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(ABSTRACT)

DISTRIBUTION OF SWINE LUNGWORM LARVAE AND THEIR DEVELOPMENTAL GROWTH.

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This concerns the summary report of a series of studies on *Metastrongylosis* hitherto published by the writer. The life cycle of swine lungworm was first elucidated by Hobmaier in 1929. Since then subsequent studies conducted by many workers have revealed that some species of earthworms act as specific intermediate hosts of swine lungworm. The writer observed that three species of earthworms, *Helodrilus foetidus*, *Allolobophora caliginosa* and *Pheretima*, serve as intermediate hosts of swine lungworm in Korea. The present summary consists of the results of survey on the distribution of infectious lungworm larvae and the studies on the developmental growth of lungworm larvae in the intermediate and terminal hosts.

A. Geographical Distribution of Earthworms Containing Infectious Larvae of Swine Lungworm.

Earthworms in various districts were examined several times in order to find the incidence of infectious lungworm larvae. They were collected from dirt or manure around hog-pens. Impressions of earthworms heart portion were examined under microscope. The results obtained are as follows.

Eighty-six percent of earthworms collected in Cheju Province contained infectious lungworm larvae. The rate of infected earthworms was 79% in Chonbuk Province, 79% in Chonbuk province, 74% in Kyongki Province, 74% in Kyongnam Province, 73% in Chungnam Province, 67% in Kyongbuk Province, 65% in Kangwon Province, and 64% in Chonnam Province. Of a total of 25,292 earthworms examined throughout the country 18,752 were found positive (74%). According with the earthworm species, 83% of *Helodrilus foetidus* and 43% of *Allolobophora caliginosa* and *Pheretima* were infected by lung worm larvae. Earthworms collected from the neighborhood of older hog-pens appear to harbor more larvae than those from the younger pens.

Earthworms in four year old hog-pens were found to harbor 12% more lung worm larvae than those in one year old hog-pens. It seemed that hog-pens in Korea provide a favorable condition for the developmental lungworm larvae.

B. Developmental Growth of Larvae of Swine Lungworm in the Intermediate Hosts.

In order to observe the developmental growth of lungworm larvae in the earthworms, mature eggs of swine lungworm were administered to earthworms.

Twelve days after the infection, encapsulated larvae of the lungworm were found and

by the 23rd to 25th day after infection fully-grown infectious larvae were seen. Developmental growth of lungworm larvae in the earthworm was observed to be readily influenced by outside temperature. On the 4th and 5th of January lungworm eggs were given to *Helodrilus foetidus* earthworm. When kept at room temperature, the larvae hatched from eggs and slightly enlarged, but no encapsulation occurred by the 63rd and 64th day of infection.

On the other hand, when kept in the incubator at 22-24 C, the hatched larvae fully developed into encapsulated larvae by the 26th day after infection. *Pheretima* earthworms also were used for the experimental observation, but seemed to be less susceptible to artificial infection of lungworm eggs than *Helodrilus foetidus* earthworms.

C. The Growth of Lungworm in the Terminal Host.

In order to observe the growth of lungworm in the terminal host, infectious larvae contained in earthworms were fed to pigs. On the 2nd and 3rd day of infection the larvae were found in mesenteric lymph nodes of pig. And on the 5th day of infection several larvae appeared in the brochioli of pig. Premature eggs were first seen in the uterus of lungworm on the 17th day of infection. The growth of lungworm larvae in pig was most rapid at the stage when the eggs in the uterus had not fully developed to maturity. The largest daily increment of growth was attained between the 14th and the 19th day of infection. Maturity of eggs of swine lungworm was attained about one month after the infection.

No direct parallelism was observed between the number of lungworms appearing in the brochioli of pigs and the number of the infectious larvae fed to pigs. Starting on the 7th day after infection some infected pigs coughed. Fecal examination conducted on infected pigs revealed that lungworm eggs appeared in feces after 27 days of infection.

D. Conclusion.

From the results of present studies it seems that *Helodrilus foetidus* plays an important role in the dissemination of swine lungworm. This earthworm species was found widely distributed in all districts, especially in the neighborhood of hog-pens. In the intermediate host the larvae of swine lungworm developed into fully grown infectious ones in about one month after the infection and in the terminal host swine lungworm attained maximum maturity in about one month after the infection.