Distribution of Avian Ureaplasmas in Various Parts of Japan

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The first isolation of ureaplasmas from chickens was reported by Stipkovits and Rashwan [11] in 1976, but their representative strain was laterly found to be related to one of the serovars of human ureaplasmas by one-and-two-dimentional protein analyses on polyacrylamide slab gels [9]. In 1977, we also isolated avian ureaplasmas from oral cavities of chickens and red jungle fowls [7], and have successively reported their biological, serological and genomic properties, and clarified their distinction from human and other animal ureaplasmas [1–3, 5, 6, 8]. However, avian ureaplasmas have not been yet isolated in the rest area of the world in spite of the trials made by other investigators. Therefore, the ecology of the avian ureaplasmas is still unclear, and their position in taxonomy is pending at present. This report concerns a field survey recently performed by us in order to obtain a geographical distribution of avian ureaplasmas in various parts of Japan.

A selective liquid medium which contained 5 μg/ml of lincomycin as described previously [4] was used for the isolation of ureaplasmas. Mucous specimens were collected with sterile cotton swabs from the oropharynx of chickens and immersed into the liquid medium. The specimens were then diluted with fresh liquid medium to make a serial 10-fold dilution from 10\(^{-1}\) to 10\(^{-8}\) and incubated at 37°C for several days. The cultures showing a color change at the bottom of the tubes with a significant rise of pH were subcultured immediately onto a solid medium without lincomycin but with phosphate-buffered solution (T-agar). Characteristic minute colonies were demonstrated on the solid medium within a few days after incubating at 37°C in an atmosphere containing a mixed gas of 5% CO\(_2\) and 95% N\(_2\).

Of 486 apparently healthy domestic fowls

Fig. 1. Geographical distribution of avian ureaplasmas in various prefectures of Japan. □ positive, □ negative, □ not tested. 
Table 1. Comparative isolation rates of avian ureaplasmas among flocks and birds at various places

<table>
<thead>
<tr>
<th>Place</th>
<th>No. of flock</th>
<th>No. of bird</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Positive/Examined</td>
<td>%</td>
</tr>
<tr>
<td>Poultry farm</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>Research laboratory</td>
<td>3</td>
<td>13</td>
</tr>
<tr>
<td>Agricultural farm</td>
<td>5</td>
<td>14</td>
</tr>
<tr>
<td>Private house</td>
<td>9</td>
<td>26</td>
</tr>
<tr>
<td>Elementary school &amp; kindergarten</td>
<td>13</td>
<td>22</td>
</tr>
<tr>
<td>Total</td>
<td>31</td>
<td>82</td>
</tr>
</tbody>
</table>

*(Gallus gallus var. domesticus)* including White Leghorn, Japanese bantams, Japanese game cocks, Japanese silky fowl and other mixed breeds of Japanese native fowls fed at 82 flocks located in 14 prefectures, ureaplasma isolates were obtained from oral cavities of 110 birds (22.6%) of 31 flocks in 9 distinct prefectures as shown in Fig. 1. Cloacal specimens of some chickens were examined at the same time, but the demonstration of ureaplasmas was not successful.

The comparative isolation rates of avian ureaplasmas among the samples obtained from the chickens at various places are shown in Table 1. Ureaplasmas were isolated with higher rates from those chickens maintained at agricultural farms, private houses, elementary schools and kindergartens than those of professional poultry farms and research laboratories.

Eleven isolates from 11 flocks in 9 prefectures were cloned and subjected to the serological identification by the metabolism inhibition test [10] with antisera against human *Ureaplasma urealyticum* strain T960, bovine *U. diversum* strain A417 and avian ureaplasma strain D6-1. These avian ureaplasmas were inhibited only by the antiserum of the avian strain D6-1 but not by the antisera of the human and the bovine strains.

The reason for lower isolation rates of ureaplasmas from the birds fed at poultry farms and research laboratories was not clearly analyzed, but it is suspected that the raising conditions such as the medication through feeding and the sanitary environment may be the important factors involved.

The results of this study disclose a fact that the avian ureaplasmas permeate through various parts of Japan, and they constitute a serologically homogeneous group that is distinct from human and bovine ureaplasmas.

REFERENCES

要約

日本各地におけるニワトリ由来ウレアプラズマの分布（短報）：潘 肇仁・柴水 暖・原澤 亮 (東京大学医学部附属動物実験施設, 宮崎大学農学部家畜微生物学教室) —— 日本各地におけるニワトリ由来ウレアプラズマの分布を調べる目的で、1都13県82鶏群の計456羽のニワトリの口腔を検査したところ、1都8県、31鶏群の110羽（22.6%）がウレアプラズマ陽性であった。ウレアプラズマの分離率は農家、個人宅、幼稚園、小学校で飼育されているニワトリの方が、専業鶏場のニワトリより高率であった。1都8県に散在している11鶏群から分離された11株は代謝阻害試験によりすべて血清学的に均一な性状を示し、ヒト由来 Ureaplasma urealyticum T960 株およびウシ由来 U. diversum A417 株とは区別された。