

# Supplementary Materials: Butylparaben Exposure Induced Darker Skin Pigmentation in Nile Tilapia (*Oreochromis niloticus*)

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**Table S1.** Sequence of primers used in RT-qPCR

Gene symbol	Primer	Primer Sequence (5'-3')
<i>β-actin</i>	Forward	TGGCTGAAGGCTACGTCATC
	Reverse	ACACATAGCTGAACCGCTCC
<i>α-MSH</i>	Forward	AGGAACCACAGCAAGAGCAG
	Reverse	GCTGTCCATCAGCTCCAGTT
<i>Asip2</i>	Forward	GTGAGGCCCAATCCTGTGAA
	Reverse	CATTGAAGAAGCGGCAGTGG
<i>Rh</i>	Forward	TCCCTGATGGAGGACCAGTT
	Reverse	ACGTACACCAGCTTGAAGGG
<i>Opsin</i>	Forward	ATGCACAGGTGGTGGACTTC
	Reverse	GAGGCATCGTTTGGGTCCCT
<i>PDE</i>	Forward	GGGCATCACAGTGCTCAATC
	Reverse	AGGATGAGTGAAAGCACCCAG
<i>Arr3a</i>	Forward	CGGAGAGACGGTGGACTCTA
	Reverse	GTGTCCTCGTCCTTCAGTCG
<i>Arr3b</i>	Forward	TTGCGGTGTGGACTTTGAGA
	Reverse	GTTAGCTGGGGCGAAGTGTGTA
<i>Rec</i>	Forward	TCATGGCTGGAATGACGGAT
	Reverse	AGGCTTTCTCCAGACGAGAC

**Table S2.** Correlation analysis of melanin indexes with ELISA/Genes indexes.

Melanin Indexes	ELISA/Genes Indexes	<i>r</i>	<i>p</i> -value
Relative area of dark skin	<i>α-MSH</i>	0.445	0.026
Relative area of dark skin	<i>Asip2</i>	−0.789	0.000
Relative area of dark skin	Tyr	0.510	0.009
Relative area of dark skin	DA	0.125	0.550
Relative area of dark skin	GABA	−0.452	0.023
Relative area of dark skin	NPY	−0.093	0.658
Relative area of dark skin	ACH	0.032	0.878
Relative area of dark skin	<i>Rh</i>	0.277	0.179
Relative area of dark skin	<i>Opsin</i>	−0.813	0.000
Relative area of dark skin	<i>PDE</i>	−0.123	0.558
Relative area of dark skin	<i>Arr3a</i>	0.787	0.000
Relative area of dark skin	<i>Arr3b</i>	0.700	0.000
Relative area of dark skin	<i>Rec</i>	−0.143	0.495
Melanin content	<i>α-MSH</i>	0.038	0.857
Melanin content	<i>Asip2</i>	−0.365	0.072
Melanin content	Tyr	0.362	0.076
Melanin content	DA	0.029	0.890
Melanin content	GABA	−0.348	0.088
Melanin content	NPY	0.122	0.560
Melanin content	ACH	0.217	0.298
Melanin content	<i>Rh</i>	0.064	0.760
Melanin content	<i>Opsin</i>	−0.452	0.023
Melanin content	<i>PDE</i>	0.078	0.709
Melanin content	<i>Arr3a</i>	0.344	0.092
Melanin content	<i>Arr3b</i>	0.422	0.036
Melanin content	<i>Rec</i>	−0.185	0.376
Relative area of melanin	<i>α-MSH</i>	0.510	0.009
Relative area of melanin	<i>Asip2</i>	−0.774	0.000
Relative area of melanin	Tyr	0.521	0.008
Relative area of melanin	DA	0.127	0.545
Relative area of melanin	GABA	−0.455	0.022
Relative area of melanin	NPY	−0.077	0.715
Relative area of melanin	ACH	−0.028	0.893
Relative area of melanin	<i>Rh</i>	0.278	0.179
Relative area of melanin	<i>Opsin</i>	−0.805	0.000
Relative area of melanin	<i>PDE</i>	−0.137	0.515
Relative area of melanin	<i>Arr3a</i>	0.778	0.000
Relative area of melanin	<i>Arr3b</i>	0.733	0.000
Relative area of melanin	<i>Rec</i>	−0.157	0.453