

One-step bioconversion of fatty acids into C8–C9 volatile aroma compounds by a multifunctional lipoxygenase cloned from *Pyropia haitanensis*

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Figure S1 GC-MS analysis of the VOCs composition of hydrolyzed sunflower seed oil by incubation with PhLOX. C1–C10 represent compounds tentatively identified as 3-pentanone, 2-hexanone, hexanoic acid methyl ester, glycerin, undecane, octanoic acid methyl ester, dodecane, 4,6-dimethyl-dodecane, decanoic acid methyl ester and dodecanoic acid methyl ester, respectively. I1–I2 represent compounds tentatively identified as *n*-nonanal and *n*-decanal. N1–N7 represent compounds tentatively identified as 2*E*,4*E*-pentadienal, 2*E*-hexenal, *n*-heptanal, 2*E*-heptenal, *n*-octanal, 2*E*-octenal and 2*E*,4*E*-nonadienal, respectively. IS represents the vanillin internal standard.

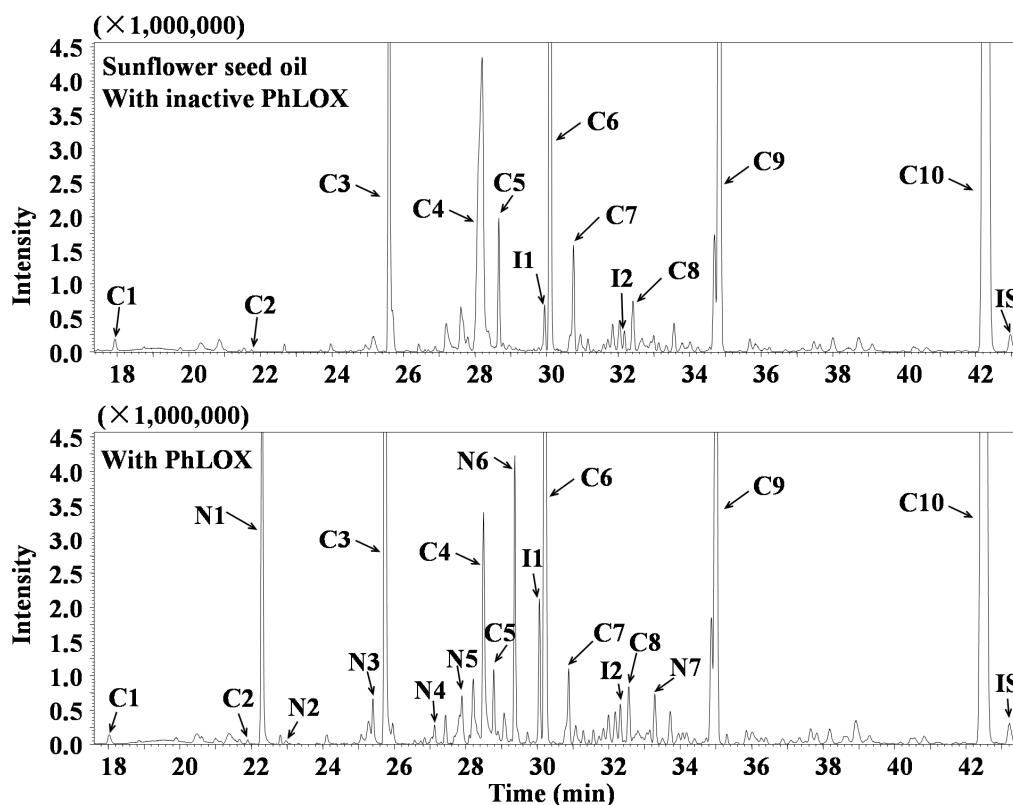


Figure S2 GC-MS analysis of the VOCs composition of hydrolyzed corn oil by incubation with PhLOX. C1–C12 represent compounds tentatively identified as 3-pentanone, 3-hexanone, 2-hexanone, hexanoic acid methyl ester, glycerin, 1H-imidazole, undecane, octanoic acid methyl ester, dodecane, 4,6-dimethyl-dodecane, decanoic acid methyl ester and dodecanoic acid methyl ester, respectively. N1–N7 represent compounds tentatively identified as 2*E*,4*E*-pentadienal, 2*E*-hexenal, *n*-heptanal, 2*E*-heptenal, *n*-octanal, 2*E*-octenal and 2*E*,4*E*-nonadienal, respectively. I1–I2 represent compounds tentatively identified as *n*-nonanal and *n*-decanal. IS represents the vanillin internal standard.

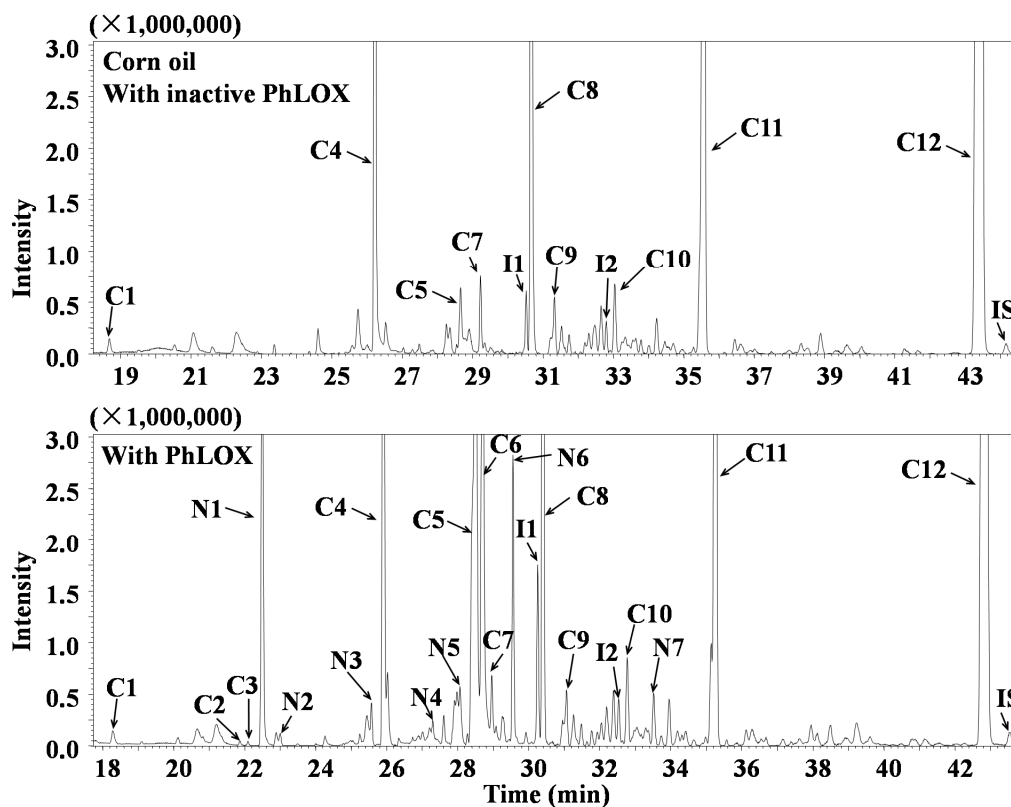


Figure S3 GC-MS analysis of the VOCs composition of hydrolyzed fish oil by incubation with PhLOX. C1–C11 represent compounds tentatively identified as 3-pentanone, 3-hexanone, 2-hexanone, hexanoic acid methyl ester, glycerin, 1H-imidazole, octanoic acid methyl ester, 4,6-dimethyl-dodecane, 2,4-dimethyl-benzaldehyde, decanoic acid methyl ester and dodecanoic acid methyl ester, respectively. X1–X2 represent compounds tentatively identified as triethylmethoxy silane and diethoxydimethyl silane. N1–N11 represent compounds tentatively identified as 2*E*,4*E*-pentadienal, 2*E*-hexenal, 4*Z*-heptenal, 1-hepten-3-ol, *n*-octanal, 2*E*-octen-1-ol, 2*E*-octenal, 3*E*,5*E*-octadien-2-one, 2*E*,4*E*-octadienal, 2*E*,6*Z*-nonadienal and 2*E*,4*Z*-decadienal, respectively. I1–I2 represent compounds tentatively identified as *n*-nonanal and *n*-decanal. IS represents the vanillin internal standard.

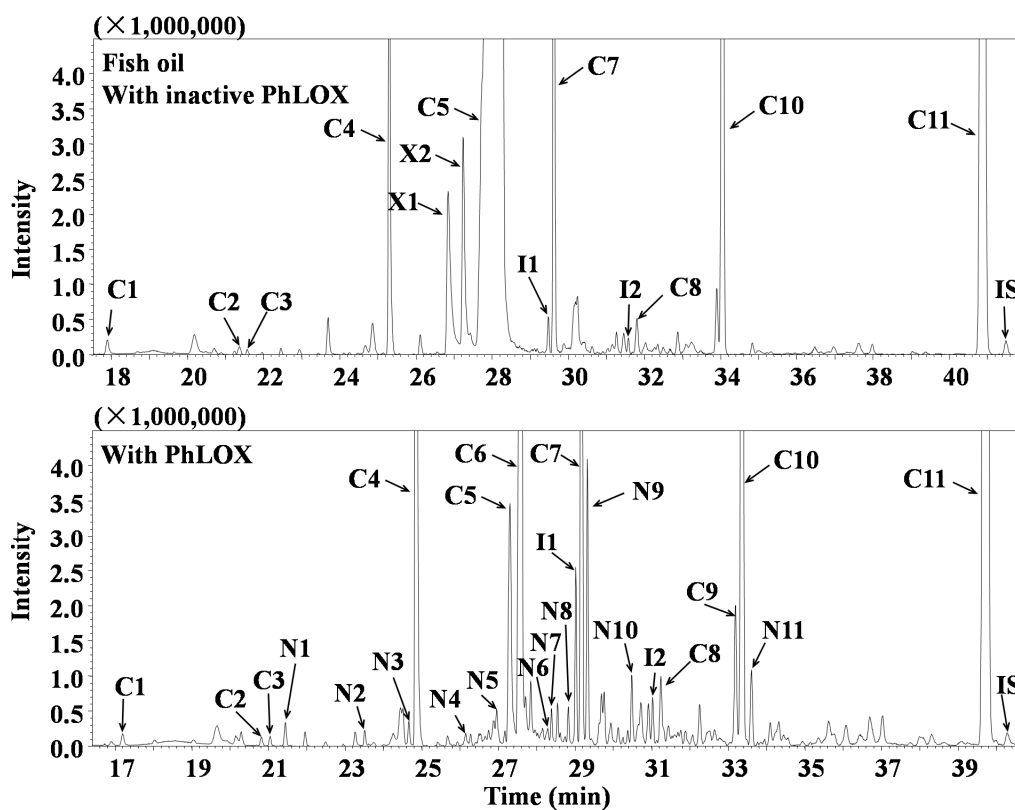


Figure S4 – GC-MS analysis of VOCs generated from different fatty acids after incubation with PhLOX. Here the second column (AgilentHP-5MS, 30 m × 0.25 mm × 0.25 μm) was used to separate and analyze the volatile products. Compounds marked as C1-C10 tentatively identified as diethoxydimethyl silane, 1H-imidazole, 2,4-dimethylundecane, hexane, cyclooctyl alcohol, 1-tetradecen-3-yne, hexadecane, pentanoic acid methyl ester, hexanoic acid methyl ester and octamethylcyclotetrasiloxane, respectively.

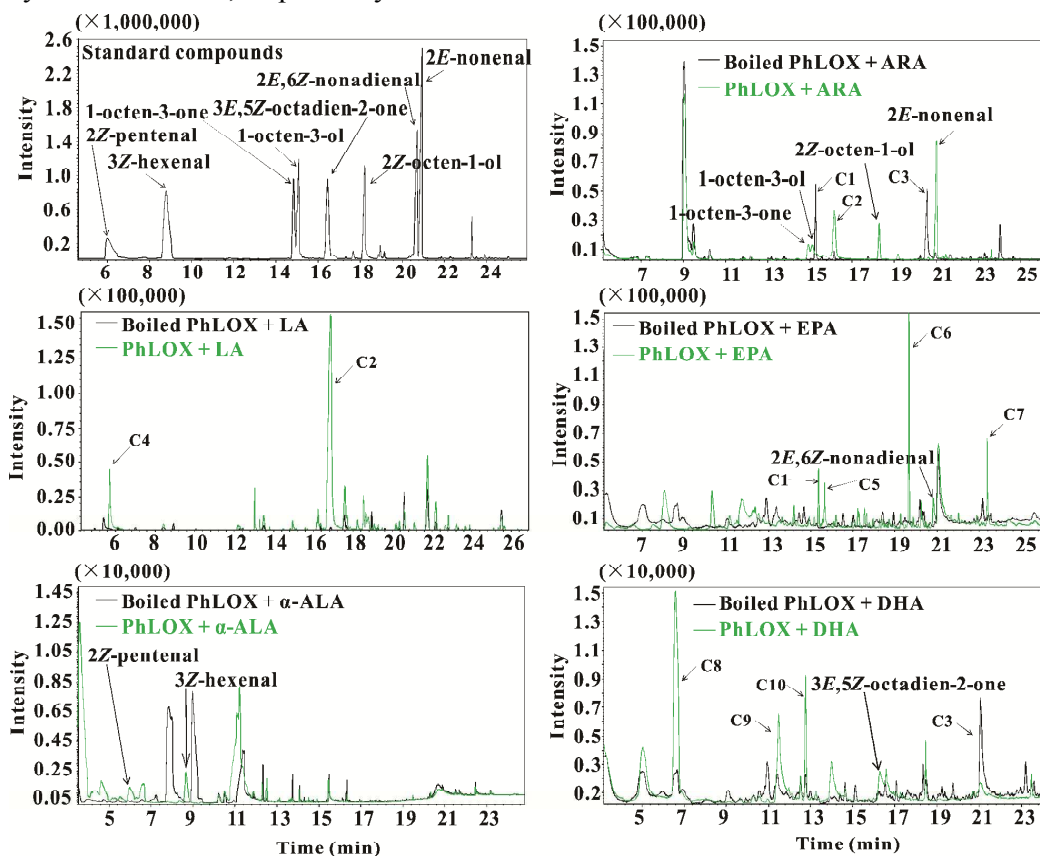


Figure S5 – GC-MS analysis of the VOCs generated from hydrolyzed oils after incubation with PhLOX. Here the second column (AgilentHP-5MS, 30 m × 0.25 mm × 0.25 μm) was used to separate and analyze the volatile products. Compounds marked as N1–N14 tentatively identified as 2*E*,4*E*-pentadienal, *n*-heptanal, 2*E*-heptenal, *n*-octanal, 2*E*-octenal, 2*E*,4*E*-nonadienal, 2*E*-hexenal, 4*Z*-heptenal, 1-hepten-3-ol, 2*E*,4*E*-octadienal, 2*E*-octenal, *n*-octanal, 3*E*,5*E*-octadien-2-one and 2*E*,6*Z*-nonadienal, respectively.

