

## THREE NEW RECORDS OF THE GENUS *Sabatieria* Rouville, 1903 (NEMATODA, CHROMADORIDA, COMESOMATIDAE) FROM THE CANARY ISLANDS

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### RESUMEN

Se citan, por primera vez para el archipiélago canario, tres especies de nematodos pertenecientes al género *Sabatieria*: *S. celtica* Southern, 1914, *S. longisetosa* (Kreis, 1929) y *Sabatieria* sp., recolectadas en sedimentos intermareales y submareales someros de dos playas de la isla de Tenerife. Se muestran las descripciones, figuras e información merística de cada una de las especies, así como datos autoecológicos.

**Palabras clave:** Nematoda, Comesomatidae, *Sabatieria*, fondos blandos, Tenerife, islas Canarias.

### ABSTRACT

Three species of the genus *Sabatieria*: *S. celtica* Southern, 1914, *S. longisetosa* (Kreis, 1929) and *Sabatieria* sp., are recorded for the first time from Canary Islands, collected from intertidal and shallow subtidal soft-bottoms of the island of Tenerife. Descriptions, figures and meristic data are reported as well as autoecological data.

**Key words:** Nematoda, Comesomatidae, *Sabatieria*, soft-bottoms, Tenerife, Canary Islands.

### INTRODUCTION

The genus *Sabatieria* Rouville, 1903 is characterized by having a cuticle ornamented with transversely punctations, lacking longitudinal rows of dots, and buccal cavity cup-shaped. Cephalic setae is larger than outer labial setae. Spicules are short. Testes (in males) and ovaries (in females) are two, opposed and outstretched. Platt [4] divided this genus in 5 groups:



- *Armata* group. Cephalic setae long ( $\leq 1,7$  cephalic diameter). Subcephalic setae present. Tubular precloacal supplement.
- *Celtica* group. Amphids multispiral (3 rounds). Precloacal supplements conspicuous. Gubernacular apophysis bent.
- *Ornata* group. Posterior group of more closely spaced precloacal supplements separated from the rest.
- *Praedatrix* group. Tubular of pore-like precloacal supplements.
- *Pulchra* group. Relatively few (5-9) usually conspicuous precloacal supplements. Paired and short subcephalic setae.

This genus comprises so far 51 species:

- *Armata* group, 6 species: *S. arcuata* Wieser, 1954, *S. armata* Gerlach, 1952, *S. elongata* Jayasree & Warwick, 1977, *S. longispinosa* Lorenzen, 1972, *S. migrans* Jensen & Gerlach, 1977 and *S. supplicans* Gerlach, 1956.
- *Celtica* group, 4 species: *S. celtica* Southern, 1914, *S. furcillata* Wieser, 1954, *S. kellei* Platt, 1983, *S. pisinna* Vitiello, 1970, and *S. strigosa* Lorenzen, 1972.
- *Ornata* group, 4 species: *S. abyssalis* (Filipjev, 1918), *S. longisetosa* (Kreis, 1929), *S. macramphis* Lorenzen, 1972 and *S. ornata* (Ditlevsen, 1918).
- *Praedatrix* group, 30 species: *S. alata* Warwick, 1973, *S. ancudiana* Wieser, 1954, *S. bitumen* Botelho, Da Silva, Morgado-Esteves & Fonsêca-Genevois, 2007, *S. conicauda* Vitiello, 1970, *S. coomansi* Chen & Vincx, 1999, *S. demani* Bresslau & Stekhoven, 1935, *S. dodecaspapillata* (Kreis, 1929), *S. exilis* Botelho, Da Silva, Tosta-Sobral & Fonsêca Genevois, 2009, *S. falcifera* Wieser, 1954, *S. flecha* Pastor de Ward, 2003, *S. fidelis* Botelho, Da Silva, Tosta-Sobral & Fonsêca-Genevois, 2009, *S. granifer* Wieser, 1954, *S. heipi* Chen & Vincx, 2000, *S. intermissa* Wieser, 1954, *S. lawsi* Platt, 1983, *S. lepida* (Vitiello, 1976), *S. lucia* Muthumbi, Soetaert & Vincx, 1997, *S. lyonessa* Warwick, 1977, *S. maboyae* Gourbault & Vincx, 1990, *S. parabyssalis* Wieser, 1954, *S. paracupida* Wieser & Hopper, 1967, *S. paradoxa* Wieser & Hopper, 1967, *S. paraspiculata* Botelho, Da Silva, Morgado-Esteves & Fonsêca-Genevois, 2007, *S. praedatrix* De Man, 1907, *S. sanjosensis* Pastor de Ward, 2003, *S. spiculata* Botelho, Da Silva, Morgado-Esteves & Fonsêca-Genevois, 2007, *S. stekhoveni* Vitiello, 1970, *S. subrotundicauda* Botelho, Da Silva, Morgado-Esteves & Fonsêca-Genevois, 2007, *S. triplex* Wieser, 1954 and *S. vasicola* Vitiello, 1970.
- *Pulchra* group, 7 species: *S. breviseta* Stekhoven, 1935, *S. maboyae* Gourbault & Vincx, 1990, *S. mortenseni* (Ditlevsen, 1921), *S. propisinna* Vitiello, 1976, *S. pulchra* (Schneider, 1906) and *S. punctata* (Kreis, 1924).
- *Sabatieria aspera* Sergeeva, 1972, *S. effilata* Stekhoven, 1950, *S. possjetiva* Platonova, 1971, *S. praebosporica* Sergeeva, 1972, *S. quadripapillata* Filipjev, 1922, *S. rota* Gerlach, 1957 and *S. sarcina* (Vitiello, 1976) are considered species *inquirenda* (Platt, 1985).

During an ecological study of the soft-bottoms from two localities on the south coast of Tenerife, several specimens that belong to the genus *Sabatieria* were collected. Three species were identified, *Sabatieria celtica* Southern, 1914, *Sabatieria longisetosa* (Kreis, 1929) and *Sabatieria* sp.



## 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. These samples were fixed with 10% formaldehyde in seawater for one day and decanted through a sieve of 63  $\mu$ m mesh size, and posteriorly preserved in 70% ethanol. All 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 curve structures are measured along the arc.

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

CHROMADORIDA Chitwood, 1933

CHROMADORINA Filipjev, 1928

COMESOMATIDAE Filipjev, 1918

*Sabatieria* Rouville, 1903

*Sabatieria celtica* Southern, 1914

(Figs 1 & 2; Tab. 1)

*Sabatieria celtica* Southern [6]: 25, fig. 8 a-d; Platt [4]: 57, figs. 6 e, 16, 18 e-g, tab. 5; Platt & Warwick [5]: 210, fig. 93; Hua & Zhang [2]: 30, fig. 4.

*Sabatieria longiseta* Steiner [7]: 593, fig. 22 a-d.

**Meristic data and studied material.**- Abrigos subtidal: june 2000, 2 males ( $\sigma$ 1 and  $\sigma$ 5) and 1 female ( $\sigma$ 1), october 2000, 2 females ( $\sigma$ 2 and  $\sigma$ 4), november 2000, 1 male ( $\sigma$ 2), april 2001, 1 female ( $\sigma$ 5); Cristianos subtidal: may 2000, 2 males ( $\sigma$ 3 and  $\sigma$ 4), march 2001, 1 female ( $\sigma$ 3).

### Description.-

**Male:** Body slender, tapering towards both ends. Head slightly round and not set off. Cuticle annulated and ornamented with transverse rows of dots; fewer rows or large dots laterally. Amphids are 55% of the corresponding body diameter in width, multispiral, 2.5 rounds, located at 7  $\mu$ m from the anterior end. Buccal cavity conical and small. 6 inner labial setae inconspicuous. 6 outer labial setae 3  $\mu$ m long, sometimes not discernible. 4 cephalic setae 1.8-2 cephalic diameters long, situated at the anterior half of the head. Subcephalic setae 0.7-0.9 cephalic diameters long, located at 18  $\mu$ m from the anterior body end. Pharynx slender and cylindrical. Ventral gland and nerve ring not seen.

The reproductive system is diorchic with two extended testis, difficult to discern. Spicules 1.3 anal diameters long, paired and arcuate, with a short central projection at the proximal end. Gubernaculum developed with a straight and narrow dorsal apophysis. 18-21 small tubular precloacal supplements, which can be easily overlooked. Tail 2.7-3.6 anal di-



ameters long, slender and cylindrical with a slightly expanded distal end. 2 caudal setae 17  $\mu\text{m}$  long. Spinneret developed.

*Female*: Total body length slightly larger than in males (2.1-2.9 mm), with a longer tail (4.7-4.8 anal diameters). Cephalic setae less developed (20-21  $\mu\text{m}$ ). Outer labial and subcephalic setae lacking. The reproductive system is didelphic, with two outstretched ovaries, difficult to discern. Vulva located at 49.2-50.1% of the total body length.

**Discussion.-** This species presents important intraspecific variations, especially in cephalic and subcephalic setae length. *Sabatieria celtica* Southern, 1914 is characterized by having spicules proximally expanded, although Chen & Vincx [1] noticed some individuals lacking this character. Gubernacular apophysis is straight in canarian specimens, being curved gubernacular apophyses a typical character of the *celtica* group (Platt [4]).

**Ecology.-** In the subtidal of Los Abrigos was recorded in fine sands ( $Q_{50} = 0.24$ ), with a very good selection ( $S_0 = 0.73$ ). The organic matter content was 0.51% and 4.61% of carbonates percentage. In the subtidal of Los Cristianos was collected in fine sands ( $Q_{50} = 0.16$ ), with a very good selection ( $S_0 = 0.58$ ). The organic matter content was 0.73% and 24.96% of carbonates percentage.

**Distribution.-** Cosmopolitan (Platt [4]).

### *Sabatieria longisetosa* (Kreis, 1929)

(Fig. 3; Tab. 2)

*Sabatieria longisetosa*.- Platt [4]: 61, fig. 17, tab. 16; Platt & Warwick [5]: 212, fig. 94 f-g.

*Parasabatieria longisetosa* Kreis [3]: 89, fig. 40 a-d.

**Meristic data and studied material.-** Abrigos subtidal: may 2000, 4 males ( $\sigma^1$ ,  $\sigma^2$ ,  $\sigma^3$  and  $\sigma^4$ ); Cristianos subtidal: february 2001, 1 male ( $\sigma^5$ ).

### **Description.-**

*Male*: Body slender, attenuating on both anterior and posterior ends. Head round and slightly set off. Cuticle annulated and ornamented with homogeneous punctations, lateral differentiation not seen. Amphids 93% of the corresponding body diameter in width, multispiral, 3 rounds, located at 6  $\mu\text{m}$  from the anterior end. Buccal cavity conical and small, without noticeable teeth. Inner labial setae lacking. 6 outer labial setae 2  $\mu\text{m}$  long and 4 cephalic setae 1.4 cephalic diameters long, situated in the anterior half of the head. Subcephalic setae 9  $\mu\text{m}$  long, located at 35  $\mu\text{m}$  from the anterior body end. Short scattered somatic setae fairly numerous pharyngeal region but scarce in the rest of the body. Pharynx slender and cylindrical.

The reproductive system is diorchic with two opposed testes. Spicules 1.6 anal diameters long, paired and arcuate, without capitulum. Gubernaculum 0.6 anal diameters long, with a distally curve apophysis. 14 small tubular precloacal supplements, divided in two groups (5 + 9) broaden the posteriormost. Precloacal setae 3  $\mu\text{m}$  long, located at 3  $\mu\text{m}$  from the cloaca. Tail 3.7-4.5 anal diameters long, cylindrical and slender with slightly swollen tail tip. 2 caudal setae 7  $\mu\text{m}$  long. Spinneret developed.

Females not found.



**Discussion.-** This species belongs to *ornata* group, characterized by having posteriormost precloacal supplements more closely situated than the remaining ones. *Sabatieria longisetosa* (Kreis, 1929) is defined by having 14 precloacal supplements and its tail length (4.1 anal diameters). Canarian individuals are larger (1.6-2.1 mm) compared to those collected in other atlantic regions (1.3-1.6 mm) and have spicules less developed in width (Platt [4]).

**Ecology.-** In the intertidal of Los Abrigos this species was recorded in medium sands ( $Q_{50} = 0.36$ ), with a very good selection ( $S_0 = 0.86$ ). The organic matter content was 1.68% and 3.8% of carbonates percentage. In the subtidal of Los Cristianos was collected in fine sands ( $Q_{50} = 0.18$ ), with a very good selection ( $S_0 = 0.73$ ). The organic matter content was 0.33% and 23.08% of carbonates percentage.

**Distribution.-** East Atlantic (Platt [4]).

### *Sabatieria* sp.

(Fig. 4; Tab. 3)

**Meristic data and studied material.-** Abrigos intertidal: may 2000, 1 female (♀1); Abrigos subtidal: december 2000, 2 females (♀2 and ♀3).

### **Description.-**

Males not found.

*Female:* Body slender, tapering towards both ends. Head round and slightly set off. Cuticle ornamented with homogeneous punctations, lateral differentiation difficult to discern. Amphids 43% of the cbd in diameter, multispiral (2.5 rounds), located at 6  $\mu$ m from the anterior body end. Buccal cavity conical and small, without developed teeth. Inner labial setae lacking. Outer labial setae 3  $\mu$ m long and 4 cephalic setae 1.5 cephalic diameters long, situated in the median part of the head. Subcephalic setae absent. Pharynx cylindrical and slender.

Reproductive system not discernable. Vulva located at 46.5-60% of the total body length. Tail 4.6 anal diameters long, cylindrical and filiform in its posterior part, with swollen tail tip. 2 caudal setae 10  $\mu$ m long. Spinneret developed.

**Discussion.-** *Sabatieria* sp. can be differentiated from the remaining species of the genus in its tail length (4.5-5.4 anal diameters), amphid size (43% cbd in diameter) and outer labial setae (1.5 anal diameters long). This species has been determined to genus level due to the absence of males.

**Ecology.-** In the intertidal of Los Abrigos this species was collected in medium sands ( $Q_{50} = 0.34-0.42$ ), with a very good selection ( $S_0 = 0.83-0.97$ ). The organic matter content was 1.33% and carbonates percentage ranged from 5.30% to 5.47%. In the subtidal of the same locality was recorded in medium sands ( $Q_{50} = 0.28$ ), with a very good selection ( $S_0 = 0.75$ ). The organic matter content was 0.78% and carbonates percentage was 5.47%.



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TABLES AND FIGURES

	♂1	♂2	♂3	♂4	♂5	♀1	♀2	♀3	♀4	♀5
Total body length	1887	2571.4	2600	1914.3	2389.7	2959	2142.9	2789.5	2544.9	2613.5
a	31.4	38.3	39.5	38.3	36.3	52.8	42.9	50.9	52.2	53.4
b	10	11.3	16.5	14.9	16	13.8	8.8	11.8	11.4	11.1
c	10.4	12.9	17.8	14.1	13.4	13.8	10.7	13.2	12.4	12.2
Cephalic diameter	22.9	25.7	22.4	23	21.9	15.7	17.1	16.5	15.4	16.4
Inner labial setae	—	—	—	—	—	—	—	—	—	—
Outer labial setae	3.1	2.9	3	2.9	3.1	—	—	—	—	—
Cephalic setae	40	42.3	39.7	39.9	38.7	20	21.4	19.8	20.1	20.8
Subcephalic setae	17.9	18.7	16.5	15.9	15.7	—	—	—	—	—
Buccal cavity diameter	8.6	8.6	8.6	8.6	8.4	7.1	7.1	6.9	7	7.2
Amphid diameter	11.4	—	7.1	11.4	10.1	10	11.4	10.1	10	9.8
Amphid height	15.7	—	10	12.9	11.2	10.5	14.3	10.6	10.4	10.3
Amphid from anterior	7	—	12.9	8.6	9.3	6.8	6	6.5	6.4	6.4
Pharynx length	189.2	228.6	157.1	128.6	149.8	214.3	242.9	235.6	222.5	235.4
Pharynx cbd	60.7	46.4	39.3	35.7	48.7	39.3	42.9	42.8	40.1	41.5
Maximum body diameter	60.4	67.1	65.9	50	65.9	56	50	54.8	48.7	48.9
Vulva from anterior						1457.1	nd	1373.9	1267.4	1309.4
% V						49.2	nd	49.3	49.8	50.1
Spicule length	64.3	69.3	60.7	67.8	62.9					
Gubernaculum length	34.5	35.7	32.1	35.7	34.8					
s'	1.3	1.3	1.3	1.4	1					
Tail length	182.1	200	146.4	135.7	178.3	214.3	200	210.1	205.9	213.4
Anal body diameter	50	71.4	45.7	50	61.9	45.7	42.9	42.3	43.4	44.0
c'	3.6	2.8	3.2	2.7	2.9	4.7	4.7	4.9	4.7	4.8
Spicule length/Tail length	0.4	0.3	0.4	0.5	0.4					

Table 1.- Measurements of *Sabatieria cellica* in µm; nd: not discernible.

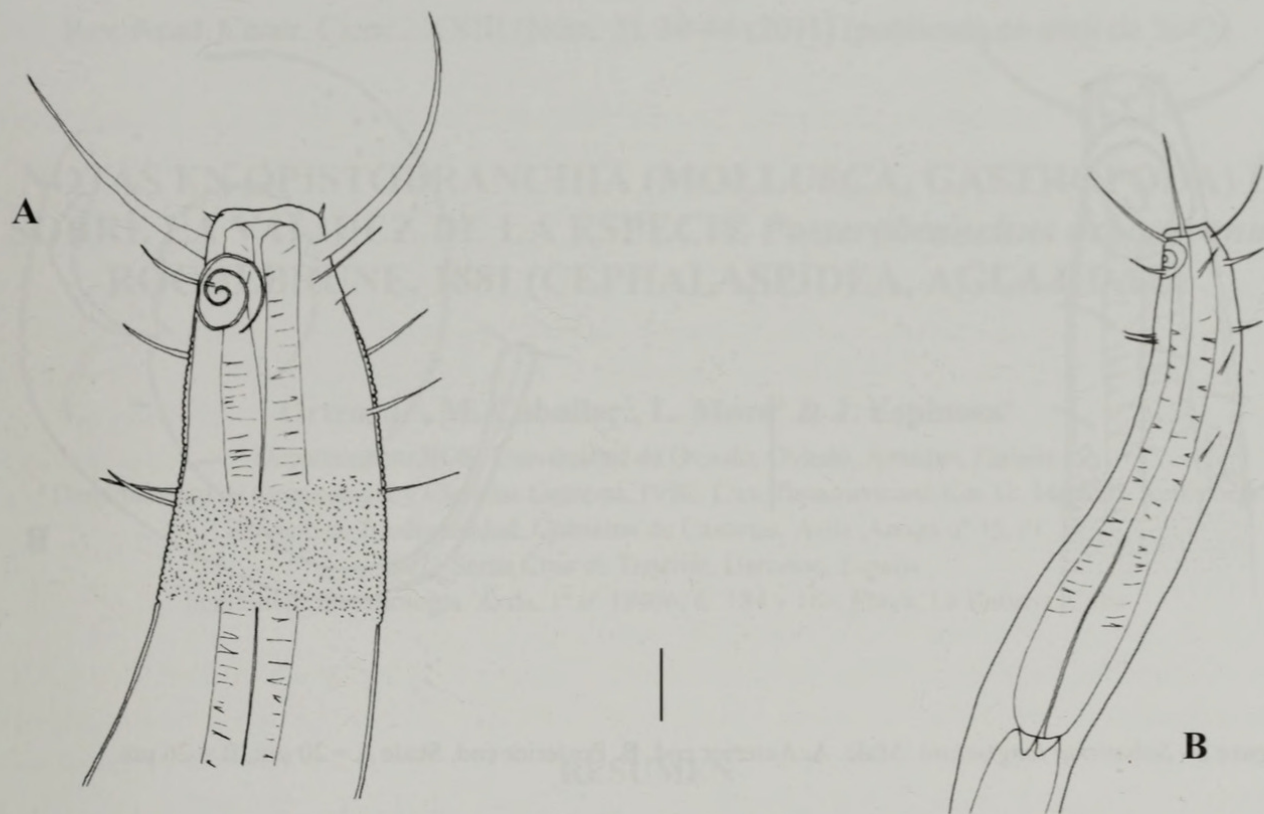
	♂1	♂2	♂3	♂4	♂5
Total body length	1628.6	1742.9	1885.7	2085.7	1942.9
a	32.6	32.5	35.2	42.3	38.9
b	7.2	7.4	8.8	4.7	8.6
c	9.7	10.4	12.9	13.3	12.7
Cephalic diameter	15.7	20.3	15.7	15.7	17.1
Inner labial setae	1.8	2	2	3	2
Outer labial setae	22.9	22.9	24.3	24.3	22.9
Cephalic setae	—	—	—	—	—
Subcephalic setae	—	—	—	—	—
Buccal cavity diameter	7.5	5.7	5.7	7.1	7.1
Amphid diameter	18.6	15.7	17.1	12.9	14.3
Amphid height	21.4	17.1	24.3	18.6	17.1
Amphid from anterior	8.6	10	10	8.6	11.4
Pharynx length	225	235.7	214.3	442.9	225
Pharynx cbd	39.3	42.9	42.9	32.1	39.3
Maximum body diameter	50	53.6	53.6	49.3	50
Spicule length	54	59	53	78.4	74.6
Gubernaculum length	22.9	18.6	27.1	24.3	27.1
s'	1.4	1.6	1.3	2.1	1.6
Tail length	167.9	167.9	146.4	157.1	153.6
Anal body diameter	38	37	39.3	35.7	46.4
c'	4.4	4.5	3.7	4.4	3.3
Spicule length/Tail length	0.3	0.4	0.4	0.6	0.6

**Table 2.-** Measurements of *Sabatieria longisetosa* in  $\mu\text{m}$ .

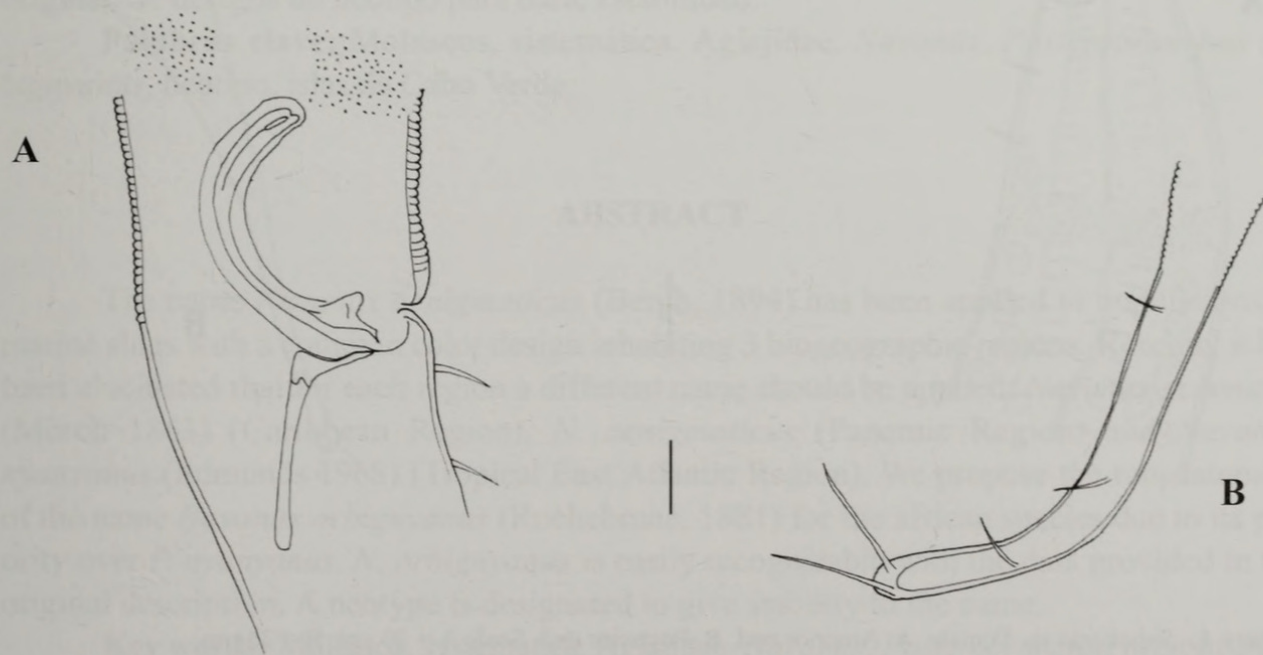
	♀1	♀2	♀3
Total body length	1500	2457.1	2200
a	28	25.5	24.6
b	6.6	7.5	8.4
c	7.6	9.1	11
Cephalic diameter	13.0	20.3	22.9
Inner labial setae	—	—	—
Outer labial setae	2.8	3	3
Cephalic setae	19.0	22.9	27.1
Subcephalic setae	9	10	9
Buccal cavity diameter	5.7	8.6	8.6
Amphid diameter	7.1	14.3	15.7
Amphid height	8.6	14.3	14.3
Amphid from anterior	6	4	5.7
Pharynx length	228.6	328.6	260.7
Pharynx cbd	46.4	82.1	78.6
Maximum body diameter	53.6	96.4	89.3
Vulva from anterior	900	1142.9	nd
% V	60	46.5	nd
Tail length	196.4	271.4	200
Anal body diameter	42.9	50	44.9
c'	4.6	5.4	4.5

**Table 3.-** Measurements of *Sabatieria* sp in  $\mu\text{m}$ ; nd: not discernible.



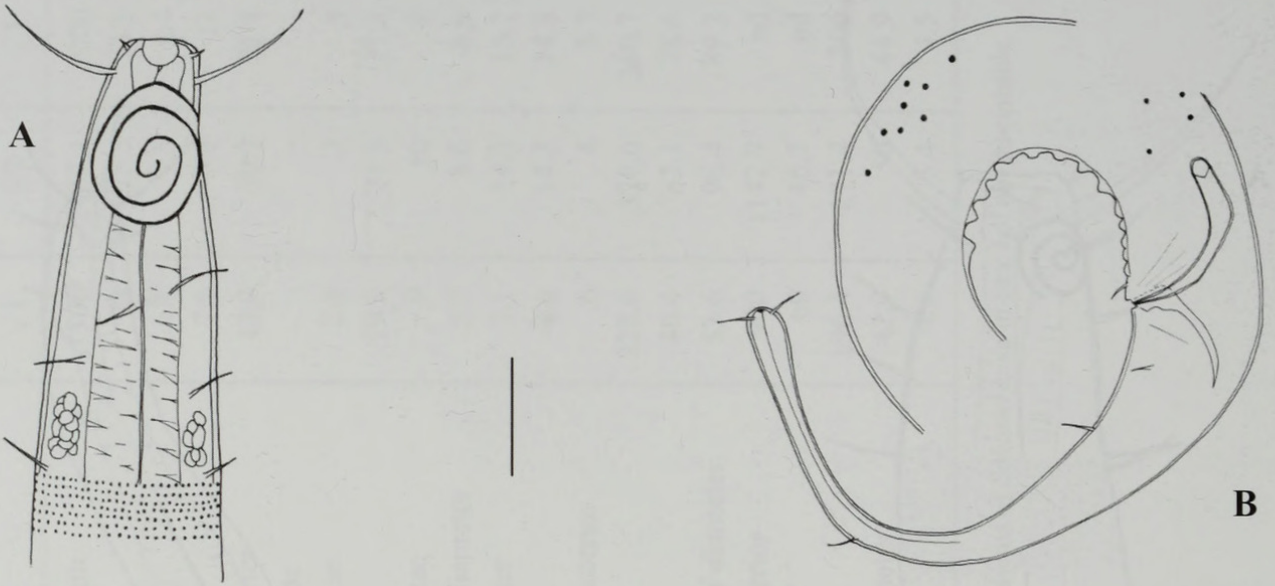


**Figure 1.-** *Sabatieria celtica*. Male. **A.** Anterior end. **B.** Pharynx, oesophageal bulb and cardias. Scale A = 15  $\mu$ m, B = 30  $\mu$ m.

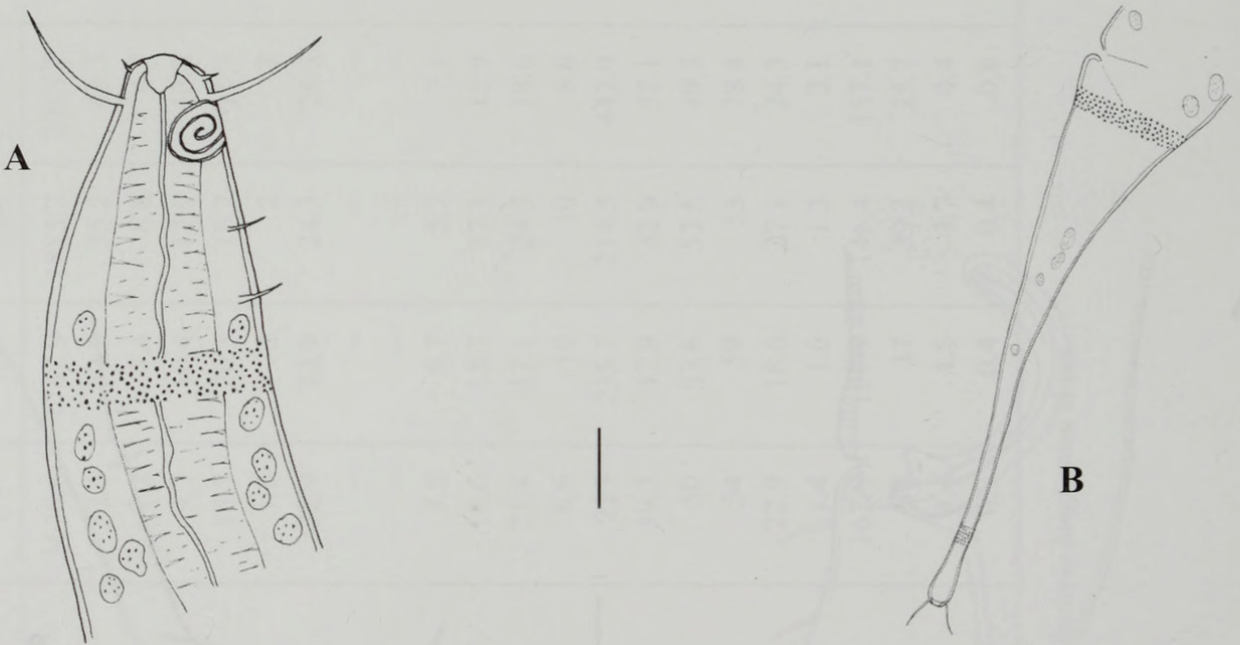


**Figure 2.-** *Sabatieria celtica*. Male **A.** Spicule and gubernaculum. **B.** Posterior end. Scale = 20  $\mu$ m.





**Figure 3.-** *Sabatieria longisetosa*. Male. **A.** Anterior end. **B.** Posterior end. Scale A = 20 µm, B = 26 µm.



**Figure 4.-** *Sabatieria* sp. Female. **A.** Anterior end. **B.** Posterior end. Scale A = 20 µm, B = 26 µm.





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