

Table 2 Overview of positiv (+), negative (-) or neutral (o) effects of phytopathogenic infection on herbivore behaviour and performance. ‘Direct/plant-mediated effects’ = Effect of fungus infection on herbivore results from contact with fungus and/or fungus-induced local plant responses’. ‘Locally plant-mediated effects’ = Effect of fungus infection on herbivore results from plant responses in infected leaf. ‘Systemic effects’ = Effect of fungus infection on herbivore results from plant responses in leaf (leaves) adjacent to infected leaf. ‘Temporal scale’ indicates time between end of feeding by herbivore and inoculation of fungus.

EFFECTS OF FUNGI ON HERBIVORES									
Spatial scale	Plant	Fungus	Temporal scale	Herbivore	Assessment of behavioural response	Effects on behaviour	Effects on larval performance	Lab/ Field	Reference
Direct/plant-mediated effects									
	<i>Cirsium arvense</i>	<i>Puccinia punctiformis</i> (rust)	Natural infection	<i>Apion onopordi</i> (Coleoptera) adults	Dual-choice test test	+		L	Friedli & Bacher 2001
	<i>Cirsium arvense</i>	<i>Puccinia punctiformis</i> (rust)	Natural infection	<i>Lixus algirus</i> (Coleoptera) adults	Herbivore abundances	+		F	Friedli & Bacher 2001
	<i>Rumex obtusifolius</i>	<i>Uromyces rumicis</i> (rust)	8 days (sporulation)	<i>Gastrophysa viridula</i> (Coleoptera) adults	Dual-choice test	-	-	L/F	Hatcher et al. 1994
	<i>Rumex crispus</i>	<i>Uromyces rumicis</i> (rust)	8 days (sporulation)	<i>Gastrophysa viridula</i> (Coleoptera) adults	Dual-choice test	o	-	L/F	Hatcher et al. 1994
	<i>Cirsium arvense</i>	<i>Puccinia punctiformis</i>	Natural infection	<i>Ectophagous herbivore species</i>	Herbivore abundances	most species: o few species: +			Kluth et al. 2001
	<i>Cirsium arvense</i>	<i>Puccinia punctiformis</i>	Natural infection	<i>Endophagous herbivore species</i>	Herbivore abundances	-			Kluth et al. 2001

Table 2 continued

Spatial scale	Plant	Fungus	Temporal scale	Herbivore	Assessment of behavioural response	Effects on behaviour	Effects on larval performance	Lab / Field	Reference
Direct/plant-mediated effects									
	<i>Carduus thoermeri</i>	<i>Puccinia carduorum</i> (rust)	No data available (sporulation)	<i>Cassida rubiginosa</i> (Coleoptera) adults	Dual-choice test	-/o	o	L	Kok et al. 1996
	<i>Carduus thoermeri</i>	<i>Puccinia carduorum</i> (rust)	No data available (sporulation)	<i>Trichosirocalus horridus</i> (Coleoptera) adults	Dual-choice test	-/o	o	L	Kok et al. 1996
	<i>Betula pubescens</i> ssp. <i>tortuosa</i>	<i>Melampsorium betulinum</i> (rust)	Natural infection	<i>Epirrita autumnata</i> (Lepidoptera) larvae	No-choice test		-	F	Lappalainen et al. 1995
	<i>Cucurbita pepo</i> x <i>texana</i>	<i>Erysiphe cichoracearum</i> (mildew)	Natural infection	<i>Diabrotica undecimpunctata</i> (Coleoptera) adults	Herbivore abundances		-	F	Moran & Schultz 1998
	<i>Cucurbita pepo</i> x <i>texana</i>	<i>Erysiphe cichoracearum</i> (mildew)	Natural infection	<i>Diabrotica virgifera</i> (Coleoptera) adults	Herbivore abundances		-	F	Moran & Schultz 1998
	<i>Cucurbita pepo</i> x <i>texana</i>	<i>Erysiphe cichoracearum</i> (mildew)	Natural infection	<i>Acalymma vittatum</i> (Coleoptera) adults	Herbivore abundances		-	F	Moran & Schultz 1998
	<i>Cucurbita pepo</i> x <i>texana</i>	<i>Erysiphe cichoracearum</i> (mildew)	Natural infection	<i>Anasa tristis</i> (Heteroptera) adults	Herbivore abundances		o	F	Moran & Schultz 1998
	<i>Cucurbita pepo</i> x <i>texana</i>	<i>Erysiphe cichoracearum</i> (mildew)	Natural infection	<i>Aphis gossypii</i> (Homoptera) adults	Herbivore abundances		o	F	Moran & Schultz 1998
	<i>Cucumis sativus</i>	<i>Cladosporium cucumerinum</i> (scab)	3, 4, 5, 6 days	<i>Diabrotica undecimpunctata</i> (Coleoptera) adults	Dual-choice test	3-4d:+	6d: o	L	Moran 1998
	<i>Cucumis sativus</i>	<i>Cladosporium cucumerinum</i> (scab)	14 days	<i>Acalymma vittatum</i> (Coleoptera) adults	Dual-choice test		o	F	Moran 1998

Table 2 continued

Spatial scale	Plant	Fungus	Temporal scale	Herbivore	Assessment of behavioural response	Effects on behaviour	Effects on larval performance	Lab / Field	Reference
Direct/plant-mediated effects									
	<i>Cucumis sativus</i>	<i>Cladosporium cucumerinum</i> (scab)	14 days	<i>Diabrotica undecimpunctata</i> (Coleoptera) adults	Dual-choice test	○		F	Moran 1998
	<i>Cucumis sativus</i>	<i>Cladosporium cucumerinum</i> (scab)	14 days	<i>Aphis gossypii</i> (Homoptera) adults	Dual-choice test	○	+/-	F	Moran 1998
	<i>Brassica rapa</i> ssp. <i>pekinensis</i>	<i>Alternaria brassicae</i> (black spot)	5 days	<i>Phaedon cochleariae</i> (Coleoptera) adults	Dual-choice test	-		L	Rostás & Hilker in press
	<i>Brassica rapa</i> ssp. <i>pekinensis</i>	<i>Alternaria brassicae</i> (black spot)	5 days	<i>Phaedon cochleariae</i> (Coleoptera) larvae	Dual-choice test	+		L	Rostás & Hilker in press
	<i>Salix x cuspidata</i>	<i>Melampsora allii-fragilis</i> (rust)	8, 12, 16 days	<i>Plagiodera versicolora</i> (Coleoptera) adults	Triple-choice test	-	-	L	Simon & Hilker unpubl. results
	<i>Salix x cuspidata</i>	<i>Melampsora allii-fragilis</i> (rust)	12 days	<i>Plagiodera versicolora</i> (Coleoptera) adults	Dual-choice test	-	-	L	Simon & Hilker unpubl. results
	<i>Senecio vulgaris</i>	<i>Coleosporium tussilaginis</i> (rust)	14 days (sporulation)	<i>Tyria jacobaeae</i> (Lepidoptera) larvae	Dual-choice test	-	○	L	Tinney et al. 1998
	<i>Senecio vulgaris</i>	<i>Puccinia lagenophorae</i> (rust)	14 days (sporulation)	<i>Tyria jacobaeae</i> (Lepidoptera) larvae	Dual-choice test	○	○	L	Tinney et al. 1998
	<i>Tussilago farfara</i>	<i>Coleosporium tussilaginis</i> (rust)	14 days (sporulation)	<i>Tyria jacobaeae</i> (Lepidoptera) larvae	Dual-choice test	-	-	L	Tinney et al. 1998

Table 2 continued

Spatial scale	Plant	Fungus	Temporal scale	Herbivore	Assessment of behavioural response	Effects on behaviour	Effects on larval performance	Lab / Field	Reference
Locally plant-mediated effects									
	<i>Brassica rapa</i> ssp. <i>pekinensis</i>	<i>Alternaria brassicae</i> (black spot)	5 days	<i>Phaedon cochleariae</i> (Coleoptera) larvae			-	L	Rostás & Hilker in press
	<i>Salix x cuspidata</i>	<i>Melampsora allii-fragilis</i> (rust)	8, 12, 16 days	<i>Plagioderia versicolora</i> (Coleoptera) adults	Triple-choice test	8,12 d: ○ 16d: -		L	Simon & Hilker unpubl. results
	<i>Lycopersicon esculentum</i>	<i>Phytophthora infestans</i> (blight)	5 days	<i>Heliothis zea</i> (Lepidoptera) larvae			○	L	Stout et al. 1999
	<i>Lycopersicon esculentum</i>	<i>Phytophthora infestans</i> (blight)	5 days	<i>Spodoptera exigua</i> (Lepidoptera) larvae			○	L	Stout et al. 1999
Systemic effects									
	<i>Cucumis sativus</i>	<i>Colletotrichum lagenarium</i> (anthracnose)	7 days	<i>Tetranychus urticae</i> (Acari) all stages			○	L	Ajlan & Potter 1991
	<i>Cucumis sativus</i>	<i>Colletotrichum lagenarium</i> (anthracnose)	7 days	<i>Spodoptera frugiperda</i> (Lepidoptera) larvae			○	L	Ajlan & Potter 1991
	<i>Cucumis sativus</i>	<i>Colletotrichum lagenarium</i> (anthracnose)	7 days	<i>Aphis gossypii</i> (Homoptera) all stages			○		Ajlan & Potter 1991
	<i>Rumex obtusifolius</i>	<i>Uromyces rumicis</i> (rust)	8 days (sporulation)	<i>Gastrophysa viridula</i> (Coleoptera) larvae			○	L	Hatcher et al. 1994
	<i>Rumex crispus</i>	<i>Uromyces rumicis</i> (rust)	8 days (sporulation)	<i>Gastrophysa viridula</i> (Coleoptera) larvae			○	L	Hatcher et al. 1994

Table 2 continued

Spatial scale	Plant	Fungus	Temporal scale	Herbivore	Assessment of behavioural response	Effects on behaviour	Effects on larval performance	Lab / Field	Reference
Systemic effects									
	<i>Cucumis sativus</i>	<i>Cladosporium cucumerinum</i> (scab)	3, 4, 5, 6 days	<i>Diabrotica undecimpunctata</i> (Coleoptera) adults	Dual-choice test	○		L	Moran 1998
	<i>Brassica rapa</i> ssp. <i>pekinensis</i>	<i>Alternaria brassicae</i> (black spot)	5 days	<i>Phaedon cochleariae</i> (Coleoptera) adults	Dual-choice test	○	○	L	Rostás & Hilker in press
	<i>Brassica rapa</i>	<i>Leptosphaeria maculans</i> (blackleg)	1 days	<i>Plutella xylostella</i> (Lepidoptera) larvae	No-choice test	-		L	Siemens & Mitchell-Olds 1996
	<i>Salix x cuspidata</i>	<i>Melampsora allii-fragilis</i> (rust)	12 days	<i>Plagiodera versicolora</i> (Coleoptera) adults	Triple-choice test	-		L	Simon & Hilker unpubl. results