



## Two new species of *Sabatieria* (Nematoda, Comesomatidae) from Golfo Nuevo, Chubut (Argentina)

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### Abstract

Two new *Comesomatidae* species from the Gulfs of San José and San Matías, Chubut province of Argentina are described. *Sabatieria flecha* sp. n. is characterized by the particular shape of the dorsal distal end of the spicule, smaller spicule length (47  $\mu\text{m}$ ; 1.5 anal body diameter), number of weakly cuticularised supplements (12), size of amphids with two and a half turns, short body length (1260  $\mu\text{m}$ ), values of a (36) and b (7,8) and tail shape with 1/3 cylindrical part. *Sabatieria sanjosensis* sp. n. is characterized by a long body length (3000  $\mu\text{m}$ ), large value for a (82) and tail shape with 1/2 cylindrical part.

**Key words:** Comesomatidae, Marine Nematoda, Patagonian coasts, *Sabatieria*, systematics

### Introduction

During a two-month survey of the nematode fauna in the Gulfs of San José and San Matías, Chubut, Argentina, two previously undescribed species of *Sabatieria* Rouville 1903 were recorded. The genus *Sabatieria* is often one of the most abundant groups of nematodes in sediment. *Sabatieria* is frequently recorded from muddy coastal marine benthic areas of the world. The genus has been reviewed extensively by Jensen (1978, 1979, 1981) and Platt (1985). *Sabatieria wieseri* Platt, 1985 and *S. mortenseni* (Ditlevsen, 1921) were the first two *Sabatieria* species re-described from the coast of Patagonia (Deseado River estuary, Santa Cruz province, Argentina; Pastor de Ward, 1984). Two new *Sabatieria* species have been recently described from the coastline of the Strait of Magellan (Chen & Vincx, 1999; 2000). In this paper, the first in a series from the Gulfs of San José and San Matías, I describe two new species, *S. flecha* sp. n. and *S. sanjosensis* sp. n.

## Description of sites studied

San José Gulf is located in the northern part of Península Valdés (42° 14' to 42° 26' S; 64° 02' to 64° 36' W) on the Atlantic coast of South America (Chubut province, Argentina). The Gulf is approximately rectangular in shape, 43 km long and 20 km wide and has an average depth of 30 m with a maximum depth of 85 m. Outside the entrance to the Gulf, the depth increases abruptly to 200 m. The San José Gulf is a patchy distribution of sublittoral sediments such as fine sand, pebbles and rocks (Zaixso, 1997). Average surface water temperature is 13.5 °C, ranging between 9.8°C (August - September) and 16.5°C (February). Average surface salinity is 33.8 p.s.u. The spring phytoplankton bloom starts in early October with a second smaller bloom occurring in late February. Mean chlorophyll *a* concentration is 0.5 mg m<sup>-3</sup> and primary production is limited to the availability of nitrates (Charpy & Charpy 1977; Charpy-Roubaud *et al.*, 1982). The *Sabatieria* species described below were found in sublittoral mud (65-83 µm, median particle size), between 53-136 m depth, see Table 1.

## Material and methods

During a cruise of the R. V. Austral (September and October, 1984), 110 bottom samples were taken. Samples were obtained with a van Veen bottom grab. At each sample site two vertical cylindrical Plexiglas core subsamples (10 cm deep, 1.4 cm in diameter) were taken from the top of the grab. They were preserved in 5% formaldehyde in seawater, decanted and sieved through both a 500 µm and 50 µm mesh sieves. The nematodes present on the 50 µm mesh sieve were counted and identified to species level. The specimens studied in the present paper were found at 9 separate locations (Figure 1, Table 1). Nematodes were fixed following the method described by Ditlevsen method (1911), stained with blue Nile and preserved in pure glycerine. Drawings were made using a Zeiss microscope incorporating a drawing device and photographs were taken with Zeiss photo-microscopy equipment with differential interference contrast (DIC). Holotype and paratypes were deposited in the Museo Nacional de Ciencias Naturales Bernardino Rivadavia, MACN N134615-34638, Argentina.

De Man's ratios, *a*, *b* and *c* used in this paper are calculated as standard. Abbreviations used in the text are: abd= anal body diameter; bdc= body diameter at level of cephalic setae; bda= body diameter at amphid level; bdnr= body diameter at level of nerve ring; bdp= body diameter at level of pharyngeal end; Col.= collector; daa= distance from anterior end to anus; danr= distance from anterior end to nerve ring; daph= distance from anterior end to pharyngeal end; dav= distance from anterior end to vulva; mbd= maximum body diameter; Spic.= spicular length in microns, along the arc; Spic%= spicule chord length as proportion of cloacal body diameter; Gub= gubernaculum length in microns; Gub%= gubernaculum length as proportion of cloacal body diameter; V%= distance from

the anterior end to the vulva opening in percentage of the total length; HD= head diameter as percentage of posterior oesophagus body diameter; A%= amphid diameter as percentage of corresponding body diameter; R3= sensilla length as percentage of head diameter; PS= number of precloacal supplements; T= tail length. Abbreviations used in the figures are: PS= precloacal supplement; S= precloacal setae; Lp= lateral punctuations; Gl= gland.

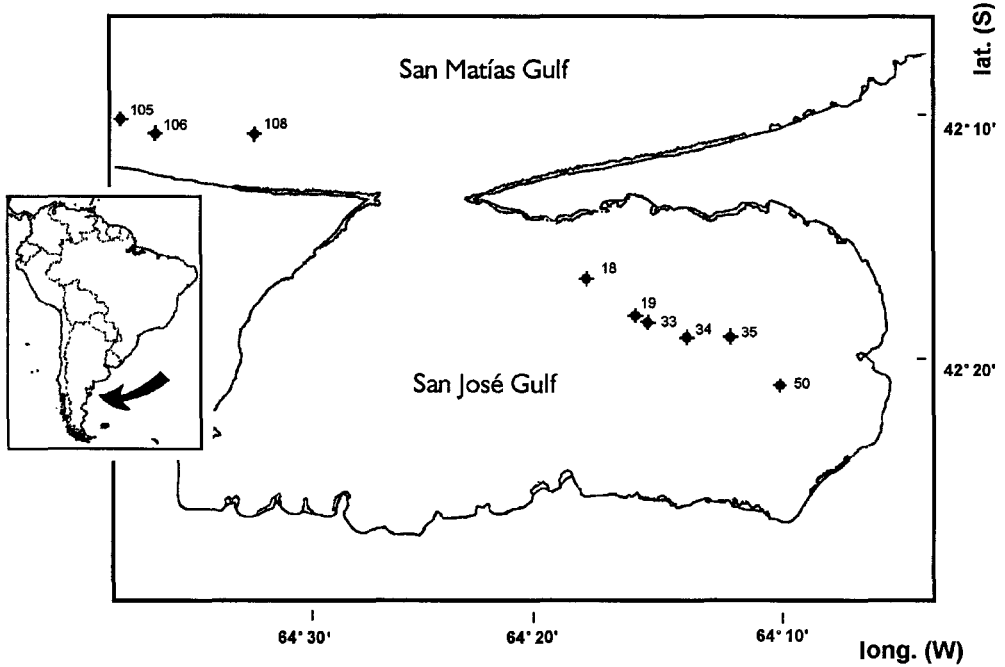
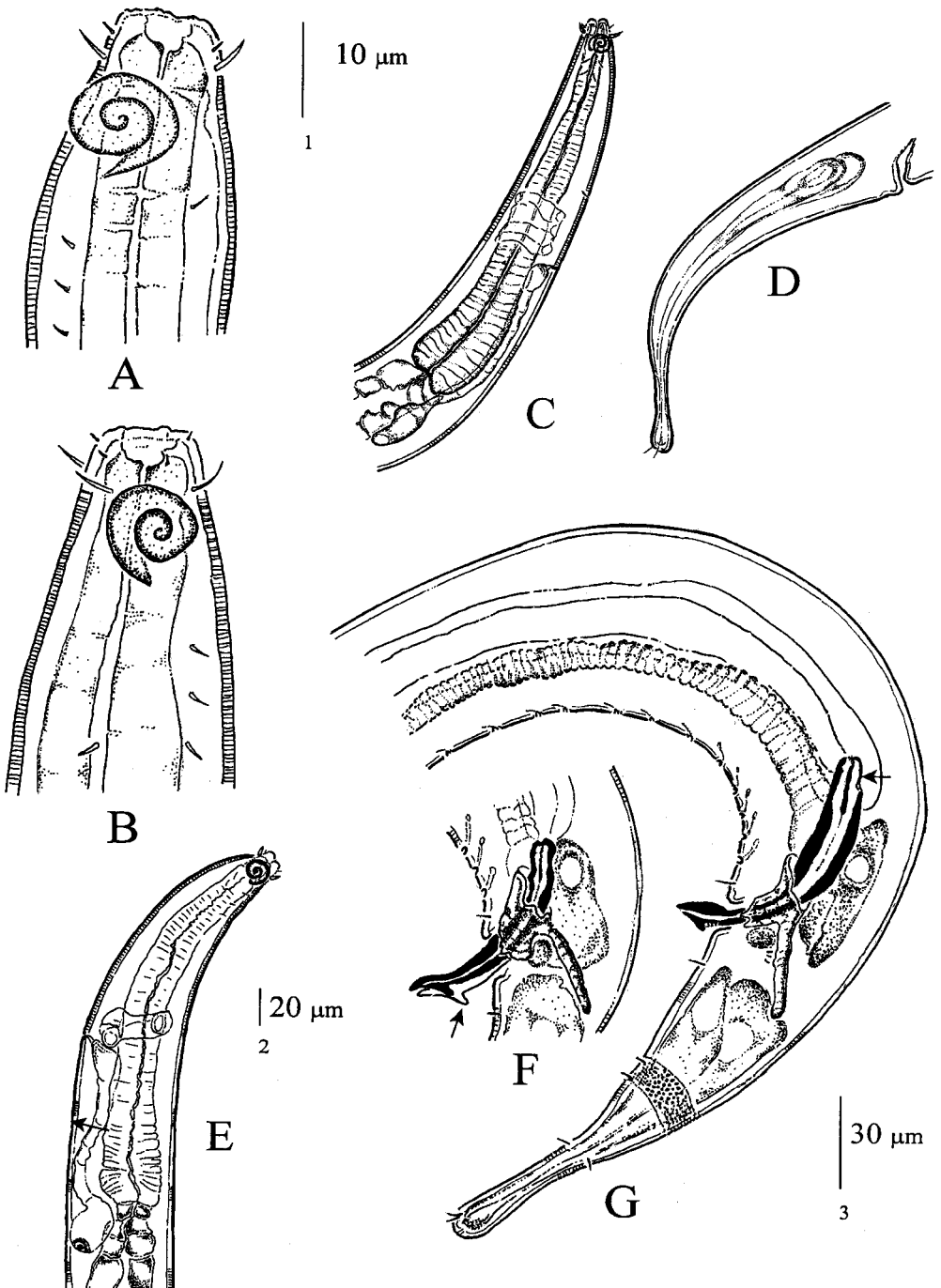


FIGURE 1: Map of the San José and San Matías Gulfs showing the sampling stations.

TABLE 1: Location of the sampling stations in San José and San Matías Gulfs.

Date	Station	Latitude S	Longitude W	Depth (m)	Median grain size ( $\mu\text{m}$ )
22/08/84	18	42°17'	64°18'	53.5	71.8
22/08/84	19	42°18'	64°15'	56.1	66.1
22/08/84	33	42°19'	64°15'	56.8	65.4
22/08/84	34	42°19'	64°12'	59.2	71.8
22/08/84	35	42°19'	64°10'	59.0	71.8
22/08/84	50	42°21'	64°08'	59.8	59.8
09/09/84	105	42°11'	64°40'	87.3	71.8
09/09/84	106	42°12'	64°38'	76.9	81.3
09/09/84	108	42°12'	64°33'	94.8	79.4



**FIGURE 2:** *Sabatieria flecha* sp. n. A. Head of male holotype; B. Head of female allotype; C. Anterior end of female; D. Tail of female allotype; E. Anterior end of male; F. copulatory apparatus male paratype, distal end of spicules; G. Posterior end of male holotype, copulatory apparatus, pre-cloacal setae, supplements and tail. Scales: 1= A, B; 2= C, D, E; 3= F, G.

## Descriptions of the species

### *Sabatieria flecha* sp. n. (Figure 2 A-G; Plate 1 A-K; Table 2)

*Type material*: Ten males and ten females and three juveniles on slide numbers: 1 HOLOTYPE, MACN N1 34615; 1 ALLOTYPE, MACN N1 34616; PARATYPES, MACN N1 34617-34628. Col.: Lic. H. Zaixso.

*Type locality*: San José Gulf and San Matías Gulf, Chubut province, Argentina. **STATIONS**: **S19**: (adult no. 7,9,10); ♀ (4,5,6,7); juv.(1); **S35**: (10); juv.(3); **S50**: (4;♀ 2,3); **S105**: (9); **S106**: (1,2,3, 5, 6); (1, 8); juv.(2); **S108**: (8).

*Habitat*: *Sabatieria flecha* sp. n. was found in very fine sand (median particle size 60-81µm), 56-95 m depth, from San José Gulf and south coast of San Matías Gulf (Fig. 1).

*Etymology*: From the Spanish word "flecha", in reference to the arrow shape spicular tip.

*Measurements*: see Table 2.

**TABLE 2.** Measurements (µm) of *Sabatieria flecha* sp. n. (\*: range, mean value in parentheses).

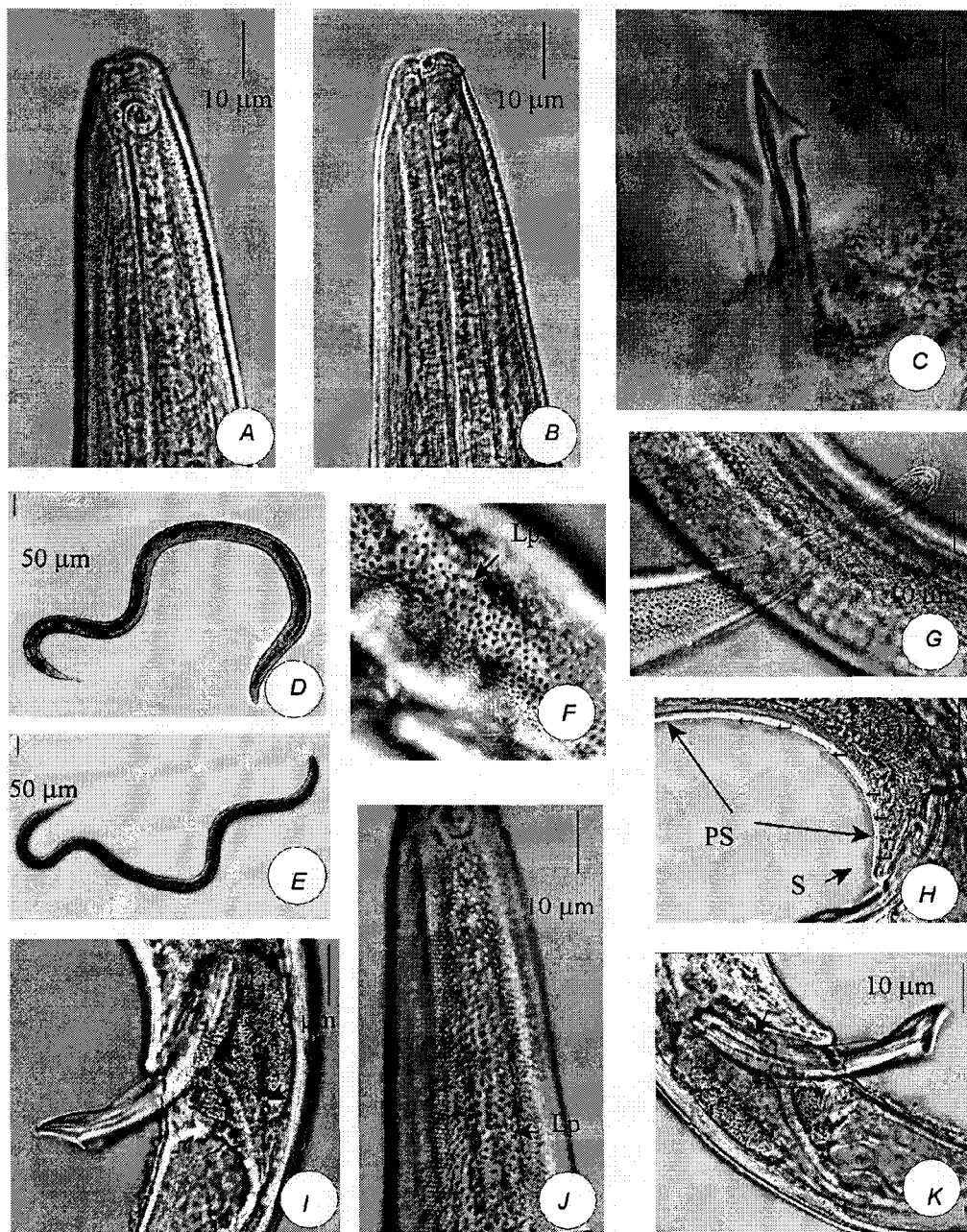
	HOLOTYPE Male	PARATYPE Males n=10 (*)	ALLOTYPE Female	PARATYPE Females n=10	JUVENILES n=3
<b>L</b>	1260	1230-1510 (1391)	1400	1340-1740 (1483)	970-1030 (1006)
<b>danr</b>	110	85-145 (118)	126	100-140 (120)	85-90 (87)
<b>Daph</b>	162	155-218 (193)	205	195-235 (211)	170-185 (177)
<b>dav</b>	----	-----	680	650-900 (739)	-----
<b>V%</b>	----	-----	49	47-59	-----
<b>Daa</b>	1132	1124-1390 (1267)	1270	1210-1580 (1342)	865-930 (896)
<b>Bdc</b>	10	9-14 (12)	10	9-13 (10)	8-11 (10)
<b>Bdnr</b>	35	32-49 (39)	41	38-48 (42)	25-32 (29)
<b>Bdph</b>	35	35-55 (44)	53	42-55 (49)	26-45 (35)
<b>Mbd</b>	35	35-55 (45)	55	50-66 (55)	29-55 (40)
<b>abd</b>	36	33-45 (39)	35	30-42 (37)	22-35 (30)
<b>HD</b>	29	20-35 (27)	19	18-26 (21)	18-42 (30)
<b>A%</b>	64	56-76 (68)	64	53-64 (57)	18-42 (30)
<b>R3</b>	40	29-44 (35)	45	31-55 (45)	27-44 (34)
<b>Spic</b>	55	50-63 (58)	--	-----	-----
<b>Spic %</b>	1.5	1.2-1.9 (1.5)	--	-----	-----
<b>gub</b>	25	13-30 (22)	--	-----	-----
<b>gub%</b>	0.8	0.3-0.9 (0.6)	--	-----	-----
<b>PS</b>	8	7-12 (8)	--	-----	-----
<b>T</b>	4.0	2.4-4.0 (3.3)	3.7	3.3-4.7 (3.8)	3.7-4.8 (4.1)
<b>a</b>	36	27-36 (31)	25	20-35 (27)	19-33 (27)
<b>b</b>	7.8	6.1-9.2 (7.3)	6.8	6.2-8.7 (7.0)	5.5-6.1 (5.7)
<b>c</b>	9.8	9.7-12.9 (11.3)	10.8	9.7-11.3 (10.5)	29.2-44.1 (37.6)

*Description. Males:* Body cylindrical, tapers slightly towards the anterior end and has a conical tail terminus. Cuticle, annulated and punctuated. Punctuations arranged in transverse rows with lateral differentiations, having larger dots irregularly arranged on the lateral fields. Six inner small labial papillae, 6 outer labial setae 1-1.5  $\mu\text{m}$  long and 4 cephalic setae 4-4.5  $\mu\text{m}$  long. Cervical region with 2-3 somatic setae posterior to the amphid. Buccal cavity small, cup shaped, the pharyngeal muscles surround the posterior part of the stoma. Amphids spiralled ventrally towards the center with two and a half turns (9  $\mu\text{m}$  diam., 64% bda), located 7-8  $\mu\text{m}$  from anterior end. Pharynx, cylindrical (155-218  $\mu\text{m}$  long), and enlarged posteriorly. Cardia is small. Ventral gland located at the cardia level and opens through an ampulla 80-135  $\mu\text{m}$  from anterior end. Reproductive system is diorchic, with opposed and outstretched testes, in anterior left and posterior right position to the intestine. Spicules, curved 47  $\mu\text{m}$  (1.5 abd) in chord length with a distal end having prominent curves in dorsal and ventral position and in dorsal view resembles an arrow shape. This particular shape does not change from different viewpoints. Spicules are bent, the proximal end presents a central cuticularized internal projection, 12  $\mu\text{m}$  long.

Gubernaculum formed by one central tubular piece and two straight, dorso-caudally oriented 25  $\mu\text{m}$  (0.8 abd) apophyses. Glandular tissue observed situated between spicula and gubernaculum. Pair of short pre-cloacal setae at 5  $\mu\text{m}$  from the cloaca and 12 (7-12) pre-cloacal supplements as tiny and weakly cuticularised pits or alveoli with thin nerve endings are present. Tail 128  $\mu\text{m}$  long (4.0 abd), approximately 1/3 cylindrical in shape. There are three caudal glands.

*Females:* Females are similar to males in general body shape, anterior sensilla, amphids and cuticle. Ovaries opposed, outstretched, anterior left and posterior to the right of the intestine. Tail 130  $\mu\text{m}$  (3.7 abd).

*Discussion. Sabatieria flecha* sp. n. is characterized by the number of pre-cloacal supplements, short body length, value of *b* and the particular shape of the distal end of the spicule. *Sabatieria flecha* sp. n. resembles *S. alata*, Warwick 1973; in spicular tip shape, head shape and measurements. *Sabatieria flecha* sp. n. resembles *S. alata* Warwick, 1973 and *S. heipi* Chen & Vincx, 2000 in general spicular form, head shape and measurements. *Sabatieria flecha* sp. n. can be distinguished from both these species and from all other *Sabatieria* species included by Platt (1985) in the *S. praedatrix* - group by the particular shape of the dorsal distal end of the spicules. In *S. flecha* sp. n., the distal end has a prominent arrow-like projection in ventral position, not a triangular ventral enlargement as in *S. alata* or in *S. heipi*. Unfortunately no photos of these two species were available for comparison. *Sabatieria flecha* sp. n can also be distinguished from *S. alata* by smaller spicule and gubernaculum length (82-90  $\mu\text{m}$  and 30-36  $\mu\text{m}$  respectively in *S. alata*); body length  $\sigma$ =3070-3320 mm and  $\text{♀}$ = 1780-2990 mm in *S. alata*); values of *a* and *b*  $\sigma$  a=37-53, b=10;  $\text{♀}$  a=36-43, b=9 in *S. alata*) and in tail shape, one half filiform in *S. alata*. *Sabatieria flecha* sp. n can also be distinguished from *S. heipi* by the number of turns in the amphids (4.2 turns in *S. heipi*; spicule length (76  $\mu\text{m}$  in *S. heipi*); value of *b* = 6.5 in *S. heipi*).



**PLATE 1:** *Sabatieria flecha* sp. n. A. Amphid on head of male; B. Buccal cavity of male; C. Tip of spicules with dorso-caudal projection; D. Entire male; E. Entire female; F. Lateral punctuations on male tail; G. Tip of male tail; H. Pre-cloacal supplements of male; I. Copulatory apparatus, glandular tissue between the spicules; J. Lateral punctuations on the male head; K. Copulatory apparatus, internal projection.

*Sabatieria sanjosensis* sp. n. (Figs. 3 A-G; Plate 2 A-M; Table 3)

*Type material*: Four males, two females and three juveniles on slide numbers: 1 HOLOTYPE, MACN N1 34629; 1 ALLOTYPE, MACN N1 34630; PARATYPES, MACN N1 34632-34638. Col.: Lic. H. Zaixso.

*Type locality*: San José Gulf, Chubut province, Argentina. **STATIONS**: **S18**: (2); **S33**: (2, 3, 4); **S34**: (1), (1), juv. (1, 2); **S35**: juv.(3).

*Habitat*: *Sabatieria sanjosensis* sp. n. was found in very fine sand (median grain size 65-72  $\mu\text{m}$ ), 53-59 m depth, from San José Gulf (Fig. 1).

*Etymology*: From the Spanish word "San José", in reference to the area where it was found.

*Measurements*: see Table 3.

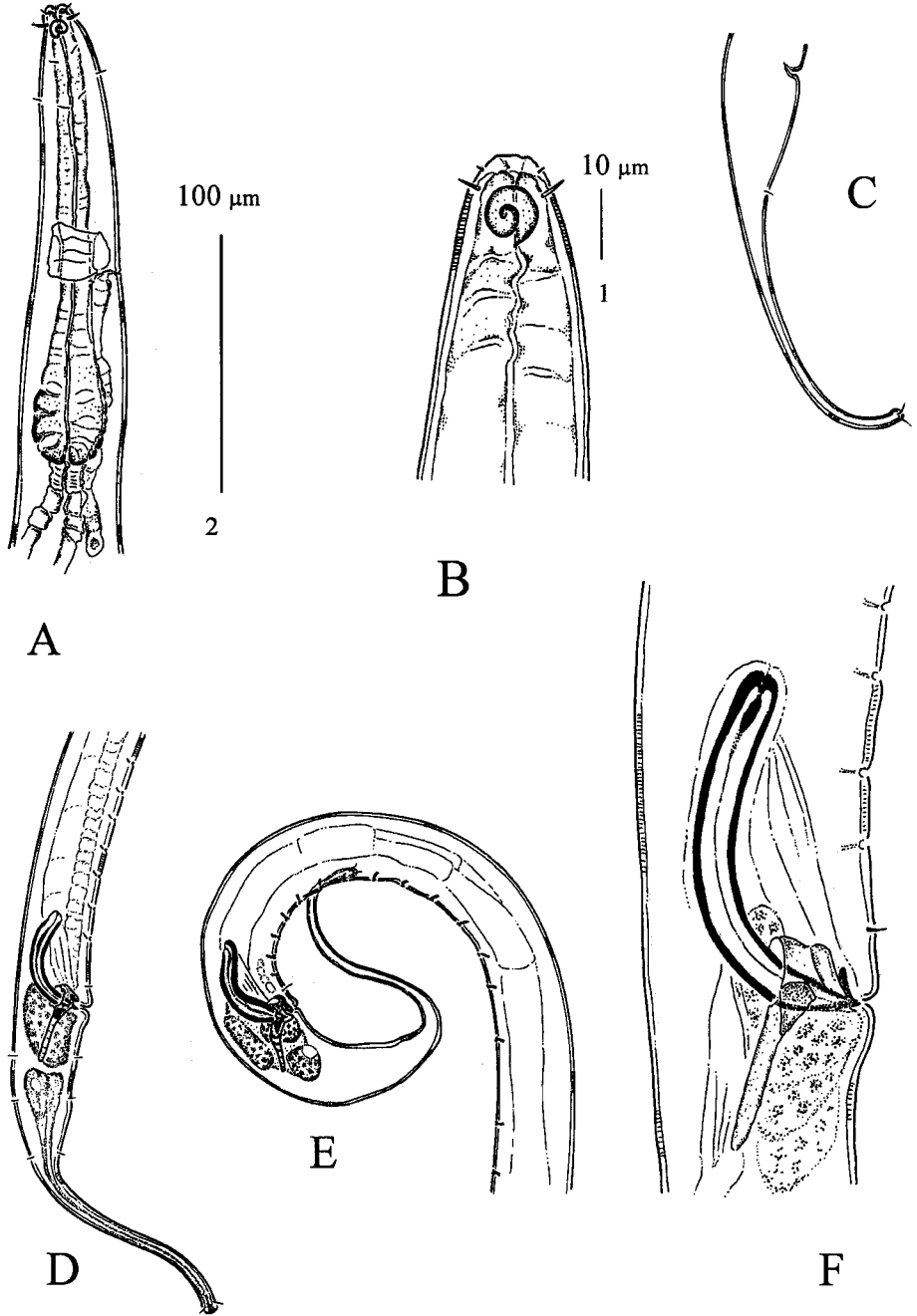
*Description. Males*: Body cylindrical, tapers slightly towards the anterior end and has a filiform tail end. Cuticle annulated and punctuated. The small punctuations are arranged in transverse rows with lateral differentiations, having larger dots regularly arranged on the lateral fields. Six inner small labial papillae, 6 outer labial setae 0.5  $\mu\text{m}$  long and 4 cephalic setae 4-5  $\mu\text{m}$  long. Cervical region without somatic setae. Amphids spiralled ventrally towards the centre, with two and a half turns, located at 5  $\mu\text{m}$  from anterior end; 7  $\mu\text{m}$  in diameter (50% bda). Stoma cup shaped, the pharyngeal muscles surround the posterior part of the stoma. Pharynx cylindrical (177-210  $\mu\text{m}$  long), posteriorly enlarged. Cardia is small. Ventral gland located at the cardia level and opens through an ampulla at 100-136  $\mu\text{m}$  from anterior end. Reproductive system is diorchic, with opposed and outstretched testes, anterior left and posterior right of the intestine. Spicules curved 40  $\mu\text{m}$  (1.3 abd) in chord length. The proximal end has a central cuticularized internal projection, 5  $\mu\text{m}$  long. Gubernaculum formed by one central basal piece 7  $\mu\text{m}$  long, two straight dorso-caudally oriented 24  $\mu\text{m}$  (0.8 abd) apophyses and a distal triangular plate with a lateral alae 10  $\mu\text{m}$  long. Glandular tissue observed situated between spicula and gubernaculum. There is a pair of short pre-cloacal setae 10  $\mu\text{m}$  from the cloaca and 16 (15-17) weakly cuticularised pre-cloacal supplements present. Tail 210  $\mu\text{m}$  long (7.0 abd), with long (50%) cylindrical end. There are three caudal glands.

*Females*: Females are similar to males in general body shape, anterior sensilla, amphids and cuticle. Ovaries opposed, outstretched, anterior left and posterior right of the intestine. Tail 140  $\mu\text{m}$  (3.7 abd).

*Discussion*. *Sabatieria sanjosensis* sp n. is characterized by the body length, values of *a* and tail shape. This new species should be included in the *S. praedatrix* – group following Platt (1985). *Sabatieria sanjosensis* sp n. resembles *S. paradoxa* Wieser & Hopper, 1967 and *S. granifer* Wieser, 1954, in head and amphid shape. It can be distinguished from both species by a larger body and spicular % and shorter tail length (in *S. paradoxa*: L=1460-1660; Spic%=1.7-1.8; T= 4.0 and in *S. granifer*: L=1765-2620; Spic=1.5-1.6; T= 3.3-4.8). *Sabatieria sanjosensis* sp n. also resembles *S. praedatrix* in body length, A% and the number of pre-cloacal supplements and it can be further distinguished by a smaller

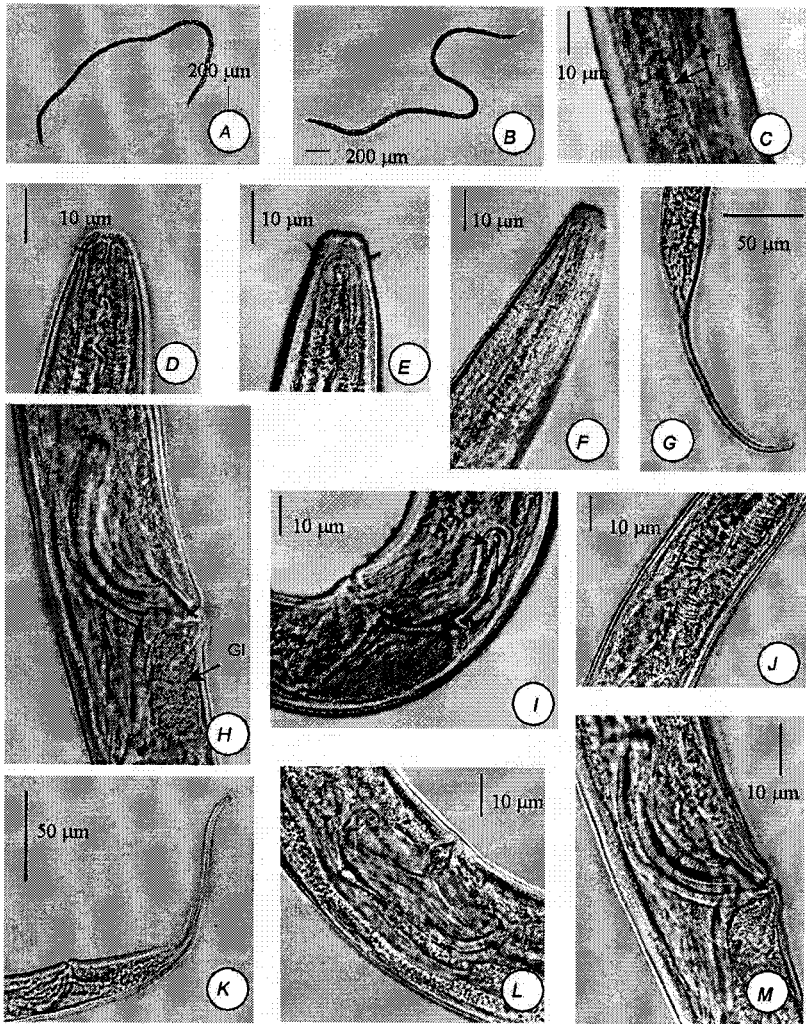


value of HD, larger R3 value, smaller spicular length and longer tail, in *S. praedatrix* (HD=40; R3=47-50; spic%= 1.5-1.8; T=4-4.5).



**FIGURE 3:** *Sabatieria sanjosensis* sp. n. A. Anterior end of male paratype; B. Head of male holotype; C. Tail of female allotype; D. Tail of male holotype; E. Posterior end of male paratype; F. Copulatory apparatus of male holotype. Scales: 1= C, G; 2= A, B, D, E, F.

*Sabatieria sanjosensis* sp. n. also resembles *S. alata* in tail length and A% value. It can be distinguished by a slightly shorter body length, much larger value of *a*, R3 values, longer spicular length and fewer pre-cloacal supplements (in *S. alata*: L= 3070-3220; a= 36-53; Hd= 32; R3 = 30; spic%= 1.6-1.8; PS= 21).



**PLATE 2:** *Sabatieria sanjosensis* sp. n. A. Entire male; B. Entire female; C. Lateral punctuations; D. Buccal cavity of male; E. Amphid of male; F. Female anterior end; G. Tail of female; H. Gland between spicules; I. Cephalization of spicules; J. Excretory gland of male; K. Tail of male; L. Vulva and uterus; M. Copulatory apparatus.

**TABLE 3.** Measurements ( $\mu\text{m}$ ) of *Sabatieria sanjosensis* sp. n. (\*: range, mean value in parentheses).

	<b>HOLOTYPE</b>	<b>PARATYPE</b>	<b>ALLOTYPE</b>	<b>PARATYPE</b>	<b>JUVENILES</b>
	<b>Male</b>	<b>Males n= 4 (*)</b>	<b>Female</b>	<b>Females n= 2</b>	<b>n=3</b>
<b>L</b>	3000	2650-3050 (2875)	3250	2250, 2300	1400-2500 (2083)
<b>danr</b>	115	80-115 (103)	110	100, 110	85-100 (92)
<b>daph</b>	206	177-210 (198)	195	175, 195	153-180 (168)
<b>dav</b>	----	-----	1550	1080, 1550	-----
<b>V%</b>	----	-----	48	47, 48	-----
<b>daa</b>	2790	2470-2854 (2684)	3110	2105, 3110	1290-2325 (1930)
<b>bdc</b>	10	8-10 (9)	10	10	8 (8)
<b>bdnr</b>	28	28-34 (31)	32	28, 32	20-24 (23)
<b>bdph</b>	32	32-38 (35)	34	30, 34	25-30 (28)
<b>mbd</b>	37	36-40 (38)	40	35, 40	25-33 (38)
<b>abd</b>	30	30-40 (35)	38	26, 38	21-27 (24)
<b>HD</b>	31	21-31 (25)	29	29, 33	27-32 (28)
<b>A%</b>	50	50-66 (55)	57	47, 57	50-60 (55)
<b>R3</b>	50	47-50 (49)	40	40	44-50 (48)
<b>Spic</b>	40	40-50 (44)	--	-----	-----
<b>Spic%</b>	1.3	1.1-1.4 (1.3)	--	-----	-----
<b>gub</b>	24	23-24 (23)	--	-----	-----
<b>gub%</b>	0.8	0.6-0.8 (0.7)	--	-----	-----
<b>PS</b>	15	15-17 (16)	--	-----	-----
<b>T</b>	7	5-7 (6)	3.7	3.7, 7.5	5.2-7.3 (6.3)
<b>a</b>	82	66-78 (75)	81.2	65.7, 81.2	56-90.4 (74.1)
<b>b</b>	14.6	13.3-15.8 (14.6)	16.7	13.1, 16.7	9.1-13.9 (12.3)
<b>c</b>	14.3	14.3-16.0 (15.1)	23.2	11.8, 23.2	66.7-97.9 (74.0)

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