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Oncholaimids (Nematoda, Oncholaimidae) from Tenerife (Canary Islands)

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RESUMEN: Cuatro especies de la familia Oncholaimidae son citadas por primera vez para el archipiélago Canario: *Oncholaimellus calvadosicus* De Man, 1890, *Oncholaimus campylocercoides* De Coninck & Stekhoven, 1933, *O. skawensis* Ditlevsen, 1921 y *Viscosia glabra* (Bastian, 1865). Las muestras proceden del intermareal y submareal somero de fondos arenosos de Los Abrigos y Los Cristianos, en la costa este y oeste de la isla de Tenerife, respectivamente. Se aportan datos merísticos y autoecológicos de las especies analizadas.

Palabras clave: Oncholaimidae, vida libre, nematodos, Tenerife, islas Canarias.

ABSTRACT: Four species of the family Oncholaimidae: *Oncholaimellus calvadosicus* De Man, 1890, *Oncholaimus campylocercoides* De Coninck & Stekhoven, 1933, *O. skawensis* Ditlevsen, 1921 and *Viscosia glabra* (Bastian, 1865) were recorded for the first time from the Canary Islands. Samples were collected in the intertidal and shallow subtidal sandy soft-bottoms from Los Abrigos and Los Cristianos, two localities situated on the eastern and western coast of Tenerife, respectively. Meristic and autoecological data of the studied species are presented.

Key words: Oncholaimidae, free-living, nematodes, Tenerife, Canary Islands

INTRODUCTION

The family Oncholaimidae is included in the superfamily Oncholaimacea, together with the family Enchelidiidae (Lorenzen, 1994). This family was created by Filipjev (1918),

but there is no specific characteristic that could establish the holophyly of this family because is large and very heterogeneous. Currently, 28 genera belong to this family.

During and ecological study of the intertidal and shallow subtidal soft-bottoms from two sandy beaches located on the east and west coast of Tenerife (Los Abrigos and Los Cristianos), four species of oncholaimids were collected: *Oncholaimellus calvadosicus* De Man, 1890, *Oncholaimus campylocercoides* De Coninck & Schuumars-Stekhoven, 1933, *O. skawensis* Ditlevsen, 1921 and *Viscosia glabra* (Bastian, 1865). All of them have been widely recorded in intertidal sands of the Atlantic ocean (Platt & Warwick, 1983).

MATERIAL AND METHODS

Samples were collected in the intertidal and shallow subtidal, at 3 m deep, soft-bottoms of Los Abrigos (SE Tenerife) and Los Cristianos (SW Tenerife). PVC cores of 4.5 cm of inner diameter were taken to a depth of 30 cm in the sediment. Samples were fixed with 10% formaldehyde in seawater for one day and decanted through a sieve of 63 μ m mesh size, and subsequently preserved in 70% ethanol. Several specimens were mounted in glycerine gel and drawings of these were done using a camera lucida on a Leica DMLB microscope equipped with Nomarski interference contrast. All measurements are in micrometers and curves structures are measured along the arc. The studied material is deposited in the collection of the Benthos Laboratory, Department of Animal Biology, University of La Laguna, Canary Islands (DBAULL).

Abbreviations used in the text are: a: body length divided by maximum body diameter; b: body length divided by pharyngeal length; c: body length divided by tail length; c': tail length divided by anal body diameter; cbd: corresponding body diameter; s': spicule length divided by anal body diameter; %V: position of vulva as a percentage of body length from anterior.

SYSTEMATICS

Phylum NEMATODA

Order ENOPLIDA Chitwood, 1935

Suborder ENOPLINA Chitwood & Chitwood, 1937

Family ONCHOLAIMIDAE Filipjev, 1916

Oncholaimellus calvadosicus De Man, 1890

(Fig. 1, Tab. 1)

Oncholaimellus calvadosicus De Man (1890): 190, fig. 10; Wieser (1959): 24, fig. 20; Platt & Warwick (1983): 216, fig. 97.

Oncholaimus littoralis Allgen (1929): 442, fig. 8.

Meristic data and studied material.- Abrigos subtidal: May 2001, 1 female ($\text{\textcircled{f}}$ 1); Cristianos intertidal: October 2001, 1 female ($\text{\textcircled{f}}$ 2).

Description.- Males not found.

Female: Body slender, tapering towards both ends. Head round and slightly set off. Cuticle smooth. Amphids not seen. Buccal cavity developed, with two conspicuous teeth. Inner labial setae lacking. Outer labial and cephalic setae 0.3 cephalic diameters long and located in the middle region of the head. Pharynx slender and cylindrical. Nerve ring at 140 μm from the anterior body end. Ventral gland not seen.

The reproductive system is didelphic, with two reflexed ovaries. Vulva located in the posterior half of the body, at 44.9-46.5% of the total length. Tail 4.4 anal diameters long, cylindrical and with truncated posterior end. Caudal setae lacking. Spinneret poorly developed.

Ecology.- *Oncholaimellus calvadosicus* was collected in medium sands in Abrigos subtidal ($Q_{50} = 0.28$) and fine sands in Cristianos intertidal ($Q_{50} = 0.15$), with a very good selection ($S_0 = 0.82-0.96$). The organic content varied between 0.46% and 1.07% and carbonates percentage ranged between 5.47% and 20.68%.

Distribution.- Amphiatlantic (Wieser, 1959; Platt & Warwick, 1983). This species is first recorded for the Canary Islands.

	♀1	♀2
Total body length	1742.9	1500
a	32.5	37.5
b	13.5	12
c	11.1	23.9
Cephalic diameter	21.4	20
Inner labial setae	-	-
Outer labial setae	6	5
Cephalic setae	10	8.6
Subcephalic setae	-	-
Buccal cavity diameter	10.7	10
Amphid diameter	-	-
Amphid height	-	-
Amphid from anterior	-	-
Pharynx length	128.6	125
Pharynx cbd	50	42.9
Maximum body diameter	53.6	40
Vulva from anterior	781.6	697.5
% V	44.9	46.5
Spicule length	-	-
Gubernaculum length	-	-
s'	-	-
Tail length	157.1	62.9
Anal body diameter	32	21.4
c'	4.9	2.9
Spicule length/Tail length		

Table 1.- Measurements of *Oncholaimellus calvadosicus* in μm .

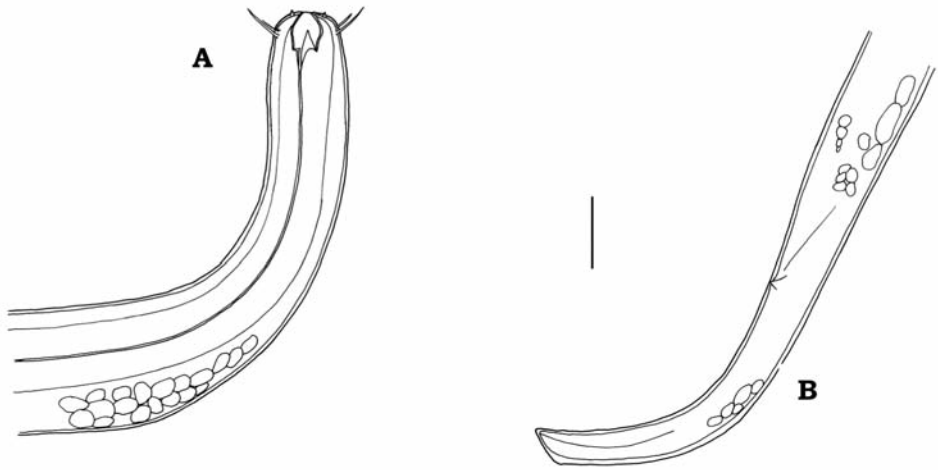


Figure 1.- *Oncholaimellus calvadosicus*. Female. A. Anterior end. B. Posterior end. Scale = 20 μ m.

Oncholaimus campylocercoides De Coninck & Stekhoven, 1933
(Fig. 2, Tab. 2)

Oncholaimus campylocercoides De Coninck & Stekhoven (1933): 48; Gerlach (1952): 334, fig. 11; Platt & Warwick (1983): 226, fig. 102; Palacín (1990): 238.

Meristic data and studied material.- Abrigos intertidal, July 2001, 2 females ($\text{♀}3$ y $\text{♀}4$), September 2001, 1 male ($\text{♂}1$), October 2001, 1 male ($\text{♂}3$) y 1 female ($\text{♀}1$), December 2001, 1 male ($\text{♂}2$); Abrigos subtidal: July 2001, 1 male ($\text{♂}4$), December 2001, 1 male ($\text{♂}5$); Cristianos subtidal: November 2001, 2 females ($\text{♀}2$ y $\text{♀}5$).

Description.- *Male*. Body slender, posteriorly attenuated. Head round and not set off. Cuticle smooth. Amphids difficult to discern. Buccal cavity developed with three teeth, being the left subventral the most prominent. Inner labial setae lacking. 6 outer labial setae 0.2 head diameters long and 4 cephalic setae 0.25 head diameters long, situated in the median head region. Pharynx cylindrical and narrow. Ventral gland and nerve ring not seen.

The reproductive system is diorchic with two opposed testes, difficult to discern. Spicules straight, 0.8 anal diameters in chord length and widens posteriorly. Gubernaculum and precloacal supplements lacking. Precloacal papilla bearing 4-5 setae 5 μ m long, at 8 μ m from the cloaca. 3-4 postcloacal setae 10 μ m long, situated at 9 μ m from the cloaca. Tail conical, 2.3 anal diameters long and rounded distally. 2 caudal setae 6 μ m long. Spinneret poorly developed.

Female. Total length (1.7-1.8 mm) shorter than in males and similar tail length (3.5-4.2 anal diameters). Reproductive system is monodelphic with one anterior reflexed ovary. Vulva at the 47.9-49.0% of the total length.

Ecology.- This species was collected in medium sands ($Q_{50} = 0.38$) and fine sands ($Q_{50} = 0.18$), with a very good selection ($S_0 = 0.73-0.93$). The organic matter content varied between 0.30% and 0.76% and carbonates percentage ranged between 5.30% and 23.08%.

	♂1	♂2	♂3	♂4	♂5	♀1	♀2	♀3	♀4	♀5
Total body length	2471.4	2300	2714.3	2557.1	2442.9	1771.4	1777.9	1671.4	1742.9	1800.5
a	53.2	50	50.7	44.8	48.9	41.3	39	36	32.5	34.1
b	4.9	6.2	6.3	6	5.5	4.8	4.9	5	4.6	4.6
c	33	26.8	19	25.6	29.7	15.5	14.1	12.3	16.3	16
Cephalic diameter	32.1	32.1	28.6	32.1	35.7	21.4	26.9	28.6	21.4	22.9
Inner labial setae	-	-	-	-	-	-	-	-	-	-
Outer labial setae	7	6.2	6.7	7.1	7.3	7	7.1	6.5	7	7.8
Cephalic setae	10	8.6	8.6	10	10	7.1	7.3	6.0	7.1	7.8
Subcephalic setae	-	-	-	-	-	-	-	-	-	-
Buccal cavity diameter	17	16	14.3	16	14.3	14.3	16.8	15.9	17.9	15.8
Amphid diameter	8.6	8	9	8	8.6	8	9.5	11.4	10	10.5
Amphid height	7.1	8	8	8	8.6	7	8.5	11.4	10	9.8
Amphid from anterior	18.6	15	18	19	18	7.9	6.8	5.7	5.7	7.6
Pharynx length	500	371.4	428.6	428.6	442.9	371.4	359.8	332.1	378.6	391.4
Pharynx cbd	39.3	39.3	39.3	60.7	57.1	38.6	37.9	39.6	36.4	388.2
Maximum body diameter	46.4	46	53.6	57.1	50	42.9	45.6	46.4	53.6	39.8
Vulva from anterior	-	-	-	-	-	850.3	866.3	800	853.9	871.2
% V	-	-	-	-	-	48	48.7	47.9	49	48.4
Spicule length	27.1	31.4	37.1	31.4	31.4	-	-	-	-	-
Gubernaculum length	-	-	-	-	-	-	-	-	-	-
s'	0.8	1.3	1.2	0.7	0.9	-	-	-	-	-
Tail length	75	85.7	142.9	100	82.1	114.3	125.6	135.7	107.1	112.3
Anal body diameter	32.1	25	32.1	46.4	35.7	31.4	35.4	32.1	29.1	33.5
c'	2.3	3.4	4.4	2.2	2.3	3.6	3.5	4.2	3.9	3.4
Spicule length/Tail length	0.4	0.4	0.3	0.3	0.4	-	-	-	-	-

Table 2.- Measurements of *Oncholaimus campylocerooides* in μm .

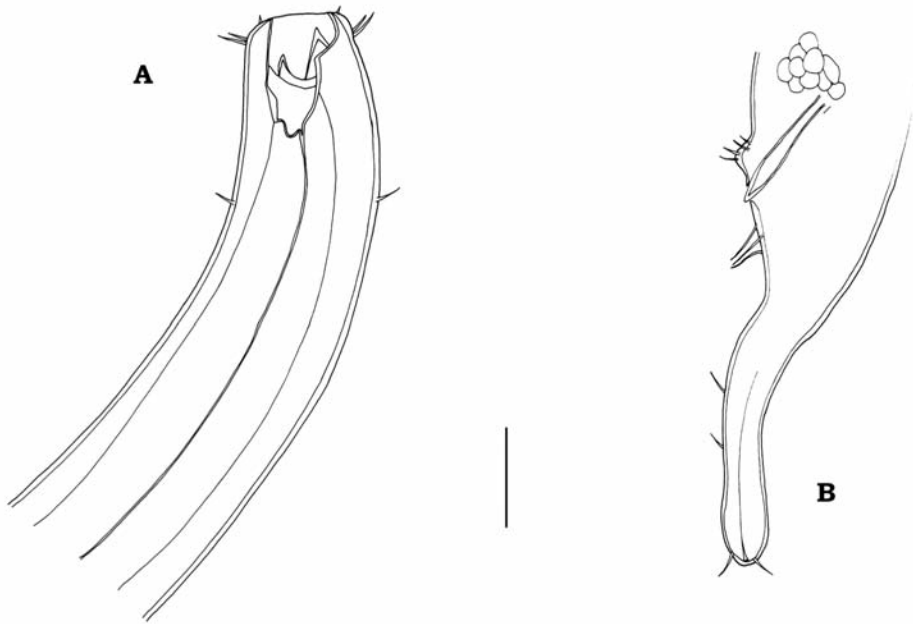


Figure 2.- *Oncholaimus campylocercoides*. Male. A. Anterior end. B. Posterior end. Scale = 22 μ m.

Distribution.- Amphiatlantic (Delamare *et al.*, 1955; Wieser, 1959). Mediterranean sea (Gerlach, 1954). Red Sea (Gerlach, 1964). This species is first recorded for the Canary Islands.

Oncholaimus skawensis Ditlevsen, 1921
(Fig. 3, Tab. 3)

Oncholaimus skawensis Ditlevsen (1921): 61, figs. 3, 6, pl. 2; Riemann (1972): 49, figs. 11, 12; Platt & Warwick (1983): 228, fig. 103.

Adoncholaimus skawensis.- Allgen (1933): 30.

Meristic data and studied material.- Abrigos intertidal: September 2001, 3 females ($\text{♀}1$, $\text{♀}2$ y $\text{♀}3$); Cristianos subtidal: November 2001, 2 females ($\text{♀}4$ y $\text{♀}5$).

Description. Males not found.

Female. Body slender, tapering towards both ends. Head round and not set off. Cuticle smooth. Amphids are 50% of the corresponding diameter, difficult to discern. Buccal cavity developed with three conspicuous teeth. Inner labial setae lacking. 6 outer labial setae 0.25 cephalic diameters long. 4 cephalic setae 0.3 cephalic diameters long, located at the middle of the head region. Somatic setae arranged in the whole body, numerous in the posterior region. Pharynx slender and cylindrical. Ventral gland and nerve ring not seen.

The reproductive system is monodelphic with one anterior reflexed ovary. Vulva at 65.3-68.6% of the total length. Tail is 4-4.7 anal diameters long, elongated and cylindrical, with round posterior end. Caudal setae lacking. Spinneret poorly developed.

	♀1	♀2	♀3	♀4	♀5
Total body length	1900	1971.4	2175.9	2228.6	2210.1
a	54	54.4	57.6	56.7	56.8
b	5.1	4.8	5.2	4.9	4.8
c	19	19	19.8	17.3	19.7
Cephalic diameter	25.1	21.4	25.1	25.0	25.3
Inner labial setae	-	-	-	-	-
Outer labial setae	5	5	4.9	4.3	5.1
Cephalic setae	7.7	8	8.5	7.7	8.3
Subcephalic setae					
Buccal cavity diameter	14.3	17.9	15.6	14.3	14.9
Amphid diameter	10	10.2	10.2	8	10
Amphid height	9.7	10.7	10.6	7	9.1
Amphid from anterior	-	-	-	-	-
Pharynx length	371.4	414.3	421.5	457.1	460.2
Pharynx cbd	32.1	30.4	32.6	35.7	34.9
Maximum body diameter	35.2	36.2	37.8	39.3	38.9
Vulva from anterior	nd	1287.9	1489.5	1528.6	1509.2
% V	nd	65.3	68.4	68.6	68.3
Spicule length	-	-	-	-	-
Gubernaculum length	-	-	-	-	-
s'	-	-	-	-	-
Tail length	100	103.6	109.8	128.6	112.3
Anal body diameter	25	22	23.5	25	24.5
c'	4	4.7	4.7	5.1	4.6
Spicule length/Tail length	-	-	-	-	-

Table 3.- Measurements of *Oncholaimus skawensis* in μm . nd, no discernible.

Ecology.- *Oncholaimus skawensis* was recorded in medium sands ($Q_{50} = 0.38$) and fine sands ($Q_{50} = 0.15$) with a very good selection ($S_0 = 0.54-0.93$). The organic matter content varied between 0.006% and 0.76% and carbonates percentage ranged between 5.30% and 19.32%.

Distribution.- Amphiatlantic (Chitwood, 1960; Platt & Warwick, 1983). East Pacific (Nelson *et al.*, 1971). This species is first recorded for the Canary Islands.

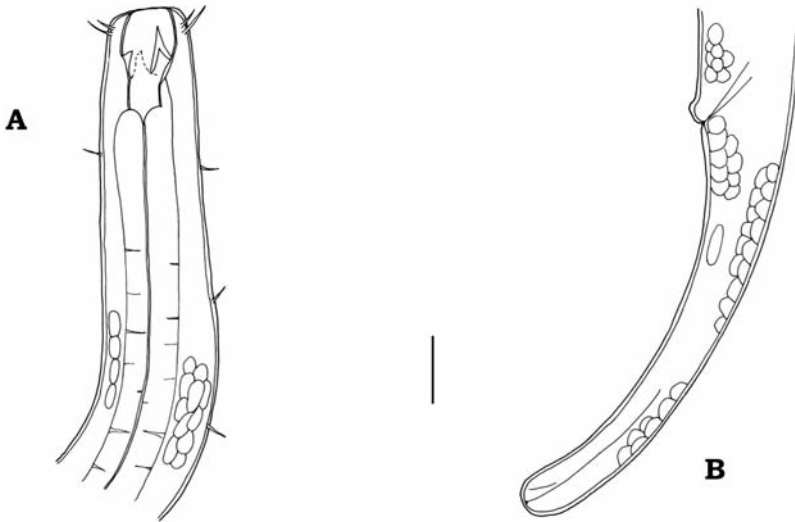


Figure 3.- *Oncholaimus skawensis*. Female. A. Anterior end. B. Posterior end. Scale = 20 μ m.

Viscosia glabra (Bastian, 1865)
(Fig. 4, Tab. 4)

Oncholaimus glaber Bastian (1865): 136, figs. 129-130.

Viscosia glabra.- Platt & Warwick (1983): 242, fig. 110; Smol & Sharma (1984): 125, fig. 1, tab. 1, pl. 1; García-Lanciego (1990): 35, fig. 12.

Viscosia carnleyensis.- Wieser (1959): 29.

Meristic data and studied material.- Abrigos intertidal: August 2001, 1 female (♀ 1); Abrigos subtidal: August 2001, 1 female (♀ 4); Cristianos intertidal: July 2001, 1 female (♀ 3); Cristianos subtidal: December 2001, 1 female (♀ 2).

Description. Males not found.

Female. Body slender tapering towards posterior end. Head slightly round and not set off. Cuticle smooth. Amphids inconspicuous. Buccal cavity developed, with three teeth. Inner and outer labial setae lacking. 6 cephalic setae 1 μ m long, situated in the anterior part of the head. Sucephalic setae lacking. Pharynx slender and cylindrical. Ventral gland and nerve ring not seen.

The reproductive system is didelphic, with two reflexed ovaries. Vulva located at 47-53% of the total length. Tail slender and cylindrical, filiform in most of its length with round posterior end. Tail length is 9.5-9.6 anal diameters. Caudal setae lacking. Spinneret poorly developed.

	♀1	♀2	♀3	♀4
Total body length	2557.1	1942.9	2171.4	1928.6
a	55.1	40.5	43.4	41.9
b	6.4	6.3	6.6	6.3
c	6.3	6.6	6.1	6.4
Cephalic diameter	25.4	23.8	25	23.3
Inner labial setae	-	-	-	-
Outer labial setae	-	-	-	-
Cephalic setae	-	-	-	-
Subcephalic setae	-	-	-	-
Buccal cavity diameter	14.3	12.9	10.7	10.7
Amphid diameter	3	2.8	3	2.9
Amphid height	30	2.9	3	2.9
Amphid from anterior	10.9	11.3	11.3	11.4
Pharynx length	442.9	357.1	328.6	285.7
Pharynx cbd	42	34.3	39.3	34
Maximum body diameter	46.4	48	50	46
Vulva from anterior	1357.1	nd	1114.3	914.3
% V	53.1	nd	51.3	47.4
Spicule length	-	-	-	-
Gubernaculum length	-	-	-	-
s' -	-	-	-	-
Tail length	398.2	308.2	327.8	315.4
Anal body diameter	41.3	32.1	34.5	33.2
c'	9.6	9.6	9.5	9.5
Spicule length/Tail length	-	-	-	-

Table 4.- Measurements of *Viscosia glabra* in μm . nd, no discernible.

Ecology.- *Viscosia glabra* was collected in medium sands ($Q_{50} = 0.38$) and fine sands ($Q_{50} = 0.17$), with a very good selection. The organic matter percentage varied between 0.61% and 1.11% and carbonates content ranged between 5.13% and 26.84%.

Distribution.- Cosmopolitan (Smol & Sharma, 1984). This species is first recorded for the Canary Islands.

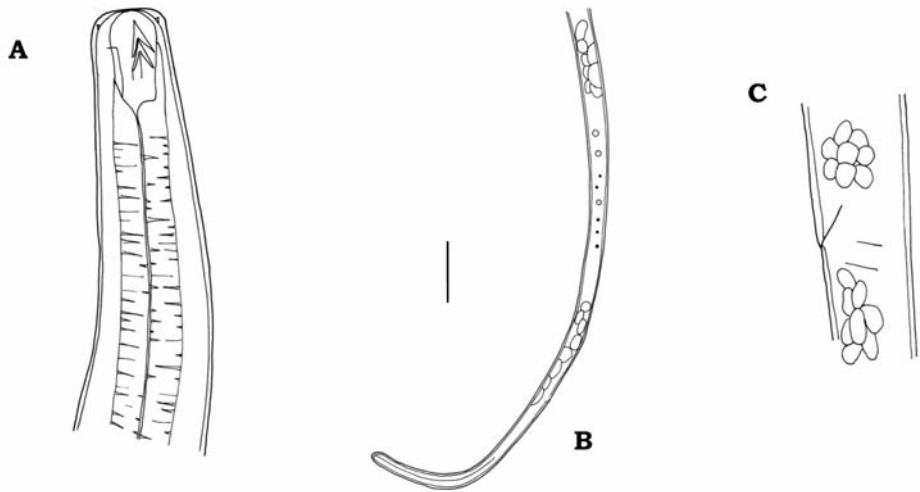


Figure 4.- *Viscosia glabra*. Female. A. Anterior end. B. Anal region. C. Posterior end. Scale A, C = 25 μ m, B = 32 μ m.

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