Supporting Table 1: Field sites at the Montezuma National Wildlife Refuge, Savannah NY for soil collection.

Site	Location	Latitude	Longitude	Plant species present in non-invaded area
CC	Carncross	43°04′56.624′′ N	76°42′38.241′′ W	*P. a. americanus, Ph. arundinacea, Eupatorium maculatum, Lythrum salicaria, Spartina pectinata, Typha sp., Solanum dulcamera, Carex lacustris, Apocynum cannabinum, Vitus riparius*
EP	Eagle Point	43°10′16.123′′ N	76°47′34.704′′ W	
RR	Railroad	43° 3'22.98" N	76°42'37.46" W	
RT	Rt 31	43° 0'58.87" N	76°42'0.19" W	

Supporting Table 2: Reported plant host ranges of *Pythium* species isolated from *P. australis*-invaded and non-invaded soils.

***Pythium* species**	**Host range (plant families)**	**References**
Py. adhaerens	Chenopodiaceae, Cucurbitaceae, Fabaceae, Poaceae	(Sparrow 1932)
Py. angustatum	Poaceae	(Sparrow 1932)
Py. aquatile	Brassicaceae, Solanaceae	(Robertson 1973; Uzuhashi *et al.* 2008)
Py. arrhenomanes	Poaceae	(Vanterpool 1942; Sprague 1950)
Py. attrantheridium	Fabaceae, Poaceae, Rosaceae, Umbelliferae	(Allain-Boule *et al.* 2004; Packer & Clay 2004; Broders *et al.* 2007; Reinhart *et al.* 2010b)
Py. carolinianum	Malvaceae, Proteaceae, Haloragaceae, Rosaceae, Pinaceae, Cucurbitaceae, Amaranthaceae	(Bazan De Segura 1970; Watanabe, Hashimoto & Sato 1977; Bernhardt & Duniway 1984; Watanabe 1988; Abdelzaher & Elnaghy 1998)
Py. chondricola	None known	
Py. citrinum	None known	(Paul 2004)
Py. conidiophorum	Fabaceae	(Nzungize *et al.* 2011)
Py. contiguanum	None known	
Py. deliense	Poaceae, Fabaceae, Solanaceae, Amaranthaceae	(Raftoyannis & Dick 2006)
Py. dissimile	Poaceae, Fabaceae, Solanaceae, Amaranthaceae	(Vestberg 1990; Raftoyannis & Dick 2006)
Py. dissotocum	Very broad	(Spencer 2004a)
Py. echinulatum	Poaceae, Rosaceae, Fabaceae	(Watanabe, Hashimoto & Sato 1977; Braun 1995; Higginbotham, Paulitz & Kidwell 2004; Broders *et al.* 2007)
Py. heterothallicum	Caprifoliaceae, Chenopodiaceae, Fabaceae, Geraniaceae, Poaceae, Rosaceae	(Spencer 2004b)
Py. hypogynum	Poaceae	(Middleton 1941)
Py. inflatum	Poaceae, Fabaceae, Solanaceae	(Robertson 1973; Broders *et al.* 2007; Van Buyten & Hofte 2013)
Py. intermedium	Rosaceae, Umbelliferae, Brassicaceae, Cucurbitaceae, Onaceae	(Long & Cooke 1969; Stanghellini *et al.* 1988; Mazzola *et al.* 2002; Hermansen *et al.* 2007; Suffert & Guibert 2007)
Py. irregulare	Very broad	(Spencer 2004c; Farr & Rossman 2014)
Py. kashmirense	None known	
Py. litorale	Cucurbitaceae, Rosaceae	(Tewoldemedhin *et al.* 2011; Parkunan & Ji 2013)
Py. marsipium	None known	
Py. monospermum	Poaceae, Solanaceae	(Sprague 1950; Robertson 1973)
Py. oopapillum	Very broad	(Bala *et al.* 2010)
Py. parvum	None known	
Py. perplexum	Myrtaceae	(Mwanza & Kellas 1987)
Py. phragmitis	Poaceae	(Nechwatal, Wielgoss & Mendgen 2005)
Py. pleroticum	Zingiberaceae	(Dohroo, Bhardwaj & Shyam

		1987)
Py. pyrilobum	Poaceae, Myrtaceae, Annonaceae	(Ward & Shipton 1984; Cother & Gilbert 1993; Abad, Shew & Lucas 1994; Linde, Kemp & Wingfield 1994)
Py. radiosum	None known	
Py. rhizo-oryzae	None known	(Bala, Gautam & Paul 2006)
Py. segnitium	None known	
Py. sylvaticum	Very broad	(Spencer 2004d)
Py. torulosum	Very broad	
Py. volutum	Poaceae	(Sprague 1950; Kerns & Tredway 2008)

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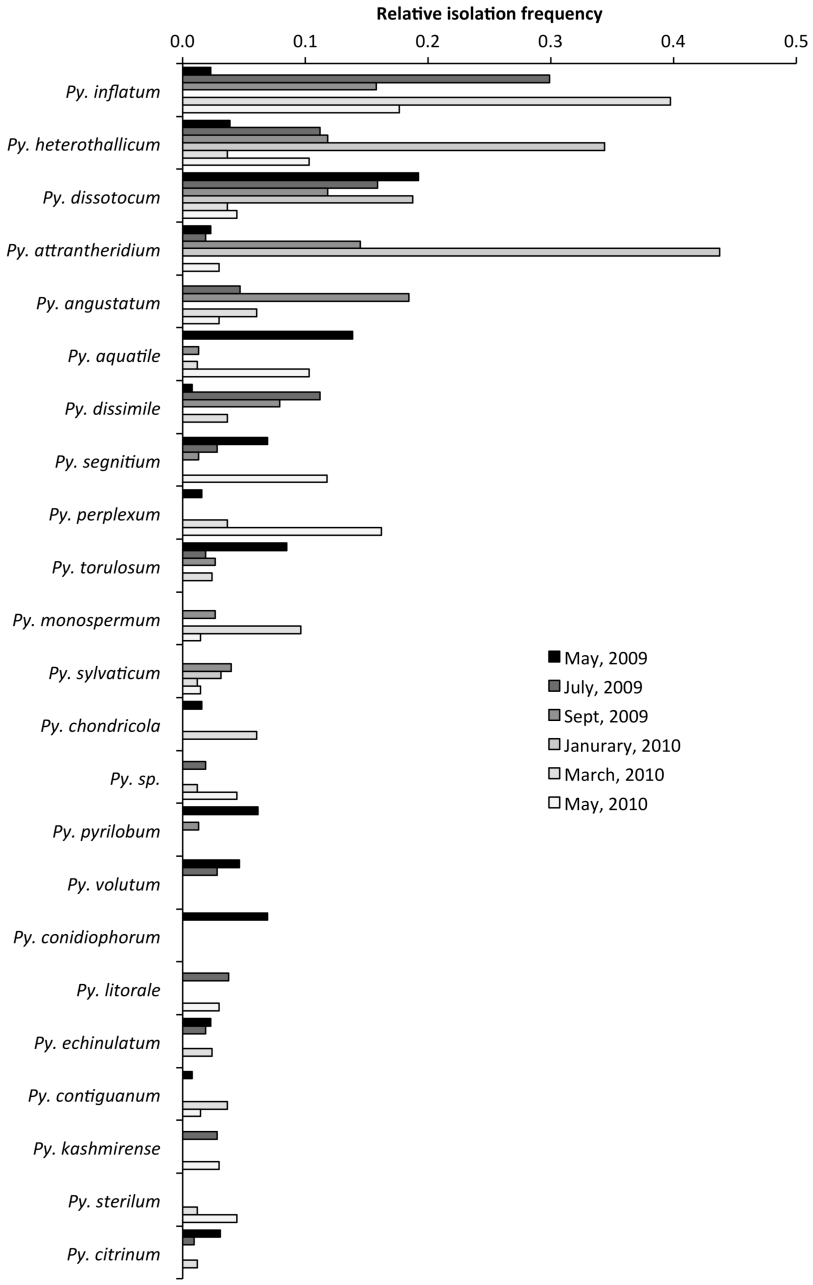
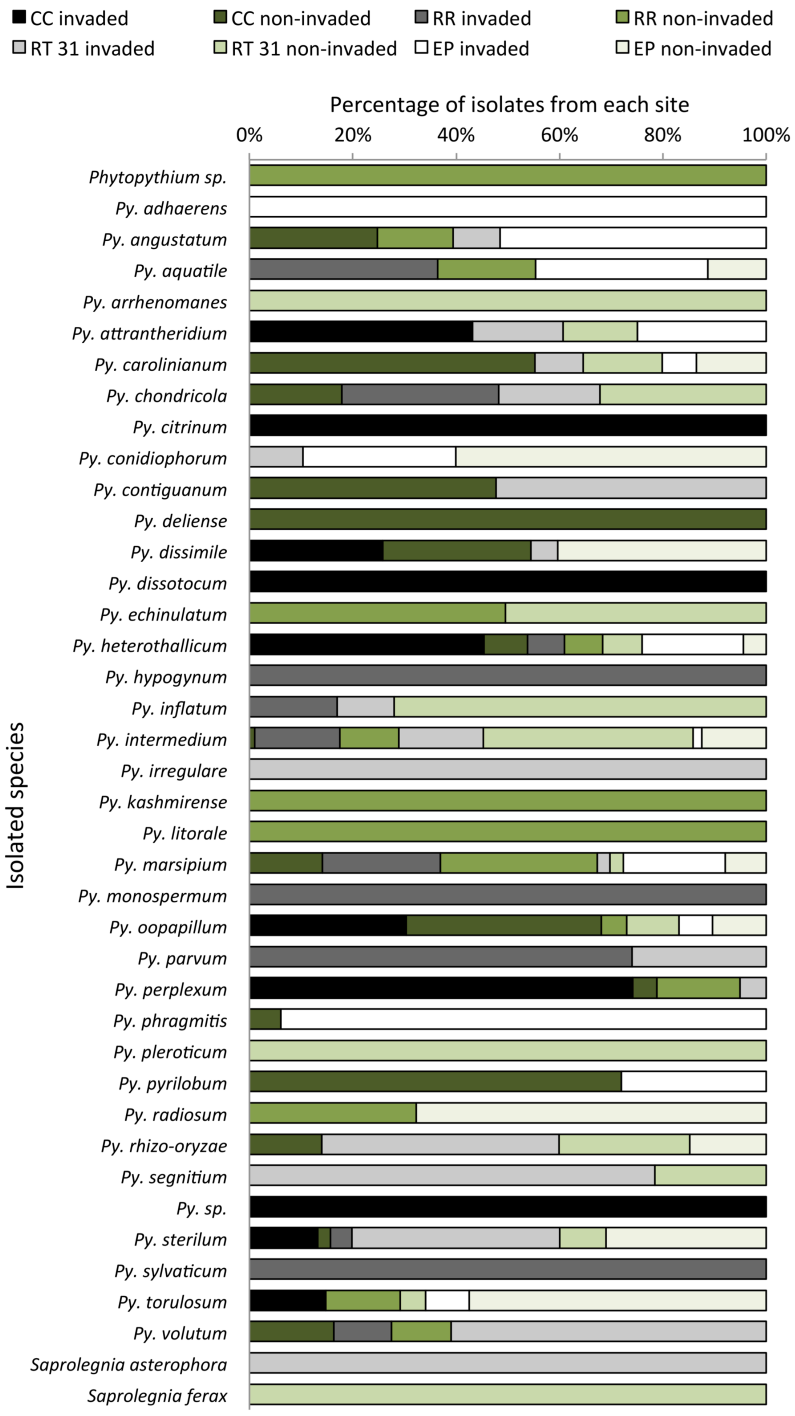
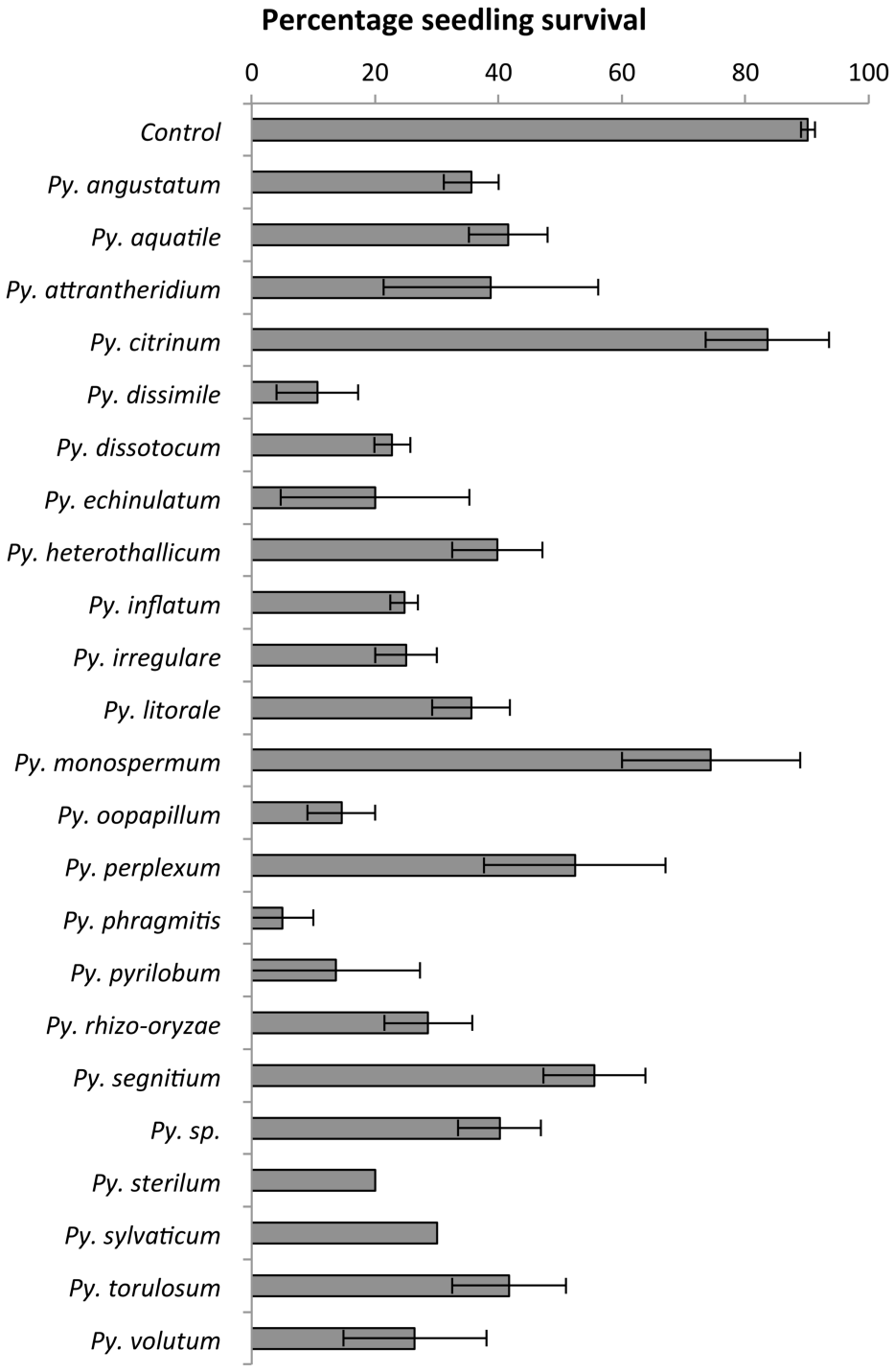
Supporting Figure 1: Twenty-five most frequently isolated oomycete species recovered from *P. australis*-invaded and non-invaded soils at different sampling dates. Isolation frequency reflects the number of isolates of a given species obtained at a particular sampling time relative to the total number of isolates recovered at that sampling time.



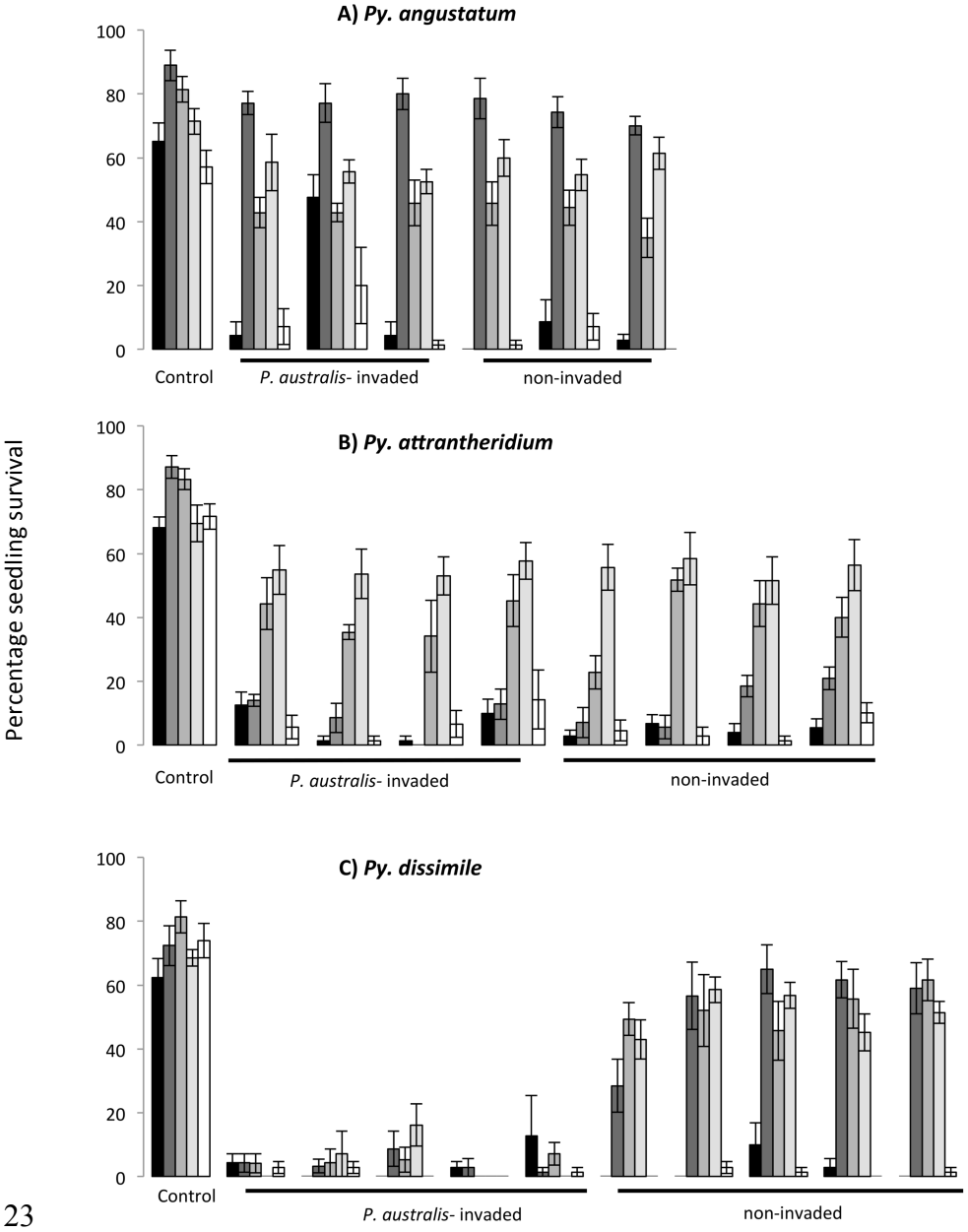
Supporting Figure 2: Distribution of oomycete species across sampling sites. Isolation frequency reflects the number of isolates of a given species obtained at a particular site relative to the total number of isolates recovered from that site.

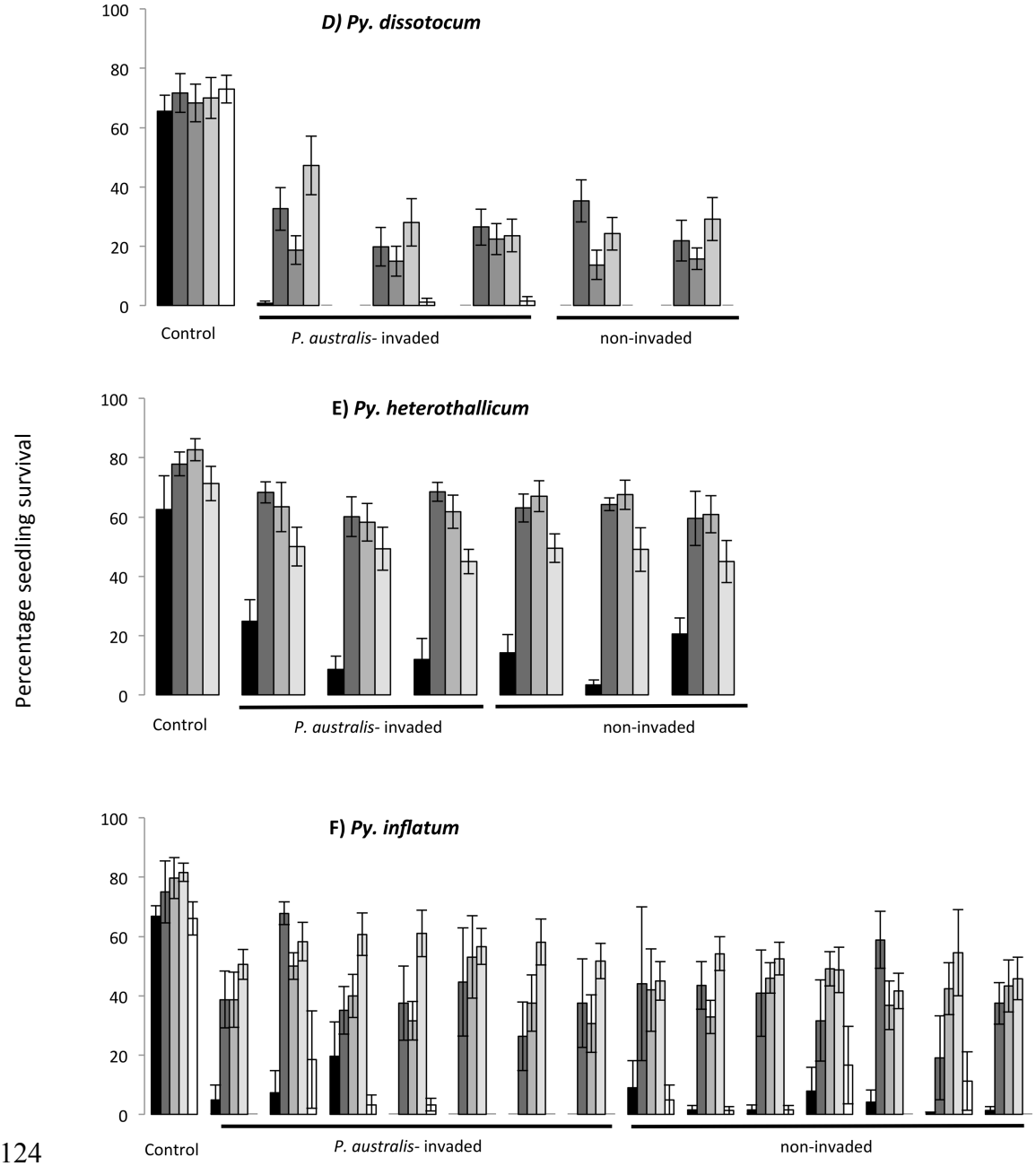


Supporting Figure 3: Overall seedling survival following inoculation by a single isolate of a given *Pythium* species. Error bars indicate standard error of seedling survival.



Supporting Figure 4: Percent seedling survival of *E. glandulosum* (black bars), *P. australis* (dark grey bars), *P. a. americanus* (medium grey bars), *M. glomerata* (light grey bars) and *L. salicaria* (white bars) following inoculation with isolates recovered from *P. australis*-invaded and non-invaded soils. *Py. dissimile* (A), *Py. attrantheridium* (B), *Py. angustatum* (C), *Py. heterothallicum* (D), *Py. dissotocum* (E), *Py. inflatum* (F). Error bars indicate standard errors from the mean of seedling survival.




D) Py. dissotocum
E) Py. heterothallicum
F) Py. inflatum
Percentage seedling survival
100
80
60
40
20
0
Control
P. australis- invaded
non-invaded

124
125