

Longior similis sp. nov. (Thelastomatoidea: Hystrignathidae) parasite of *Passalus interstitialis* from western Cuba and new records of *Longior zayasi*

Jans MORFFE, Nayla GARCÍA y Luisa VENTOSA

Instituto de Ecología y Sistemática, Carretera de Varona km 3¹/₂, Capdevila, Boyeros, A.P. 8029,
C.P. 10800, Ciudad de La Habana, Cuba
jans@ecologia.cu, nayla@ecologia.cu, mluisa@ecologia.cu

ABSTRACT. A new species of *Longior* (Thelastomatoidea: Hystrignathidae) in the gut caeca of *Passalus interstitialis* Escholtz, 1829 from Escaleras de Jaruco, La Habana province, Cuba is described. It is related to *Longior elieri* García, Ventosa *et* Morffe, 2009 from Isla de la Juventud, but differs in having the first cephalic annule slightly inflated, the body longer, comparatively slender and the tail comparatively shorter. *Longior zayasi* Coy, García *et* Alvarez, 1993 is recorded from *Passalus pertyi* Kaup, 1869 from La Jaula, San José de las Lajas, La Habana province (Western Cuba) and La Platica, Sierra Maestra, Granma province (Eastern Cuba). Specimens from La Jaula population are the smallest but have the stoma longer than specimens from La Platica. The latter population has the tail longer, but several measurements relate it to those of La Jaula specimens. A comparative table with the measurements of *L. zayasi* from these localities plus La Melba and El Salón (type locality) is presented.

Key words: Nematoda, Hystrignathidae, *Longior*, Passalidae, *Passalus*, new species, new records, Cuba.

RESUMEN. Se describe una especie nueva de *Longior* (Thelastomatoidea: Hystrignathidae) del intestino posterior de *Passalus interstitialis* Escholtz, 1829 de Escaleras de Jaruco, provincia La Habana, Cuba. Está relacionada con *Longior elieri* García, Ventosa *et* Morffe, 2009 pero difiere en el primer anillo cefálico ligeramente dilatado, el cuerpo más largo pero proporcionalmente más delgado y la cola, en proporción más corta. Se registra *Longior zayasi* Coy, García *et* Alvarez, 1993 para *Passalus pertyi* Kaup, 1869 de La Jaula, San José de las Lajas, provincia La Habana (Cuba Occidental) y La Platica, Sierra Maestra, provincia Granma (Cuba Oriental). Los ejemplares de La Jaula tienen el cuerpo menor que los de las demás localidades y el estoma más largo que los de La Platica. Los especímenes de esta última población tienen la cola más larga, pero varias medidas los hacen similares a los de La Jaula. Se ofrece una tabla comparativa con las medidas de *L. zayasi* de estas localidades, La Melba y El Salón (localidad tipo).

Palabras clave: Nematoda, Hystrignathidae, *Longior*, Passalidae, *Passalus*, especie nueva, registros nuevos, Cuba.

INTRODUCTION

The genus *Longior* Travassos *et* Kloss, 1958 was erected to contents those hystrignathids without spines on the cervical cuticle, a single cephalic annule, sub-cylindrical procorpus and ridged eggs (Travassos and Kloss, 1958). Later, *L. pulchra* Travassos *et* Kloss, 1958, *L. longicollis* (Artigas, 1926) and *L. macrovata* (Travassos *et* Kloss, 1957) were placed within this genus.

Hunt (1981) described *L. semialata* Hunt, 1981 from *Passalus unicornus* from Saint Lucia, Lesser Antilles, being the first record of this genus for the West Indies. Coy *et al.* (1993) described *L. zayasi* from *P. interstitialis* from Cuba. García *et al.* (2009a) recorded *P. pertyi* Kaup, 1869 as a new host for the latter species. *Longior alius* García *et* Coy, 1994 and *Longior elieri* García, Ventosa *et* Morffe, 2009 have been described from the same host (García and Coy, 1994; García *et al.* 2009b).

The aim of this work is to describe a new species of *Longior* from Western Cuba and to record *L. zayasi* for two new localities.

MATERIALS AND METHODS

Eight specimens of *Passalus interstitialis* and two specimens of *P. pertyi* were collected by hand on rotting logs of *Ficus* sp. from Escaleras de Jaruco, Jaruco, La Habana province, Cuba and La Jaula, San José de las Lajas, La Habana province, Cuba, respectively. They were maintained alive in jars and feed with moistened wood chips until dissection. The beetles were anaesthetized in a killing jar with ethyl ether and immediately dissected by practicing longitudinal incisions in both abdominal pleural membranes. Guts were extracted and dissected in Petri dishes with isotonic saline solution under a dissection microscope. The parasites were removed and killed in hot water (60-70°C). They were fixed with 70% ethanol.

One specimen of *P. pertyi* from La Platica, Sierra Maestra, Bartolomé Masó, Granma province, Cuba was collected as described above. It was killed by immersion in 70% ethanol and conserved in atmosphere of ethyl acetate. Finally, it was frozen in a common refrigerator. Dissection was made as described above, using water instead of saline solution.

Nematodes were clear-mounted in glycerine on glass slides, then covered with coverslips and its edges sealed with nail polish to avoid hydration of glycerine. They were examined under a compound microscope at 400x. Measurements were taken as indicated in Travassos and Kloss (1958), and are given in millimetres. They were taken with an ocular micrometer attached to the microscope. For each variable is given the range and the median plus standard deviation in parentheses. De Man's ratios a, b, c and V% (De Man, 1884) were calculated.

Nematodes were photographed with an AxioCam digital camera attached to a Carl Zeiss AxiosKop 2 Plus compound microscope. Line drawings were made with the softwares CorelDRAW X3 and Adobe Photoshop CS2, using the micrographs as templates. The scales of all plates are given in millimetres.

All the material is deposited in the Helminthological Collection of Zoological Collections (CZACC) of the Institute of Ecology and Systematic, Havana, Cuba.

SYSTEMATICS

Genus *Longior* Travassos *et* Kloss, 1958*Longior similis* sp. nov.

(Figs. 1 A-G; 2 B)

Diagnosis. First cephalic annule slightly inflated. Wide annule from the end of first cephalic annule to about one third of the procorpus length. Lateral alae from about two body-widths behind the basal bulb to the anus. Eggs with longitudinal ridges. Body of about 6.5 tail-lengths long.

Diagnosis (in Spanish). Primer anillo cefálico ligeramente dilatado. Anillos anchos desde el fin del primer anillo cefálico hasta aproximadamente un tercio del cuerpo esofágico. Alas laterales desde una cierta distancia tras el bulbo (aproximadamente dos veces el ancho del cuerpo) hasta el nivel del ano. Huevos con estrias longitudinales. Cuerpo de aproximadamente 6,5 veces la longitud de la cola.

Description. Female with body long and slender. Cuticle without spines. Wide annule present from the end of first cephalic annule to about the first third of procorpus. Posterior to annule cuticle finely annulated. Sub-cuticular longitudinal striae present. Lateral alae well developed, extending from about two body-widths behind the bulb to the level of the anus. Head bearing eight papillae arranged in pairs. First cephalic annule slightly inflated, of about 1.5 head-lengths long and set-off from the head by a groove. Stoma long and tubular extends for about three first annule-lengths. Esophagus consists of a long and sub-cylindrical procorpus with base slightly set off from isthmus. Bulb pyriform. Nerve ring encircling the procorpus at about 30% of its length. Excretory pore situated at about one body-width behind the bulb. Intestine simple and sub-rectilinear, slightly dilated in the anterior portion. Rectum long and anus not prominent. Vulva a median transverse slit near middle-body, with the lips not prominent. Genital tract mono-prodelphic. Ovary reflected. Eggs ovoid, with eight longitudinal ridges in the shell. Tail conical, long, subulate and ending in a fine tip. Male unknown.

Measurements. Holotype female a=17.19, b=4.44, c = 6.25, V%=51.82, total length=2.750, maximum body width=0.160, stoma length=0.063, procorpus length = 0,500, isthmus length=0.038, diameter of basal bulb=0.070, total length of esophagus=0.620, nerve ring to anterior end=0.213, excretory pore to anterior end=0.760, vulva to posterior end=1.325, anus to posterior end = 0.440, eggs=0.120-0.125×0.058-0.063 (0.123 ± 0.004×0.060 ± 0.004, n=2).

Paratype females (n=8): a=16.88-22.50 (20.85 ± 1.89), b=4.18-4.73 (4.48 ± 0.16), c=6.22-6.99 (6.56 ± 0.25), V%=51.22-53.70 (52.53 ± 0.82), total length=2,675-3,075 (2.875±0.151), maximum body width=0.120-0.160 (0.139 ± 0.012), stoma length=0.058-0.065 (0.061 ± 0.003), procorpus length=0.500-0.570 (0.541 ± 0.021), isthmus length=0.030-0.045 (0.036 ± 0,006), diameter of basal bulb=0.068-0.075 (0.069 ± 0.003), total length of esophagus=0.600-0.680 (0.641 ± 0.026), nerve ring to anterior end=0.218-0.238 (0.228 ± 0.007), excretory pore to anterior end=0.780-0.850 (0.818 ± 0.026), vulva to posterior end=1.250-1.500 (1.366 ± 0.092), anus to posterior end=0.410-0.470 (0.439 ± 0.026), eggs=0.120-0.135×0.043-0.063 (0.128 ± 0.005×0.050 ± 0.006 n=16).

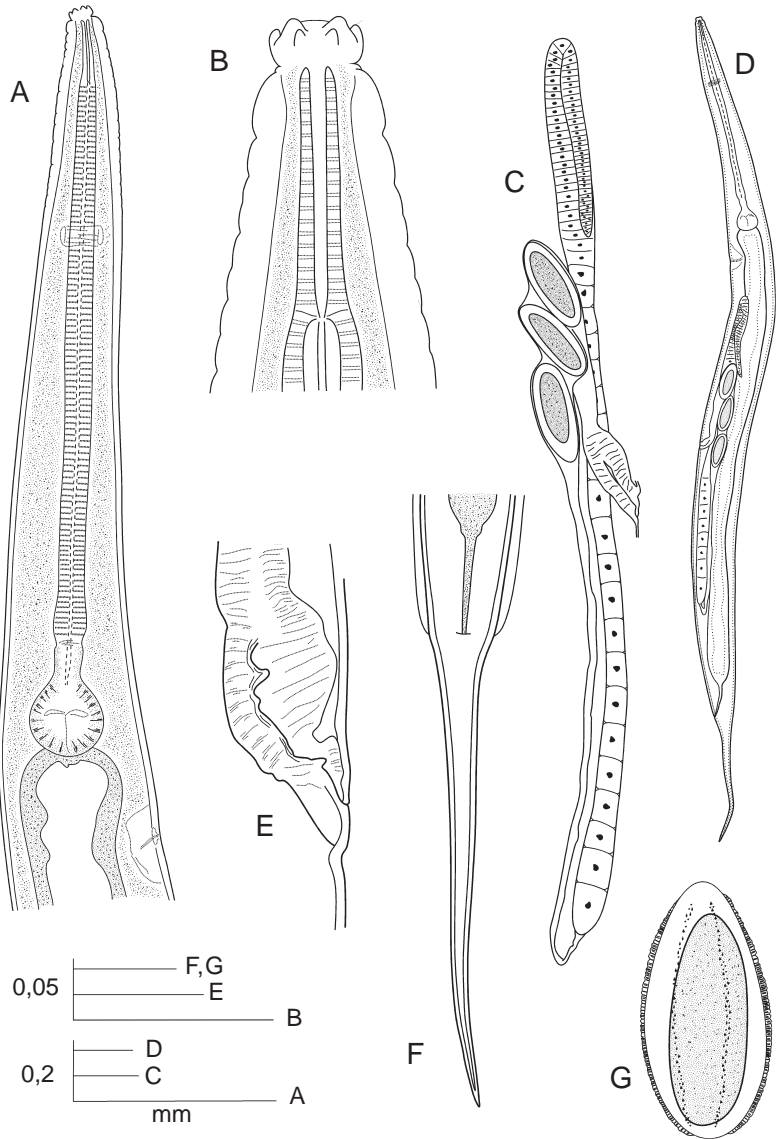


Fig. 1. *Longior similis* sp. nov. Female. A, esophageal region; B, cephalic end; C, genital tract; D, habitus; E, vulva; F, tail; G, egg.

Discussion. *L. similis* sp. nov. can be differentiated of the most species of genus by the presence of wide annules in the first third of the esophageal region. It shares this feature only with *L. elieri*. From this species differs in having the first cephalic annule slightly inflated, instead of the non-inflated annule of *L. elieri*. Also, *L. similis* sp. nov. has the body longer (2.675-3.075: 1.650-1.950 mm), but comparatively slender ($a=17.2-22.5: 14.9-17.7$) and the tail comparatively shorter ($c=6.22-6.99: 4.70-5.40$).

Type host. *Passalus interstitialis* Escholtz, 1829 (Coleoptera: Passalidae).

Site. Hind gut caeca.

Types. Female holotype (CZACC 11.4478) CUBA, Escaleras de Jaruco, Jaruco, La Habana province; in *Passalus interstitialis*; 16/III/2008; colls. E. Fonseca, J. Morffe and F. Álvarez. Paratypes (eigth females) (CZACC 11.4479–11.4486) same data as holotype.

Etymology. Specific epithet from the Latin *similis*, similar, because its resemblances with *Longior elieri* sp. nov. from Isla de la Juventud, Cuba.

Longior zayasi Coy, García et Álvarez, 1993

Host. *Passalus pertyi* Kaup, 1869 (Coleoptera: Passalidae).

Site. hind gut caeca.

Localities. La Jaula, San José de las Lajas, La Habana, Cuba; La Platica, Sierra Maestra, Bartolomé Masó, Granma province, Cuba.

Material examined. (15 females) (CZACC 11.4487-11.4501) La Jaula, San José de las Lajas, La Habana province, Cuba; in *Passalus pertyi*; 15/III/2008; colls. E. Fonseca, J. Morffe, G. León and F. Álvarez. (six females) (CZACC 11.4446–11.4451) La Platica, Sierra Maestra, Bartolomé Masó, Granma province, Cuba; in *Passalus pertyi*; 27/I/2007; coll. E. Fonseca.

Measurements

La Jaula population

Females ($n = 15$): $a = 24.67-30.00 (27.08 \pm 1.57)$, $b = 4.16-5.13 (4.61 \pm 0.25)$, $c = 6.59-8.65 (7.30 \pm 0.52)$, $V\% = 50.00-55.56 (52.96 \pm 1.62)$, total length = 3.200-4.050 (3.655 ± 0.266), maximum body width = 0.110-0.150 (0.135 ± 0.012), stoma length = 0.065-0.078 (0.072 ± 0.004), procorpus length = 0.620-0.730 (0.665 ± 0.034), isthmus length = 0.038-0.060 (0.053 ± 0.005), diameter of basal bulb = 0.063-0.075 (0.067 ± 0.004), total length of esophagus = 0.750-0.860 (0.793 ± 0.034), nerve ring to anterior end = 0.230-0.255 (0.241 ± 0.008), excretory pore to anterior end 0.950-1.150 (1.029 ± 0.062), vulva to posterior end = 1.450-1.950 (1.722 ± 0.168), anus to posterior end = 0.390-0.580 (0.503 ± 0.053), eggs = 0.125-0.145 \times 0.043-0.058 ($0.135 \pm 0.004 \times 0.049 \pm 0.003$ $n = 39$).

La Platica population

Females ($n = 6$): $a = 29.36-36.20 (32.74 \pm 3.13)$, $b = 4.83-5.41 (5.08 \pm 0.21)$, $c = 6.03-6.92 (6.49 \pm 0.37)$, $V\% = 49.24$, total length = 3.620-4.150 (3.954 ± 0.209), maximum body width = 0.100-0.140 (0.122 ± 0.015), stoma length = 0.058-0.070 (0.061 ± 0.005), procorpus length = 0.600-0.690 (0.650 ± 0.035), isthmus length = 0.048-0.060 (0.053 ± 0.004), diameter of basal bulb = 0.060-0.073 (0.065 ± 0.004), total length of esophagus

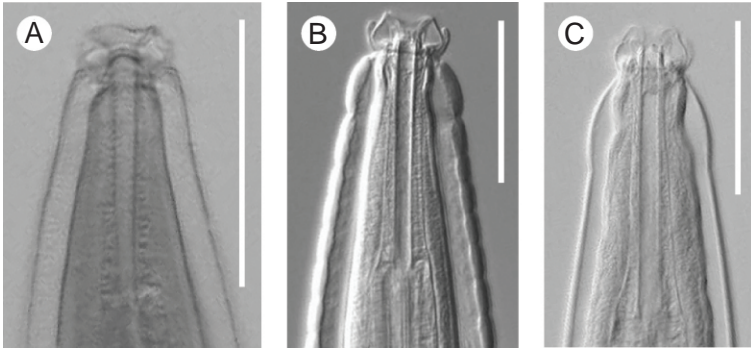


Fig. 2. Cephalic ends of three species of *Longior* from Cuba. A, *L. elieri* García, Ventosa *et Morffe*; B, *L. similis* sp. nov.; C, *L. zayasi* Coy, García *et Alvarez*. Scale bars: 0.05 mm.

= 0.730-0.820 (0.775 ± 0.035), nerve ring to anterior end = 0.235-0.250 (0.243 ± 0.011), vulva to posterior end = 2.000, anus to posterior end = 0.600-0.640 (0.610 ± 0.017), eggs = $0.125-0.140 \times 0.050-0.058$ ($0.135 \pm 0.005 \times 0.054 \pm 0.003$ n = 8).

Comments. *L. zayasi* was described from *P. interstitialis* from El Salón, Sierra del Rosario, Pinar del Río province, Cuba. Posteriorly, García *et al.* (2009a, 2009c) recorded this species in *P. pertyi* from El Mulo, Sierra del Rosario, Candelaria, Pinar del Río province and La Melba, Nipe-Sagua-Baracoa, Holguín province, Cuba.

The specimens from La Jaula population have the stoma longest than the rest of the populations. Its body length, basal bulb diameter, esophagus and tail are smaller (Table I). All these measurements, except the body length, are similar to those of the specimens from La Platica.

La Platica specimens possess the longest tail, similar to those from El Salón (type locality). They possess the longest distance from the nerve ring to the anterior end, also similar to specimens from La Jaula population. The body and isthmus length is similar to those of La Melba population. Measurements such as the distance of the excretory pore to anterior end could not be considered due to the state of preservation. Most of the measurements of the specimens from El Salón show larger dimension, except egg length, which is larger in La Melba population.

In the original description (Coy *et al.*, 1993) the reference to the extension of lateral alae was omitted. Examining the vouchers and the material from the type locality we observe that lateral alae extends from about two body-widths behind the basal bulb to the level of the anus. This is similar with other two Cuban species of the genus: *Longior elieri* (Isla de la Juventud) and *L. similis* sp. nov. described above.

Acknowledgments.- We are grateful to our colleagues Elier Fonseca and Gunnary León from the University of Havana, Cuba and the undergraduate student Facundo Álvarez for their help during the collect of hosts. To Dr. Jorge L. Fontenla and Dr. Luis F. de Armas for the review of the manuscript. We thanks to MSc. Yamir Torres and Dr. Alejandro Barro for their help with the micrographs. This work was supported by IDEAWILD and the project “Zoological Collections, their Conservation and Management” of the Ministry of Science, Technology and Environment, Cuba.

REFERENCES

- Coy, A.; N. García and M. Álvarez. 1993. Nemátodos parásitos de insectos cubanos, Orthoptera (Blattidae y Blaberidae) y Coleoptera (Passalidae y Scarabaeidae). Acta Biol. Venez. 14(3): 53-67.
- De Man, J.G. 1884. Die frei der reinen Erde und in sussen Wasser Lebenden nematoden niederlandischen fauna, Eine Systematische Faunistische Monographie. Leiden, 206 pp.
- García, N. and A. Coy. 1994. Descripción de dos nuevas especies y registro de nuevos hospederos de nemátodos (Nematoda) de la región oriental de Cuba. Avicennia. 1: 13-17.
- García, N., L. Ventosa and J. Morffe. 2009a. Nuevas especies de histrignátidos (Thelastomatoidea: Hystrignathidae) de la Sierra del Rosario, Pinar del Río, Cuba. Novitates Caribaea 2: 17-22.
- García, N.; L. Ventosa and J. Morffe. 2009b. Dos especies nuevas de los géneros *Lepidonema* y *Longior* (Thelastomatoidea: Hystrignathidae) de la Isla de la Juventud, Cuba. Solenodon 8:1-7.
- García, N.; L. Ventosa and J. Morffe. 2009c. Especie nueva de *Artigasia* (Thelastomatoidea: Hystrignathidae) de Pico La Melba, Holguín, Cuba. Solenodon 8: 8- 11.
- Hunt, D. J. 1981. On *Artigasia horridospina* n. sp., *Longior semialata* n. sp., *Mentele magnifica* n. sp., *Paraxyo ensicrinatus* n. sp. (Oxyurida: Hystrignathidae) and *Pulchrocephala ? pulchrocephala* Travassos, 1925 (Oxyurida: Pulchrocephalidae). Syst. Parasitol. 3: 33-52.
- Travassos, L. and G. Kloss. 1958. Sobre a fauna de nematodeos dos coleopteros Passalidae da Estação Biologica de Boracéia. Arq. Zool. Sao Paulo 11: 23-57.

Table 1. Comparative measurements of females of *Longior zayasi* from El Salón, Sierra del Rosario, Pinar del Río province, Cuba; La Jaula, San José de las Lajas, La Habana province, Cuba; La Melba, Nipe-Sagua-Baracoa, Holguín province, Cuba and La Platica, Sierra Maestra, Granma province, Cuba.

Host Locality	<i>P. pernyi</i>	<i>P. pernyi</i>	<i>P. pernyi</i>
	El Salón, Pinar del Río (type locality) (n = 5)	La Jaula, La Habana (n = 15)	La Melba, Holguín (n = 6)
			La Platica, Granma (n = 6)
Female measurements			
Total length	4,238-4,576	3,200-4,050	3,390-4,090
Maximum body width	0,110-0,208	0,110-0,150	0,150-0,170
Stoma length	-	0,065-0,078	0,055-0,060
Procorpus length	0,833-0,911	0,620-0,730	0,640-0,740
Isthmus length	0,052-0,078	0,038-0,060	0,050-0,063
Basal bulb diameter	0,078	0,063-0,075	0,073-0,080
Esophagus length	0,966-1,066	0,750-0,860	0,770-0,950
Nerve ring-anterior end	-	0,230-0,255	0,225-0,250
Excretory pore-anterior end	-	0,950-1,150	0,950-1,040
Vulva-posterior end	1,870-2,100	1,450-1,950	1,720-2,040
Anus-posterior end	0,572-0,676	0,390-0,580	0,480-0,610
Eggs	0,130-0,156×0,052	0,125-0,145×0,043-0,058	0,135-0,153×0,050-0,070
a	21,25-24,71	24,67-30,00	21,19-27,27
b	4,22-4,53	4,16-5,13	4,27-5,13
c	6,77-7,86	6,59-8,65	6,70-7,90
V%	41,62-47,27	50,00-55,56	45,65-55,67
			0,125-0,140×0,050-0,058
			29,36-36,20
			4,83-5,41
			6,03-6,92
			49,24