

TABLE S1. Protein sequences of 59 *Drosophila* species from 12 *Drosophila* taxa

SPECIES	GENE	LOCUS	CDS/MRNA	PROTEIN	GENOMIC_SEQUENCE
<i>Drosophila grimshawi</i>	XDH	Dgri\GH18370	XM_001990149.1	XP_001990185.1	NW_001961675.1
<i>Drosophila grimshawi</i>	AOX3	Dgri\GH19388	XM_001990470.1	XP_001990506.1	NW_001961675.1
<i>Drosophila grimshawi</i>	AOX3-D2	Dgri\GH19389	XM_001990471.1	XP_001990507.1	NW_001961675.1
<i>Drosophila grimshawi</i>	AOX1	DDgri\GH19390	XM_001990472.1	XP_001990508.1	NW_001961675.1
<i>Drosophila grimshawi</i>	AOX2-D	Dgri\GH19396	XM_001990483.1	XP_001990519.1	NW_001961675.1
<i>Drosophila grimshawi</i>	AOX2-D	Dgri\GH18200	XM_001990484.1	XP_001990520.1	NW_001961675.1
<i>Drosophila virilis</i>	XDH	Dvir\ry	XM_002056159.1	XP_002056195.1	NW_002014432.1
<i>Drosophila virilis</i>	AOX1	Dvir\GJ10314	XM_002056246.1	XP_002056282.1	NW_002014432.1
<i>Drosophila virilis</i>	AOX3	Dvir\GJ10313	XM_002056247.1	XP_002056283.1	NW_002014432.1
<i>Drosophila virilis</i>	AOX3-D	Dvir\GJ10312	XM_002056248.1	XP_002056284.1	NW_002014432.1
<i>Drosophila virilis</i>	AOX2	Dvir\GJ23371	XM_002053340.1	XP_002053376.1	NW_002014424.1
<i>Drosophila mojavensis</i>	XDH	Dmoj\Xdh	XM_001998885.1	XP_001998921.1	NW_001979112.1
<i>Drosophila mojavensis</i>	AOX2	Dmoj\GI10152	XM_002000265.1	XP_002000301.1	NW_001979112.1
<i>Drosophila mojavensis</i>	AOX1	Dmoj\GI22594	XM_002000276.1	XP_002000312.1	NW_001979112.1
<i>Drosophila willistoni</i>	AOX3	Dwil\GK11683	XM_002069711.1	XP_002069747.1	NW_002032853.1
<i>Drosophila willistoni</i>	AOX2	Dwil\GK11684	XM_002069712.1	XP_002069748.1	NW_002032853.1
<i>Drosophila willistoni</i>	AOX1	Dwil\GK11685	XM_002069713.1	XP_002069749.1	NW_002032853.1
<i>Drosophila willistoni</i>	XDH	Dwil\ry	XM_002070719.1	XP_002070755.1	NW_002032853.1
<i>Drosophila persimilis</i>	XDH	Dper\ry	XM_002013852.1	XP_002013888.1	NW_001985953.1
<i>Drosophila persimilis</i>	AOX7	Dper\GL11937	XM_002019924.1	XP_002019960.1	NW_001985959.1
<i>Drosophila persimilis</i>	AOX1	Dper\GL11936	XM_002019925.1	XP_002019961.1	NW_001985959.1
<i>Drosophila persimilis</i>	AOX2	Dper\GL11935	XM_002019926.1	XP_002019962.1	NW_001985959.1
<i>Drosophila persimilis</i>	AOX5	Dper\GL11934	XM_002019927.1	XP_002019963.1	NW_001985959.1
<i>Drosophila persimilis</i>	AOX4	Dper\GL11933	XM_002019928.1	XP_002019964.1	NW_001985959.1
<i>Drosophila persimilis</i>	AOX6	Dper\GL11489	XM_002016225.1	XP_002016261.1	NW_001985955.1
<i>Drosophila pseudoobscura</i>	XDH	Dpse\ry	XM_001358466.2	XP_001358503.2	NC_009005.2
<i>Drosophila pseudoobscura</i>	AOX7	Dpse\GA26139	XM_002138062.1	XP_002138098.1	NC_009005.2
<i>Drosophila pseudoobscura</i>	AOX4	Dpse\GA14970	XM_001360036.2	XP_001360073.1	NC_009005.2
<i>Drosophila pseudoobscura</i>	AOX6	Dpse\GA24746	XM_002138362.1	XP_002138398.1	NC_009006.2
<i>Drosophila pseudoobscura</i>	AOX1	Dpse\GA14972	XM_001360034.2	XP_001360071.1	NC_009006.2
<i>Drosophila pseudoobscura</i>	AOX2	Dpse\GA14971	XM_001360037.2	XP_001360074.2	NC_009006.2
<i>Drosophila pseudoobscura</i>	AOX5	Dpse\GA19318	XM_001360035.2	XP_001360072.1	NC_009006.2
<i>Drosophila ananassae</i>	XDH	Dana\GF16930	XM_001954028.1	XP_001954064.1	NW_001939291.1
<i>Drosophila ananassae</i>	AOX1	Dana\GF16487	XM_001954917.1	XP_001954953.1	NW_001939291.1
<i>Drosophila ananassae</i>	AOX3-D3	Dana\GF16486	XM_001954918.1	XP_001954954.1	NW_001939291.1
<i>Drosophila ananassae</i>	AOX2	Dana\GF16485	XM_001954919.1	XP_001954955.1	NW_001939291.1
<i>Drosophila ananassae</i>	AOX3	Dana\GF16483	XM_001954921.1	XP_001954957.1	NW_001939291.1
<i>Drosophila ananassae</i>	AOX4	Dana\GF16482	XM_001954922.1	XP_001954958.1	NW_001939291.1
<i>Drosophila erecta</i>	AOX1	Dere\GG20464	XM_001980039.1	XP_001980075.1	NW_001956552.1
<i>Drosophila erecta</i>	AOX2	Dere\GG20453	XM_001980040.1	XP_001980076.1	NW_001956552.1

<i>Drosophila erecta</i>	AOX3	Dere\GG20443	XM_001980041.1	XP_001980077.1	NW_001956552.1
<i>Drosophila erecta</i>	AOX4	Dere\GG20432	XM_001980042.1	XP_001980078.1	NW_001956552.1
<i>Drosophila erecta</i>	XDH	Dere\Xdh	XM_001980288.1	XP_001980324.1	NW_001956552.1
<i>Drosophila yakuba</i>	XDH	Dyak\ry	XM_002097435	XP_002097471.1	NT_167065.1
<i>Drosophila yakuba</i>	AOX4	Dyak\GE26365	XM_002097680.1	XP_002097716.1	NT_167065.1
<i>Drosophila yakuba</i>	AOX3	Dyak\GE26366	XM_002097681.1	XP_002097717.1	NT_167065.1
<i>Drosophila yakuba</i>	AOX2	Dyak\GE26367	XM_002097682.1	XP_002097718.1	NT_167065.1
<i>Drosophila yakuba</i>	AOX1	Dyak\GE26368	XM_002097683.1	XP_002097719.1	NT_167065.1
<i>Drosophila melanogaster</i>	XDH	ry	NM_079613.3	NP_524337.1	NM_079613.3
<i>Drosophila melanogaster</i>	AOX1	CG18522	NM_142218.2	NP_650475.1	NM_142218.2
<i>Drosophila melanogaster</i>	AOX2	CG18519	NM_169665.2	NP_732047.1	NM_169665.2
<i>Drosophila melanogaster</i>	AOX3	CG6045	NM_142220.2	NP_650477.1	NM_142220.2
<i>Drosophila melanogaster</i>	AOX4	CG18516	NM_142221.2	NP_650478.1	NM_142221.2
<i>Drosophila sechellia</i>	AOX4	Dsec\GM25759	XM_002031002	XP_002031038.1	NW_001999689.1
<i>Drosophila sechellia</i>	AOX3	Dsec\GM25760	XM_002031003.1	XP_002031039.1	NW_001999689.1
<i>Drosophila sechellia</i>	AOX2	Dsec\GM25761	XM_002031004.1	XP_002031040.1	NW_001999689.1
<i>Drosophila sechellia</i>	AOX1	Dsec\GM25762	XM_002031005.1	XP_002031041.1	NW_001999689.1
<i>Drosophila sechellia</i>	XDH	Dsec\GM24078	XM_002031347.1	XP_002031383.1	NW_001999689.1
<i>Drosophila simulans</i>	AOX1	Dsim\GD20338	XM_002103258.1	XP_002103294.1	NT_167061.1

TABLE S2. Protein sequences of publicly available prokaryotic and eukaryotic AOX and XOR protein sequences

LINEAGE	ACCESSION	LINEAGE	ACCESSION
NEMATODES XDHs		Penicillium chrysogenum XDH	XP_002564663.1
C.elegans XDH	NP_502747.1	Trichophyton tonsurans XDH	EGD97942.1
C.briggsae XDH	XP_002632693.1	Ajellomyces dermatitidis XDH	EGE79311.1
C.brenneri XDH	EGT57369.1	Myceliophthora thermophila XDH	XP_003666737.1
C.ramanei XDH	XP_003089996.1		
Ascaris suum XDH	ADY40519.1	BACTERIA XDHs (full)	
		Myxococcus xanthus XDH	YP_631346.1
INSECTS XDHs		Myxococcus fulvus XDH	YP_004667669.1
Culex quinquefasciatus XDH	XP_001846124.1	Corallocooccus coralloides XDH	YP_005371681.1
Aedes aegypti XDH	XP_001662131	Bacterium Ellin514 XDH	ZP_03630202.1
Anopheles gambiae XDH	AAO14865.1	Pantoea ananatis XDH	YP_003520258.1
Ceratis capitata XDH	AAG47345.1		
Calliphora vicina XDH	CAA30281.1	INSECTS AOXs	
Danaus plexippus XDH	EHJ74298.1	Anopheles gambiae AOX	XP_001688700.1
Bombyx mori XDH	BAA21640.1	Drosophila melanogater AOX	NP_524337.1
Megachile rotundata XDH	XP_003704895.1	Aplis florea AOX	XP_003693286.1
Apis Mellifera XDH	XP_001119950.1	Bombus terrestris AOX	XP_003403056.1
		Acromyrmex echinator AOX	EGI61333.1
PLANTS XDHs		Culex quinquefasciatus AOX	XP_001864334.1
Arabidopsis thaliana XDH2	NP_195216.2	Aedes aegypti AOX	XP_001654511.1
Arabidopsis thaliana XDH	NP_195215.2	Megachile rotundata AOX	XP_003705117.1
Ricinus communis XDH	XP_002513485.1	Bombus impatiens AOX	XP_003489421.1
Glycine max XDH	XP_003543538.1		
Medicago truncatula XDH	XP_003597436.1	PLANT AOXs	
Vitis vinifera XDH	CBI16388.3	Arabidopsis thaliana AOX	NP_180283.1
Brachypodium distachyon XDH	XP_003562358.1	Arabidopsis lyrata AOX	XP_002879065.1
Oryza sativa XDH	ABF96752.1	Vitis vinifera AOX	XP_002273629.1
Physcomitrella patens XDH	XP_001760766.1	Ricinus communis AOX	XP_002515837.1
Selaginella moellendorffii XDH	XP_002966075.1	Glycine max AOX	XP_003519469.1
		Solanum lycopersicum AOX	NP_001234456.1
Fungi XDHs		Arachis hypogaea AOX	ACJ26769.1
Coccidioides immitis XDH	XP_001247724.1	Populus trichocarpa AOX	XP_002313633.1
Emericella nidulans XDH	CAA58034.1	Brassica rapa AOX	BAE93768.1
Mycosphaerella graminicola XDH	EGP91562.1	Sorghum bicolor AOX	XP_002463759.1
Aspergillus nidulans XDH	XP_663217.1		
Aspergillus oryzae XDH	XP_001820196.1		
Neosartorya fischeri XDH	XP_001266923.1		