## Supplementary data

**Table S1.** Insecticidal activities of four organic extracts of culture broth of 14 entomopathogenic bacteria (EPB) of *Xenorhabdus* and *Photorhabdus* against L5 larvae of *S. exigua*. The bioassay was carried out by injecting 3 µL of bacterial culture broth extracts from different concentrations into the hemocoel of L5 larva. Each treatment dose used 10 larvae and each treatment replicated three times.

**Table S2.** GC-MS prediction of secondary metabolites in organic extracts of bacterial culture broth from 14 species of *Xenorhabdus* and *Photorhabdus.*

**Table S3.** Secondary metabolites predicted from *Photorhabdus temperata temperata* (Ptt), *Xenorhabdus hominickii* (Xh) and *Xenorhabdus ehlersii* (Xe) which were used for biological activity analysis.

**Fig. S1.** Chromatograms from the GC-MS analysis of the organic extracts of 14 bacterial culture broths for the prediction of bacterial metabolites. Four organic solvents such as hexane, ethyl acetate, chloroform and butanol were used to get organic extracts 'HEX', 'EAX', 'CX' and 'BX' from the bacteria, *Photorhabdus temperata* subsp. *temperata* ANU101 ('Ptt'), *Xenorhabdus hominickii* ANU101 ('Xh'), *X. nematophila* K1 ('XnK1'), *X. ehlersii* KSY ('Xe'), , *X. nematophila* SK1 ('XnSK1'), *X. nematophila* SK2 ('XnSK2'), *Photorhabdus luminescens* KACC12123 ('Pl 193'), *P. luminescens* subsp. *laumondii* KACC12283 ('Pl laum'), *P. luminescens* subsp.

*thracensis* KACC12284 (‘Pl thra’), *X. nematophila* KACC12145 (‘Xn12145’), *X. nematophila* Mexico (‘XnM’), *X. nematophila* France (‘XnF’), *X. bovienii* (‘Xb’), and *X. poinarii* (‘Xp’). The extracts were dried using rotary evaporator and the resulting product was dissolved in methanol. After filtration, the sample was used for GC analysis and MS recording. NIST 11 database were used to predict compounds based on mass spectra. X axis indicates the retention time in min.

**Table S1**. Insecticidal activities of four organic extracts of culture broth of 14 entomopathogenic bacteria (EPB) of *Xenorhabdus* and *Photorhabdus* against L5 larvae of *S. exigua*. The bioassay was carried out by injecting 3 µL of bacterial culture broth extracts from different concentrations into the hemocoel of L5 larva. Each treatment dose used 10 larvae and each treatment replicated three times.

| EPB[1] | Organic[2] extracts | $LD_{50}$ (µg/larva) (95 % CI) | Slope ± SE | df | $\chi 2$ |
|---|---|---|---|---|---|
| Xn SK1 | HEX | 720.95 (355.7-1431.2) | 0.30 ± 0.67 | 3 | 0.821 |
| | EAX | 399.45 (204.8-789.3) | 0.35 ± 0.55 | 3 | 0.933 |
| | CX | 563.42 (290.3-1107.8) | 0.33 ± 0.61 | 3 | 0.902 |
| | BX | 516.72 (253.8-1029.5) | 0.42 ± 0.49 | 3 | 0.713 |
| Xn SK2 | HEX | 432.42 (218.3-851.5) | 0.35 ± 0.52 | 3 | 0.537 |
| | EAX | 205.59 (106.8-407.5) | 0.42 ± 0.48 | 3 | 0.728 |
| | CX | 310.47 (157.9-608.9) | 0.34 ± 0.58 | 3 | 0.899 |
| | BX | 248.91 (132.4-486.8) | 0.39 ± 0.52 | 3 | 0.666 |
| Xn M | HEX | 305.57 (157.3-611.7) | 0.33 ± 0.62 | 3 | 0.527 |
| | EAX | 259.14 (126.3-505.3) | 0.38 ± 0.53 | 3 | 0.552 |
| | CX | 268.93 (132.6-522.8) | 0.35 ± 0.59 | 3 | 0.554 |
| | BX | 228.91 (112.8-445.8) | 0.41 ± 0.52 | 3 | 0.666 |
| Xn F | HEX | 278.78 (136.1-536.3) | 0.33 ± 0.62 | 3 | 0.491 |
| | EAX | 184.31 (91.8-365.4) | 0.43 ± 0.47 | 3 | 0.649 |
| | CX | 281.46 (140.3-563.2) | 0.38 ± 0.54 | 3 | 0.526 |
| | BX | 195.58 (186.2-384.9) | 0.41 ± 0.48 | 3 | 0.610 |
| Xn 12145 | HEX | 522.41 (260.3-1021.3) | 0.35 ±0.58 | 3 | 0.537 |
| | EAX | 372.19 (184.9-742.7) | 0.38 ± 0.54 | 3 | 0.61 |
| | CX | 495.45 (252.7-969.8) | 0.37 ± 0.56 | 3 | 0.592 |
| | BX | 383.88 (190.6-774.6) | 0.37 ± 0.54 | 3 | 0.691 |
| Xn K1 | HEX | 665.87 (332.8-1323.3) | 0.35 ± 0.58 | 3 | 0.635 |
| | EAX | 492.56 (245.2-983.7) | 0.39 ±0.53 | 3 | 0.732 |
| | CX | 617.69 (306.9-1221.6) | 0.37 ± 0.55 | 3 | 0.688 |
| | BX | 512.57 (254.7-1018.7) | 0.39 ±0.53 | 3 | 0.732 |
| Xb | HEX | 199.06 (101.1-401.2) | 0.38 ± 0.54 | 3 | 0.862 |
| | EAX | 154.31 (77.9-302.5) | 0.42 ± 0.47 | 3 | 0.649 |
| | CX | 203.77 (102.3-405.7) | 0.42 ± 0.52 | 3 | 0.899 |
| | BX | 167.78 (85.3-332.4) | 0.43 ± 0.48 | 3 | 0.937 |
| Xe | HEX | 787.58 (395.5-1572.1) | 0.32 ± 0.64 | 3 | 0.952 |
| | EAX | 422.29 (214.5-841.8) | 0.34 ± 0.59 | 3 | 0.988 |
| | CX | 629.09 (317.3-1254.2) | 0.32 ± 0.63 | 3 | 0.942 |
| | BX | 584.94 (299.5-1162.9) | 0.34 ± 0.52 | 3 | 0.963 |
| Xh | HEX | 219.32 (112.4-436.2) | 0.33 ± 0.65 | 3 | 0.649 |
| | EAX | 132.24 (74.3-261.7) | 0.37 ± 0.52 | 3 | 0.993 |
| | CX | 189.79 (98.6-367.4) | 0.28 ± 0.68 | 3 | 0.971 |
| | BX | 92.44 (53.9-179.8) | 0.33 ± 0.57 | 3 | 0.997 |
| Xp | HEX | 770.77 (387.2-1497.5) | 0.28 ± 0.74 | 3 | 0.993 |
| | EAX | 483.92 (242.5-965.8) | 0.29 ± 0.69 | 3 | 0.917 |
| | CX | 677.98 (341.61354.2) | 0.29 ± 0.42 | 3 | 0.786 |
| | BX | 438.06 (221.7-875.1) | 0.31 ± 0.56 | 3 | 0.929 |
| Ptt | HEX | 178.59 (95.3-376.2) | 0.36 ± 0.56 | 3 | 0.967 |
| | EAX | 111.75 (57.1-120.9) | 0.34 ± 0.61 | 3 | 0.945 |

| | | | | | |
|---|---|---|---|---|---|
| | CX | 167.21 (85.9-333.8) | 0.32 ± 0.62 | 3 | 0.893 |
| | BX | 126.89 (65.4-245.5) | 0.303 ± 0.66 | 3 | 0.961 |
| Pl 193 | HEX | 350.37 (180.2-697.3) | 0.32 ± 0.62 | 3 | 0.952 |
| | EAX | 209.94 (56.1-416.9) | 0.31 ± 0.62 | 3 | 0.982 |
| | CX | 312.56 (158.5-621.4) | 0.34 ± 0.59 | 3 | 0.932 |
| | BX | 242.99 (124.9-480.6) | 0.32 ± 0.62 | 3 | 0.984 |
| Pl laum | HEX | 381.08 (190.7-754.9) | 0.29 ± 0.71 | 3 | 0.931 |
| | EAX | 207.96 (106.7-412.8) | 0.31 ± 0.62 | 3 | 0.985 |
| | CX | 301.41 (153.2-600.3) | 0.30 ± 0.66 | 3 | 0.930 |
| | BX | 180.47 (93.5-357.8) | 0.34 ± 0.58 | 3 | 0.897 |
| Pl thra | HEX | 536.96 (266.5-1067.4) | 0.30 ± 0.66 | 3 | 0.961 |
| | EAX | 211.59 (109.2-413.7) | 0.33 ± 0.59 | 3 | 0.883 |
| | CX | 314.34 (158.9-625.6) | 0.38 ± 0.53 | 3 | 0.778 |
| | BX | 170.82 (88.4-336.2) | 0.35 ± 0.58 | 3 | 0.972 |

[1] Entomopathogenic bacteria (EPB) acronyms are mentioned in Materials and Methods.
[2] Organic extract acronyms are: hexane extracts ('HEX'), ethyl acetate extracts ('EAX'), chloroform extract ('CX') and butanol extract ('BX').

**Table S2.** GC-MS prediction of secondary metabolites in organic extracts of bacterial culture broth from 14 bacterial isolates of *Xenorhabdus* and *Photorhabdus.*

| RT[1] | Compound[2] | Xn SK1 | Xn SK2 | Xn M[3] | Xn F | Xn | Xn K1 | Xb | Xe | Xh | Xp | Ptt | Pl 193 | Pl | Pl thra |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **2.246** | Ethanol, 2,2-diethoxy- | | + | | | | | | | | | | | | |
| **2.4** | 4-Ethylamino-n-butylamine | | | | | | | | | | | + | | | |
| **2.453** | 1-Butanamine, N-butyl- | + | | + | + | + | + | + | | + | | + | + | + | + |
| **2.471** | Leucine | | + | | | | | | | | | | | | |
| **2.476** | n-Butylethylenediamine | | | | | + | | + | | | | | | | |
| **2.5** | Phenol | | | | | | | | | | + | | + | | + |
| **2.518** | 1-Propanol, 3-(methylthio)- | | | | | | | | | | | | | + | + |
| **2.482** | Propanedioic acid, propyl- | + | | | | | | | + | | | | | | |
| **2.848** | Glycerin | | | | | | | | | | | | + | | |
| **3.018** | 1-Hexanol, 2-ethyl- | | | | | | | | | + | | | | | |
| **3.031** | Benzyl alcohol | | | | | | | | | + | | + | | | |
| **3.191** | 2,5-Dimethyl-4-hydroxy-3(2H)-furanone | | | | | | | | | | | + | | | |
| **3.628** | Pyrazine, 3-ethyl-2,5-dimethyl- | | + | | | | | | | + | | | | | |
| **3.84** | Cyclobutene, 2-propenylidene- | | | | | | | | | | | | + | | + |
| **3.864** | Benzeneethanamine | | | | | | | + | | + | | | | | + |
| **4.153** | Phenylethyl Alcohol | | | | + | | | | + | + | + | + | + | + | + |
| **4.602** | 4H-Pyran-4-one, 2,3-dihydro-3,5-dihydroxy-6-methyl- | + | | + | + | + | + | + | + | + | | + | + | + | |
| **4.926** | Hexanoic acid, 5-oxo-, ethyl ester | | + | | | | | | | + | | | | | |
| **4.997** | Octanoic acid | | | + | + | + | + | + | | | | + | | | + |
| **5.045** | Benzeneacetic acid, methyl ester | | | | | | | | | | | | + | + | + |
| **6.024** | Benzothiazole | | | | | | | | | | + | + | + | | |
| **6.621** | Benzeneacetic acid | + | | | | | | | | | | | + | + | + |
| **6.638** | 1,1-Diisobutoxy-isobutane | | | | | | | | | + | | | | | |
| **6.768** | Butane, 1,1-dibutoxy- | | + | | | | | | + | | | | | | |
| **7.17** | 5-Thiazoleethanol, 4-methyl- | | | + | + | + | + | + | | + | + | + | | | |
| **7.418** | Indole | | | | | | | | | + | | + | + | + | + |
| **7.618** | Propanedioic acid, phenyl- | | | | | | | | | | | | | | + |
| **7.79** | 1,2-Ethanediol, 1-phenyl- | | | | | | | | | | | + | | | |
| **7.79** | Formamide, N, N-dibutyl- | | | | + | + | | + | | + | + | | | + | |
| **8.652** | l-Leucine, N-methoxycarbonyl-, methyl ester | | | | | | + | | | | | | | | |
| **8.734** | Cyclohexasiloxane, dodecamethyl- | | | | | | | | | + | | | | | |
| **9.265** | Butanoic acid, butyl ester | + | + | + | + | + | + | + | | + | + | | | + | + |
| **9.289** | Propanoic acid, 2-methyl-, 3-hydroxy-2,4,4-trimethylpentyl ester | | | | | | | | + | + | + | | + | | |
| **9.903** | 1-Tetradecene | | | + | + | | | + | | | | | | | + |
| **9.372** | n-Decanoic acid | | | | | + | | | | | | + | | | |
| **9.431** | Propanoic acid, 2-methyl-, butyl ester | | | | | | | + | | + | | | | | |
| **9.85** | Benzeneethanol, alpha.-(phenylmethyl)- | | | | | | | | | | | | + | + | + |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **9.915** | 2-Tetradecene, (E)- | | | + | + | | | + | | + | | | + | | | |
| **10.11** | Tetradecane | | | + | + | + | + | + | + | + | + | | + | | | + |
| **10.375** | Benzeneethanol, 4-hydroxy- | | | | | | | | | + | | + | + | + | | + |
| **11.343** | Benzene, (2-isothiocyanatoethyl)- | | | | | | | | | | | | + | | | |
| **11.349** | Phthalimide | | + | + | + | + | + | + | | + | + | + | + | + | | + |
| **11.452** | o-Cyanobenzoic acid | | | + | + | + | + | + | | + | | + | + | + | | + |
| **11.615** | Dodecane, 2-methyl- | | | | | | + | + | | | | | | | | |
| **11.798** | 7-Methyl-octadecane | | | | | | + | | | | | | | | | |
| **11.957** | Acetic acid, phenyl-, isopentyl ester | | | | | | | | | | | | | + | | |
| **11.963** | Hexathiane | | | | | | | | + | | + | | + | | | + |
| **12.264** | 3-Ethoxy-4-Methoxyphenol | | | | | | | | | + | | | | | | |
| **12.294** | Cyclopentadecane | | + | | + | | | | | | | | | | | |
| **12.335** | Acetamide, N-(2-phenylethyl)- | | | | | | | | | + | | + | | | | |
| **12.489** | Pentadecane | + | + | + | + | + | + | + | + | | + | + | + | + | | + |
| **12.489** | Phenol, 3,5-bis(1,1-dimethylethyl)- | | | | | | | | | | | | + | | | |
| **12.654** | N-Butyryl-DL-homoserine lactone | | + | + | + | + | + | + | | | | | | | | |
| **12.672** | Phenol, 2,4-bis(1,1-dimethylethyl)- | + | + | + | | + | | | + | + | + | | | + | | + |
| **12.678** | Phenol, 2,5-bis(1,1-dimethylethyl)- | | | | + | | + | + | | | | | | | | |
| **12.50** | Phenol, 2,6-bis(1,1-dimethylethyl)- | | | | | | | | | | | + | | | | |
| **13.929** | Pentadecane, 2-methyl- | | + | | | | + | | | | | | | | | |
| **14.036** | Dodecanoic acid | | | | | + | | + | | | | + | + | + | | + |
| **14.088** | Pentadecane, 3-methyl- | | + | | + | | + | | | | | | | | | |
| **14.437** | 2,6,10,14-Tetramethyl-7-(3-methylpent-4-enylidene) pentadecane | | + | | | | | | | | | | | | | |
| **14.579** | Cetene | + | + | | + | + | | + | | | + | | + | + | | + |
| **14.59** | 5-Octadecene, (E)- | | | + | | | | | | | | | | | | |
| **14.602** | Z-8-Hexadecene | | | + | + | | + | | + | | | + | | | | |
| **14.762** | Hexadecane | + | + | + | + | + | + | + | + | | + | + | + | + | | + |
| **14.885** | Cyclopropane, 1-methyl-1-(1-methylethyl)-2-nonyl- | | + | | | | | | | | | | | | | |
| **14.938** | Indole-3-pyruvic acid | | | | | | | | | + | | + | | | | + |
| **14.962** | Tryptophol | | | | | | | | | + | | + | + | + | | + |
| **14.974** | 1H-Indole-3-acetic acid, hydrazide | | | | | | | | | + | | + | | | | |
| **15.688** | 7,9-Dimethyl-1,4-dioxa-7,9-diazacycloundecane-8-thione | | | | | | | | | + | | | | | | |
| **15.741** | Methyl jasmonate | | | | | | | | | | | | + | | | |
| **15.801** | Heptadecane, 3-methyl- | | | | | | + | | | | | | | | | |
| **15.853** | 2-Bromo dodecane | | + | | | | | | | | | | | | | |
| **15.883** | Hexadecane, 7,9-dimethyl- | | | | | | + | | | | | | | | | |
| **16.078** | 2-Mercaptophenol | | | | | | | | | + | | + | | | | |
| **16.137** | Phenol, 2-[(1-methylethyl) thio]- | | | | | | | + | | | | | | | | |
| **16.166** | Hexadecane, 2-methyl- | | + | | + | | + | | | | | | | | | |
| **16.208** | 1-Pentadecene | | | | | | | | | | | + | | | | |
| **16.515** | 4-Mercaptophenol | | + | | | | | | | | | | | + | | |
| **16.769** | Dodecane, 2,6,11-trimethyl- | | | | | | | | | | | | + | | | |
| **16.969** | Heptadecane | + | + | + | + | + | + | + | + | | + | + | + | + | | + |
| **17.005** | Nonadecane, 9-methyl- | | | | + | | | | | | | | | | | |
| **17.105** | Heptadecane, 2,6-dimethyl- | | + | | | | | | | + | | | | | | |

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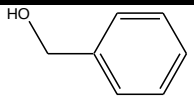
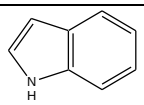
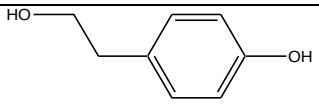
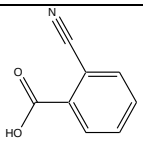
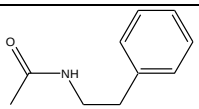
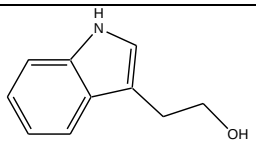
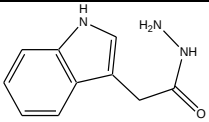
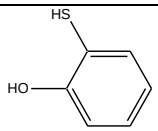
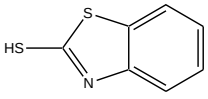
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **17.241** | N-Hexanoyl-DL-homoserine lactone | | + | | | | | | | | | | | | | | |
| **17.317** | 1H-Benzimidazole, 2-(methylthio)- | | | | | | | | | | | | | + | | | |
| **17.395** | dl-Alanyl-l-leucine | | | | | | | | + | + | + | + | | + | + | | |
| **17.524** | 1H-Benzimidazole, 2-(methylthio)- | | | | | + | | + | | | | | | | | | |
| **17.589** | 1H-Thieno[3,4-d] imidazole-4-propanoic acid, hexahydro-2-oxo-, [3aS-(3a.alpha.,4.beta.,6a.alpha.)]- | | | + | | | | | | | | | | | | | |
| **17.772** | Pyrrolo[1,2-a] pyrazine-1,4-dione, hexahydro- | + | + | | | | + | | | + | + | + | + | | | + | |
| **17.884** | Propanamide, 2-amino-3-(3-indolyl)- | | | | | | | | | | | | | + | | + | |
| **18.008** | N-Isopropyl-N-propyl aminoethyl-2-chloride | | + | | | | | | | | | | | | | | |
| **18.203** | N, N-Dipropyltryptamine | | | | | | | | + | | | | | | | + | |
| **18.469** | Heptadecane, 3-methyl- | | + | | | | + | | | | | | | | | + | |
| **18.345** | Cyclo-(glycyl-l-leucyl) | + | + | | + | | | | + | | | | | + | | | |
| **18.734** | 5-Octadecene, (E)- | | + | | | | | | | | | | | | + | | |
| **18.929** | 1-Octadecene | + | | | | | | | + | + | + | | | | | + | + |
| **18.935** | E-15-Heptadecenal | | + | | | + | + | + | | | | | | | | | |
| **19.077** | Octadecane | + | + | + | + | + | + | + | + | | + | + | + | + | + | | |
| **19.106** | Hexadecane, 7,9-dimethyl- | | | | | | | | | | | | | + | | | |
| **19.106** | 1H-Indole-3-acetic acid, methyl ester | | | | | | | | | + | | | + | | | + | |
| **19.201** | 1-Hexadecanol, 2-methyl- | | | | | | | | | | | | | + | | | |
| **19.231** | D, L-3-Camphorcarboxylic acid | | | | | + | | | | | | | | | | | |
| **19.277** | Hexadecane, 2,6,10,14-tetramethyl- | | + | | | | | | | | | | | | | | |
| **19.289** | Dicyclohexyldisulphide | | | | | | | | | | + | + | + | | | | |
| **19.756** | Phenol, 3,5-dimethoxy- | + | + | + | | | | + | + | + | + | | + | + | + | | |
| **19.773** | 1H-Indene, 2-butyl-5-hexyloctahydro- | | | | | | | | | + | | | | | | | |
| **20.34** | 2,6-Dichlorobenzenesulfonyl chloride | | | | | | + | | | | | | | | | | |
| **20.352** | Benzene, 1,2-bis(1-buten-3-yl)- | | | | | + | | | | | | | | | | | |
| **20.517** | Octadecane, 3-methyl- | | + | | | | | | | | | | | | | | |
| **20.623** | 1-Nonadecene | + | + | + | + | + | + | | | | + | + | + | + | | | |
| **20.671** | Cyclotetradecane | | | + | | | | | | | | | | | | | |
| **20.677** | 1H-Indole-3-ethanol, acetate (ester) | | | | | | | | | + | | + | | | | + | |
| **20.718** | 4-Cyclopenta-1,3-dienylbutyric acid, ethyl ester | | | | | | + | | | | | | | | | | |
| **20.883** | Hexadecane, 1-chloro- | | | | | | | | | | | | | | | | + |
| **20.99** | Benzeneacetic acid, 2-phenylethyl ester | | | | | | | | | | | | | | + | | + |
| **21.019** | Propanamide, 2,2,3,3,3-pentafluoro-N-(2-phenylethyl)- | | | | | | | | | | | | | + | | + | |
| **21.102** | E-8-Methyl-9-tetradecen-1-ol acetate | | | | + | | | | | | | | | | | | |
| **21.09** | Nonadecane | + | + | | | | + | | | | | | | | + | + | |
| **21.131** | 2-Dodecen-1-yl (-) succinic anhydride | | | | | | | | | + | + | + | + | | | | |
| **21.131** | 1,13-Tetradecadien-3-one | | | | | | | | | | | | | + | | | |

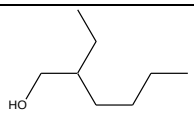
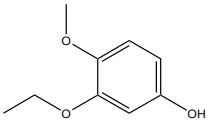
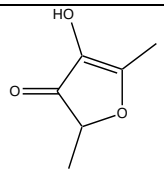
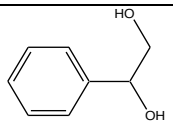
| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **21.35** | L-Proline, N-valeryl-, decyl ester | | | | | | | | | | + | | | + | | |
| **21.349** | Pentadecanoic acid, 13-methyl-, methyl ester | | | | | | | | | | | | | | | + |
| **21.503** | Pyrrolo[1,2-a] pyrazine-1,4-dione, hexahydro-3-(2-methylpropyl)- | + | + | + | + | + | + | + | | + | | + | + | + | + |
| **21.55** | Hexadecanoic acid, methyl ester | | + | | | | | | | | + | + | + | + | | |
| **21.751** | 2,5-Furandione, 3-dodecyl- | | | | | | | | + | | | | + | | | |
| **21.804** | Benzenepropanoic acid, 3,5-bis(1,1-dimethylethyl)-4-hydroxy-, methyl ester | + | | + | + | + | + | + | + | + | + | + | + | + | + | |
| **21.969** | Stannane, tetraethyl- | | | | | | | | | + | | | | | | |
| **22.005** | 2',4'-Dihydroxyacetophenone oxime | | | | | + | | | | | | | | | | |
| **22.146** | 1,2-Benzenedicarboxylic acid, butyl 2-methylpropyl ester | | + | | | | | | | | | | | | | |
| **22.147** | 2-Mercaptobenzothiazole | | | | + | + | + | | + | + | | + | | | | |
| **22.158** | 1,2-Benzenedicarboxylic acid, bis(2-methylpropyl) ester | | | | | | | + | | | | | | | | |
| **22.182** | Diethyl Phthalate | | | | | + | | | | | + | + | | + | | |
| **22.701** | E-15-Heptadecenal | | | | | | | | | | | + | | + | + | |
| **22.731** | 3-Phenylbicyclo (3.2.2) nona-3,6-dien-2-one | | | | | | | | | | | + | | | | |
| **22.778** | Cyclohexane, 1-(1,5-dimethylhexyl)-4-(4-methylpentyl)- | | + | | | | | | | | | | | | | |
| **22.885** | Cyclohexadecane, 1,2-diethyl- | + | + | | | + | | + | | | | | | | | |
| **23.009** | Eicosane | + | + | + | + | + | + | + | + | | + | + | + | + | + | |
| **23.032** | Octadecane, 1-chloro- | | | | | | + | | + | | | | | | | |
| **23.144** | Cyclic octaatomic sulfur | | | + | + | + | + | + | + | + | + | | + | + | + | |
| **24.03** | E-11-Methyl-12-tetradecen-1-ol acetate | | | | | | | | | | | + | + | | | |
| **24.26** | Fluorene, 4-[1,2-dihydroxyethyl]- | | | | | + | | | | + | | | | | | |
| **24.419** | Oleanitrile | + | + | + | + | + | + | + | + | | + | + | | | | + |
| **24.496** | 2-Benzimidazolethiol | | | | + | | + | | | | | | | | | |
| **24.65** | 2-Methyl-E-7-octadecene | | | | | | | | | | | + | | + | | |
| **24.85** | Heptadecanenitrile | | + | | | | | | | | | | | | | |
| **24.886** | 1-Eicosene | | | + | | | + | + | | + | | | | | | |
| **24.886** | Nonadecanenitrile | | | | + | | | | | + | | | | | | |
| **24.891** | Octadecanenitrile | | | | | + | | + | | | + | + | | | | + |
| **24.992** | DL-Tryptophan, N-acetyl- | | | | | | | | | | | | | + | | + |
| **25.104** | Indole-3-butyramide | | | | | | | | | | | | | + | | |
| **25.328** | Heptadecanoic acid, 16-methyl-, methyl ester | | | + | | | | | + | | | | | | | |
| **25.329** | Heptadecanoic acid, 14-methyl-, methyl ester | | | | | | + | | | + | | | | | | |
| **25.411** | 2,5-Piperazinedione, 3-methyl-6-(phenylmethyl)- | + | + | | + | | + | + | + | + | + | + | + | | | + |
| **25.777** | Alloaromadendrene | + | | | | | | | | | | | | | | |
| **25.813** | 2,5-Piperazinedione, 3-(phenylmethyl)- | + | + | | | | | | | + | | + | | | | |
| **25.854** | Androstenedione | | | | | | | | | | | | + | | | |
| **26.32** | Z-5-Nonadecene | | | | | | | | | | + | | | | | + |

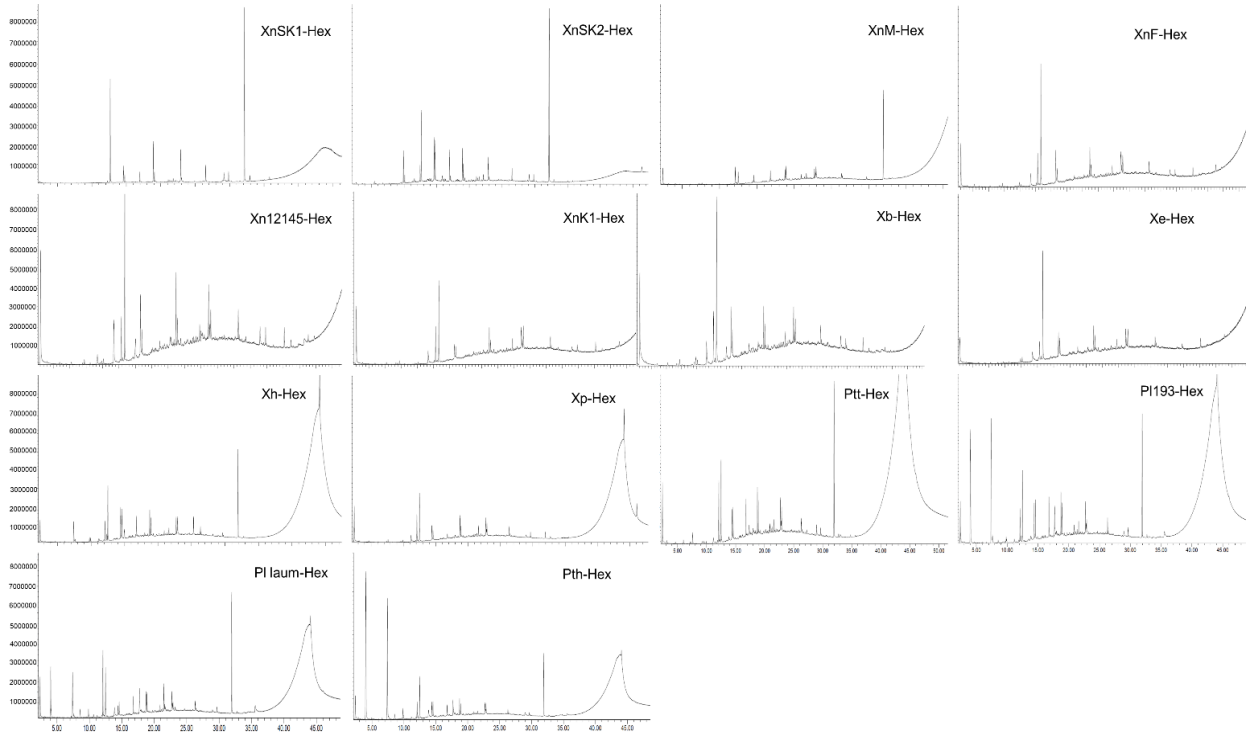
| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **26.403** | E-8-Methyl-9-tetradecen-1-ol acetate | | | | | | | | | + | | | | | + |
| **26.479** | 9-Tricosene, (Z)-* | | | + | | | | | | | | | | | |
| **26.509** | 1-Docosene | + | | | + | + | + | + | + | + | | | | | |
| **26.604** | Octadecane, 2,6,10,14-tetramethyl- | | | | | | | + | | | | | | | |
| **26.639** | Docosane | | | + | + | | + | + | + | + | + | | + | + | + |
| **26.94** | Diethyldithiophosphinic acid | + | + | + | + | + | + | + | + | + | + | | | | |
| **27.076** | Pyrene, 4-methyl- | | | | | | | | | | | + | | | |
| **27.507** | 2,5-Piperazinedione, 3-benzyl-6-isopropyl- | | + | + | + | + | + | + | + | + | + | | | | |
| **29.302** | Pyrrolo[1,2-a] pyrazine-1,4-dione, hexahydro-3-(phenylmethyl)- | + | + | + | + | + | + | + | | + | | + | + | + | + |
| **28.817** | Cyclo-(l-leucyl-l-phenylalanyl) | + | | | + | + | + | | + | + | | + | + | + | + |
| **28.912** | Benzyl butyl phthalate | | + | | | | | | | | | | | | |
| **29.16** | 9-Octadecenamide, (Z)- | + | + | + | | + | | + | | | | + | + | | |
| **29.827** | 1-Docosanethiol | | | | | | | + | | | | | | | |
| **31.061** | 3-Benzylidene-hexahydro-pyrrolo[1,2-a] pyrazin-1,4-dione | | | | | | + | | | | | | | | |
| **31.078** | Hexanoic acid, 2-ethyl-, hexadecyl ester | | + | | | | | | | | | | | | |
| **32.153** | Bis(2-ethylhexyl) phthalate | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| **32.159** | Diisooctyl phthalate | + | | | | | | | | | | | | | |
| **32.212** | Di-n-octyl phthalate | | + | | | | | | | | | + | | | |
| **32.424** | Pentanamide, N-[2-(indol-3-yl)] ethyl- | | | | | | | | | + | | | | | + |
| **32.454** | Acetamide, N-[2-(1H-indol-3-yl) ethyl]- | | | | | | | | | | | | | + | |
| **32.755** | Cyclotrisiloxane, hexamethyl- | | | | | | | + | + | + | | + | | + | + |
| **33.026** | Zinc,bis(dimethylcarbamodithioato-S,S')-, (T-4)- | | | | | | | | | | | + | + | | |
| **34.709** | l-Proline, N-allyloxycarbonyl-, octadecyl ester | | | | + | | | | | | | | | | |
| **35.488** | 4-(cis-6-Methoxymethyl-3,4-dimethyl-3-cyclohexenyl)-trans-3-buten-2-one 2,4-dinitrophenylhydrazone | | | | | + | | | | | | | | | |
| **35.813** | 5-Methyl-2-phenylindolizine | | | | | + | | | | | | | | | |
| **44.196** | Zinc dibutyldithiocarbamate | | | | | | | | | | | + | | | |
| | Σ182 | 32 | 53 | 36 | 44 | 44 | 49 | 47 | 33 | 60 | 36 | 63 | 54 | 49 | 53 |

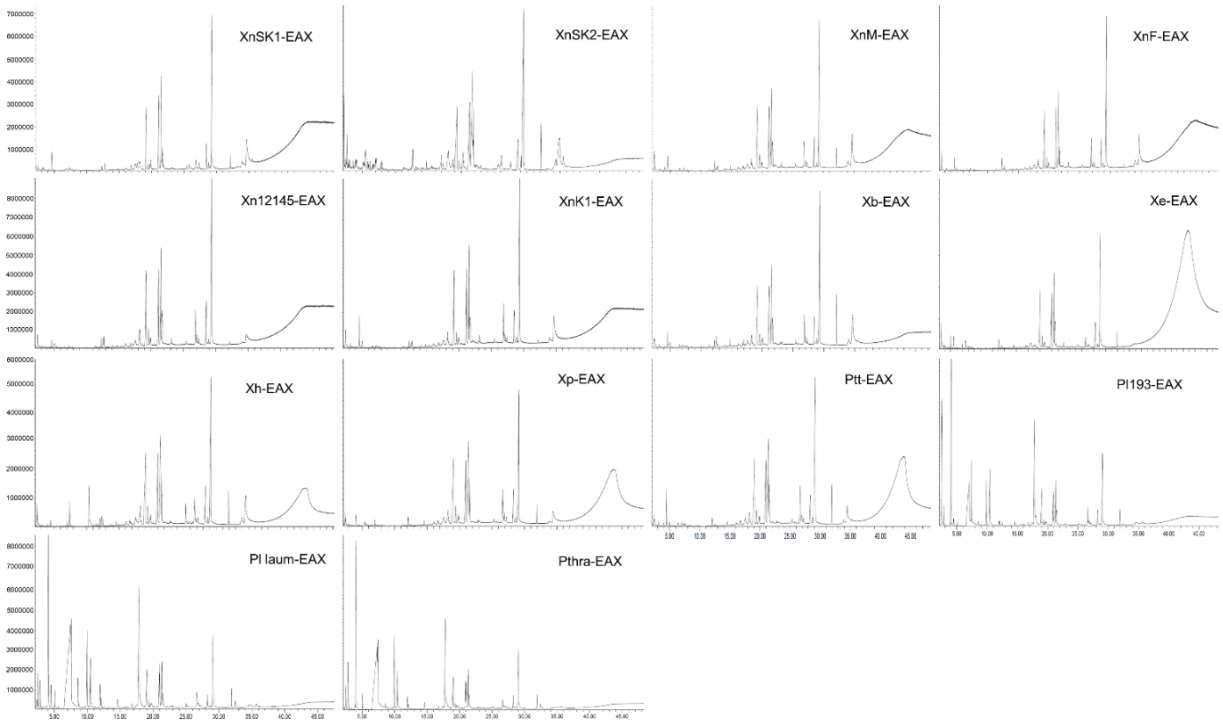
[1] Retention time at GC analysis.
[2] Compounds are predicted from four organic extracts of bacterial culture broths.
[3] Bacterial acronyms are described in Materials and Methods.

**Table S3.** Secondary metabolites predicted from *P. temperata temperata*, *Xenorhabdus hominickii*, and *X. ehlersii*

| Compounds (Acronym) | Structure |
|---|---|
| Benzyl alcohol (BA) |  |
| Indole (IND) |  |
| Benzeneethanol, 4-hydroxy- (BH) |  |
| o-Cyanobenzoic acid (CBA) |  |
| Acetamide, N-(2-phenylethyl)- (NPA) |  |
| Tryptophol (TPL) |  |
| 1H-Indole-3-acetic acid, hydrazide (IAAH) |  |
| 2-Mercaptophenol (MP) |  |
| 2-Mercaptobenzothiazole (MT) |  |

| | |
|---|---|
| 1-Hexanol, 2-ethyl- (EH) |  |
| 3-Ethoxy-4-Methoxyphenol (EMP) |  |
| 2,5-Dimethyl-4-hydroxy-3(2H)-furanone (DHF) |  |
| 1,2-Ethanediol, 1-phenyl- (PE) |  |


XnSK1-Hex
XnSK2-Hex
XnM-Hex
XnF-Hex
Xn12145-Hex
XnK1-Hex
Xb-Hex
Xe-Hex
Xh-Hex
Xp-Hex
Ptt-Hex
Pl193-Hex
Pl laum-Hex
Pth-Hex


XnSK1-EAX
XnSK2-EAX
XnM-EAX
XnF-EAX
Xn12145-EAX
XnK1-EAX
Xb-EAX
Xe-EAX
Xh-EAX
Xp-EAX
Ptt-EAX
Pl193-EAX
Pl laum-EAX
Pthra-EAX

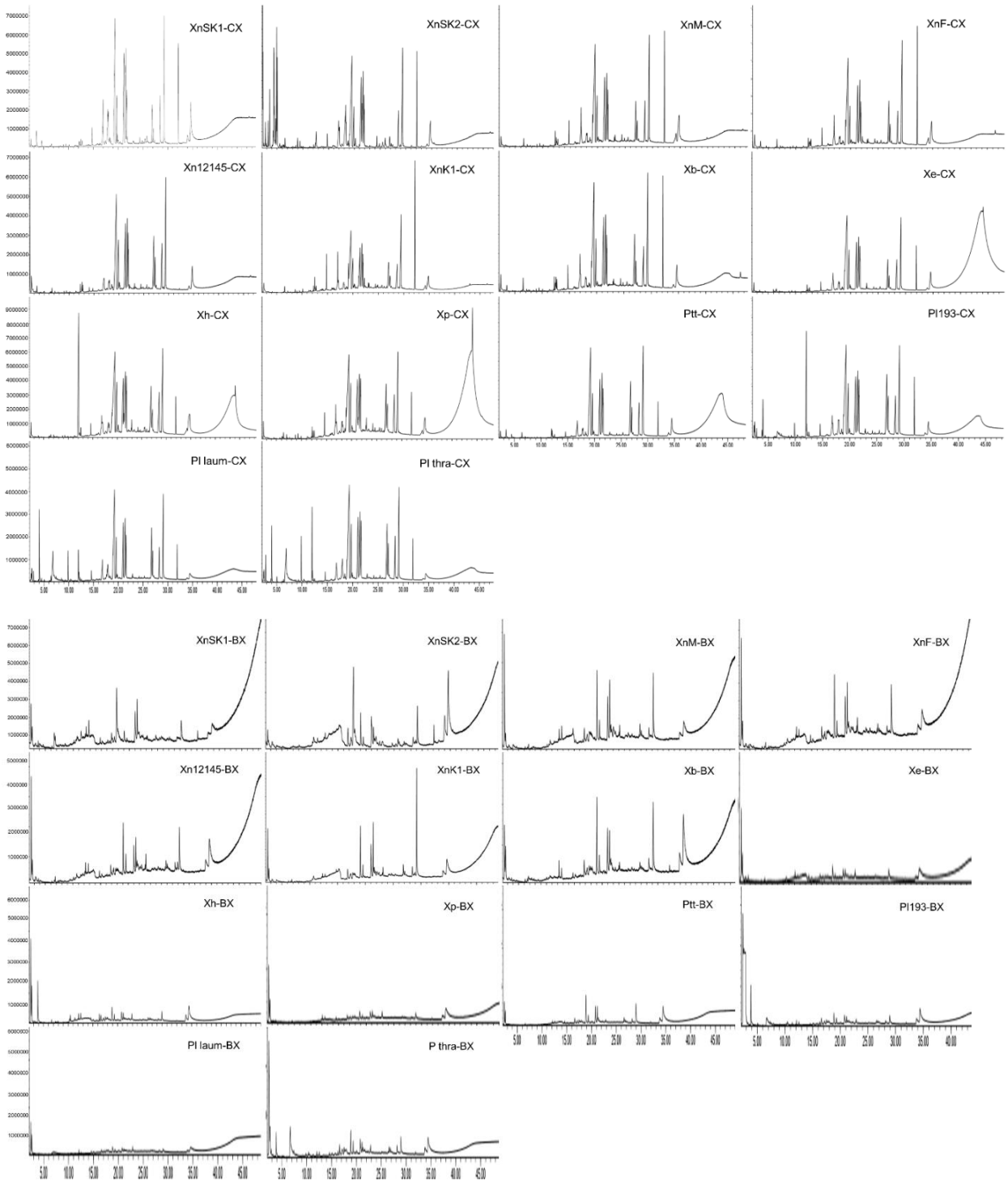

XnSK1-CX
XnSK2-CX
XnM-CX
XnF-CX
Xn12145-CX
XnK1-CX
Xb-CX
Xe-CX
Xh-CX
Xp-CX
Ptt-CX
Pl193-CX
Pl laum-CX
Pl thra-CX
XnSK1-BX
XnSK2-BX
XnM-BX
XnF-BX
Xn12145-BX
XnK1-BX
Xb-BX
Xe-BX
Xh-BX
Xp-BX
Ptt-BX
Pl193-BX
Pl laum-BX
P thra-BX

**Fig. S1**