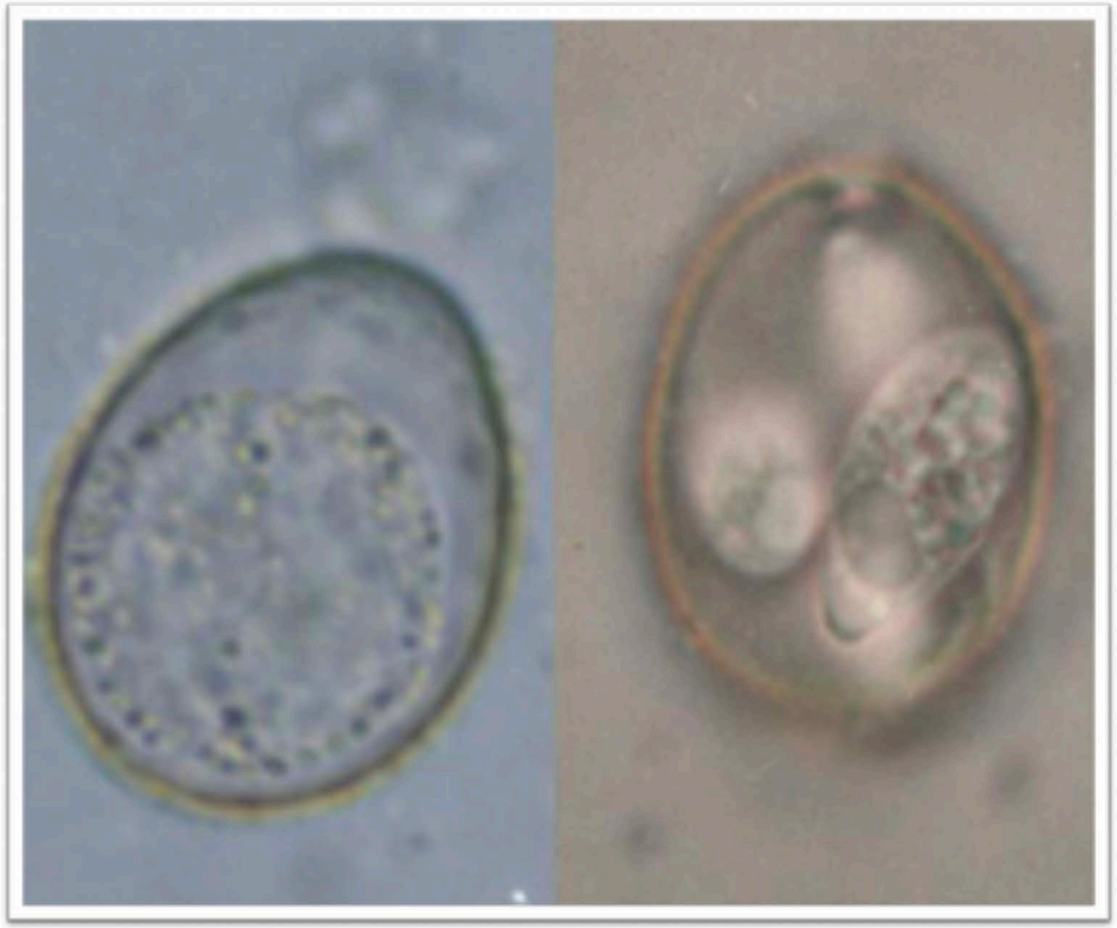


Slimy Orange colour flecks

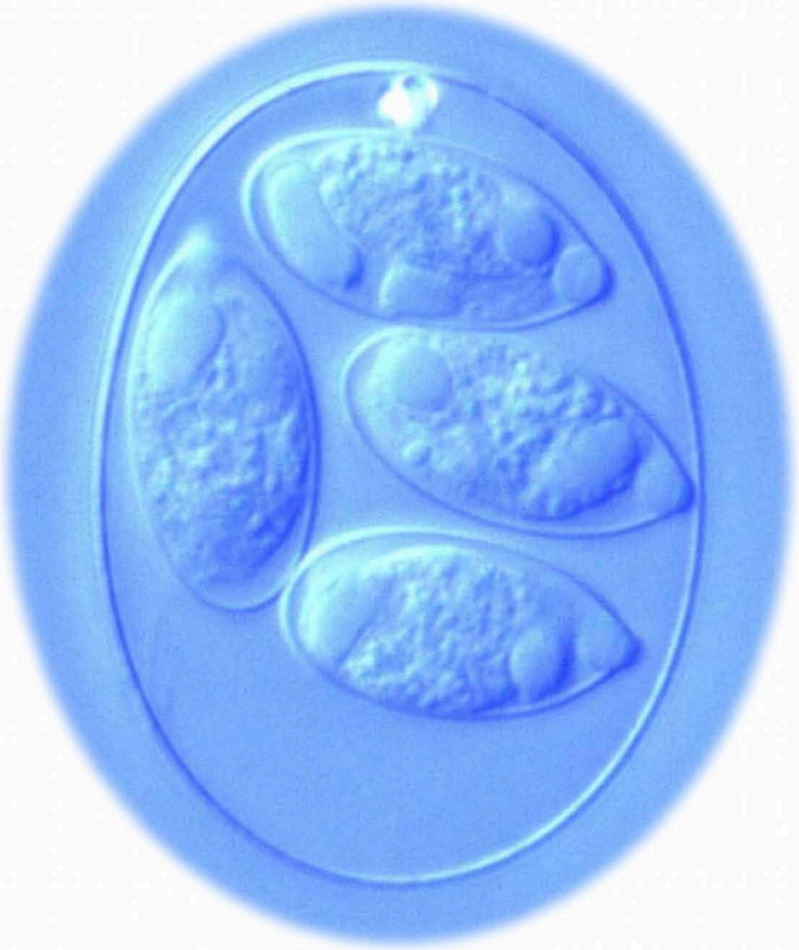
Mid intestinal Coccidiosis - *Eimeria maxima* Unsporulated Oocyst



Mid intestinal Coccidiosis - *Eimeria maxima*
Unsporulated & Sporulated Oocyst



Sporulated Oocyst



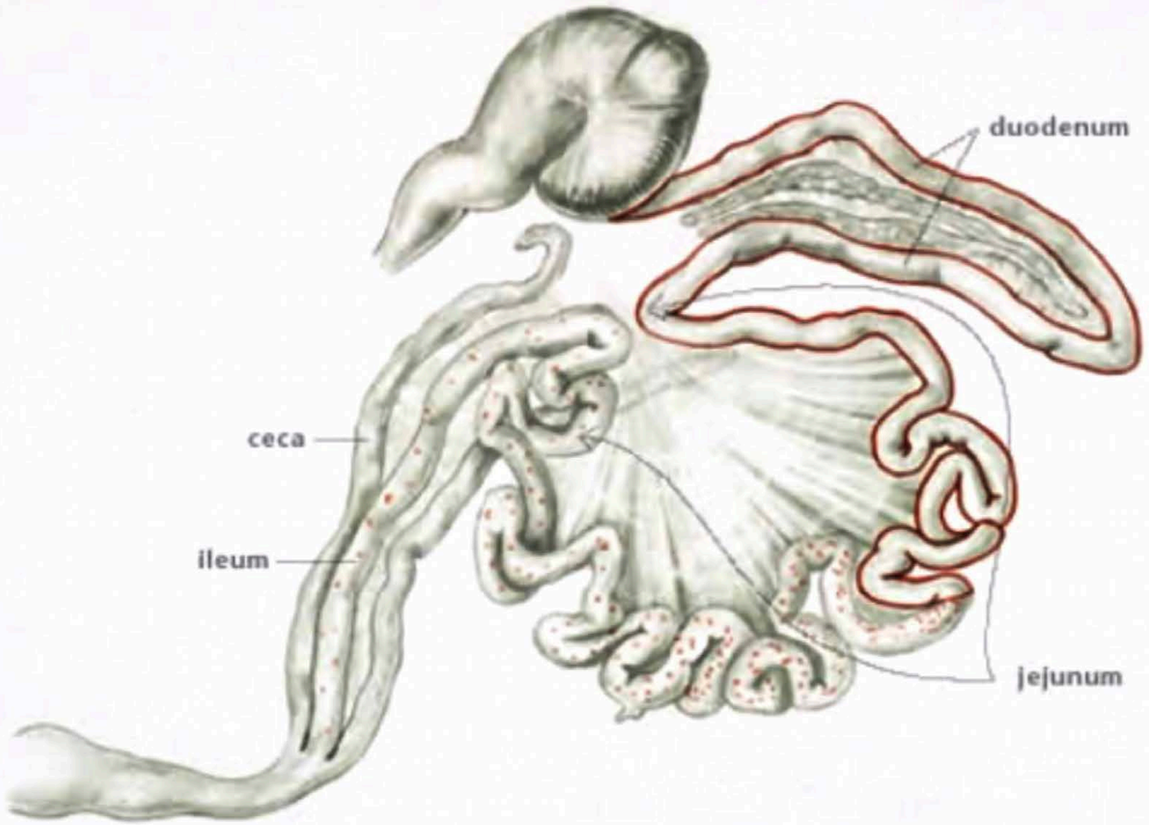
Foregut or Duodenal Coccidiosis

E. acervulina, E. mitis & E. praecox

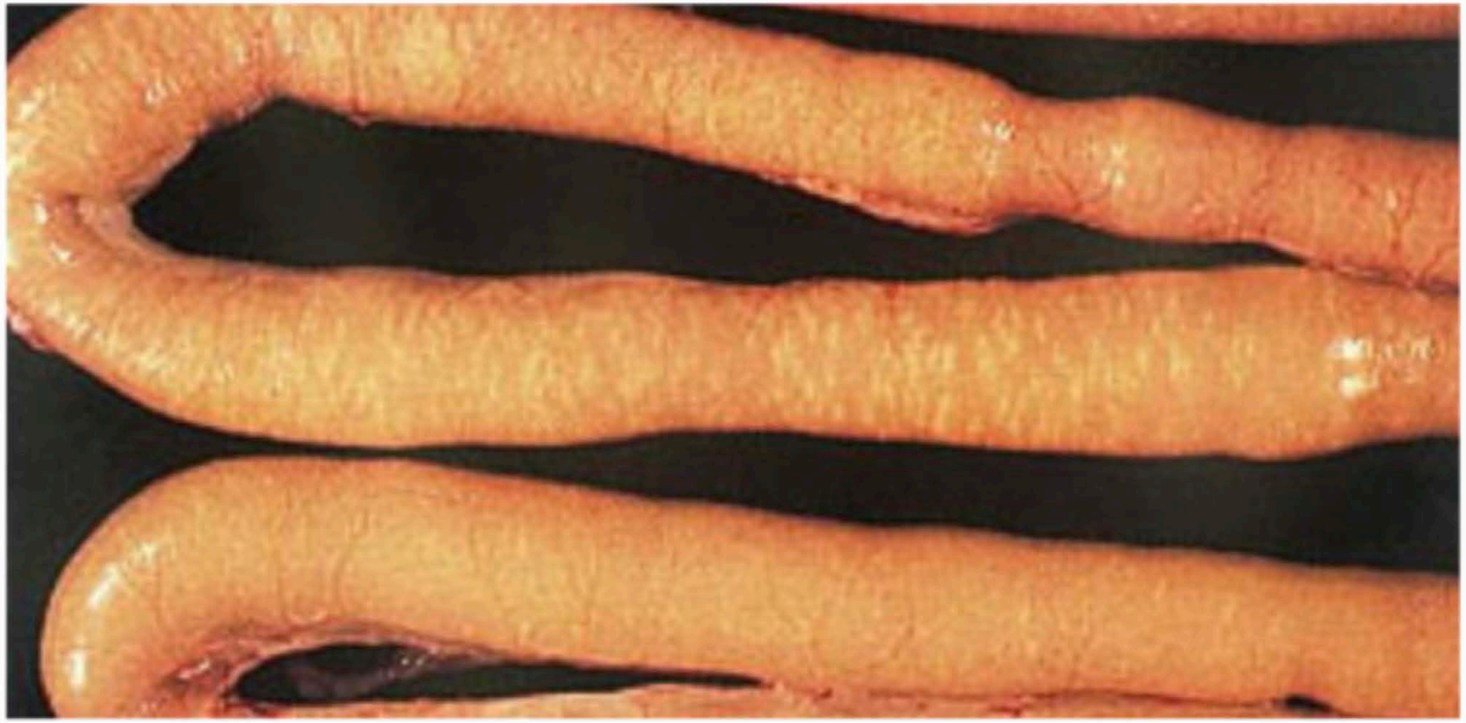
E. acervulina

- - Major species predominant
- - Moderate – severely pathogenic
- - Lesion extend Midgut or still further
- - Mild infection - Whitish transverse streak in duodenum
- - ***Ladder like bands*** visible from both serosal and mucosal surface
- - Severe infection – intestinal wall thickened, congested – mucoid enteritis

Anterior Intestinal Coccidiosis – *Eimeria acervulina Site*

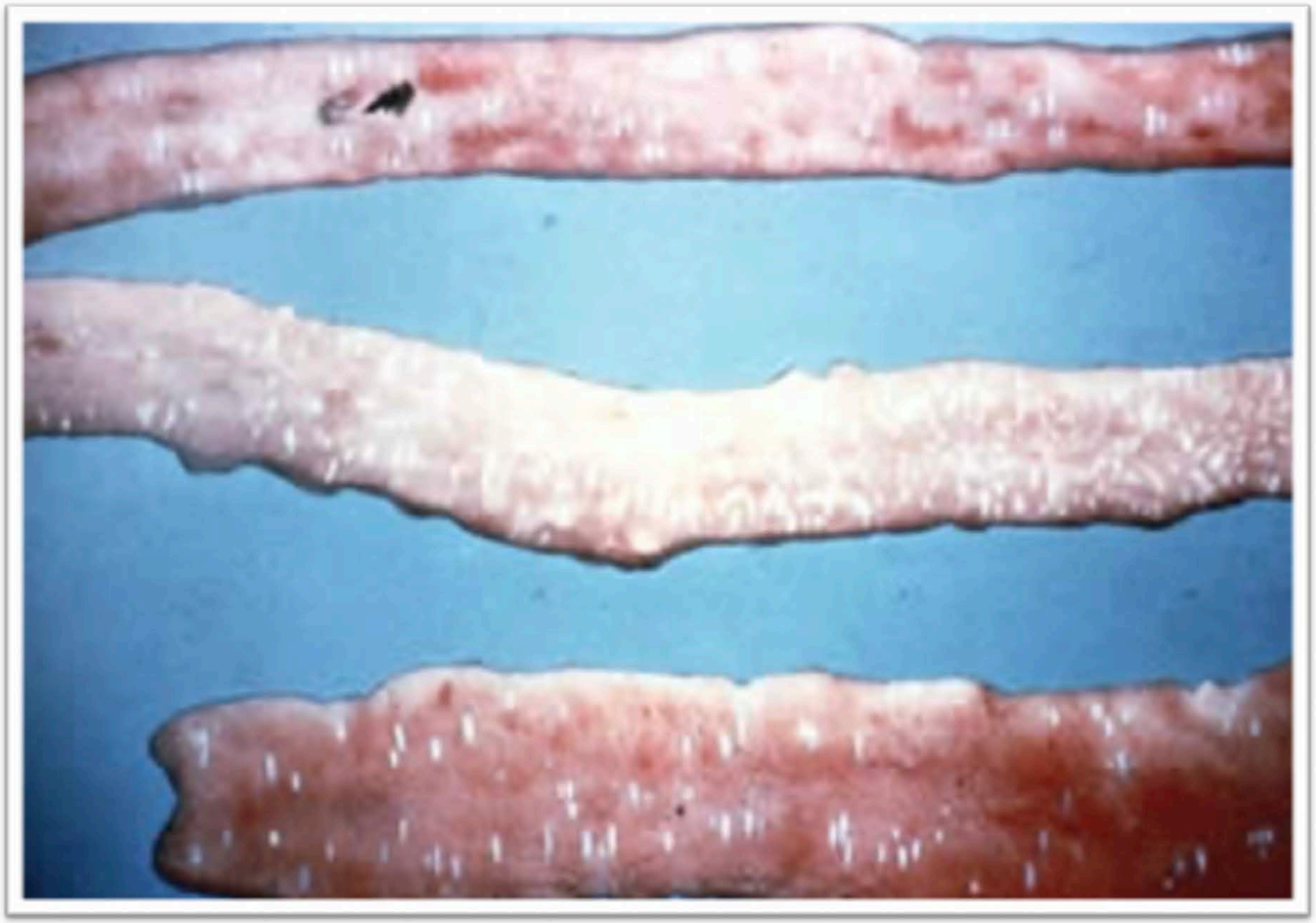


Anterior intestinal Coccidiosis – *Eimeria acervulina*



Ladder-like markings

Anterior intestinal Coccidiosis – *Eimeria acervulina*



Anterior intestinal Coccidiosis – *Eimeria acervulina*

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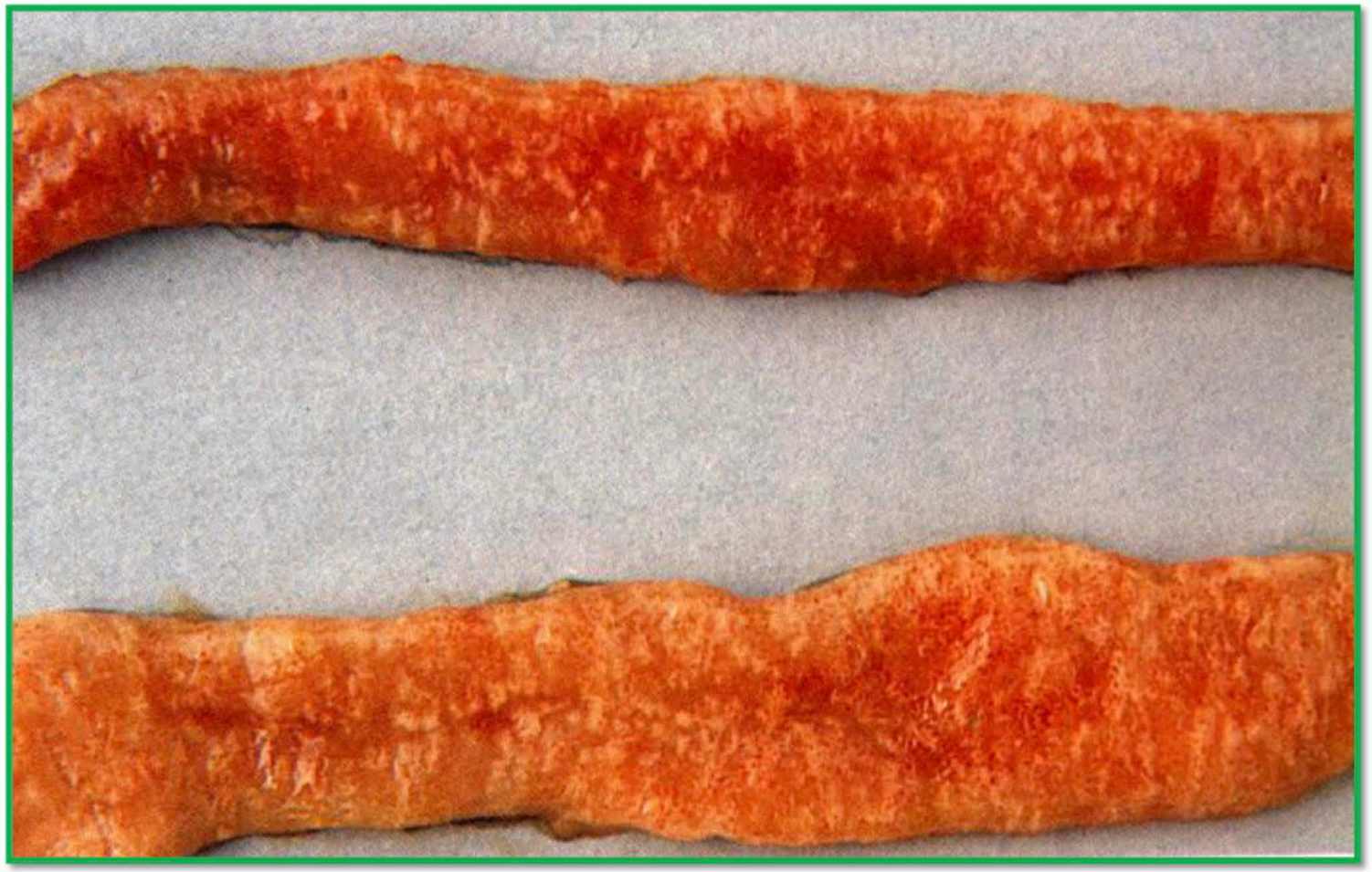
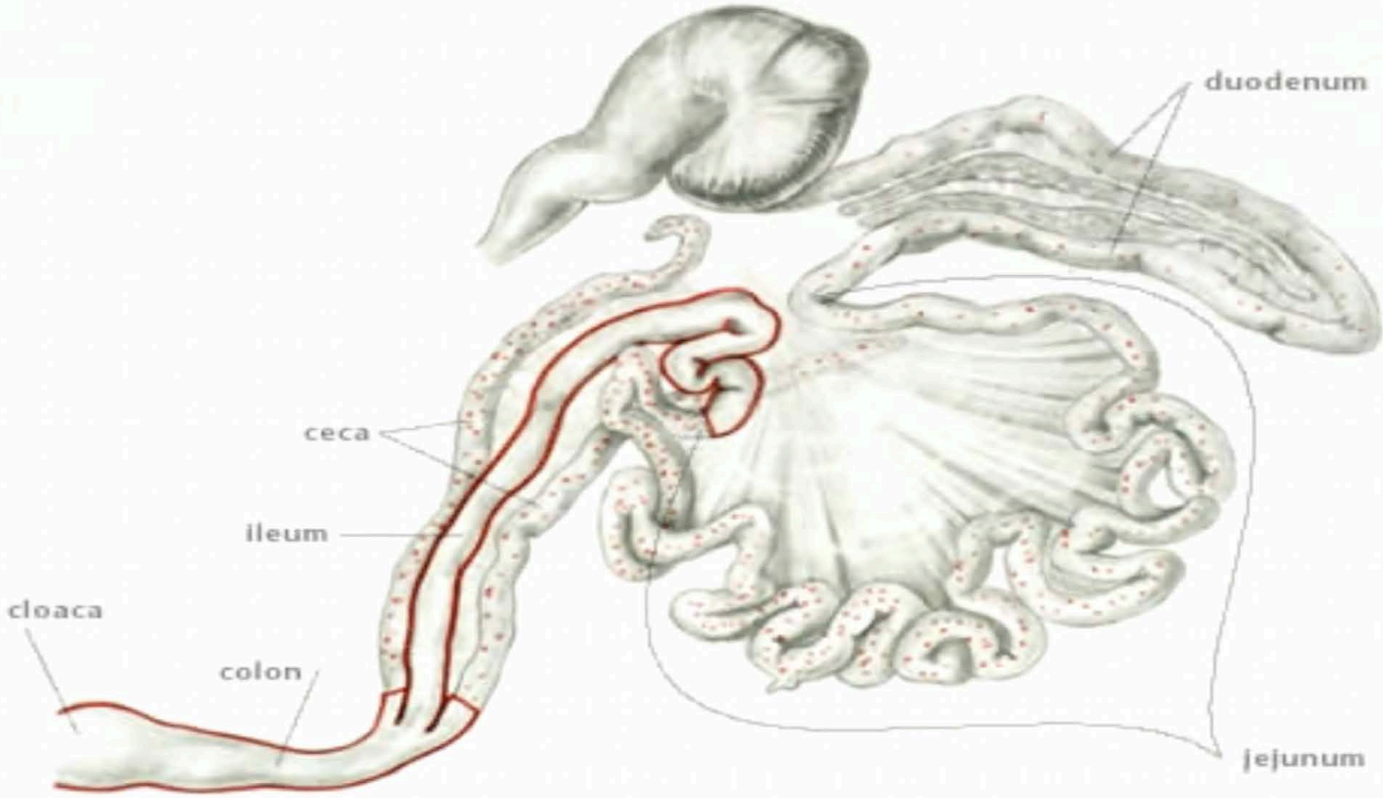


Hindgut or Ileo-rectal Coccidiosis

E. brunetti

- Occurs severely on 4-9 weeks & also occurs in adults.
- Location behind Yolk Sac diverticulum to rectum and caeca
- Gut wall thickened, ***diphtheritic inflammation, coagulative necrosis,*** haemorrhagic streaks in mucosa
- Contents blood stained, eroded fine shreds of mucosa ***(Rice bran like)***, blockage of rectum, droppings pinkish
- Mucosal scrapings – large No. of oocysts

Hind intestinal (or) Rectal Coccidiosis – *Eimeria brunetti Site*



Hind intestinal (or) Rectal Coccidiosis – *Eimeria brunetti*

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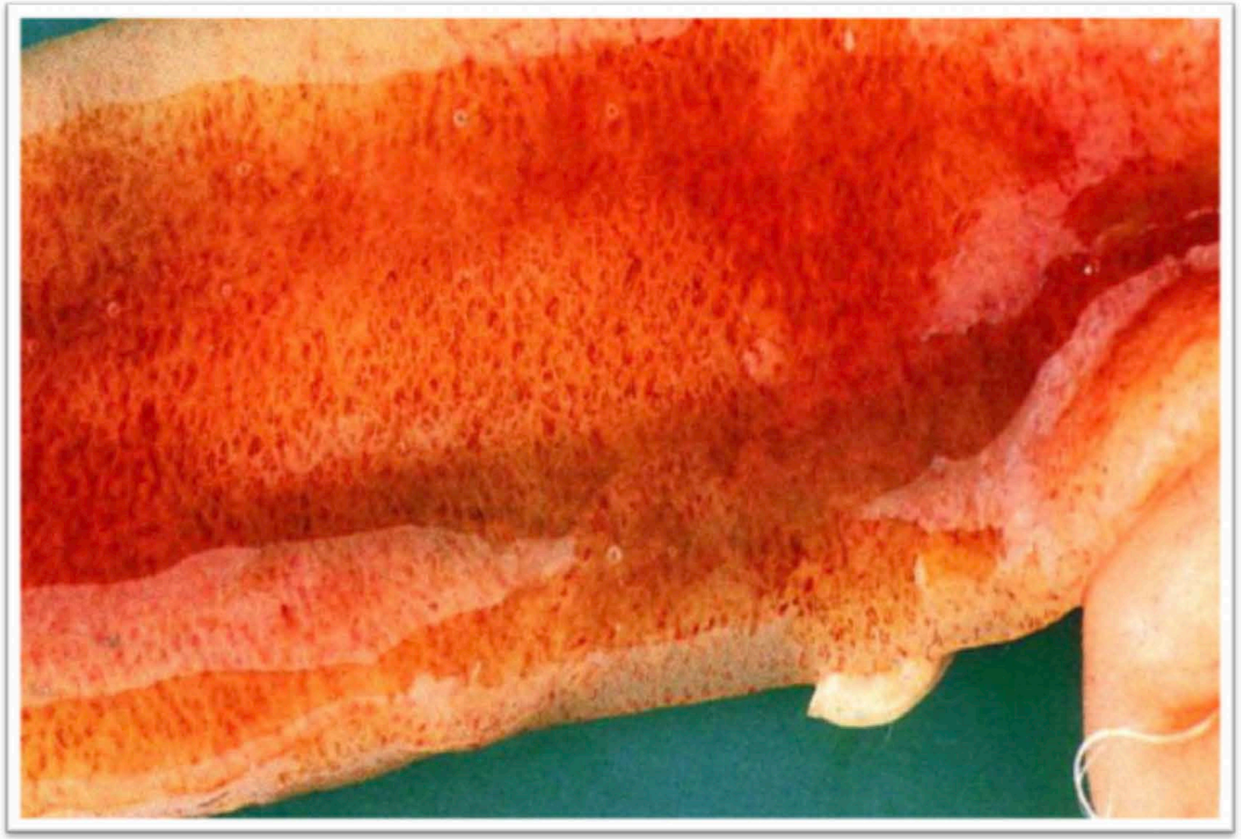
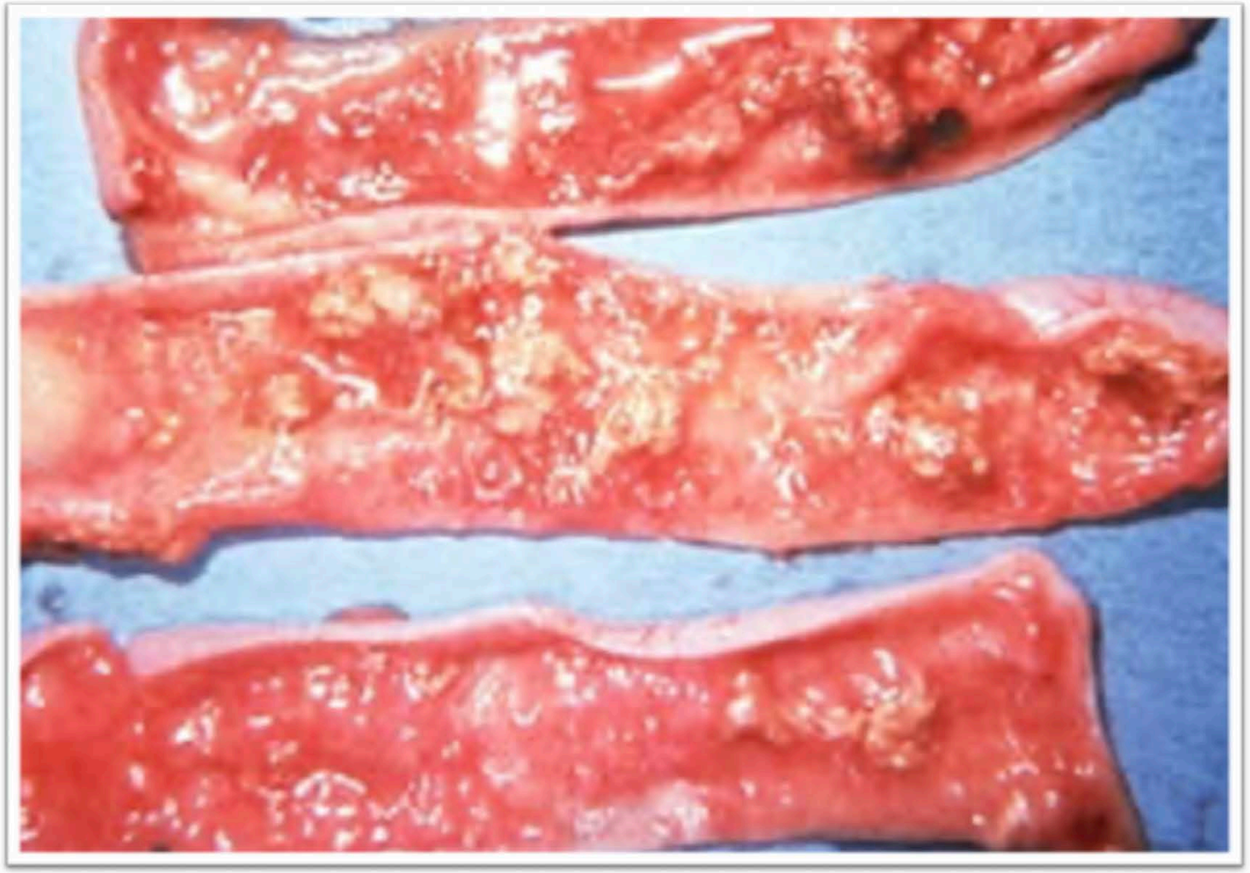


Salmon coloured flecks

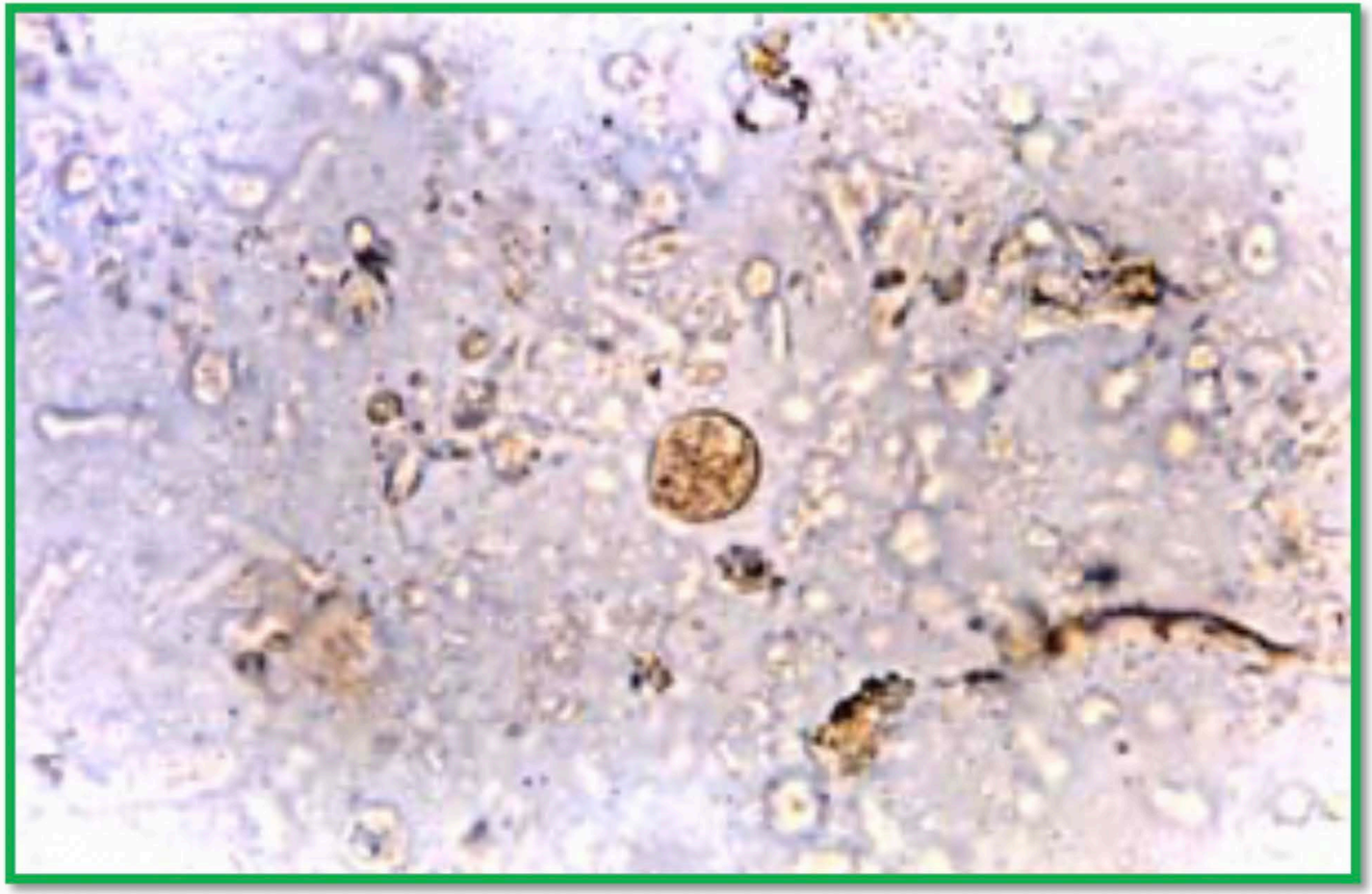
Hind intestinal (or) Rectal Coccidiosis – *Eimeria brunetti*



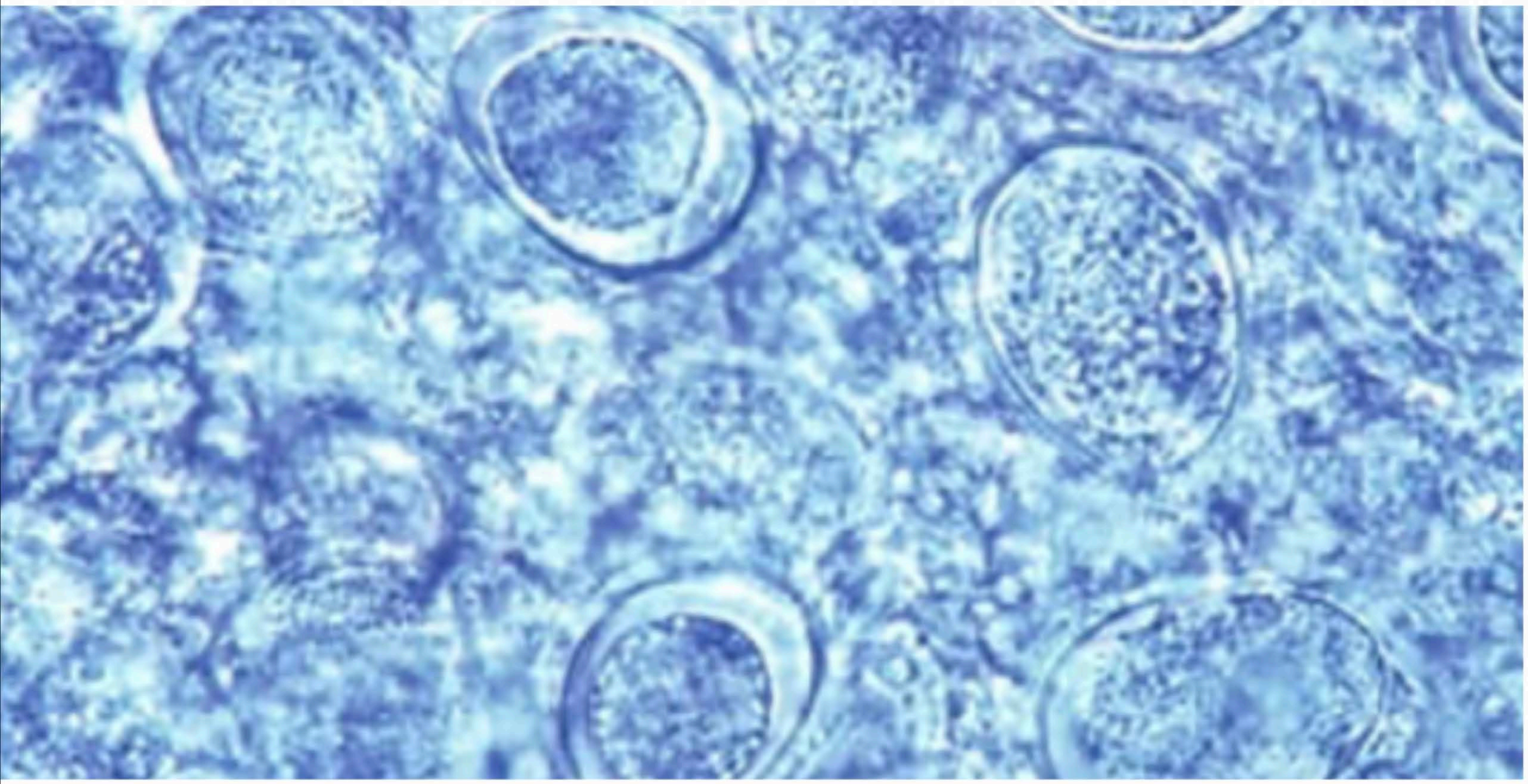
Hind intestinal (or) Rectal Coccidiosis – *Eimeria brunetti*

Rice –bran like materials in hind intestine

Hindintestinal (or) Rectal Coccidiosis – *Eimeria brunetti - Schizont*



Hindintestinal (or) Rectal Coccidiosis
– *Eimeria brunetti – Unsporulated Oocysts*



Hindintestinal (or) Rectal Coccidiosis
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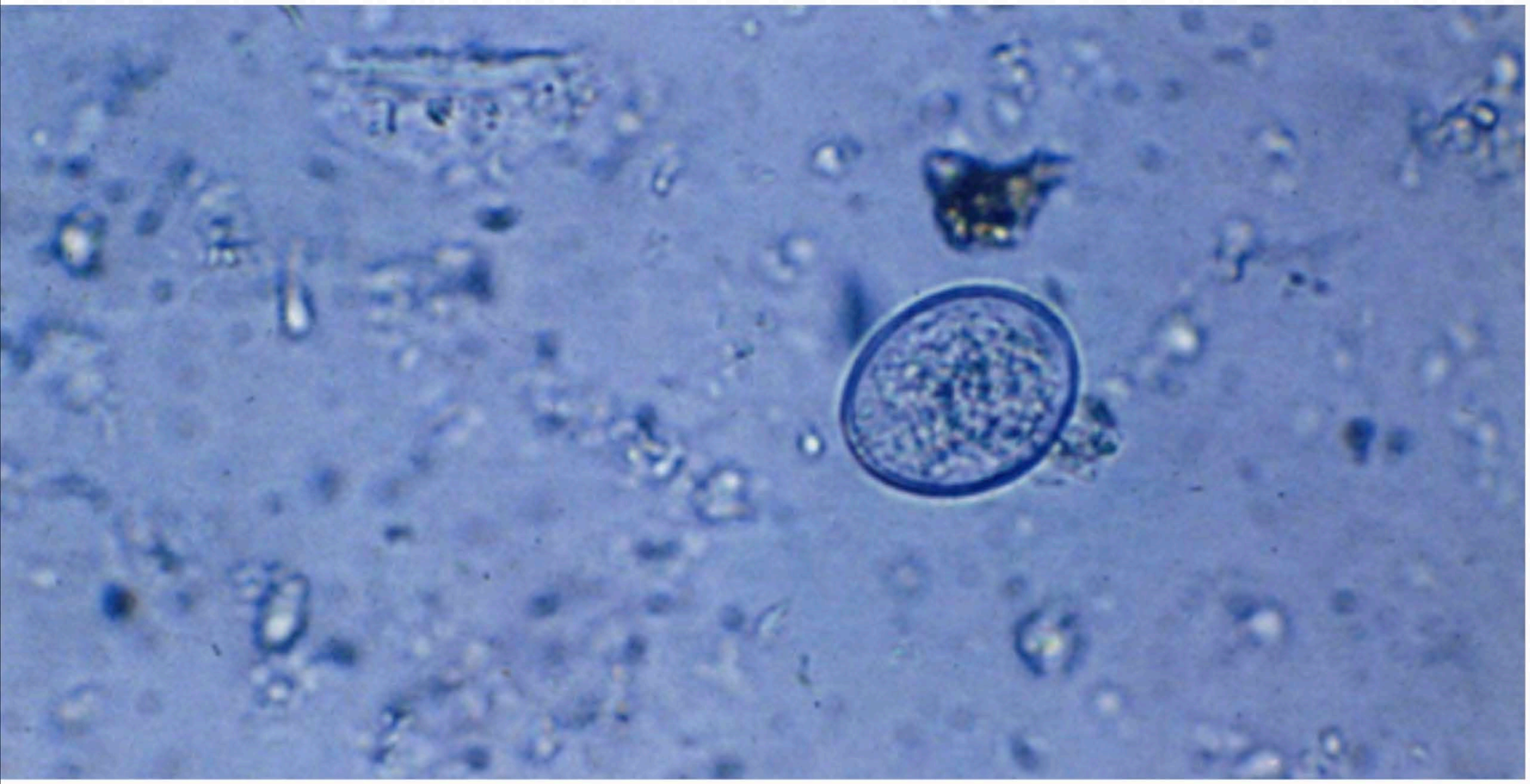
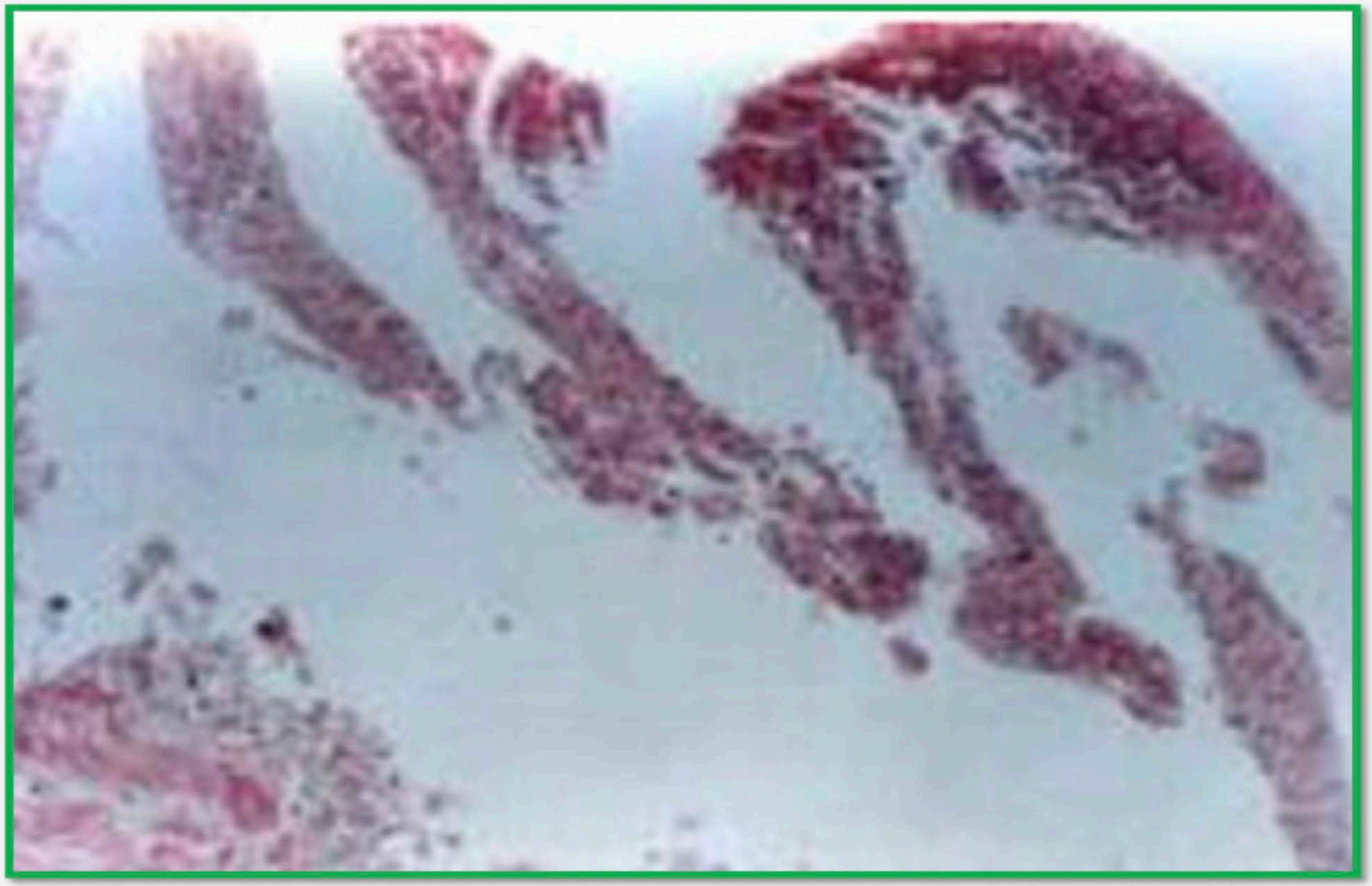


Hindintestinal (or) Rectal Coccidiosis – Eimeria brunetti – Intestine HP- H & E



Foregut or Duodenal Coccidiosis

E. mitis & E. praecox

- less pathogenic and rare

E. mivati & E. hagani – regarded
by coccidiologist as of doubtful validity

SUMMARY OF PM DIAGNOSIS

PM LESIONS	*EIMERIA* SPECIES
CAECAL CORE / CAECAL PLUG	*E. TENELLA*
SALT & PEPPER LIKE LESION	*E. NECATRIX*
SLIMY ORANGE COLOURED FLECKS	*E. MAXIMA*
SALMON COLOURED FLECKS / RICE BRAN LIKE LESION	*E. BRUNETTI*
LADDER LIKE MARKINGS / STREAKS	*E. ACERVULINA*

Microscopical demonstration of stages of chicken coccidia

Caecal Coccidiosis – *Eimeria tenella*

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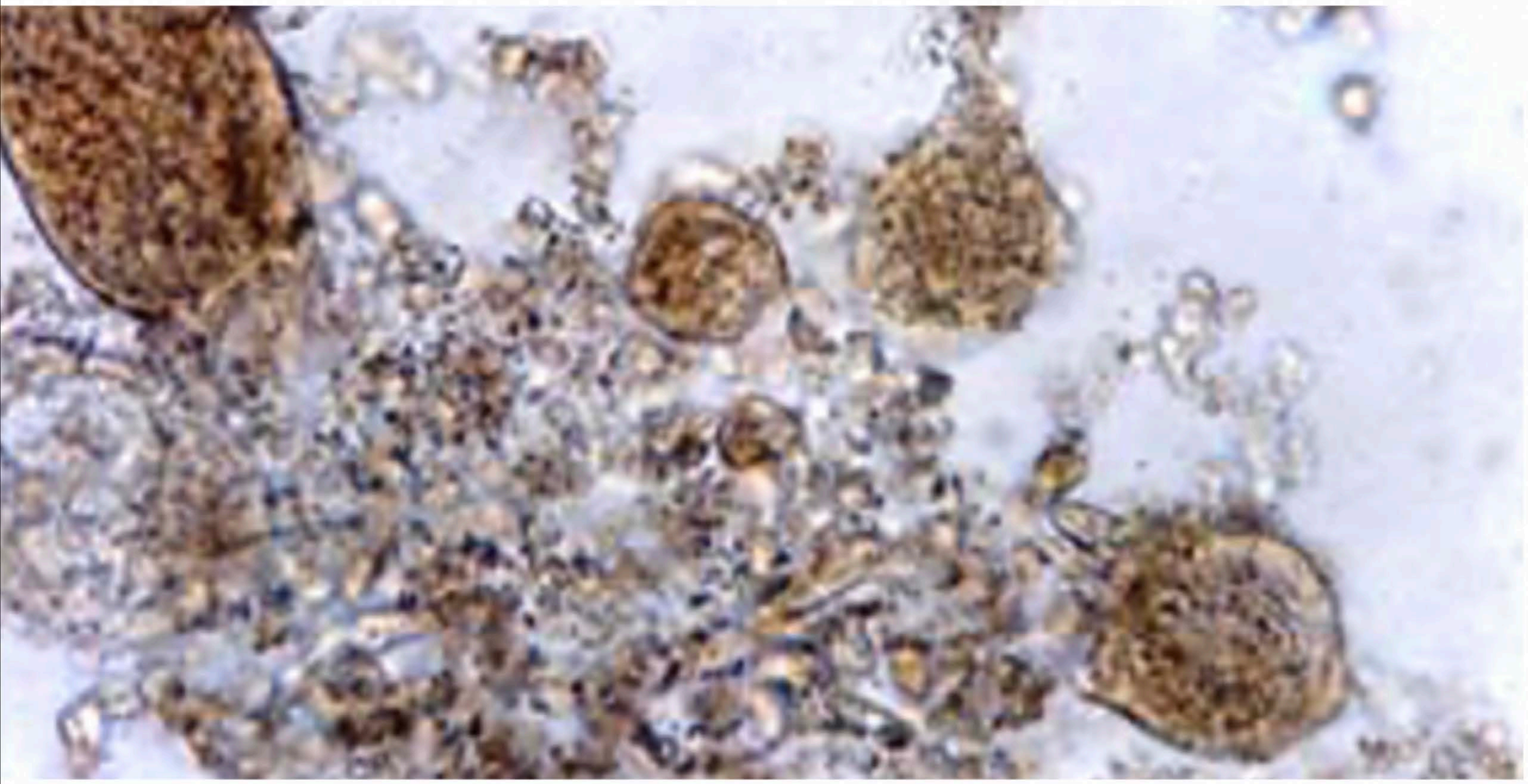
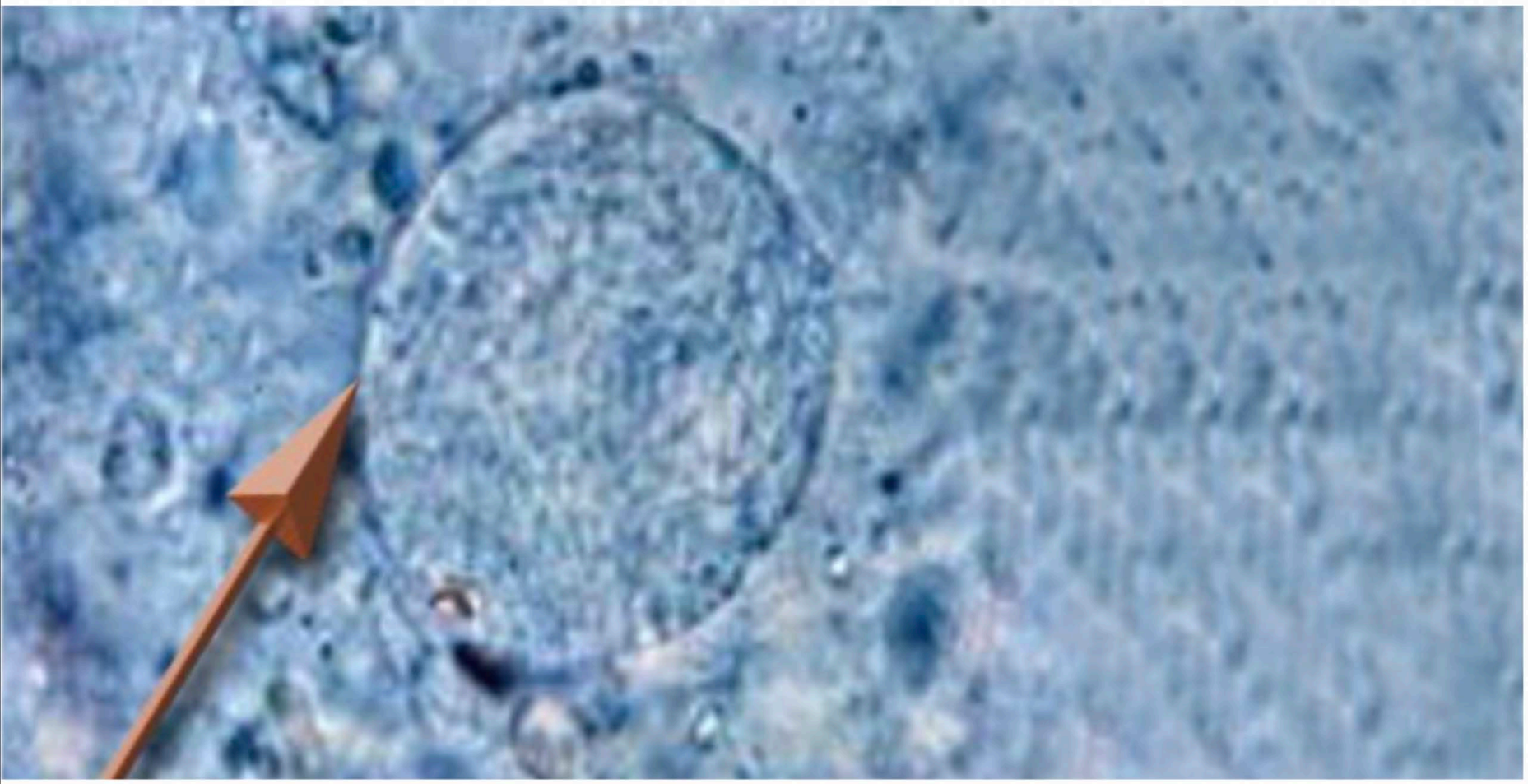
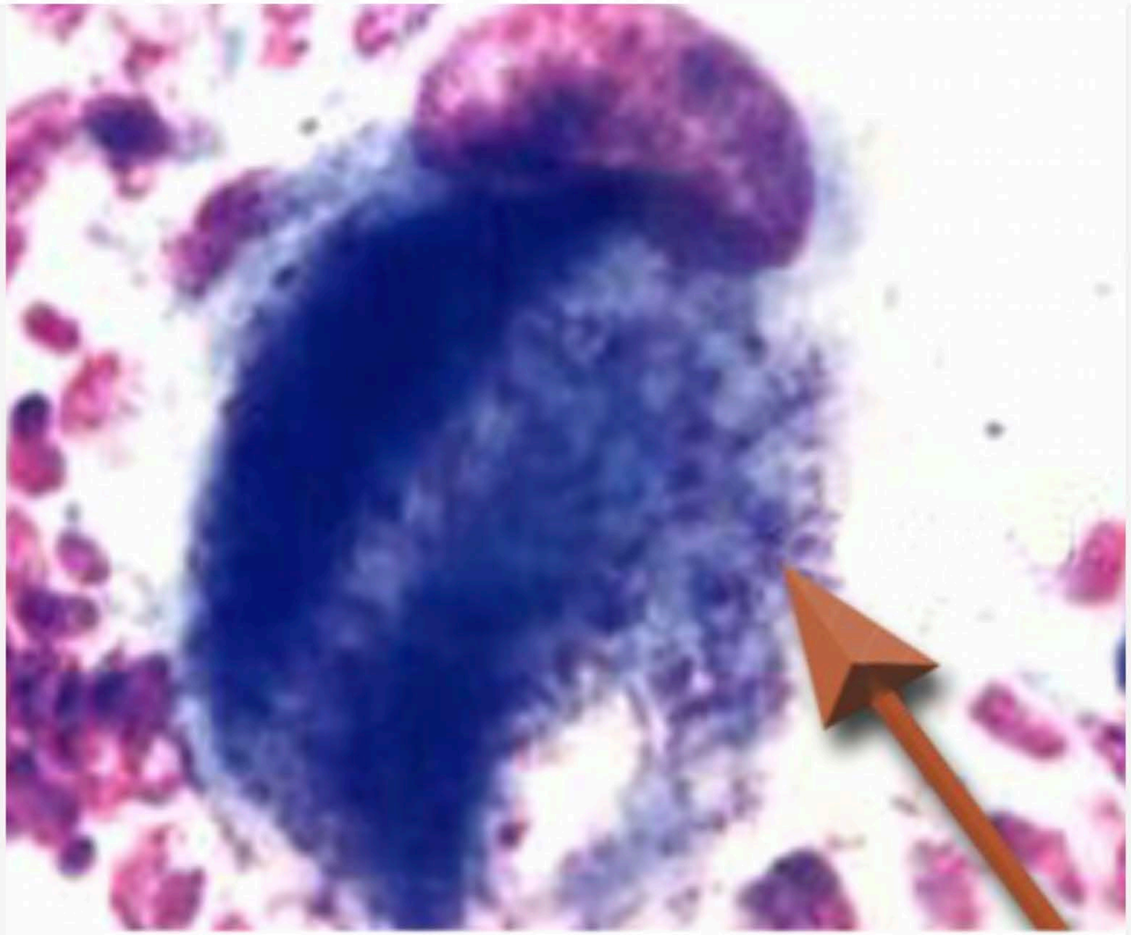
II Generation Schizont



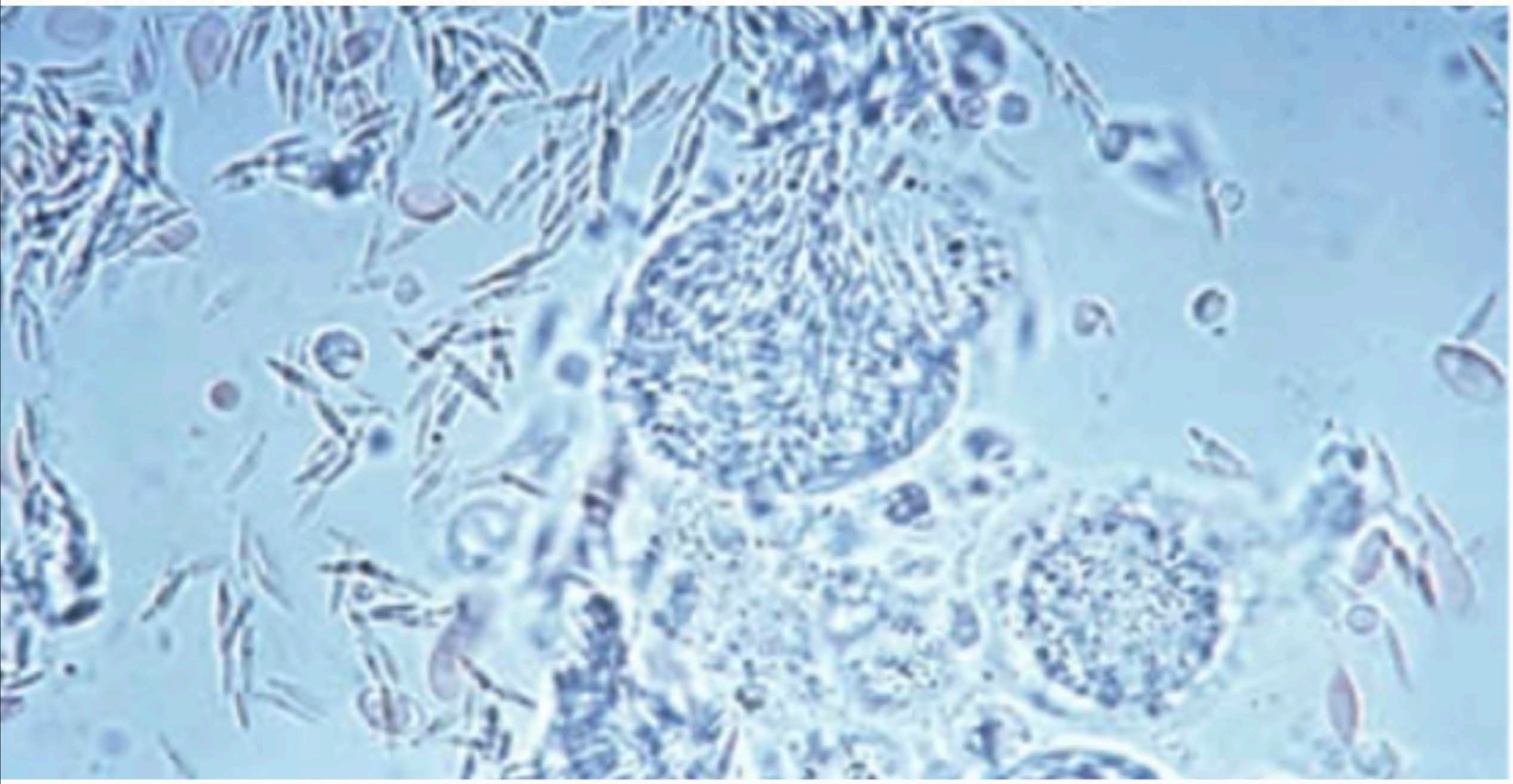
Caecal Coccidiosis – *Eimeria tenella*
II Generation Schizont



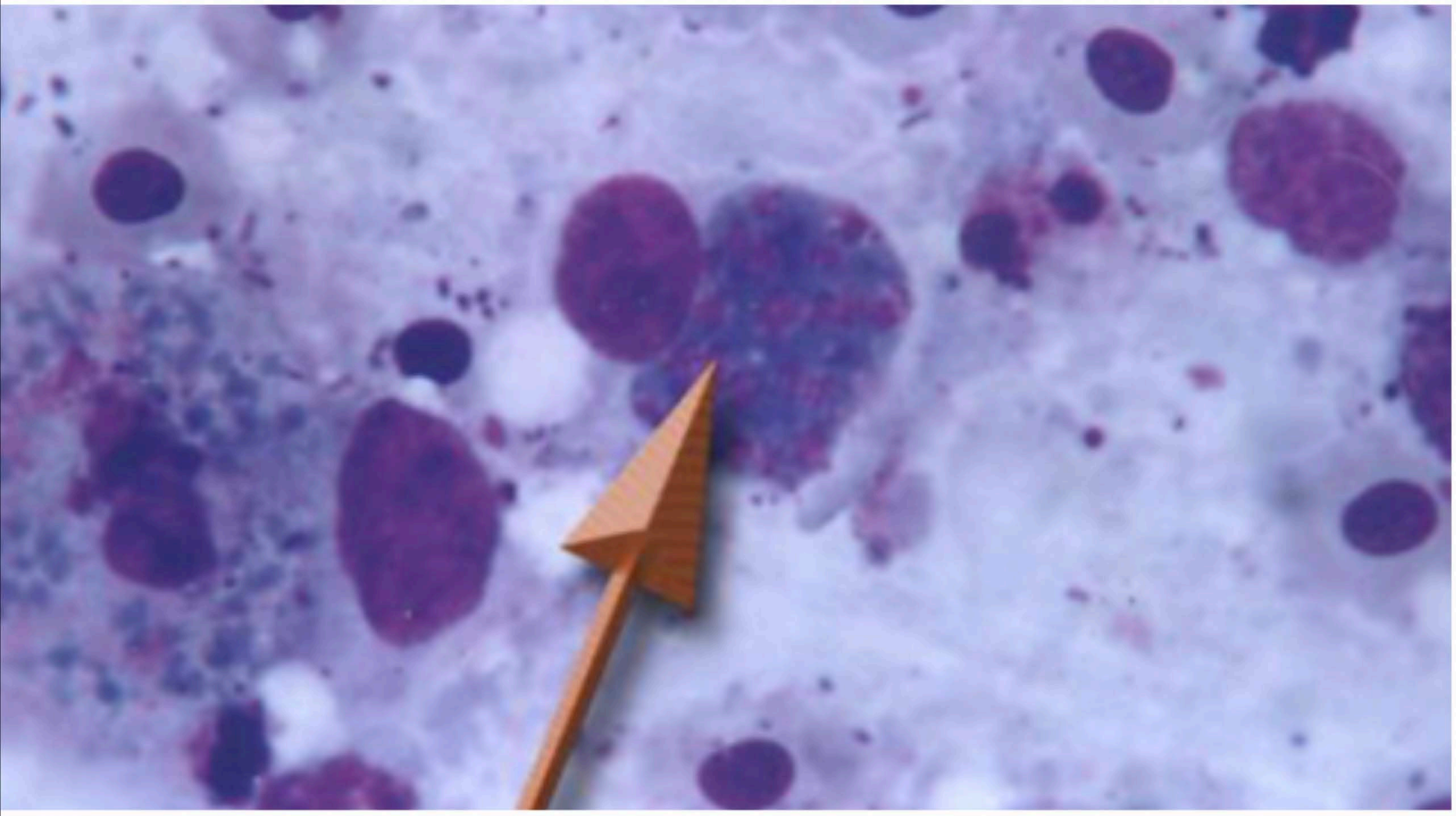
Caecal Coccidiosis – *Eimeria tenella*
II Generation Schizont – Giemsa stained



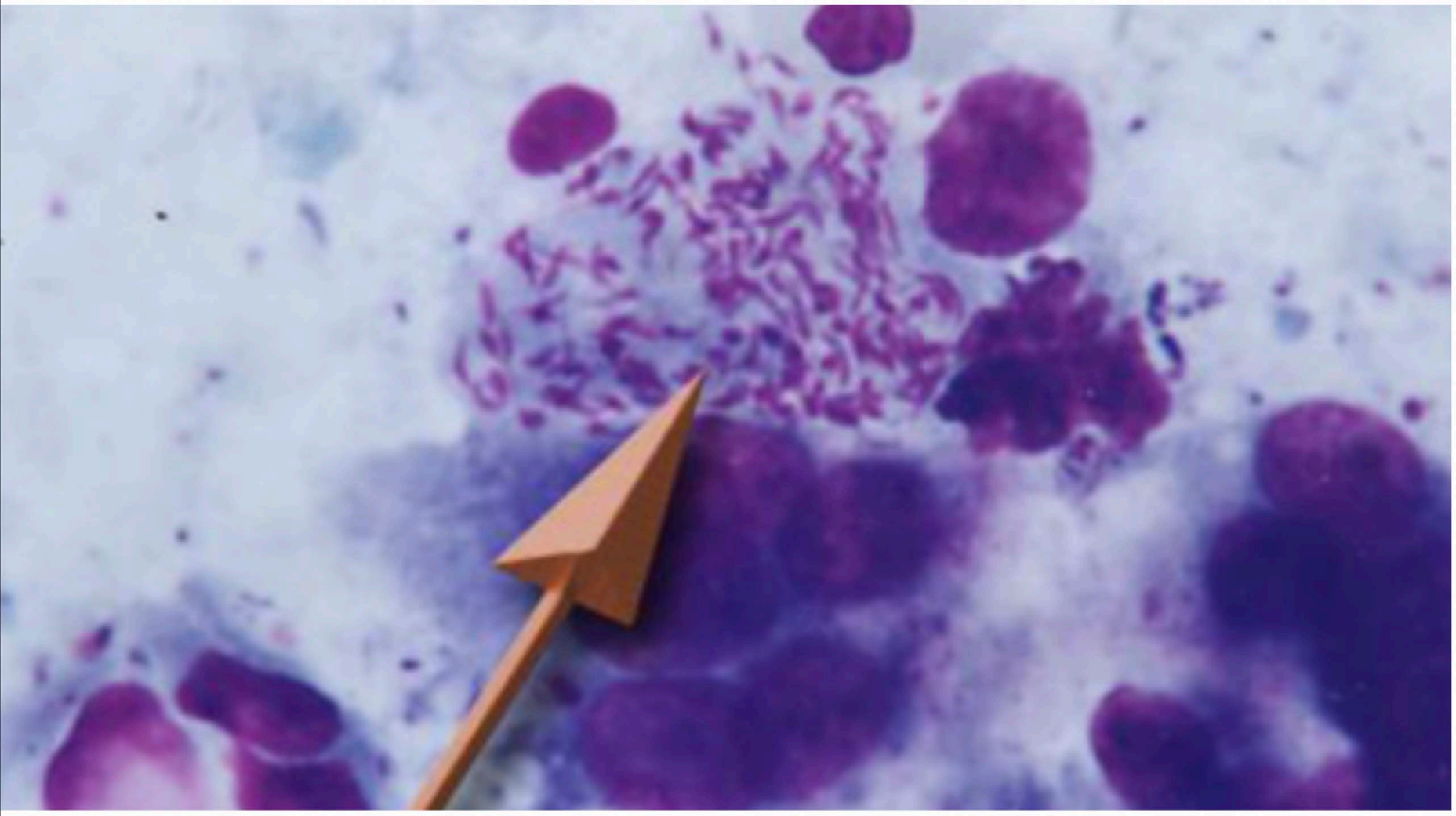
Caecal Coccidiosis – *Eimeria tenella*
II Generation Schizonts liberating Merozoites



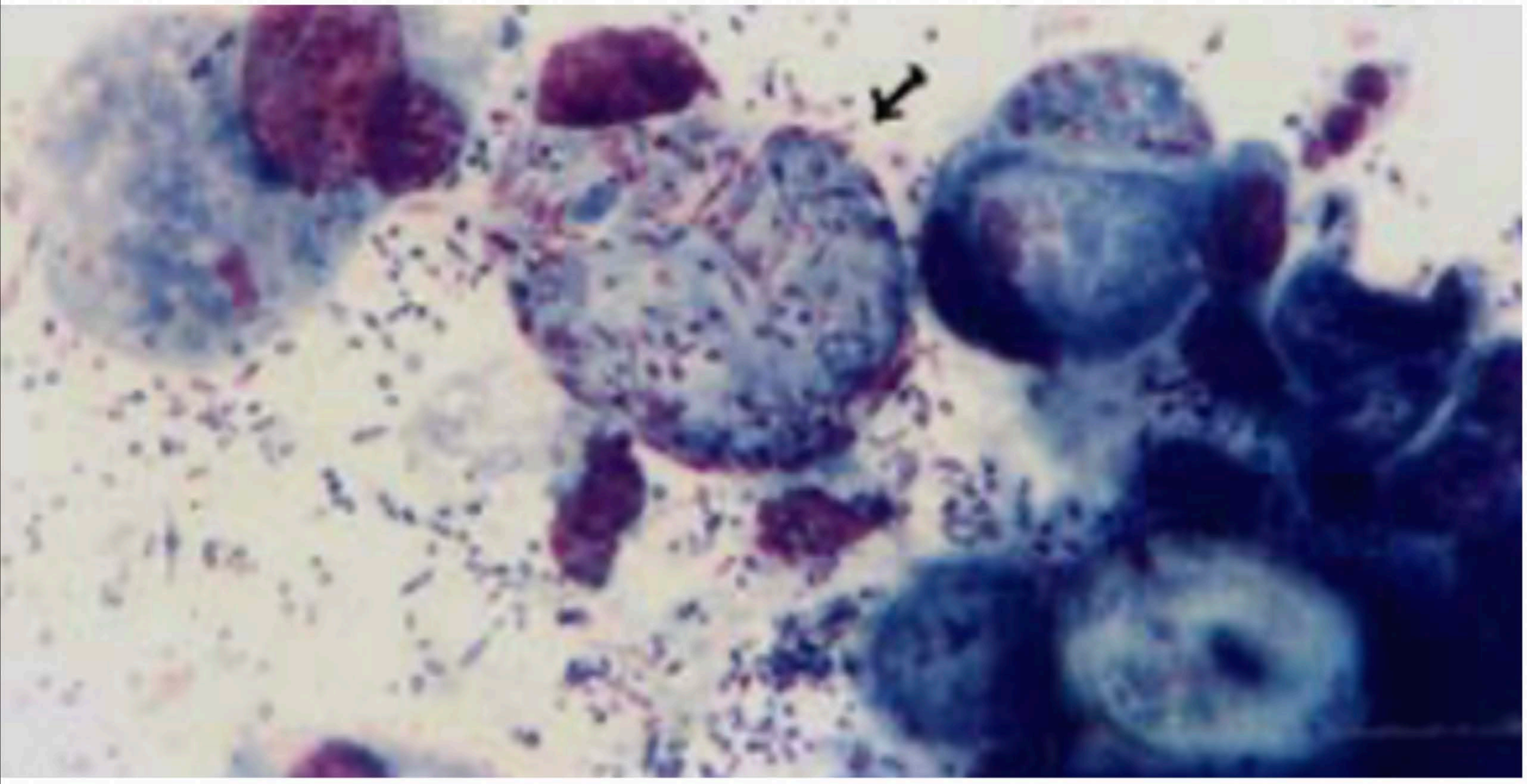
Eimeria tenella - Macrogamont



Eimeria tenella - Microgamont

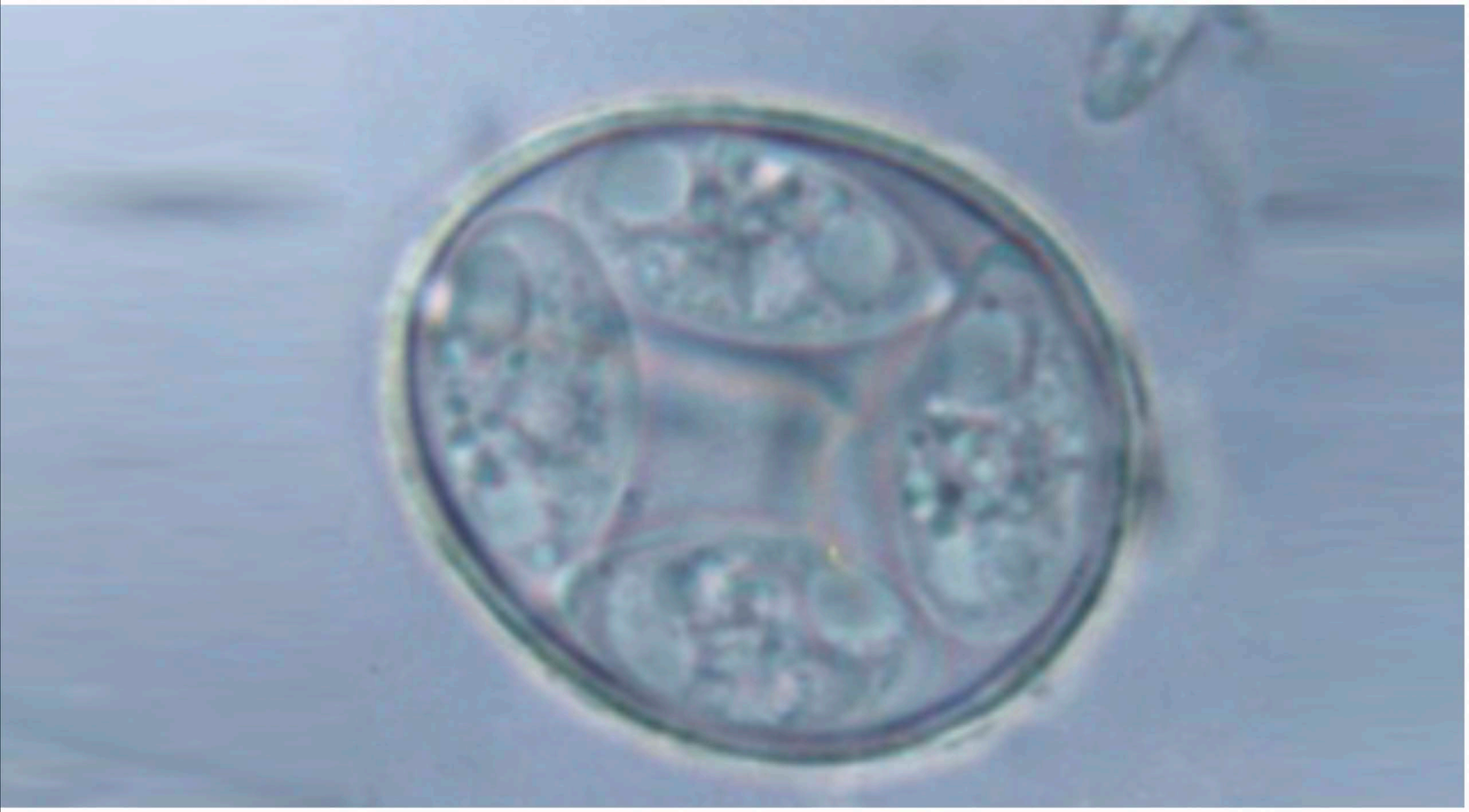


Eimeria tenella – Macro, Microgamont, Oocyst formation

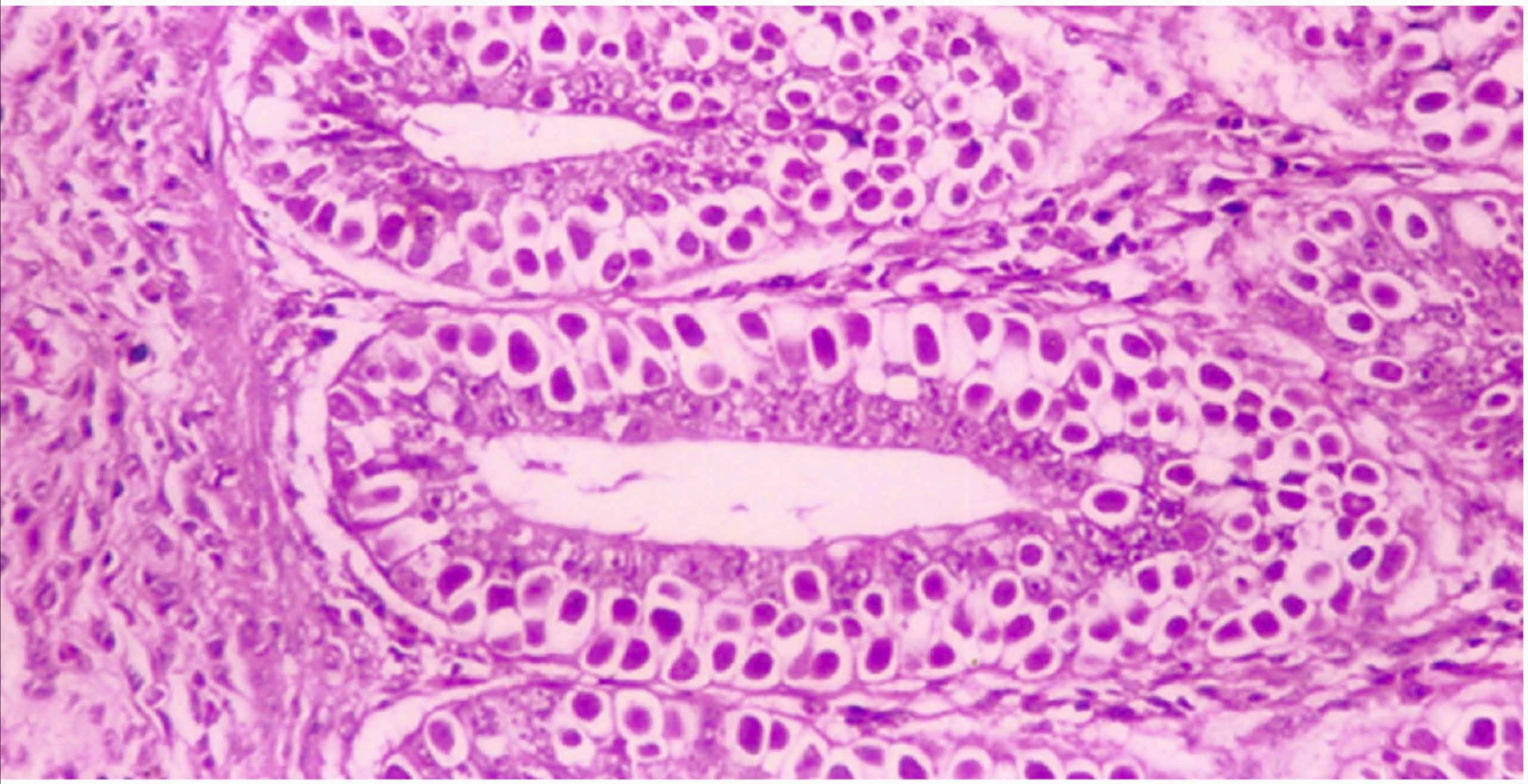


Eimeria tenella – unsporulated oocyst

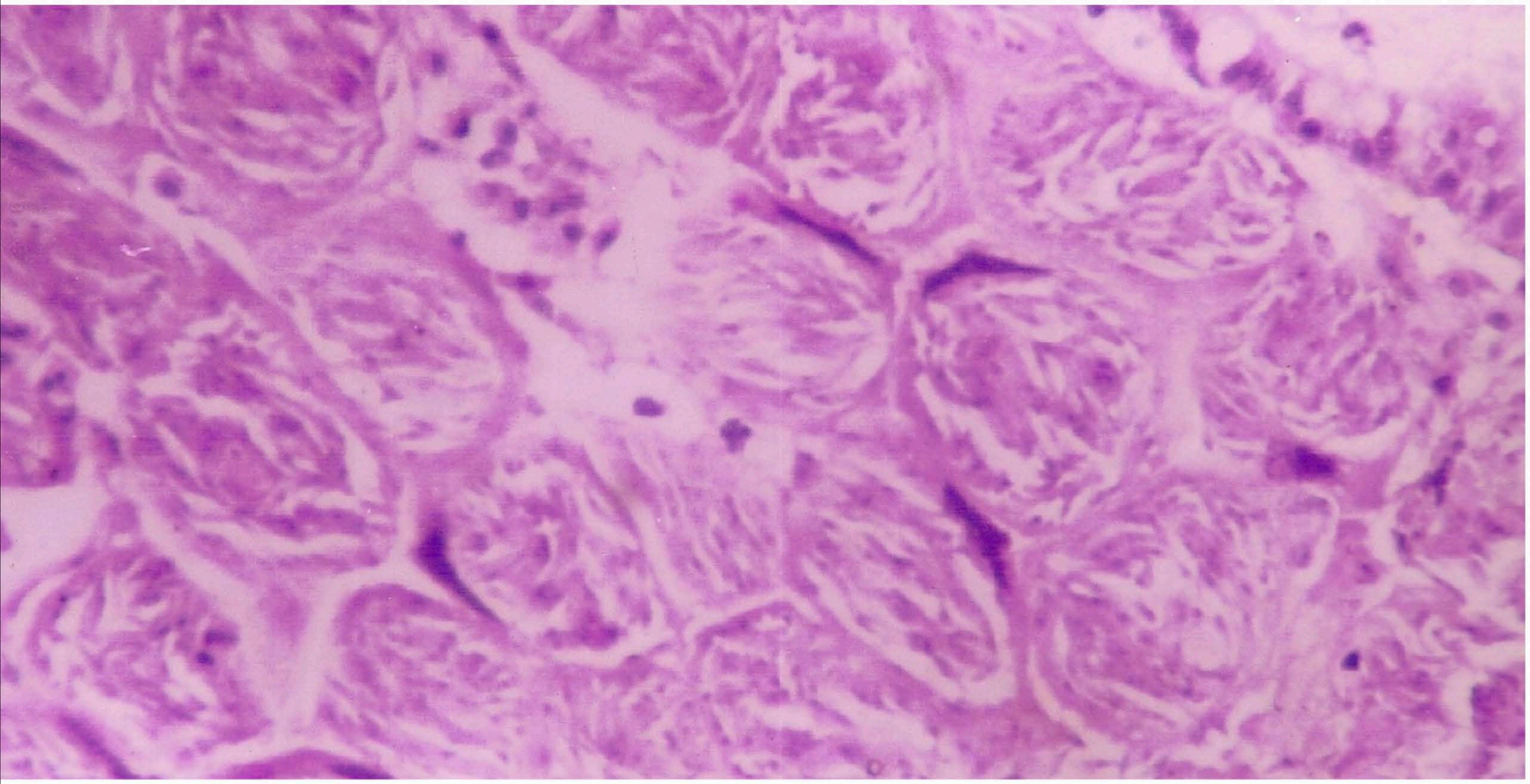
Eimeria tenella – Sporulated oocyst



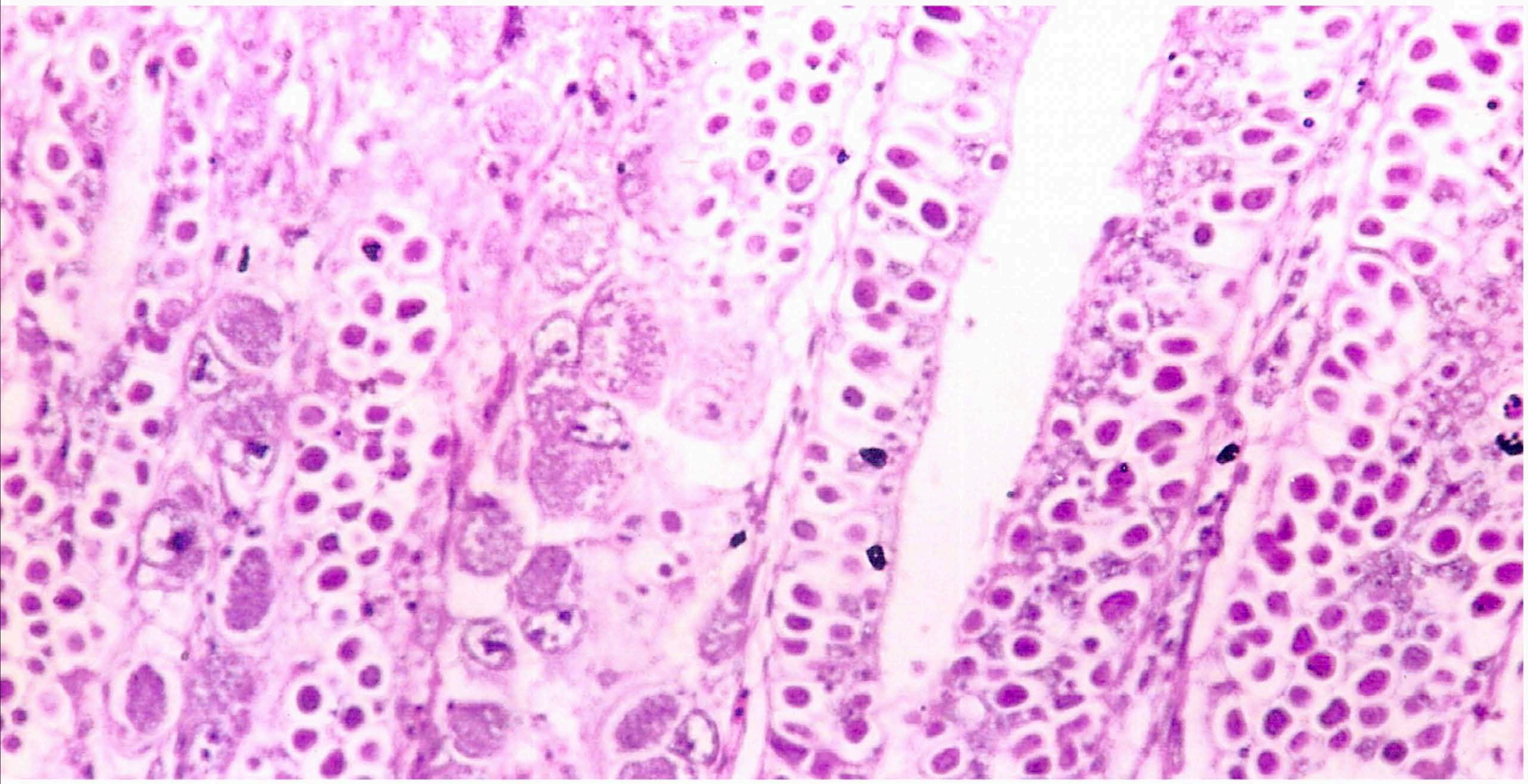
Caecal Coccidiosis – *Eimeria tenella* Developing II Generation Schizont – HP Section H & E stain



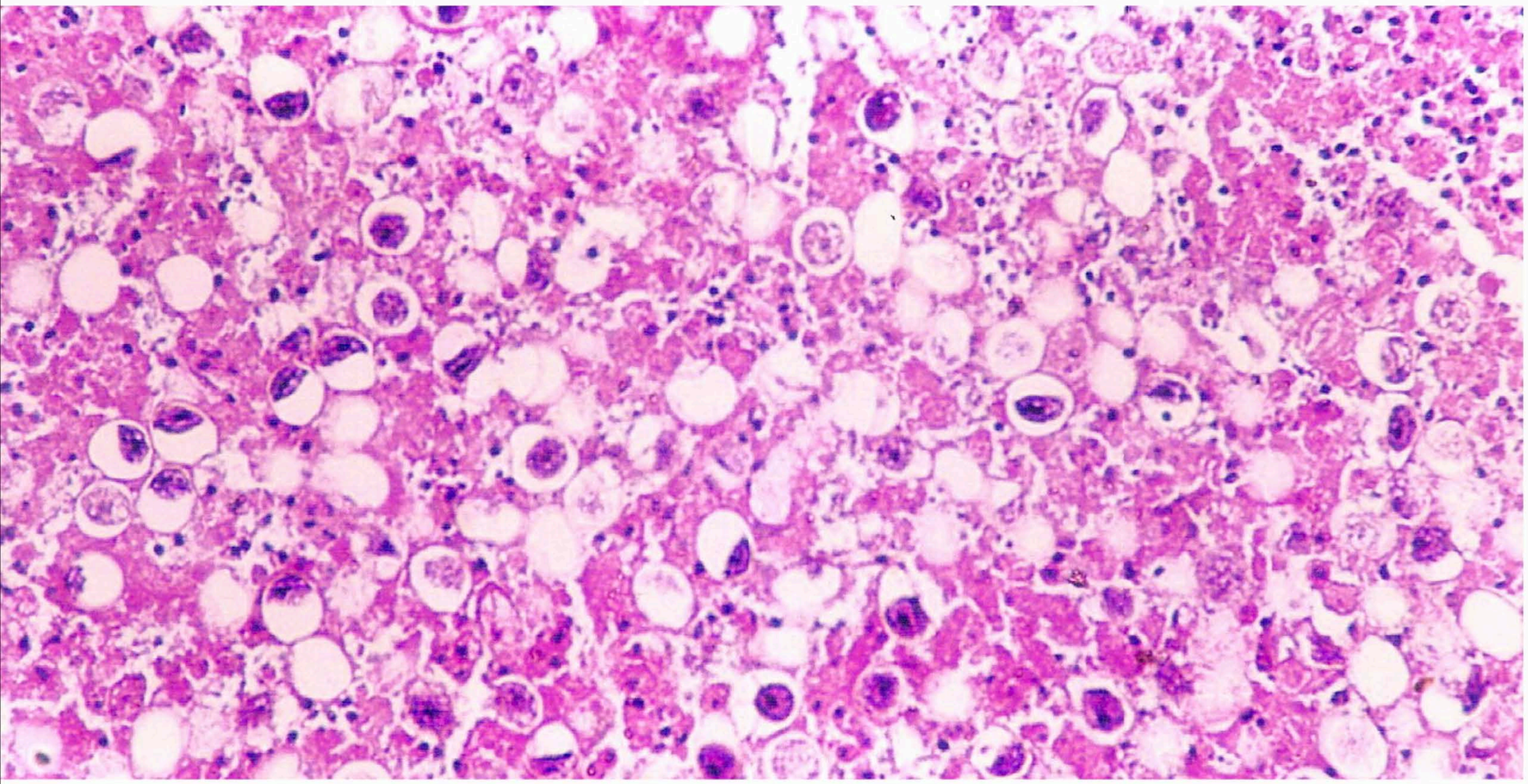
Caecal Coccidiosis – *Eimeria tenella* Developing II Generation Schizont – HP Section H & E stain



Caecal Coccidiosis – *Eimeria tenella* Gamonts – HP Section H & E stain



Caecal Coccidiosis – *Eimeria tenella*
Developing oocysts – HP Section H & E stain



CONCLUSION

Trends in the diagnosis and control of chicken coccidiosis

Post mortem diagnosis of chicken coccidiosis

Pathogenesis, Sequential Pathology & Clinical signs of chicken coccidiosis
Postmortem diagnosis
Caecal coccidiosis
Intestinal coccidiosis (Fore gut / Mid gut / Hind gut coccidiosis)
Microscopical demonstration of stages of chicken coccidia

Post mortem diagnosis of chicken coccidiosis

Thank you