

# FIRST REPORT OF TWO POLYMORPHIC SPECIES OF *OSTERTAGIA* (NEMATODA:TRICHOSTRONGYLOIDEA) IN *CERVUS ELAPHUS* IN SPAIN: *O. LEPTOSPICULARIS* AND *O. KOLCHIDA*

J.M. ORTIZ, M. GOYENA & F. ALONSO

Departamento de Patología Animal, Parasitología y Enfermedades Parasitarias,  
Facultad de Veterinaria, Universidad de Murcia, Campus de Espinardo, 30100 Murcia, Spain

Received 26 July 1996; accepted 26 November 1996

**REFERENCE:** ORTIZ (J.M.), GOYENA (M) & ALONSO (F.D). 1996.— First report of of two polymorphic species of *Ostertagia* (Nematoda: Trichostrongyloidea) in *Cervus elaphus* in Spain: *O. leptospicularis* and *O. kolchida*. *Research and Reviews in Parasitology*, 56 (4): 221-223.

**ABSTRACT:** The authors give the first report in Spain of *Ostertagia leptospicularis* and *O.kolchida* from red deer, *Cervus elaphus*, in the Parque Natural de Cazorla, Segura y las Villas. A short description of both polymorphic species is given.

**KEY WORDS:** Nematoda, Trichostrongyloidea, *Ostertagia leptospicularis*, *Ostertagia kolchida*, polymorphic species, *Cervus elaphus*, Spain.

## INTRODUCTION

*Ostertagia leptospicularis* Assadov, 1953 and *O. kolchida* Popova, 1937 (Nematoda: Trichostrongyloidea) are common parasites in the abomasum of wild ruminants in Europe. They can also infect domestic ruminants where pastures are shared. In these cases they have been shown to cause severe ostertagiosis (LICHTENFELS, PILITT & LANCASTER, 1988).

During a study of the helminthfauna of wild ruminants in the Parque Natural de las Sierras de Cazorla, Segura y las Villas (Andalucía, Spain), specimens of *O. leptospicularis* and *O. kolchida* were collected from red deer, *Cervus elaphus*. These parasites have not been reported previously in this host in Spain (CORDERO DEL CAMPILLO, CASTAÑON & REGUERA, 1994).

## MATERIAL AND METHODS

Twelve animals between 1 and 7 years old were selectively shot and examined to determine nematode species and parasitic load. Necropsy was carried out in situ and the gastrointestinal tract was

processed separately (abomasum, small intestine and large intestine). The worms were treated according to the methodology normally used in Helminthology.

## RESULTS

Parasite identification was made from morphology of males, based on the descriptions of SKRJABIN, SHIKHOBALOVA & SCHULZ (1954), ROSE (1963), DROZDZ (1965), DURETTE-DESSET (1982) and DURETTE-DESSET (1983). Characteristics and measures of both *O. leptospicularis* and *O. kolchida* are noted in Table 1.

*O. leptospicularis* was found in eight of the twelve animals studied (66,67%) and *O. kolchida* in two of them (16,67%). The parasitic load ranged from 28 to 1716 in *O. leptospicularis* and from 63 to 76 in *O. kolchida*.

### *Ostertagia leptospicularis*

The male worm of *O. leptospicularis* (Fig. 1) is small and slender, reaching approximately 7,5 mm in length

Characteristics	<i>Ostertagia leptospicularis</i>	<i>Ostertagia kolchida</i>
Bursa type	2-1-2	2-1-2
Length	6,5-7,8 mm	7,5-8,2 mm
Width	0,11-0,13 mm	0,12-0,15 mm
Genital conus	well developed, with dorsal membrane supported by two distinct rays	dorsal membrane supported by a thick central trunk which terminates in a small captlike structure
Spicules	trifurcates 0,175-0,200 mm long	trifurcates 0,124-0,195 mm long
Gubernaculum	form: racket-shaped 0,045-0,050 mm long	form: rosette 0,050 mm long

Table 1.— Differential characteristics between the two polymorphic species *Ostertagia leptospicularis* and *O. kolchida*.

and 0.12 mm in width. The structure of the bursa and the arrangement of the bursal rays are characteristic of the genus (DURETTE-DESSET, 1982, 1983). The proconus forms a sturdy ventral protuberance at the base of the bursa. The genital conus, which lies dorsal to the proconus, has a well developed supporting apparatus. The dorsal membrane of the genital conus is supported by two distinct rays. The spicules are equal in length, approximately 0.175-0.200 mm, and form; they are trifurcate. Two lateral branches arise from the distal end of the main trunk; these are so fine that they can be distinguished clearly only after the dissection of the spicula or on careful examination under a high magnification. The end of the spicules forms a strongly chitinized hook, with the concave edge facing towards the interspicular space. The gubernaculum is approximately 0,045-0,050 mm long.

#### *Ostertagia kolchida*

The male worm of *O. kolchida* (Fig. 2) is 7.5-8.2 mm long and 0.13 mm wide. The dorsal membrane of the genital conus is supported by a thick central trunk, which terminates in a small caplike structure. The spicules are equal, with a length of 0.124-0,195 mm. They are trifurcate and more robust than *O. leptospicularis*. The two lateral branches which arise from the main trunk are dissimilar in form. The distal end of the dorsal branch is

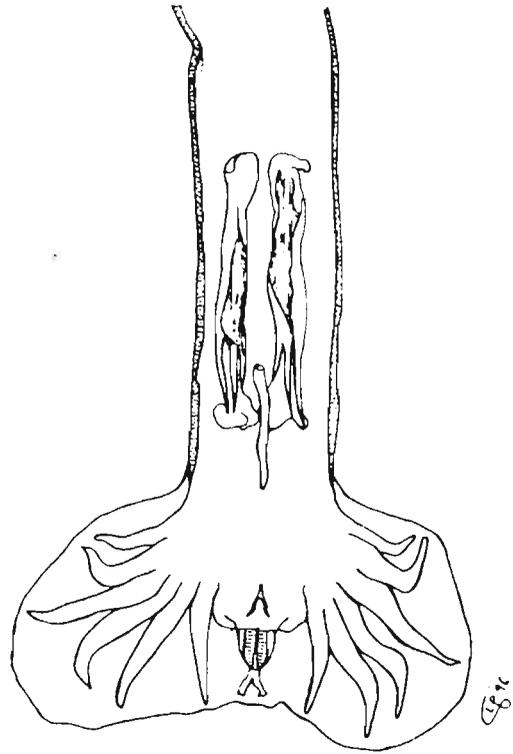


Fig. 2.— *Ostertagia kolchida*: male bursa in ventral view. Scale bar = 0.1 mm.

somewhat triangular in outline and distinctly pointed when viewed from the ventral or dorsal side, whereas the distal end of the ventral branch terminates in a blunt, indistinct tip. All three branches are covered with transparent membranes. The proper ends of the spicules are surrounded by chitinized caps. The gubernaculum is about 0,05 mm long, almost colorless and with a rosette-like structure at its proximal end.

#### DISCUSSION

The simultaneous presence of *O. leptospicularis* when *O. kolchida* appears agrees with the theory of polymorphism described by FORD (1953). The author defined this phenomenon as the occurrence together in the same habitat at the same time of two or more discontinuous forms of a species, the rarest of which (*O. kolchida* in this case) is too frequent to be maintained merely by recurrent mutation (LANCASTER & HONG, 1981). In Ostertagiinae, the first indication of polymorphism is presented by DROZDZ (1974, 1979). In polymorphic species, one form is invariably very much in the minority and frequently each «pair» consists of one type of male with slender spicules whilst the other has more robust spicules and

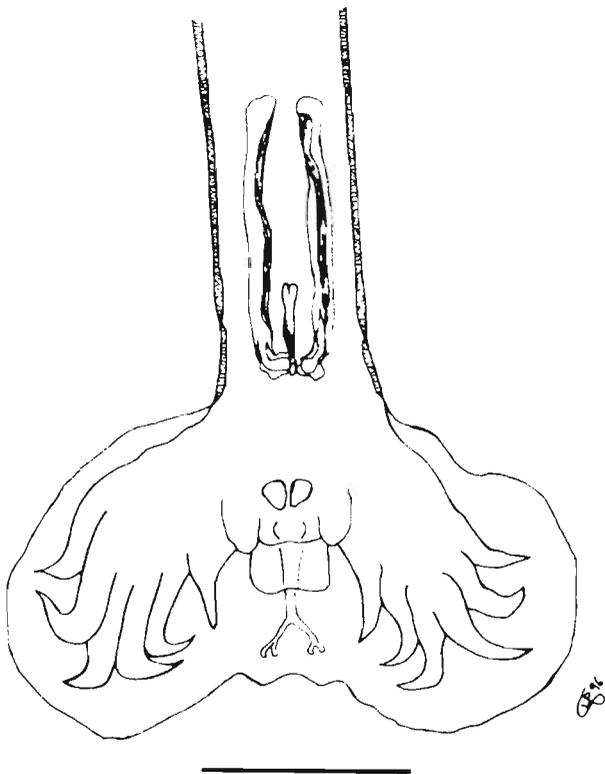


Fig. 1.— *Ostertagia leptospicularis*: male bursa in ventral view. Scale bar = 0.1 mm.

usually possesses Sjöberg's organ, defined by DROZDZ (1965) as a protusion of the genital cone. The presence or lack of minor morphs is a generic feature in the *Ostertagiinae* (DROZDZ, 1995). The *O. leptospicularis/O. kolchida* pair are typical examples of this type of association. They differ by characters which are recognised as generic features, e.g., the structure of spicules, gubernaculum and genital cone (DROZDZ, 1995).

#### ACKNOWLEDGEMENTS

We acknowledge the Department of Parasitology of Torino, Italy, especially Prof. Dr. Rossi, for advice and help. We are also grateful to Mr. Luis Pablo Rozas for assisting with the designs.

#### REFERENCES

- ASSADOV (S.M.), 1953.— [On the study of the fauna of the Trichostrongylidae of the roe in Azerbaidjan]. *Izv. Akademii Nauk Azerbaidjan SSR*, 1: 59-66. (in Russian)
- CORDERO DEL CAMPILLO (M.), CASTAÑON (L.) & REGUERA (A.), 1994.— *Indice-Catálogo de Zooparásitos Ibéricos*. Secretariado de Publicaciones, Universidad de León, León, 650 pp.
- DROZDZ (J.), 1965.— Studies on helminths and helminthiasis in cervidae. I. Revision of the subfamily *Ostertagiinae* Sarwar, 1956 and an attempt to explain the phylogenesis of its representatives. *Acta Parasitologica Polonica*, 13: 445-481.
- DROZDZ (J.), 1974.— The question of genetic isolation and of permanent coincidence of some species of the subfamily *Ostertagiinae*. In: *III International Congress of Parasitology (Munich), Proceedings*: 777-778.
- DROZDZ (J.), 1979.— Izolacja genetyczna jako kingterimo okrslojaca gatunek wsrod micieci pasozyticznych. *Diadomowsci Parazytologiczne*, 25: 171-193.
- DROZDZ (J.), 1995.— Polymorphism in the *Ostertagiinae* López Neyra, 1974 and comments on the systematics of these nematodes. *Systematic Parasitology*, 32: 91-99.
- DURETTE-DESSET (M.C.), 1982.— Sur les divisions génériques des nématodes *Ostertagiinae*. *Annales de Parasitologie Humaine et Comparée*, 57: 375-381.
- DURETTE-DESSET (M.C.), 1983.— Keys to genera of the superfamily Trichostrongyloidea. In: *CIH Keys to the Nematode Parasites of Vertebrates* (R.C. Anderson and A.G. Chabaud edit.), Commonwealth Agricultural Bureaux, Farnham Royal, 10: 1-85.
- FORD (E.B.), 1953.— The genetics of polymorphism in the Lepidoptera. *Advances in Genetics*, 5, 43-87.
- LANCASTER (M.B.) & HONG (C.), 1981.— Polymorphism in nematodes. *Systematic Parasitology*, 3: 29-31.
- LICHTENFELS (J.R.), PILITI (P.A.) & LANCASTER (M.B.), 1988.— Systematics of the Nematodes that cause *Ostertagiosis* in cattle, sheep and goats in North America. *Veterinary Parasitology*, 27: 3-12.
- POPOVA (C.G.), 1937.— New nematodes of cattle, *Ostertagia kolchida*. In: *Sbornik Rabot po Gel'mintologii, Posvyashchennyi Akademiku K.I. Skrybinu*: 497-499. (in Russian)
- ROSE (J.H.), 1963.— *Ostertagia crimensis* and *Grossspiculagia podjapolskyi* in British cattle. *Research in Veterinary Science*, 4: 450-453.
- SKRJABIN (K.I.), SHIKHOBALOVA (N.P.) & SCHULZ (R.S.), 1954.— Trichostrongylids of animals and man. In: *Essentials of Nematology*, Vol. 3 (K.I. Skryabin edit.), Izdatel'stvo Akademii Nauk SSSR, Moskva, 704 pp.