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SUPPORTING INFORMATION

Synthesis and application of a phenazine class substrate for high-throughput screening of laccase activity

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Figure S1. Results of *E. coli* and *P. putida* growth on 37.5 µg ml^{-1} Ferbamine-LB agar and Ferbamine-TS agar plates after 10 h of incubation, respectively.

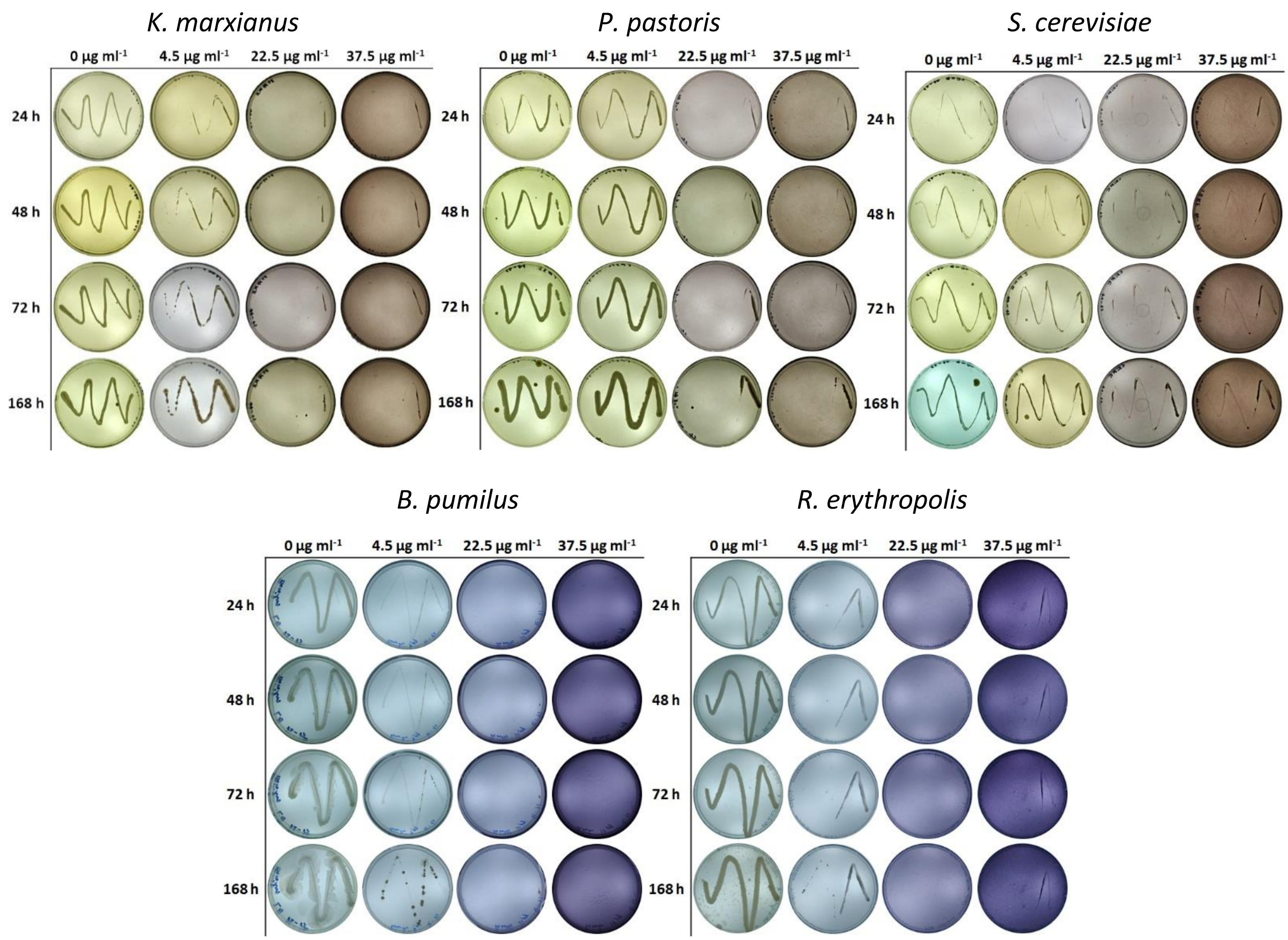


Figure S2. Results of Ferbamine concentration (0-37.5 µg ml^{-1}) influence on the growth of *K. lactis, P. pastoris, S. cerevisiae, B. pumilus* and *R. erythropolis* growth on 0-37.5 µg ml^{-1} Ferbamine and YEPG, LB or nutrient agar plates.

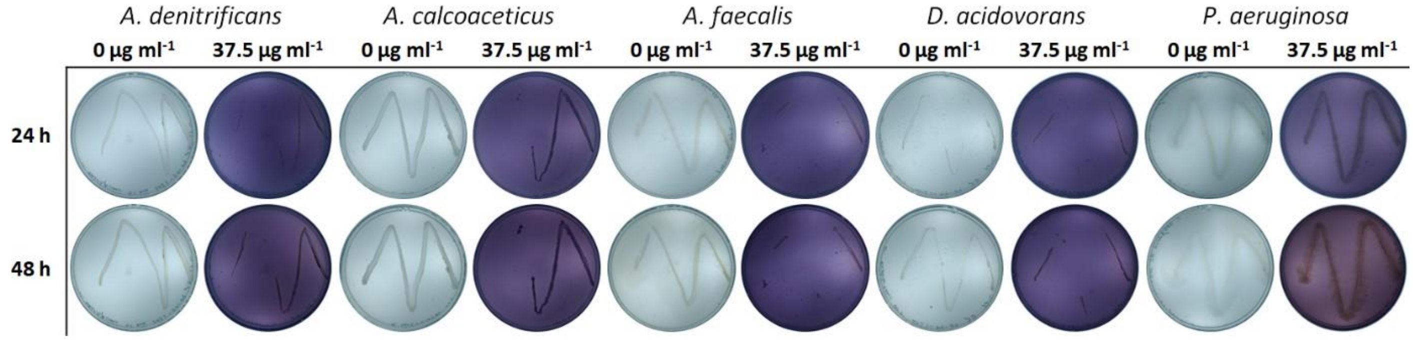


Figure S3. Results of Ferbamine concentration (0-37.5 µg ml^{-1}) influence on the growth of *R. erythropolis, A. denitrificans, D. acidovorans, P. aeruginosa, A. faecalis* and *A. calcoaceticus* growth 37.5 µg ml^{-1} Ferbamine-nutrient agar and control plates.

Liquid chromatography (LC) high-resolution mass spectrometry (HRMS) analysis of Ferbamine synthesis product. The chromatography and mass spectrometry were carried out at Institute of Chemistry, Vilnius University (Lithuania), using Dual-Esi Q-TOF 6250 spectrometer (Agilent Technologies, Santa Clara, USA). Data analysis was performed by the authors' group.

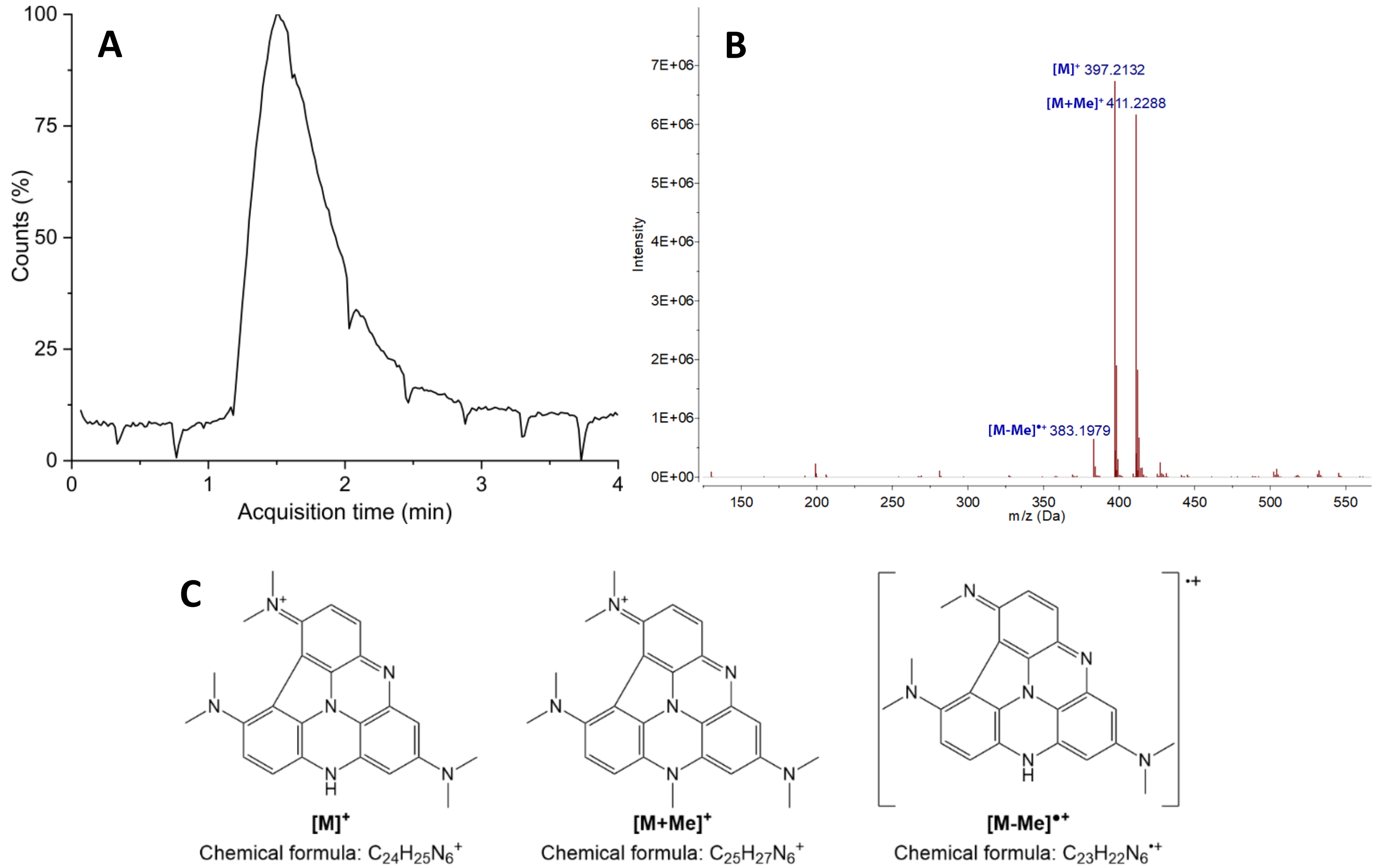


Figure S4. Results of Ferbamine LC-HRMS analysis. **A** – LC chromatogram; **B** – HRMS spectra at chromatography acquisition (retention) time 1.515 min; **C** – predicted chemical formula and assigned molecular structures to HRMS signals.

Attenuated total reflectance Fourier-transform infrared spectroscopy (ATR-FTIR) analysis of Ferbamine synthesis product.

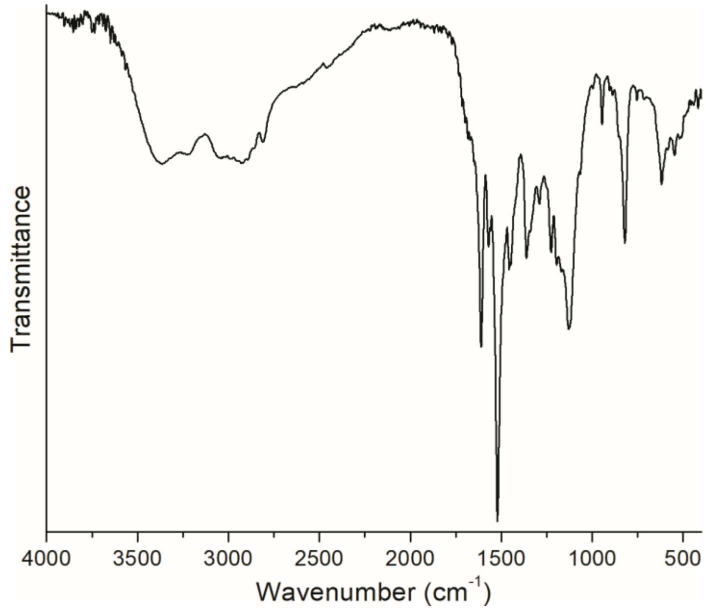


Figure S5. ATR-FTIR spectra of Ferbamine.

Ultraviolet-Visible (UV-VIS) light spectroscopy of native, partially reduced or oxidized Ferbamine solutions.

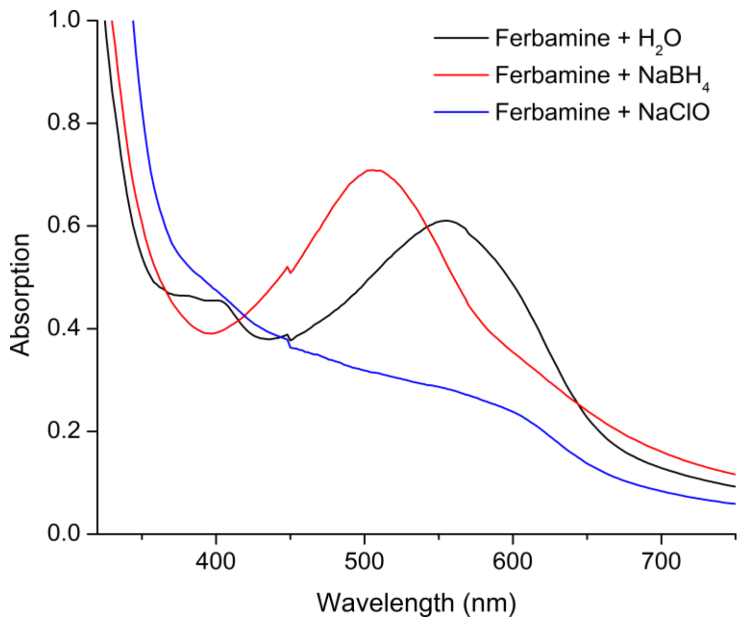
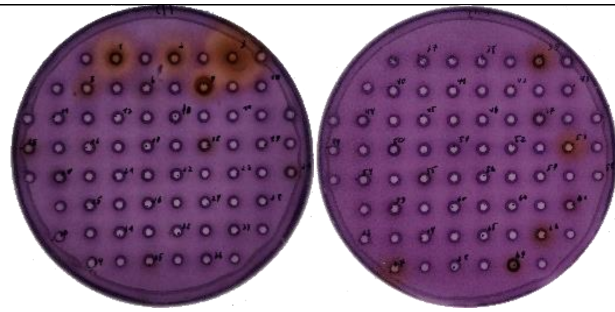


Figure S6. UV-VIS spectra of partially reduced (Ferbamine + $NaBH_4$), oxidized (Ferbamine + NaClO) and control (Ferbamine + H_2O) Ferbamine solutions.

Table S1. Result of laccase activity screening in the collection of extracts from terrestrial fungi.



Extract No.	Species	Assays: Metol [U ml^{-1}][a]	Assays: Ferbamine	Previously reported laccase[b]
3	*Clitocybe nebularis*	9.00	+++	Yes (Asav 2021)
39	*Psilocybe cubensis*	5.40	+++	Yes (Lenz et al. 2020)
6	*Cortinarius violaceus*	5.25	+	No (Chen et al. 2003)
2	*Macrolepiota procera*	4.80	+++	Yes (Luis et al. 2004)
50	*Gomphidius glutinosus*	3.90	-	Not tested
53	*Pleurotus eryngii*	2.70	+++	Yes (Guo et al. 2017)
1	*C. nebularis*	2.55	+++	Yes (Asav 2021)
67	*Rhodocybe gemina*	1.65	+	Not tested
15	*Tricholoma tigrinum*	1.65	+	Not tested
66	*Tricholoma saponaceum*	1.50	++	Yes (Khaund and Joshi 2014)
33	*Lentinula edodes*	1.13	-	Yes (Yano et al. 2009)
5	*Ganoderma lucidum*	1.05	++	Yes (Jeon et al. 2008)
55	*Gymnopilus penetrans*	0.90	+	No (Marr et al. 1986)
9	*Cortinarius caperatus* (*Rozites caperata*)	0.83	+++	Not tested
62	*Amanita vaginata*	0.83	+	Not tested
47	*Anthurus archeri* (*Clathrus archeri*)	0.75	+	Not tested
18	*Pleurotus ostreatus* (summer strain)	0.75	+	Yes (Park and Park 2014)
35	*Clitocybe geotropa*	0.68	+	Not tested
54	*Amanita spissa*	0.68	-	No (Chen et al. 2003)
70	*A. vaginata*	0.68	-	Not tested
51	*Tricholomopsis rutilans*	0.68	-	Not tested
59	*Clavariadelphus pistillaris*	0.60	+	Yes (Marr et al. 1986)
40	*Ramaria stricta*	0.53	-	Yes (ABTS, guaiacol), No (syringaldazine) (Erden et al. 2009)
20	*P. ostreatus* (winter strain)	0.45	+	Yes(Park and Park 2014)
36	*Russula alutacea*	0.45	+	Not tested
57	*Clitocybe geotropa*	0.38	-	Not tested
31	*Paxilllus atrotomentosus*	0.38	-	Not tested
69	*Cortinarius multiformis*	0.30	++	Not tested
32	*Clitocybe gibba*	0.30	-	Not tested

28	*Lactarius necator*	0.23	-	Not tested
63	*Amanita rubescens*	0.15	-	No (Hutchison 1990)
58	*Craterellus cornucopioides*	0.15	-	Not tested
43	*P. ostreatus*	0.15	-	Yes (Park and Park 2014)
42	*Xerocomus badius*	0.15	-	No (Hutchison 1990)
65	*Agaricus bisporus*	0.08	-	Yes (Mayolo-Deloisa et al. 2011)
41	*A. rubescens*	0.08	-	No (Hutchison 1990)
42	*A. rubescens*	0.08	-	No (Hutchison 1990)
46	*P. atrotomentosus*	0.08	-	Not tested
24	*Amanita excelsa*	-	+	Not tested
16	*Macrolepiota rachodes*	-	+	No (Luis et al. 2004)
8	Amanita citrina	-	-	No (Hutchison 1990)
61	*A. citrina*	-	-	No (Hutchison 1990)
64	*A. citrina*	-	-	No (Hutchison 1990)
37	*A. rubescens*	-	-	No (Hutchison 1990)
60	*A. spissa*	-	-	No (Chen et al. 2003)
68	*A. spissa*	-	-	No (Chen et al. 2003)
21	*Armillaria borealis*	-	-	Not tested
22	*Boletus badius*	-	-	Not tested
11	*Boletus erythropus*	-	-	Not tested
25	*Coprinus comatus*	-	-	Yes (Bao et al. 2013)
34	*Fomitopsis pinicola*	-	-	Yes (Park and Park 2014)
23	*Kuehneromyces mutabilis*	-	-	Yes (Gramss 2020)
14	*L. necator*	-	-	Not tested
19	*L. edodes*	-	-	Yes (Yano et al. 2009)
56	*Lycoperdon perlatum*	-	-	Yes(Harkin et al. 1974)
27	*Sparassis crispa*	-	-	Not tested
10	*Suillus bovinus*	-	-	No(Timonen and Sen 1998)
38	*Suillus granulatus*	-	-	Yes (Cullings et al. 2008)
17	*Suillus luteus*	-	-	No (Mucha 2011)
30	*Suillus variegatus*	-	-	Not tested
26	*Tricholoma sulphureum*	-	-	Not tested

[a] 1 U is defined as 1 μmol of Metol catalysed per 1 min, at pH 5.0 and 20 °C.

[b] Yes – laccase gene or activity has been previously reported in the species; No – species has been tested, but laccase genes or activity was not detected; Not tested – species has not been tested for laccase genes or activity.

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