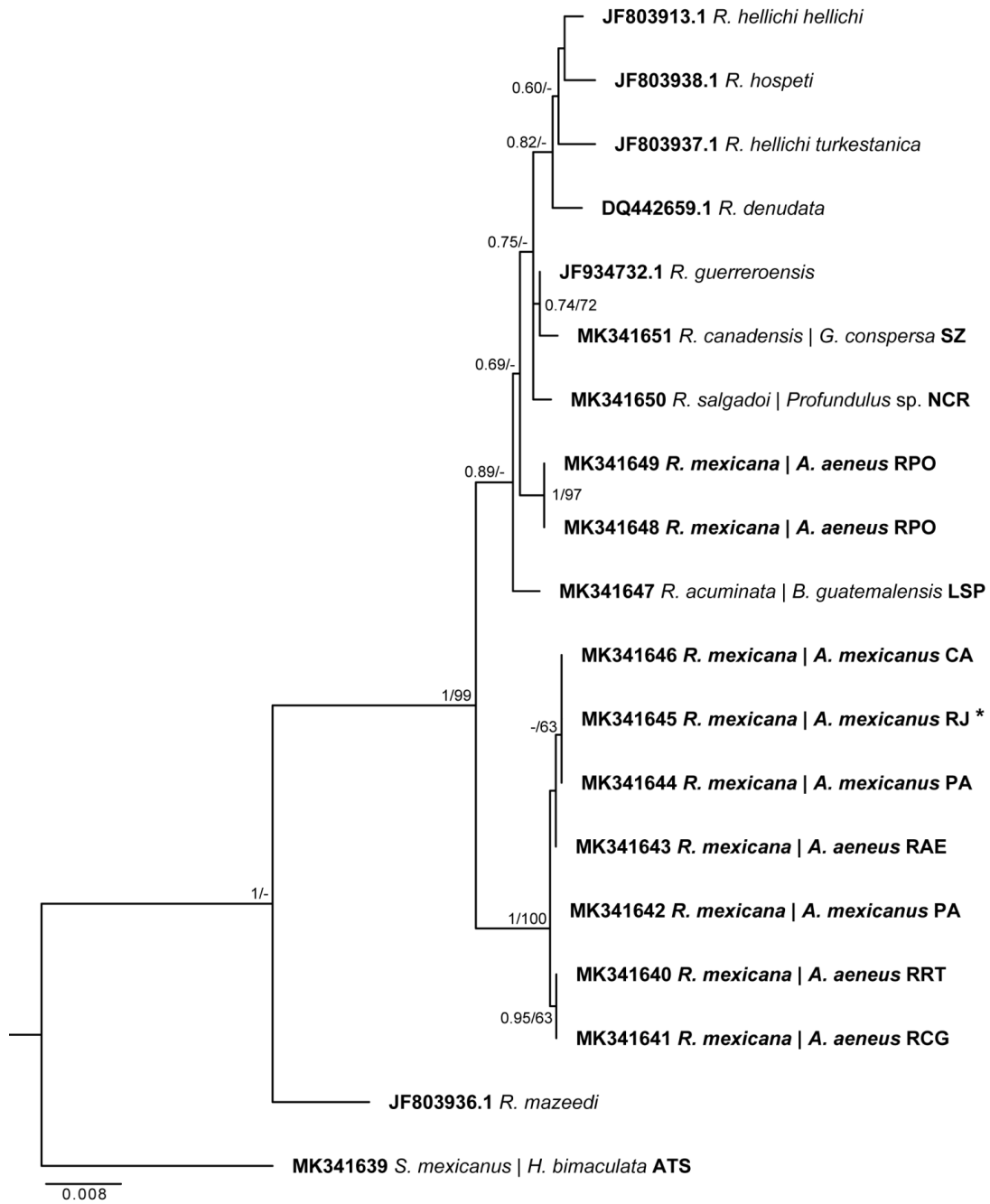


**Diversity of *Rhabdochona mexicana* (Nematoda:  
Rhabdochonidae), a parasite of *Astyanax* spp. (Characidae)  
in Mexico and Guatemala, using mitochondrial and nuclear  
genes, with the description of a new species**

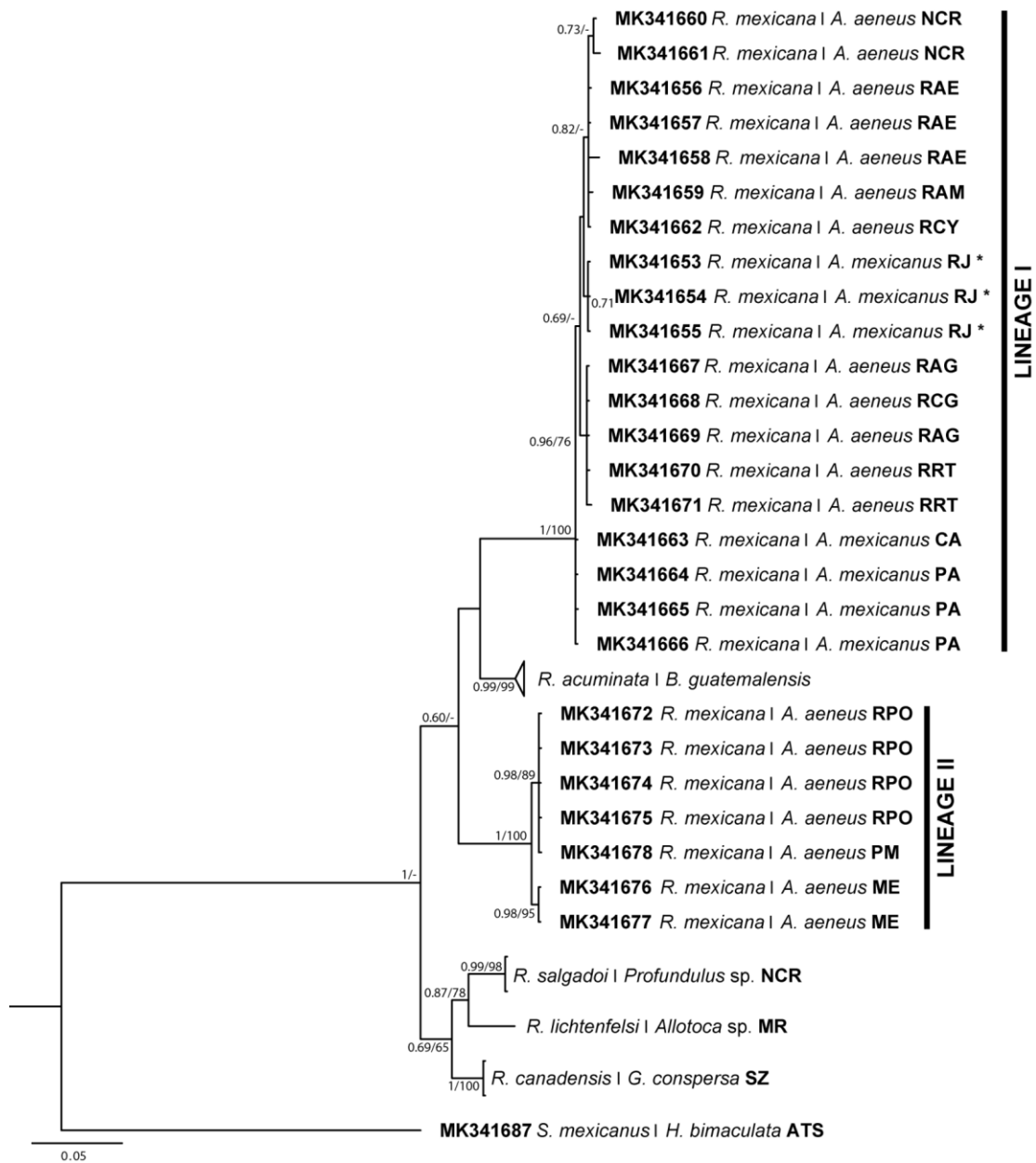
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**A. Santacruz, C.P. Ornelas-García and G. Pérez-Ponce de León**

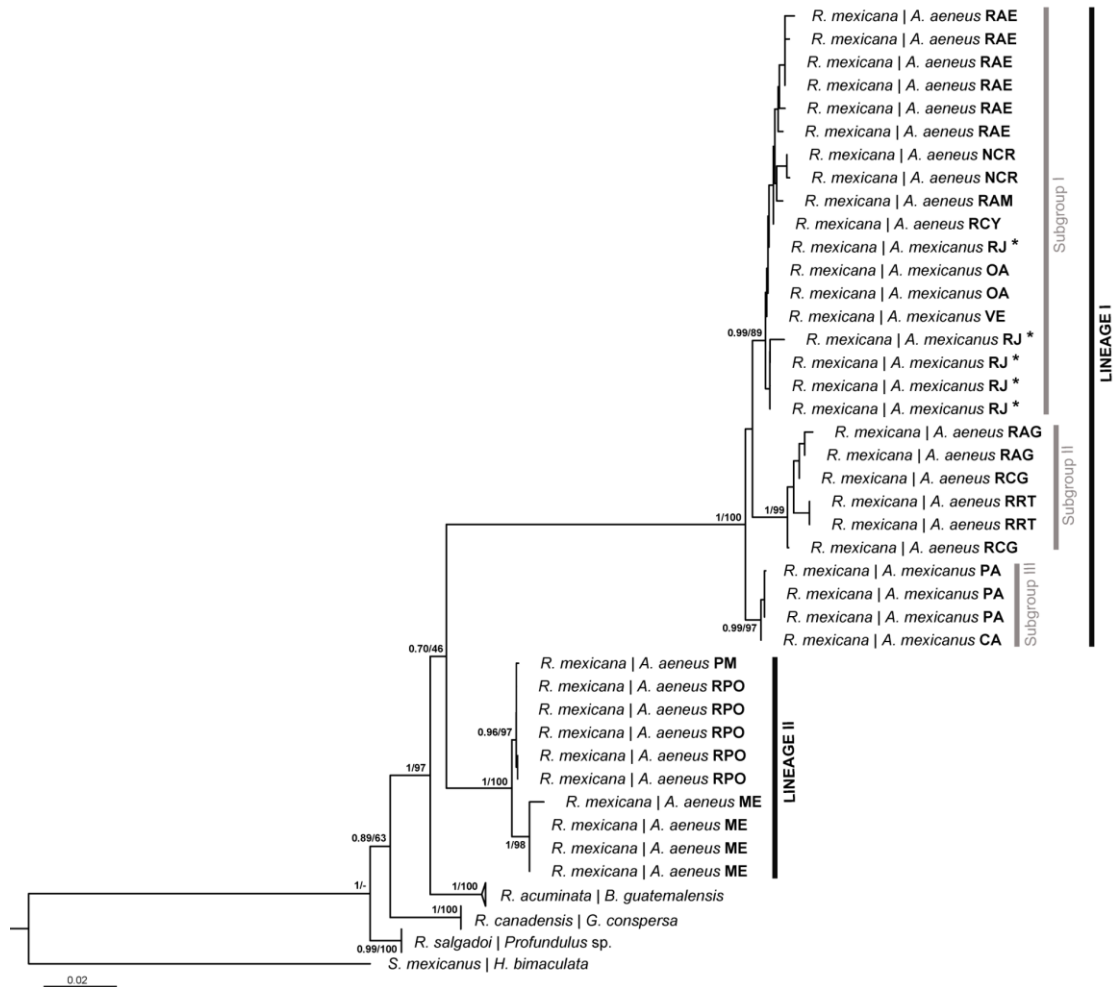
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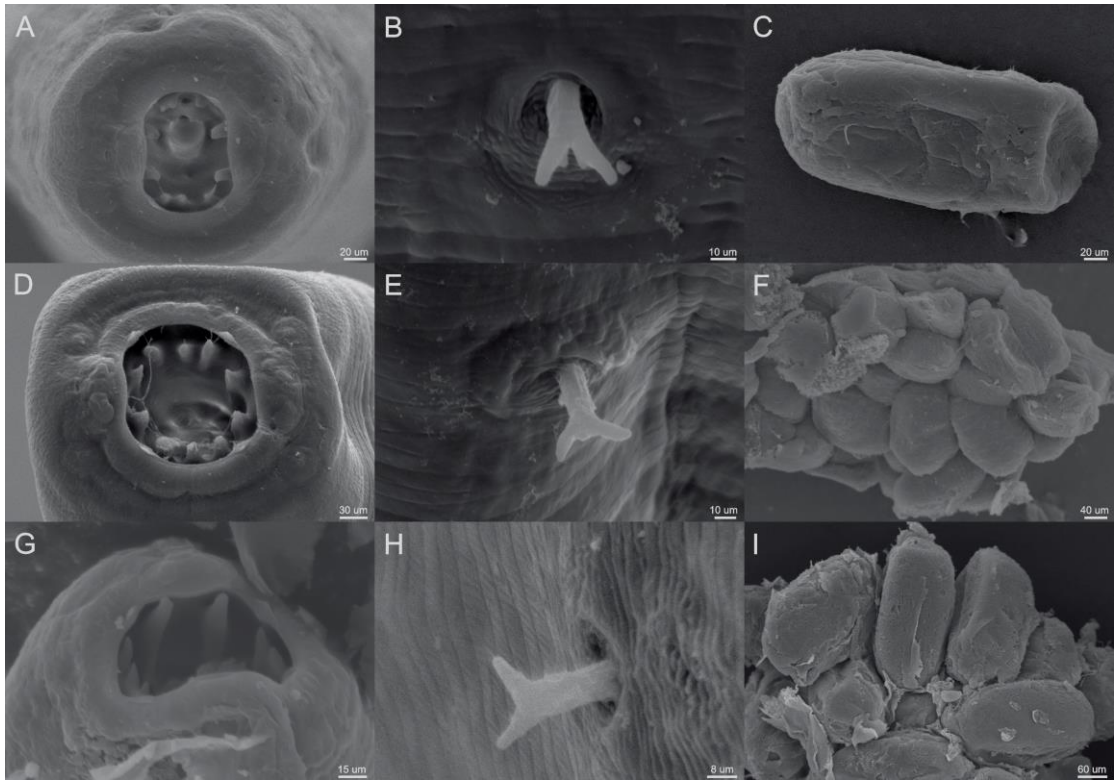
**Supplementary fig. S1.** Maximum likelihood analysis recovered from sequences of 18S rRNA. Posterior probability support value from the BI analysis and bootstrap support value (above 60%) are shown in the internodes. The scale bar refers branch length. An asterisk indicates the type locality of *R. mexicana*.



**Supplementary fig. S2.** Maximum likelihood analysis recovered from sequences of 28S rRNA. Posterior probability support value from the BI analysis and bootstrap support value (above 60%) are shown in the internodes. The scale bar refers branch length. An asterisk indicates the type locality of *R. mexicana*.



**Supplementary fig. S3.** Maximum likelihood phylogenetic reconstruction recovered from the concatenated dataset of *cox1*+28S + 18S. Posterior probability support value from the BI analysis and bootstrap support value (above 60%) are shown in the internodes. The scale bar refers branch length. An asterisk indicates the type locality.



**Supplementary fig. S4.** SEM microphotographs of the *R. mexicana* species complex: *R. mexicana* Subgroup 1 (A–C), *R. mexicana* Subgroup 2 (D–F) and *R. mexicana* Subgroup 3 (G–I). Apical view showing the presence of 10 teeth (A, D, G); bifurcated deirids (B, E, H); eggs without filaments (C, F, I).

**Supplementary table S1.** GenBank accession numbers.

Nematode species	Locality code	<i>cox1</i>	28S rDNA	18S rDNA	Reference
<i>R. mexicana</i> Lineage I S1	NCR	MK341606–MK341607	MK341660–MK341661	–	this study
	OA	MK341608–MK341609	–	–	this study
	RAE	MK341595–MK341600	MK341656–MK341658	MK341643	this study
	RAM	MK341611	MK341659	–	this study
	RCY	MK344779	MK341662	–	this study
	RJ	MK341601–MK341605	MK341653–MK341655	MK341645	this study
	VE	MK341610	–	–	this study
<i>R. mexicana</i> Lineage I S2	RAG	MK341616–MK341617	MK341667, MK341669	–	this study
	RCG	MK341618–MK341619	MK341668	MK341641	this study
	RRT	MK341620–MK341621	MK341670–MK341671	MK341640	this study
<i>R. mexicana</i> Lineage I S3	CA	MK341612	MK341663	MK341646	this study
	PA	MK341613–MK341615	MK341664–MK341666	MK341642, MK341644	this study
<i>R. osorioi</i> n. sp.	ME	MK341628–MK341631	MK341676–MK341677	–	this study
	PM	MK341622	MK341678	–	this study
	RPO	MK341623–MK341627	MK341672–MK341675	MK341648–MK341649	this study
<i>R. acuminata</i>	MT	MK341634	MK341681	MK341647	this study
	RPI	MK341635–MK341636	MK341679–MK341680	–	this study
<i>R. canadensis</i>	SZ	MK341637	MK341685–MK341686	MK341651	this study
<i>R. lichtenfelsi</i>	–	DQ991009.1	–	–	Mejía-Madrid <i>et al.</i> , 2007b
<i>R. salgadoi</i>	NCR	MK341632–MK341633	MK341683–MK341684	MK341650	this study

<i>R. denudata</i>	–	–	–	DQ442659.1	Wijová <i>et al.</i> , 2006
<i>R. hellichi hellichi</i>	–	–	–	JF803913.1	Moravec, 2007
<i>R. hellichi turkestanica</i>	–	–	–	JF803937.1	Moravec, 2007
<i>R. hospeti</i>	–	–	–	JF803938.1	Moravec, 2007
<i>R. guerreroensis</i>	–	–	–	JF934732.1	Laetsch <i>et al.</i> , 2012
<i>R. mazeedi</i>	–	–	–	JF803936.1	Moravec, 2007
<i>S. mexicanus</i>	ATS	MK341638	MK341687	MK341639	this study

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**Supplementary table S2.** *Rhabdochona osorioi* n. sp. in comparison with *R. acuminata*.

Host species	<i>R. acuminata</i> (Caspeta <i>et al.</i> , 2005)		<i>R. acuminata</i> (Cremonte <i>et al.</i> , 2002)			<i>R. acuminata</i> (this study)		<i>Rhabdochona osorioi</i> n. sp.	
	<i>Brycon guatemalensis</i>		<i>Diplomistes mesembrinus</i>		<i>Percichthys trucha</i>	<i>Brycon guatemalensis</i>		<i>Astyanax aeneus</i>	
Sex	M	F	M	F	M	F	F	M	F
Body length	13.3–15.2 mm	26.1–34.6 mm	6.2–9.1 mm	12.5–16.5 mm	4.1–7.1 mm	7.45–10.8	13.3–23.6 mm	7.8–10.5 mm	11.6–27.2 mm
Wide	142–170	253–303	111–133	149–198	69–110	99–148	200–291	163–200	154–327
Prostom length	25–27	25–36	18–24	27–32	20–33	24–32	32–34	23–34	24–41
Prostom wide	10–16	20–25	12–15	15–18	13–19	16–21	15–17	15–23	21–28
Vestibule including prostom	154–170	170–213	126–162	132–192	81–131	100–126	–	84–12	112–128
Muscular oesophagus length	374–416	414–591	273–375	315–444	200–281	220–390	40–52	221–342	173–436
Glandular esophagus length	3.1–3.9 mm	3.6–5.0 mm	1.3–1.8	1.1–1.9 mm	0.8–1.2 mm	1.0–1.5 mm	–	1.7–3.2 mm	–
Nerve ring from anterior end	230–253	230–299	152–201	183–228	136–183	127–174	227–254	125–169	147–227
Excretory pore from anterior end	333–402	342–450	222–309	297–400	170–263	172–290	350–392	202–249	173–240
Deirids from anterior end	62–75	59–82	right 48–63, left 53–65	right 48–63 left 57–67	right 28–53 left 32–60	–	73–80	39–49	39–45
Precloacal papillae	9+9, 9+10, 10+10, 11+11	–	8 + 8 y 9 + 10	–	–	–	–	15+15	–
Postcloacal papillae	6 +6, 7 +7	–	6 + 7, 7 +7, 6 +8, 7 + 8	–	–	–	–	6+7, 7+7	–
Area rugosa	absent	–	absent	–	–	–	–	absent	–



Left spicule length	473–510	–	439–479	–	422–487	–	–	414–451	–
Shaft length	239–266	–	199–240	–	206–232	–	–	–	–
Right spicule length	110–115	–	63–88	–	84–101	–	–	117–138	–
Length ratio of spicules	1:4.3–4.5	–	–	–	–	–	–	–	–
Tail conical length	315–379	–	269–386	–	–	176–228	263–291	151–347	218–364
Vulva from anterior end	–	14.0–22.8 mm	–	5.0–7.7 mm	–	3.3–5.1 mm	13.2 mm	–	4.6–14.1 mm
Eggs		29–32 x 16–18	–	24–31 x 15–18	–	–	–	–	16.3–20.6 x 30.4–37.1 mm