



Article

Identification and Pathogenicity of *Fusarium* Species from Herbaceous Plants on Grassland in Qiaojia County, China

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Table S1. Details of *Fusarium* strains included in the phylogenetic analyses.

Species name	Accession number	GenBank accession no.		
		ITS	TEF1	RPB2
<i>F. acuminatum</i>	N-43-1	MT560377		
<i>F. acuminatum</i>	Facu-DCY5	—	ON331997	ON331995
<i>F. acuminatum</i>	NRRL 54211	HM068319	HM068309	HM068329
<i>F. acuminatum</i>	QJ1662	PQ289632	PQ421085	PQ227790
<i>F. acuminatum</i>	NRRL 54212	HM068320	—	HM068330
<i>F. avenaceum</i>	QJ2111	PQ295808	PQ337245	PQ337257
<i>F. avenaceum</i>	NRRL 54939	PP336534	OL772892	OL773196
<i>F. avenaceum</i>	QJ418	PQ295809	PQ337246	PQ337258
<i>F. avenaceum</i>	QJ488A	PQ295810	PQ337247	PQ337259
<i>F. avenaceum</i>	R2-30	LC724043	LC724044	LC724046
<i>F. avenaceum</i>	NRRL 36374	OL832183	OL772755	OL773059
<i>F. clavum</i>	EeR24	ON908966	OP293703	OP293705
<i>F. clavum</i>	QJ1722	PQ289631	PQ280811	PQ227791
<i>F. clavum</i>	QJ1722A	PQ295799	PQ337248	PQ337260
<i>F. clavum</i>	F336	OR123399	OQ511147	OR371943
<i>F. clavum</i>	NRRL 45997	GQ505761	GQ505672	GQ505850
<i>F. clavum</i>	MFG 70146	—	OR634794	OR727723
<i>F. clavum</i>	NRRL 25795	GQ505686	GQ505597	—
<i>F. clavum</i>	JW 288002	MZ890484	MZ921826	MZ921694
<i>F. clavum</i>	NL19-048011	MZ890486	MZ921828	MZ921696
<i>F. croceum</i>	NRRL 3020	GQ505675	GQ505586	GQ505764
<i>F. croceum</i>	NL19-060011	MZ890490	MZ921832	MZ921700

<i>F. croceum</i>	NL19-059006	MZ890489	MZ921831	MZ921699
<i>F. duofalcatissporum</i>	NRRL 36448	GQ505741	GQ505652	GQ505830
<i>F. equiseti</i>	GZUA.1656	MG839500	MG839497	MG839491
<i>F. equiseti</i>	HSRF1	OR473084	OR475297	PP118283
<i>F. equiseti</i>	yl-1	MN150474.1	MN128581	MK848689
<i>F. equiseti</i>	HSRF27	OR473103	OR528674	PP118271
<i>F. equiseti</i>	HSRF2	OR473085	OR475298	PP118284
<i>F. equiseti</i>	NRRL 26419	GQ505688	GQ505599	GQ505770
<i>F. equiseti</i>	NL19-059004	MZ890494	MZ921837	MZ921705
<i>F. flagelliforme</i>	26MPL17AB	—	ON292364	—
<i>F. flagelliforme</i>	NL19-050003	MZ890498	MZ921841	MZ921709
<i>F. flagelliforme</i>	NL19-052002	MZ890499	MZ921842	MZ921710
<i>F. flagelliforme</i>	NRRL 31011	GQ505695	GQ505606	GQ505784
<i>F. flagelliforme</i>	NL19-068002	MZ890500	MZ921843	MZ921711
<i>F. flagelliforme</i>	NRRL 36269	GQ505734	GQ505645	GQ505823
<i>F. flagelliforme</i>	QJ2093	PQ295807	PQ325565	PQ337251
<i>F. flagelliforme</i>	QJ16632	PQ295798	PQ325563	PQ337249
<i>F. flagelliforme</i>	QJ18122	PQ295800	PQ325564	PQ337250
<i>F. flocciferum</i>	NRRL 54147	—	—	MH582369
<i>F. torulosum</i>	NRRL 22748	—	—	MH582376
<i>F. graminearum</i>	CBS 119173	—	KT855178	KT855204
<i>F. graminearum</i>	YLY2-1	—	OP10520	OP785265
<i>F. graminearum</i>	5HS	—	MZ07899	MZ07895
<i>F. graminearum</i>	7a-K-3	OR598801	OR604580	PP576702
<i>F. graminearum</i>	7a-K-2	OR598800	OR604579	PP576701
<i>F. graminearum</i>	7a-K-1	OR598799	OR604578	PP576700
<i>F. graminearum</i>	ZL3-2	—	OP105205	OP785266
<i>F. graminearum</i>	JT3-2	—	OP105200	OP785261
<i>F. graminearum</i>	16H	MT185454	MT238998	MT250617
<i>F. graminearum</i>	BH1-2	—	OP105195	OP785256
<i>F. ipomoeae</i>	LC7940	MK280798	MK289642	K289796
<i>F. ipomoeae</i>	17B	MT185457	MT239001	MT250620
<i>F. ipomoeae</i>	HBJ	MZ409522	MZ41153	MZ411535
<i>F. ipomoeae</i>	NRRL 34034	GQ505725	GQ505636	GQ505814
<i>F. ipomoeae</i>	QJ5211A	PQ295816	PQ348088	PQ337264
<i>F. ipomoeae</i>	QJ5211	PQ295815	PQ348087	PQ337263
<i>F. ipomoeae</i>	QJ5111	PQ295811	PQ348085	PQ337261
<i>F. ipomoeae</i>	QJ5111A	PQ295813	PQ348086	PQ337262
<i>F. ipomoeae</i>	GZAX 402	OP454871	OP432881	OP432883
<i>F. ipomoeae</i>	LC12165	MK280832	MK28959	MK28975
<i>F. ipomoeae</i>	BJ22.3	MT946880	MT946880	MT946881

<i>F. ipomoeae</i>	MAFF 150448	LC685056	LC685060	LC685189
<i>F. ipomoeae</i>	MAFF 150445	LC685055	LC685059	LC685188
<i>F. longifundum</i>	QJ5112	PQ295814	PQ348090	PQ337253
<i>F. longifundum</i>	QJ513112	PQ295817	PQ348091	PQ337254
<i>F. longifundum</i>	QJ51112	PQ295812	PQ348089	PQ337252
<i>F. longifundum</i>	NRRL 36372	GQ505738	GQ505649	GQ505827
<i>F. meridionale</i>	MFR119	—	ON316722	N502983
<i>F. meridionale</i>	3B	OR538625	OR553042	OR561908
<i>F. meridionale</i>	QJ2081	PQ295802	PQ348092	PQ325566
<i>F. meridionale</i>	QJ2092	PQ295805	PQ348093	PQ325567
<i>F. meridionale</i>	QJ2092A	PQ295806	PQ348094	PQ325568
<i>F. nirenbergiae</i>	FS53	OR538687	OR553051	OR561970
<i>F. nirenbergiae</i>	FS89 Broca INT	OR538698	OR553057	OR561981
<i>F. oxysporum</i>	hnxryzj1	OP071248	OP087208	OP467559
<i>F. oxysporum</i>	hnxryzj	ON872218	ON897740	OP467557
<i>F. oxysporum</i>	FJDO-1	MK880499	MW546934	MZ031970
<i>F. oxysporum</i>	FJDO-2	MK880500	MW546935	MZ031971
<i>F. oxysporum</i>	MFG 70127	—	OR634785	OR727736
<i>F. oxysporum</i>	QJ2001622	PQ295818	PQ348095	PQ337256
<i>F. oxysporum</i>	NL19-94002	MZ890538	MZ921884	MZ921753
<i>F. oxysporum</i>	NL19-94008	MZ890539	MZ921885	MZ921754
<i>F. pernambutanum</i>	PLMF6	—	LC800437	LC810990
<i>F. pernambutanum</i>	GG4-1	—	PP102795	PP102807
<i>F. sambucinum</i>	MFG 70175	—	OR020730	OR727753
<i>F. sambucinum</i>	YN82	—	OR019814	OR019826
<i>F. sambucinum</i>	YN78	—	OR019813	OR019825
<i>F. sambucinum</i>	QJ20911	PQ295803	PQ348096	PQ337265
<i>F. sambucinum</i>	QJ203	PQ289633	PQ421086	PQ227792
<i>F. sambucinum</i>	QJ20911A	PQ295804	PQ348097	PQ337266
<i>F. sambucinum</i>	Heidelberg14562	MZ707296	MZ707294	MZ707295
<i>F. scirpi</i>	a18	—	PP420214	OR859740
<i>F. scirpi</i>	QJ188	PQ295801	PQ348098	PQ337255
<i>F. scirpi</i>	NRRL 26922	GQ505690	GQ505601	GQ505779
<i>F. scirpi</i>	NRRL 13402	GQ505681	GQ505592	GQ505770
<i>F. scirpi</i>	NRRL 29134	GQ505694	GQ505605	GQ505783
<i>F. scirpi</i>	199J	—	PP874558	PP874507
<i>F. scirpi</i>	NRRL 36478	GQ505743	GQ505654	GQ505832
<i>F. sulawesiense</i>	TGGF2022-8A	—	OR427939	OR509691
<i>F. sulawesiense</i>	TGGF2022-21A	—	OR427944	OR509696
<i>F. toxicum</i>	NL19-050001	MZ890504	MZ921847	MZ921715
<i>F. toxicum</i>	NL19-041005	MZ890502	MZ921845	MZ921713

<i>Nectria eustromatica</i>	CBS 121896	HM534896	HM534875	HM534886
<i>Nectria mariae</i>	CBS 125294	MH863507	—	KM232404

—: GenBank accession no. are not available in other studies.
Fusarium isolates used for phylogenetic analysis are indicated in bold.

Table S2. Conidia characteristics on **potato dextrose agar** (PDA) of *Fusarium* isolates.

<i>Fusarium</i> species	Isolate	conidia		
		Length(μm)	width(μm)	Septa
<i>F. acuminatum</i>	QJ1662	9.6-56.6	1.9-4.6	0-5
<i>F. avenaceum</i>	QJ211	5.8-62.2	2.2-3.3	0-6
<i>F. avenaceum</i>	QJ418	13.2-36.6	1.6-3.8	0-5
<i>F. avenaceum</i>	QJ488A	18.5-39.4	2.8-3.9	1-4
<i>F. oxysporum</i>	QJ2001622	3.8-31.4	1.9-4.1	0-4
<i>F. sambucinum</i>	QJ20911	18.1-23.8	3.4-4.6	0-4
<i>F. sambucinum</i>	QJ203	17.3-31.1	3.5-4.8	0-5
<i>F. sambucinum</i>	QJ20911A	15.3-29.8	2.8-4.6	0-5
<i>F. meridionale</i>	QJ2081	10.7-39.8	2.6-3.9	0-4
<i>F. meridionale</i>	QJ2092	9.4-48.4	2.3-4.7	0-5
<i>F. meridionale</i>	QJ2092A	7.8-39.9	2.2-4.3	0-5
<i>F. flagelliforme</i>	QJ16632	5.9-47.3	2.5-3.1	0-6
<i>F. flagelliforme</i>	QJ18122	6.1-40.9	1.9-3.5	0-5
<i>F. flagelliforme</i>	QJ2093	8.0-46.9	2.6-3.9	0-5
<i>F. longifundum</i>	QJ51112	9.6-56.6	1.9-4.6	1-5
<i>F. longifundum</i>	QJ5112	9.8-54.9	2.4-4.8	0-5
<i>F. longifundum</i>	QJ513112	7.4-48.9	2.1-3.7	0-5
<i>F. clavum</i>	QJ1722	6.8-44.2	2.3-4.1	0-4
<i>F. clavum</i>	QJ1722A	6.7-38.0	2.3-3.9	0-4
<i>F. ipomoeae</i>	QJ5111A	14.9-25.7	2.9-3.6	0-5
<i>F. ipomoeae</i>	QJ5211A	8.5-38.3	2.3-4.1	0-5
<i>F. ipomoeae</i>	QJ5111	28.9-48.1	3.6-4.8	0-5
<i>F. ipomoeae</i>	QJ5211	6.3-36.8	2.4-3.9	0-4
<i>F. scirpi</i>	QJ188	5.6-53.3	2.9-4.7	0-6

Table S3. Pathogenicity of *Fusarium* isolates.

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<i>Fusarium</i> species complex	<i>Fusarium</i> species	Isolated	Host	Pathogenicity
<i>F. incarnatum-equiseti</i> species complex (FIESC)	<i>F. clavum</i>	QJ1722	<i>Themeda triandra</i> Forssk.	10%-50%
		QJ1722A	<i>Themeda triandra</i> Forssk.	33.3%-50%
	<i>F. flagelliforme</i>	QJ18122	<i>Bromus japonicus</i> Thunb.	42.8%-100%
		QJ2093	<i>Capillipedium parviflorum</i> R.	83%-100%
		QJ16632	<i>Avena fatua</i> L.	100%
	<i>F. ipomoeae</i>	QJ5211	<i>Heteropogon contortus</i> L.	0%
		QJ5211A	<i>Heteropogon contortus</i> L.	10%-22.2%
		QJ5111	<i>Setaria viridis</i> L.	50%-100%
		QJ5111A	<i>Setaria viridis</i> L.	66.7%-100%
	<i>F. longifundum</i>	QJ513112	<i>Avena fatua</i> L.	77.8%-100%
		QJ51112	<i>Setaria viridis</i> L.	22.2%-90%
		QJ5112	<i>Setaria viridis</i> L.	10%-66.7%
	<i>F. scirpi</i>	QJ188	<i>Capillipedium parviflorum</i> R.	33.3-100%
<i>F. oxysporum</i> species complex (FOSC)	<i>F. oxysporum</i>	QJ2001622	<i>Avena fatua</i> L.	33.3%-100%
<i>F. sambucinum</i> species complex (FSAMSC)	<i>F. meridionale</i>	QJ2092	<i>Capillipedium parviflorum</i> R.	50%-100%
		QJ2092A	<i>Capillipedium parviflorum</i> R.	66.7%-100%
		QJ2081	<i>Setaria viridis</i> L.	33.3%-88.9%
	<i>F. sambucinum</i>	QJ203	<i>Bothriochloa pertusa</i> L.	0%
		QJ20911	<i>Avena fatua</i> L.	10%-55.6%
		QJ20911A	<i>Avena fatua</i> L.	10%-60%
<i>F. tricinctum</i> species complex (FTSC)	<i>F. acuminatum</i>	QJ1662	<i>Neotrinia splendens</i> Trin.	0%
	<i>F. avenaceum</i>	QJ2111	<i>Brachypodium sylvaticum</i> Huds.	100%
		QJ418	<i>Avena fatua</i> L.	100%
		QJ488A	<i>Avena fatua</i> L.	100%

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