



Figure S1: Agarose gel images of PCR products obtained by using *CYP354A1* and *CYP6A14* primers. M: 100 bp DNA ladder. (A: *CYP354A1*; Live individuals from the LC₅₀ assay, B: Dead individuals from the LC₅₀ assay, C: *CYP6A14*; Live individuals from the LC₅₀ assay, D: Dead individuals from the LC₅₀ assay, E: Live individuals from the LC₉₉ assay, F: Dead individuals from the LC₉₉ assay)

Table S3: Comparison of nucleotide sequences of *CYP6A14* with control in live and dead *Tribolium castaneum* from LC₅₀ concentration application.

Nucleotide position in the <i>CYP6A14</i> sequence	Mutations (Live-Control)	Nucleotide position in the <i>CYP6A14</i> sequence	Mutations (Dead-Control)
320120	T-C	320123	T-G
320123	C-Deletion	320126	C-T
320131	A-T	320128	G-T
320132	A-C	320130	G-Insertion
320144	A-C	320134	A-T
320146	T-Insertion	320135	A-G
320154	C-Insertion	320136	A-C
320161	T-Insertion	320145	T-Insertion
320162	T-Insertion	320146	A-Insertion
320180	T-Insertion	320148	T-A
320199	G-A	320207	A-G
320207	A-G	320229	G-A
320229	G-A	320304	A-G
320304	A-G	320319	A-G
320319	A-G	320430	C-A
320428	T-Insertion	320440	T-A
320429	C-A		

Table S4: Comparison of nucleotide sequences of *CYP6A14* with control in dead *Tribolium castaneum* from LC₉₉ concentration application

Nucleotide position in the <i>CYP6A14</i> sequence	Mutations (Dead-Control)
320137	C-G
320139	A-G
320142	T-Deletion
320143	A-Deletion
320148	T-G
320149	C-G
320152	A-G
320154	T-C
320155	T-G
320158	T-Deletion
320159	T-A
320165	C-T
320172	T-C
320201	A-G
320202	A-T
320210	C-A
320214	A-G
320216	G-Deletion
320218	G-T

320221	A-T
320234	A-T
320236	G-A
320248	G-C
320249	T-C
320252	A-G
320253	T-C
320257	G-T
320260	G-A
320262	G-C
320263	A-C
320264	A-C
320267	T-C
320275	C-T
320277	T-G
320282	T-A
320285	T-A
320294	T-A
320311	A-G
320326	A-G

Table S5: Comparison of nucleotide sequences of *CYP345A1* with control in live *Tribolium castaneum* from LC₅₀ concentration application

Nucleotide position in the <i>CYP345A1</i> sequence	Mutations (Live-Control)
21970	A-G
21973	T-Deletion
21975	T-A
21978	A-Insertion
21982	A-Deletion
21983	T-Deletion
21984	G-Deletion
21985	T-Deletion
21989	C-Deletion
21993	C-Insertion
21997	T-A
22003	G-A
22004	A-G
22017	A-Deletion
22033	G-T
22042	A-T
22045	A-T
22047	A-G
22067	A-T
22068	G-C

22077	A-T
22082	G-Deletion
22083	G-T
22085	A-T
22105	A-T
22110	A-Deletion
22111	A-T
22112	A-T
22114	A-T
22138	A-G
22142	G-A

Table S6: Comparison of nucleotide sequences of *CYP345A1* with control in dead *Tribolium castaneum* from LC₅₀ concentration application

Nucleotide position in the <i>CYP345A1</i> sequence	Mutations (Dead-Control)
21967	A-Insertion
21968	C-Insertion
21969	A-Insertion
21973	A-T
21975	G-Insertion
21976	T-Insertion
21977	G-Insertion
21980	T-G
21983	C-T
21986	G-Deletion
21987	A-Deletion
21988	T-Deletion
21989	G-Deletion
21990	T-Deletion
21991	T-Deletion
21997	C-Insertion
21998	C-Insertion
22003	G-Deletion
22004	T-Deletion
22005	T-Deletion
22006	G-Deletion
22007	T-Deletion
22008	G-Deletion
22009	C-Deletion
22010	G-Deletion
22011	A-Deletion
22012	A-Deletion
22013	A-Deletion
22014	G-Deletion
22015	A-Deletion
22016	G-Deletion
22017	G-Deletion

22018	G-Deletion
22019	A-Deletion
22024	C-Insertion
22025	T-A
22027	G-A
22031	A-Insertion
22032	G-Insertion
22033	C-Insertion
22034	C-Insertion
22035	A-Insertion
22036	C-Insertion
22037	C-Insertion
22038	T-Insertion
22039	C-Insertion
22040	A-Insertion
22041	C-Insertion
22043	A-Insertion
22044	T-A
22048	G-Deletion
22051	G-C
22057	G-A
22058	G-A
22059	G-T
22061	G-C
22062	T-A
22065	G-C
22066	T-C
22068	T-C
22070	A-Deletion
22072	G-C
22073	A-C
22074	A-C
22083	T-C
22088	T-Insertion
22089	C-Insertion
22090	C-Insertion
22091	C-Insertion
22092	C-Insertion
22093	C-Insertion
22094	A-Insertion
22095	T-Insertion
22100	C-Insertion
22101	C-Insertion
22102	A-Insertion
22103	C-Insertion
22104	C-Insertion
22105	A-Insertion
22106	C-Insertion

22110	A-C
22114	G-Deletion
22115	T-Deletion
22118	T-Deletion
22119	A-Deletion
22120	A-Deletion
22121	T-Deletion
22122	T-Deletion
22126	G-Deletion
22127	G-Deletion
22128	A-Deletion
22129	G-Deletion
22130	A-Deletion
22131	A-Deletion
22132	A-Deletion
22133	T-Deletion
22134	A-C
22137	T-C
22138	A-T
22140	A-C
22142	A-G
22148	A-C
22149	G-C
22150	T-C
22152	T-A
22153	A-C
22157	A-C
22160	G-C
22166	A-C
22167	G-T
22174	C-Insertion
22175	C-Insertion
22176	T-Insertion
22177	T-Insertion
22178	C-Insertion
22179	C-Insertion
22180	C-Insertion
22182	G-C
22185	T-C
22189	G-A
22191	G-A
22192	G-C

Table S7: Comparison of nucleotide sequences of *CYP345A1* with control in dead *Tribolium castaneum* from LC₉₉ concentration application

Nucleotide position in the <i>CYP345A1</i> sequence	Mutations (Dead-Control)
21964	T-C

21967	T-Deletion
21968	A-Deletion
21969	C-Deletion
21974	G-Insertion
21975	T-Insertion
21976	A-Insertion
21977	G-Insertion
21978	T-Insertion
21979	C-Insertion
21982	G-T
21986	G-C
21989	G-C
21992	T-Insertion
21993	C-Insertion
21994	T-Insertion
21995	T-Insertion
21996	A-Insertion
21997	C-T
21998	G-T
22007	C-Insertion
22008	T-Insertion
22009	C-Insertion
22011	G-T
22013	G-Deletion
22014	C-Deletion
22015	G-Deletion
22016	A-Deletion
22017	A-Deletion
22018	A-Deletion
22019	G-Deletion
22020	A-Deletion
22021	G-Deletion
22022	G-Deletion
22023	G-Deletion
22024	A-Deletion
22025	A-Deletion
22026	A-Deletion
22027	T-Deletion
22028	G-Deletion
22029	T-Deletion
22030	C-Deletion
22031	G-Deletion
22032	A-Deletion
22033	G-Deletion
22034	G-Deletion
22035	A-Deletion
22037	A-T
22040	G-T

22043	G-Deletion
22044	A-Deletion
22045	A-Deletion
22046	A-Deletion
22047	A-Deletion
22048	A-Deletion
22049	G-Deletion
22050	G-Deletion
22051	G-Deletion
22052	A-Deletion
22053	G-Deletion
22057	T-Insertion
22058	G-C
22062	G-Deletion
22063	A-Deletion
22064	A-Deletion
22065	G-Deletion
22066	A-C
22067	A-T
22068	A-C
22071	A-C
22078	C-Insertion
22079	T-Insertion
22080	A-Insertion
22081	C-Insertion
22082	T-Insertion
22083	C-Insertion
22084	A-Insertion
22085	T-Insertion
22086	G-Insertion
22087	T-Insertion
22088	A-Insertion
22089	C-Insertion
22090	G-Insertion
22095	C-Insertion
22096	C-Insertion
22097	C-Insertion
22098	C-Insertion
22099	C-Insertion
22100	T-C
22103	C-A
22107	G-T
22110	T-Insertion
22111	G-Insertion
22112	A-Insertion
22113	C-Insertion
22114	T-Insertion
22115	T-Insertion

22116	T-Insertion
22117	T-Insertion
22123	A-T
22124	A-T
22128	T-Insertion
22129	C-Insertion
22130	C-Insertion
22131	T-Insertion
22132	T-Insertion
22133	C-Insertion
22134	T-Insertion
22135	T-Insertion
22136	T-Insertion
22137	G-Insertion
22138	A-Insertion
22139	C-Insertion
22140	G-Insertion
22141	C-Insertion
22142	A-Insertion
22143	T-Insertion
22144	C-Insertion
22145	C-Insertion
22146	T-Insertion
22151	A-T
22152	G-C
22153	A-G
22154	A-G
22157	A-G
22160	T-C
22161	A-T
22163	A-Deletion
22164	T-Deletion
22165	A-Deletion
22166	A-Deletion
22167	A-Deletion
22168	A-Deletion
22169	G-Deletion
22170	G-C
22173	T-C
22175	T-Deletion
22176	A-Deletion
22177	A-Deletion
22178	A-Deletion
22182	T-Insertion
22183	T-Insertion
22184	C-Insertion
22185	A-Insertion
22186	T-Insertion

22187	G-Insertion
22192	A-Deletion
22193	G-Deletion
22194	T-Deletion
22195	A-Deletion
22199	A-Insertion
22200	T-Insertion
22201	T-Insertion
22202	G-Insertion
22203	T-Insertion
22204	G-Insertion
22205	C-Insertion
22206	G-Insertion
22207	T-Insertion
22208	T-Insertion
22209	G-Insertion
22210	C-Insertion
22211	A-Insertion
22212	A-Insertion
22213	T-Insertion
22214	G-Insertion
22215	C-Insertion
22216	C-Insertion
22217	T-Insertion
22218	T-Insertion
22219	G-T