OUTBREAK OF EIMERIA KOFOIDI AND E. LEGIONENSIS COCCIDIOSIS IN RED-LEGGED PARTRIDGES (ALECTORIS RUFAs)

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ABSTRACT

An outbreak of coccidiosis occurred in red-legged partridges is reported. At the post-mortem examination the birds showed a mucous haemorrhagic enteritis, mostly in the duodenal intestinal tract. Direct microscopic examination of intestinal content revealed the presence of a high number of oocysts. After incubation, on the basis of the morphological features, two species of coccidia were identified: Eimeria kofoidi and E. legionensis.

Key Words: Coccidiosis, Red-legged partridge, Alectoris rufa, Eimeria kofoidi, Eimeria legionensis.

Introduction

Game birds, including pheasants and partridges, are widely reared for releasing into the wild. Intensive farming of these species is frequently performed in pens and this could favour the diffusion of parasitic diseases. Coccidiosis, familiar to the poultry farmer, are prevalent on game farms too (Reck and McQuistion, 1994), however little literature is available on its real diffusion in game birds and on the involved coccidia species. In order to give a contribution to the knowledge of this parasitosis, we report an outbreak of coccidiosis occurred in red-legged partridges in Emilia Romagna region (Italy).

Material and methods

Case history

The outbreak occurred during the 2003 breeding season in a game farm producing pheasants (Phasianus colchicus colchicus), red-legged partridges (Alectoris rufa) and grey partridges (Perdix perdix) only from own breeders in order to release them in the farm's sor-
rounding area. Six different hatches of red-legged and grey partridges were obtained by artificial incubation. After each hatch, mixed and homogeneous groups were formed and housed on wood shavings in small pens previously cleaned and sanitised with caustic soda and dry heat. Drinkable water was usually used to water the birds except a short period during the breeding of the two first hatches when rainwater, collected from roofs in a basin, was used. Mortality occurred only in the two first hatches and affected exclusively the red-legged partridges. Never grey partridges have been affected. In the first hatch, composed by 74 red-legged partridges and 86 grey partridges, the mortality lasted 10 days starting from the 31st day of life and involved the 52.1% of the red-legged partridges. In the second outbreak mortality lasted from the 26th to the 31st day of age involving the 46.5% of red-legged partridges (53 birds out of 114). After the second hatch no mortality cases occurred. The affected birds were depressed and showed ruffled feathers 24 to 36 hours before death.

Post mortem examination and coproculture

Dead birds underwent necropsy and post mortem macroscopic lesions were recorded. Intestinal contents of 4 partridges were removed and emulsified with 2% potassium dichromate and vermiculite and placed in a shallow layer in Petri dishes. The plates were keep at 26 ± 2 °C, periodically humidified with mineral water, and examined at intervals for two weeks. The oocysts were extracted by water suspension, filtration and centrifugation; they were fixed in 10% formalin, then observed with light microscope and measured with the “camera lucida”.

Results and discussion

At the post-mortem examination red-legged partridges showed a mucous-haemorrhagic enteritis mostly in the duodenal intestinal tract. Direct microscopic examination of intestinal content revealed the presence of a high number of oocysts. After incubation, about half of the oocysts were sporulated and were morphologically distinguished in two groups:

1) rounded oocysts with smooth and thin wall, measuring 16-19 x 14-16 µm (17.44 by 14.91 µm in average, shape index 1.16). Almost half of these were non sporulated, with a granular spherical mass of 10 µm centrally placed. When sporulated, the sporocyst were oval and measured 8.5 X 5.5 µm, with a granular sporocyst residuum (Figure 1);

2) elliptic oocysts, measuring 19-24 x 13-16 µm (21.97 by 15.34 µm in average, shape index 1.43). A few of these were not sporulated, with central spherical sporont. Micropyle was present as a light hollow. The wall was smooth and thin (> 1 µm). Most of the oocysts were sporulated: no oocyst residuum was observed; the sporocysts were almond-shaped and measured 9.73 x 5.56 µm in average; Stieda bodies were present, sporocyst residuum was not evident (Figure 1).

On the basis of these morphological features,
we assumed the occurrence of a mixed infestation, and the two species of coccidia were identified as Eimeria kofoidi (Yakimoff and Matikaschwili, 1936) and E. legionensis (Cordero and Pla, 1966), respectively.

In literature, surveys of the partridges’ coccidia are rare, and often there isn’t agreement regarding the species reported and their intestinal localizations. In birds belonging to the Alectoris genus, different coccidia have been reported: E. alectoriae, E. kofoidi, E. caucasica, E. gonzalescristal, E. paludensis, E. phasiani, E. procera, E. legionensis, E. tenella and E. coturnicis (Lizcano and Romero, 1972; Levine, 1988; Cordero and Hidalgo, 1999). E. kofoidi was described both in A. graeca and in A. rufa, in the terminal portion of ileum and in caecum (Lizcano and Romero, 1972), and in Perdix perdix (Pellerdy, 1974). E. legionensis was described for the first time in Spain, in the caecum of A. rufa (Cordero and Pla, 1966), and afterwards it was also found in A. graeca, where it caused a severe outbreak of coccidiosis with a catarrhal-inflammatory change of the small intestine (Pellerdy, 1974). Furthermore experimental infection of grey partridges with E. legionensis caused a significant weight decrease and severe diarrhoea with enteritis in ileum as well as thiphritis; the oocysts production was low, but no mortality occurred (Vanparijs et al., 1991).

Conclusions

It is not clear if the partridges' coccidia are host specific and which tract of intestine they affect. With regard to the first issue we did not observe any clinical sign or mortality in the grey partridges housed together with the affected red-legged partridges. We are not in a position to give any new information to better understand the coccidia localisation, due to the fact that coproculture was carried out on the whole intestinal content, without distinguishing the different tracts. However the macroscopic lesions were mostly in the duodenum.

It remains to be clarified how the infection has been introduced. The only management difference occurred between the affected and health hatches was the use of rainwater instead of tap water for watering the birds. Therefore we hypothesize a possible faecal contamination of the rainwater by wild red-legged partridges free living in the farm area.

REFERENCES

CORDERO DEL CAMPILLO, M., PLA HERNANDEZ, M., 1966. Sobre las coccidiosis de las perdices, con descripción de Eimeria Legionensis n.sp., parasita de Alectoris rufa L. y una clave para su diferenciación. Rev. Iber. de Parasitol. 26(1):27-41.

CORDERO DEL CAMPILLO, M., HIDALGO, R., 1999. Otras Coccidiosis aviaria. In: Cordero del Campillo et al. (eds) Parasitología Veterinaria. McGraw-Hill Madrid, Spain, pp 768-770.

LEVINE, N.D., 1988. The protozoan Phylim Apicomplexa. Ed. CRC Press, Boca Raton, FL, USA.

LIZCANO HERRERA, J., ROMERO RODRIGUEZ, J., 1972. Contribución al estudio de las coccidiopatías del Alectoris rufa (L.). Rev. Iber. de Parasitol. 32(1-2):95-113.

PELLERDY, L.P., 1974. Coccidia and Coccidiosis. Ed. Verlag Paul Parey, Berlin und Hamburg, Germany.

RECK, M., MCQUISTION, T.E., 1994. The anticoccidial Effects of Amprolium, Monensin and Sodium Sulfamethazine in Farm-Reared Chukar Partridges (Alectoris graeca) in Illinois. Trans. Ill. State Acad. Sci. 87(1-2):51-59.

VANPARIJS, O., HERMANS, L., MARSBOOM, R., 1991. Anticoccidial efficacy of diclazuril in partridges. Vet. Rec. 129:339-340.

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