**Supplementary file**

**Isolation, Taxonomical Characterization, Antimicrobial Activity and Chemical Profiling of Thirteen Marine-Derived Fungi from the Mediterranean Sea Coasts of Egypt**

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| b: .*Kleibsella* | A close up of a speedometer  Description automatically generated with low confidenceA picture containing text  Description automatically generated  a:  *Bordetella sp* |
| A picture containing several  Description automatically generatedA close-up of a coin  Description automatically generated with medium confidence  d: .*Listeria* | A picture containing device, gauge  Description automatically generated  c: *E.coli* |
| A picture containing device, gauge  Description automatically generated  f:  *Staphyllococcus epidermidis* | A picture containing device  Description automatically generated  e:  *Staphylociccus aureus* |
| Calendar  Description automatically generatedA picture containing indoor  Description automatically generated  g:  *Candida albicans* | |

**Figure S1**: Antimicrobial activity assaying of the supernatants of thirteen fungal strain (Nr. 2-13,15) using well difusion method against seven diverse pathogenic microorganisms (a-g).

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| a: *Bordetella*sp | b: *klebsiella* | c: *E.coli* |
| Diagram  Description automatically generated | A picture containing calendar  Description automatically generated | Calendar  Description automatically generated |
| d: *Staphylococcus aureus* | e: *Staphylococcus epidermidis* | f:*Candida albicans* |

**Figure S2**: Antimicrobial activity assaying of five fungal strains supernatants (Nr. 8,9,12,13,15) dissolved in DMSO using well difusion method against six diverse pathogenic microorganisms (a-f).

**Table S1**: Tentatively identified compounds by GC-MS produced by fungal strain **8** optimized at four different conditions

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Optimized Strain** | **Compound Name** | **Rt (min)** | **A (%)** | | **MF** | **MWt** |
| **A:** **EM8** | 9,17-Di-O-acetyl-26,32di-O-methylkijanolide (**1**) | 21.45 | 0.46 | | C39H52O9 | 664 |
| Hexadecane, 7,9-dimethyl (**2**) | 21.74 | 0.53 | | C18H38 | 254 |
| Phenol,2,5-bis(1,1-dimethylethyl) (**3**) | 22.34 | 0.70 | | C14H22O | 206 |
| Pentadecane | 24.05 | 0.81 | | C15H32 | 212 |
| Benzene, (1-ethyloctadecyl) (**4**) | 25.59 | 0.91 | | C26H46 | 358 |
| Heptane, 2,2,3,3,4,4,5,5,6,6,-heptamethyl (**5**) | 26.23 | 1.31 | | C14H30 | 198 |
| Ethanol, 2,2’-iminobis (**6**) | 26.38 | 0.82 | | C4H11NO2 | 105 |
| 2-Propenoic acid, (1methyl1,2ethanediyl) bis[oxy(methyl2,1ethanediyl)] ester (**7**) | 27.55-28.0 | 7.95 | | C15H24O6 | 300 |
| Oxalic acid, allyl nonylester (**8**) | 28.31 | 1.97 | | C14H24O4 | 256 |
| Benzeneacetonitrile,àmethyl (**9**) | 28.53 | 1.55 | | C9H9N | 131 |
| Docosane | 30.29 | 1.88 | | C22H46 | 310 |
| (R)6,6'Di naphthalene-1-,4dione2yl)2,2'dimethoxy1,1'binaphthyl (**10**) | 30.58 | 0.86 | | C42H26O6 | 626 |
| Hexadecanoic acid methyl ester | 30.90 | 6.52 | | C17H34O2 | 270 |
| Cucurbitacin B, dihydro (**11**) | 31.49 | 0.46 | | C32H48O8 | 560 |
| Colchifoleine (**12**) | 31.78 | 0.67 | | C21H23NO7 | 401 |
| Humulane-1,6-dien-3-ol (**13**) | 32.97 | 1.00 | | C15H26O | 222 |
| 9,12-octadecadienoic acid methyl ester (**14**) | 34.03 | 25.03 | | C19H34O2 | 294 |
| 9-octadecenoic acid methyl ester | 34.12 | 14.12 | | C19H36O2 | 296 |
| Octadecanoic acid methyl ester | 34.59 | 1.52 | | C19H38O2 | 298 |
| Heneincosane | 35.74 | 1.08 | | C21H44 | 296 |
| Decanoicacid,1,1a,1b,4,4a,5,7a,7b,8,9decahydro4a,7bdihydroxy1,1,6,8tetramethyl5oxo3[[(1oxodecyl)oxy]methyl]9aHcyclopropa[3,4]benz[1,2e]azulene9,9adiylester (**15**) | 37.12 | 0.65 | | C50H82O9 | 826 |
| 2Chloro-2'-hydroxy3',4'dimethoxy5'chloromethylacetophenone (**16**) | 51.69 | 0.45 | | C11H12Cl2O4 | 678 |
| Pyrrolidine | 52.84 | 0.51 | | C4H9N | 71 |
| Cantaxanthin (**17**) | 54.41 | 0.94 | | C40H53O2 | 564 |
| **Total sum.** |  | **72.7** | |  |  |
| **B. EMRH-8** | (4Bromophenyl) bis(2,4dibromophenyl) amine (**1**) | 5.09 | 5.06 | | C18H10Br5N | 635 |
| Benzene, 1,2dimethyl (**2**) | 5.17 | 2.43 | | C8H10 | 106 |
| 3Amino-s-triazole (**3**) | 5.63 | 3.55 | | C2H4N4 | 84 |
| (4S,6S)4,6Dihydroxy4, 6dimethylnona1,8dien5one (**4**) | 5.79 | 1.42 | | C11H18O3 | 198 |
| 1,3,6,8tetrabromo9(4'iodophenyl) carbazole (**5**) | 6.12 | 1.71 | | C18H8Br4IN | 681 |
| 3Methylcis2,3epoxycy clohexan1ol (**6**) | 6.93 | 1.54 | | C7H12O2 | 128 |
| 4H1,2,4Triazol4amine (**7**) | 7.05 | 1.68 | | C2H4N4 | 84 |
| Hydroxy tetracosane (**8**) | 7.33 | 2.30 | | C24H50O | 354 |
| 1Acetamido3,4,4,8,8pentamethylbicyclo [3.2.2]non2enanti7ol (**9**) | 7.39 | 1.20 | | C16H27NO2 | 265 |
| Octanal (**10**) | 8.34 | 2.08 | | C8H16O | 128 |
| 5Chloro2,2'dithienyldisulfide (**11**) | 8.41 | 2.47 | | C8H5ClS4 | 264 |
| Ethanol, 2chloro (**12**) | 8.47 | 1.94 | | C2H5ClO | 80 |
| Olean12en28oic Acid, 3,16dioxo,methyl ester (**13**) | 19.84 | 1.52 | | C31H46O4 | 482 |
| Ether, hexyl pentyl (**14**) | 21.65 | 1.37 | | C11H24O | 172 |
| (1S,3S)8Hydroxy6methoxyNmethyl1,3dimethyl1,2,3,4tetrahydroisoquinoline (**15**) | 22.35 | 5.56 | | C13H19NO2 | 221 |
| 1Buten3yne (**16**) | 23.67 | 1.23 | | C4H4 | 52 |
| 3O(2Bromo4,5dimethoxybenzyl)1,2:  5,6diOisopropylideneà,Dglucofuranoside (**17**) | 25.10 | 1.65 | | C21H29BrO8 | 488 |
| Docosane (**18**) | 26.45 | 1.40 | | C22H46 | 310 |
| Hexadecanoic acid,methyl ester (**19**) | 30.93 | 2.88 | | C17H34O2 | 270 |
| Z,Z)1Iodo9,12octadecadiene (**20**) | 34.06 | 1.52 | | C18H33I | 376 |
| 9Octadecenoic acid, methyl ester, (E) (**21**) | 34.14 | 4.45 | | C19H36O2 | 296 |
| 5"(1,1Dimethylethyl) 2,2',2",2"',2""pentamethoxy[1,1':3',1":3",1''':3"'.1""quinquephenyl] 3,3""dimethanol (**22**) | 47.64 | 1.22 | | C41H44O7 | 648 |
| **Total sum.** |  | **50.18** | |  |  |
| **C: EMRS8** | 2(Difluoromethyl)2methyloxazolidine (**1**) | 5.13 | 1.42 | | C5H9F2NO | 137 |
| (Z)2,4Dihydro4[(hydroxyamino)methylene]5methyl2phenyl3Hpyraz  ol3one (**2**) | 5.29 | 2.26 | | C11H11N3O2 | 217 |
| 2-Amino1,2diphenylethanol (**3**) | 5.37 | 0.94 | | C14H15NO | 213 |
| 1,3-Propanediol, 2,2bis(hydroxymethyl (**4**) | 8.25 | 0.71 | | C5H12O4 | 136 |
| 2Methylpent4en1ol (5) | 8.36 | 0.70 | | C6H12O | 100 |
| 7,22bis(Chloroacetyl)7,14,15,22tetraaza[7.2.7.1.](1,3)(1,3)(1,4)(1,4)cyclophan14-ene (**6**) | 9.32 | 0.70 | | C41H46Cl2N4O2 | 696 |
| 3-Penten-2-one (**7**) | 9.41 | 0.67 | | C5H8O | 84 |
| Cyanamide, [2(1bromo6a,7,7a,10a,11,11ahexahydro4hydro  xy6oxo6H[1,3]benzodioxolo[5,6c][1]benzopyran2yl)ethyl]methyl (**9**) | 14.86 | 0.61 | | C18H19BrN2O5 | 422 |
| n-Butyl6[3,4dichlorophenyl]-N-methyl-1,2,4,5-tetrazin-3-amine (**10**) | 15.82 | 0.70 | | C13H15Cl2N5 | 311 |
| 1-Octanol | 15.97 | 1.10 | | C8H18O | 130 |
| 5"(1,1Dimethylethyl)2,2',2",2"',2""pentamethoxy[1,1':3',1":3",1''':3"'.1""quinquephenyl]3,3""dicarboxylic acid (**11**) | 16.23 | 1.01 | | C41H40O9 | 676 |
| Methyl1{4Methoxy3chloro6[2[3(2'methoxy3'chloro5'(1,3dioxan2yl) phenyl)4methoxyphenyl]ethyl]phenyl}2methoxybenzene4carboxylate (**12**) | 16.46 | 1.40 | | C36H36Cl2O8 | 666 |
| N-Isopentyl-N-nitrosopentylamine (**13**) | 16.68 | 0.53 | | C10H22N2O | 186 |
|  | 2,2Bis[4[[4chloro6(3ethynylphenoxy)1,3,5triazin2yl]oxy]phenyl]propane (**14**) | 17.76 | 0.75 | | C37H24Cl2N6O4 | 686 |
| 2,6Bis[5cyano6(4bromophenyl)1,2,4triazin3yl]pyridine (**15**) | 18.18 | 0.88 | | C25H11Br2N9 | 595 |
| Z-7-Hexadecenal (16) | 18.58 | 2.52 | | C16H30O | 238 |
| 7{4'[4"(5"'Chloro2"'methoxybenzoyl)amino]phenyl}2(thienylmethylene)3oxo5(pfluorophenyl)2,3dihydro5Hthiazolo[3,2a]pyrimidine (**17**) | 19.43 | 0.57 | | C31H21ClFN3O3S2 | 601 |
| Dodecane, 4,6-dimethyl (**18**) | 21.66 | 0.65 | | C14H30 | 198 |
| Nonadecane | 21.76 | 1.15 | | C19H40 | 268 |
| 2-tert-Butyl-4-isopropyl-5-methylphenol (**20**) | 22.36 | 3.71 | | C14H22O | 206 |
| Dodecane, 2,6,11-trimethyl (**21**) | 24.07 | 1.07 | | C15H32 | 212 |
| Nonane, 3-methyl-5-propyl (**22**) | 26.25 | 4.59 | | C13H28 | 184 |
| 1HImidazole2methanol (**23**) | 26.99 | 0.89 | | C4H6N2O | 98 |
| Undecane, 2,10-dimethyl | 28.34 | 1.66 | | C13H28 | 184 |
| 7-Hexadecane | 29.84 | 4.20 | | C16H32 | 224 |
| Nonadecane | 30.33 | 19.24 | | C19H40 | 268 |
| Hexadecanoic acid, methyl ester | 30.92 | 8.98 | | C17H34O2 | 270 |
| Sulfurous acid, hexylpentyl ester (**24**) | 32.22 | 2.14 | | C11H24O3S | 236 |
| 9,12-Octadecadienoic acid (Z,Z), methyl ester | 34.05 | 10.11 | | C19H34O2 | 294 |
| 9-Octadecenoic acid (Z),methyl ester | 34.16 | 4.97 | | C19H36O2 | 296 |
| Hexane,2,2,3,4,5,5-hexamethyl (**25**) | 35.77 | 0.65 | | C12H26 | 170 |
| Eicosane, 7-hexyl (**26**) | 37.43 | 0.77 | | C26H54 | 366 |
| 1,2Benzenedicarboxylicacid, bis(2-ethylhexyl)ester (**27**) | 41.52 | 5.54 | | C24H38O4 | 390 |
| **Total sum.** |  | **87.79** | |  |  |
| **D: EMWB-8** | Methanethiol (**1**) | 5.12 | 4.49 | CH4S | | 48 |
| Chloromethyl chloroacetate (**2**) | 5.16 | 3.43 | C3H4Cl2O2 | | 142 |
| Octadecane (**3**) | 5.51 | 1.26 | C18H38 | | 254 |
| pyrrolidin1propionic acid (**4**) | 6.86 | 1.16 | C7H13NO2 | | 143 |
| Nonane, 3-methylene (**5**) | 7.17 | 1.48 | C10H20 | | 140 |
| Docosane (**6**) | 8.32 | 12.19 | C22H46 | | 310 |
| (6Bromopyridin2yl)phenylmethanol (**7**) | 10.35 | 1.43 | C12H10BrNO | | 263 |
| Octane, 4methyl (**8**) | 11.21 | 2.94 | C9H20 | | 128 |
| Chloromethyl propanoate (**9**) | 11.29 | 1.17 | C4H7ClO2 | | 122 |
| 3-Nonanone,2methyl (**10**) | 16.21 | 2.07 | C10H20O | | 156 |
| (4S,6S)4,6Dihydroxy4,6dimethylnona1,8dien5one (**11**) | 18.36 | 1.44 | C11H18O3 | | 198 |
| (trans)3Ethoxy1vinylcyclobutanol (**12**) | 19.10 | 1.58 | C8H14O2 | | 142 |
| 1[10[3(dimethylamino)propyl]10Hphenothiazin2yl] (**13**) | 21.60 | 1.32 | C19H22N2OS | | 326 |
| (1à,4à,4aà,10aà)1,4,4a,5,6,7,8,9,10,10adecahydro1,4,11,11tetramethyl1,4-methanocycloocta[d]pyridazine (**14**) | 22.34 | 5.37 | C15H26N2 | | 234 |
| 2,2Dimethyl1,3propan ediol isobutanoate (**15**) | 22.73 | 1.18 | C9H18O3 | | 174 |
| 1Hexadecene (**16**) | 23.92 | 1.16 | C16H32 | | 224 |
| 4,5-dihydrofuran-3-carbaldehyde (**17**) | 27.50 | 2.88 | C5H6O2 | | 98 |
| **Total sum.** |  | **46.55** |  | |  |
| **E: EMWS-8** | S-Methyl propanethioate (**1**) | 5.86 | 2.32 | | C4H8OS | 104 |
| OH-Spirilloxanthin (**2**) | 6.81 | 2.08 | | C41H58O2 | 582 |
| Cyclopropene (**3**) | 7.62 | 1.43 | | C3H4 | 40 |
| Dichloroacetaldehyde (**4**) | 8.50 | 2.01 | | C2H2Cl2O | 112 |
| 1,5-Dimethyl3,7dithiabicyclo[3.3.1]nonan9one Hydrazone (**5**) | 13.41 | 1.48 | | C9H16N2S2 | 216 |
| 5(1H)Indolizinone, hexahydro (**6**) | 15.46 | 2.42 | | C8H13NO | 139 |
| (3Thienyl) butadiyne (**7**) | 19.33 | 2.21 | | C8H4S | 132 |
| N(aminocarbonyl)2ethyl (**8**) | 21.35 | 1.73 | | C7H14N2O2 | 158 |
| 2,2dimethyl1,3dithiolane (**9**) | 34.36 | 1.43 | | C5H10S2 | 134 |
| (E)NMethyl4,8dimeth yl3,7nonadien1amine (**10**) | 38.16 | 1.59 | | C12H23N | 181 |
| 3Aminocrotonamide (**11**) | 45.26 | 1.82 | | C4H8N2O | 100 |
| **Total sum.** |  | **20.52** | |  |  |



**Figure S3**: Chemical structures of tentatively identified compounds by GC-MS from fungal strain EM-8



**Figure S4**: Chemical structures of tentatively identified compounds by GC-MS from fungal strain EMRH-8



**1 2 3 4 5 6**



**7 9 10 11**



**12 13 14**



**15 16**

 

**17 19 20**



**21 22 23 24**



**25 26 27**

**Figure S5**: Chemical structures of tentatively identified compounds by GC-MS from fungal strain EMRS-8



**Figure S6**: Chemical structures of tentatively identified compounds by GC-MS from fungal strain EMWB-8



**Figure S7**: Chemical structures of tentatively identified compounds by GC-MS from fungal strain EMWS-8

**Table S2**: Tentatively identified compounds by GC-MS produced by fungal strain **13** optimized at four different conditions

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Optimized Strain** | **Compound Name** | **Rt (min)** | **A (%)** | **MF** | **MWt** |
| **A:** **EM-13** | Tetramethoxybazzanin J (**1**) | 7.50 | 0.44 | C32H30Cl2O6 | 548 |
| 1,2-Propadiene | 7.63 | 0.50 | C3H4 | 260 |
| Nitrosyl chloride | 8.41 | 0.58 | ClNO | 65 |
| 2-Methyl-2-aminopropanenitrile (**2**) | 8.46 | 0.60 | C4H8N2 | 84 |
| Ohioensin A (**3**) | 9.31 | 0.45 | C23H16O5 | 372 |
| 1,11,12,13,14,14-Hexachloro-5,7di(pchlorophenyl)5,6-diazapentacyclo[9.2.1.2(3,9).0(2,10).0(4,8)]hexadeca6,12diene (**4**) | 11.19 | 0.53 | C26H18Cl8N2 | 638 |
| 5,5"-Dibromo3,3'',4,4''-tetrabutyl2,2':5',2"terthiophene (**5**) | 12.17 | 0.42 | C28H38Br2S | 628 |
| 6,6"Bis(chloromethyl)[4,4':6',4"terdibenzofuran] (6) | 14.86 | 0.47 | C38H22Cl2O3 | 596 |
| 2,5-Bis(5-benzyloxycarbonyl4-methyl-2-pyrrolylmethyl)-3,4-diethylpyrrole (**7**) | 16.02 | 0.47 | C36H39N3O4 | 577 |
| 3-Acetamidobutan-2-one (**8**) | 17.80 | 0.50 | C6H11NO2 | 129 |
| Cyclobutane, methylene (**9**) | 18.62 | 0.46 | C5H8 | 68 |
| 3,4-Dihydro2H1,5(3"tbutyl)benzodioxepine (**10**) | 22.35 | 0.99 | C13H18O2 | 206 |
| Pentadecanoic acid,14-methyl,methyl ester (**11**) | 30.90 | 14.83 | C17H34O2 | 270 |
| 9,12-Octadecadienoic acid (Z,Z), methyl ester (**12**) | 34.03 | 34.81 | C19H34O2 | 294 |
| 9-Octadecenoic acid (Z), methyl ester (**13**) | 34.12 | 20.86 | C19H36O2 | 296 |
| Octadecanoic acid,methyl ester (**14**) | 34.59 | 1.81 | C19H38O2 | 298 |
| 2,2',5,5'Tetrabromo-4,4'-ditertbutylbiphenyl (**15**) | 37.01 | 0.45 | C20H22Br4 | 578 |
| Ursa-9(11),12dien28oic acid, 3-(acetyloxy),methyl ester, (3á)2 (**16**) | 46.59 | 0.47 | C33H50O4 | 510 |
| 1,12-Dibromo4,9diisopropyl2,3,10,11tetramethoxy14oxo 6,7-(  methanoxymethano)dinaphtho[1,2b:2',1'd]furan (**17**) | 48.52 | 0.44 | C32H30Br2O7 | 684 |
| 1',1'-Dicarboethoxy1á,2ádihydro3'Hcycloprop[1,2]cholesta1,4,6trien-3-one (**18**) | 48.98 | 0.59 | C34H50O5 | 538 |
| Salmoxanthin (**19**) | 50.34 | 0.48 | C40H56O4 | 600 |
| 5à-Cholestan7àyl4(àHydroxyphenylmethyl)phenylacetate25, àether (**20**) | 51.18 | 0.52 | C42H58O3 | 610 |
| 2,5-Dibromo1,4-dinhex Adecylbenzene (**21**) | 51.75 | 0.86 | C38H68Br2 | 682 |
| 3',4'didehydro1',2'dihydro1',2'dihydroxy (**22**) | 51.82 | 0.56 | C40H56O2 | 568 |
| 2-Methyl2pentyl1,3dithiolane 1oxide (**23**) | 52.15 | 0.46 | C9H18OS2 | 206 |
| Ethylenediamine,N,N,N',N'tetraethyl1,2bis(p-methoxyphenyl) (**24**) | 52.58 | 0.50 | C24H34N2O2 | 380 |
|  | 5"(1,1Dimethylethyl)2,2',2",2"',2""pentamethoxy[1,1':3',1":3",1''':3"'.1""quinquephenyl]3,3""dicarboxylic acid (**25**) | 52.91 | 0.67 | C41H40O9 | 676 |
| 3,4-Diphenyl 7-styrylpyridazino [4',3':4,5] thieno[3,2b][1,8] naphthyridine (**26**) | 53.31 | 0.48 | C32H20N4S | 492 |
| **Total sum.** | **92.43%** | | | |
| **B: EMRH-13** | Nephthoside 1,2',3',4'-tetraacetate (**1**) | 5.15 | 5.42 | C40H56O10 | 696 |
| Benzeneethanamine (**2**) | 5.28 | 1.47 | C8H11N | 121 |
| Dimethyl 5"(1,1Dimethylethyl) 2,2',2",2"',2""pentamethoxy  [1,1':3',1":3",1''':3"'.1""quinquephenyl]3,3""dicarboxylate (**3**) | 5.33 | 1.45 | C43H44O9 | 704 |
| 1-Acetyl4,4bis[4(3bromopropoxy) 3,5dimethoxyphenyl] piperidine (**4**) | 5.36 | 2.39 | C29H39Br2NO7 | 671 |
| Pyrrolidinone (**5**) | 5.76 | 1.30 | C4H7NO | 85 |
| 5-[4,5Bis(methoxycarbonyl)1,3dithiole2ylidene ]3[p(N,Ndiethylamino)phenylimino]1,2dithiole4thione (**6**) | 6.45 | 4.17 | C20H20N2O4S5 | 512 |
| DL-Leucine, N-acetyl (**7**) | 6.92 | 1.41 | C8H15NO3 | 173 |
| 2(Dibromomethyl)2hydroxytetrahydrofuran (**8**) | 7.18 | 1.37 | C5H8Br2O2 | 258 |
| 3,5-cyclo5 (N-methylamino) 2,7,8,12,13,17,18 heptapropyl 3 ethyl21H,23 Hporphrin | 7.14 | 1.34 | C46H63N5 | 685 |
| 2,7,12,17 tetrabromo cyclotetrathiophen (2,7,12,17tetrabromcycloocta[1,2b:4,3b':5,6b":8,7b"']tetrathiophen (**9**) | 7.72 | 1.76 | C16H4Br4S4 | 640 |
| 2-Butyne1,4diol (**10**) | 8.37 | 1.95 | C4H6O2 | 86 |
| 2,2',7,7'-Tetrabromo-9,9'-spirobifluorenone (**11**) | 11.61 | 1.45 | C25H12Br4 | 628 |
| 1(2Bromobenzoyl)3,5,7triphenyl1H1,2diazepine (**13**) | 12.46 | 1.36 | C30H21BrN2O | 504 |
| 2,5-Dibromo1,4dinhexadecylbenzene (**14**) | 19.28 | 1.64 | C38H68Br2 | 682 |
| Docosane | 21.64 | 2.42 | C22H46 | 310 |
| Allyl-5-t-butylhydroquinone (**15**) | 22.34 | 10.84 | C13H18O2 | 206 |
| Nonane,2,2,4,4,6,8,8heptamethyl (**16**) | 22.69 | 2.64 | C16H34 | 226 |
| 4Acetyl-4-(benzenesulfonyl)-1,2-Dimethyl1cyclohexene (**17**) | 24.42 | 1.84 | C16H20O3S | 292 |
| N-valerylcarnitine oxylactone (**18**) | 26.45 | 2.16 | C9H14O4 | 186 |
| (R)6,6'Di(naphthalene1,4dione2yl)2,2'-dimethoxy1,1'-binaphthyl (**19**) | 27.72 | 1.45 | C42H26O6 | 626 |
| Pentadecane | 30.76 | 1.55 | C15H32 | 212 |
| Tetratetracontane | 31.56 | 1.33 | C44H90 | 618 |
| 1,1Dibromo2(3,3",4,4"tetrabutyl2,2':5',2"terthiophene5yl)  Ethylene (**20**) | 32.34 | 1.39 | C30H40Br2S3 | 654 |
| 2R)8,13epoxy2,2(8',13'epoxy2'bmethoxy3'oxolabdane1'a,2'adiyldioxy)1ahydroxylabdan3one (**21**) | 36.27 | 1.27 | C41H66O8 | 686 |
| Acetic acid, 1,1',4'triacetoxy5,5'diisopropyl-6,7,6',7'-tetrameth  oxy3,3'dimethyl[2,2']binaphthalenyl4ylester (**22**) | 45.52 | 1.42 | C40H46O12 | 718 |
| 3,4,5,6-Tetrakis(pchlorophenoxy)1,2-dicyanobenzene (**23**) | 46.92 | 1.86 | C32H16Cl4N2O4 | 632 |
|  | 2-Pyridinepropanoic acid, àmethyláoxo, ethyl ester (**24**) | 49.36 | 1.40 | C11H13NO3 | 207 |
| Anodendrosidea (**25**) | 50.38 | 2.10 | C30H36O11 | 572 |
| Hexahydroferrginin A (**26**) | 51.72 | 1.59 | C30H42O4 | 466 |
| Spherodenon (**27**) | 51.86 | 1.67 | C41H58O2 | 588 |
| 25-Norisopropyl-9,19-cyclolanostan-22-en-24-one,3-acetoxy-24-phenyl 3 (**28**) | 51.97 | 2.69 | C35H48O3 | 516 |
| .psi.,.psi.Carotene, 1,1',2,2'tetrahydro1,1'dimethoxy2 (**29**) | 52.31 | 2.02 | C42H64O2 | 600 |
| Stearic acid,3(octadecyloxy)propylester (**30**) | 53.09 | 1.28 | C39H78O3 | 594 |
| NPhenylthiocarbamoyldiethoxyacetamidine (**31**) | 54.81 | 1.33 | C13H19N3O2S | 281 |
| **Total sum.** |  | **98.01%** |  |  |
| **C: EMRS-13** | bicyclo[3.3.0]oct2ene4à,6àcarbolactone (**1**) | 5.11 | 7.57 | C9H10O2 | 150 |
| Benzene, eicosyl (**2**) | 5.54 | 1.25 | C26H46 | 358 |
| Propanethioic acid, Spentyl ester (**3**) | 5.64 | 1.18 | C8H16OS | 160 |
| 1Hexene, 3,5,5trimethyl (**4**) | 8.33 | 0.90 | C9H18 | 126 |
| 1Propanone,2methyl1phenyl (**5**) | 9.14 | 0.73 | C10H12O | 148 |
| 1,3,5triazine2,4,6(1H,3H,5H)trione (**6**) | 9.96 | 0.89 | C3H3N3O3 | 129 |
| Dichloroacetaldehyde (**7**) | 10.19 | 0.74 | C2H2Cl2O | 112 |
| (22E)3àBromostigmasta5,22diene (**8**) | 22.14 | 0.71 | C29H47Br | 474 |
| 3-(2Oxocyclohexylcarboxamido)2,3-dihydro1H,5H [1] benzopyran (**9**) | 22.35 | 1.52 | C10H9NO3 | 191 |
| Hexadecanoic acid, methyl ester (**10**) | 30.90 | 17.15 | C17H34O2 | 270 |
| 9Octadecenoic acid, methyl ester (**11**) | 32.54 | 2.77 | C19H36O2 | 296 |
| 9,12Octadecadienoic acid, methyl ester (**12**) | 34.04 | 15.63 | C19H34O2 | 294 |
| 9Octadecenoic acid (Z),methyl ester (**13** | 34.13 | 6.33 | C19H36O2 | 296 |
| Octadecanoic acid, methyl ester (**14**) | 34.59 | 1.92 | C19H38O2 | 298 |
| cis10Nonadecenoic acid, methyl ester (**15**) | 36.11 | 4.77 | C20H38O2 | 310 |
| 1,2Benzenedicarboxylic acid, dioctyl ester (**16**) | 41.49 | 12.46 | C24H38O4 | 390 |
| 3,5cyclo6methoxyà (Iodotetradecyl)pregnanoic acid ethyl ester (**17**) | 42.95 | 0.73 | C38H65IO3 | 696 |
| 3methylfuro[2,3b]pyridine (**18**) | 48.00 | 0.61 | C8H7NO | 133 |
| **Total sum** |  | **77.86** |  |  |
| **D: EMWB-13** | Undecane, 5methyl (**1**) | 5.63 | 1.91 | C12H26 | 170 |
| Pyrrolidine (**2**) | 6.51 | 1.77 | C4H9N | 71 |
| Chloromethyl chloroacetate (**3**) | 8.33 | 3.55 | C3H4Cl2O2 | 142 |
| LAlanine, 1,1dimethylethyl ester, hydrochloride (**4**) | 9.51 | 1.85 | C7H15NO2 | 145 |
| (2E)3Methyl4oxo2pentenal (**5**) | 10.69 | 1.98 | C6H8O2 | 112 |
| Butanal, 3methyl (**6**) | 11.27 | 1.67 | C5H10O | 86 |
| (E,E)1,10bis(1,3Dioxolan2yl)3,7decadiene (**7**) | 11.49 | 2.21 | C16H26O4 | 282 |
| Pentane,3ethyl2,4dimethyl (**8**) | 15.21 | 1.25 | C9H20 | 128 |
| Decane (**9**) | 16.21 | 1.99 | C10H22 | 142 |
| Octacosane (**10**) | 21.64 | 1.74 | C28H58 | 394 |
| 3,4Dihydro2H1,5(3"tbutyl)benzodioxepine (**11**) | 22.34 | 12.09 | C13H18O2 | 206 |
| 3Methoxy6oxaestra1,3,5(10),7tetraen17one (**12**) | 22.72 | 1.70 | C18H20O3 | 140 |
| methacrylic acid hexadecanyl ester (**13**) | 23.90 | 2.53 | C20H38O2 | 310 |
| Heptadecane (**14**) | 26.45 | 2.09 | C17H36 | 240 |
| Decane, 3ethyl3methyl (**15**) | 30.75 | 2.52 | C13H28 | 184 |
| 7Ethyl2,2,3trimethyl5 methylidenenonane3,7diol (**16**) | 30.89 | 1.84 | C15H30O2 | 242 |
| Spherodenon (**17**) | 45.36 | 1.90 | C41H58O2 | 582 |
| **Total sum** |  | **44.59** |  |  |
| **E: EMWS13** | Methane, thiobis (**1**) | 5.94 | 3.49 | C2H6S | 62 |
| Cyanoacetylene (**2**) | 14.41 | 1.34 | C3HN | 51 |
| Benzenemethanol,à(1aminoethyl) (**3**) | 14.49 | 1.41 | C9H13NO | 151 |
| 1,3Butadiyn (**4**) | 15.28 | 1.16 | C4H2 | 50 |
| Tetradecane, 4ethyl (**5**) | 21.64 | 1.68 | C16H34 | 226 |
| (1à,4à,4aà,10aà)1,4,4a,5,6,7,8,9,10,10adecahydro1,4,11,11tetramethyl1 ,4methanocycloocta[d]pyridazine (**6**) | 22.34 | 5.97 | C15H26N2 | 234 |
| 7,8Epoxylanostan11ol,3acetoxy3 (**7**) | 28.92 | 1.20 | C32H54O4 | 502 |
| Eicosanoic acid, methylester (**8**) | 30.92 | 2.10 | C21H42O2 | 326 |
| Methyl 9cis,11transoctadecadienoate (**9**) | 34.05 | 6.14 | C19H34O2 | 294 |
| 10Octadecenoic acid, methyl ester (**10**) | 34.13 | 5.31 | C19H36O2 | 296 |
| Rhodopin (**11**) | 45.49 | 1.47 | C40H58O | 554 |
| Rhodoxanthin (**12**) | 50.59 | 1.25 | C40H50O2 | 562 |
| **Total sum** |  | **32.52** |  |  |





**Figure S8**: Chemical structures of tentatively identified compounds by GC-MS from fungal strain EM-13



**1 2 3 4 5**



**6 7 8 9 10 11**

 

**13** **14 15**



**16 17 18 19 20 21**



**22 23 24 25 26**



**27 28**



**29**



**30 31**

**Figure S9**: Chemical structures of tentatively identified compounds by GC-MS from fungal strain EMRH-13



**Figure S10**: Chemical structures of tentatively identified compounds by GC-MS from fungal strain EMRS-13



**Figure S11**: Chemical structures of tentatively identified compounds by GC-MS from fungal strain EMWB-13



**Figure S12**: Chemical structures of tentatively identified compounds by GC-MS from fungal strain EMWS-13

|  |  |
| --- | --- |
| **Isolate Nr.1**  On potato dextrose agar  After 48 hr | A picture containing cup, indoor, plastic, drink  Description automatically generated  **Isolate Nr. 13**  On potato dextrose agar  After 48 hr |
| A picture containing cup, indoor, food, drink  Description automatically generated  **Isolate Nr.14**  On potato dextrose agar  After 48 hr | A picture containing cup, food, indoor, plastic  Description automatically generated  **Isolate Nr.15**  On nutrient agar  After 10 days |

**Figure S13**: Pure cultures of different morphological fungal isolates (1, 13, 14 , 15 )