

Isolation of *Mycoplasma columbinum* and *M. columborale* from Pigeons

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ABSTRACT

306 pigeons were examined for mycoplasmas. Incidence ranged between 56% and 75%. The highest incidence of mycoplasmas was found in oropharynx (69.1%) and intestine (66.1%), followed by lung (45.2%), trachea (31.9%), air sacs (29.3%), kidneys (21%), liver (17%) and heart (9.4%). Mycoplasma could be recovered also from testicles and ovaries.

The arginine metabolizing Mycoplasma was predominant (62.4%), while glucose fermenters constituted only 20.8% of the isolates. The serological examination of 170 isolates using 26 Mycoplasma antisera revealed the identification of *M. columbinum* (40 cases), *M. columborale* (20 cases), *M. gallinarum* (3 cases), *M. orale* 3 (2 cases) and one case each of serotype L.

INTRODUCTION

Little information are found in the available literature on the incidence of Mycoplasma in pigeons. Marjanovic et al⁽¹⁾ reported on the isolation of *M. gallisepticum* from two dead pigeons. Yoder and Hofstad⁽²⁾ as well as Gerlach⁽³⁾ could isolate only Mycoplasma serotype L from pigeons. Shimizu and Nagatomo⁽⁴⁾ discovered two new species of Mycoplasma from pigeons, namely *M. columbinum* and *M. columborale*. The present work is dealing with the isolation of the two last mentioned Mycoplasma in the frame of a survey of pigeon mycoplasma in Egypt.

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MATERIALS AND METHODS

A total of 306 pigeons were collected from the shooting Club, private breeders and markets, Swabs were taken from the conjunctiva, oropharynx and rectum of living pigeons, and from the internal organs that were removed aseptically after slaughtering. Heart infusion agar and broth were used for isolation, Inoculated plates and bottles were incubated at 37°C for a maximum of 14 days and examined microscopically every 3 days. In positive cases the isolated Mycoplasma were purified by cloning.

For the biochemical differentiation all isolates were tested for their sensitivity to Digitonin⁽⁵⁾, ability to ferment glucose and/or hydrolyze arginine⁽⁶⁾.

For the serological identification we used the growth inhibition test⁽⁷⁾ and growth precipitation test⁽⁸⁾.

RESULTS

Mycoplasma could be isolated from 204 out of the 306 pigeons examined, i.e. an incidence of 66.7%. The highest incidence was reported in the private breedings (75%), and the lowest (56%) in the shooting club. The examination of the various parts and organs of pigeons revealed that oropharynx is probably the predilection seat for mycoplasmas, as 69.1% of swabs taken from this site were positive. An almost similarly high incidence was found also in the intestinal tract (66.1%). Mycoplasmas could be isolated also at varying rates from lungs, trachea, air sacs, testicles, kidneys, liver, heart and ovaries (Table 1).

Table 1 : Isolation and biochemical identification of Mycoplasma from pigeons

Material	No. of samples examined	No. of Mycoplasma isolates	Biochemical identification of the isolates								
			%	No.	%	No.	%	No.	%	No.	
Lung	241	109	45.2	70	64.2	25	23.0	10	9.1	4	3.7
Oropharynx	214	148	69.1	86	58.1	38	34.3	20	13.5	6	4.1
Trachea	210	67	31.9	47	70.2	10	14.9	10	14.9	—	—
Air sacs	198	58	29.3	34	58.6	15	25.9	5	8.6	4	6.9
Liver	128	22	17.2	14	63.6	—	—	8	36.4	—	—
Kidneys	95	20	21.0	15	75.0	3	15.0	—	—	2	10.0
Heart	85	8	9.4	4	50.0	—	—	—	—	—	—
Small intestine	50	21	42.0	11	52.4	5	23.8	5	23.8	—	—
Rectal swabs	29	7	24.1	7	100.0	—	—	—	—	—	—
Testicles	25	9	36.0	4	44.4	—	—	5	55.6	—	—
Ovaries	23	2	8.7	2	100.0	—	—	—	—	—	—
Conjunctiva	23	—	—	—	—	—	—	—	—	—	—
Total	1321	471	35.7	294	62.4	98	20.8	63	13.4	16	3.4

Arg. arginine GI = glucose
Percent with respect to total no.

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All isolates were inhibited by digitonin and most of them were arginine positive and glucose negative (62.4%). Glucose positive isolates amounted to 20.8%. The remaining isolates were in both tests (arginine and glucose) either positive (13.4%) or negative (3.4%). With the help of the 8 avian mycoplasma antisera only 4 isolates could be identified, 3 as *M. gallinarum* and one as serotype L. The use of all 16 mycoplasma antisera of different origin (human, bovine, canine, rodents.) revealed weak reaction in 3 cases, namely in antisera of *M. orale 3* (2 strains) and *M. salivarium* (1 strain).

With the help of *M. columbinum* and *M. columborale* antisera, received later from Denmark (Dr. Freundt), 40 isolates recovered from the lungs, air sacs, intestines and liver could be identified as *M. columbinum* and 20 isolates recovered from the oropharynx, tracheae, lungs and air sacs as *M. columborale* (Table 2).

Table 2 : Serological identification of Mycoplasma from pigeons.

Mycoplasma serotype	No. of Identified isolates
<i>M. columbinum</i>	40
<i>M. columborale</i>	20
<i>M. gallinarum</i>	3
<i>M. serotype L</i>	1
<i>M. orale 3</i>	2
<i>M. species</i> (unidentified)	103

DISCUSSION

This is the first report of *M. columbinum* and *M. columborale* in Egypt. Although only a limited number of isolates could be tested, because of the small amounts of antisera available, yet *M. columbinum* and *M. columborale* constituted 53% and 40% of the tested isolates respectively. The occurrence of *M. columbinum* in the oropharynx and trachea coincided with the findings of Shimizu and Nagatomo⁽⁴⁾, but in addition, it could be isolated from nearly all internal organs. In case of *M. columborale*, the aforementioned authors could isolate it only from the oropharynx, while, in the present work *M. columborale* was recovered from oropharynx, trachea and air sacs. The results indicate the wide spread of these two species in Egypt.

All isolates which showed positive or negative reaction in both arginine and glucose could not be typed with the available antisera. They need further study using other antisera to find out whether they belong to known *M.* species or they are new species.

In recent years, there has been an expansion in the number of diseases in mammals, birds and plants attributed to Mycoplasma. It is not possible to assess whether the Mycoplasma isolated in this study were responsible for any disease in pigeons. It is, therefore, desirable that the pathogenicity of these species, especially *M. columbinum* and *M. columborale*, should be determined.

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