SUPPORTING INFORMATION

Supplemental Figure 1. Sequence alignment of proteins identified through BLAST to be similar to *MI*HMPDdc. Strictly conserved residues are highlighted in read while less strictly conserved residues are shown in red font. The secondary structure for HMPDdc is shown above the alignment.

Supplemental Figure 2. Sequence alignment of decarboxylase proteins identified through BLAST with HMPDdc and the aldolase submitted to BLAST. Strictly conserved residues are highlighted in red and less strictly conserved residues are shown in red font. The secondary structure of HMPDdc is shown above the alignment.

MHPDdc[Mesorhizobium_loti_MAFF

MHPDdc [Mesorhizobium loti MAPP aldolase/adducin [Polynucleobac aldolase/adducin-like [Burkhold aldolase[Pseudomonas entomophi aldolase[Pseudomonas entomophi aldolase/adducin[Byphomonas ne aldolase/adducin[Bradyrhirobiu putative aldolase[Bradyrhirobiu possible_ribulose-5-phosphate N-methylBydantoinaseB/acetone-possible aldolase[Aurantimonas hypECIG 11697[Botryotinia fuck hypENOG 05501[Phaeosphaeria nodor aldolase/adducin[Desulfitobact aldolase/adducin[Nocardioides aldolase/adducin[Nocardioides

MHPDdc[Mesorhizobium_loti_MAFF

MHPDdc[Mesorhizobium loti MAPP aldolase/adducin[Polynucleobac aldolase/adducin-like[Burkhold aldolass/adducin-liks [Burkhold aldolass[Pseudomonas entomophi aldolass/adducin [Byphomonas ne aldolass/adducin [Byphomonas ne aldolass/adducin [Bradyrhizobi possible_ribuloss-5-phosphate n-msthylbydantoinassB/acetone_ possible_aldolass[Aurantimonas hypB01G_D1697[Botryotinia_fuck hypBN0G_06501[Phaeogphaeria_nodor sNOG_00416[Phaeogphaeria_nodor aldolass/adducin[Nocardioides_

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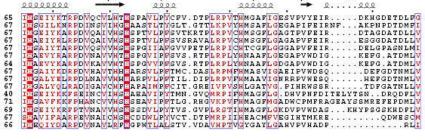
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1	ANRILFDQGIVD	AFGHASVRHD	KDPOR FLLARNM	APGTVGI DD	IVEFTLD	GVPVNAGGRAVYLERF
1	ANHILFDQGIVD	AFGHVSVRHD	KDPER FLLARNM	APGTVRPED	IVQFTMD	GAPVDAGGRAVYLERF
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1	GSRVLADLĜIVD	AFGHVSARSP.	ANPRH FLMARSI	APAQVTA ND	IMEFDEN	GE PVDAKNRAVFLERF
1	MLADLGVVD	AFGHVSARNP.	ANPHH FLMSRSI	APAOVTA ND	IMEFDEN	GEPVDARNRTVFLERF
1	ANRILARETIID	NFGHVSVRHP	LNPDR YFLSRSR	SPEIVTR DD	IMEFTLE	GEOIGDDPRKPYAERH
1	TNRIFARESIID	NLGHVSLHHP	LHPDR YLLSRSR	SPONVTSDD	IMEFTLD	GEOVGDDPRTPYSERH
1	ANHILAREDVLD	AFGHVSIRDP	ENPEO. YLIARAR	SPEVVEE AD	ILRFTLD	SNPVDPASPASYSERV
1						GAPVDPKAMKGYOERF
1	ANHILHOOGLVD	AFGHISIRHP	MDKSQYLIAAYDPG	APALVKSRSDF	IAYWIAD	SSPVDASAPOGYSERF
1	ASHILHHHGVFD	AYGHVSVRSP	DNSST FWMPCNM	PPALVSSAEDL	VEYKVDS	AEAVEKNAKPGYLERH
1	VNRILANEGILD	VLGHISVRNP	VKGDT FFOACRS	FPGDVTRDD	ILEIDLE	GNIVSEKKKSLYREVG
1	ACRESDNEGETE	GFGHISSRST.	APEYLLITPRT	APGLIREATEF	IHYRP	AEPSDDQLAQLPPERH
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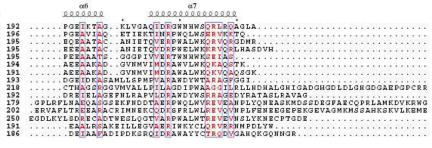


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MHPDdc[Mesorhizobium_loti_MAFF

MHPDdc[Mesorhizobium loti MAPP 192 aldolase/adductn[Polynucleobac 196 aldolase/adductnlike[Burkhold 195 aldolase[Pseudomonas entomophi 195 aldolase/adductn[Bradynhizobiu 194 aldolase/adductn[Bradynhizobiu 194 aldolase/adducin[Bradyrhizobi putative_aldolase[Bradyrhizobi possible_ribulose-5-phosphate M-methylhydantoinaseB/acetone_ possible_aldolase[Aurantimonas hypENG_11697[Botryotinia_fuck hypENG_06501[Phaeosphaeria_nodor aldolase/adducin[Desulfitobact aldolase/adducin[Nocardioides_



Supplemental Figure 1

MHPDdc_M.loti_MAFF303099 MHPDdc_M.loti_MAFF303099 DHPdc_Rhodcoccus sp.HA1 DHPdc_Rhodcoccus sp.DK17 DHPdc_Arthrobacter_keyseri aldolase_Burkholderia_sp.383	1 1 1 1	αΙ <u>DECONTINUES TO TABLE AND AND AND AND AND AND AND AND AND AND</u>	
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MHPDdc_M.loti_MAFF303099 MHPDdc_M.loti_MAFF303099 DHPdc_Rhodococcus_sp.RHA1 DHPdc_Rhodococcus_sp.DK17 DHPdc_Arthrobacter_keyseri aldolase_Burkholderia_sp.383	93 106 106 110 134	η3 η4 β5 α3 α4 β6 TESPAVLPYCFVD.TPLRPVTHMGAFICES/VPVYEIRBCHGDETDLFGGSPDVCADTAESLGSOTVVTHMA 1000000000000000000000000000000000000	
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Supplemental Figure 2