

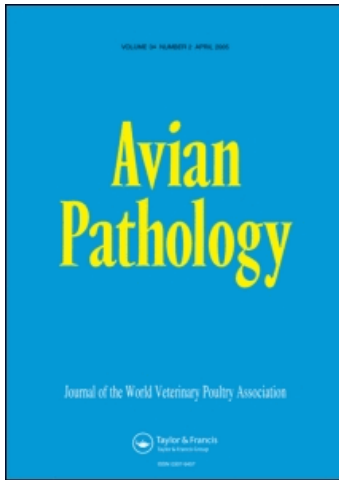
This article was downloaded by:

On: 8 September 2008

Access details: *Access Details: Free Access*

Publisher *Taylor & Francis*

Informa Ltd Registered in England and Wales Registered Number: 1072954 Registered office: Mortimer House, 37-41 Mortimer Street, London W1T 3JH, UK



Avian Pathology

Publication details, including instructions for authors and subscription information:

<http://www.informaworld.com/smpp/title-content=t713405810>

Respiratory and intestinal trichomoniasis in mule ducks

S. S. Tsai ^a; T. C. Chang ^a; M. Kuo ^a; C. Itakura ^b

^a Department of Veterinary Medicine, National Pingtung Polytechnic Institute, Taiwan ^b Department of Comparative Pathology, Graduate School of Veterinary Medicine, Hokkaido University, Sapporo, Japan

Online Publication Date: 01 September 1997

To cite this Article Tsai, S. S., Chang, T. C., Kuo, M. and Itakura, C.(1997)'Respiratory and intestinal trichomoniasis in mule ducks',*Avian Pathology*,26:3,651 — 656

To link to this Article: DOI: 10.1080/03079459708419241

URL: <http://dx.doi.org/10.1080/03079459708419241>

PLEASE SCROLL DOWN FOR ARTICLE

Full terms and conditions of use: <http://www.informaworld.com/terms-and-conditions-of-access.pdf>

This article may be used for research, teaching and private study purposes. Any substantial or systematic reproduction, re-distribution, re-selling, loan or sub-licensing, systematic supply or distribution in any form to anyone is expressly forbidden.

The publisher does not give any warranty express or implied or make any representation that the contents will be complete or accurate or up to date. The accuracy of any instructions, formulae and drug doses should be independently verified with primary sources. The publisher shall not be liable for any loss, actions, claims, proceedings, demand or costs or damages whatsoever or howsoever caused arising directly or indirectly in connection with or arising out of the use of this material.

CASE REPORT

Respiratory and intestinal trichomoniasis in mule ducks

S. S. TSAI,¹ T. C. CHANG,¹ M. KUO¹ & C. ITAKURA²

¹Department of Veterinary Medicine, National Pingtung Polytechnic Institute, Taiwan, and ²Department of Comparative Pathology, Graduate School of Veterinary Medicine, Hokkaido University, Sapporo 060, Japan

SUMMARY

Two types of trichomoniasis, respiratory and intestinal, were found in two duck farms. Based on the morphological features, the organism was identified as *Tetratrichomonas anatis*.

In the first outbreak, main clinical signs were bilateral swelling of infraorbital sinuses, sneezing and profuse diarrhoea with high fatality (300/400) in young ducks. Histological lesions were confined to the upper respiratory tract and lower small intestine and consisted of mucofibrino-purulent sinusitis and catarrhal rhinitis, tracheitis and enteritis. The protozoa appeared frequently in the infraorbital sinuses, the respiratory region of the nose, and the lower small intestine, but rarely in the trachea. In the second outbreak, the lesions were limited to the lower small intestine with catarrhal enteritis in adult ducks clinically showing profuse diarrhoea and low mortality.

INTRODUCTION

The cause of intestinal trichomoniasis, *Tetratrichomonas anatis*, has been reported to inhabit the lower digestive tract of ducks (Diamond, 1957). This organism induces catarrhal enteritis leading to yellowish diarrhoea and mortality up to 60 to 70% in young ducks, and salpingitis with yolk peritonitis in adults. *Hexamita* sp. and *Trichomonas* sp. have been associated with fibrino-necrotic enteritis in the lower small intestine of breeder ducks (Leibovitz, 1973). However, some researchers have suggested that the trichomonas is a nonpathogenic organism which tends to multiply in fluid faeces (George, 1980). Respiratory trichomoniasis is found in infants (McLaren *et al.*, 1983), pigs (Soulsby, 1968) and pigeons (Charlton *et al.*, 1991). As far as we know, the respiratory form of trichomoniasis has not been reported in ducks. This paper describes two incidences of trichomoniasis involving the upper respiratory and lower digestive tracts in ducks.

Received 18 March 1996; Accepted 9 September 1996.

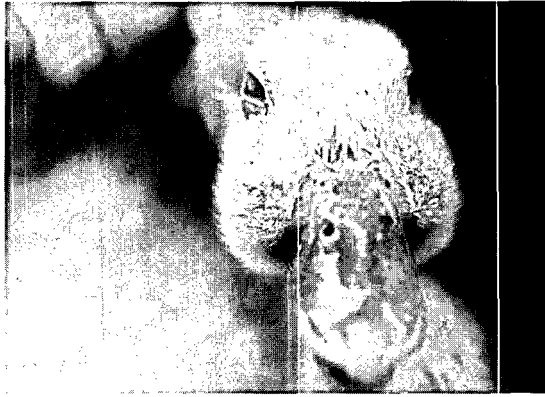


Figure 1. *The infected duck has bilateral swelling of infra-orbital sinuses.*

CASE REPORT

The first outbreak occurred in a farm having about 10,000 3-day-old ducks that had been reared in southern Taiwan. The main clinical signs were cough, sneezing with a dirty beak and diarrhoea, followed by marked swelling of the infra-orbital sinuses of both sides (Figure 1). Sick ducks were not submitted to necropsy until 28 days old. The morbidity was about 4% (400/10,000) and the mortality was about 3% (300/10,000) at 28 days of age. Treatment with amoxicillin (200 parts/ 10^6), diazine plus trimethoprim (500 parts/ 10^6) and chloramphenicol (400 parts/ 10^6) had no effect. Three ducks necropsied at 28 days of age showed muco-fibrino-purulent sinusitis in both sides of infraorbital sinuses (Figure 2), and much mucus in the lumen of the lower small intestine.

The second incidence occurred in 70-day-old ducks that showed signs of diarrhoea and emaciation. Mortality was rare, but about 2,000 out of the 7,000 ducks were culled within a month due to emaciation. The flock was injected intramuscularly with antiserum for duck virus hepatitis at 1-day-old and vaccinated with killed fowl cholera bacterin at 30 days old. Treatments with sulphamonomethoxine (500 parts/ 10^6), bacitracin (150 parts/ 10^6) and amprol plus (amprolium + ethopabate; 150 parts/ 10^6) were not effective. Three ducks necropsied at 70 days of age showed generalized atrophy of internal organs and catarrhal inflammation in the lower small intestine. In addition, one duck had gizzard erosion and greyish-white pseudomembranous inflammation in the oesophageal mucosa between the crop and proventriculus.

Wet smears were made from the exudates of infraorbital sinuses and intestinal contents from ducks from both incidences. Many motile protozoa having an undulating membrane and flagella were seen, and after staining with Liu's method they were revealed as pear-shaped and measured about 12 to 20 μm in length and 8 to 12 μm in width. They had a nucleus, four anterior flagella, a backwardly directed trailing flagellum, a pelta, a clearly visible axostyle and an undulating membrane. Based on these morphological features, the organisms

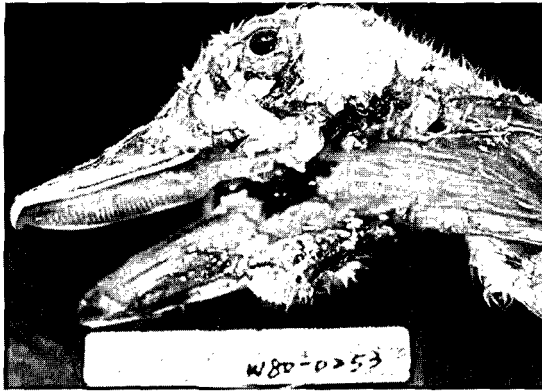


Figure 2. Infra-orbital sinus is filled with fibrinous exudates (arrowhead).

were identified as *Tetratrichomonas anatis* (George, 1980). Besides these protozoa, many unidentified bacteria were also found in the smears.

In the both outbreaks the organs of the necropsied ducks including the brain, eyes, infra-orbital sinuses, nose, trachea, lung, heart, oesophagus, crop, gizzard, liver, intestines, spleen, bursa of Fabricius and kidney were collected, fixed in 10% buffered formalin, embedded in paraffin, sectioned, and stained with haematoxylin and eosin (HE).

Sections of the upper respiratory tract from the first outbreak including the infraorbital sinuses, nose and trachea, showed marked hyperplasia of mucous cells in their epithelia. Excess mucofibrinous exudate containing many desquamated epithelial cells and heterophils, some mononuclear cells and erythrocytes were present in their lumens.

A large number of pyriform-shaped protozoa stained purplish-red with HE were seen in the infra-orbital exudates. In the nose they were detected only in the respiratory region, but not in the vestibular and olfactory areas. A few protozoa were found in the trachea although none in the lung.

In both outbreaks there were many pyriform protozoa in the lower small intestine within the intestinal and crypt lumens and associated with an increase of goblet cells and excess mucus secretion (Figure 3). Marked infiltration of plasma cells and lymphocytes was noted in the lamina propria of the small intestine. No organisms were observed in the upper small intestine and caeca. Hyperkeratosis with superficial invasion of candidial hyphae and blastospores was found in both the eroded gizzard and oesophageal mucosa of the second incident. Urolithiasis was frequently found in the renal tubules.

DISCUSSION

Tetratrichomonas anatis has been blamed for causing catarrhal to fibrinous enteritis (Diamond, 1957; Leibovitz, 1973). The associated lesions included pericarditis, peritonitis, pleuritis, salpingitis, and focal necrosis in the liver, intestinal wall and



Figure 3. Voluminous trophozoites of *Tetratrichomonas anatis* are seen in the intestinal lumen. HE, bar = 50 μ m.

other visceral organs (Diamond, 1957). In the present study, lesions were confined to the upper respiratory tract and lower small intestine. The protozoa found in the different organs seemed to be the same species based on their morphological characteristics.

Tetratrichomonas suis is found in the digestive and upper respiratory tracts of pigs, but its pathogenicity is not completely established (Soulsby, 1968). Respiratory trichomoniasis caused by *Trichomonas vaginalis* has been reported in two infants whose mother previously had had episodes of trichomoniasis vaginitis (McLaren *et al.*, 1983). Unfortunately, the transmission route of duck respiratory trichomoniasis in our cases was not determined.

There are discrepancies concerning the pathogenicity of *Tetratrichomonas anatis* in ducks. Despite the respiratory and intestinal involvements in the present study, the protozoa certainly induced tissue reactions *in situ*. The diarrhoea described during the second incident showed an excellent improvement after treatment with 600 parts/10⁶ dimetridazole for 6 days. These facts seemed to indicate that *Tetratrichomonas anatis* was pathogenic for ducks. Its pathogenicity was age-dependent, similar to that of *Trichomonas gallinae* in squabs (Charlton *et al.*, 1991). However, massive infections of *Trichomonas anatis* are established only when the mucosa is in a catarrhal condition (Kotlan, 1923). Whether it is a primary or secondary pathogen for ducks needs further study.

REFERENCES

- Charlton, R.B., Bickford, A.A., Cooper, G.L. & Chiu, H.W. (1991). Systemic trichomoniasis in a squab operation. *Avian Diseases*, 35, 426–432.
- Diamond, L.S. (1957). The establishment of various trichomonads of animals and man in axenic cultures. *Journal of Parasitology*, 43, 488–490.
- George, J.R. (1980). *Parasitology for veterinarians*. Philadelphia: W.B. Saunders Company.
- Kotlan, A.S. (1923). Zur Kenntnis der Darmflagellaten aus der Hausente und anderen Wasservogeln. *Zentralblatt für Bakteriologie, Parasitenkunde, I Infektions Krankheiten und Hygiene*, 90, 24–28.

- Leibovitz, L. (1973). Necrotic enteritis of breeder ducks. *American Journal of Veterinary Research*, 34, 1053-1061.
- McLaren, L.C., Davis, L.E., Healy, G.R. & James, C.G. (1983). Isolation of *Trichomonas vaginalis* from the respiratory tract of infants with respiratory disease. *Pediatrics*, 71, 888-890.
- Soulsby, E.J.L. (1968). *Helminths, arthropods and protozoa of domestic animals*. Philadelphia: Lea & Febiger.

RÉSUMÉ

Trichomonose chez le canard

Deux formes de Trichomonose, respiratoire et intestinale ont été observées dans deux élevages de canards. L'agent a été identifié: *Tetratrichomonas anatis*, sur la base des caractères morphologiques.

Dans le premier cas, les principaux symptômes cliniques ont été un gonflement bilatéral des sinus infra-orbitaux, des éternuements, et une diarrhée profuse, accompagnés d'une forte mortalité (300/400) chez les jeunes canards. Les lésions histologiques ont été limitées au niveau du tractus respiratoire supérieur et à la partie inférieure de l'intestin grêle. Ces lésions correspondaient à une sinusite mucofibrino-purulente et une rhinite catarrhale, une trachéite et une entérite. Le protozoaire a été fréquemment observé au niveau des sinus infra-orbitaux, des cavités nasales et dans la partie inférieure de l'intestin grêle, mais rarement dans la trachée. Dans le second cas, les lésions étaient limitées à la partie inférieure de l'intestin grêle avec une entérite catarrhale chez les canards adultes qui présentaient une diarrhée profuse et une faible mortalité.

ZUSAMMENFASSUNG

Respiratorische und intestinale Trichomoniasis bei Bastard-Enten

Zwei Arten von Trichomoniasis, respiratorische und intestinale, wurden in zwei Entenfarmen festgestellt. Die Erreger wurden auf Grund ihrer morphologischen Eigenschaften als *Tetratrichomonas anatis* identifiziert.

Beim ersten Ausbruch, von dem junge Enten betroffen waren, bestanden die hauptsächlichen klinischen Symptome in beidseitiger Schwellung der Infraorbitalsinuse, Niesen und profusem Durchfall mit hoher Sterblichkeit (300/400). Die histologischen Veränderungen waren auf den oberen Respirationstrakt und den unteren Dünndarm beschränkt und bestanden in mukofibrinopurulenter Sinusitis und katarrhalischer Rhinitis, Tracheitis und Enteritis. Die Protozoen fanden sich häufig in den Infraorbitalsinussen, in der Respirationregion der Nase und im unteren Dünndarm, aber selten in der Trachea. Beim zweiten Ausbruch waren die Läsionen auf den unteren Dünndarm mit katarrhalischer Enteritis bei adulten Enten beschränkt, die klinisch einen profusen Durchfall mit geringer Mortalität aufwiesen.

RESUMEN

Tricomoniasis intestinal y respiratoria en patos

Se observaron dos tipos de tricomiasis, respiratoria e intestinal, en dos granjas de patos. Este organismo fue considerado *Trichomonas anatis* por sus características morfológicas.

Los signos clínicos principales en el primer brote fueron tumefacción bilateral de los senos infraorbitarios, estornudos y diarrea profusa con una mortalidad elevada (300/400) en patos jóvenes. Las lesiones microscópicas se centraron en la porción superior del sistema respiratorio y la porción inferior del intestino delgado y consistieron de una sinusitis fibrinopurulenta y mucoide así como rinitis, traqueitis y enteritis catarral. Se observaron protozoos frecuente-

mente en los senos infraorbitarios, la porción respiratoria de la nariz, la porción inferior del intestino delgado e infrecuentemente en la tráquea. Las lesiones en el segundo brote se limitaron a la porción inferior del intestino delgado que presentaba una enteritis catarral en patos adultos que clínicamente presentaban una diarrea profusa y una baja mortalidad.