

**Table S1.** In silico identification of genes involved in PHA metabolism in *C. tardaugens* NBRC 16725 (accession number CP034179). The induction values (FC) of the genes upon culturing the bacteria in the presence of E2 and TES versus pyruvate (PYR) are included. RecA and GyrB encoding genes are included as housekeeping controls.

<i>C. tardaugens</i>		FC	
Function	Gen ( <i>EGO55_</i> )	TES vs E2 vs PYR	PYR
$\beta$ -ketothiolase (PhaA)	09255 ( <i>bktB</i> )	3.62	2.28
	20150	3.09	1.14
	05760	-4.39	-2.27
	05015	-1.30	1.60
	13750	4.92	2.80
	13790	2.21	1.77
	05665	-2.06	-1.63
	03475	-2.55	1.06
	14320	-1.91	-1.69
acetoacetyl-CoA reductase (PhaB)	18540	-1.31	-2.64
	09490	-2.25	-1.64
PHB synthase (PhaC)	12105	1.70	-1.04
	17580	1.09	-1.46
	18530	1.94	-1.01
PHB depolymerase (PhaZ)	09590	3.11	1.11
phasin (PhaP)	12100	34.08	18.05
housekeeping (RecA)	01665	2.11	1.38
housekeeping (GyrB)	09795	1.29	1.00

**Table S2.** In silico identification of genes related to PHA metabolism in bacteria belonging to the Sphingomonadaceae family described as PHA producers. Genes encoding homologous proteins and percentage identity to those from *C. tardaugens* found in genomes of *Sphingopyxis alaskensis* LMG 18877 (Godoy et al., 2003), *Sphingopyxis chilensis* S37 (Godoy et al., 2003) and *Novosphingobium nitrogenifigens* Y88<sup>T</sup> (Smit et al., 2012) are included.

<i>C. tardaugens</i>				
function	Gen ( <i>EGO55_</i> )	organism	gen	% ID
$\beta$ -ketothiolase (PhaA)	09255	<i>S. chilensis</i> S37	-	-
	( <i>bktB</i> )	<i>S. alaskensis</i> LMG 18877	<i>Sala_2896</i>	43.80
		<i>N. nitrogenifigens</i> Y88	<i>Y88_0137</i>	58.93
	20150	<i>S. chilensis</i> S37	-	-
		<i>S. alaskensis</i> LMG 18877	<i>Sala_0781</i>	74.68
		<i>N. nitrogenifigens</i> Y88	<i>Y88_0992</i>	77.89
	05760	<i>S. chilensis</i> S37	-	-
		<i>S. alaskensis</i> LMG 18877	<i>Sala_2896</i>	44.67
		<i>N. nitrogenifigens</i> Y88	<i>Y88_3817</i>	71.82
	05015	<i>S. chilensis</i> S37	-	-
		<i>S. alaskensis</i> LMG 18877	<i>Sala_2162</i>	65.39
		<i>N. nitrogenifigens</i> Y88	<i>Y88_2522</i>	70.08
	13750	<i>S. chilensis</i> S37	-	-
		<i>S. alaskensis</i> LMG 18877	<i>Sala_3158</i>	53.06
		<i>N. nitrogenifigens</i> Y88	<i>Y88_3600</i>	53.18

	13790	<i>S. chilensis</i> S37	-	-
		<i>S. alaskensis</i> LMG 18877	<i>Sala_2162</i>	55.14
		<i>N. nitrogenifigens</i> Y88	<i>Y88_2522</i>	52.63
	05665	<i>S. chilensis</i> S37	-	-
		<i>S. alaskensis</i> LMG 18877	<i>Sala_1244</i>	45.43
		<i>N. nitrogenifigens</i> Y88	<i>Y88_0475</i>	39.64
	03475	<i>S. chilensis</i> S37	-	-
		<i>S. alaskensis</i> LMG 18877	<i>Sala_1637</i>	71.46
		<i>N. nitrogenifigens</i> Y88	<i>Y88_0475</i>	36.93
	14320	<i>S. chilensis</i> S37	-	-
		<i>S. alaskensis</i> LMG 18877	<i>Sala_1244</i>	44.08
		<i>N. nitrogenifigens</i> Y88	<i>Y88_0475</i>	39.41
acetoacetyl-CoA reductase (PhaB)	18540	<i>S. chilensis</i> S37	-	-
		<i>S. alaskensis</i> LMG 18877	<i>Sala_2255</i>	53.56
		<i>N. nitrogenifigens</i> Y88	<i>Y88_3538</i>	53.97
	09490	<i>S. chilensis</i> S37	-	-
		<i>S. alaskensis</i> LMG 18877	<i>Sala_2255</i>	79.58
		<i>N. nitrogenifigens</i> Y88	<i>Y88_3538</i>	80.00
PHB synthase (PhaC)	12105	<i>S. chilensis</i> S37	-	-
		<i>S. alaskensis</i> LMG 18877	<i>Sala_0505</i>	55.89
		<i>N. nitrogenifigens</i> Y88	<i>Y88_3019</i>	52.03
	17580	<i>S. chilensis</i> S37	-	-
		<i>S. alaskensis</i> LMG 18877	<i>Sala_0505</i>	37.40
		<i>N. nitrogenifigens</i> Y88	<i>Y88_2357</i>	68.73
	18530	<i>S. chilensis</i> S37	-	-
		<i>S. alaskensis</i> LMG 18877	<i>Sala_0505</i>	35.07
		<i>N. nitrogenifigens</i> Y88	<i>Y88_2357</i>	66.14
Phasin (PhaP)	12100	<i>S. chilensis</i> S37	-	-
		<i>S. alaskensis</i> LMG 18877	<i>Sala_0504</i>	50.83
		<i>N. nitrogenifigens</i> Y88	<i>Y88_3020</i>	62.18
PHB depolymerase (PhaZ)	09590	<i>S. chilensis</i> S37	-	-
		<i>S. alaskensis</i> LMG 18877	<i>Sala_1984</i>	66.17
		<i>N. nitrogenifigens</i> Y88	<i>Y88_2997</i>	67.89
PHB oligomer hidrolase (PhaY)	15075	<i>S. chilensis</i> S37	-	-
		<i>S. alaskensis</i> LMG 18877	<i>Sala_0774</i>	50.70
		<i>N. nitrogenifigens</i> Y88	<i>Y88_2567</i>	57.80

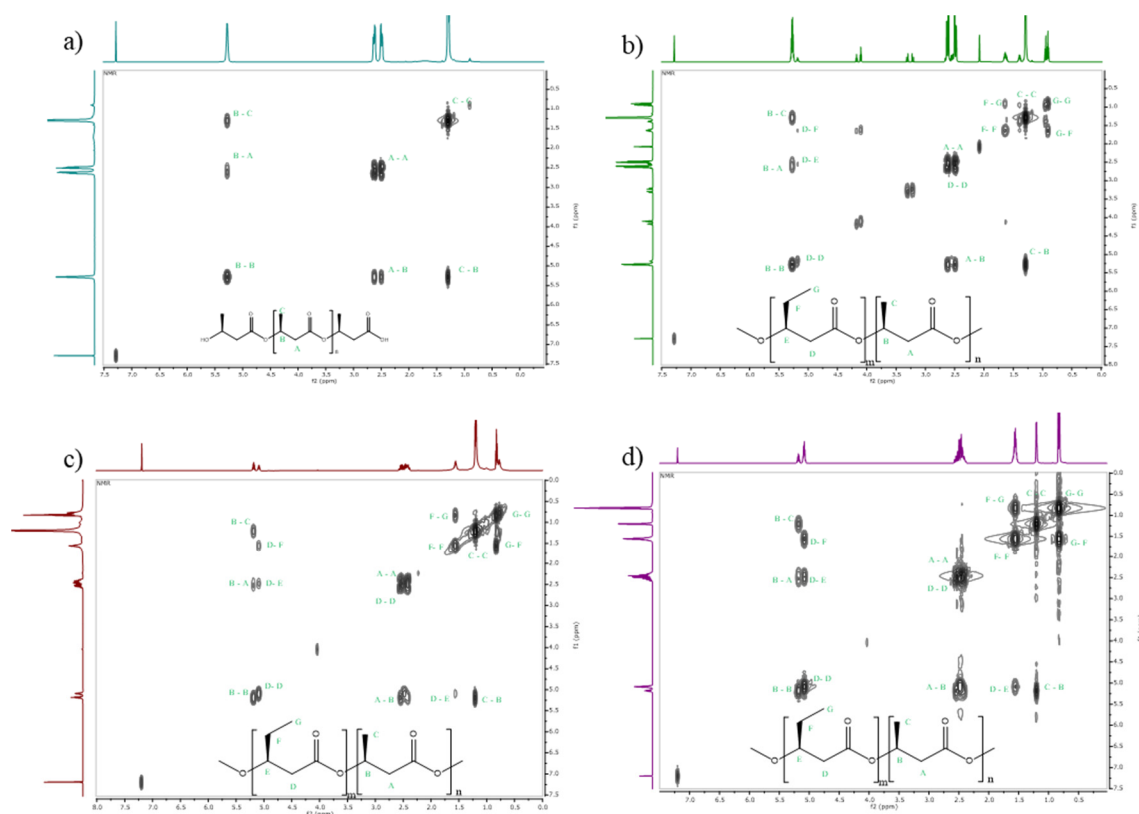
**Table S3.** In silico identification of genes related to PHA metabolism in different estrogen-degrading bacteria. Genes encoding homologous proteins and percentage identity to those from *C. tardaugs* found in genomes of *Croceicoccus estronivorus*, *Sphingomonas* sp. KC8, *Vibrio* sp. H5, *Achromobacter xylosoxidans* NBRC 15126, *Steroidobacter denitrificans* FST, *Denitratisoma oestradiolicum* DSM 16959, *Sphingobium estronivorans* AXB and *Sphingobium bisphenolivorans* YL23 are included.

<i>C. tardaugs</i>				
function	Gen EGO55_	organism	gen	% ID
$\beta$ -ketothiolase (PhaA)	09255	<i>C. estronivorus</i>	<i>MB02_08935</i>	87.69
	(bktB)	<i>Sphingomonas</i> sp. KC8	<i>KC8_00885</i>	48.72
		<i>Vibrio</i> sp. H5	-	-
		<i>A. xylosoxidans</i> NBRC 15126	<i>AX27061_4634</i>	59.18
		<i>Sdo. denitrificans</i> FST	<i>ACG33_03505</i>	43.40

	<i>D. oestradiolicum</i> DSM 16959	CBW56_06210	57.44
	<i>S. estronivorans</i> AXB	F7P65_RS13585	65.81
	<i>S. bisphenolivorans</i> YL23	L858_RS0111020	46.68
20150	<i>C. estronivorus</i>	MB02_13535	86.43
	<i>Sphingomonas</i> sp. KC8	KC8_04605	70.00
	<i>Vibrio</i> sp. H5	-	-
	<i>A. xylosoxidans</i> NBRC 15126	AX27061_0119	62.66
	<i>Sdo. denitrificans</i> FST	ACG33_06440	58.40
	<i>D. oestradiolicum</i> DSM 16959	CBW56_06210	39.75
	<i>S. estronivorans</i> AXB	F7P65_RS09775	69.39
	<i>S. bisphenolivorans</i> YL23	L858_RS0114315	71.10
05760	<i>C. estronivorus</i>	MB02_09945	44.42
	<i>Sphingomonas</i> sp. KC8	KC8_00885	45.61
	<i>Vibrio</i> sp. H5	-	-
	<i>A. xylosoxidans</i> NBRC 15126	AX27061_3894	70.35
	<i>Sdo. denitrificans</i> FST	ACG33_03505	45.00
	<i>D. oestradiolicum</i> DSM 16959	CBW56_06210	46.04
	<i>S. estronivorans</i> AXB	F7P65_RS16970	86.25
	<i>S. bisphenolivorans</i> YL23	L858_RS0111020	43.86
05015	<i>C. estronivorus</i>	MB02_07390	61.75
	<i>Sphingomonas</i> sp. KC8	KC8_18205	78.52
	<i>Vibrio</i> sp. H5	-	-
	<i>A. xylosoxidans</i> NBRC 15126	AX27061_3311	61.48
	<i>Sdo. denitrificans</i> FST	ACG33_00745	63.00
	<i>D. oestradiolicum</i> DSM 16959	CBW56_04335	56.75
	<i>S. estronivorans</i> AXB	F7P65_RS17445	81.54
	<i>S. bisphenolivorans</i> YL23	L858_RS0111020	38.75
13750	<i>C. estronivorus</i>	MB02_15950	84.64
	<i>Sphingomonas</i> sp. KC8	KC8_01045	69.27
	<i>Vibrio</i> sp. H5	-	-
	<i>A. xylosoxidans</i> NBRC 15126	AX27061_3894	41.65
	<i>Sdo. denitrificans</i> FST	ACG33_00350	63.38
	<i>D. oestradiolicum</i> DSM 16959	CBW56_04315	62.08
	<i>S. estronivorans</i> AXB	F7P65_RS18190	84.38
	<i>S. bisphenolivorans</i> YL23	L858_RS0109310	38.61
13790	<i>C. estronivorus</i>	MB02_15915	92.25
	<i>Sphingomonas</i> sp. KC8	KC8_01010	73.75
	<i>Vibrio</i> sp. H5	-	-
	<i>A. xylosoxidans</i> NBRC 15126	AX27061_3311	53.94
	<i>Sdo. denitrificans</i> FST	ACG33_00745	55.14
	<i>D. oestradiolicum</i> DSM 16959	CBW56_04335	64.91
	<i>S. estronivorans</i> AXB	F7P65_RS18235	86.50
	<i>S. bisphenolivorans</i> YL23	L858_RS0111020	39.23
05665	<i>C. estronivorus</i>	MB02_10175	37.38
	<i>Sphingomonas</i> sp. KC8	KC8_06310	63.16
	<i>Vibrio</i> sp. H5	-	-
	<i>A. xylosoxidans</i> NBRC 15126	AX27061_3894	40.86
	<i>Sdo. denitrificans</i> FST	ACG33_04450	54.27
	<i>D. oestradiolicum</i> DSM 16959	CBW56_17310	60.45
	<i>S. estronivorans</i> AXB	F7P65_RS03380	69.08
	<i>S. bisphenolivorans</i> YL23	L858_RS0109310	68.83

	03475	<i>C. estonivorus</i>	MB02_10175	41.23
		<i>Sphingomonas</i> sp. KC8	KC8_06310	45.91
		<i>Vibrio</i> sp. H5	-	-
		<i>A. xylosoxidans</i> NBRC 15126	AX27061_4634	38.02
		<i>Sdo. denitrificans</i> FST	ACG33_04450	48.09
		<i>D. oestradiolicum</i> DSM 16959	CBW56_17310	45.18
		<i>S. estonivorans</i> AXB	F7P65_RS16205	46.15
		<i>S. bisphenolivorans</i> YL23	L858_RS0109310	44.84
	14320	<i>C. estonivorus</i>	MB02_10115	35.59
		<i>Sphingomonas</i> sp. KC8	KC8_06310	69.17
		<i>Vibrio</i> sp. H5	-	-
		<i>A. xylosoxidans</i> NBRC 15126	AX27061_4634	36.90
		<i>Sdo. denitrificans</i> FST	ACG33_04450	54.41
		<i>D. oestradiolicum</i> DSM 16959	CBW56_17310	57.71
		<i>S. estonivorans</i> AXB	F7P65_RS16205	69.92
		<i>S. bisphenolivorans</i> YL23	L858_RS0109310	62.09
acetoacetyl-CoA reductase (PhaB)	18540	<i>C. estonivorus</i>	MB02_08675	53.14
		<i>Sphingomonas</i> sp. KC8	KC8_08570	56.07
		<i>Vibrio</i> sp. H5	-	-
		<i>A. xylosoxidans</i> NBRC 15126	AX27061_1571	50.00
		<i>Sdo. denitrificans</i> FST	ACG33_13100	50.42
		<i>D. oestradiolicum</i> DSM 16959	CBW56_05405	53.11
		<i>S. estonivorans</i> AXB	F7P65_RS10460	54.39
		<i>S. bisphenolivorans</i> YL23	L858_RS0109895	54.81
	09490	<i>C. estonivorus</i>	MB02_08675	90.42
		<i>Sphingomonas</i> sp. KC8	KC8_08570	78.33
		<i>Vibrio</i> sp. H5	-	-
		<i>A. xylosoxidans</i> NBRC 15126	AX27061_5428	49.18
		<i>Sdo. denitrificans</i> FST	ACG33_13100	50.00
		<i>D. oestradiolicum</i> DSM 16959	CBW56_05400	53.25
		<i>S. estonivorans</i> AXB	F7P65_RS10460	77.08
		<i>S. bisphenolivorans</i> YL23	L858_RS0109895	76.67
PHB synthase (PhaC)	12105	<i>C. estonivorus</i>	MB02_01745	78.75
		<i>Sphingomonas</i> sp. KC8	KC8_11780	61.17
		<i>Vibrio</i> sp. H5	-	-
		<i>A. xylosoxidans</i> NBRC 15126	-	-
		<i>Sdo. denitrificans</i> FST	-	-
		<i>D. oestradiolicum</i> DSM 16959	-	-
		<i>S. estonivorans</i> AXB	F7P65_RS04060	37.40
		<i>S. bisphenolivorans</i> YL23	L858_RS0104680	38.00
	17580	<i>C. estonivorus</i>	MB02_16645	55.56
		<i>Sphingomonas</i> sp. KC8	KC8_11780	37.16
		<i>Vibrio</i> sp. H5	-	-
		<i>A. xylosoxidans</i> NBRC 15126	AX27061_5422	56.24
		<i>Sdo. denitrificans</i> FST	ACG33_13110	56.28
		<i>D. oestradiolicum</i> DSM 16959	CBW56_07150	40.28
		<i>S. estonivorans</i> AXB	F7P65_RS04055	38.18
		<i>S. bisphenolivorans</i> YL23	L858_RS0104685	37.37
	18530	<i>C. estonivorus</i>	MB02_16645	55.56
		<i>Sphingomonas</i> sp. KC8	KC8_11780	36.04
		<i>Vibrio</i> sp. H5	-	-

		<i>A. xylosoxidans</i> NBRC 15126	AX27061_1570	35.60
		<i>Sdo. denitrificans</i> FST	ACG33_13110	56.34
		<i>D. oestradiolicum</i> DSM 16959	CBW56_07150	39.86
		<i>S. estonivorans</i> AXB	F7P65_RS04055	36.75
		<i>S. bisphenolivorans</i> YL23	L858_RS0104685	37.90
Phasin (PhaP)	12100	<i>C. estonivorans</i>	MB02_01750	76.65
		<i>Sphingomonas</i> sp. KC8	KC8_11785	45.22
		<i>Vibrio</i> sp. H5	-	-
		<i>A. xylosoxidans</i> NBRC 15126	AX27061_1570	45.53
		<i>Sdo. denitrificans</i> FST	ACG33_13110	36.95
		<i>D. oestradiolicum</i> DSM 16959	CBW56_RS07120	43.73
		<i>S. estonivorans</i> AXB	F7P65_RS04055	58.40
		<i>S. bisphenolivorans</i> YL23	L858_RS0104685	56.88
		<i>C. estonivorans</i>	MB02_08585	81.40
		<i>Sphingomonas</i> sp. KC8	KC8_18185	66.67
PHB depolymerase (PhaZ)	09590	<i>Vibrio</i> sp. H5	-	-
		<i>A. xylosoxidans</i> NBRC 15126	AX27061_1430	46.32
		<i>Sdo. denitrificans</i> FST	-	-
		<i>D. oestradiolicum</i> DSM 16959	-	-
		<i>S. estonivorans</i> AXB	F7P65_RS03690	51.96
		<i>S. bisphenolivorans</i> YL23	L858_RS0106030	48.12
		<i>C. estonivorans</i>	MB02_05805	80.27
		<i>Sphingomonas</i> sp. KC8	KC8_00605	57.95
		<i>Vibrio</i> sp. H5	-	-
		<i>A. xylosoxidans</i> NBRC 15126	AX27061_3624	32.11
PHB oligomer hidrolase (PhaY)	15075	<i>Sdo. denitrificans</i> FST	-	-
		<i>D. oestradiolicum</i> DSM 16959	CBW56_09945	26.95
		<i>S. estonivorans</i> AXB	F7P65_RS02785	58.74
		<i>S. bisphenolivorans</i> YL23	L858_RS0108480	58.74
		<i>C. estonivorans</i>	MB02_05805	80.27
		<i>Sphingomonas</i> sp. KC8	KC8_00605	57.95



**Figure S1.**  $^1\text{H}$ - $^1\text{H}$  Correlation Spectroscopy (COSY) analysis of the PHA copolymer produced by *C. tauraugens* NBRC 16725. (a) PHB commercial standard, (b) PHBV commercial standard, (c) PHBV formed in M63 0.1 N minimal medium supplemented with 2 mM E2. (d) PHBV formed in M63 0.1 N minimal medium supplemented with 1.89 mM TES. The correlation between protons are shown in the spectrum.