

Silkworm_XDH_1	1	-----MGLLNAEEDPNKICTELVFYVNGKKVIE-SSPDPEWTLLWYLRKKLRITGTKLG
Fruit_fly_XDH	1	-----MSNSVLFFVNGKKVTE-VSPDPECTLLTFLREKLRLCGTKLG
Silkworm_XDH_2	1	-----MDAINEVVPRAETAALVFFVNGKKVLE-SNPDPETLLFYLRKKLRITGTYKG
Human_XDH	1	-----MTADKLVFVNGRKVVE-KNADPETTLLAYLRKKLGLSGTKLG
Rat_XDH	1	-----MTADELVFFVNGKKVVE-KNADPETTLLVYLRKKLGLCGTKLG
Cow_XDH	1	-----MTADELVFFVNGKKVVE-KNADPETTLLAYLRKKLGLRGTKLG
Chicken_XDH	1	-----MAPPETGDELVFVNGKKVVE-KDVPETTLLTYLRKKLGLCGTKLG
Maize_XDH	1	MGSLTRVPAEDPAAAEWEWSDEAVIYVNGVRRVL-PDGLAHLTLLQYLR-DIGLRGTLKG
Maize_AO-1	1	-----MGKEAGAAESSTVVLAVNGKRYEA-AGVAPSTSLLEFLRTQTPTVRGPKLG
BmIAO1	1	-----MSNIEFTVNGILCSVGCEVSSTLMVDYIRHHLRLRGTKYM

Silkworm_XDH_1	54	CAEGGCGACTVMVSKYNRQENKIIHLAVNACLAPVCAMHGLAVTTVEGIGSTKTKLHPVQ
Fruit_fly_XDH	43	CAEGGCGACTVMVSRLDRRANKIRHLAVNACLTPVCSMHGCAVTTVEGIGSTKTRLHPVQ
Silkworm_XDH_2	53	CGEGGCGACTVMVSKYLNEDRINHIAVNACLISVCAMHGLAVTTVEGIGSTQDRLHPVQ
Human_XDH	43	CGEGGCGACTVMLSKYDRLQNKIVHFSANACLAPICSLHHVAVTTVEGIGSTKTRLHPVQ
Rat_XDH	43	CGEGGCGACTVMISKYDRLQNKIVHFSVNACLAPICSLHHVAVTTVEGIG-NTQKLHPVQ
Cow_XDH	43	CGEGGCGACTVMLSKYDRLQDKIIHFSANACLAPICTLHHVAVTTVEGIGSTKTRLHPVQ
Chicken_XDH	47	CGEGGCGACTVMISKYDPFQKILHHTANACLFPICALHHVAVTTVEGIGNTKSRLHPAQ
Maize_XDH	59	CGEGGCGACTVMVSCYDRITKKS LHFATINACLAPLYSVEGMHIITVEGIGDRQRLHPVQ
Maize_AO-1	50	CGEGGCGACVVLVSKYDPATDEVTEFSASSCLTLLHSVDRCSVTTSEGIGNTRDGYHPVQ
BmIAO1	42	CREAGCGACNVSVIKTPGGP----ELSVNSCVVPVASC DGWKIKTIESIGNKKGYSHSIQ

Silkworm_XDH_1	114	ERIAKAHGSQCGFCTPGIVMSMYTLLRSCKNI-----QYSDLEVAFQGNLCR
Fruit_fly_XDH	103	ERLAKAHGSQCGFCTPGIVMSMYALLRNAEQP-----SMRDLLEVAFQGNLCR
Silkworm_XDH_2	113	ERIAKSHGSQCGFCTPGIVMSMYALLRNNIKI-----AYEDIEGALQGNLCR
Human_XDH	103	ERIAKSHGSQCGFCTPGIVMSMYTLLRNQPEP-----TMEEIEENAFQGNLCR
Rat_XDH	102	ERIAKSHGSQCGFCTPGIVMSMYTLLRNQPEP-----TVEEIEENAFQGNLCR
Cow_XDH	103	ERIAKSHGSQCGFCTPGIVMSMYTLLRNQPEP-----TVEEIEDAFQGNLCR
Chicken_XDH	107	ERIAKSHGSQCGFCTPGIVMSMYTLLRNKPKP-----KMEDIEDAFQGNLCR
Maize_XDH	119	ECLAKAHGSQCGFCTPGFVMSMYALLRSSKQPP-----TEDQIEDCLAGNLCR
Maize_AO-1	110	QRLSGFHASQCGFCTPGMCMISFISALVKADNKSDRPDPAGFSKITTS EAEKAVSGNLCR
BmIAO1	98	KAVAKCNGTQCGYCTPGVWMAMYSLQLNNTEMT-----MLEIEKSFEGNLCR

Silkworm_XDH_1	161	CTGYRAIIEGYKTFIEDWEAQRIKNGP-----QNGTCAMGKDCCKNKSDSCE
Fruit_fly_XDH	150	CTGYRPILEGYKTFTEKFCAG-----MGEKCKVSGKGCG
Silkworm_XDH_2	160	CTGYRPIIEGKTFMEGWENVYSTG-----GNMCRMGENCCRI
Human_XDH	150	CTGYRPILQGFRTFARD-----GGCCGGDGNPNCCMNQKKD
Rat_XDH	149	CTGYRPILQGFRTFAKD-----GGCCGSGGNPNCCMNQTKD
Cow_XDH	150	CTGYRPILQGFRTFAKN-----GGCCGNGNPNCCMNQKKD
Chicken_XDH	154	CTGYRPILEGYRTFAVDSNCCGKAANGTGCCHSKGENSMNGGCCGKANPGCCMNE-KE
Maize_XDH	167	CTGYRPIIDAFRVFAKTDNLAYTNSCEDAKDQAICPSTGKPCSCRNETDVNVNESSLS
Maize_AO-1	170	CTGYRPIDVTCKSFASD-----VDLEDLGLNCFW
BmIAO1	145	CTGYRTILQAFKQYAKD-----SPT

Silkworm_XDH_1	209	EADSESQYIFDKSSFLPYDSSQEPIFPPELKLSSIYDSQYVIYRGKQTTWYRPTNIETVL
Fruit_fly_XDH	185	TDAETDDKLFERSEFQPLDPSQEPIFPPELQLSDAFDSQS LIFSSDRVTWYRPTNLEELL
Silkworm_XDH_2	198	KKETEHDLIFDPSAFRPYDPTQEPIFPPELKLNEYSTSYLVFRGENVIWLRPNRLKELV
Human_XDH	187	HSVSLSPSLFKPEEFTPLDPTQEPIFPPELRLKDTPRKQLRFEGERVWIIQASTLKELL
Rat_XDH	186	QTVSLSPSLFNPEDFKPLDPTQEPIFPPELRLKDTPPKKLRFEGERVWIIQASTMEELL
Cow_XDH	187	HTVTLSPSLFNPEEFMPLDPTQEPIFPPELRLKDVPPKQLRFEGERVWIIQASTLKELL
Chicken_XDH	213	NVTMMSSSLFDSSSEFQPLDPTQEPIFPPELMTQRNKEQKQVCFKGERVMWIIQPTTLQELV
Maize_XDH	227	SVERYSPYSYNEIDGSAYNE-RELIFPPELQLRKVMP--LKLNKSNEIKWYRPLKQLL
Maize_AO-1	199	KKGEPAEVSRLPGYNSGAVCTFPEFLKSEIKSTMKQVNDVPIAASGDGWYHPKSTIELH
BmIAO1	165	SISDIEDLHICEKSDQCCCKNCDESDWCLVANNVGSTTKELTLKDGVKWFTVTQISDIF

Silkworm_XDH_1	269	SLKDK--FPNAKVVVGNSEVGVVEVKFKRCVYPIIIMPNCVPELNNTITENEHGLTVGASVT
Fruit_fly_XDH	245	QLKAK--HPAAKLVGNTVEGVVEVKFKHFLYPHLINPTQVKELLEIKENQDGIYFGAASV
Silkworm_XDH_2	258	LVKSR--IPDSKVVVGNTIEIGVEMKFKKFFYPVLISPTIIGEVNYCSIENDGILVGAAT
Human_XDH	247	DLKAQ--HPDAKLVGNTIEIGIEMKFKNMLFPMIVCPAWIPELNSVEHGPDGISFGAACP
Rat_XDH	246	DLKAQ--HPDAKLVGNTIEIGIEMKFKNMLFPLIVCPAWIPELNSVHGPPEGISFGASCP
Cow_XDH	247	DLKAQ--HPEAKLVGNTIEIGIEMKFKNQLFPMIICPAWIPELNAVEHGPPEGISFGAACA
Chicken_XDH	273	ALKSQ--YPNAKLVGNTVEGVIEMLKNNMLYPVILAPAWIPEMNAVQQTETGITFGAACT
Maize_XDH	284	HLKSC--YLDAKLIIGNSEGVVETKFKNAQYKVLIAVTHIPELNTLKAKEDGHIHGSAVR
Maize_AO-1	259	RLFDSSWFDDSSVKIVASNTGSGVYKQDLYDKYIDIKGIPELSVINKNDKAIELGGSVVS

BmIAO1	225	EILLVEGTDSYMLAAGN--TSKVPYPITTPFSVIIDISGVSELKGYTLTDQN-LVVGAGNT
Silkworm_XDH_1	327	LNDIEETFREYIKKLPPYKTRVLTTIVEMLNWFAGKQIRNVAAIGGNVMTGS----PISD
Fruit_fly_XDH	303	LMEIDALLRQRIEQLPESETRFLFQCTVDMLEHYFAGKQIRNVACLGGNIMTGS----PISD
Silkworm_XDH_2	316	LTELQIFLKSFIVEHP-SKSKI FKAVNAMLHWFAGKQVRNVASLTGNIVTAS----PISD
Human_XDH	305	LSIVEKTLVDAVAKLPAQKTEVFRGVLEQLRWFAGKQVKSVASVGGNIITAS----PISD
Rat_XDH	304	LSLVESVLAEEIAKLPEQKTEVFRGVMEQLRWFAGKQVKSVASIGGNIITAS----PISD
Cow_XDH	305	LSSVEKTLLEAVAKLPTQKTEVFRGVLEQLRWFAGKQVKSVASLGGNIITAS----PISD
Chicken_XDH	331	LSSVEEVLKAVAEALPSYKTEIFQAALQLRWFAGPQIRNVAAALGGNIMTAS----PISD
Maize_XDH	342	LAQLQNFLKKVVAEHDLPETSSCQAIVRQLKWFAGTQIRNVASIGGNICTAS----PISD
Maize_AO-1	319	ISKAIEVLSD-----GNLVFRKIDHLLNKVASPFVRNTATIGGNIMMAQR-LPFESD
BmIAO1	282	LTEFMEILEKASTEEG---FEYLVKFTHEMEYLGHKTLRNATIGGNLMMKNKNVAFASD
Silkworm_XDH_1	383	LNPILMSLKVKLNLLSQEN---GHRTVLMDETFFTGYRKNVVKSN EILLSIEIPFSTKFQ
Fruit_fly_XDH	359	MNPVLSAAGQLEVASFVDGKLQKRSVHMGTFFFTGYRRNVIEAHEVLLGIHFRKTPDQ
Silkworm_XDH_2	371	LNPILMPCSAVLNVYSTTN---GSRQITIDENFFKGYRKTILEDDEVVISIKLPFSTNDQ
Human_XDH	361	LNPVFMASGAKLTLVSRGT----RRTVQMDHTFFPGYRKTLLSP EILLSIEIPYSREGE
Rat_XDH	360	LNPVFMASGAKLTLVSRGT----RRTVRMDHTFFPGYRKTLLRPEEILLSIEIPYSKEGE
Cow_XDH	361	LNPVFMASGAKLTLVSRGT----RRTVPMDHTFFPSYRKTLLGP EILLSIEIPYSREDE
Chicken_XDH	387	LNPVLMASGSKLTLISMEG----KRTVMMEDEKFFTGYRKTIVKPEEVLLSVEIPYSKEGE
Maize_XDH	398	LNPLWIAVGAKFH IIDVNG---NVRTTLAKDFFLGYRKVDIKPEEILLSIILPWTRPFE
Maize_AO-1	370	VATVLLAAGSTVTVQVASKR-----LCFTLEEFLEQPPCDSRTLLLSIFPEWGS DY
BmIAO1	339	LYLLFEIVGAQVTVKSEQEYG-----TETVTMHEFTLLKMGVKVLVNILPLPLEDY
Silkworm_XDH_1	440	YLKAIKQAKRREDDISIVTSAVNVEFEE--NTNVIKYINLAFGG-MAPVTKIATNTGNVL
Fruit_fly_XDH	419	YIVAFKQARRRDDIIAIVNAAINVR FEE--KSNIVAEISMAFGG-MAPTTLAPRTSQLM
Silkworm_XDH_2	428	YFKSYKQARRRDDDISIVTAAFNVQFE----GNKVIKSKLCYGG-MGPTTLLASKSSKML
Human_XDH	417	YFSAFKQASRREDDIAKVTSGMRVLFKP--GTTEVQELALCYGG-MANRTISALKTTQ RQ
Rat_XDH	416	FFSAFKQASRREDDIAKVTSGMRVLFKP--GTIEVQELSLCFGG-MADRTISALKTT PKQ
Cow_XDH	417	FFSAFKQASRREDDIAKVTSGMRVLFQP--GSMQVKELALCYGG-MADRTISALKTTQ KQ
Chicken_XDH	443	YFSAFKQAYRREDDIAIVTCGMRVLFQH--GTSRVQEVKLSYGG-MAPTTLALKTCREL
Maize_XDH	454	YVKEFKQAHRRDDIALVNAGMRVYLQETERNWIISDVSI VFGG-VAAVPLSASRTENFL
Maize_AO-1	422	VTFETFRAAPRPFGNVSYVNSAFLARTS-GSLIEDICLAFGAYGVDHAIRAKKVEDFL
BmIAO1	390	KIVTFKIMQRAQAVHATLNAGFN YKLSN---DNVVREAKIVYGALT TASTRATETEKYLI
Silkworm_XDH_1	497	KGLKWNENMLEKAYSLLIDELPLDPSAPGGNIQFRRAL TMSLFLKSYLAIGKAMS-SD--
Fruit_fly_XDH	476	VGQEWSHQLVERVAESLCTELPLAASAPGGMIAYRRALV VSLFFKAYLAISLKL SKSG--
Silkworm_XDH_2	483	LGKHWNHETLSTVFHSLCEEFNLEFSVPGGMAEYRKSLCLSLFFKFYLVNKDKLDISN--
Human_XDH	474	LSKLWKEELLQDVCAGLAEELHLPDAPGGMVDFRCTL TLSFFFFKFYLTVLQKL GQE---
Rat_XDH	473	LSKSWNEELLQSV CAGLAEELQLAPDAPGGMVEFRRTL TLSFFFFKFYLTVLQKL GRA---
Cow_XDH	474	LSKFWNEKLLQDVCAGLAEELSLSPDAPGGMIEFRRTL TLSFFFFKFYLTVLKKL GK----
Chicken_XDH	500	AGRDWNEKLLQDACRLLAGEMDLSPSAPGGMVEFRRTL TLSFFFFKFYLTVLQKL SKDQ--
Maize_XDH	513	TGKKWDSGLLDDTFNLLKEDISISENAPGGMIEFRRL TLSFFFFKFYLSVTHEMKIKG--
Maize_AO-1	481	KGKSLSSFVILEAIKLLKDTVSPSEGT--HHEYRVSLAVSFLFSLSSLANSSSAPSNI
BmIAO1	447	GKPLFTNETLQGALTVLDSDLVVENPPEPSAEYRKHLALCLFYKGLLSLCPTATLQP--
Silkworm_XDH_1	554	-YVYGDLI---ESY YGSGADSFHGNVPKSSQYFELVGEKQLKSDAVGRPIQHMSAYKQAT
Fruit_fly_XDH	534	-ITSSDAL---PSEERSGAETFHTPVLKSAQLFERVCSDQ PICDP IGRPKVHAAALKQAT
Silkworm_XDH_2	541	-GESSTRP---PKLSCG---DETRGEPSSSQYFEIRNSGE--VDALGKPLPHASAMKHAT
Human_XDH	531	--NLEDCG-KLDPTFASATLLFQKDPADVQLFQEV PKGQSEEDMVGRPLPHLAADMQAS
Rat_XDH	530	--DLED MCGKLDPTFASATLLFQKDPANVQLFQEV PKDQSEEDMVGRPLPHLAANMQAS
Cow_XDH	530	--DSKDKCGKLDPTYTSATLLFQKHPPANIQLFQEV PNGQSKEDTVGRPLPHLAAAMQAS
Chicken_XDH	558	-NGPNNLCEPVPPNYISATELFHKDPIASTQLFQEV PRGQLVEDTVGRPLVHLSAAKQAC
Maize_XDH	571	-LLADGLHADHLSAVQPYSRPVTVGTQSYELVRQG-----ASVQGPMVHMSAMLQVT
Maize_AO-1	539	DTPNGSYTHETGSNVDSPERHIKVDSNDLPIRSRQEMVFSDEYKPVGKPIKKVGAEIQAS
BmIAO1	505	-----RYSRGAIKIHDSRPVSEATQTYETNNKLYPLTEPLPKHEALIQCS
Silkworm_XDH_1	610	GEAIYCDDMPIAEGELYLAFVLSSKAHAKLISVDAKKALAE PGVIAFYSAKDLT----KE
Fruit_fly_XDH	590	GEAIYTDDIPRMDGEVYLAFVLSTKPRAKITKLDASEALALDGVHQFFCYKDLT----EH
Silkworm_XDH_2	592	GEAIYCDDLPRIDGELFTLVLSSESHAKIKSIDTTAALSIPGVVAF FCAKDL E----VD
Human_XDH	588	GEAVYCDDIPRYENELSLRLVTSTRAHAKIKSIDTSEAKKVP GFVCFISADDVP----GS
Rat_XDH	588	GEAVYCDDIPRYENELSLRLVTSTRAHAKITSIDTSEAKKVP GFVCFLTAEDVP----NS
Cow_XDH	588	GEAVYCDDIPRYENELFLRLVTSTRAHAKIKSIDVSEA QKVP GFVCFLSADDIP----GS
Chicken_XDH	617	GEAVYCDDIPHYENELYLTLVSTQAHAKILSIDASEAQSVPGFVCFVSAKDV P----GS

Maize_XDH	622	GEAEYTD DD TPPPNTLHAAVL SK KAHARILSIDDSLAKSSPGFAGLFLSKDIP----GV
Maize_AO-1	599	GEAVYVDDIPAPKDCLYGAFI Y STH PH AHVRSINFKSSLASQKVITVI TAKD IPSG--GE
BmIAO1	550	GEAMYSDDLPLSPHEV FA SVFVLSTVAVGEIISIDPTKALEVDGVI AF YSAKDIPGLNSFT
Silkworm_XDH_1	666	QNSIGPIF HDEEL FARDKVLSQGQTIGVIVAVDQATAQAARMVKVEY--EEIQPIIVTI
Fruit_fly_XDH	646	ENEVGVPV FHDEH VFAAGEVHCYGGIVGAIADNKALAQRAARLVKVEY--EELSPVIVTI
Silkworm_XDH_2	648	RNIWGSIIKDEE IFC STYVTSRSCIVGAI VATSEI VAKKARDLV SITY --ERLQPVIVTL
Human_XDH	644	NITG--ICNDETVFAKDKVTCVGHIIIGAVVADTPEHTQRAAQGVKITY--EELP-AIITI
Rat_XDH	644	NATG--LFNDETVFAKDEVTCVGHIIIGAVVADTPEHAQRAARGVKITY--EDLP-AIITI
Cow_XDH	644	NETG--LFNDETVFAKDTVTCVGHIIIGAVVADTPEHAERAAHVVKVITY--EDLP-AIITI
Chicken_XDH	673	NITG--IANDETVFAEDVVTVCVGHIIIGAVIADTQEHSRRAAKAVKIKY--EELK-PIVTI
Maize_XDH	678	NHTG-PIIHDEEFFASNI VTCV GQIIIGIVVADTHDNAKTAANKVHIEY--CELP-AILSI
Maize_AO-1	657	NIGSSFLMQGEALFADPIAEFAGQNIGV VIAET QRYANMAAKQAVVEYSTENLQPPILTI
BmIAO1	610	PDDLPLYAQAEVVLCSGRVCY YE QPIGIIVAEDQITADIAAKLVKATY--KNFKNFVVNI
Silkworm_XDH_1	724	EDAIKYN SF YPQ--FPKTIKRGNVKAVFDDKNN-IIIEGRCRMGGQEHFYLETHAAFAIP
Fruit_fly_XDH	704	EQAI EHKS YFPD--YPRFVTKGNVEEALAQAD--HTFEGTCRMGGQEHFYLETHAALAVP
Silkworm_XDH_2	706	EDAI EHNS YFEN--YPQTL SQGN VDEVFSKTK--FTVEGKQRSQAQEHFYLETISAYAIR
Human_XDH	699	EDAIK NNS YFGP--ELKIE-KGDLKKG FSEAD --NVVSGEIIYGGQEHFYLETHCTI AVP
Rat_XDH	699	QDAI NNS YFGS--EIKIE-KGDLKKG FSEAD --NVVSGELYIGGQEHFYLETNCTI AVP
Cow_XDH	699	EDAIK NNS YFGS--ELKIE-KGDLKKG FSEAD --NVVSGELYIGGQDHFYLETHCTI AVP
Chicken_XDH	728	EEAIEQQ SFI KP--IKRIE-KGDV NKGF ESD--HILEGEMHIGGQEHFYLETNCTI AVP
Maize_XDH	734	EEAVKIG SF HPN--TKKCLVKG DVEQ CFLSGACDRIVSGQVHVGGQEHFYMEPQCTI LVP
Maize_AO-1	717	EDAIQRNSYIQIP PFLAP KPVGDY NK MAEADH-KILSAE VKLE SQYYFYMETQAALAI P
BmIAO1	668	KEAIQDASRNTLY-----TSADATE TGT DVTKVISGTNSGDQYHFTMETLVCV TNP
Silkworm_XDH_1	781	KKEDDELQIF CSS QHPSEIAKL VSHIL HVPMNRIVARVKRMGGGFGGKESRGMLVALPVA
Fruit_fly_XDH	760	R-DSDELELFCSTQHPSEVQKLVAHV TALPA HRVVCRAKRLGGGFGGKESRGISVALPVA
Silkworm_XDH_2	762	K--EDELEIIC SSQ SPSEIASFVSHTLGIPQH KVIA KVKRIGGGFGGKETRSSSLALPVA
Human_XDH	754	KGEAGEMELFVSTQNTMKTQS FVAK MLGVPANRIVVRVKRMGGGFGGKETRSTV VST AVA
Rat_XDH	754	KGEAGEMELFVSTQNTMKTQS FVAK MLGVPDNRIVVRVKRMGGGFGGKETRSTV VST ALA
Cow_XDH	754	KGEEGEMELFVSTQ NAM KTQS FVAK MLGVPVNRILVRVKRMGGGFGGKETRSTLV SV AVA
Chicken_XDH	783	KGEDGEMELFVSTQNL MKTQ EFTASALGVPSNRIVVRVKRMGGGFGGKETRNTIL TT VVA
Maize_XDH	792	VDSGNEIHMV SSTQ APQKHQKYVASVLGLPQS KVVCK TKRIGGGFGGKETRS AI FAAAAS
Maize_AO-1	776	D-EDNCIT IYS STQMPELTQNL IAR CLGIPFHNVRVISRRVGGGFGGKAMKATH TACACA
BmIAO1	720	T--EEGLEIHTATQWTNGVQLMVSRALGIEK NRVD VHVRRVGGAYGLKISRSTQVAVACS
Silkworm_XDH_1	841	LAAHKLNRPVWCMLDRDEDMQ MTG TRHPFLIKYKAATKEGKIVGAVVNIYNNGGYSTD L
Fruit_fly_XDH	819	LAAYRMGRPVRCMLDRDEDM LITG TRHPFLFKYKVGFTKEGLITACDIECYN NAG WSMDL
Silkworm_XDH_2	820	IAAYILKKPVRSV LD RDEDIQMSGIRHPFLTKYKVAFDENGK IAGAV DFVANGGFSMDL
Human_XDH	814	LAA YKTGR PVRCMLDRDEDM LITG GRHPFLARYKVGFMKTGT VVALE VDFHSN GN TQDL
Rat_XDH	814	LAAHKTGRPVRCMLDRDEDM LITG GRHPFLAKYKVGFMKTGT VVALE VAHFSN GN TEDL
Cow_XDH	814	LAAYKTGHPVRCMLDRNEDML ITG GRHPFLARYKVGFMKTGT IVALE V VDH YSNAGNSRDL
Chicken_XDH	843	VAAFKTGRPVRCMLDRDEDM LISG GRHPFLGRYKVGFMKNGKIKSLEVS YS SNNGNSADL
Maize_XDH	852	VPSFCLRRPVKLVLDRD VDMIS TGQRHSFLGKYKVGFTNEGKILALDLEIYNNGGHS LDL
Maize_AO-1	835	LAAFKLRRPVRMYLDRKTD MIMAG GRHPMKAKYSVGFKSDGKITALHL DLGIN AGISPDV
BmIAO1	778	LVTYKLNRP CRIL QSLATNMKAMGKRLPYLAKYEVAVN SSGT VQYTNLNM YED NG--YKI
Silkworm_XDH_1	901	SGPVVERAMFHFENAYYIPNCEVTGYVCR TNLP SNTAFRGFGGPQGMFAGNMVREIAHR
Fruit_fly_XDH	879	SFSVLERAMFHFENCYRIPNVRVGGWVCKTNLPSNTAFRGFGGPQGM YAGE HIIRDVARI
Silkworm_XDH_2	880	SCALIERSTFHV DN CYSIPNIKINAYVCKTNLPSNTAFRGFGAPQV MLAE SMIRQIAST
Human_XDH	874	SQSIMERALFHMDNCYKIPNIRGTGR LCK TNLPSNTAFRGFGGPQGM LIAE CWMSEVAVT
Rat_XDH	874	SRSIMERALFHMDNAYKIPNIRGTGR ICK TNLPSNTAFRGFGGPQGM LIAE YWMSEVAIT
Cow_XDH	874	SHSIMERALFHMDNCYKIPNIRGTGR LCK TNLSSNTAFRGFGGPQALFIAENWMSEVAVT
Chicken_XDH	903	SHGVMDRALLHLDNSYNIPNVSIMGFICKTNLSSNTAFRGFGGPQGM LIAE CWMSDLARK
Maize_XDH	912	SLAVLERAMFHSENVYDIENIRINGQVCF TN FPSNTAFRGFGGPQGLL LIAE NW IHH IATE
Maize_AO-1	895	SP-LMPRAIIGALKKY NWGT LEFDTKVCKTNVSSKSAMRAPGDVQGSFIAEAI IEH VASA
BmIAO1	836	NEDFYGLSLDAINN CYK SKNLTYKCYNTVTDTHKNTWCRA PGTME FIANTELIMERI AYE
Silkworm_XDH_1	961	LGKSP EEIS RNLNLYRGNNTTHYG----QVLT YCT LQRCWDECVQNSNLAERK LK IKEFNK
Fruit_fly_XDH	939	VGRDVVDV MRLN FYKTDGYTHYH----QQLEHFP IERC LEDCLKQSR YDE KRQEIARFNR
Silkworm_XDH_2	940	LGKSYEEIVEVNIYKEGSV TY YN----QLLT YCT LSRCWNQCIDSSRYIARKKAV ND FNR
Human_XDH	934	CGMPAEEVRRKNLYKEGDLTHFN----QKLEGFTLPRCWEECLASSQYHARKSE V DKFNK
Rat_XDH	934	CGLPAEEVRRKNMYKEGDLTHFN----QKLEGFTLPRCWDECIASSQYLARKRE VE KFNR

Cow_XDH	934	CGLPAEEVRWKNMYKEGDLTHFN----QRLEGFSVPRCWDECLKSSQYYARKSEVDFKFNK
Chicken_XDH	963	CGLPPEEVRKINLYHEGDLTHFN----QKLEGFTLRRCWDECLSSSNYHARKKLIEEFNK
Maize_XDH	972	LQRSPPEEIKELNFHNDGVVLYHG----QLQNCTISSVWDELKASCNFVEARKAINNFNS
Maize_AO-1	954	LALDTNTVRRKNLHDFESLEV FYGESAGEASTYSLVSMFDKLALSPEYQHRAMIEQFNS
BmIAO1	896	LELDPVTVRLANVDTKR-----YKEVIEAYETLTKTADYEARRAEVNTFNA
Silkworm_XDH_1	1017	QHRWRKRGISIIPTKFGIAFTEKLLNQAGALVLVYVDGSVLLSHGGTEMGQGLHTKMIQV
Fruit_fly_XDH	995	ENRWRKRGMAMVPTKYGIAFGVMHLNQAGSLINLYGDGSVLLSHGGVEIGQGLNTHKMIQC
Silkworm_XDH_2	996	SNRWKKKGIALVPTKYGISFQTDVLMQAGALLVYNDGAVLLSIGGIEMGQGLFTKMIQI
Human_XDH	990	ENCWKKRGLCIIPTKFGISFTVPFLNQAGALLHVYTDGSVLLTHGGTEMGQGLHTKMOVQV
Rat_XDH	990	ENCWKKRGLCIIPTKFGISFTLPFLNQAGALVHVYTDGSVLLTHGGTEMGQGLHTKMOVQV
Cow_XDH	990	ENCWKKRGLCIIPTKFGISFTVPFLNQAGALHVYTDGSVLLSHGGTEMGQGLHTKMOVQV
Chicken_XDH	1019	QNRWKKRGMCIPTKFGISFTVPFLNQAGALVHVYTDGSVLLTHGGTEMGQGLHTKMIQV
Maize_XDH	1028	NNRWKKRGIAMIPTKFGISFTAKFMNQAGALVQVYTDGTVLVTHGGVEMGQGLHTKVAQV
Maize_AO-1	1014	SNKWKRGISCVPATYEVNLRPTPG-----KVSIMNDGSI AVEVGGIEIGQGLWTKVKQM
BmIAO1	942	TNRWRKRGLRFSFLRWTP---ISAGITGATVVSINQGDATVTIVHGGVEMGQGINTKAMQI
Silkworm_XDH_1	1077	ATRALGIDV-----SKIHISETSTDKVPNTSATAASAGSDLNMAVLEACEKIMKRL
Fruit_fly_XDH	1055	AARALGIPS-----ELIHISETATDKVPNTSPTAASVGSIDLNGMAVL DACEKLNKRL
Silkworm_XDH_2	1056	ASKALEIGQ-----SRIHISEAATDKIPNSTATAASMSSDLYGMAVLNACNTLNQRL
Human_XDH	1050	ASRALKIPT-----SKIYISETSTNTVPNTSPTAASVSADLNGQAVYAACQTILKRL
Rat_XDH	1050	ASRALKIPT-----SKIHISETSTNTVPNTSPTAASASADLNGQGVY EACQTILKRL
Cow_XDH	1050	ASKALKIPI-----SKIYISETSTNTVPNSSPTAASVSTDIYGVAVY EACQTILKRL
Chicken_XDH	1079	ASRSLGIPT-----SKIYISETSTNTVPNTSPTAASVSADINGMAVHNACQTILKRL
Maize_XDH	1088	AASSFNIPL-----SSVFISETSTDKVPNASPTAASASSDLYGAAVLDACQQIKVRM
Maize_AO-1	1069	TAFGLGQLCPDGGECLLDKVRVIQADTLSLIQGGMTAGSTTSETSCETVRQSCVALVEKL
BmIAO1	999	CAHL LKISMD-----KIQVKATNTIAFTNQFVTGGSVASENVSAAVGAACETLLSRL
Silkworm_XDH_1	1129	KPYIDKNPDGKWENWVSAAYVDR-VLSATGFHATPDIGFDFKTTS-GKPFNYFTYGVAC
Fruit_fly_XDH	1107	APIKEALPGGTWKEWINKAYFDR-VLSATGFYAMPGIGYHPETNPARTYSYTNVGVV
Silkworm_XDH_2	1108	KPYKTKDPNGKWEDWVSEAYVDR-VCLFATGFYSAPKIEYNRNTNS-GRLEFYFTYGVAC
Human_XDH	1102	EPYKKKNPSGSWEDWVTAAYMDT-VLSATGFYRTPNLGYSFETNS-GNPFHYFSYGVAC
Rat_XDH	1102	EPFKKKKPTGPWEAWMDAYTSA-VLSATGFYKTPNLGYSFETNS-GNPFHYFSYGVAC
Cow_XDH	1102	EPFKKKKNPDGSWEDWMAAYQDR-VSLSTGFYRTPNLGYSFETNS-GNAFHYFTYGVAC
Chicken_XDH	1131	EPIKQSNLKGSWEDWIKTAYENC-ISLSATGFYRIPDVGYNFETNK-GKPFHYFSYGVAC
Maize_XDH	1140	EPIASKGTHNSFAELAQACYMER-VDLSAHGFYATPNIGFDWTIGK-GTPFNYFTYGA AF
Maize_AO-1	1129	NPIKES-----LEAKSNTVEW-SALIAQASMASVNLSAQPYWTPDPSPKSYLNYGAGT
BmIAO1	1051	EAVKATMEGSPTFEQVVKQAFDTNVDLKADGLRSASN-----FEPYDVF GATL
Silkworm_XDH_1	1187	TEVEIDCLSGDHQVLRTDIVMDLGEISLNPAIDIGQIEGGFIQGYGLFTIEELIYSPT---
Fruit_fly_XDH	1166	TVVEIDCLTGDHQVLSTDIVMDIGSSLNPAIDIGQIEGAFMQGYGLFTLEELMYS PQ---
Silkworm_XDH_2	1166	SEVIIDCLTGDHEVLRTDIVMDVGESINPAIDIGQIEGAFMQGYGLFTMEEVVFSAN---
Human_XDH	1160	SEVEIDCLTGDHKNLRTDIVMDVGSSLNPAIDIGQVEGAFVQGLGLFTLEELHYSPE---
Rat_XDH	1160	SEVEIDCLTGDHKNLRTDIVMDVGSSLNPAIDIGQVEGAFVQGLGLFTMEELHYSPE---
Cow_XDH	1160	SEVEIDCLTGDHKNLRTDIVMDVGSSLNPAIDIGQVEGAFVQGLGLFTLEELHYSPE---
Chicken_XDH	1189	SEVEIDCLTGDHKNIRTDIVMDVGTSLNPAIDIGQIEGAFVQGI GLFTMEELRYSPE---
Maize_XDH	1198	AEVEIDTLTGDFYTRTADIVMDLGF SINPAIDIGQIEGAFIQGLGWAAIEELKWGDNDNHK
Maize_AO-1	1181	SEVEVDILTGAATILRSDLVYDCGQSLNPAVDLGGQIEGCFVQGI GFFTNE DYKTNSD---
BmIAO1	1099	AEVEIDVLTGEHEILRVDLIEDVGTSVNPEIDIGQIEGAFVMGLGYWTC EQLVYNSTST---
Silkworm_XDH_1	1244	----GTLYSRGPGAYKIPGFGGYSSEFNVSLLKGAPNPRAVYSSKAVGEPPLFLASSAYF
Fruit_fly_XDH	1223	----GMLYSRPGMYKLPGFADIPGEFNVSLLTGAPNPRAVYSSKAVGEPPLF IGSSAFF
Silkworm_XDH_2	1223	----GETLSRGPSTYKIPTLS DIPKEFNVSLLKGAPNPRAVYSSKAIGEPPLFLAASVFF
Human_XDH	1217	----GSLHTRGPSTYKIPAFGSIPIEFRVSLLRDCPNKKAIYASKAVGEPPLFLAASIFF
Rat_XDH	1217	----GSLHTRGPSTYKIPAFGSIPIEFRVSLLRDCPNKKAIYASKAVGEPPLFLAASIFF
Cow_XDH	1217	----GSLHTRGPSTYKIPAFGSIPTEFRVSLLRDCPNKKAIYASKAVGEPPLFLGASVFF
Chicken_XDH	1246	----GNLYTRGPGMYKIPAFGDIPT EFYVSLLRDCPNSKAIYSSKAVGEPPLFLSASVFF
Maize_XDH	1258	WIRPGHLFTCGPGSYKIPSVNDIPLNFKVSLLKGVNPKAIHSSKAVGEPPLFLGSAVLF
Maize_AO-1	1238	----GLVIHDGTWYKIPTVDNIPKEFNVEMFNSAPDKKRVLSKASGEPPLVLATSVHC
BmIAO1	1157	----GQLLTTRAWN YFVPQARDIPQKMNIHLRPKSYSNDTAFGSKCVGEPPLCMSIALVL
Silkworm_XDH_1	1300	AIHEAIIKAARADAG-----VPLEFDMEAPATSARIRMACEDHITKKLKD KPDNSFV PW
Fruit_fly_XDH	1279	AIKEAIIAAREDDQG-----LSGDFPLEAPSTSARIRIACQDKTE LLEIPEPGSFTPW
Silkworm_XDH_2	1279	AIKEAIIAARSDSG-----VPVEFELDAPATCERIRMSCEDDITLQVKPTVKRIGV PW

Human_XDH	1273	AIKDAIRAARAQHTG----NNV KEL FR LD S PAT PE KIR NACVD KFT TL CV TG VP EN CK PW
Rat_XDH	1273	AIKDAIRAARAQHG-----DNA KQL F QL D S PATPE KIR NACVD QFT TL CV TG VP EN CK SW
Cow_XDH	1273	AIKDAIRAARAQHTN----NNT KEL FR LD S PAT PE KIR NACVD KFT TL CV TG AP GN CK PW
Chicken_XDH	1302	AIKDAI YSARE DSG-----VTE P FR LD S PAT PER IR NACVD TFT K MC PSA EP GT FK PW
Maize_XDH	1318	AIKDAISAARA EEG -----HLD WF PLDN PAT PER IR MACVD SI T KK FAGIDYRS KL SV
Maize_AO-1	1294	AMREAI RAAR K EF SVSTSPAKSAVT FQ MD V PATMP V K EL CGLDVVERYLENVSAASAGP
BmIAO1	1213	AIIEATAAARK ES GYG-----ATDI FN IGAP F TPE KI SLSTKTAIKE L LYN-----
Silkworm_XDH_1	1353	NV V P-
Fruit_fly_XDH	1332	N I V P -
Silkworm_XDH_2	1332	N V I A -
Human_XDH	1329	S V R V -
Rat_XDH	1328	S V R I -
Cow_XDH	1329	S L R V -
Chicken_XDH	1355	S V R A -
Maize_XDH	1371	-----
Maize_AO-1	1354	NTAKA
BmIAO1		-----

Supplemental Fig. 5. Alignment of the amino acid sequences of several XDHs, a maize AO, and BmIAO1. The 20-amino-acid sequence of BmIAO1 determined here is underlined. Accession numbers are: Silkworm_XDH_1 (D38159), Silkworm_XDH_2 (D43965), Maize_XDH (BT069925), Human_XDH (D11456), Rat_XDH (J05579), Cow_XDH (X83508), Chicken_XDH (D13221), BmIAO1 (XM_004925903), Fruit_fly_XDH (BT015293), and Maize_AO-1 (D88451).