STUDIES ON THE ECOLOGY OF ASCARIS LUMBRICOIDES

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(Received June 10, 1964)

Information is available that Ascaris lumbricoides, in addition to man, has also been found in different species of animals, including the domesticated sheep (Ovis aries).

Mozgovoi (1953) regards only man as obligate host of Ascaris lumbricoides and the others, the animals, as accidental hosts. Moreover, he expresses the views that ascarides found in other animals may have erroneously been determined as A. lumbricoides.

In a number of his independent or collective publications (1951, 1955, 1958, 1960 and 1961) Mozgovoi expressed the view that in the domesticated sheep, the domesticated goat and Saiga tatarica there parasitizes an ascaris — Ascaris ovis — which is specific to these animals. He assumes that the Ascaris bovis, described by Oshmarin and found in calves, is probably Ascaris ovis.

This view of Mozgovoi is based on the morphological differences of the ascarides found in the sheep, goat and S. tatarica from A. lumbricoides and A. suum, on the unsuccessful invasion of lambs, kids and calves with a culture of A. suum eggs, capable of producing an invasion, and the lack of viability in live adult specimens of A. suum after their transplantation in the small intestine of lambs, kids and calves.

Matoff and Vassilev (1958) showed, on the basis of morphological, faunistic and experimental-biological studies that A. suum parasitizes in lambs and rejected the independence of A. ovis and reduced it to a synonym of A. suum. The attempt to invade five lambs with A. lumbricoides failed.

Vassilev (1960) experimentally demonstrated that A. suum may parasitize facultatively in the goat as well.

L. Novoselska-Georgieva (1960) reported that the ascarides recovered from lambs are antigenically identical with A. suum. At the same time she found certain antigenic differences between A. lumbricoides and A. suum.

The results of the investigations of Matoff and Vassilev, of Vassilev and of L. Georgieva show without any doubt that Ascaris suum may parasitize in sheep (lambs) and goats (kids).

According to Ransom, Ransom and Foster, Goodey and others (quoted after Mozgovoi), A. lumbricoides parasitizes in sheep. Some of these authors, as well as Baylis and Daunney, Thornton and others do not differentiate A. suum and A. lumbricoides as two independent species and regard them as a single species. This fact and Mozgovoi's suspicion that the ascarides found in sheep may have wrongly been identified as A. lumbricoides raise the question whether or not this ascaris may parasitize sheep and goat.

This paper sums up the results of the experimental investigation of this problem.
Material and methods

To experimental invasion with a culture of infective *A. lumbricoides* were subjected:

17 lambs, including 13 from 1 to 10 days old and four 20-days old, and 10 kids old from 5 to 10 days.

All the kids and 16 of the lambs were invaded once each by about 2500 to 3000 infective eggs. One of the lambs received the same quantity of infective eggs but in portions given over four consecutive days.

The invasion viability of the culture was tested beforehand by the invasion of mice. The experimental lambs and kids were killed at different intervals after the exposure to infestation.

The liver, lungs, trachea, oesophagus, rumen and abomasum, small and large intestines of the experimental animals, killed up to the 25th day after the invasion, were examined for ascaride larvae of for young ascarides. The small and large intestines, the lungs and liver, the large biliary ducts and the gall-bladder of the animals killed on the 30th day and the following days after the invasion were examined for larvae and ascarides. The parenchyma of the liver and the lungs was examined for larvae by BÄERMANN'S method and the compressor method.

Results

The following results were registered in the experimental lambs:

In a lamb killed on the 7th day after the invasion ascaris larvae were found only in the lung. (42 larvae in all were recovered by BÄERMANN'S method. Three of them measured from 0.3 to 0.37 mm in length. The other larvae were from 0.66 to 1.18 mm long)

In a lamb killed on the 10th day after invasion 5 ascaris larvae were recovered only from the lungs: one of them 0.46 mm long and the others from 0.82 to 1.10 mm long. The oesophagus of these four larvae measured from 0.17 to 0.21 mm.

In a lamb killed on the 20th day after invasion only one 0.92 mm long ascaris larva was found in the lung. The last two lambs were 20 days old at the time of invasion.

Of the remaining 14 invaded lambs, killed and examined from the 30th to the 90th day after the invasion (two on the 30th day, two on the 32nd day, one on the 41st day, one on the 51st day, four on the 65th day, tow on the 81st day and two on the 90th day). *A. lumbricoides* were found in only two of them.

In a lamb killed on the 30th day after the invasion, 13 *A. lumbricoides* were found in the small intestine from 13 to 20 mm long. In the caecum 12 *A. lumbricoides* were recovered, measuring 8 to 10 mm in length, dead and the cuticle separated from the body in certain regions.

In the female ascarides recovered from this lamb the vulva was situated in the middle or in the second half of the body. The distance from the anterior end of the body to the vulva is at a ratio from 1:1 to 2:1 to the distance from the vulva to the posterior end of the body.