

Description of Non-Type *Seinura winchesi* from Mushroom Compost (Nematoda: Seinuridae)

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Abstract: Non-type material identified as *Seinura winchesi*, and deposited in the collection of the Nematology Department, Rothamsted Experimental Station, England, is described. The material was collected from mushroom compost in Leeds, England, in 1957. Females of this population are characterized by a set-off head, knobless stylet (20–21 µm), two rows of oogonia-oocytes, and absence of a postuterine sac. The median bulb is oblong and, at times, is constricted in the middle. The body is 565 to 675 µm long and tapers posteriorly to a pointed terminus. The cuticle is finely annulated, and there are three incisures in the lateral field. The ovary is outstretched and overlaps the esophageal gland lobes. A spermatheca is present, and spermatozoa are visible. The vulva is posteriorly located ($V = 77\text{--}80$), and a flap is absent. Males are 550 to 680 µm long with a spicate tail that bears three pairs of subventral papillae. The spike is short (14–18 µm), about one-half the tail length. The testis is 360 to 412 µm long, not reflexed, and at times overlaps the esophageal gland lobes. Spermatogonia-spermatocytes are in two rows. Spicules are 14 to 15 µm long with a prominent apex, and small rostrum. A bursa and gubernaculum are absent.

Key words: nematode, *Seinura diversa*, *Seinura winchesi*, Seinuridae, taxonomy.

Seinura winchesi was described from pig manure by T. Goodey in 1927. Originally placed in the genus *Aphelenchus*, it was transferred to the genus *Seinura* by J. B. Goodey in 1960. In 1963, J. B. Goodey redescribed the species. The original material described by T. Goodey no longer exists (J. A. Rowe, IACR-Rothamsted), and the deposit site of material described by J. B. Goodey is unknown.

Non-type material identified as *S. winchesi* by D. J. Hooper (IACR-Rothamsted) does exist in the Rothamsted Experimental Station Nematode Collection. This material was collected from mushroom compost in Leeds, England, in 1957. This paper describes the Leeds material and compares morphometric data from the current study with those from studies by T. Goodey and J. B. Goodey.

MATERIALS AND METHODS

Non-type material of *Seinura winchesi* was obtained from the Rothamsted Experimental Station Nematode Collection. This material was collected from mushroom compost in Leeds, England, in 1957. The material was fixed in TAF and stained in lactophenol-cotton blue. In 1962 it was mounted in glycerin. The material consisted of five females mounted on slide no. 86a/4/2 and five males mounted on slide no. 86a/4/3. Due to the poor condition of one of the females, measurements and descriptions were based on four specimens. All measurements are in micrometers unless otherwise specified.

SYSTEMATICS

Seinura winchesi (T. Goodey, 1927) J. B. Goodey, 1960 (Figs. 1–8)

Description

Females: Measurements of four females are listed in Table 1. Body straight or ventrally curved, tapering posteriorly to long, non-filiform tail. Cuticle with fine, transverse striae. Lateral field with three incisures. Head set off by constriction. Stylet long (20–21), without knobs; tip slanted ventrally. Posterior portion of stylet very difficult to distinguish. Median bulb oblong, at times with constriction in the middle; valves centrally situated. Median bulb 18 to 18.2 long, and 12 to 13 wide. Esophageal gland lobes 92.4 to 118 long. Excretory pore below nerve ring, 96 to 102 from anterior end. Nerve ring 89 to 96 from anterior end. Rectum visible in one of four specimens; anus invisible in all specimens. Ovary single, outstretched, overlapping esophageal gland lobes. Oogonia-oocytes arranged in two rows. Spermatheca present; spermatozoa visible. Uterus 35 to 40 long. Postuterine sac absent. Vulva posteriorly located ($V = 77\text{--}80\%$); flap absent.

Males: Measurements of five males are listed in Table 1. Body ventrally curved, tail curved to spicate terminus (Fig. 5). Spike 14 to 18 long, about one-half tail length. Stylet 20 to 22, without knobs. Median bulb longer (16–18.2) than wide (12–13), valves centrally situated. Excretory pore 87 to 96 from anterior end. Nerve ring 79 to 87 from anterior end. Testis 360 to 412 long, not reflexed, reaching or overlapping esophageal gland lobes. Gland lobes 100 to 110 long. Spermatogonia-spermatocytes in two rows. Spicules 14 to 15 long; apex prominent, rostrum small. Three pairs of subventral papillae present: first pair adanal, second and third pairs post-anal. Bursa and gubernaculum absent.

Locality

From mushroom compost in Leeds, England.

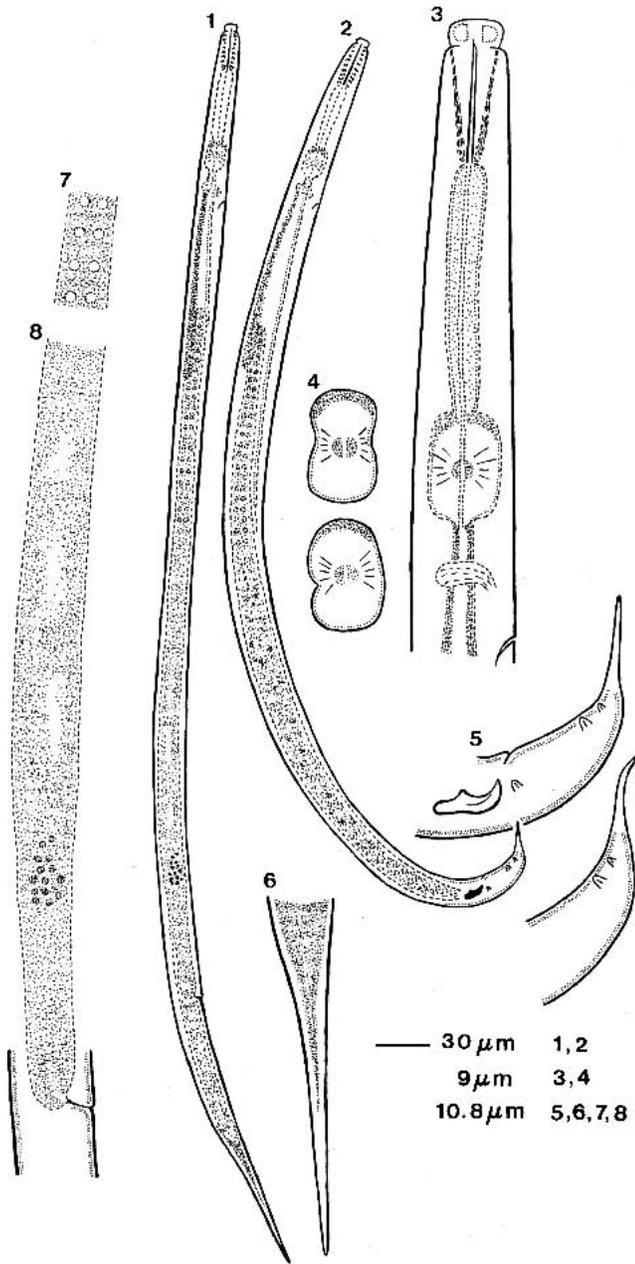
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FIGS. 1-8. *Seimura winchisi* (T. Goodey, 1927) J. B. Goodey, 1960 from mushroom compost in Leeds, England. 1) Full view of female. 2) Full view of male. 3) Head and neck of female. 4) Variation in shape of median bulb. 5) Male tails. 6) Female tail. 7) Arrangement of oogonia-oocytes. 8) Vulva and gonad.

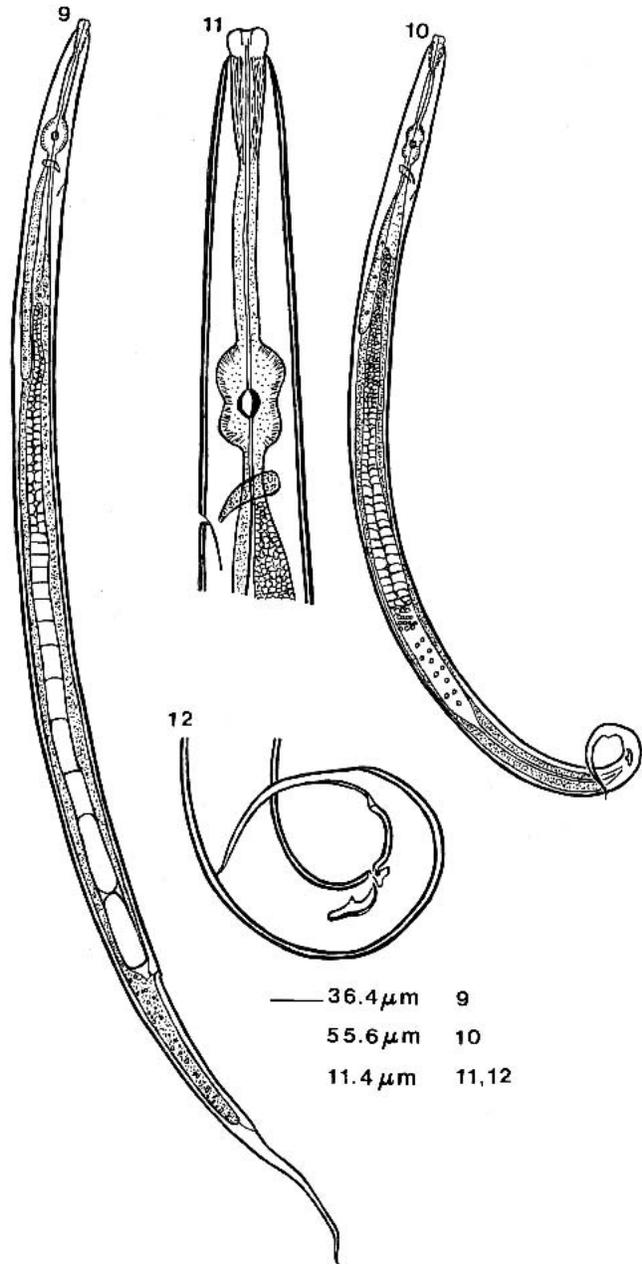
Specimens

Females: Collected 18 October 1957. Slide no. 86a/4/2 in Nematology Department, Rothamsted Experimental Station, Harpenden, Hertfordshire, England.

Males: Same data as females. Slide no. 86a/4/3 in Nematology Department, Rothamsted Experimental Station, Harpenden, Hertfordshire, England.

Diagnosis

Seimura winchisi females from mushroom compost in Leeds, England, are characterized by an offset head and



FIGS. 9-12. *Seimura winchisi* (T. Goodey, 1927) J. B. Goodey, 1960. 9) Full view of female. 10) Full view of male. 11) Head and neck of male. 12) Male tail. (Redrawn from T. Goodey, 1927.)

a long body (565-675 μm) that tapers posteriorly to a non-filiform tail. The cuticle bears fine transverse striae, and there are three incisures in the lateral field. The stylet is 20 to 21 μm long with a ventrally slanted tip. Stylet knobs are absent. Esophageal gland lobes are 92.4 to 118 μm long. The median bulb is longer (18-18.2 μm) than wide (12-13 μm). The excretory pore is 96 to 102 μm from the anterior end. The ovary is outstretched, 283 to 415 μm long, and overlaps the esophageal gland lobes. Oogonia-oocytes are in two rows. A spermatheca is present, and spermatozoa are visible. The vulva is posteriorly located ($V = 77-80\%$), and a

TABLE 1. Morphometrics of *Seinura winchesi* from mushroom compost (this study), from T. Goodey's 1927 description, from J. B. Goodey's 1963 description, and from *S. diversa* (Paesler, 1957) J. B. Goodey, 1960.

	This study		T. Goodey (1927)		J. B. Goodey (1963)		Paesler (1957)	
	Females	Males	Females	Males	Females	Males	Females	Males
Linear measurements (µm)								
n	4	5	4	4	?	?	6	6
Body length	565–675	550–680	800–900	660–680	470–680	540–670	620–1,030	550–680
Greatest width	17–18	21–27	25–30	22–24	—	—	24–42	21–22
Procorpus length	35–39	32–36	48.6 ^a	38.8 ^a	51.7 ^a	—	50 ^a	54 ^a
Metacarpus length	18–18.2	16–18.2	27 ^a	21.7 ^a	17.2 ^a	—	36.4 ^a	22.2 ^a
Metacarpus width	12–13	12–13	18.9 ^a	15 ^a	17.2 ^a	—	18.2 ^a	12.7 ^a
Gland lobe length	92.4–118	100–110	156.8 ^a	129.7 ^a	158.6 ^a	—	172.7 ^a	101.6 ^a
Stylet length	20–21	20–22	24–27	24–27	25–27	25–27	21–22.5	21–22.5
Excretory pore to anterior end	96–102	87–96	113.5 ^a	100 ^a	120.7 ^a	—	127.3 ^a	114.3 ^a
Anterior end to nerve ring	89–96	79–87	91.9 ^a	97.3 ^a	103.4 ^a	—	118.2 ^a	104.8 ^a
Tail length	?	35–45	120–130	60 ^a	124.1 ^a	63.3 ^a	60–91	40–50
Vulva to tail tip	148–158	—	227 ^a	—	224.8 ^a	—	156.4 ^a	—
Spicule length	—	14–15	—	13.3 ^a	—	15 ^a	—	14 ^a
Tail spike length	—	14–18	—	33.3 ^a	—	36.7 ^a	—	16.5–20.5
Ratios								
a	31–40.2	25.4–26.6	31–32	28–30	20–38	22–33	24–28	26.5–30
b	7.8–9.0	7.3–9.1	9.6 ^a	9.1 ^a	9.1 ^a	9.1 ^a	8.5–11	6.4–13
c	?	15–19.4	10	6.7–7.1	6.2–9.9	7.1–9.6	8.5–11	13–15
c'	?	2.1–3.0	10 ^a	3.9 ^a	9.4 ^a	3.8 ^a	7–8 ^a	2.7–3.4 ^a
V	77–80	—	70–83.7	—	72–82	—	75–77	—

^a Calculated from figures.

flap is absent. A postuterine sac is absent. Males are characterized by a curved, spicate tail. The spike is short (14–18 µm), about one-half the tail length. Three pairs of subventral papillae are present: two prominent pairs, and one small pair just anterior to the tail spike. Spicules are 14 to 15 µm long with a prominent apex, and a small rostrum. A bursa and gubernaculum are absent. The testis is 360 to 412 µm long, not reflexed, and at times overlaps the esophageal gland lobes. Spermatogonia-spermatocytes are in two rows.

Relationships

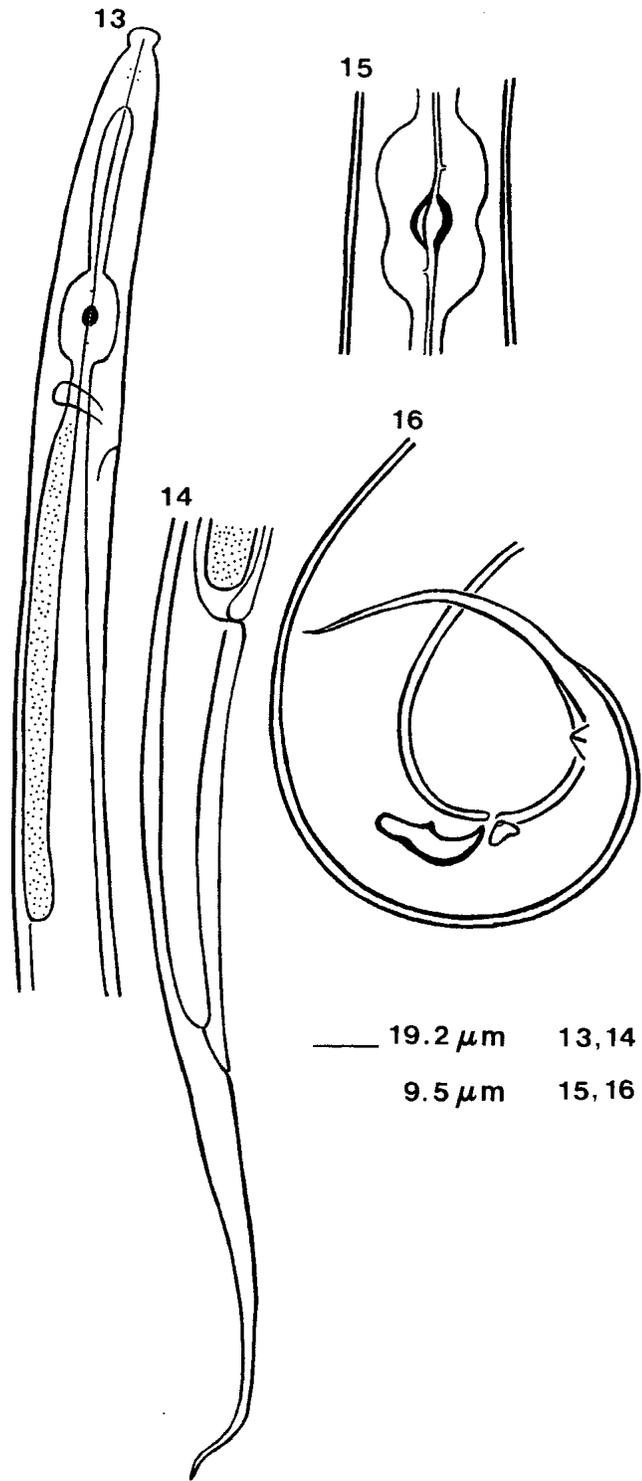
Nine other *Seinura* species lack a postuterine sac. Characters that differentiate these species from *S. winchesi* are listed in Table 2.

Remarks

Specimens of *S. winchesi* from mushroom compost in Leeds, England, only partially fit previous descriptions by T. Goodey (1927) (Table 1; Figs. 9–12) and J. B. Goodey (1963) (Table 1; Figs. 13–16). The shorter female body (565–675 µm vs. 800–900 µm), stylet (20–21 µm vs. 24–27 µm), vulva-to-tail-tip distance (147.5–158.4 µm vs. 227 µm), male tail (35–45 µm vs. 60 µm), male tail spike (14–18 µm vs. 33.3 µm), and larger male c value (15–19.4 vs. 6.7–7.1) differentiate the Leeds material from specimens originally described by T. Goodey in 1927. Further, curvature of the male tail was less pronounced in the Leeds material than was previously described and illustrated by T. Goodey (Fig. 12) and J. B. Goodey (Fig. 16). Also, three pairs of papillae

TABLE 2. Characters that differentiate *Seinura* species without a postuterine sac from *Seinura winchesi*.

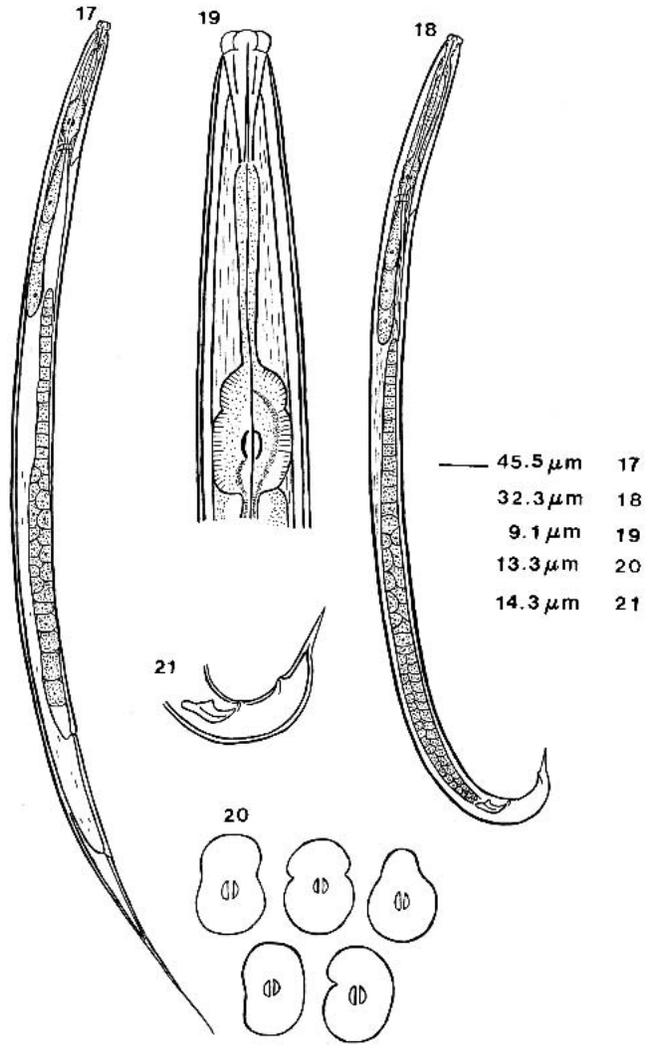
<i>S. celeris</i> Hechler & Taylor, 1965	stylet knobs present, oogonia in five rows
<i>S. demani</i> (T. Goodey, 1928) J. B. Goodey, 1960	stylet knobs present, shorter female stylet (15–18 µm)
<i>S. diversa</i> (T. Goodey, 1927) J. B. Goodey, 1960	oogonia, spermatogonia in single row
<i>S. kherai</i> Singh, 1977	oocytes in 1–2 rows, shorter female stylet (12–18 µm)
<i>S. oliveirae</i> (Christie, 1939) J. B. Goodey, 1960	stylet knobs present, oogonia in 3–5 rows
<i>S. oxura</i> (Paesler, 1957) J. B. Goodey, 1960	oogonia in 2–5 rows, shorter female tail (c 9.4–21.3)
<i>S. paraoxyura</i> Mavlyanov, 1976 in Baranovskaya, 1981	oogonia-oocytes in 1–2 rows, shorter female tail (c 13.2–13.5)
<i>S. propora</i> Siddiqi, Husain & Khan, 1967	oocytes in 2–3 rows, shorter female stylet (17 µm)
<i>S. tandoni</i> Singh, 1977	oocytes in 1–2 rows, shorter female stylet (16–18 µm)



FIGS. 13–16. *Seimura winchesi* (T. Goodey, 1927) J. B. Goodey, 1960. 13) Head and neck of female. 14) Female tail. 15) Median bulb showing occasional fixation artifact. 16) Male tail. (Redrawn from J. B. Goodey, 1963.)

were observed on the male tail (Fig. 5) vs. two pairs in studies by T. Goodey and J. B. Goodey.

There are strong morphologic and morphometric similarities between the Leeds material and *S. diversa*



FIGS. 17–21. *Seimura diversa* (Paesler, 1957) J. B. Goodey, 1960. 17) Full view of female. 18) Full view of male. 19) Head and neck. 20) Variation in shape of median bulb. 21) Male tail. (Redrawn from Paesler, 1957.)

(Paesler, 1957) J. B. Goodey, 1960 (Figs. 17–21; Table 1). However, the presence of a single row of oogonia and spermatogonia, and two pairs of papillae on the male tail, differentiates *S. diversa* from the Leeds material.

Apparent differences between the Leeds material and original *S. winchesi* material are not considered sufficiently unequivocal to justify designation of the Leeds material as a different species.

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