Screening and evaluation of phenols and furans degrading fungi for the biological pretreatment of lignocellulosic biomass

Molecules	F		Glu + F		V		Glu + V		S		Glu + S		H		Glu + H		MPF	Glu + MPF
Concentrations (g L^{-1})	2	1	2	1	2	0.5	2	0.5	2	0.25	2	0.25	2	0.25	2	0.25	1 F + 0.5 V + 0.25 S + 0.25 H	1 F + 0.5 V + 0.25 S + 0.25 H
SPECIES																		
Alternaria alternata	-100% ± 0	-100% ± 0	-97% ± 1	-97% ± 0	-100% ± 0	-100% ± 0	-100% ± 0	-100% ± 0	-100% ± 0	-100% ± 0	-99% ± 0	-96% ± 1	-98% ± 0	-99% ± 0	-98% ± 0	-91% ± 1	-100% ± 0	-100% ± 0
Alternaria tenuissima	-96% ± 0	-95% ± 1	-96% ± 1	-94% ± 1	-98% ± 0	-91% ± 1	-92% ± 0	-90% ± 1	-97% ± 0	-93% ± 1	-95% ± 0	-90% ± 1	-98% ± 0	-90% ± 0	-96% ± 1	-90% ± 0	-100% ± 0	-99% ± 0
Aspergillus aculeatus	-98% ± 0	-95% ± 1	-95% ± 0	-93% ± 0	-99% ± 0	-99% ± 0	-99% ± 0	-99% ± 0	-98% ± 0	-76% ± 1	-98% ± 0	-67% ± 2	-99% ± 0	-76% ± 3	-96% ± 1	-54% ± 2	-100% ± 0	-100% ± 0
Aspergillus candidus	-96% ± 1	-93% ± 1	-93% ± 1	-92% ± 1	-100% ± 0	-93% ± 1	-93% ± 1	-93% ± 2	-95% ± 0	-90% ± 1	-95% ± 1	-90% ± 0	-100% ± 0	-94% ± 1	-99% ± 1	-90% ± 0	-100% ± 0	-100% ± 0
Aspergillus nidulans	-99% ± 0	-99% ± 0	-98% ± 0	-93% ± 2	-100% ± 0	-65% ± 3	-100% ± 0	-54% ± 2	-100% ± 0	-97% ± 0	-99% ± 0	-94% ± 1	-100% ± 0	-93% ± 0	-98% ± 0	-93% ± 1	-100% ± 0	-100% ± 0
Aspergillus niger	-100% ± 0	-99% ± 0	-62% ± 5	-26% ± 3	-94% ± 1	49% ± 8	-100% ± 0	117% ± 6	-100% ± 0	32% ± 5	-73% ± 5	91% ± 8	-99% ± 0	53% ± 7	-99% ± 0	117% ± 6	-100% ± 0	-100% ± 0
Aspergillus terreus	-100% ± 0	-98% ± 0	-99% ± 0	-85% ± 0	-100% ± 0	-3% ± 1	-99% ± 0	2% ± 1	-95% ± 2	-21% ± 1	-52% ± 1	-15% ± 1	-98% ± 0	-2% ± 1	-99% ± 0	1% ± 1	-100% ± 0	-100% ± 0
Aureobasidium pullulans var melanogenum	-99% ± 1	-99% ± 0	-94% ± 1	-94% ± 1	-98% ± 0	-97% ± 0	-98% ± 0	-94% ± 1	-100% ± 0	-99% ± 0	-97% ± 1	-97% ± 1	-98% ± 0	-92% ± 0	-92% ± 0	-80% ± 1	-100% ± 0	-99% ± 1
Bjerkandera adusta	-98% ± 0	-95% ± 0	-96% ± 0	-94% ± 0	-99% ± 0	-93% ± 1	-94% ± 0	-91% ± 1	-100% ± 0	-94% ± 1	-99% ± 0	-92% ± 1	-97% ± 0	-98% ± 0	-96% ± 0	-91% ± 0	-100% ± 0	-97% ± 1
Byssochlamys nivea	-52% ± 2	-41% ± 4	-50% ± 2	-37% ± 3	-99% ± 0	-29% ± 5	-100% ± 0	-12% ± 3	-53% ± 3	-20% ± 11	-54% ± 2	17% ± 10	-100% ± 0	16% ± 3	-100% ± 0	40% ± 16	-78% ± 4	-35% ± 6
Cepalotrichum stemonitis	-100% ± 0	-100% ± 0	-100% ± 0	-100% ± 0	-100% ± 0	-100% ± 0	-100% ± 0	-100% ± 0	-100% ± 0	-100% ± 0	-100% ± 0	-100% ± 0	-100% ± 0	-93% ± 2	-100% ± 0	-91% ± 1	-100% ± 0	-100% ± 0
Cladosporium herbarum	-100% ± 0	-97% ± 1	-98% ± 1	-95% ± 1	-99% ± 1	-96% ± 1	-96% ± 1	-95% ± 1	-94% ± 1	-94% ± 1	-92% ± 1	-91% ± 1	-99% ± 1	-99% ± 1	-97% ± 1	-90% ± 1	-100% ± 0	-100% ± 0
Cladosporium xilophylum	-98% ± 0	-98% ± 0	-98% ± 0	-97% ± 0	-99% ± 0	-96% ± 0	-97% ± 0	-95% ± 0	-98% ± 0	-97% ± 0	-98% ± 0	-95% ± 0	-97% ± 0	-95% ± 0	-96% ± 0	-94% ± 0	-100% ± 0	-99% ± 0
Cladosporium cladosporioides	-100% ± 0	-100% ± 0	-100% ± 0	-100% ± 0	-100% ± 0	-100% ± 0	-100% ± 0	-100% ± 0	-100% ± 0	-100% ± 0	-100% ± 0	-100% ± 0	-100% ± 0	-100% ± 0	-100% ± 0	-100% ± 0	-100% ± 0	-100% ± 0
Cladosporium pseudocladosporioides	-99% ± 0	-98% ± 1	-98% ± 0	-97% ± 0	-100% ± 0	-99% ± 0	-98% ± 0	-96% ± 1	-100% ± 0	-97% ± 1	-98% ± 0	-97% ± 0	-100% ± 0	-100% ± 0	-98% ± 1	-96% ± 0	-100% ± 0	-100% ± 0
Cladosporium sphaerospermum	-98% ± 0	-98% ± 0	-98% ± 0	-97% ± 0	-99% ± 0	-95% ± 0	-97% ± 0	-95% ± 0	-98% ± 0	-97% ± 0	-98% ± 0	-96% ± 0	-97% ± 0	-95% ± 0	-96% ± 0	-95% ± 1	-100% ± 0	-100% ± 0
Coniochaeta canina	-100% ± 0	-100% ± 0	-100% ± 0	-100% ± 0	-100% ± 0	-100% ± 0	-100% ± 0	-100% ± 0	-100% ± 0	-100% ± 0	-100% ± 0	-100% ± 0	-100% ± 0	-100% ± 0	-100% ± 0	-99% ± 1	-100% ± 0	-100% ± 0
Coprinopsis cinerea	-96% ± 0	-93% ± 0	-92% ± 1	-92% ± 1	-94% ± 1	-93% ± 1	-92% ± 0	-90% ± 1	-99% ± 0	-92% ± 1	-96% ± 1	-88% ± 1	-96% ± 1	-96% ± 0	-95% ± 0	-85% ± 1	-100% ± 0	-99% ± 0
Coriolopsis gallica	-96% ± 1	-95% ± 0	-99% ± 0	-93% ± 1	-95% ± 1	-96% ± 1	-95% ± 0	-91% ± 1	-95% ± 0	-92% ± 1	-95% ± 0	-91% ± 1	-96% ± 0	-92% ± 0	-94% ± 1	-90% ± 1	-98% ± 0	-94% ± 0
Cyclocybe aegerita	-100% ± 0	-98% ± 0	-99% ± 0	-95% ± 1	-100% ± 0	-97% ± 1	-100% ± 0	-95% ± 0	-97% ± 1	-94% ± 0	-96% ± 1	-92% ± 1	-96% ± 1	-92% ± 0	-96% ± 1	-90% ± 0	-99% ± 0	-97% ± 0
Fusarium fujikuroi	-98% ± 0	-95% ± 2	-97% ± 0	-57% ± 2	-98% ± 0	-98% ± 0	-98% ± 0	-98% ± 0	-100% ± 0	-33% ± 1	-100% ± 0	-33% ± 1	-99% ± 0	-98% ± 1	-99% ± 0	-40% ± 2	-100% ± 0	-100% ± 0
Fusarium proliferatum	-100% ± 0	-92% ± 1	-100% ± 0	-74% ± 7	-100% ± 0	-100% ± 0	-100% ± 0	-99% ± 0	-100% ± 0	-53% ± 1	-100% ± 0	-51% ± 1	-100% ± 0	-53% ± 2	-100% ± 0	-53% ± 1	-100% ± 0	-100% ± 0
Fusarium verticillioides	-100% ± 0	-100% ± 0	-99% ± 0	-99% ± 0	-100% ± 0	-100% ± 0	-100% ± 0	-100% ± 0	-100% ± 0	-53% ± 1	-100% ± 0	-53% ± 2	-100% ± 0	-100% ± 0	-99% ± 0	-94% ± 0	-100% ± 0	-100% ± 0
Ganoderma lucidum	-76% ± 1	-67% ± 2	-74% ± 3	-52% ± 3	-100% ± 0	-38% ± 12	-95% ± 0	-24% ± 5	-99% ± 1	-35% ± 2	-100% ± 0	-34% ± 4	-98% ± 1	-25% ± 2	-97% ± 0	-19% ± 2	-100% ± 0	-100% ± 0
Lecythophora hoffmannii	-100% ± 0	-100% ± 0	-99% ± 0	-97% ± 1	-100% ± 0	-100% ± 0	-100% ± 0	-100% ± 0	-100% ± 0	-95% ± 2	-100% ± 0	-95% ± 2	-100% ± 0	-100% ± 0	-100% ± 0	-100% ± 0	-100% ± 0	-100% ± 0
Mucor circinelloides	-100% ± 0	-100% ± 0	-100% ± 0	-94% ± 0	-100% ± 0	-97% ± 1	-100% ± 0	-74% ± 3	-100% ± 0	-100% ± 0	-100% ± 0	-75% ± 4	-100% ± 0	-100% ± 0	-100% ± 0	-81% ± 3	-100% ± 0	-100% ± 0
Paecilomyces variotii	-18% ± 1	7% ± 2	-1% ± 6	23% ± 2	-100% ± 0	-21% ± 4	-100% ± 0	11% ± 2	-83% ± 4	28% ± 2	-42% ± 3	28% ± 2	-100% ± 0	-19% ± 4	-100% ± 0	33% ± 7	-100% ± 0	-100% ± 0
Penicillium decumbens	-95% ± 1	-94% ± 2	-95% ± 3	-92% ± 3	-97% ± 1	-90% ± 2	-95% ± 1	-90% ± 1	-98% ± 1	-93% ± 1	-93% ± 1	-92% ± 1	-92% ± 1	-92% ± 1	-91% ± 1	-92% ± 2	-98% ± 1	-98% ± 1
Penicillium roqueforti	-100% ± 0	-100% ± 0	-100% ± 0	-99% ± 0	-100% ± 0	-100% ± 0	-100% ± 0	-100% ± 0	-100% ± 0	-100% ± 0	-100% ± 0	-98% ± 1	-99% ± 0	-97% ± 1	-99% ± 0	-93% ± 0	-100% ± 0	-100% ± 0
Phanerochaete chrysosporium	-97% ± 0	-96% ± 0	-95% ± 0	-96% ± 1	-100% ± 0	-100% ± 0	-100% ± 0	-100% ± 0	-100% ± 0	-99% ± 1	-100% ± 0	-97% ± 1	-100% ± 0	-94% ± 1	-96% ± 1	-91% ± 1	-100% ± 0	-100% ± 0
Pleurotus ostreatus	-96% ± 1	-96% ± 1	-95% ± 1	-91% ± 1	-100% ± 0	-93% ± 1	-91% ± 1	-91% ± 0	-96% ± 1	-94% ± 1	-94% ± 1	-91% ± 1	-100% ± 0	-90% ± 2	-95% ± 1	-90% ± 2	-99% ± 0	-98% ± 0
Porostereum/Lopharia spadicea	-100% ± 0	-100% ± 0	-100% ± 0	-63% ± 4	-100% ± 0	-99% ± 0	-100% ± 0	-91% ± 1	-100% ± 0	-100% ± 0	-100% ± 0	-53% ± 1	-100% ± 0	-71% ± 6	-100% ± 0	-65% ± 5	-100% ± 0	-100% ± 0
Purpureocillum liliacinum	-100% ± 0	-97% ± 0	-100% ± 0	-98% ± 0	-100% ± 0	-98% ± 0	-99% ± 0	-57% ± 1	-100% ± 0	-97% ± 0	-98% ± 0	-74% ± 6	-99% ± 0	-65% ± 3	-98% ± 0	-55% ± 1	-100% ± 0	-100% ± 0
Synchephalastrum racemosum	-100% ± 0	-92% ± 1	-92% ± 2	-92% ± 1	-100% ± 0	-100% ± 0	-100% ± 0	-64% ± 1	-100% ± 0	-55% ± 2	-100% ± 0	-53% ± 2	-100% ± 0	-82% ± 1	-98% ± 0	-54% ± 1	-100% ± 0	-100% ± 0
Trametes gibbosa	-98% ± 1	-95% ± 0	-96% ± 0	-94% ± 0	-98% ± 1	-93% ± 0	-94% ± 1	-92% ± 2	-99% ± 0	-94% ± 1	-96% ± 1	-90% ± 1	-99% ± 0	-96% ± 1	-96% ± 0	-91% ± 1	-100% ± 0	-100% ± 0
Trametes pubescens	-100% ± 0	-100% ± 0	-100% ± 0	-95% ± 0	-100% ± 0	-100% ± 0	-100% ± 0	-93% ± 1	-100% ± 0	-87% ± 1	-100% ± 0	-66% ± 2	-100% ± 0	-100% ± 0	-100% ± 0	-100% ± 0	-100% ± 0	-100% ± 0
Trametes versicolor	-96% ± 1	-94% ± 1	-93% ± 0	-93% ± 0	-97% ± 1	-87% ± 1	-85% ± 3	-73% ± 1	-100% ± 0	-96% ± 0	-96% ± 0	-92% ± 1	-99% ± 0	-92% ± 1	-98% ± 1	-90% ± 1	-94% ± 1	-93% ± 0
Trichoderma asperellum	-100% ± 0	-100% ± 0	-100% ± 0	-97% ± 1	-100% ± 0	-97% ± 1	-100% ± 0	-60% ± 2	-100% ± 0	-68% ± 2	-100% ± 0	-56% ± 1	-99% ± 0	-77% ± 1	-100% ± 0	-61% ± 2	-100% ± 0	-100% ± 0
Trichoderma harzianum	-100% ± 0	-100% ± 0	-94% ± 2	-94% ± 2	-100% ± 0	-100% ± 0	-100% ± 0	-76% ± 2	-100% ± 0	-66% ± 2	-100% ± 0	-68% ± 2	-100% ± 0	-60% ± 2	-100% ± 0	-55% ± 3	-100% ± 0	-100% ± 0
Umbelopsis/Mortierella isabellina	-98% ± 0	-97% ± 0	-94% ± 1	-94% ± 1	-97% ± 0	-97% ± 0	-96% ± 1	-66% ± 1	-99% ± 0	-90% ± 1	-98% ± 0	-59% ± 2	-99% ± 0	-99% ± 0	-98% ± 1	-57% ± 2	-100% ± 0	-100% ± 0