

Supporting Information for

Thorough Utilization of Rice Husk: Metabolite Extracts for Silver Nanocomposite Biosynthesis and Residues for Silica nanomaterials Fabrication

Chun Song,^{*a1} Fang Ye,^{a1} Sijie Liu,^{*b} Fangfang Li,^b Yuxiong Huang,^c Rong Ji,^d Lijuan
Zhao^{*d}

^aInstitute of Ecological and Environmental Sciences, College of Environmental Sciences,
Sichuan Agricultural University, Chengdu, 611130, China

^bSchool of Materials Science and Engineering, Huazhong University of Science and
Technology, 1037 Luoyu Road, Wuhan 430074, China

^cShenzhen Environmental Science and New Energy Technology Engineering Laboratory,
Tsinghua-Berkeley Shenzhen Institute, Shenzhen 518055, China

^dState Key Laboratory of Pollution Control and Resource Reuse, School of Environment,
Nanjing University, Nanjing, 210023, China

**Corresponding author.* Email address: songchun@sicau.edu.cn (C. Song);
liusijie@hust.edu.cn (S. Liu); lzhao@nju.edu.cn (L. Zhao)

¹ C.S. and F.Y. contributed equally to this manuscript, considered as co-first authors.

Table S1 340 low molecular weight metabolites were identified and quantified in RH extracts

Metabolites	Quant Masses	Metabolites	Quant Masses	Metabolites	Quant Masses	Metabolites	Quant Masses	Metabolites	Quant Masses
(-)-Dihydrocarveol	169	4-Hydroxybenzoic acid	267	citric acid	147	kytorphin	263	palatinitol	259
1,2-Cyclohexanedione	227	4-hydroxybutyrate	233	citrulline	256	lactic acid	117	palmitic acid	132
1,5-Anhydroglucitol	125	4-hydroxycinnamic acid	249	coniferyl alcohol	235	Lactobionic Acid	259	p-Anisic acid	209
10-Hydroxydecanoic acid	227	4-Hydroxymandelic acid	267	Coprostan-3-one	267	lactulose	232	p-benzoquinone	121
11-beta-prostaglandin-F-2-alpha	199	4-Hydroxymandelonitrile	223	creatine degra	147	L-Allothreonine	73	Pelargonic acid	187
1-Hydroxy-2-naphthoic acid	227	4-Hydroxymethyl-3-methoxyphenoxycetic acid	249	Cumic Acid	221	L-dopa	218	Phenyl beta-D-glucopyranoside	225
1-Hydroxyanthraquinone	281	4-HYDROXYPYRIDINE	152	cuminic alcohol	207	leucine	158	phenylacetaldehyde	137
1-Kestose	217	4-methylumbelliferone	267	cycloleucine	156	Leucrose	204	Phenylacetic acid	91
1-Methyladenosine	213	4-nitrocatechol	194	Cysteinylglycine	176	Levoglucofan	217	phenylalanine	192
1-Methylhydantoin	258	4-nitrophenol	196	cytidine	240	L-glutamic acid	84	Phenylphosphoric acid phosphate	213
1-Monopalmitin	239	4-oxo-1H-quinoline-2-carboxylic acid	225	D-(glycerol 1-phosphate)	299	L-homoserine	263	phosphomycin	267
2,3-Dimethylsuccinic acid	147	4-Vinylphenol dimer	192	D-alanyl-D-alanine	83	linoleic acid	67	phosphomycin	84
2,4-diaminobutyric acid	202	5,6-dihydrouracil	171	D-Altrose	205	linolenic acid	240	Phytanic acid	159
2,6-Diaminopimelic acid	184	5-Aminoimidazole-4-carboxamide	173	D-Arabitol	217	L-Malic acid	174	Phytol	213
20alpha-Hydroxycholesterol	201	5-Aminovaleric acid	174	Dehydroascorbic Acid	173	Lumazine	249	picolinic acid	180
22-Ketocholesterol	173	5-aminovaleric acid lactam	105	D-erythronolactone	179	lysine	174	pimelic acid	199
24,25-dihydrolanosterol	174	5-Hydroxyindole-3-acetic acid	218	D-erythro-sphingosine	191	Lyxonic acid, 1,4-lactone	231	Pipecolinic acid	156
2-Amino-1-phenylethanol	174	5-hydroxytryptophan	263	D-galacturonic acid	334	Lyxose	103	proline	142
2-amino-2-methylpropane-1,3-diol	146	5-Methoxyindole-3-acetic acid	349	D-Glyceric acid	189	Maleamate	244	prostaglandin A2	199

2-Amino-2-norbornanecarboxylic acid	259	5-Methoxytryptamine	174	dibenzofuran	56	maleic acid	245	Prostaglandin E2	225
2-aminoethanethiol	130	5-Methylresorcinol	267	Digalacturonic acid	204	Maleimide	154	putrescine	174
2'-deoxyadenosine	207	6-Aminopenicillanic acid	188	Dihydroxyacetone	174	malonic acid	173	pyrogallol	239
2'-Deoxycytidine 5'-triphosphate dehydrated product	160	6-deoxy-D-glucose	117	Dithioerythritol	263	maltose	204	Pyruvic acid	174
2-Deoxy-D-galactose	142	6-hydroxy caproic acid	261	DL-dihydroxyserine	132	maltotriose	204	quinic acid	255
2-deoxy-D-glucose	172	6-hydroxy caproic acid dimer	187	dl-p-Hydroxyphenyllactic acid	314	mannitol	205	resveratrol	225
2-Deoxyerythritol	117	6-hydroxy caproic acid trimer	228	D-Talose	160	Melatonin	232	ribose	103
2'-deoxyguanosine	281	6-phosphogluconic acid	299	Elaidic acid	226	Melezitose	267	ribulose-5-phosphate	227
2-Deoxytetronic acid	233	8-Aminocaprylic acid	213	epsilon-Caprolactam	170	Menthone	82	Saccharic acid	333
2-Deoxyuridine	169	Abietic Acid	185	Ergosterol	210	methionine sulfoxide	128	scopoletin	183
2-Furoic Acid	125	acetanilide	199	Erythrose	205	methyl dodecanoate	185	Sedoheptulose	204
2-hydroxy-3-isopropylbutanedioic acid	259	Acetol	219	Ethanolamine	174	methyl octanoate	87	serine	132
2-Hydroxybiphenyl	227	Acetophenone	138	farnesol	123	Methyl Phosphate	241	Sinapyl alcohol	210
2-hydroxybutanoic acid	131	Acetylsalicylic Acid	121	ferulic acid	249	methyl trans-cinnamate	131	Sophorose	204
2-hydroxypyridine	152	Aconitic Acid	229	formononetin	174	Methyl yellow	121	sorbitol	132
2-Hydroxyvaleric acid	247	adenine	264	fructose	225	Methyl-beta-D-galactopyranoside	204	sorbose	84
2-ketoadipate	100	adenosine	230	fucose	160	Methylmalonic acid	86	stearic acid	132
2-ketobutyric acid	84	Adipamide	255	fumaric acid	245	Mono(2-ethylhexyl)phthalate	221	succinate semialdehyde	89
2-keto-isovaleric acid	186	adipic acid	275	Galactinol	204	Monoolein	201	succinic acid	247
2-Ketovaleric acid	89	ADRENOSTERONE	226	Galactonic acid	217	myo-inositol	267	sucrose	229
2-methylfumarate	259	alanine	116	Gallic acid	281	Myristic Acid	195	sulfuric acid	259
2-Methylglutaric Acid	123	Alizarin	180	Gentiobiose	204	N-(2-hydroxyethyl)-iminodiacetic acid	232	Synephrine	267
3,4-Dihydroxyphenyl glycol	267	Allantoic acid	259	gentisic acid	223	N-Acetyl-beta-D-mannosamine	84	Tagatose	263
3,4-Dihydroxypyridine	240	allose	249	Glucoheptonic acid	259	N-Acetyl-D-galactosamine	202	tartaric acid	219
3,5-Dihydroxyphenyl glycine	223	alpha-D-glucosamine 1-phosphate	98	gluconic acid	205	N-Acetylisatin	233	Tartronic acid	102
3,6-Anhydro-D-galactose	231	alpha-ketoisocaproic	183	Gluconic lactone	160	N-Acetyl-L-glutamic acid	288	terephthalic acid	221

3-Aminoisobutyric acid	102	acid Aminoxyacetic acid	235	glucose	244	N-Acetyl-L-leucine	228	Tetradecanoic acid, methyl ester	199
3-hydroxy-3-methylglutaric acid	199	Aniline-o-sulfonic acid	182	Glucose-1-phosphate	217	N-Acetyl-N-formyl-5-methoxykynurenamine	58	Threitol	267
3-Hydroxyanthranilic acid	222	asparagine	159	glucose-6-phosphate	314	N-Acetyltryptophan	202	Threonic acid	220
3-hydroxybenzyl alcohol	179	aspartic acid	232	glucuronic acid	160	N-alpha-Acetyl-L-ornithine	257	threonine	219
3-hydroxybutyric acid	191	Atrazine-2-hydroxy	242	glutamic acid	246	naringenin	267	thymidine	259
3-hydroxy-L-proline	230	azelaic acid	201	glutamine	155	N-Carbamylglutamate	246	thymine	255
3-Hydroxynorvaline	131	benzoic acid	179	Glutaric Acid	263	N-formyl-L-methionine	233	toluenesulfonic acid	229
3-Hydroxypalmitic acid	233	Benzoylformic acid	104	glycerol	205	Nicotianamine	249	trans-4-hydroxy-L-proline	263
3-hydroxyphenylacetic acid	245	beta-Alanine	248	glycine	174	nicotinic acid	180	trehalose	191
3-Hydroxypropionic acid	219	beta-Mannosylglycerate	204	glycocyanine	263	Nicotinoylglycine	106	trehalose-6-phosphate	227
3-Hydroxypyridine	152	biotin	242	glycolic acid	147	N-Methyl-DL-alanine	130	tryptophan	202
3-Methylamino-1,2-propanediol	86	butyraldehyde	145	gly-pro	174	N-Methyl-L-glutamic acid	70	tyramine	239
3-Phenyllactic acid	193	caprylic acid	201	guaiacol	181	N-methyltryptophan	144	tyrosine	226
4,2',4'-trihydroxychalcone	222	carbamoyl-aspartic acid	257	Guanidinosuccinic acid	235	noradrenaline	235	uracil	241
4',5-dihydroxy-7-methoxyisoflavone	232	Carbazole	255	guanine	352	Norleucine	86	uridine	217
4-Acetylbutyric acid	114	Carnitine	159	guanosine	245	O-acetylserine	102	valine	144
4-aminobutyric acid	174	cellobiose	249	Hesperitin	209	octanal	226	vanillin	223
4-Androsten-11beta-ol-3,17-dione	267	Cetadiol	253	indole-3-acetamide	202	oleic acid	117	Vanillylmandelic acid	297
4-Androsten-19-ol-3,17-dione	263	cholesterol	136	Indolelactate	259	ornithine	244	xanthine	267
4-Androstene-3,17-dione	169	cholic acid	67	inosine	259	O-Succinylhomoserine	128	xylitol	117
4-Cholesten-3-one	222	cis-gondoic acid	267	isocitric acid	245	oxalic acid	147	xylose	234
4-hydroxy-3-methoxybenzoic acid;	267	Citraconic acid	259	Isoleucine	158	oxamic acid	190	palatinitol	259
4-hydroxybenzaldehyde	223	Citraconic acid deagl	89	Isomaltose	160	oxoproline	156	palmitic acid	132