Journal of the Marine Biological Association of the United Kingdom, page 1 of 9.
doi:10.1017/S0025315415002039

New species of *Chaetonema* (Nematoda, Anoplostomatidae) and *Admirandus* (Nematoda, Oncholaimidae) from Patagonia, Río Negro and Santa Cruz, Argentina

VIRGINIA LO RUSSO, GABRIELA VILLARES AND CATALINA T. PASTOR DE WARD
Centro Nacional Patagónico (CONICET), C.C. 128 (9120) Puerto Madryn, Chubut, Argentina

Two new species are described from the Patagonia coast of Argentina, South Atlantic, and written keys to both genera are given. Chaetonema patagonica *sp. nov. can most easily be differentiated from the other four species of the genus by the amphid shape and by the absence of a precloacal organ.* Admirandus sanjuliensis *sp. nov. is characterized by position of the Demanian pores, one preanal and two postanal, the configuration of pre- and postcloacal papillae and setae and by having the shortest stoma in the genus.*

Keywords: Chaetonematinae, Adoncholaiminae, marine Nematoda, Patagonia, taxonomy, descriptions, dichotomous keys

Submitted 23 June 2015; accepted 13 November 2015

INTRODUCTION

Nematological surveys conducted in the period 2008–2009 for a project (PICT/SECYT No.2/33345), on biodiversity of meiofauna in San Julián Bay, Santa Cruz province, and in Río Negro, Patagonia, Argentina, revealed a new species of *Chaetonema* (Anoplostomatidae) and a new species belonging to genus *Admirandus* (Oncholaiminae).

The family Anoplostomatidae Gerlach & Riemann, 1974 consists of two subfamilies: Chaetonematinae Gerlach & Riemann, 1974 (males with precloacal tubule) and Anoplostomatinae Gerlach & Riemann, 1974 (males with bursa). Chaetonematinae are characterized by extreme sexual dimorphism in amphid structures. We describe here one new species of *Chaetonema: Chaetonema patagonica* sp. nov.

The family Oncholaimidae Filipjev, 1916 comprises seven subfamilies and 27 genera. The subfamily Adoncholaiminae Gerlach & Riemann, 1974 includes four genera (*Meyersia* Hopper, 1967; *Kreisoncholaimus* Rachor, 1969; *Adoncholaimus* Filipjev, 1918 and *Admirandus* Belogurov & Belogurova, 1979). *Adoncholaimus* and *Admirandus* are the most related genera. They differ by the position of Demanian system glandular duct openings, these being precloacal openings in *Adoncholaimus* and postcloacal openings in *Admirandus* (Belogurov & Belogurova, 1979; Tchesunov *et al.*, 2010; Shimada & Kajihara, 2014). We describe here one new species of *Admirandus: Admirandus sanjuliensis* sp. nov. and the role of the position of glandular ducts is discussed.

Corresponding author:
C.T. Pastor de Ward
Email: pastor@cenpat-conicet.gob.ar

MATERIALS AND METHODS

Description of site studied

Samples for species description were obtained from Argentine littoral coasts at two different sites along Argentine Patagonian beaches (Figure 1, Table 1).

The northernmost site (Banco Perdices) is in San Antonio Bay, Río Negro province. This bay is located in the north-west of San Matías Gulf. It is composed by a shallow channel system with small islands and sandbanks, which are completely covered at high tide. The tidal amplitude reaches 9.30 m, with low tides exposing a width muddy area of 7 km. Banco Perdices is characterized by an extensive littoral zone covered with *Spartina* sp. in the upper fringe.

The southernmost site (San Julián Bay) is located in Santa Cruz province on the Atlantic coast of South America. It is situated in the high latitude Patagonian desert characterized by constant winds (>9 m s^{-1}), with an annual mean of 40 km h^{-1} (Gassó & Stein, 2007), dust storms and low, irregular rain regimes (<200 mm per year) and air temperatures between 8 to 10°C. The bay is an inlet, 19.9 km long, and runs parallel to the coast, separated from the sea by a long and narrow peninsula. It has two distinct areas within, one near the entrance to the bay (length/width 6.8/5.3 km) and one towards the very end, 'Rincón' (length/width 11.8/8.2 km), separated by a narrow passage where the city of Puerto San Julián is situated.

Chaetonema patagonica sp. nov. has a wide distribution along the Patagonian coast. It was found in Banco Perdices in San Antonio Este, Río Negro near the city of San Julián and Rincón, San Julián Bay, Santa Cruz.

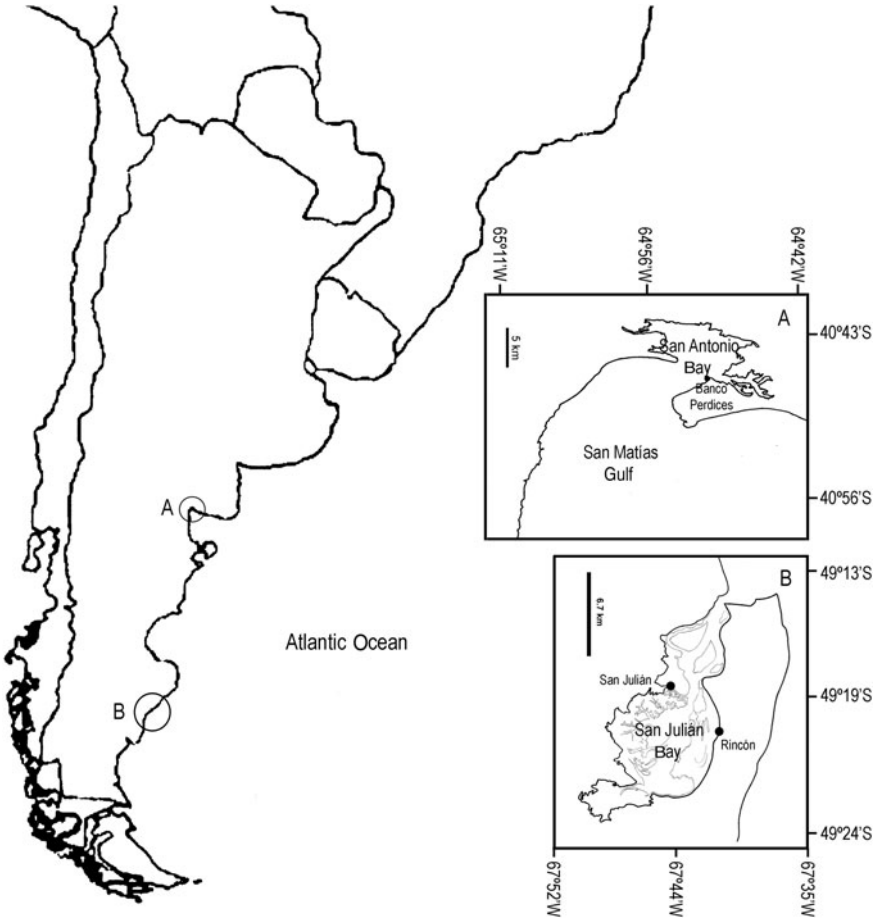

Fig. 1. Map showing the study sites, San Antonio Este and San Julián Bay.

Admirandus sanjuliensis sp. nov. was found in Rincón at middle littoral/mean tide and low-littoral/low tide, un-vegetated habitat.

Sampling techniques and treatment

All species described below were found in samples obtained by hand, at each site and level location, with a cylindrical Plexiglas core (inner diameter 2.8 cm). They were preserved in cold 5% formaldehyde in filtered seawater stained with rose bengal, decanted and sieved through both 500 and 50 μm mesh sieves. The nematodes present on the 50 μm sieve were transferred to a solution consisting of alcohol 96°/distilled water/glycerin (2:2:1) and left in it for 1 week in a desiccator until nematodes were in pure glycerin. Then they were counted and mounted in pure glycerine prior to being identified to species level. Demanian system drawings were performed from nematodes stained in a solution of Blue Nile stained-glycerin for 5 min and then mounted in pure glycerin. Drawings were made using a Zeiss microscope incorporating a drawing device and photographs were taken with Zeiss and Olympus BX51 microscopy, both equipped with differential interference contrast (DIC). The granulometric analysis samples were oven dried at 85°C for 24 h

Table 1. Localities, samples, dates and environmental parameters (Temp., temperature in sediments); Sal., salinity; % FF, % fine fraction; SO, sorting; SK, kurtosis; OM organic matter).

Province	Locality/sample number	Date	Latitud	Longitud	Temp. (°C)	Sal. (‰)	%FF	So	Sk	OM (%)
Santa Cruz	San Julián, Rincón/81	12/01/2009	49°21.24′S	67°41.71′W	22.00	35.50	16.85	0.46	1.18	2.03
Santa Cruz	San Julián, Rincón/86	12/01/2009	49°21.30′S	67°41.85′W	19.90	33.50	2.77	0.66	0.67	1.31
Santa Cruz	San Julián, Rincón/87	12/01/2009	49°21.32′S	67°41.87′W	19.90	33.50	6.55	0.80	1.08	1.28
Santa Cruz	San Julián, Rincón/88	12/01/2009	49°21.35′S	67°41.90′W	19.90	33.50	14.07	0.78	1.15	1.37
Santa Cruz	San Julián, Rincón/89	12/01/2009	49°21.34′S	67°41.94′W	19.90	33.50	3.51	0.78	1.15	1.23
Santa Cruz	San Julián, Rincón/90	12/01/2009	49°21.32′S	67°41.91′W	19.90	33.50	3.59	0.78	0.98	1.27
Santa Cruz	San Julián, Ciudad/56	13/01/2009	49°18.59′S	67°42.88′W	13.40	33.00	32.48	0.52	0.59	3.23
Santa Cruz	San Julián, Ciudad/57	13/01/2009	49°18.60′S	67°42.87′W	13.40	33.00	61.03	0.55	1.42	5.16
Río Negro	San Antonio Este, Ba. Perdices/134	12/02/2009	40°46.88′S	64°51.11′W	22.90	48.50	3.51	0.86	1.06	0.09
Río Negro	San Antonio Este, Ba. Perdices/136	14/02/2009	40°47.09′S	64°51.30′W	32.70	52.20	70.50	0.71	0.96	0.05

and subsequently sieved through a series of sieves (2, 1, 0.5, 0.125 and 0.063 mm) and the grain size determined on the basis of the weight of each size fraction (Giere *et al.*, 1988). The de Man's ratios, *a*, *b* and *c* used in this paper are calculated as standard. The classification followed for the systematic position of the species was Lorenzen (1981, 1994) and De Ley & Blaxter (2004).

Holotypes and paratypes are deposited in the Collection of Nematodes of the Centro Nacional Patagónico, CNP-NEM recognized as National Service of Biological Data of Argentina and included in their web page from 2011 (http://www.gbif.org/dataset/06df03fc-8973-490c-af74-089fffae9e24; http://www.gbif.org/dataset/d592283b-b00e-4a39-9499-289842ccddf1).

Abbreviations used in the tables

A%, amphid diameter as percentage of corresponding body diameter; Abd, anal body diameter; Aw, amphid width; Ah, amphid height; BdA, body diameter at amphid level; Bdcs, body diameter at level of cephalic setae; Bdnr, body diameter at level of nerve ring; Bdph, body diameter at level of pharyngeal end; Csl, cephalic setae length; Csl%, cephalic setae length as proportion of head diameter; DaA, distance from anterior end to amphid; Daa/c, distance from anterior end to anus/cloaca; Danr, distance from anterior end to nerve ring; Daph, distance from anterior end to pharyngeal end; Dav, distance from anterior end to vulva; G, gubernaculum length in microns; Gcd, gubernaculum length as proportion of cloacal body diameter; L, total body length; Mbd, maximum body diameter; S, spicular length in microns, along the arc; Scd, spicule chord length as proportion of cloacal body diameter; Tl, tail length; Ta, tail in anal diameters; V%, distance from the anterior end to the vulva opening in percentage of total length.

RESULTS AND DICUSSION

SYSTEMATICS

Phylum NEMATODA Potts, 1932
Class ENOPLEA Inglis, 1983
Subclass ENOPLIA Pearse, 1942
Order ENOPLIDA Filipjev, 1929
Suborder ENOPLINA Chitwood & Chitwood, 1937
Superfamily ENOPLOIDEA Dujardin, 1845
Family ANOPLOSTOMATIDAE Gerlach & Riemann, 1974
Subfamily CHAETONEMATINAE Gerlach & Riemann, 1974

EMENDED DIAGNOSIS (Modifications from diagnosis of Smol & Coomans, 2006)

Chaetonematinae

Amphids with extreme sexual dimorphism in their structure (formerly the amphids in the male were mistaken for the Steiner's organ cf. Lorenzen (1981, 1994)). In many species, the four cephalic setae are situated anterior to the six outer labial setae. The males have a precloacal tubule **or setae**. Marine.

Type and only genus: *Chaetonema* Filipjev, 1927

Chaetonema patagonica sp. nov.
(Figures 2 & 3; Table 2)

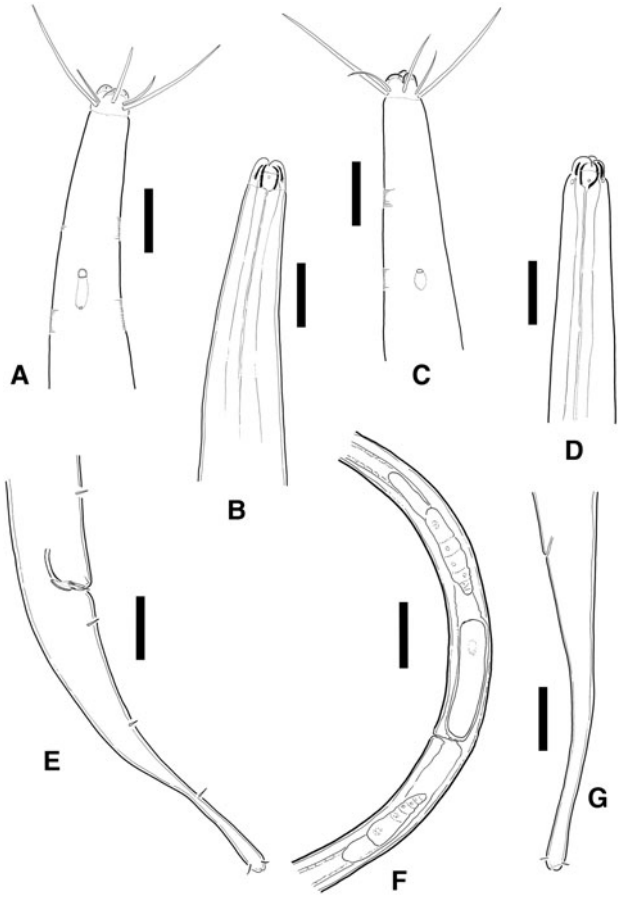

Fig. 2. *Chaetonema patagonica* sp. nov.: (A) head region of holotype male (external); (B) head region of holotype male (internal); (C) head region of paratype female (external); (D) head region of paratype female (internal); (E) posterior end of holotype male, showing copulatory apparatus; (F) uterus view on vagina level of paratype female; (G) posterior end of paratype female. Scale bars: A–E, G 20 µm; F 100 µm.

TYPE MATERIAL

Holotype: adult male. Registration number CNP-NEM N°4438; type locality: Ciudad de San Julián, San Julián Bay/57; coordinates: 49°18.59′S 67°42.87′W; coll. C.T. Pastor de Ward, 13 January 2009.

Paratypes: one adult male CNP-NEM N°4176 and one adult female CNP-NEM N°4492; Ciudad, San Julián Bay/56–57; coll. C.T. Pastor de Ward, 13 January 2009.

- One adult female CNP-NEM N°10642 and four juveniles CNP-NEM N°11372; 11385; 11559 and 27719; Rincón, San Julián Bay/86,88–89; coll. C.T. Pastor de Ward, 12 January 2009.
- Two adult females CNP-NEM N°17014 and 17266; Ba. Perdices, San Antonio Bay/136; coll. V. Lo Russo- G. Villares, 14 February 2009.
- One juvenile CNP-NEM N°16973; Ba. Perdices, San Antonio Bay/134; coll. V. Lo Russo- G. Villares, 12 February 2009.

ETYMOLOGY

This species name is derived from the word 'Patagonia' in reference to the coast on which it was found.

MATERIAL EXAMINED

Measurements: see Table 2.

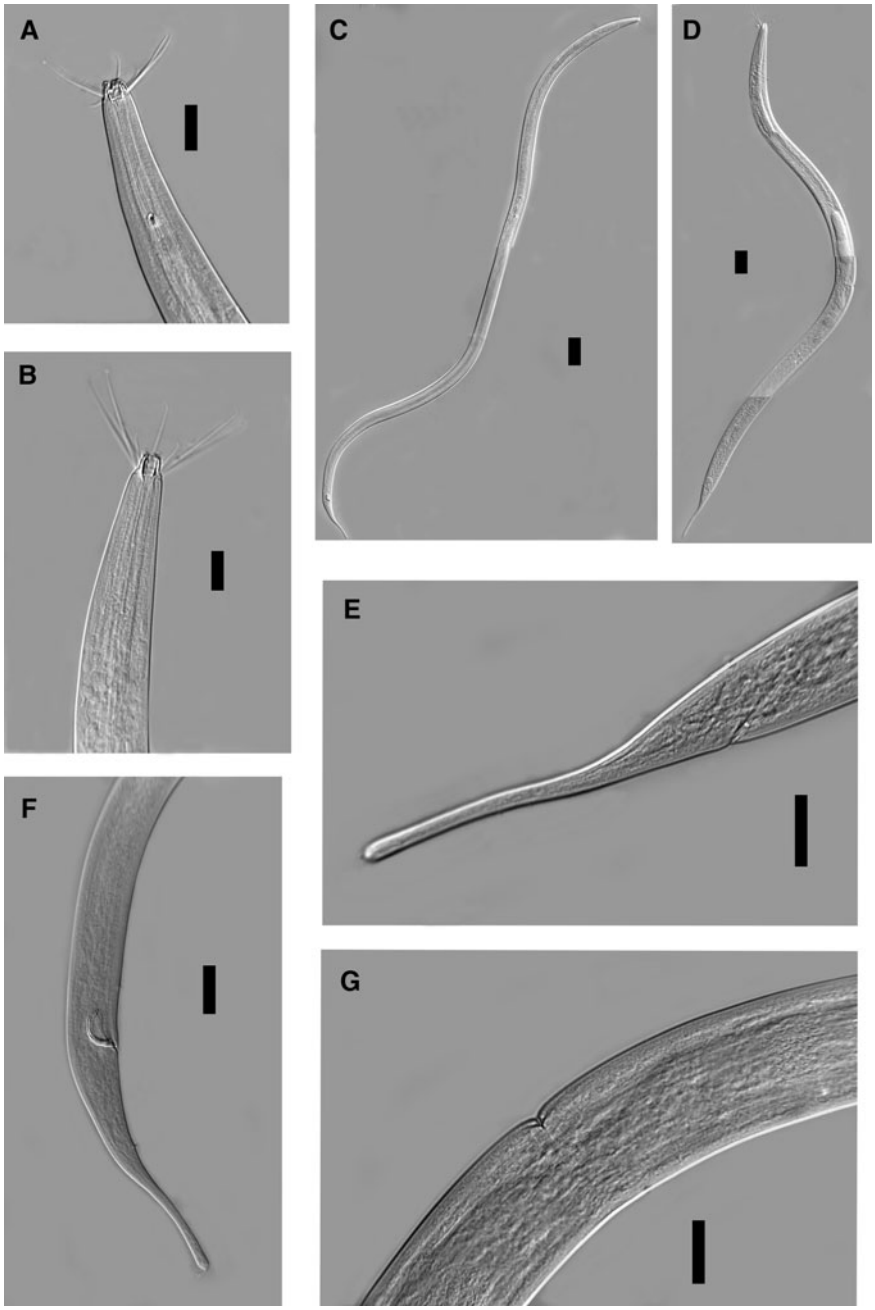

Fig. 3. *Chaetonema patagonica* sp. nov.: (A) photo holotype male amphid level; (B) photo holotype male estoma; (C) entire male; (D) entire female; (E) tail paratype female; (F) photo tail holotype male; (G) photo vulva opening paratype female. Scale bars: A–B, E–G, 20 μm; C–D, 100 μm.

DESCRIPTION

Male (holotype): Body cylindrical, extremely thin, tapering acute towards both ends. Cuticle finely striated. Head with three lips, each with distinct pair of inner labial papillae. Ten setae (6 + 4) in two close crowns: six 35 μm (5–6 HD) and four 15 μm. Amphideal fovea bottle shape, larger in males (10 μm in length and 3 μm wide and 55 μm from anterior end, Figure 2A) than in females (5.5 μm in length and 3.5 μm wide and 48.5 μm from anterior end, Figure 2C); amphideal aperture in males nearly square shape (Figure 2A) and oval in females (Figure 2C). The Steiner's organ is very delicate, it is found 2–3 μm behind the amphideal fovea.

Buccal cavity cylindrical, 7 μm in height and 5 in width, without observed teeth. Presence of a distinct cephalic capsule, 9 μm in length. Pharynx cylindrical without differentiations surrounding the buccal cavity. Nerve ring is positioned at 51.9% of oesophagus. Excretory gland and excretory pore 90 μm from anterior end.

Reproductive system diorchic with anterior and posterior outstretched testis. Short, arquate spicules, tubular gubernaculum. One precloacal seta and three postcloacal subventrally. Tail conical with the opening of three caudal glands positioned precaudally.

Female (paratype): With the exception of the amphids, similar to males. Female reproductive system didelphic, amphidelphic with antidromously reflexed ovaries situated

Table 2. Morphometrics of *Chaetonema patagonica* sp. nov. All measurements are in μm and in the form: mean ± SD (range).

	Holotype Male	Paratype Male	Paratype Female
n	–	2	4
L	1751.00	1585.3 (1495–1751)	1276.3 (1015–1530)
a	56.48	55.6 (49.8–60.4)	34.1 (26.7–46.5)
b	8.76	7.3 (5.8–8.8)	5.3 (4.7–5.8)
c	16.68	13.8 (11.2–16.7)	11.2 (8.8–12.2)
Csl (short)	15.00	14 (13–15)	13.8 (12.5–15)
Csl (large)	35.00	33.0 (31.0–35.0)	36.25 (29.0–42.5)
DaA	55.00	60 (55–68)	48.5 (39–67)
Csl%	4.38	4.56 (2.9–7.2)	3.4 (2.9–3.8)
Bdcs	8.00	8.7 (8–9)	10.8 (10–12)
Aw	3.00	3 (3–3)	3.5 (2–5)
Ah	10.00	10.7 (10–11)	5.5 (4–7)
BdA	20.00	18 (17–20)	21.8 (17–28)
A%	15.00	16.8 (15–17.6)	16.2 (11.1–23.5)
Danr	145.00	138.3 (135–145)	116.3 (110–120)
Daph	200.00	220 (200–260)	239.5 (215–265)
Bdnr	31.00	27 (25–31)	31.3 (25–35)
Bdph	31.00	28.7 (25–31)	35.3 (25–43)
Mbd	31.00	28.7 (25–31)	39 (25–50)
Daa/c	1646.00	1468.7 (1375–1646)	1162.5 (900–1405)
Abd	20.00	18 (16–20)	21.3 (15–30)
Dav	–	–	604.5 (525–690)
V%	–	–	47.8 (45.1–51.7)
S	22.00	21.3 (21–22)	–
Scd	1.10	1.2 (1.1–1.3)	–
G	12.00	11.3 (11–12)	–
Gcd	0.60	0.6 (0.6–0.7)	–
Ta	5.25	6.6 (5.3–8.4)	5.6 (3.8–6.7)
Tl	105.00	116.7 (105–135)	113.8 (100–125)

to the left of intestine, with anterior and posterior ovaries always situated on opposite sides. The vulva located at median is a thin slit. Mature egg 90 × 20 μm.

DIAGNOSIS AND RELATIONSHIPS

Chaetonema patagonica sp. nov. can most easily be differentiated from the other four species of the genus by an amphid bottle shape, arched spicule, tubular gubernaculum, and only one setae instead of precloacal organ. Platt (1973), gave last key to *Chaetonema* genus. We add here a new key to accommodate the new species. *Chaetonema steineri* Filipjev, 1927, *C. longisetum* (Steiner, 1916) and *C. vicinum* Gerlach, 1954 are not included because they are considered here as species inquirendae because only females or juveniles are known.

KEY FOR THE SPECIES OF GENUS *CHAETONEMA* (KEY TO MALES)

1. Precloacal supplement absent..... 2
   — Precloacal supplement present..... 3
2. Amphid bottle shape (10 μm), spicule 22 μm ..... *C. patagonica* sp. nov.
   — Amphid elongated groove, ending horse-shoe shape (100 μm long), spicule 40 μm (2.5 abd long) .... *C. riemanni* Platt, 1973
3. Precloacal supplement a narrow, rod-like structure; spicule 30 μm (1.3 abd long) ..... *C. amphora* Wieser, 1953
   — Precloacal supplement well cuticularized, complicated 'clasping' structure..... 4

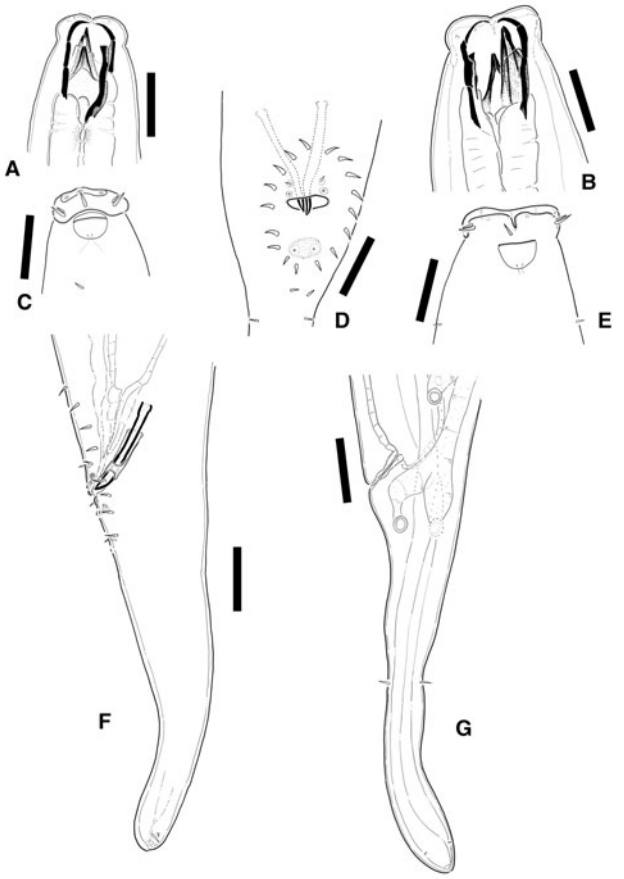

Fig. 4. *Admirandus sanjuliensis* sp. nov.: (A) head region of holotype male (internal); (B) head region of paratype female (internal); (C) head region of holotype male (external); (D) subventral view of paratype male; (E) head region of paratype female (external); (F) posterior end of holotype male, showing copulatory apparatus; (G) posterior end of paratype female. Scale bars: A–E, G, 20 μm; F, 100 μm.

4. Longest cephalic setae 17 μm, 2 h.d.; *L* = 1168 μm .... *C. cancellatum* Gerlach, 1956.
   — Longest cephalic setae 30 μm, 3 h.d. long; *L* = 1670–2220 μm ..... *C. captator* Wieser, 1953.

Suborder ONCHOLAIMINA De Coninck, 1965
Superfamily ONCHOLAIMOIDEA Filipjev, 1916
Family ONCHOLAIMIDAE Filipjev, 1916
Subfamily ADONCHOLAIMINAE Gerlach & Riemann, 1974
Genus *Admirandus* Belogurov & Belogurova, 1979

EMENDED DIAGNOSIS (Modifications from diagnosis of Tchesunov *et al.*, 2010)

Oncholaimidae

Outer labial and cephalic sensilla papilliform. Buccal capsule elongate, length to width ratio *c.* **1.5:1 to 3:1**. Three onchs in the buccal cavity: the largest the right subventral, the other two lower ones equal. Ovaries paired. Demanian tube system generally of the *Adoncholaimus* type, but with **pre- or postcloacal** terminal canals and pores situated **pre-cloacal (1) and on the tail (2). Presence of terminal canals as long ducts.** The spicules curved, relatively long, slender, proximally cephalated, distally pointed, slightly broadening only in front

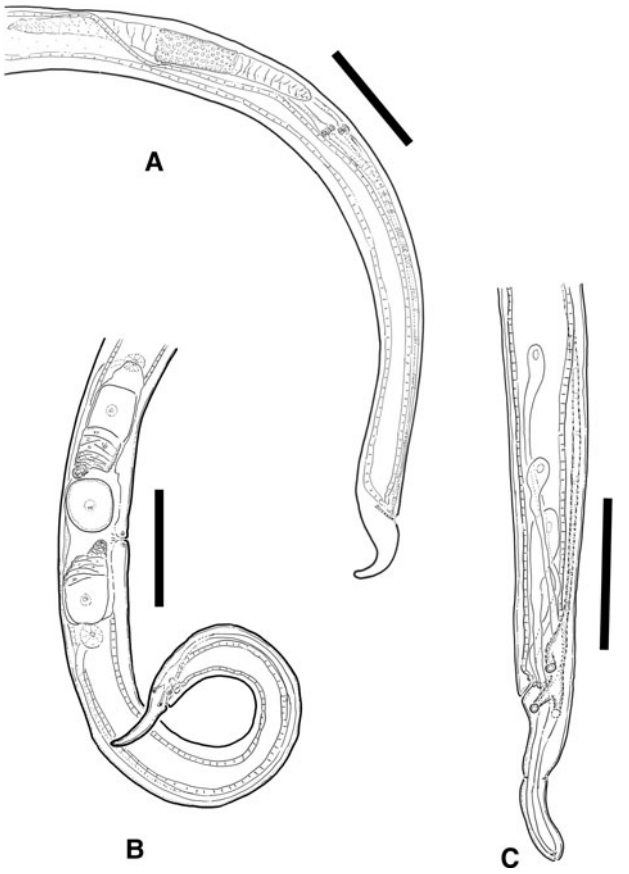

Fig. 5. *Admirandus sanjuliensis* sp. nov.: (A) genital apparatus of holotype male; (B) uterus view on vagina level of paratype female; (C) posterior end of paratype female with Demanian porus. Scale bars: A–B, 200 µm; C, 100 µm.

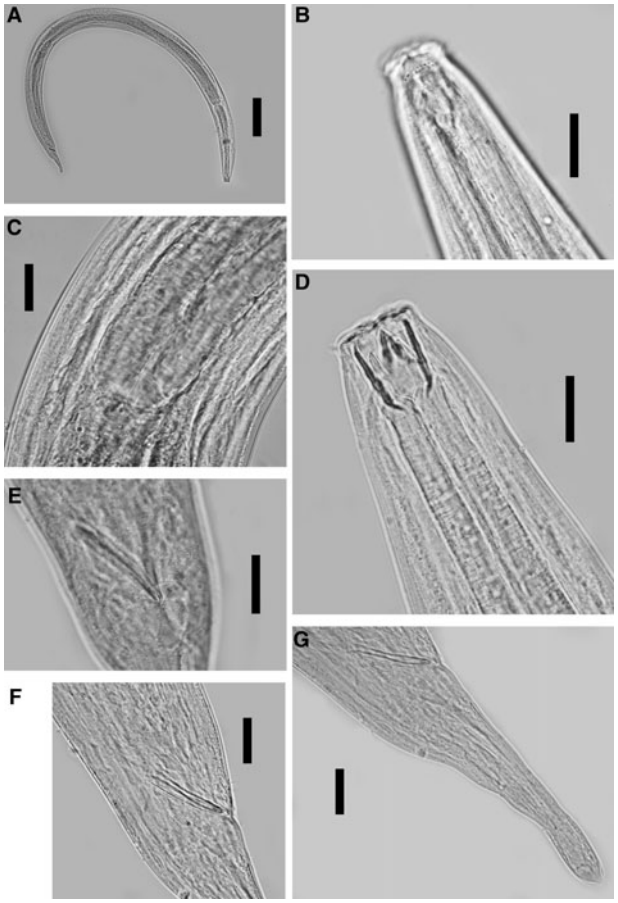

Fig. 6. *Admirandus sanjuliensis* sp. nov.: (A) entire male ; (B) photo anterior end holotype external; (C) cardia holotype; (D) photo anterior end holotype internal; (E) subventral view paratype male; (F) sublateral view holotype male; (G) photo tail holotype male. Scale bars: B-F, 20 µm; A, 100 µm.

of the distal end. Gubernaculum present. Midventral preanal supplementary organ present or not. Tail with anterior conical and posterior cylindrical portions.

Admirandus sanjuliensis sp. nov.
(Figures 4–7; Table 3)

TYPE MATERIAL

Holotype: adult male. Registration number CNP-NEM N°11072; type locality: Rincón, San Julián Bay/87; coordinates: 49°21.32′S 67°41.87′W; coll. C.T. Pastor de Ward, 12 January 2009.

Paratypes: four adult males and five adult females. Registration numbers CNP-NEM No. 11073 (male 2/87); CNP-NEM No. 284 (male 3/90); CNP-NEM No. 11060 (male 4/87); CNP-NEM No. 9844 (male 5/81); CNP-NEM No. 9979 (female 1/81); CNP-NEM No. 10975 (female 2/87); CNP-NEM No. 9935 (female 3/81); CNP-NEM No. 285 (female 4/90); CNP-NEM No. 286 (female 5/90); type locality: Rincón, San Julián Bay; coll. C.T. Pastor de Ward, 12 January 2009.

ETYMOLOGY

From the Spanish word 'San Julián', in reference to the bay where it was found for the first time.

MATERIAL EXAMINED

Measurements: see Table 3.

DESCRIPTION

Male (holotype): Body cylindrical, tapers slightly towards the anterior end and has a conical tail terminus. Cuticle smooth. Six inner small labial papillae, 6 outer labial (5 µm long) and 4 cephalic setae (4 µm long). Stoma square to rectangular in shape, length to width ratio 1:1.2, pharyngeal muscles surrounding the posterior part of the stoma. Three onchia in the buccal cavity, the largest right-subventral, the other equal. Amphids cup shaped (10 µm diam, 43.5% bda), located 8 µm from anterior end. Pharynx, cylindrical (460 µm long), anteriorly surrounding buccal cavity. Cardia is small. Ventral gland located at the cardia level and opens through an ampulla 100 µm from anterior end.

Reproductive system is diorchic, with opposed and outstretched testes (posterior of 490 µm in length; anterior testis length not seen), in anterior left and posterior right position to the intestine. Spicules, short, slightly curved 35 µm (0.9 abd) in chord length. Gubernaculum formed by one central tubular piece. One pair of short pre-cloacal setae and one pair of papillae, between 2 and 5 µm from the cloaca. One pair of postcloacal papillae and eight pairs of pericloacal setae 5 µm long. Tail 120 µm long (3 abd), approximately

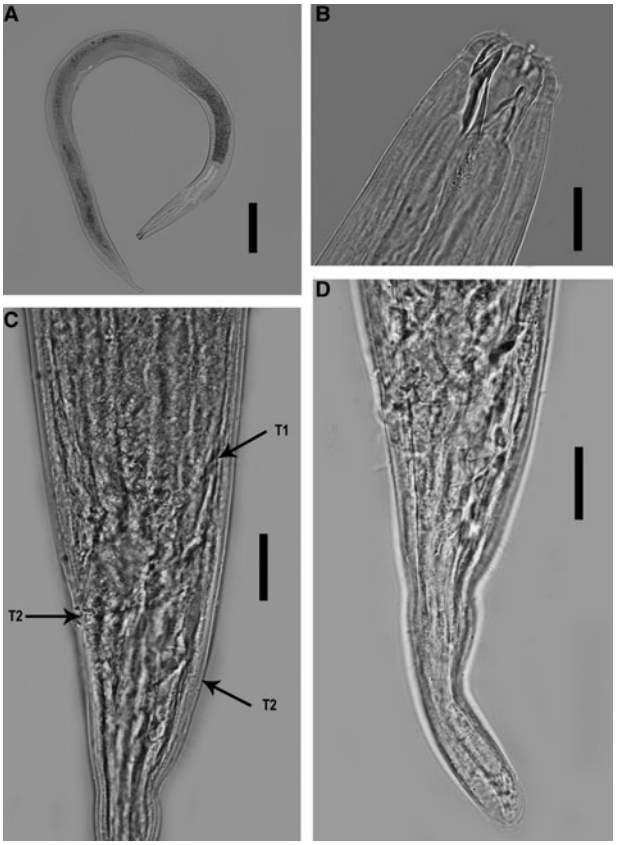

Fig. 7. *Admirandus sanjuliensis* sp. nov.: (A) entire female; (B) photo anterior end paratype female; (C) photo tail (partim) paratype female with three tubes opening (T1, T2 &T3); (D) photo of tail female paratype. Scale bars: B–D, 20 μm; A, 100 μm.

Table 3. Morphometrics of *Admirandus sanjuliensis* sp. nov. All measurements are in μm and in the form: mean ± SD (range).

	Holotype Male	Paratype Male	Paratype Female
n	–	4	4
L	2560	2600 (2340–2870)	2534 (2200–3170)
a	25.6	27.6 (22.3–31.9)	27.2 (22.2–31.6)
b	5.6	5.6 (5.3–5.9)	5.5 (4.9–6.3)
c	21.3	20.5 (15.6–22.5)	19.2 (14.7–22.6)
Csl (short)	4	3.8 (3–4)	3.8 (3–4)
Csl (large)	5	4.8 (4–5)	4.8 (4–5)
DaA	7	6.4 (5–8)	6 (4–10)
Csl%	23.8	20.9 (17.4–23.8)	19.4 (13.3–25)
Bdcs	21	23 (21–24)	25.4 (20–30)
Aw	10	10 (8–12)	8.3 (7–9)
BdA	23	24.6 (23–26)	26.5 (23–29)
A%	43.5	41.1 (30.8–50)	32.5 (30.4–36)
Danr	230	255 (230–280)	262 (240–300)
Daph	460	464 (440–490)	460 (430–500)
Bdnr	80	75 (60–80)	72 (60–90)
Bdph	100	86 (70–100)	82 (70–90)
Mbd	100	95 (90–105)	96 (70–130)
Daa/c	2440	2472 (2190–2740)	2400 (2060–3030)
Abd	40	34 (30–40)	40 (30–50)
Dav	–	–	1324 (1110–1620)
V%	–	–	52.2 (50.5–54.5)
S	35	34.6 (31–39)	–
Scd	0.9	1 (0.9–1.1)	–
G	13	14.2 (12–16)	–
Gcd	0.3	0.4 (0.3–0.5)	–
Ta	3	3.8 (3–4.4)	3.4 (2.8–3.8)
Tl	120	128 (120–150)	134 (100–150)

conical-cylindrical in shape with one pair of setae in the middle of the tail. There are three caudal glands present with their bodies precloacal and their openings in the spinneret.

Female (paratype): Females are similar to males in general body shape, anterior sensilla, amphids and cuticle. Ovaries paired, antidromously reflexed, anterior and posterior right of the intestine. Tail 120 μm (3 abd). Demanian tube system generally as *Adoncholaimus* type with three Demanian ducts, one precloacal and two postcloacal, see Figures 5C and 7C.

DIAGNOSIS AND RELATIONSHIPS

Admirandus sanjuliensis sp. nov. is characterized by the position of the Demanian pores, one preanal and two postanal, the configuration of pre- and post-cloacal papillae and setae, and by having the shortest stoma in the genus.

Table 4 presents a detailed comparison between the genera *Admirandus* and *Adoncholaimus*, together with *A. papillatus* and our new species. Our new species and *A. papillatus* have an intermediate position between the genera *Admirandus* and *Adoncholaimus* and could thus be included either in *Adoncholaimus* or in *Admirandus*, depending on what characters are considered more important. The type of sensilla (papilliform), the number of Demanian pores and the length of the terminal ducts indicate that our new species belongs to *Admirandus*. By contrast, the stoma proportion, the tail shape and length, and the tail setae (with the presence of two pairs of setae over the swelling on tail as many species of the genus), indicate that our species belongs to *Adoncholaimus*.

The Demanian pores position is intermediate between two genera.

Here we follow Tchesunov *et al.* (2010) when he says: '*Adoncholaimus* species have terminal ducts of the demanian system opening anterior to the anus, and the number of the terminal ducts is nearly constantly two. By contrast, *Admirandus* possess three terminal ducts and they open on the tail.' And we follow Shimada & Kajihara (2014) in their opinion about *Adoncholaimus*: 'We follow their [Belogurov & Belogurova (1979)] view and have added the new definition 'terminal pores with **short terminal ducts** opening on body cuticle in preanal region.' So the number and position of Demanian pores and the duct lengths are the most important characters to separate both genera. So the presence of three Demanian pores with long ducts points to *Admirandus* while two with short ducts to *Adoncholaimus* (Table 4). *Admirandus papillatus* has two pores with long ducts that open on the tail. This species also present an intermediate position but as this agrees with two of the three main characters of *Admirandus*, was placed in this genus. Also agrees with other important characters of *Admirandus* as the stoma proportion and the tail shape and setae on it.

Admirandus sanjuliensis sp. nov. differ from *A. belogurovi* Tchesunov *et al.*, 2010 and *A. multicavus* Belogurov & Belogurova, 1979, by having a nearly longer as wide stoma.

Table 4. Comparative chart of *Admirandus* and *Adoncholaimus* genera characteristics with *A. papillatum* and the new species.

	***Admirandus* genus**	***A. papillatum***	**New species**	***Adoncholaimus* genus**
Labial and cephalic sencilla	papilose	papilose	papilose	setose
Head/wide	2 of 1	3 of 1	1.2 of 1	1 of 1
Number of onchia	3	3	3	3
Amphid	oval midlevel buccal cavity	oval midlevel buccal cavity	oval anterior level buccal cavity	oval anterior level (partim)
Nerve ring	4 stomatal lengths	5 stomatal lengths 50%	9 stomatal lengths 50%	variable
Excretor gland	2 stomatal lengths	2 stomatal lengths	4 stomatal lengths	variable
Oesophagus	cylindrical muscular	cylindrical muscular	cylindrical muscular	cylindrical muscular
Male gonads	paired r-l	paired r-l	paired r-l	paired r-l
Female gonads	paired r-l	paired r-l	paired r-l	paired r-l
Number of porus of Demanian	3	2	3	2
Uvette	not mentioned	absent	absent	present or absent
Terminal ducts	long	long	long	short
Demanian porus position	after cloaca on tail	after cloaca on tail	pre, on and after cloaca	before cloaca
Spicules	long and thin 50–100 μm	38–41 μm	35 μm	equal to or larger than body diameter
Tail shape	anteriorly conical posterior filiform	anteriorly conical posterior filiform	anteriorly conical posterior cylindrical	anteriorly conical posterior cylindrical
Tail setation	conspicuous	conspicuous	3 pairs + 2 with swelling on tail	2 with swelling on tail (partim)

KEY FOR THE SPECIES OF GENUS *ADMIRANDUS*

1. Demanian system with 2 gland openings .... *A. papillatus* (Kreis, 1932)
   — Demanian system with 3 gland openings 2
2. Stoma nearly longer as wide ..... *A. sanjuliensis* sp. nov.
   — Stoma, two times longer than wide 3
3. Spicule length less than 50 μm ..... *A. belogurovi* Tchesunov *et al.*, 2010
   — Spicule longer than 50 μm .... *A. multicavus* Belogurov & Belogurova, 1979

ACKNOWLEDGEMENTS

We thank anonymous referees for valuable comments.

FINANCIAL SUPPORT

This work was financed by PICT/SECYT No. 2/33345 and CONICET (2008–2009).

REFERENCES

Belogurov O.I. and Belogurova L.S. (1979) Morphology of three species of marine nematodes of the genus *Adoncholaimus* Filipjev, 1918 and validation of *Admirandus multicavus* gen. et sp. n. (Nematoda, Oncholaimidae). In *Free-living and parasitic worms*. Vladivostok: Far-eastern University, pp. 37–63.

De Ley P. and Blaxter M.L. (2004) A new system for Nematoda: combining morphological characters with molecular trees, and translating clades into ranks and taxa. *Nematology Monographs and Perspectives* 2, 633–653.

Filipjev I.N. (1916) Free living nematodes in the collection of the Zoological Museum of the Imperial Academy of Sciences in Petrograd (in Russian, English diagnoses). *Ezhegodnik Zoologicheskogo Muzeia Imperatorskoi Akademii Nauk* 21, 59–116.

Filipjev I.N. (1918) Free-living nematodes of the vicinities of Sevastopol. *Reports of Special zoological laboratory and Sevastopol biological station of Russian Academy of Science* Ser. II, 4, 1–350.

Filipjev I.N. (1927) Les nématodes libres des mers septentrionales appartenant à la famille des Enoplidae. *Archiv für Naturgeschichte* 91A, 1–216.

Gassó S. and Stein A.F. (2007) Does dust from Patagonia reach the sub-Antarctic Atlantic Ocean? *Geophysical Research Letters* 34, L01801. doi: 10.1029/2006GL027693.

Gerlach S.A. (1954) Nématodes marins libres des eaux souterraines littorales de Tunisie et d'Algérie. *Vie Milieu* 4, 221–237.

Gerlach S.A. and Riemann F. (1974) *The Bremerhaven checklist of aquatic nematodes. A catalogue of Nematoda Adenophorea excluding the Dorylaimida. Part 2*. Bremen: Kommissionsverlag Franz Leuwer.

Giere O., Eleftheriou A. and Murison D.J. (1988) Abiotic factors. In Higgins R.P. and Thiel H. (eds) *Introduction to the study of meiofauna*. Washington, DC: Smithsonian Institution Press, pp. 61–78.

Hopper B.E. (1967) Free-living marine nematodes from Biscayne Bay, Florida. II. Oncholaimidae: descriptions of five new species and one new genus (*Meyersia*). *Marine Biology* 1, 145–151.

Kreis H.A. (1932) Freilebende marine Nematoden von den Sunda-Inseln II. Oncholaiminae. (Papers from Dr. Th. Mortensen's Pacific Expedition 1914–16). *Videnskabelige Meddelelser fra Danssk naturhistorik Forening* 93, 23–69.

Lorenzen S. (1981) *Entwurf eines phylogenetischen Systems der freilebenden Nematoden*. Bremen: Leuwer.

Lorenzen S. (1994) *The phylogenetic systematics of freeliving nematodes*. London: The Ray Society.

Platt H.M. (1973) Freeliving marine nematodes from Strangford Lough, Northern Ireland. *Cahiers de Biologie Marine* 14, 295–321.

Rachor E. (1969) Das de mansche organ der Oncholaimidae, eine genito-intestinale verbindung bei Nematoden. *Zeitschrift für Morphologie und Ökologie der Tiere* 66, 87–166.

Shimada D. and Kajihara H. (2014) Two new species of free-living marine nematodes of *Adoncholaimus* Filipjev, 1918 (Oncholaimida: Oncholaimidae: Adoncholaiminae) from Hokkaido, northern Japan, with a key to species and discussion of the genus. *Nematology* 16, 437–451.

Smol N. and Coomans A. (2006) Order Enoplida. In Abebe E., Andrássy I. and Traunspurger W. (eds) *Freshwater nematodes: ecology and taxonomy*. Wallingford: CABI Publishing, pp. 225–292.

Steiner G. (1916) Freilebende Nematoden aus der Barentssee. *Zoologische Jahrbücher* (*Systematik*) 39, 511–664.

and

Tchesunov A.V., Mokievsky V.O. and Vu Thanh N. (2010) Three new free-living nematode species (Nematoda, Enoplida) from mangrove habitats of Nha Trang, Central Vietnam. *Russian Journal of Nematology* 18, 155–173.

Correspondence should be addressed to:
C.T. Pastor de Ward
Centro Nacional Patagónico (CONICET). C.C. 128 (9120) Puerto Madryn, Chubut, Argentina
email: pastor@cenpat-conicet.gob.ar