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Supplementary material:

Table 1: The comprehensive list of the detoxification enzymes -cytochrome P450s (P450s), glutathione-S-transferases (GSTs), and carboxylesterases (CCEs) - of *Culex quinquefasciatus*. The table also shows the total number of genes of each of the gene family that are identified in the present analysis of the *Culex* genome sequence. The P450 enzyme supergene family is divided into four clans, viz. mitochondrial, CYP2, CYP3, and CYP4. Each of the clan is further divided into gene families, namely mitochondrial gene families (CYP12 gene family, 301, 302, 314, 315), CYP2 clan (CYP15, 303, 304, 305, 306, 307), CYP3 clan (CYP6, 9, 329), and CYP4 clan (CYP4, 325 gene families). In the similar way, GST supergene family has been classified into Delta, Epsilon, Sigma, Theta, Omega, Unclassified, and microsomal GST classes. Likewise, the CCE supergene family divided into alpha, beta, Juvenile hormone processing, glutactin, gliotactins, neuroligins, and neurotactins (pl. see ref [24-25] for the basis of classification of these supergene families).

P450s				GSTs	COEs	
CYP 6	**CYP4**	**CYP325**	**CYP 304**	**Delta GSTs**	**Mitochondrial & secreted**	**Juvenile**
CPIJ000298	CPIJ014579	CPIJ006951	CPIJ017242	AB443867	CPIJ000046	CPIJ002073
CPIJ000299	CPIJ009468	CPIJ006950	CPIJ017243	AB443867	CPIJ000047	CPIJ002075
CPIJ002535	CPIJ009473	CPIJ015959	CPIJ017244	AB443867	CPIJ000045	CPIJ002074
CPIJ002536	CPIJ009474	CPIJ017200	CPIJ017245	AB443867	CPIJ000048	CPIJ013026
CPIJ002537	CPIJ009475	CPIJ015954	CPIJ017246	CPIJ002663	CPIJ008749	CPIJ013027
CPIJ002538	CPIJ009476	CPIJ017199	*5*	CPIJ002675	CPIJ005694	CPIJ013028
CPIJ003361	CPIJ009477	CPIJ015958	**CYP 307**	CPIJ002674	CPIJ000051	CPIJ013029
CPIJ003375	CPIJ020229	CPIJ010810	CPIJ000989	CPIJ002678	CPIJ000049	CPIJ013175
CPIJ003376	CPIJ009478	CPIJ015961	*1*	CPIJ002679	CPIJ016025	CPIJ014154
CPIJ003377	CPIJ015681	CPIJ015960	**CYP 301**	CPIJ002660	CPIJ016026	CPIJ020045
CPIJ003378	CPIJ006721	CPIJ015957	CPIJ008980	CPIJ000304	CPIJ015342	CPIJ007140
CPIJ003389	CPIJ001886	CPIJ015963	*1*	CPIJ002683	CPIJ004752	CPIJ009768
CPIJ004410	CPIJ007188	CPIJ014730	**CYP 12**	CPIJ002682	CPIJ007829	CPIJ015077
CPIJ004411	CPIJ011127	*34*	CPIJ010227	CPIJ010814	CPIJ016341	*11*
CPIJ005899	CPIJ001758	**CYP9**	CPIJ010228	CPIJ002681	CPIJ007825	**Uncharacterized**
CPIJ005900	CPIJ001757	CPIJ019765	CPIJ010229	CPIJ002680	CPIJ007826	CPIJ007638
CPIJ005952	CPIJ010075	CPIJ010203	CPIJ010230	CPIJ002676	CPIJ016336	*1*
CPIJ005953	CPIJ008937	CPIJ014220	CPIJ010231	*14*	CPIJ007824	**neuroligin**
CPIJ005954	CPIJ008936	CPIJ014221	*5*	**Epsilon**	CPIJ007827	CPIJ007493
CPIJ005955	CPIJ001754	CPIJ014218	**CYP302**	CPIJ018628	CPIJ016339	CPIJ007495
CPIJ005956	CPIJ001755	CPIJ012470	CPIJ010826	CPIJ018627	CPIJ007828	CPIJ012197
CPIJ005957	CPIJ000293	CPIJ010542	*1*	CPIJ018629	CPIJ016340	*3*
CPIJ005958	CPIJ000294	CPIJ010539	**CYP 314**	CPIJ018630	CPIJ018232	**neurotactin**
CPIJ005959	CPIJ010480	CPIJ010537	CPIJ001380	CPIJ018631	CPIJ018233	CPIJ008533
CPIJ008566	CPIJ016284	CPIJ010538	*1*	CPIJ018632	CPIJ018231	*1*
CPIJ009085	CPIJ001810	CPIJ010540	**CYP 315**	CPIJ018625	CPIJ013679	**gliotactin**
CPIJ010858	CPIJ018943	CPIJ010541	CPIJ011843	CPIJ018624	*26*	CPIJ000482
CPIJ011129	CPIJ017351	CPIJ010536	*1*	CPIJ018626	**Microsomal alpha**	*1*
CPIJ015223	CPIJ018854	CPIJ010544		*9*	CPIJ013917	
CPIJ015428	CPIJ018944	CPIJ010543		**Omega**	CPIJ013918	
CPIJ016356	CPIJ018668	CPIJ010545		CPIJ000031	*2*	
CPIJ016846	CPIJ009415	CPIJ010546		*1*	**Glutactin**	
CPIJ016847	*32*	CPIJ010175		**Sigma**	CPIJ002786	
CPIJ016848	**CYP325**	CPIJ010547		CPIJ006160	CPIJ002787	
CPIJ016849	CPIJ011837	CPIJ005332		*1*	CPIJ002785	
CPIJ016850	CPIJ011838	CPIJ003082		**Theta**	CPIJ004636	
CPIJ016851	CPIJ011636	*21*		CPIJ014052	CPIJ004637	
CPIJ016852	CPIJ011841	**CYP329**		CPIJ014053	*5*	
CPIJ016853	CPIJ005683	CPIJ000655		CPIJ014051	**Beta & pheromone**	
CPIJ016854	CPIJ005684	1		CPIJ014054	CPIJ011169	
CPIJ016855	CPIJ005685	**CYP 306**		CPIJ019572	CPIJ005122	
CPIJ016856	CPIJ007086	CPIJ001038		CPIJ020053	CPIJ017763	
CPIJ016857	CPIJ007085	CPIJ001039		*6*	CPIJ016681	
CPIJ017014	CPIJ007089	*2*		**unclassified**	CPIJ016683	
CPIJ017462	CPIJ007090	**CYP 305**		CPIJ009434	CPIJ019485	
CPIJ017609	CPIJ007091	CPIJ014940		CPIJ016212	CPIJ016686	
CPIJ018494	CPIJ007093	CPIJ014941		CPIJ014694	CPIJ016685	
CPIJ019586	CPIJ007092	CPIJ014942		CPIJ018633	*8*	
CPIJ019587	CPIJ007095	*3*		*4*	**Aceltylcholines**	
CPIJ019673	CPIJ009570	**CYP 15**		**microsomal GSTs**	CPIJ000662	
CPIJ019700	CPIJ009569	CPIJ014944		CPIJ012756	CPIJ006034	
CPIJ019702	CPIJ010272	*1*		CPIJ018241	*2*	
CPIJ019703	CPIJ011835	**CYP 303**		CPIJ012754		
CPIJ019704	CPIJ000925	CPIJ009170		CPIJ012755		
CPIJ019751	CPIJ000929	*1*		CPIJ015233		
55				*5*		

Table 2a: Comparative distribution of various gene families or classes of cytochrome p450s, glutathione-S-transferases, and carboxylesterases from sequenced dipteran species. The enzyme data for the *Drosophila, Aedes*, and *Anopheles* were retrieved from Claudianos *et. al.* [25] And for *Culex* freshly analyzed data is used.

Species	*D. melanogaster*	*A. gambiae*	*A. aegypti*	*Cx. quinquefasciatus*
Cytosolic GSTs				
Delta	11	12	9	14
Epsilon	14	8	8	9
Omega	4	1	1	1
Sigma	1	1	1	1
Theta	4	2	4	6
Zeta	2	1	1	**0**
Iota	**0**	1	1	1
Others (unclassified)	**0**	3	2	3
Microsomal	**0**	4	3	4
Total GSTs	***36***	***33***	***30***	***39***
Cytochrome P450s				
CYP4	32	45	59	66
CYP3	36	42	84	77
CYP2	6	10	11	13
Mitochondrial CYPs	11	9	10	10
P450 total	***85***	***106***	***164***	***166***
CCEs				
Mitochondrial & secreted&microsomal	13	16	22	28
Hormone/semiochemical processing				
D clade/ integument esterases	3	0	0	0
E clade/ beta esterases	2	4	2	8
F clade/ juvenile hormone esterases	3	10	12	13
Neuro/developmental				
H clade/glutactin	5	10	7	5
I clade/ uncharacterized	1	1	1	1
J clade/ acetylcholinesterases	1	2	2	2
K clade/ gliotactins	1	1	1	1
L clade/ neuroligins	4	5	5	3
M clade/ neurotactins	2	2	2	1
CCEs total	***35***	***51***	***54***	***62***

Table 2b: Comparative distribution of various IR gene families or classes of cytochrome P450s, glutathione-S-transferases, and carboxylesterases from the sequenced dipteran species

	Culex quinquefasciatus	***Anopheles gambiae***	***Aedes aegypti***	***Drosophila melanogaster***
P450s	**166**	**105**	**160**	**85**
CYP3 Clan	*77*	36	82	36
CYP4 Clan	66	32	57	32
Percent contribution	*143 (86%)*	*68 (64%)*	*139 (87%)*	*68 (80%)*
GSTs	**40**	**31**	**29**	**38**
Delta	14	12	8	11
Epsilon	9	8	8	14
Percent contribution	*23 (57%)*	*20 (66%)*	*16 (55%)*	*25 (66%)*
Esterases	**62**	**51**	**49**	**35**
Alpha class	*28 (50%)*	*16 (30%)*	*22 (40%)*	*13 (40%)*