

Compound	Sources	$[\alpha]_D^{25}$ ; $^{\circ} \cdot \text{dm}^{-1} \cdot \text{g}^{-1} \cdot \text{cm}^3$	Form	UV ; $\lambda_{\text{max}}$ (nm) ( $\epsilon$ (L.mol <sup>-1</sup> .cm <sup>-1</sup> ))	Mass Spectrometry data m/z (relative %) (major fragments)	[Lit]
<b>1a</b>	<i>Bunodophoron patagonicum</i> (acetone extract of ascomata)		Cream crystals from acetone/toluene		301* (13), 300 (M <sup>+</sup> , 76), 267 (25)	42
<b>1b</b>			Cream crystals from dichloromethane/light petroleum		314* (M <sup>+</sup> , 100), 283 (28), 267 (27).	
<b>1f</b>			Colorless microcrystals from 40% ethyl acetate/5% acetic acid/light petroleum		286* (M <sup>+</sup> , 4), 242 (100), 227 (71)	
<b>1g</b>			Pale yellow crystals from dichloromethane/light petroleum		301* (4), 300 (23), 269 (20), 268 (100), 168 (29), 149 (33), 137 (55).	8
<b>1c</b>	Cultured mycobiont of <i>Evernia esoredosia</i>		Cream crystals from acetone/light petroleum	241 (4.7), 257 (4.5), 309 (4.2) (MeOH)	EIMS (70eV) 272.0668 [M] <sup>+</sup> , calcd for C <sub>15</sub> H <sub>12</sub> O <sub>5</sub> : 272.0683 272 (43), 254 (100), 228 (63), 198 (41)	40
	<i>Bunodophoron patagonicum</i> (ascomata)					42
	Cultured mycobiont of <i>Usnea orientalis</i>					19
<b>1e</b>	Cultured mycobiont of <i>Usnea orientalis</i>		Cream crystals from 10% aqueous acetone	241 (4.7), 259 (4.6), 309 (4.3) (EtOH)	EIMS (70eV) 270 (12), 241 (22), 228 (23), 227 (26), 213 (62), 199(35), 185 (100).	19
<b>1d</b>	Cultured mycobiont of <i>Stereocaulon japonicum</i>		Yellow crystals from benzene/acetone	241 (4.54), 287 sh (4.05), 372 (3.84) (MeCN)	EIMS (70eV) 286.0482 [M] <sup>+</sup> , calcd for C <sub>15</sub> H <sub>10</sub> O <sub>6</sub> : 286.0477; 286 (26), 268 (67), 242 (100), 213 (38), 128 (27).	41
<b>2a</b>	<i>Crocynaea membranacea</i> (= <i>Pannaria lanuginosa</i> ) <i>Lepraria membranacea</i> <i>Schizopelte californica</i> (= <i>Combea californica</i> ) <i>Psoroma tenue</i>		Colorless needles from aqueous acetone	247 (4.52), 318 (3.92) (MeOH)	316* (M <sup>+</sup> ,13), 298 (43),272 (100), 254 (79), 228 (97), 198 (37), 114 (26)	8 10 17 21
<b>2b</b>	<i>Schizopelte californica</i> (Syn. <i>Combea californica</i> ) <i>Roccella hypomecha</i>		Colorless crystals (EtOAc/ <i>n</i> -hexane)		EIMS (70 eV) 286 (M-CO <sub>2</sub> , 55), 268 (37), 253 (30), 242 (44),227 (59), 115 (21), 91 (100), 77 (24), 63 (27), 55 (52), 51 (35); positive FAB: m/z 331 (M+H <sup>+</sup> , 26)	10 53
<b>2c</b>	<i>Roccella capensis</i> , <i>Leproloma diffusum</i> , <i>L. vouauxii</i> , <i>Schizopelte californica</i>		Tuft needles (CHCl <sub>3</sub> /MeOH)	247 (4.78), 275 (4.39), 303 (4.11), 314 (4.03) (MeOH)	330* (M <sup>+</sup> , 2), 254 (52), 198 (24), 57 (43), 43 (100)	17 53
<b>2d</b>	<i>Schizopelte californica</i> <i>Leproloma vouauxii</i>		Pale buff crystals (acetone/cyclohexane)	259-264, sh 280-285, sh 305-315 (MeOH)	330 (M <sup>+</sup> , 8), 312 (32), 286 (100), 255 (59), 226 (40), 127 (26), 44 (65)	42 55

	<i>Leprocaulon tenellum</i>				8	
<b>2e</b>	<i>Roccella capensis</i>		Needles from MeOH		371* (96, [M -H ] <sup>-</sup> ), 357 (79), 342 (100), 327 (27), 284 (30), 283 (27), 225 (29).	22
<b>2f</b>	<i>Schizopelte californica</i> <i>Roccella capensis</i> <i>Combea mollusca</i>		Needles from acetone	236 (4.62), 270 (4.29), 286 (4.26), 302 (4.07), 312 (4.12) (MeOH)	358* (M <sup>+</sup> ,100), 327 (40), 311 (20)	17 22 23
<b>2g</b>	<i>Schizopelte californica</i>		Colorless crystals from EtOAc/light petroleum		358* (M <sup>+</sup> ,100), 327 (17)	17
<b>2h</b>	<i>Roccella hypomecha</i>		Needles from acetone/MeOH		344* (M <sup>+</sup> ,19), 312 (100), 147 (26)	24
<b>3</b>	<i>Lepraria diffusa</i> (= <i>Leproloma diffusum</i> )		Buff needles from acetone/cyclohexane		346* (M <sup>+</sup> , 0.2), 97 (26), 83 (36), 69 (53), 67 (21), 57 (100)	18
<b>4a</b>	<i>Cladonia floerkeana</i> <i>C. squamulosa</i> <i>C. miniata</i> , <i>C. rangiferina</i> <i>C. didyma</i> , <i>C. incrassata</i> <i>Rocella hypomecha</i>		Needles from <i>n</i> -hexane	243 (4.66), 249 (4.59), 256 (4.55), 262 (4.48), 310 (4.28) (MeOH)	370* (M <sup>+</sup> , 2), 342 (74), 326 (25), 324 (87), 299 (74), 298 (100), 283 (30), 269 (62), 254 (53), 241 (53), 228 (53)	33-36 54
<b>4b</b>	<i>C. floerkeana</i> , <i>C. incrassata</i> , <i>C. squamulosa</i> , <i>C. didyma</i>		White flakes from CHCl <sub>3</sub> /cyclohexane		399* (12), 398 (M <sup>+</sup> , 45), 381 (28), 380 (100), 354 (41), 267 (20), 258 (21)	36, 54
<b>4c</b>	<i>Cladonia didyma</i>		Colorless needles from CH <sub>2</sub> Cl <sub>2</sub> /light petroleum		370* (M <sup>+</sup> ,18), 352 (35), 326 (100)	36
<b>4d</b>	<i>Cladonia didyma</i> <i>C. cristatella</i> , <i>C. macilentia</i> , <i>C. strepsilis</i>		Crystals from CHCl <sub>3</sub> / <i>n</i> -heptane		342* (M <sup>+</sup> ,35), 324 (100), 298 (26)	10 36 37
<b>5a</b>	<i>Letrouitia vulpina</i>				HRMS C <sub>20</sub> H <sub>17</sub> ClO <sub>5</sub> M <sup>+</sup> - H <sub>2</sub> O found 372.0768/374.0747 calcd 372.0765/374.0735 EIMS 392 (1.5), 390 (M <sup>+</sup> , 5), 374 (35), 372 (100), 357 (40)	10, 25
<b>5b</b>	<i>Letrouitia vulpina</i>				HRMS C <sub>22</sub> H <sub>24</sub> O <sub>6</sub> M <sup>+</sup> found 384.1571 calcd 384.1573 EIMS 384 (M <sup>+</sup> , 42), 366 (100), 340 (25), 296 (43)	10, 25
<b>5c</b>	<i>Letrouitia vulpina</i>				HRMS C <sub>22</sub> H <sub>23</sub> ClO <sub>6</sub> M <sup>+</sup> found 418.1186/420.1159 calcd 418.1183/420.1154 EIMS 418 (M <sup>+</sup> , 26), 402 (35), 400 (100)	10, 25
<b>6a</b>	<i>Phyllopsora haemophaea</i> , <i>P. furfuracea</i>		Needles from MeOH	241 (4.66), S 264 (4.51), 271 (4.53), sh 303 (3.96), 312 (4.08), 338 (3.80) (MeOH)	468* (M <sup>+</sup> ,6), 450 (100), 424 (20), 352 (80), 334 (40), 307 (46)	8 38

<b>6b</b>	<i>Letrouitia vulpina</i>				HRMS C <sub>24</sub> H <sub>24</sub> O <sub>6</sub> M <sup>+</sup> - H <sub>2</sub> O found 408.1576 calcd 408.1573 EIMS 426 (M <sup>+</sup> , 12), 409 (24), 408 (87), 338 (55), 320 (38), 293 (30), 265 (70), 252 (20), 71 (100)	10, 25
<b>6c</b>	<i>Letrouitia vulpina</i>				HRMS C <sub>24</sub> H <sub>23</sub> ClO <sub>6</sub> M <sup>+</sup> - H <sub>2</sub> O found 442.1193/444.1171 calcd 442.1183/444.1154 EIMS 460 (M <sup>+</sup> , 4), 444 (20), 442 (57), 372 (52), 354 (29), 320 (35), 265 (68), 71 (100)	10, 25
<b>6d</b>	<i>Letrouitia vulpina</i>				HRMS C <sub>22</sub> H <sub>22</sub> O <sub>7</sub> M <sup>+</sup> found 398.1370 calcd 398.1366 EIMS 398 (M <sup>+</sup> , 56), 354 (28), 326 (25), 310 (100), 292 (43), 265 (87)	10, 25
<b>6e</b>	<i>Letrouitia vulpina</i>				HRMS C <sub>22</sub> H <sub>21</sub> ClO <sub>7</sub> M <sup>+</sup> found 432.0978/434.0955 calcd 432.0976/434.0946 EIMS 432 (M <sup>+</sup> , 18), 414 (50), 344 (35), 310 (100)	10, 25
<b>7a</b>	<i>Cladonia strepsilis</i> <i>Stereaulocolon azureum</i>		Prism or needles from acetic acid	242 (4.42), 256 (4.23), sh, 274 (4.06), sh 298 (4.01), 308 (4.10), sh 330 (3.65) (MeOH)	EIMS (70 eV), 270 (M <sup>+</sup> , 100), 242 (22), 241 (97), 213 (21), 149 (17), 127 (28).	9 26, 27
<b>7b</b>	<i>Alectoria sarmentosa</i>		Colorless needles from EtOH/benzene	229 sh (4.50), 243 (4.51), 260 (4.45), 295 (4.11), 329 (3.88) 305 (4.17), (MeOH)	EIMS 286 (M <sup>+</sup> , 62), 240 (26), 212 (100) 184 (22), 155 (22), 149 (21), 128 (23), 77 (24), 69 (40), 44 (52)	26
<b>7c</b>	<i>Haematomma ochroleucum</i>		Needles from EtOH	247 (4.45), sh 260 (4.32), sh 284 (4.09), 330 (3.57) (MeOH)	314* (M <sup>+</sup> ), 298, 270, 241	8, 9
<b>7d</b>	<i>Psoroma tenue</i>		Needles from pyridine/ acetic acid = 1:1		EIMS 328 (M <sup>+</sup> ), 299, 270, 241	21
<b>8a</b>	Cultured mycobiont of <i>Lecanora iseana</i>		Colorless crystalline solid	217.5 (4.26), 229 (4.31), 241.5 sh (4.19), 257.5 sh (3.90), 264.5 (3.93), 298.5 sh (4.00), 306.5 (4.02) (MeOH)	HR-EIMS calc. for C <sub>14</sub> H <sub>11</sub> <sup>35</sup> ClO <sub>3</sub> [M] <sup>+</sup> : 262.0397. Found: 262.0378. Calc. for C <sub>14</sub> H <sub>11</sub> <sup>37</sup> ClO <sub>3</sub> [M] <sup>+</sup> : 264.0368. Found: 264.0377.	43
<b>8b</b>	Cultured mycobiont of <i>Lecanora iseana</i>		Colorless crystalline solid	220 (4.41), 232.5 (4.47), 243 sh (4.37), 259 sh (4.01), 267 (4.08), 296 sh (4.12), 302 (4.13) (MeOH).	HR-EIMS calc. for C <sub>14</sub> H <sub>10</sub> <sup>35</sup> Cl <sub>2</sub> O <sub>3</sub> [M] <sup>+</sup> : 296.0007. Found: 296.0017. Calc. for C <sub>14</sub> H <sub>10</sub> <sup>35</sup> Cl <sup>37</sup> ClO <sub>3</sub> [M] <sup>+</sup> : 297.9978. Found: 297.9935. Calc. for C <sub>14</sub> H <sub>10</sub> <sup>37</sup> Cl <sub>2</sub> O <sub>3</sub> [M] <sup>+</sup> : 299.9948. Found: 299.9931.	43

<b>9a</b>	Cultured mycobiont of <i>Lecanora cinereocarnea</i> <i>Aspergillus versicolor</i> isolated from <i>Lobaria quercizans</i>		Colorless crystalline solid	219 (4.51), 226 (4.52), 239.5 (4.35), 257 sh (4.09), 263 (4.12), 302 (4.23), 310 (4.23) (MeOH)	HR-EIMS calcd for C <sub>14</sub> H <sub>12</sub> O <sub>3</sub> [M] <sup>+</sup> : 228.0787. Found: 228.0781.	44 49
<b>9b</b>	Cultured mycobiont of <i>Lecanora cinereocarnea</i>		Colorless crystalline solid	205 (4.37), 223 (4.55), 228 (4.57), 243 sh (4.35), 263 (4.09), 306.5 (4.25), 314.5 (4.25) (MeOH)	HR-EIMS calcd for C <sub>14</sub> H <sub>11</sub> <sup>35</sup> ClO <sub>3</sub> [M] <sup>+</sup> : 262.0397. Found: 262.0374; calc. for C <sub>14</sub> H <sub>11</sub> <sup>37</sup> ClO <sub>3</sub> [M] <sup>+</sup> : 264.0368. Found: 264.0357.	44
<b>9c</b>	Cultured mycobiont of <i>Lecanora cinereocarnea</i>		Colorless crystalline solid	231 (4.60), 245 (4.35), 262.5 (4.02), 309 sh (4.27), 317.5 (4.32) (MeOH)	HR-EIMS calcd. for C <sub>14</sub> H <sub>10</sub> <sup>35</sup> Cl <sub>2</sub> O <sub>3</sub> [M] <sup>+</sup> : 296.0007. Found: 296.0016; calc. for C <sub>14</sub> H <sub>10</sub> <sup>35</sup> Cl <sup>37</sup> ClO <sub>3</sub> [M] <sup>+</sup> : 297.9978. Found: 297.9962; calc. for C <sub>14</sub> H <sub>10</sub> <sup>37</sup> Cl <sub>2</sub> O <sub>3</sub> [M] <sup>+</sup> : 299.9948. Found: 299.9936.	44
<b>9d</b>	Cultured mycobiont of <i>Lecanora cinereocarnea</i>		Colorless crystalline solid	219 (4.45), 225.5 (4.46), 239 sh (4.30), 257 sh (4.04), 263 (4.07), 300.5 (4.19), 308.5 (4.23) (MeOH)	HR-EIMS calcd for C <sub>15</sub> H <sub>13</sub> O <sub>3</sub> [M] <sup>+</sup> : 242.0944. Found: 242.0961	44
<b>9e</b>	Cultured mycobiont of <i>Lecanora cinereocarnea</i>		Colorless crystalline solid	227 (4.26), 241 sh (4.18), 255 (3.88), 263 (3.91), 305 (4.07), 312.5 (4.06); (MeOH)	HR-EIMS calcd. for C <sub>15</sub> H <sub>14</sub> <sup>35</sup> ClO <sub>3</sub> [M] <sup>+</sup> : 276.0554. Found: 276.0577; calc. for C <sub>15</sub> H <sub>14</sub> <sup>37</sup> ClO <sub>3</sub> [M] <sup>+</sup> : 278.0524. Found: 278.0503.	44
<b>10</b>	Marine-derived fungus <i>Alternaria</i> sp.		Yellow amorphous powder	338, 260, 238	HR-ESIMS 289 [M + H] <sup>+</sup> ; 289.0708 (calcd for C <sub>15</sub> H <sub>13</sub> O <sub>6</sub> , 289.0712)	45
<b>11a</b>	Marine sponge-derived ascomycete Super1F1-09		Yellowish white powder	215 (4.11), 266 (4.03), 286 (4.01), 310 (4.09) (MeOH)	HR-ESIMS 227.0712 [M-H] <sup>-</sup> (calcd for C <sub>14</sub> H <sub>12</sub> O <sub>3</sub> , 227.0714).	46
<b>11b</b>			Yellowish white powder	216 (4.11), 267 (4.08), 286 (4.02), 311 (4.13) (MeOH)	HR-ESIMS 244.0736 [M-H] <sup>-</sup> (calcd for C <sub>14</sub> H <sub>12</sub> O <sub>3</sub> , 243.0663).	46
<b>11c</b>			Yellowish white powder	219 (4.13), 260 (4.03), 305 (4.07), 335 (4.19) (MeOH)	HR-ESIMS 258.0528 [M-H] <sup>-</sup> (calcd for C <sub>14</sub> H <sub>12</sub> O <sub>3</sub> , 257.0455).	46
<b>12a</b>	<i>Aspergillus karnatakaensis</i>		Grayish-white solid	314.1 (4.07), 301.8 (3.92), 286.9 (4.03), 267.1 (4.07), 227.2 (4.45) (MeOH)	EIMS 314 (M <sup>+</sup> , 32), 296 (35), 241 (100)	48
<b>12b</b>	<i>Aspergillus karnatakaensis</i>		White solid	364.5 (2.93), 353.0 (2.94), 346.9 (2.94), 313.9 (3.99), 303.4 (3.83), 286.5 (3.98), 267.0 (4.04), 227.7 (4.45) (MeOH)	EIMS 296 (M <sup>+</sup> , 83), 241 (100)	48
<b>13</b>	<i>Aspergillus versicolor</i> isolated from <i>Lobaria quercizans</i>		Brown amorphous solid	231 (4.10) (MeOH)	HR-ESIMS 257.0818 ([M-H] <sup>-</sup> , C <sub>15</sub> H <sub>13</sub> O <sub>4</sub> ; calcd. 257.0808).	49
<b>14</b>	Unidentified culture				297 [M+H] <sup>+</sup> , C <sub>19</sub> H <sub>20</sub> O <sub>3</sub>	56

<b>15a</b>	<i>Preussia</i> sp. from <i>Enantia chlorantha</i>		Yellow amorphous powder	274, 295 and 312 (MeOH)	345.09688 (calcd for C <sub>18</sub> H <sub>17</sub> O <sub>7</sub> , 345.09743).	47
<b>15b</b>	<i>Preussia</i> sp. from <i>Enantia chlorantha</i>		Yellow amorphous powder	273, 293 and 315 (MeOH)	HR-EIMS 331.0812 ; C <sub>17</sub> H <sub>15</sub> O <sub>7</sub> , calcd 331.0817.	47
<b>16a, 17a</b>	Various lichens	+ 495 or - 495(CHCl <sub>3</sub> , c 1.00)	Yellow prisms from CHCl <sub>3</sub> -EtOH	220 (4.44), 290 (4.45), sh 325 (3.85) (EtOH)	344* (M <sup>+</sup> , 60), 260 (70), 233 (100), 217 (20)	8
<b>16b, 17b</b>	(+) from <i>Cladonia mitis</i> and (-) from <i>Cladonia pleurota</i> and <i>Leprocaulon microscopicum</i>	+ 495 or - 495(CHCl <sub>3</sub> , c 1.00)	Yellow prisms from CHCl <sub>3</sub> -MeOH	232 (4.42), 282 (4.47), 327nm (3.91) (EtOH)	344* (M <sup>+</sup> , 62), 260 (100), 233 (83), 217 (38)	8 39 59
<b>17c</b>	<i>Cercosporidium henningsii</i> <i>Phoma</i> species	- 26 (CHCl <sub>3</sub> , c 1.6)	Yellow crystals from EtOAc		HR-EIMS 331.0691 ; C <sub>16</sub> H <sub>13</sub> NO <sub>7</sub> , calcd 331.0692. EIMS 331 (M <sup>+</sup> , 80), 247 (30), 230 (96), 220 (54), 203 (100)	50 51
<b>17d</b>	<i>Cercosporidium henningsii</i>	- 423 (MeCN, c 0.21)	Yellow powder from EtOAc		HR-EIMS 345.0847 ; C <sub>16</sub> H <sub>13</sub> NO <sub>7</sub> , calcd 345.0847. EIMS 346 (M <sup>+</sup> , 8), 345 (47), 261 (21), 244 (77), 234 (48), 217 (100)	11
<b>18</b>	<i>Parmelia perlata</i>		Yellow powder from EtOAc		FAB-MS 346 (M <sup>+</sup> ), 330, 260, 233, 165	28
<b>19</b>	<i>Usnea longissima</i>	Data in chinese	Data in chinese		344 (M <sup>+</sup> ), 328, 260, 233,	29
<b>20a</b>	<i>Stereocaulon alpinum</i> <i>Ramalina terebrata</i>	+39 (c 0.77, CH <sub>2</sub> Cl <sub>2</sub> )	Yellow gum	297 (4.1), 216 (4.0) (MeOH)	HR-EIMS 488.1552 (M +H) <sup>+</sup> ; C <sub>24</sub> H <sub>26</sub> NO <sub>10</sub> , calcd 488.1557.	30 60
<b>20b, 20c</b>	<i>Stereocaulon alpinum</i> <i>Ramalina terebrata</i>	+159 (c 0.46, MeOH) or +162 (c 0.43, MeOH)	Yellow gum	297 (4.2), 216 (4.3) (MeOH)	HR-EIMS 473.1392 or 473.1393 (M +H) <sup>+</sup> ; C <sub>23</sub> H <sub>24</sub> NO <sub>10</sub> , calcd 474.1400.	30 60
<b>21a</b>	<i>Lecanora rubina</i> <i>Rhizoplaca chrysoleuca</i> <i>Leprocaulon microscopicum</i>	- 231 (CHCl <sub>3</sub> , c 0.875)	Weak yellowish plates from MeOH	230 (4.30), 282 (4.45) 337 (3.47) (MeOH)	HR-ESIMS 375.1086 C <sub>19</sub> H <sub>19</sub> O <sub>8</sub> (M-H) <sup>-</sup> calcd 375.1085. 376* (M <sup>+</sup> , 100), 361 (30), 260 (25), 250 (30), 235 (45), 234 (30), 233 (48)	31 39 59
<b>21b</b>	<i>Rhizoplaca chrysoleuca</i> <i>Phoma</i> sp	- 218 (CHCl <sub>3</sub> , c 0.293)	Yellow prisms from MeOH	205 (3.95), 230 (4.13), 284 (4.33), sh 340 (3.30) (MeOH)	376* (M <sup>+</sup> , 100), 361, 345, 344, 329, 301, 292, 279, 260, 250, 236, 235, 234, 233, 219, 217, 215, 207, 191, 167, 149, 143, 123, 108, 94	39 50
<b>21c</b>	<i>Haematomma hilare</i> <i>Leprocaulon microscopicum</i>		Yellow powder	229, 277, 346 (MeOH)	390 (M <sup>+</sup> , 24), [M-C <sub>6</sub> H <sub>6</sub> O <sub>3</sub> ] <sup>+</sup> 264 (40); [M-CH <sub>3</sub> OH-C <sub>5</sub> H <sub>3</sub> O <sub>3</sub> ] <sup>+</sup> 247 (44)	10

<b>22a</b>	<i>Haematomma flexuosum</i> , <i>H. matogrossense</i> <i>Mycosphaerella nawae</i>	+ 146 (CHCl <sub>3</sub> , <i>c</i> 0.15)	Pale yellow crystals	335 (sh, 3.46), 280 (4.38), 228 (4.23) (MeOH)	EIMS 376 (M <sup>+</sup> , 37), 250 (53), 235 (100)	32 63
<b>22b</b>	<i>Haematomma flexuosum</i> , <i>H. matogrossense</i> <i>Mycosphaerella nawae</i>	- 91 (CHCl <sub>3</sub> , <i>c</i> 0.18)	Pale yellow crystals	223 (4.30), 281 (4.44), 340 (sh, 3.50) (MeOH)	HR-EIMS 376.1193 ; C <sub>19</sub> H <sub>20</sub> O <sub>8</sub> , calcd 376.1158 EIMS 376 (M <sup>+</sup> , 36), 250 (81), 235 (100)	32 63
<b>22c</b>	<i>Phoma</i> species	- 0.006 (MeOH, 0.08 g/100 mL)	Light tan crystals from EtOAc:MeOH, 1:9	282 (4.8), 240 (3.7), 204 (5.3) (MeOH)	HR-EIMS 390.1324 ; C <sub>20</sub> H <sub>22</sub> O <sub>8</sub> , calcd 390.1315 EIMS 390 (M <sup>+</sup> , 26), 264 (53), 249 (100), 247 (51)	50
<b>22d</b>	<i>Mycosphaerella nawae</i>	+ 106 (CH <sub>3</sub> CN, <i>c</i> 0.3)	Colorless crystals	225 (4.15), 280 (4.40), 340 (sh, 3.36) (MeOH)	EIMS 392 (M <sup>+</sup> , 19), 250 (72), 235 (100)	50
<b>23a</b>	<i>Lecanora iseana</i>		Colorless crystalline solid	214.5 (4.51), 228.5 (4.48), 244.5 (4.41), 257 (4.41), 264 sh (4.39), 299.5 sh (4.28), 308 (4.31) (MeOH)	HR-EIMS 454.1414 ; C <sub>28</sub> H <sub>22</sub> O <sub>6</sub> [M] <sup>+</sup> , calcd 454.1417	43
<b>23b</b>	<i>Lecanora iseana</i>		Colorless crystalline solid	217.5 (4.52), 229.5 (4.54), 242 (4.54), 256 sh (4.41), 263.5 sh (4.29), 300.5 sh (4.35), 310.5 (4.40) (MeOH)	HR-EIMS 454.1420 ; C <sub>28</sub> H <sub>22</sub> O <sub>6</sub> [M] <sup>+</sup> , calcd 454.1417	43

\* Ionization method for mass spectrometry not indicated

**Table S1.** Sources and physico-chemical properties of dibenzofurans from lichens and ascomycetes.

Compound*	Microbial strain	Method	Antimicrobial activity	[Lit]	
4a	Bacteria	<i>Staphylococcus aureus</i> Terashima strain	Broth dilution assay	Highest dilution at which growth is inhibited : 80,000	97
		<i>Escherichia coli communior</i> **		NA	91
		<i>Staphylococcus aureus</i> COL (MRSA)	Disk diffusion method (10 mg/mL)	Inhibition zone: 28 mm	34
		<i>Enterococcus faecium</i> (Van A) (VRE)		Inhibition zone: 22 mm	
		<i>Staphylococcus aureus</i> ATCC 6538		Broth microdilution assay (MIC)	7.5 µg/mL
	Mycobacteria	<i>Mycobacterium tuberculosis</i> **	Broth dilution assay	Highest dilution at which growth is inhibited : 40,000	92
		<i>Mycobacterium smegmatis</i> ATCC 607		Highest dilution at which growth is inhibited : 160,000 (after 3 and 7 days incubation) and 80,000 (14 days incubation)	
		<i>Mycobacterium tuberculosis</i> H37Rv		Highest dilution at which growth is inhibited : 20,000 (Sauton's medium, 4 weeks incubation) and < 20,000 (Kirchner's, 3 weeks incubation)	
	4b	Bacteria	<i>Staphylococcus aureus</i> COL (MRSA)	Disk diffusion method (10 mg/mL)	Inhibition zone: 17 mm
<i>Enterococcus faecium</i> (Van A) (VRE)			Inhibition zone: 22 mm		
		<i>Staphylococcus aureus</i> ATCC 6538	Broth microdilution assay (MIC)	7.5 µg/mL	33
7a	Bacteria	<i>Staphylococcus aureus</i> Terashima strain	Broth dilution assay	Highest dilution at which growth is inhibited : < 5,000	97
	Mycobacteria	<i>Mycobacterium tuberculosis</i> **		Highest dilution at which growth is inhibited : < 10,000	
7b	Bacteria	<i>Staphylococcus aureus</i> ATCC 13709	Agar-dilution streak methodology	25 µg/mL	26
		<i>Escherichia coli</i> ATCC 9637		NA	
		<i>Salmonella gallinarum</i> ATCC 9184		NA	
		<i>Klebsiella pneumoniae</i> ATCC 10031		NA	
		<i>Pseudomonas aeruginosa</i> ATCC 27853		NA	
	Mycobacteria	<i>Mycobacterium smegmatis</i> ATCC 607		25 µg/mL	
	Yeasts	<i>Candida albicans</i> ATCC 10231		NA	
9a	Yeasts	<i>Candida albicans</i> **	Microdilution method	64 µg/mL	49
10	Bacteria	<i>Staphylococcus aureus</i> **	Agar diffusion method (MIC)	100 µg/mL	45
11a	Bacteria	<i>Staphylococcus aureus</i> ATCC 29213	Broth microdilution assay (MIC)	50 µg/mL	46
		<i>Escherichia coli</i> ATCC 8739		NA	

	Mycobacteria	<i>Mycobacterium marinum</i> ATCC BAA535		25 µg/mL		
<b>11b, 11c</b>	Bacteria	<i>Staphylococcus aureus</i> ATCC 29213		NA		
		<i>Escherichia coli</i> ATCC 8739		NA		
	Mycobacteria	<i>Mycobacterium marinum</i> ATCC BAA535		NA		
<b>12a, 12b</b>	Bacteria	<i>Staphylococcus aureus</i> **	Agar overlay method	NA	48	
		<i>Bacillus subtilis</i> **				
		<i>Escherichia coli</i> **				
		<i>Pseudomonas aeruginosa</i> **		Weak activity at 100 µg/disk		
	Fungi	<i>Alternaria infectoria</i> **				NA
		<i>Cladosporium</i> sp.**				
		<i>Penicillium italicum</i> **				
		<i>Penicillium digitatum</i> **				
		<i>Penicillium expansum</i> **				
		<i>Aspergillus fumigatus</i> **				
		<i>Fusarium avenaceum</i> **				
		<i>Fusarium culmorum</i> **				
		<i>Fusarium solani</i> **				
		<i>Fusarium sporotrichioides</i> **				
	<i>Fusarium oxysporum</i> **					
	<i>Botrytis cinera</i> **					
<b>13</b>	Yeasts	<i>Candida albicans</i> **	Microdilution method	> 64 µg/mL	49	
<b>14</b>	Bacteria	<i>Staphylococcus aureus</i> supersensitive HS 999	Broth microdilution assay (MIC)	2 µg/mL	102	
		<i>Staphylococcus aureus</i> ATCC 29213		4 µg/mL		
		<i>Enterococcus faecalis</i> ATCC 27270		2 µg/mL		
		<i>Streptococcus pneumoniae</i> ATCC 49619		> 32 µg/mL		
		<i>Escherichia coli</i> supersensitive HS 294		32 µg/mL		
		<i>Escherichia coli</i> ATCC 10536		> 32 µg/mL		
	Yeasts	<i>Saccharomyces cerevisiae</i> supersensitive PM 503		1 µg/mL		
		<i>Candida albicans</i> C 43		8 µg/mL		
Fungi	<i>Aspergillus fumigatus</i> ND 158	> 32 µg/mL				



17b	Fungi	<i>Sclerotium rolsii</i> **	Poisoned food technique (ED <sub>50</sub> )	69.63 ± 0.46 µg/mL	93	
		<i>Rhizoctonia solani</i> **		64.62 ± 0.46 µg/mL		
		<i>Rhizoctonia bataticola</i> **		70.36 ± 0.47 µg/mL		
		<i>Fusarium udum</i> **		70.86 ± 0.45 µg/mL		
		<i>Pythium aphanidermatum</i> **		62.30 ± 1.07 µg/mL		
		<i>Pythium debaryanum</i> **		70.98 ± 0.44 µg/mL		
17c	Bacteria	<i>Staphylococcus aureus</i> ATCC 25923	Disk diffusion method (MIC)	2.0 µg	50	
		<i>Escherichia coli</i> LT 18290-015		> 500 µg		
	Fungi	<i>Pythium ultimum</i> **	Broth microdilution assay (MIC)	3-4 µg/mL		11
		<i>Sclerotinia sclerotiorum</i> **		5-8 µg/mL		
		<i>Rhizoctonia solani</i> **		8-10 µg/mL		
		<i>Trichophyton rubrum</i> ***		4 µg/mL		
		<i>Trichophyton mentagrophytes</i> ***		6 µg/mL		
		<i>Trichophyton tonsurans</i> ***		1 µg/mL		
		<i>Aspergillus sp.</i> ***		32 µg/mL		
	Yeasts	<i>Candida albicans</i> ***	Broth microdilution assay (MIC)	81 µg/mL		11
		<i>Candida tropicalis</i> ***		128 µg/mL		
		<i>Candida stellatoidea</i> ***		23 µg/mL		
		<i>Candida parapsilosis</i> ***		64 µg/mL		
		<i>Candida krusei</i> ***		45 µg/mL		
<i>Saccharomyces cerevisiae</i> ***		16 µg/mL				
17d	Fungi	<i>Trichophyton rubrum</i> ***	Broth microdilution assay (MIC)	4 µg/mL	11	
		<i>Trichophyton mentagrophytes</i> ***		3 µg/mL		
		<i>Trichophyton tonsurans</i> ***		1 µg/mL		
		<i>Aspergillus sp.</i> ***		> 512 µg/mL		
	Yeasts	<i>Candida albicans</i> ***	Broth microdilution assay (MIC)	> 512 µg/mL		11
		<i>Candida tropicalis</i> ***		> 512 µg/mL		
		<i>Candida stellatoidea</i> ***		> 512 µg/mL		
		<i>Candida parapsilosis</i> ***		> 512 µg/mL		
		<i>Candida krusei</i> ***		> 512 µg/mL		
		<i>Candida krusei</i> ***		> 512 µg/mL		

		<i>Saccharomyces cerevisiae</i> ***			
<b>20a</b>	Bacteria	<i>Staphylococcus aureus</i> KCTC 3881	Disk diffusion assay (inhibition zone) / Broth microdilution assay (MIC)	NA	30
		<i>Bacillus subtilis</i> KCTC 1022		Inhibition zone: 27 ± 2.3 mm (30 µg/disk) / MIC: 11.14 ± 0.9 µg/mL	
		<i>Escherichia coli</i> KCTC 1039			
		<i>Pseudomonas aeruginosa</i> KCTC 1636		NA	
	Yeasts	<i>Candida albicans</i> KCTC 7965			
<b>20b</b>	Bacteria	<i>Staphylococcus aureus</i> KCTC 3881	Disk diffusion assay (inhibition zone) / Broth microdilution assay (MIC)	NA	30
		<i>Bacillus subtilis</i> KCTC 1022		Inhibition zone: 22 ± 1.8 mm (30 µg/disk) / MIC: 12.73 ± 1.1 µg/mL	
		<i>Escherichia coli</i> KCTC 1039			
		<i>Pseudomonas aeruginosa</i> KCTC 1636		NA	
	Yeasts	<i>Candida albicans</i> KCTC 7965			
<b>20c</b>	Bacteria	<i>Staphylococcus aureus</i> KCTC 3881	Disk diffusion assay (inhibition zone) / Broth microdilution assay (MIC)	NA	30
		<i>Bacillus subtilis</i> KCTC 1022		Inhibition zone: 20 ± 2.1 mm (30 µg/disk) / MIC: 26.4 ± 2.7 µg/mL	
		<i>Escherichia coli</i> KCTC 1039			
		<i>Pseudomonas aeruginosa</i> KCTC 1636		NA	
<b>22a</b>	Bacteria	<i>Staphylococcus aureus</i> **	Agar dilution method (MIC)	6.2 µg/mL	42
		<i>Bacillus subtilis</i> **		6.2 µg/mL	
		<i>Escherichia coli</i> **		> 100 µg/mL	
	Yeasts	<i>Candida albicans</i> **		100 µg/mL	
	Fungi	<i>Trichophyton asteroides</i> **		6.2 µg/mL	
<i>Trichophyton rubrum</i> **		25 µg/mL			
<b>22b</b>	Bacteria	<i>Staphylococcus aureus</i> **	Agar dilution method (MIC)	6.2 µg/mL	52
		<i>Bacillus subtilis</i> **		6.2 µg/mL	
		<i>Escherichia coli</i> **		> 100 µg/mL	
	Yeasts	<i>Candida albicans</i> **		100 µg/mL	
	Fungi	<i>Trichophyton asteroides</i> **		25 µg/mL	
		<i>Trichophyton rubrum</i> **		25 µg/mL	
		<i>Mycosphaerella nawae</i>	Agar nutrient plate	Growth inhibition with dosages of 25-50 µg/disc	
<b>22c</b>	Bacteria	<i>Staphylococcus aureus</i> ATCC 25923	Disk diffusion method (MIC)	1.6 µg	50

		<i>Escherichia coli</i> LT 18290-015		> 500 µg	
	Fungi	<i>Pythium ultimum</i> **	Broth microdilution assay (MIC)	4-5 µg/mL	
		<i>Sclerotinia sclerotiorum</i> **		3-5 µg/mL	
		<i>Rhizoctonia solani</i> **		5-8 µg/mL	
<b>22d</b>	Bacteria	<i>Staphylococcus aureus</i> **	Agar dilution method (MIC)	> 100 µg/mL	52
		<i>Bacillus subtilis</i> **			
		<i>Escherichia coli</i> **			
	Yeasts	<i>Candida albicans</i> **			
	Fungi	<i>Trichophyton asteroides</i> **			
		<i>Trichophyton rubrum</i> **			
	Yeasts	<i>Candida albicans</i> KCTC 7965			

\* Except for (+)-usnic acid and (-)-usnic acid.

\*\* Strains not specified

\*\*\* Several strains tested for each micro-organism (not specified). The MICs are mean values.

NA: not active at tested concentrations

**Table S2.** Antimicrobial activity of some dibenzofurans isolated from lichens and ascomycetes.

Compound*	Cell lines	IC <sub>50</sub> (incubation time)**	[Lit]
<b>9a</b>	PC3	39.4 ± 1.7 μM <sup>c</sup>	49
	A549	> 50 μM <sup>c</sup>	
	A2780	> 50 μM <sup>c</sup>	
<b>13</b>	PC3	> 50 μM <sup>c</sup>	47
	A549	> 50 μM <sup>c</sup>	
	A2780	> 50 μM <sup>c</sup>	
<b>15a</b>	L6	106 μM (70h)	47
<b>15b</b>		184 μM (70h)	
<b>17b</b>	HT-29	> 100 μM (48h)	59
<b>21a</b>	HT-29	> 100 μM (48h)	59
<b>21b</b>	L1210	Growth inhibition: 93% (23h); 94% (46h) <sup>a</sup>	94
	P388	T/C = 128% (25 mg/kg); T/C = 122% (50 mg/kg) <sup>b</sup>	
	Lewis lung carcinoma	T/C = 122% (25 mg/kg); T/C = 106% (50 mg/kg) <sup>b</sup>	
<b>21c</b>	HT-29	> 100 μM (48h)	59
<b>22a</b>	MDCK	0.96 μM <sup>c</sup>	52
<b>22b</b>		1.22 μM <sup>c</sup>	
<b>22d</b>		485 μM <sup>c</sup>	

\* Except for (+)-usnic acid and (-)-usnic acid.

\*\* All IC<sub>50</sub> are expressed in μM.

<sup>a</sup> Cultured L1210 cells were continuously exposed to compound at ca. 1.4 x 10<sup>-7</sup> mol/mL. Cell counts were made at the end of 23 and 46 h.

<sup>b</sup> Dose-response assays were conducted at dose levels of 200, 100, 50, 25, 12, and 6 (mg/kg)/day. Test compound in gum acacia suspension was administered intraperitoneally to tumored mice on days 1-9 (nine injections). Assays were determined in duplicate. The highest T/C values for each assay, along with associated doses, are recorded in the table. A T/C value of ≥ 125 is considered significantly active, where T/C represents the ratio of the median survival time of the treated animals over those of the control animals expressed as a percentage.

<sup>c</sup> Incubation time not specified

**Table S3.** Cytotoxic activity of some dibenzofurans isolated from lichens and ascomycetes