Two new and three redescribed species of *Viscosia* (Nematoda, Oncholaimidae)

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Abstract

Viscosia coomansi sp. nov. and *Viscosia heterolaima* sp.nov. are described from Lake Grevelingen and Eastern Scheldt (The Netherlands). *Viscosia glabra* (Bastian, 1865) de Man 1890, *Viscosia franzii* Boucher 1977, and *Viscosia viscosa* (Bastian 1865) de Man 1890 are redescribed, taking into account new important characters. Juvenile specimens are depicted for *V. viscosa. Viscosia carnleyensis* Ditlevsen, 1921 is synonymized with *Viscosia glabra* (Bastian, 1865). *Mononcholaimus viscosus* Allgén, 1930 and *Mononcholaimus elegans* sensu Schuurmans-Stekhoven, 1942, 1950 (nec. Kreis, 1924) are synonymized with *Viscosia viscosa* (Bastian, 1865).

Introduction

The identification of a *Viscosia*-species is a difficult task due to the enormous number of species described and the tentative information within the descriptions. Moreover, about 70% of the known species are recorded only once in the literature, and often only one or few specimens were found, indicating that information on variability is lacking.

Five *Viscosia*-species from different habitats are compared and their similarities and differences discussed. We tried to improve the descriptions taking into account the important and new characteristics pointed out by Smol (in prep.).

Materials and methods

Localities

Dievengat: A polyhaline brackish water pool in the southern part of the nature reserve 'Het Zwin', situated in the extreme north-western corner of Belgium. A more detailed description is given by Smol *et al* (1981).
Sediment: well sorted fine sand underlying a 2–3 mm layer of detritus.
Coordinates: 51°21'00"N, 03°22'30"E. Salinity 8–40‰.
Sampled: October 1973–September 1977.

Eastern Scheldt: 51°32'40"N, 03°59'50"E.
Fine sandy sediment. Sampled: June 1979–May 1980.

Lake Grevelingen: 51°46'00"N, 03°56'00"E.
Fine medium sand. Sampled: June 1979–May 1980.

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Techniques

All samples were fixed in 4% formaldehyde at 70 °C. The nematodes were transferred to dehydrated glycerol (Seinhorst, 1959; De Grisse, 1965) and mounted on Cobb-slides for identification.

The drawings were made with the aid of a camera lucida on a Leitz Dialux 20 EB and a Wild M20 microscope.

All measurements, except ratios, are in micrometers. The values in the measurement formula indicate:

$$\frac{\text{cephalic setae} \quad \text{nerve ring} \quad \text{ventral pore} \quad \text{pharynx} \quad \text{vulva/M} \quad \text{anus/cloacal aperture} \quad \text{total length}}{\text{corresponding body diameter (c.b.d.)}}$$

The buccal index formula, explained in the abbreviations, is used to describe the morphology of the buccal cavity:

$$BI = \frac{B \quad ; \quad br}{LV \quad D \quad RV}$$ (modified after Belogurov & Belogurova, 1977)

Spicula are measured along the arc.

We use the terms 'ventral' pore and 'ventral' gland as the excretory function of these structures has not been proven. Other terminology is adapted from Coomans (1978).

The distinction between papillae and setae is made as follows:

$\leqslant 2\ \mu m$ = papillae;

$> 2\ \mu m$ = setae.

One male and one female of each species described in this paper are deposited in the collection of the Instituut voor Dierkunde, Rijksuniversiteit, Gent, Belgium.

Abbreviations

a	body length/max. body diameter
b	body length/pharyngeal length
br	length basorabdion/length buccal cavity (%)
c	body length/tail length
c'	tail length/anal body diameter
a.b.d.	anal body diameter
c.b.d.	corresponding body diameter
n	number of specimens examined
s.d.	standard deviation
$\bar{x}$	arithmetic mean
B	length/width of buccal cavity
BI	buccal index
D	length dorsal tooth/length buccal cavity (%)
L	body length (in micrometer)
LV	length left ventrosublateral tooth/length buccal cavity (%)
M	middle of body
RV	length right ventrosublateral tooth/length buccal cavity (%)
S	spicule length (in micrometer)
V	position of vulva from anterior as a percentage of the total body length

Viscosia coomansi sp.n. (Fig. 3 & Plates 3, 6)

Locality: Lake Grevelingen, Eastern Scheldt, The Netherlands

Measurements

	♂♂ (n = 5)		♀♀ (n = 5)	
	$\bar{x}$ ± s.d.	range	$\bar{x}$ ± s.d.	range
L	2706.4 ± 155.9	(2583–2973)	2953.4 ± 114.7	(2833–3071)
a	74.9 ± 6.5	(68.0–84.9)	70.4 ± 8.3	(60.3–82.8)
b	7.3 ± 0.5	(7.0–7.6)	7.8 ± 0.5	(7.2–8.4)
c	17.5 ± 1.0	(15.9–18.6)	17.9 ± 1.8	(15.7–20.7)
c′	7.2 ± 0.8	(6.0–7.8)	6.4 ± 0.7	(5.6–7.0)
Vulva			48.6 ± 1.8	(47.0–51.0)
Spicules	24.6 ± 0.9	(24–25)		

♂1 (holotype)	8	177	229	339	–	2439	2583 (slide No. 505)
	17	37	37	37	38	24	
	a = 68.0		b = 7.6	c = 17.9			
♂2(paratype)	8	198	252	382	–	2535	2690
	16	33	34	35	36	20	
	a = 74.7		b = 7.0	c = 17.4			
♀1(allotype)	9	199	247	380	1457	1925	3071 (slide No. 506)
	18	38	39	40	46	28	
	a = 66.8		b = 8.1	c = 21.0	V = 47.4%		
♀2(paratype)	8	198	239	387	1416	2673	2833
	17	34	34	37	47	26	
	a = 60.3		b = 7.3	c = 17.7	V = 50.0%		

$BI_{♂1}$: 2.1 ; 50% / 38% 38% 84% $BI_{♀1}$: 2.2 ; 40% / 36% 36% 85%

Description

Males: long, thin nematodes tapering slightly towards anterior end. Cuticle plain, lacking ornamentation.

Lip region demarcated by slight depression. 6 internal labial papillae; 6 external labial setae (5 μm) and 4 cephalic setae (4 μm) in one circle.

Amphideal fovea cup-shaped, 10 μm in diameter, 59% of c.b.d., aperture located 8 μm from anterior end.

Buccal cavity 12 μm long, 10 μm wide (range: 20–21 × 9–10 μm); prominent ventrosublateral tooth on right side. Left ventrosublateral and dorsal teeth small, not reaching midway the buccal cavity.

Pharynx muscular, slightly widened at base.

Nerve ring at 52% of pharyngeal length.

Ventral pore at 34 μm from nerve ring with slight sclerotization. Ventral gland cell on right side of intestine, 209 μm from base of pharynx.

Cardia muscular, 25 μm long.

Reproductive system with two opposed, outstretched testes, on right side of intestine. Spicules straight, 24 μm long, three small denticles on tip of each spicule. Sperm spherical, with prominent nuclei, 8–10 μm in diameter; 10 adanal papillae. Copulatory muscle bands reaching till the most anterior caudal gland; the ones immediately anterior to the cloacal region rather obscure.

Three preanal caudal glands: 230, 295 and 363 μm from cloacal opening; the first and third on left side of intestine and second on right side. Spinneret not very prominent.

Tail tapering immediately posterior to cloacal opening but with slight swelling at tip, 144 μm long.

Females: (only differences distinguishing it from the male are given).

Buccal cavity 22 × 9 μm (range: 21–22 × 9–10 μm).

Reproductive system with two equally developed branches; ovaries antidromously reflexed on right side of intestine. Vulva simple, demanian system as described by Rachor (1969) for *Viscosia*. Ovum: 115 × 31 μm.

Discussion

V. coomansi sp.n. is very closely related to *V. viscosa* Bastian, 1865. Both have the similar teeth at a similar position, but *V. coomansi* stands out by its larger size and high a-value. Also, the spicules of *V. coomansi* are straighter and lack the curvature typical for *V. viscosa*.

Both species are distinguished from the others of this genus by the smaller teeth being inconspicuous and positioned in the second half of the buccal cavity.

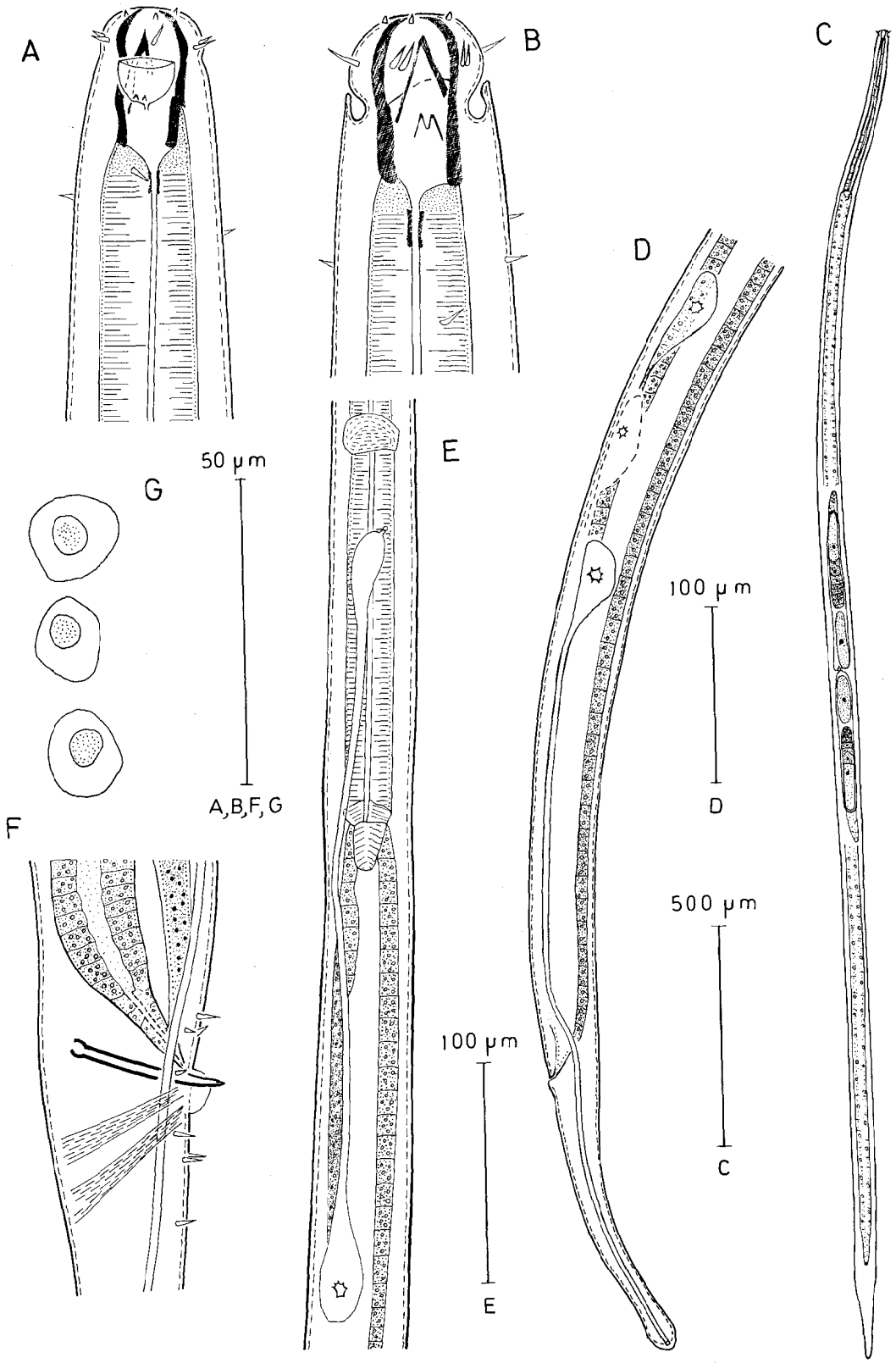

Fig. 3. Viscosia coomansi sp.n.
A. Head end ♂1; B. Head end ♀1; C. Total view ♀1; D. Tail shape, caudal glands ♀2; E. Ventral gland ♀1; F. Spicular apparatus ♂1; G. Sperm cells ♂2.

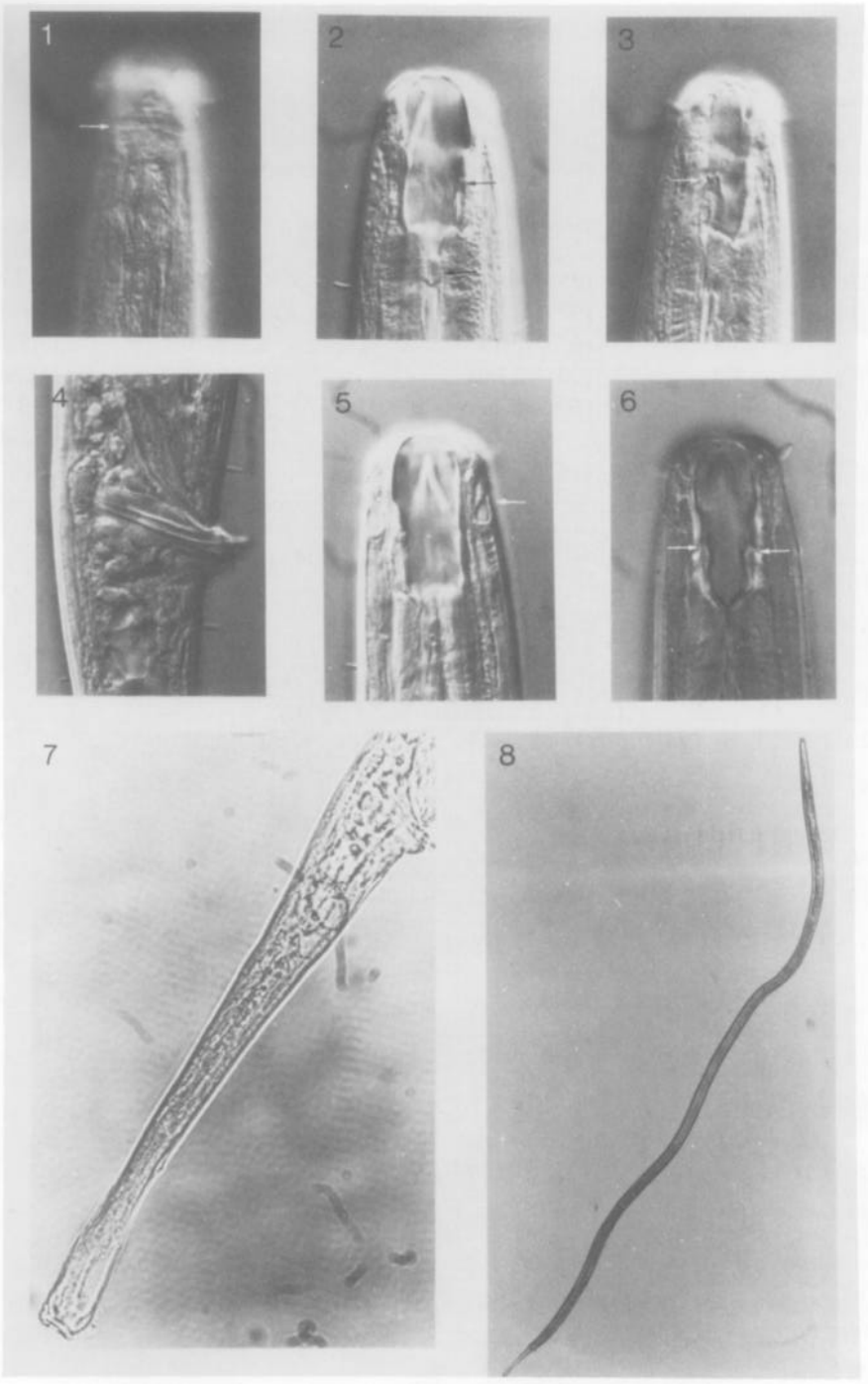

Plate 3. Viscosia coomansi sp.n.
1. Amphid (lateral view) ♂$_1$; 2. Dorsal tooth (lateral view) ♂$_1$; 3. Left ventrosublateral tooth ♂$_1$; 4. Spicular apparatus ♂$_1$; 5. Amphids (ventral view) ♀$_1$; 6. Dorsal & left ventrosublateral teeth ♀$_1$; 7. Tail ♂$_1$; 8. Total view ♂$_1$.