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SPAULIGODON ALOISEI N. SP. (NEMATODA: PHARYNGODONIDAE) PARASITE OF *PODARCIS SICULA* (REPTILIA: LACERTIDAE) FROM ITALY

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ABSTRACT: A new species of an oxyurid nematode is described from the large intestine of the lacertid lizard *Podarcis sicula* (Rafinesque, 1810) (Reptilia: Lacertidae) from Italy. *Spauligodon aloisei* n. sp. differs from other species of the genus by a combination of morphological and metrical characters, including a spined tail in males and females, absence of a spicule in males, arrangement of the last pair of the male caudal papillae, vulva location, and egg morphology. The species most similar to *S. aloisei* n. sp. is *Spauligodon caspius* Annayev, 1987, described from *Tenuidactylus* (=*Gymnodactylus*) *caspius* in Turkmenistan. Tail length and location of the excretory pore and vulvar opening separate *S. caspius* from *S. aloisei* n. sp. This article increases the number of species of this genus from reptiles in the Paleartic Realm to 19.

Pharyngodonid nematodes of *Spauligodon* Skrajabin, Schikhobalova, and Lagodovskaja, 1960 (Pharyngodonidae) are parasites of reptiles. Currently 36 species are described; 18 of these are in the Paleartic Realm (Bursey and Goldberg, 1999; Ramallo et al., 2002). One species, *Spauligodon extenuatus* (Rudolphi, 1819), is reported from Italian reptiles (Castaño-Fernandez et al., 1988). During our 2000 and 2001 helminthological surveys of reptiles in Calabria (southern Italy), intestinal nematodes were recovered from *Podarcis sicula* (Rafinesque, 1810) (Lacertidae) and were found to be an undescribed species of *Spauligodon*. The present study describes the new species from *P. sicula*.

MATERIALS AND METHODS

Eight lizards, *P. sicula*, were collected in Fiumefreddo Bruzio (16°03′30″N, 39°14′26″E) (Calabria, Italy) in June 2000 and September 2001. Lizards were caught with pitfall traps, anesthetized, and killed with chloroform before dissection. Nematodes were collected from the large intestine and stored in 70% ethanol. Worms were cleared in Amann lactophenol and examined under a compound microscope. Measurements (μm) were made on 37 mature specimens (18 males and 19 females). Drawings were made using a camera lucida.

DESCRIPTION

Spauligodon aloisei n. sp.

(Fig. 1a–d)

Female (based on 17 gravid specimens): Small, white, nematodes tapering anteriorly, posteriorly cylindrical; length 5,369 (5,047–5,747); width at level of esophageal bulb 326 (309–360). Cuticle with fine cross-striations approximately 8 (7–10) long. Esophagus (including bulb) length 440.5 (422–494); bulb width 110 (103–113); esophagus width 44 (41–49). Nerve ring 166 (154–179), excretory pore 296 (210–360) from anterior end. Ovarian, uterine coils postbulbar. Vulva just behind excretory pore. Filamentous portion of tail 628 (525–669) long, 7 (5–9) wide, with 6 (4–9) epicuticular spines. Egg ellipsoidal, flattened on one side. Egg 120 (118–125) long, 39 (33–49) wide.

Male (based on 18 adult specimens): White, fusiform nematodes 1,500 (1,318–1,571) long; width at level of esophageal bulb 139 (110–169). Lateral alae 35 (28–46) wide, extending posteriorly from level of nerve ring to anterior border of caudal alae. Cuticle with fine cross-striations approximately 3 (2–5) long. Mouth bounded by 3 bilobed lips. Esophagus and bulb length, 280 (210–330); bulb width, 67 (58–79); esophagus width 25 (15–31). Nerve ring 121 (87–154), excretory pore 356 (268–443) from anterior end. Narrow caudal alae 40 (28–49) wide, 42 (33–49) long. Three pairs of caudal papillae; precloacal pair situated on slightly inflated portion of caudal end; first postcloacal pair posterolaterally directed, enclosed by caudal alae; second postcloacal pair on base of tail, 21 (18–26) behind first postcloacal pair. Filiform tail extends 396 (333–494) beyond postcloacal papillae, with 2 (1–4) spines.

Taxonomic summary

Type specimen: Holotype male (SA00062001); allotype female (SA00062002); and paratypes 18 males and 16 females (SA00062003-2036), Helminthological Collection Laboratory of Parasitology, University of Barcelona, Spain.

Type host: Podarcis sicula (Rafinesque, 1810) (Reptilia: Lacertidae).

Common name: Lucertole.

Type locality: Fiumefredo Bruzio (16°03′30″N, 39°14′26″E) Calabria, southern Italy.

Site of infection: Large intestine.

Prevalence: Three of 8 (37.5%).

Mean intensity: Twelve (8–16).

Etymology: The specific name is in honor of Gaetano Aloise of the Universitá della Calabria, Cosenza, Italy, for his contribution to the knowledge of vertebrates in Italy and particularly in the Calabrian region.

Remarks

Bursey and Goldberg (1999) summarized the morphological characters used to separate species of *Spauligodon*, i.e., the presence or absence of a spicule, the presence and number or absence of spines in the tail of adult males and females, and the shape of eggs. From these characters and the recent description of *Spauligodon loboi* Ramallo, Bursey, and Goldberg, 2002, only *Spauligodon caspius* Annayev, 1987, described from *Tenuidactylus* (=*Gymnodactylus*) *caspius* in Turkmenistan is similar to *S. aloisei* n. sp. (Annayev, 1987). In both species tail is spined in males and females, eggs are barrel-shaped, and spicule is lacking. *Spauligodon aloisei* n. sp. differs from *S.*

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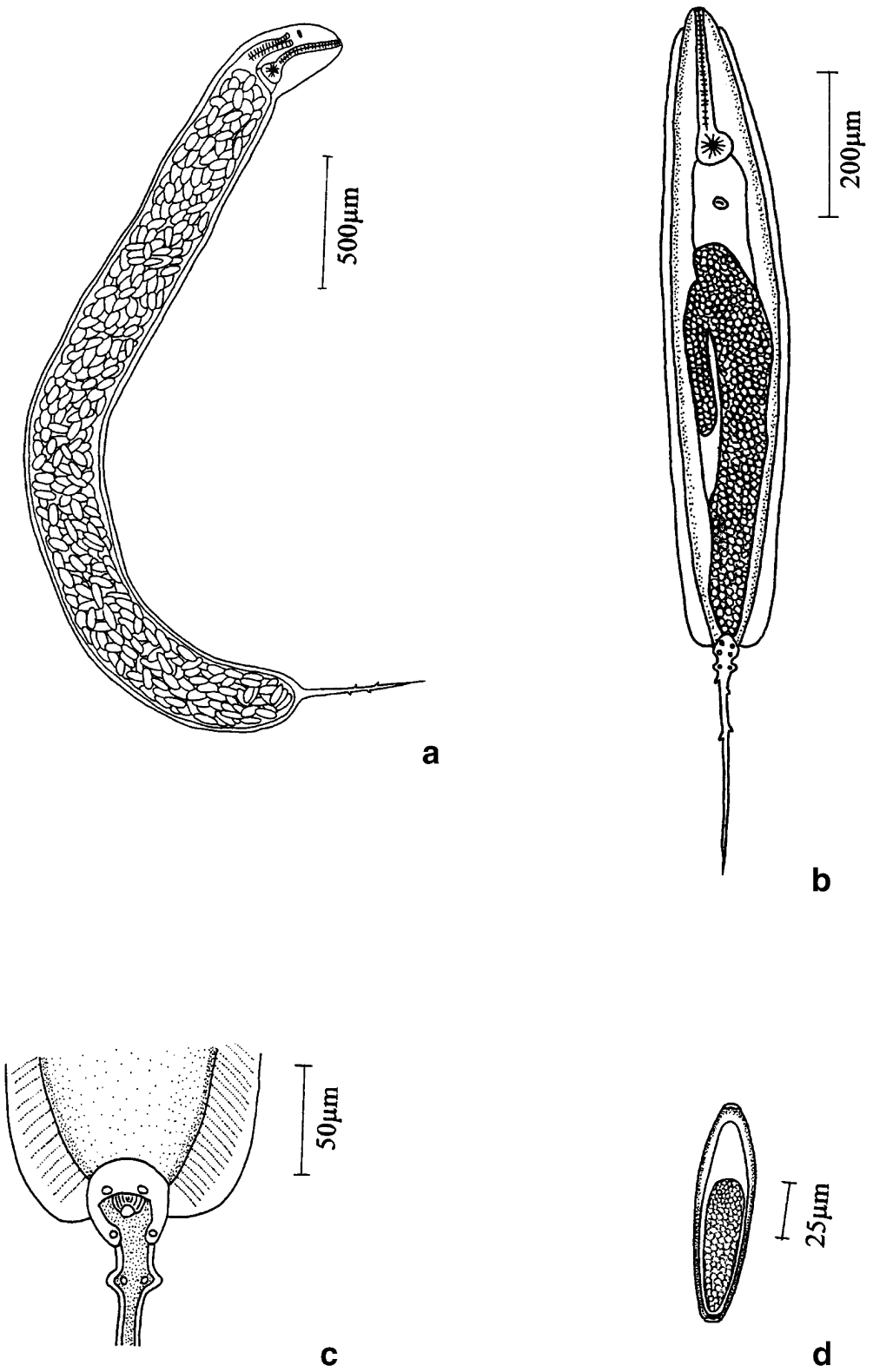

FIGURE 1. *Spauligodon aloisei* n. sp. (**a**) Female, ventral view. (**b**) Male, ventral view. (**c**) Male, posterior end, ventral view. (**d**) Egg.

caspius in several morphological and metrical parameters. Males of *S. aloise* n. sp. are smaller than those of *S. caspius* in all parameters except tail length. In males of *S. caspius* the posterior pair of male genital papillae is close to the end of caudal alae, whereas in *S. aloisei* n. sp. these papillae are clearly separated. Females of *S. caspius* are similar to those of *S. aloisei* n. sp. but differ in tail length, which is greater in *S. caspius*, and in the location of the genital pore and vulval opening. In *S. caspius* the genital pore and the vulva are always postbulbar, whereas in *S. aloisei* n. sp. both are above the level of the esophageal bulb.

DISCUSSION

Eight species of *Spauligodon* are known from the Mediterranean area: *Spauligodon auziensis* Seurat, 1917 from North Africa and France; *Spauligodon cabrerae* Castaño-Fernández et al., 1988 from the Balearic Islands; *Spauligodon carbonelli* Roca and García-Adell, 1988 from the Iberian Peninsula; *S. extenuatus* and *Spauligodon laevicauda* (Seurat, 1924) from North Africa, Italy, and Spain; *Spauligodon paratectipenis* (Chabaud and Golvan, 1957) from Africa; *Spauligodon tectipenis* (Gedoelst, 1919) from Africa and Spain; and *Spauligodon vojteki* Moravec, Barŭs, and Ryšavý, 1987 from Egypt (Bursey and Goldberg, 1999). The Mediterranean species most similar to *S. aloisei* n. sp. are those without a spicule, i.e., *S. cabrerae*, *S. paratectipenis*, and *S. tectipenis*. Morphologically, *S. aloisei* n. sp. differs from *S. cabrerae*, which has an oval egg shape and a smooth tail in the male, and from *S. paratectipenis* and *S. tectipenis*, which have smooth tails in females (Bursey and Goldberg, 1999). Skrajabin et al. (1960) described a spiny male tail in *S. tectipenis*, whereas Lopez-Neyra (1947) translated Gedoelst's description of this species as ''male caudal extension without spines.'' In Italy, only *S. extenuatus* was previously reported in reptiles (García-Calvente, 1948). In Rudolphi's description of *S. extenuatus*, the presence of a spicule and smooth male tail, as well as egg measurements, separate *S. aloisei* n. sp. from the African, Italian, and Spanish individuals (Lopez-Neyra, 1947; García-Calvente, 1948).

Bursey and Goldberg (1999) and Ramallo et al. (2002) stated that the geographical distribution and morphological characters are the most important factors to distinguish the 36 *Spauligodon* species currently recognized. In the Mediterranean area, Castaño-Fernandez et al. (1988) decribed *S. cabrerae* from *Podarcis lilfordi* in the Island of Cabrera (Balearic Islands, Mediterranean Sea). Despite the geographical proximity of these species, Castaño-Fernandez et al. (1988) consider that isolation could have played an important role in the speciation of *Spauligodon atlanticus*, *S. cabrerae*, and *Spauligodon tarentolae*. As stated by Chabaud and Brygoo (1962) regarding the importance of the geographical distribution in the speciation of reptilian oxyurids, the Mediterranean region offers an ideal situation to study the phylogeny and phylogeography of *Spauligodon* spp.

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