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Species	Country	ID	L	a	b	c	c'	V	ODS	ODP	OA/gr	Tail	LRW	MBD	JTA	Reference
<i>X. rivesi</i>	Argentina	XrARG	1850	42	5.4	59	1.3	53	91	47	74	31	10	44	8	Chaves & Mondino 2013
<i>X. rivesi</i>	Bosnia-Herzegovina	XrBH	1874.4	50.5	6.5	51.2	1.6	53.9	95.7	46.3	73.1	36.7	9.5	22.9	8	this work
<i>X. rivesi</i>	Egypt	XrEGy	1600	35.1	6.6	56	1	52.1	87.5	52.8	72.2	28.6	10	28.6	9.1	Handoo et al. 2015
<i>X. rivesi</i>	Iran	XrIRA	1700	44.7	6.4	55.2	1.3	52.2	81.5	46.2	66.2	30.8	11.1	38.2	9.4	Fadaei et al. 2003
<i>X. rivesi</i>	Italy	XrITA1	2000	55	6.4	63.3	1.4	52	93.6	53.3	75.4	32.2	10.3	36.9	7.4	De Luca & Agostinelli 2011
<i>X. rivesi</i>	Italy	XrITA2	1892.7	49.4	8.3	58.7	1.3	52.5	90.7	51.1	76.8	32.4	8.91	38.3	8.3	Troccoli et al 2024
<i>X. rivesi</i>	Kansas USA	XrKAN	1700	41	6.4	51	1.4	52	84	51	74	34	10	42	7	Lamberti & Bleve 1979
<i>X. rivesi</i>	Minnesota USA	XrMNN	2000	45	6.7	59	1.1	53	88	52	70	35	11	45	8	Orlando et al. 2016
<i>X. rivesi</i>	Nebraska USA	XrNEB	1900	45	6.6	59	1.3	52	85	48	74	33	10	43	6.5	Lamberti & Bleve 1979
<i>X. rivesi</i>	Portugal	XrPOR	2000	53	7	61	1.5	52	91	50	73	33	9	37	9	Lamberti et al. 1994
<i>X. rivesi</i>	Slovenia	XrSLO	1860	47.9	5.9	55.2	1.6	53.5	90.9	50.2	80	33.8	10.3	38.8	9	Urek et al. 2008
<i>X. rivesi</i>	Spain	XrSPA	1730	44.1	6.8	52.8	1.4	53.3	89	49.1	71.9	32.8	10.8	39.2	8	Gutierrez-Gutierrez et al. 2011
<i>X. thornei</i>	USA	XrthoUS	2100	47	6.6	71	1.3	51	85	53	71	29	11	44	6	Lamberti & Golden 1986
<i>X. thornei</i>	China	XrthoCHI	1800	47	6.9	63	1.1	48	80	55	75	29	10	40	7.8	Wang et al 1996
<i>X. incognitum</i>	Japan	XrincJAP	1900	45	6.3	62	1.1	51	87	52	72	30	12	42	10	Lamberti & Bleve 1979
<i>X. incognitum</i>	China	XrincCHI	1900	49	6.4	69	1.2	50	89	55	78	29	11	39	9.5	Wang et al 1996
<i>X. floricdae</i>	FLO	XrflorUS	1800	44	6.3	59	1.3	51	90	54	74	31	13	42	9	Lamberti & Bleve 1979
<i>X. peruvianum</i>	perù	XrperPER	1700	49	6.7	56	1.4	52	88	49	72	30	10	33	8	Lamberti & Bleve 1979
<i>X. laevisstriatum</i>	USA	XrlaeUS	1600	49	7	49	1.5	51	79	41	57	34	10	34	11	Lamberti & Bleve 1979
<i>X. californicum</i>	USA	Xrcal1US	2000	60	6.8	63	1.6	51	90	48	76	31	10	33	6	Lamberti & Bleve 1979
<i>X. californicum</i>	USA	Xrcal2US	2033	70	6.5	65	1.4	49	93	46	75	31	8.4	29	6	Orlando et al. 2016
<i>X. intermedium</i>	USA	XrintUS	1600	43	6	47	1.5	52	76	45	63	33	10.5	37	10	Lamberti & Bleve 1979
<i>X. citricolum</i>	USA	XrcitUS	1600	46	5.8	44	1.7	54	78	48	72	36	13	35	15	Lamberti & Bleve 1979
<i>X. bricolense</i>	USA	XrbrUS	2100	44.5	6.4	77.8	1	52	87	51	68	36	10	37	9	Ebsary et al
<i>X. americanum</i>	USA	XamUSA1	1500	54	5.8	49	1.8	50	69	44	53	31	8	28	5	Cobb. 1913
<i>X. americanum</i>	USA	XamUSA2	1600	50	6.8	45	1.9	50	80	45	65	35	10	32	7	Lamberti & Golden 1984
<i>X. americanum</i>	South Africa	XamSA	1700	41.2	6.7	47.3	1.6	50.8	82.1	48.9	67.7	35.8	10.7	41.45	10.3	Loots & Heyns 1984

TABLE S2. Table of characters including in *X. pachtaicum* subgroup multivariate analysis

Species	Country	ref	ID	L	a	b	c	c'	V	ODS	ODP	OA/gr	Tail	LRW	MBD	ABD	J
<i>X. fortuitum</i>	Italy	Roca et al 1987	XforITA	2600	74	7.1	70	1.9	54	103	52	89	38	9	36	20	9
<i>X. utahense</i>	USA	Lamberti & Blevé-Zacheo, 1979	XuthUSA	2100	63	6.7	64	1.4	54	93	49	81	33	11	34	23	8
<i>X. incertum</i>	Bulgaria	Lamberti et al., 1983	XincBUL	1900	57	6.4	69	1.5	57	92	51	71	28	9	34	19	10
<i>X. incertum</i>	Croatia	Barsi, 1994	XincCRO	1900	62.9	6.3	72.9	1.5	58.7	90.5	49.5	82.9	26.7	8.8	42	28	15
<i>X. incertum</i>	Bosnia-Herzegovina	this work	XincBH	1952.2	54.3	6.5	57.6	1.7	55.4	75.2	53.4	70	33.9	9	35.9	19.7	9.4
<i>X. incertum</i>	Spain	Gutiérrez-Gutiérrez et al. 2012	XincSP1	1844	49.7	9	64.5	1.2	52.4	92.2	49.7	76.4	28.6	9.5	37.3	22	6.5
<i>X. incertum</i>	Spain	Archidona-Yuste et al. 2016	XincSP2	1854	59.9	6.5	66.5	1.4	57.1	82	47.8	66.8	28	8.3	37.3	22	8.8
<i>X. madeirense</i>	Portugal	Lamberti et al., 1993	XmadPO	2000	62	6.3	55	1.9	55	104	49	88	36	8.7	32	18	7
<i>X. pachydermum</i>	Portugal	Lamberti et al., 1994	XpachyPO1	2400	72	7.4	79.5	1.4	60	80	48	68	30	9	33	21	11
<i>X. pachydermum</i>	Portugal	Lamberti et al., 1993	XpachyPO2	2000	68	6.2	69	1.5	60	91	49	78	29	8.8	29	19	9.4
<i>X. opisthohysterum</i>	India	Siddiqi 1961	XopiIND	1800	59.5	7.45	56	1.9	57	66	36	50	33	9	30	16	7
<i>X. opisthohysterum</i>	Spain	Archidona-Yuste et al. 2016	XopiSPA	1559	48.4	6.1	57.1	1.6	63.5	62.7	39.2	54.5	27.3	9	30	16	7.5
<i>X. simile</i>	Bulgaria	Lamberti, Choleva et Agostinelli, 1994	XsimBUL	1900	71	7.2	67	1.7	53	66	39	51	29	9	27	17	8
<i>X. simile</i>	Serbia	Barsi, 1994	XsimSER1	2100	78.3	7.1	74.6	1.6	54.7	66	42	60.7	28.8	9.4	27.4	17.6	7.8
<i>X. simile</i>	Serbia	Barsi & De Luca 2008	XsimSER2	2170	74.9	7.2	64.8	1.88	53.7	66.4	41.8	59.9	33.8	9.8	29	18	7.8
<i>X. simile</i>	Montenegro	Barsi, 1994	XsimMON	1900	69.5	6.2	63.8	1.7	56.2	66.3	42.9	60.8	29.2	9.2	26.8	17.3	8.3
<i>X. simile</i>	Bosnia-Herzegovina	Barsi & Lamberti 2004	XsimBH	2150	71.2	7.2	73.1	1.6	54.8	67.5	40.6	60.3	29.5	9.9	30.2	18.4	8
<i>X. simile</i>	Slovakia	Lamberti et al., 1999	XsimSLO	2400	77.3	8.2	74	1.8	54	69.4	43.5	60.8	33.1	9.6	31.3	18.3	7.6
<i>X. simile</i>	Hungary	Repasi et al. 2008	XsimHUN	2300	75.7	7.8	72.6	1.7	55	66.9	42	58	31	9	29.8	17.8	7.3
<i>X. simile</i>	Syria	Ali et al., 2024	XsimSYR	1746.6	62.9	6.9	61.4	1.7	59.9	72.6	40.3	62.7	28.5	9.2	27.9	17.1	5.7
<i>X. parasimile</i>	Serbia	Barsi & Lamberti 2004	XpasimSER	1980	70.5	7	59.9	2.02	55.5	69.7	41.6	62.6	33.3	8.9	27.7	16.6	8.2
<i>X. parasimile</i>	Serbia	Barsi & De Luca 2008	XpasimSER	1940	69.3	6.8	60.5	2.02	54.3	68	41.7	62	32.2	8.8	28.1	16	6.6
<i>X. penevi</i>	Morocco	Lazarova et al 2016	XpenMOR	1687	61	6.1	57.7	1.8	57.1	77	47.7	68	29.3	8.3	27.6	16.2	8.4
<i>X. browni</i>	Czech Republic	Lazarova et al 2016	XbroCZR	2031	69.3	7.3	69.9	1.78	55	83	42	71	29	8	29	16	7
<i>X. parapachydermum</i>	Spain	Gutiérrez-Gutiérrez et al. 2012	Xpapa	1777	64	8.3	60.3	1.8	59	81	46.5	70.3	29.8	8.8	-	-	9.3
<i>X. astaregense</i>	Spain	Archidona-Yuste et al. 2016	Xast	2981	72.4	9.1	123.2	1	56.9	85.3	54.1	73.2	23.6	9.3	-	-	8.2
<i>X. plesiopachtaicum</i>	Spain	Archidona-Yuste et al. 2016	Xples	1864	64	6.8	73.1	1.4	57.3	82.6	47.7	69.4	25.7	9.5	-	-	7.6
<i>X. vallense</i>	Spain	Archidona-Yuste et al. 2016	Vval	2019	68.9	7.9	73.4	1.6	55	79	47.5	69.5	27.8	8.5	-	-	7.6
<i>X. pachtaicum</i>	Hungary	Repasi et al. 2008	XpachHUN	1900.0	66.0	6.4	59.4	1.8	56.8	86.7	48.3	76.0	31.6	8.5	28.5	17.0	9.2
<i>X. pachtaicum</i>	Bulgaria	Lazarova et al 2016	XpacBUL	1735	58.7	5.9	58.2	1.7	58.6	84.2	48.9	76.8	29.8	8.8	28.9	17.1	8.7

TABLE S3. Pairwise D2D3 divergence

	Species	Country	Acc. No.	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]	[19]	[20]	[21]	[22]	[23]	[24]	[25]	[26]	[27]	[28]	[29]	[30]	[31]	[32]	
[1]	<i>X. rivesi</i>	Bosnia-Herzegovina	PV397456																																	
[2]	<i>X. rivesi</i>	Bosnia-Herzegovina	PV397458	8																																
[3]	<i>X. rivesi</i>	Bosnia-Herzegovina	PV397457	24	3																															
[4]	<i>X. rivesi</i>	Italy	OR683646	11	10	26																														
[5]	<i>X. rivesi</i>	Italy	OR683647	11	10	26	0																													
[6]	<i>X. rivesi</i>	Italy	OR683649	14	13	29	2	3																												
[7]	<i>X. rivesi</i>	Chile	OR683651	13	12	27	2	2	3																											
[8]	<i>X. rivesi</i>	Italy	JX912150	11	10	26	0	0	3	2																										
[9]	<i>X. rivesi</i>	Chile	OR683650	13	12	27	2	2	3	4	2																									
[10]	<i>X. rivesi</i>	Italy	OR683648	2	3	3	2	2	2	2	2	2																								
[11]	<i>X. rivesi</i>	USA	KU680972	12	11	27	1	1	4	3	1	1	1																							
[12]	<i>X. rivesi</i>	USA	KU680969	9	8	24	6	6	9	8	6	6	2	5																						
[13]	<i>X. rivesi</i>	USA	KX688559	8	5	5	5	5	6	7	5	7	2	6	5																					
[14]	<i>X. rivesi</i>	USA	KX263176	9	8	24	6	6	9	8	6	8	2	7	6	1																				
[15]	<i>X. rivesi</i>	USA	KX263149	11	8	9	6	6	9	5	6	3	0	6	4	2	5																			
[16]	<i>X. rivesi</i>	USA	KX263140	17	17	33	13	13	16	9	13	9	2	14	11	5	13	8																		
[17]	<i>X. rivesi</i>	Italy	JX912149	7	6	22	7	7	10	9	7	7	1	6	3	6	7	6	12																	
[18]	<i>X. rivesi</i>	USA	KU680970	8	7	23	6	7	10	9	7	7	2	6	3	5	6	6	12	1																
[19]	<i>X. rivesi</i>	Spain	JQ990039	9	8	24	5	5	8	7	5	7	2	6	5	1	2	5	12	5	5															
[20]	<i>X. rivesi</i>	USA	MT527958	8	7	23	8	8	11	9	8	9	2	9	6	3	3	6	14	6	5	3														
[21]	<i>X. rivesi</i>	Croatia	LT882697	6	7	7	7	7	10	8	7	8	2	8	5	5	7	7	12	2	3	5	6													
[22]	<i>X. thornei</i>	USA	AY601593	8	7	23	8	8	11	9	8	9	2	9	6	3	3	6	14	6	5	3	0	6												
[23]	<i>X. rivesi</i>	Spain	JQ990038	9	8	24	6	6	9	8	6	8	2	7	6	1	0	5	13	7	6	2	3	7	3											
[24]	<i>X. rivesi</i>	Spain	KP268971	9	6	6	6	6	9	8	6	8	2	7	6	1	0	5	13	7	6	2	3	7	3	0										
[25]	<i>X. inaequale</i>	India	HM163210	25	25	40	26	26	29	24	26	24	3	27	24	20	26	20	23	24	23	23	24	24	24	26	25									
[26]	<i>X. rivesi</i>	Spain	HM921358	14	12	28	10	10	13	12	10	12	2	11	10	5	4	9	17	11	10	6	7	11	7	4	4	24								
[27]	<i>X. rivesi</i>	USA	KX263141	19	15	31	15	15	18	12	15	10	1	14	12	9	14	11	9	11	12	15	14	13	14	14	14	24	16							
[28]	<i>X. rivesi</i>	Spain	HM921357	14	12	28	10	10	13	12	10	12	2	11	10	5	4	9	17	11	10	6	7	11	7	4	4	24	0	16						
[29]	<i>X. rivesi</i>	USA	AY601589	15	14	30	9	9	12	8	9	8	2	10	9	5	8	3	11	10	11	8	9	10	9	8	8	20	5	14	5					
[30]	<i>X. rivesi</i>	USA	AY601588	15	14	30	9	9	12	8	9	8	2	10	9	5	8	3	11	10	11	8	9	10	9	8	8	20	5	14	5	0				
[31]	<i>X. thornei</i>	USA	AY601595	10	8	24	9	9	12	11	9	11	2	10	7	7	8	10	14	5	6	7	5	7	8	8	20	5	14	5	7	7	7	7	7	
[32]	<i>X. utahense</i>	USA	AY601598	10	8	24	9	9	12	11	9	11	2	10	7	7	8	10	14	5	6	7	5	7	8	8	20	5	14	5	7	7	7	7	7	0

TABLE S4. Pairwise COI divergence

	Species	Country	Acc. No.	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]
[1]	<i>X. rivesi</i>	Spain	KY816646										
[2]	<i>X. rivesi</i>	Spain	JQ990060	0									
[3]	<i>X. rivesi</i>	Spain	KY816645	0	0								
[4]	<i>X. rivesi</i>	USA	KX263100	15	15	15							
[5]	<i>X. californicum</i>	USA	KX263076	50	50	50	54						
[6]	<i>X. rivesi</i>	USA	KX263103	52	52	52	52	54					
[7]	<i>X. rivesi</i>	USA	KX263102	52	52	52	52	54	0				
[8]	<i>X. rivesi</i>	USA	KX263104	47	47	47	51	57	45	45			
[9]	<i>X. rivesi</i>	Italy	OR777100	40	40	40	44	51	61	61	47		
[10]	<i>X. rivesi</i>	Italy	OR777103	40	40	40	44	51	61	61	47	0	
[11]	<i>X. rivesi</i>	Italy	OR777104	40	40	40	44	51	61	61	47	0	0
[12]	<i>X. rivesi</i>	Italy	OR777102	42	42	42	46	53	63	63	49	2	2
[13]	<i>Xiphinema sp.</i>	USA	KX263099	51	51	51	52	49	62	62	52	24	24
[14]	<i>Xiphinema sp.</i>	USA	KX263084	48	48	48	52	58	55	55	54	29	29
[15]	<i>X. rivesi</i>	Bosnia-Herzegovina	PV461875	40	40	40	44	51	61	61	47	0	0
[16]	<i>X. rivesi</i>	Bosnia-Herzegovina	PV461876	40	40	40	44	51	61	61	47	0	0
[17]	<i>X. rivesi</i>	Bosnia-Herzegovina	PV461877	44	44	44	49	58	65	65	52	8	8
[18]	<i>X. rivesi</i>	Bosnia-Herzegovina	PV461878	42	42	42	46	54	63	63	49	3	3
[19]	<i>Xiphinema sp.</i>	USA	KX263086	51	51	51	53	57	54	54	53	27	27
[20]	<i>X. rivesi</i>	Italy	OR777101	40	40	40	43	52	56	56	44	4	4
[21]	<i>X. rivesi</i>	USA	AM086697	68	68	68	63	71	59	59	67	63	63