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# Prevalence of *Leptospira interrogans* in Wild Rodents in Korea

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Leptospirosis has been known as endemic disease in Korea since 1984. Wild rodent, mostly *Apodemus agrarius*, has been known as an important source of leptospiral infection especially in rainy circumstances in harvest reason of rural area.

The infection rates of *Leptospira interrogans* in field rodents, *Apodemus agrarius*, was investigated by culture and PCR detection of leptospiral DNA, and compared with previous data. Furthermore, the serogroup and serovar were investigated.

Two hundred twenty two *Apodemus agrarius* were captured during October to December 1996. Spirohaetes were isolated from 22 (9.9%) and leptospiral DNA was detected in an additional six rodents (12.6%).

Subsequent cross-agglutinin absorption test, monoclonal antibody reactivity classified 21 cultures among 22 isolates as *Leptospira interrogans* serogroup Icterohemorrhagiae serovar lai.

The above data did not differ from previous survey in 1984 to 1987. There was no significant change of *Leptospira interrogans* infection in field rodents in Korea.

**Key Word:** *Leptospira interrogans, Apodemus agrarius*, PCR, Crossagglutinin absorption

**Table 1.** Isolation and PCR confirmation of *L. interrogans* from *A. agrarius*

| Area where rodents collected | No. of rodents examined | No. of isolates (positive%) | PCR detect (positive%) |
|---|---|---|---|
| Central Korea | 76 | 11 (14.5) | 12 (15.8) |
| Kyumgi prov. | 33 | 6 (18.2) | 7 (21.2) |
| Kangwon prov. | 34 | 4 (11.7) | 4 (11.7) |
| Chungbuk prov. | 9 | 1 ( 7.5) | 1 (11.1) |
| Southern Korea | 146 | 11 (7.5) | 16 (11 ) |
| Chunbuk prov. | 31 | 1 (3.2) | 2 ( 6.5) |
| Chunnam prov. | 115 | 10 (8.7) | 14 (12.2) |
| Total | 222 | 22 (9.9) | 28 (12.6) |

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**Table 2.** Strains isolated

| Strain No. | Originated from | Strain No. | Originated from |
|---|---|---|---|
| JR34 | Chunnam Whasoon | NR3 | Kangwon Chunchon |
| JR57 | Chunnam Damyang | | |
| JR58 | 〃 | NR4 | Kangwon Wonju |
| JR62 | Chunnam Chungmyung | NR6 | Chungbuk Jechun |
| JR72 | 〃 | NR8 | Kyungki Jungok |
| JR82 | 〃 | NR9 | 〃 |
| JR86 | 〃 | NR10 | 〃 |
| JR89 | 〃 | NR11 | Kyungki Yeonchon |
| JR94 | 〃 | NR12 | 〃 |
| JR109 | Chunman Kwangyang | NR13 | 〃 |
| CR3 | Kangwon Chunchon | KR48 | Junbuk Iksan |
| NR2 | 〃 | | |

**Table 3.** Reactivities of the isolates to monoclonal antibodies

| Serovar (Strain) \ MAb | F20-C4-3 | F52C2-2 | F70C7-3 | F70C20-2 | F82C1-3 | F82C2-2 | F89C3-3 |
|---|---|---|---|---|---|---|---|
| All 22 isolates | − | − | ++++ | − | ++ | ++++ | − |
| *lai* (HY10*) | − | − | +++ | − | ++ | ++++ | − |
| *lai* (017†) | − | − | ++++ | − | ++ | ++++ | − |
| *yeonchon* (HM3*) | ++ | ++ | +++ | ++ | ++ | − | +++ |
| *hongchon* (18R*) | ++++ | | +++ | − | − | ++++ | − |
| *icterohemorrhagiae* (RGA) | ++++ | ++ | ++++ | +++ | − | − | − |
| *copenhageni* (M20) | ++++ | + | ++++ | ++++ | − | − | ++ |
| *naam* (Naam) | ++ | + | ++++ | − | − | ++++ | − |
| *mwogolo* (Mwogolo) | − | − | +++ | − | − | +++ | − |

*Reference strain isolated in Korea †Reference strain obtained from NIH Japan

**Table 4.** Cross-agglutinin absorption test of isolate with serovar *lai*

| Isolate | Hyperimmune serum | Absorbing Culture | Residual homologous antibody titer after absorption (%) | Suspected serovar |
|---|---|---|---|---|
| JR 34 | JR 34 | Lai 017 | 0.39 | lai |
| | Lai 017 | JR 34 | 1.56 | |
| JR 57 | JR 57 | Lai 017 | 3.125 | lai |
| | Lai 017 | JR 57 | 0.78 | |
| JR 58 | JR 58 | Lai 017 | <0.78 | lai |
| | Lai 017 | JR 58 | 0.78 | |
| JR 77 | JR 77 | Lai 017 | 3.125 | lai |
| | Lai 017 | JR 77 | <0.78 | |
| NR 13 | NR 13 | Lai 017 | 25 | lai? |
| | Lai 017 | NR 13 | 0.78 | |
| JR 82 | JR 82 | Lai 017 | 1.56 | lai |
| | Lai 017 | JR 82 | <0.78 | |
| JR 86 | JR 86 | Lai 017 | 0.78 | lai |
| | Lai 017 | JR 86 | <0.78 | |
| JR 89 | JR 89 | Lai 017 | 0.78 | lai |
| | Lai 017 | JR 89 | <0.78 | |

Other 14 cultures had almost same pattern of cross-agglutinin absorption with serovar lai as above cultures except NR 13. (residual homolagous antibodies titer after absorption were less than 3%)

## SUMMARY

The prevalence of *Leptospira interrogans* in field rodents, *Apodemus agrarius*, captured during October to December 1996 was 12.6%.

The above data did not differ from previous survey in 1984 to 1987.

Twenty one cultures among 22 isolates were identified as serovar lai by cross-agglutinin absorption test and monoclonal antibody reactivity.

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