

# Supplementary Materials

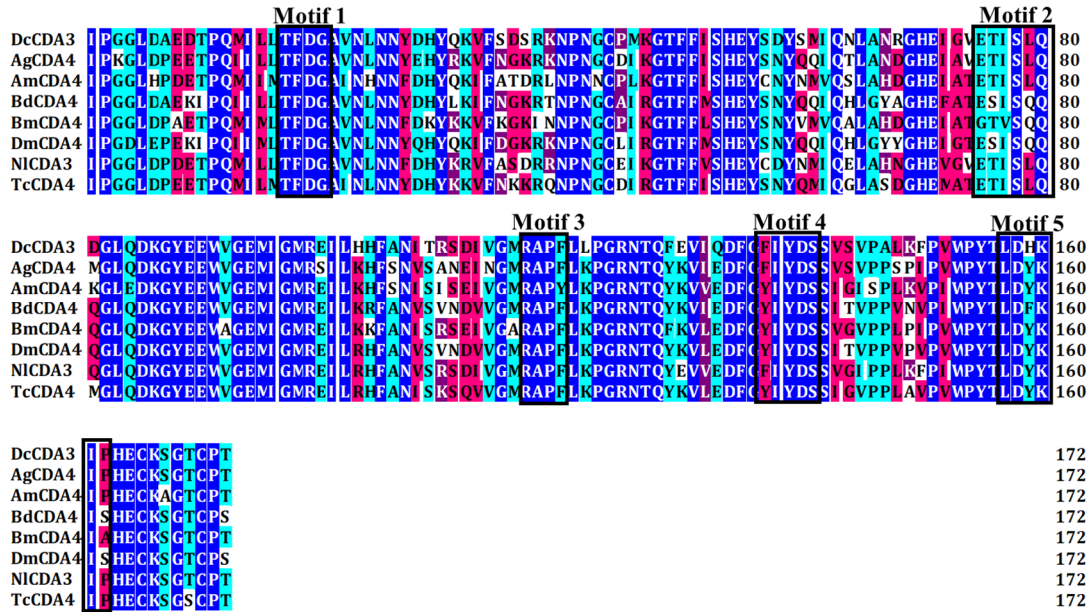


Figure 1. Amino acid sequence alignment of catalytic domains of carbohydrate esterase family 4 enzymes from eight insect species. The amino acid sequences from *Drosophila melanogaster* (Dm), *Bactrocera dorsalis* (Bd), *Apis mellifera* (Am), *Diaphorina citri* (Dc), *Nilaparvata lugens* (NI), *Bombyx mori* (Bm), *Anopheles gambiae* (Ag) and *Tribolium castaneum* (Tc). The black boxes regions are the motifs (motifs 1-5) required for catalytic activity. Identical amino acids are highlighted in blue, similar amino acids are highlighted in light blue and red.

Table S1. Sequences and relevant information used for phylogenetic analysis of the chitin deacetylase gene.

Genes	GenBank No	Species
<i>TcCDA2A</i>	NP_001096047.1	<i>Tribolium castaneum</i>
<i>TcCDA2B</i>	NP_001116303.1	<i>Tribolium castaneum</i>
<i>AmCDA2</i>	XP_623723.2	<i>Apis mellifera</i>
<i>AgCDA2</i>	XP_320596.4	<i>Anopheles gambiae</i>
<i>DmCDA2</i>	NP_001163469.1	<i>Drosophila melanogaster</i>
<i>BdCDA2A</i>	XP_011201905.1	<i>Bactrocera dorsalis</i>
<i>NICDA1</i>	AJQ20732.1	<i>Nilaparvata lugens</i>
<i>BmCDA2</i>	NP_001103795.1	<i>Bombyx mori</i>
<i>BmCDA1</i>	XP_004929283.1	<i>Bombyx mori</i>
<i>AgCDA1</i>	XP_320597.3	<i>Anopheles gambiae</i>
<i>BdCDA1</i>	AUP42574.1	<i>Bactrocera dorsalis</i>
<i>DmCDA1</i>	NP_001262062.1	<i>Drosophila melanogaster</i>
<i>NICDA2</i>	AJQ20733.1	<i>Nilaparvata lugens</i>
<i>AmCDA1</i>	XP-391915.1	<i>Apis mellifera</i>
<i>TcCDA1</i>	NP_001095946.1	<i>Tribolium castaneum</i>
<i>TcCDA3</i>	NP_001104011.1	<i>Tribolium castaneum</i>
<i>BmCDA3</i>	XP_004931841.2	<i>Bombyx mori</i>

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<i>BdCDA3</i>	XP_019844396.1	<i>Bactrocera dorsalis</i>
<i>AgCDA3</i>	XP_317336.3	<i>Anopheles gambiae</i>
<i>DmCDA3</i>	NP_609806.1	<i>Drosophila melanogaster</i>
<i>DmCDA4</i>	NP_728468.1	<i>Drosophila melanogaster</i>
<i>BdCDA4</i>	AUP42578.1	<i>Bactrocera dorsalis</i>
<i>DcCDA3</i>	XP_008480111.1	<i>Diaphorina citri</i>
<i>NiCDA3</i>	AJQ20734.1	<i>Nilaparvata lugens</i>
<i>AmCDA4</i>	XP_001120478.2	<i>Apis mellifera</i>
<i>BmCDA4</i>	XP_012548585.1	<i>Bombyx mori</i>
<i>AgCDA4</i>	XP_310753.4	<i>Anopheles gambiae</i>
<i>TcCDA4</i>	NP_001103903.1	<i>Tribolium castaneum</i>
<i>BdCDA5</i>	XP_011210019.1	<i>Bactrocera dorsalis</i>
<i>AmCDA5</i>	XP_624655.3	<i>Apis mellifera</i>
<i>NiCDA4</i>	AJQ20735.1	<i>Nilaparvata lugens</i>
<i>TcCDA5A</i>	NP_001103739.1	<i>Tribolium castaneum</i>
<i>TcCDA5B</i>	EFA13323.2	<i>Tribolium castaneum</i>
<i>BmCDA5</i>	XP_021207767.1	<i>Bombyx mori</i>
<i>AgCDA5</i>	XP_316929.4	<i>Anopheles gambiae</i>
<i>DmCDA5</i>	NP_001097044.2	<i>Drosophila melanogaster</i>
<i>TcCDA7</i>	NP_001104012.1	<i>Tribolium castaneum</i>
<i>TcCDA8</i>	NP_001103906.1	<i>Tribolium castaneum</i>
<i>BmCDA9_1</i>	XP_004923455.1	<i>Bombyx mori</i>
<i>BmCDA9_2</i>	XP_004923480.1	<i>Bombyx mori</i>
<i>TcCDA9</i>	NP_001103904.1	<i>Tribolium castaneum</i>
<i>DmCDA9</i>	NP_001286519.1	<i>Drosophila melanogaster</i>
<i>BdCDA9</i>	AUP42579.1	<i>Bactrocera dorsalis</i>

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