Mycoplasma columborale and Mycoplasma columbinum from pigeons: a first report of their isolation in Nigeria

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Summary: Four glucose-fermenting and two arginine-positive mycoplasma strains were isolated from the trachea, oropharynx and lungs of pigeons. Biochemical and serological tests were used to identify the two groups as M. columborale and M. columbinum. The implications of contact between pigeons and chickens are discussed.

KEYWORDS: Mycoplasma - Nigeria - Pigeon - Poultry diseases - Respiratory diseases - Wild birds.

INTRODUCTION

Mycoplasma columborale, Mycoplasma columbinum and M. columbinasale are recognised pigeon species of mycoplasma. They have been recovered from pigeons in Britain (8, 4, 3). There appears to be no previous report of their isolation in Nigeria. During an investigation into the role of wild birds in the epidemiology of chronic respiratory disease of chickens, a small number of pigeons were screened culturally for mycoplasmas.

METHODS

Six pigeons (Columba livia var. domestica) showing respiratory symptoms were selected from a batch of fifty pigeons in a local market in Zaria, Nigeria. They were killed with chloroform and examined post mortem. Swabs were taken aseptically from the oropharynx, trachea, lungs and air sacs.

Mycoplasma culture

The medium used was that described by Frey et al. (2). Yeastolate (Difco laboratories, Detroit, Michigan, USA) was used instead of Baker’s yeast extract. Cystine hydrochloride and nicotinamide adenine dinucleotide (NAD) enrichments (as recommended for avian mycoplasmas) were added.

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Mycoplasma identification

Mycoplasma-like isolates on agar were cloned and subjected to biochemical tests, namely: glucose and arginine utilisation tests and serum requirement test. Speciation of isolates was done by the growth-inhibition test of Clyde (1) and the epi-immunofluorescence test (6).

RESULTS

Mycoplasma species were isolated from all six birds (Table I). Four glucose-fermenting colonies were identified as *M. columborale* while two isolates that split arginine and formed film and spots were identified as *M. columbinum*. Growth of the two groups of mycoplasmas was inhibited by hyperimmune sera against *M. columborale* (MMP-4) and *M. columbinum* (MMP-1) respectively. The isolates failed to show fluorescence with *M. gallisepticum* (PG31), *M. synoviae* (WVU 1853) and *M. gallinarum* (PG16) conjugates. Recognised poultry species such as *M. gallisepticum* (MG), *M. synoviae* (MS) and *M. meleagridis* were not isolated.

<table>
<thead>
<tr>
<th>Isolate designation</th>
<th>Isolation site</th>
<th>Arginine utilisation</th>
<th>Glucose fermentation</th>
<th>Film &amp; spots</th>
<th>Mycoplasma species</th>
</tr>
</thead>
<tbody>
<tr>
<td>1LP</td>
<td>lung</td>
<td>NR</td>
<td>+</td>
<td>–</td>
<td><em>M. columborale</em></td>
</tr>
<tr>
<td>2SP</td>
<td>oropharynx</td>
<td>NR</td>
<td>+</td>
<td>–</td>
<td><em>M. columborale</em></td>
</tr>
<tr>
<td>3TP</td>
<td>trachea</td>
<td>+</td>
<td>NR</td>
<td>+</td>
<td><em>M. columbinum</em></td>
</tr>
<tr>
<td>4SP</td>
<td>oropharynx</td>
<td>NR</td>
<td>+</td>
<td>–</td>
<td><em>M. columborale</em></td>
</tr>
<tr>
<td>5TP</td>
<td>trachea</td>
<td>+</td>
<td>NR</td>
<td>+</td>
<td><em>M. columbinum</em></td>
</tr>
<tr>
<td>6SP</td>
<td>oropharynx</td>
<td>NR</td>
<td>+</td>
<td>–</td>
<td><em>M. columborale</em></td>
</tr>
</tbody>
</table>

NR = no reaction

DISCUSSION

There are reports of previous isolations of *M. columborale* and *M. columbinum* from the trachea and oropharynx of clinically healthy pigeons (7, 3). These organisms have also been reported from respiratory disorders of pigeons (4). The same authors demonstrated the pathogenic potential of *M. columborale* for chicks. It could not be ascertained whether the two mycoplasma isolates in this study were responsible for the respiratory conditions observed in the six pigeons. However, the pathogenic potential of *M. columborale* has been demonstrated for chicks (4).

In Nigeria, pigeons are kept for consumption or as pets. These pigeons and other wild birds are regularly found near poultry farms in and around Zaria where they
come to feed. In many instances they gain access to the feeding troughs of chickens (personal observation). It is therefore possible that pigeons and wild birds play a major role in the spread of poultry pathogens from one farm to another. The fact that *M. columborale* and *M. columbinum* species, thought to be specific for pigeons, have also been isolated from chickens (5) is evidence of contact between pigeons and chickens. The inability to isolate MS and MG from the sick pigeons may be due to technical problems, because pathogenic mycoplasmas are more difficult to isolate than commensals. Therefore it would be necessary to screen large numbers of pigeons serologically and culturally for known poultry pathogenic mycoplasmas in order fully to establish their prevalence, and the role of pigeons in the spread and maintenance of these organisms in the environment.

**ACKNOWLEDGEMENTS**

This report is part of an investigation into the role of wild birds in the epizootiology of chicken mycoplasmosis.

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**Résumé :** Quatre souches de mycoplasmes assurant la fermentation du glucose et deux souches positives pour l'arginine ont été isolées à partir de la trachée, du buccopharynx et de poumons de pigeons. Les tests biochimiques et sérologiques pratiqués ont permis d'identifier ces deux groupes comme étant *M. columborale* et *M. columbinum*. Les implications des contacts entre pigeons et poulets sont discutées.

**MOTS-CLÉS :** Maladies aviaires - Maladies respiratoires - Mycoplasmes - Nigeria - Oiseaux sauvages - Pigeons.

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**PRIMER INFORME SOBRE EL AISLAMIENTO DE MYCOPLASMA COLUMBORALE Y MYCOPLASMA COLUMBINUM EN PALOMAS EN NIGERIA.** — J.U. Molokwu y D.S. Adegboye.

**Resumen:** Se aislaron cuatro cepas de micoplasmas que realizan la fermentación de la glucosa y dos cepas positivas para la arginina, a partir de la traquea, la
orofaringe y pulmones de palomas. Las pruebas bioquímicas y serológicas practicadas permitieron identificar estos dos grupos como M. columborale y M. columbinum. Se comentan las implicaciones de los contactos entre palomas y pollos.

PALABRAS CLAVE: Aves salvajes - Enfermedades aviares - Enfermedades respiratorias - Micoplasmas - Nigeria - Palomas.

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REFERENCES


