Expression and characterization of CYP52 genes involved in the biosynthesis of sophorolipid and alkane metabolism in *Starmerella bombicola*

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Table S1. Primer sequences for cloning of *CYP52E3*, *CYP52M1*, *CYP52N1* and *UGTA1* into the vector pYES2.

Genes	Sequence	Cloning sites
CYP52-E3	Forward: 5'-CGCGGATCCAACACAATGTCCATTAATTTCTCT-3' Reverse: 5'- CCGCTCGAGCTAGCGAATGAACTTCGC-3'	*Bam*HI/*Xho*I
CYP52-M1	Forward: 5'- CCCAAGCTTAACACAATGTCCATCAAAGACATT-3' Reverse: 5'-CCGCTCGAGTTAAGAAAACCGCACAAC -3'	*Hind*III/*Xho*I
CYP52-N1	Forward: 5'- CGCGGATCCAACACAATGTCTCTTTATGCTGTG-3' Reverse: 5'-CCGCTCGAGTTAACTCAGTTTCACTCG-3'	*Bam*HI/*Xho*I
UGTA1	Forward: 5'-CGCGGATCCAACACAATGTCCCCTTCATCACAC-3' Reverse: 5'-CCGCTCGAGCTAAGAACTCACCGCTAA-3'	*Bam*HI/*Xho*I

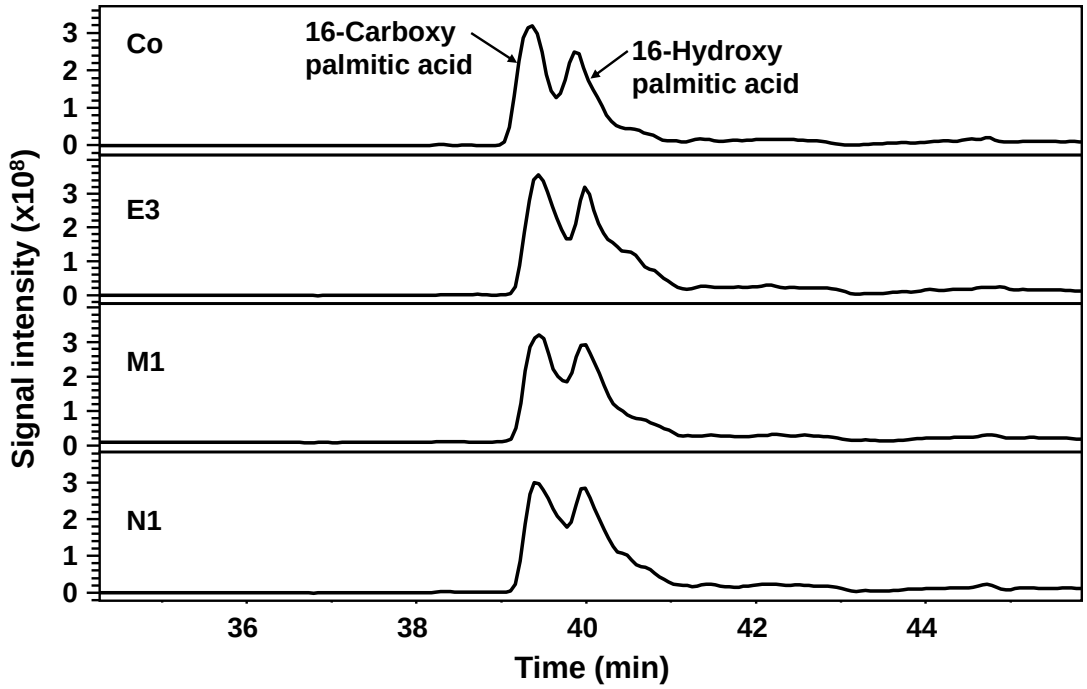

Fig. S1. LC-MS analysis of products formed by incubation of 16-hydroxy palmitic acid with control cell (Co), *CYP52E3*- (E3), *CYP52M1*- (M1), and *CYP52N1*- (N1) transformed cells.

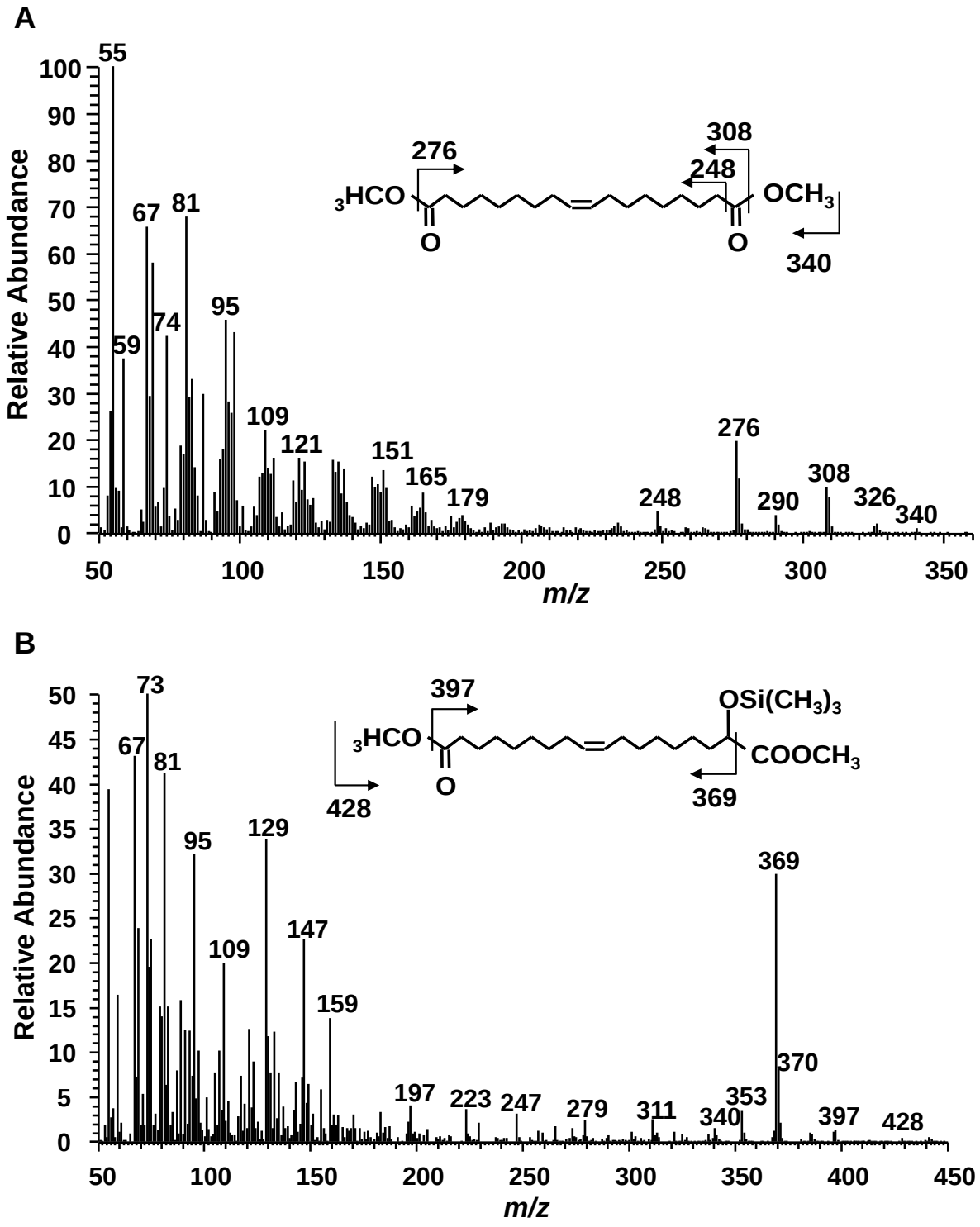

Fig. S2. GC-MS spectra of 18-carboxy oleic acid (A) and putative 17-hydroxy-18-carboxy oleic acid (B).

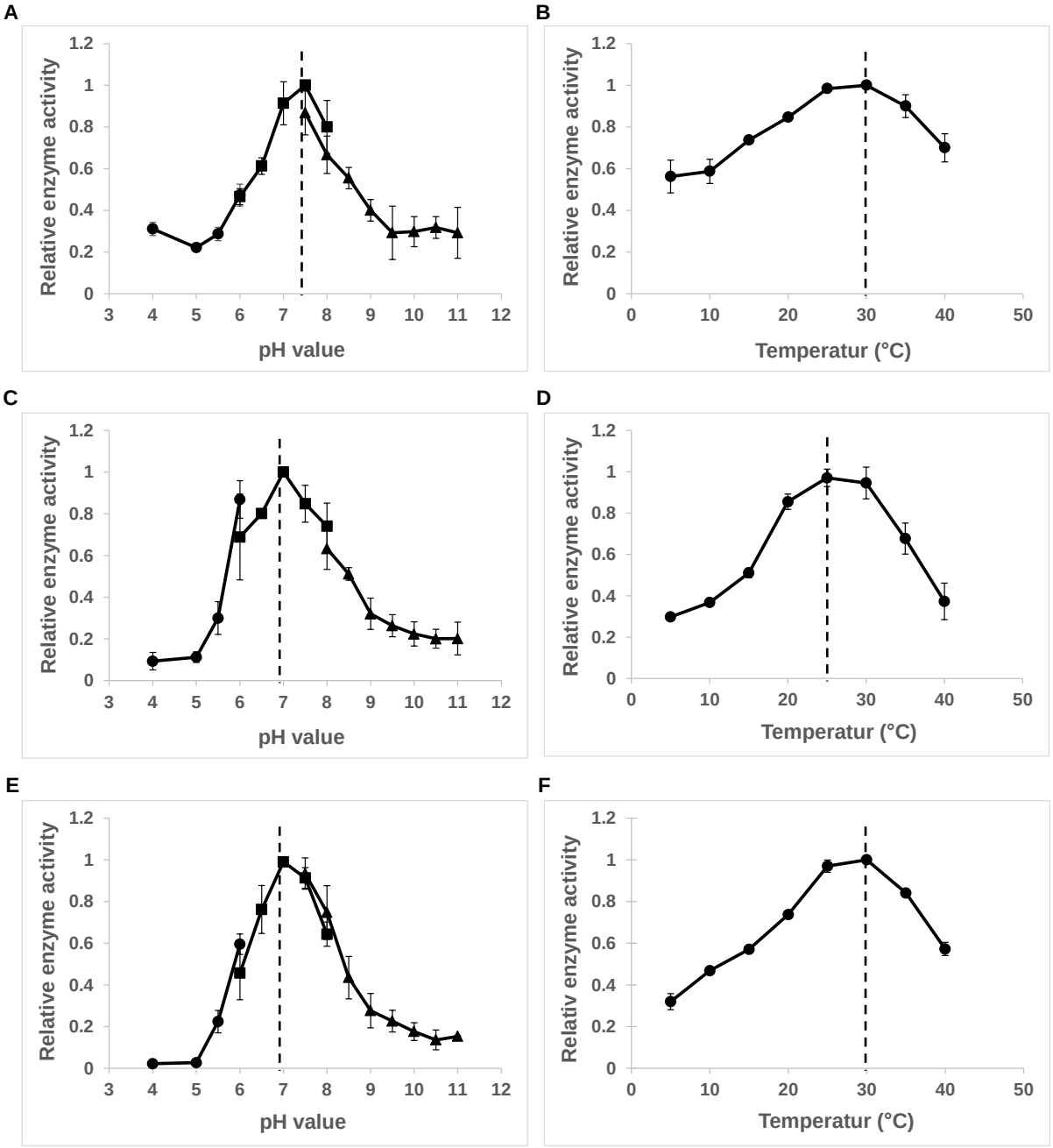

Fig. S3. Determination of the optimal pH and the optimal temperature for CYP52M1.

pH optimum of CYP52M1 towards oleic acid (A), arachidonic acid (C), and linoleic acid (E). Temperature optimum of CYP52M1 towards oleic acid (B), arachidonic acid (D), and linoleic acid (F). Values are the means of two or three separate determinations.

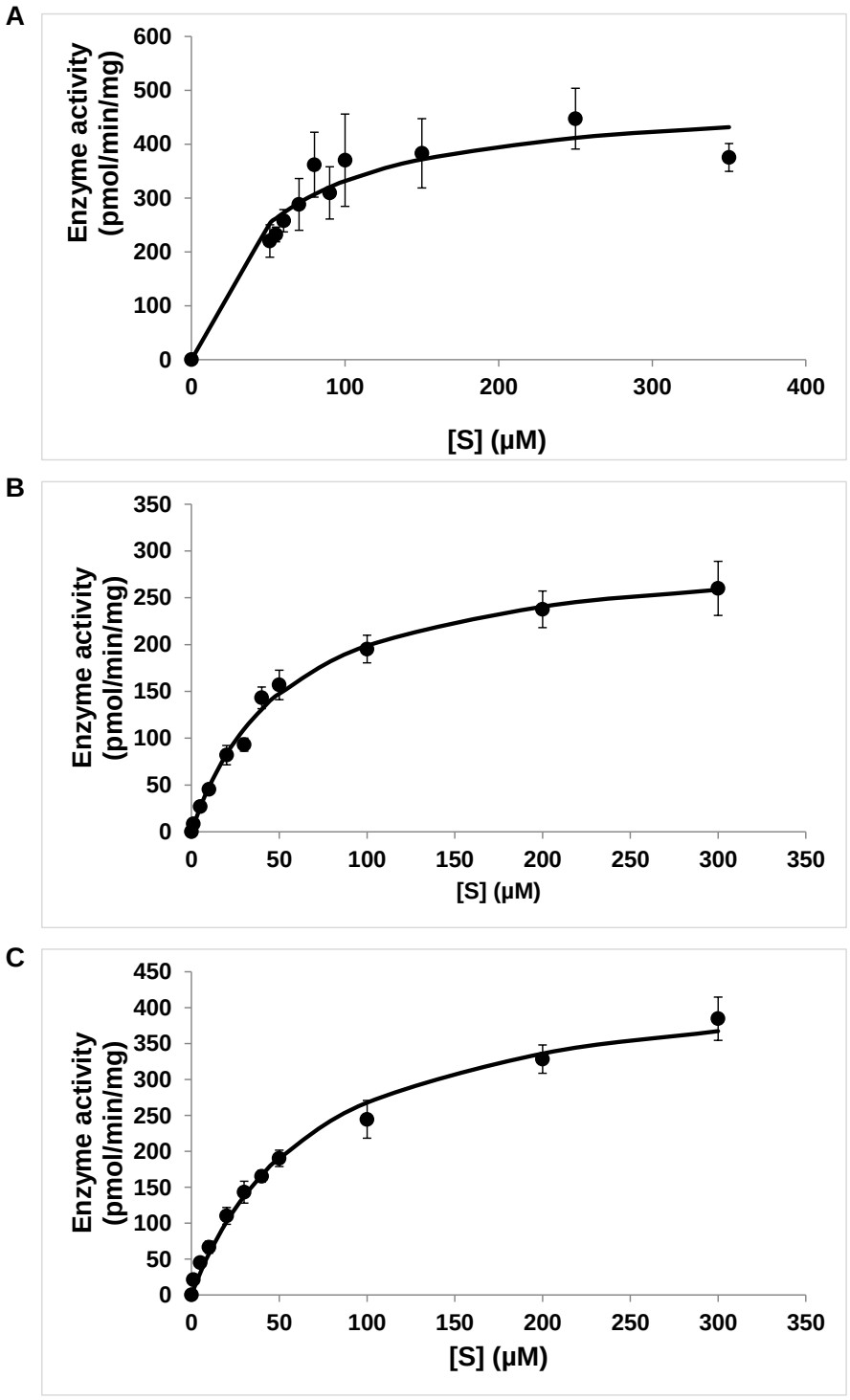

Fig. S4. Determination of the kinetic constants for CYP52M1 towards oleic (A), arachidonic (B), and linoleic acid (C).