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 CanCYP93B38 N-CPFAIADILMYN-SSAFAPYGYWKKIRKLIMNDLLNATVTKRDRSRRLRGGIRKIRK... 213
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 TurCYP93F12 P-KPTAVIRHILYGS-SSAFAPYGYWKKIRKLIMNDLLNATVTKRDRSRRLRGGIRKIRK... 126
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 AcoCYP93K4 P-RLLSGV-SSAFAPYGYWKKIRKLIMNDLLNATVTKRDRSRRLRGGIRKIRK... 211

230 240 250 260 270 280 290 300 310 320 330
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 BolCYP93D1 L-ELAGGFNVSDIWFQKLDLQGLKRLKVRKIDVIERIMEES-RNHDAGG-VSMIDILILDIDEDKNSIKLARENKAFIMINYGGGTDSIAI 118
 BnaCYP93D1 C L-ELAGGFNVSDIWFQKLDLQGLKRLKVRKIDVIERIMEES-RNHDAGG-VSMIDILILDIDEDKNSIKLARENKAFIMINYGGGTDSIAI 213
 BolCYP93D2P L-ELAGGFNVSDIWFQKLDLQGLKRLKVRKIDVIERIMEES-RNHDAGG-VSMIDILILDIDEDKNSIKLARENKAFIMINYGGGTDSIAI 149
 AlyCYP93D1 L-ELAGGFNVSDIWFQKLDLQGLKRLKVRKIDVIERIMEES-RNHDAGG-VSMIDILILDIDEDKNSIKLARENKAFIMINYGGGTDSIAI 310
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 EguCYP93A127 TAEIHKFNLSDIWFQKLDLQGLKRLKVRKIDVIERIMEES-RNHDAGG-VSMIDILILDIDEDKNSIKLARENKAFIMINYGGGTDSIAI 322
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 CanCYP93A42 L-ELAGGFNVSDIWFQKLDLQGLKRLKVRKIDVIERIMEES-RNHDAGG-VSMIDILILDIDEDKNSIKLARENKAFIMINYGGGTDSIAI 317
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5

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lucCYP93A123 --RSCIDVRGCHFLIPGSGRRCCGSGTALVAVTAAALVCCEDKDKKNGKENGIDVTEGLTERRALNLCVIVRDIETLI-- 516

lucCYP93A117 KG--SQGVSRGCHFLIPGSGRRCCGSGTALVAVTAAALVCCEDKDKKNGDVTMEGLTERRALNLCVIVRDIETTINGLTD-- 330

lucCYP93A84 --SDISGLIMPFGSGRRCCGSGTALVAVTAAALVCCEDKDKKNGGGOVTEGLTERRALNLCVIVRPELLPSI-- 506

clacCYP93A84 --SDISGLIMPFGSGRRCCGSGTALVAVTAAALVCCEDKDKKNGGGOVTEGLTERRALNLCVIVRDIETTINGLTD-- 501

lucCYP93A24 ENESGKMGVLDVRGCHFLIPGSGRRCCGSGTALVAVTAAALVCCEDKDKKNGGGOVTEGLTERRALNLCVIVRDIETTINGLTD-- 517

pmuCY93A59 DNESGIKGCHFLIPGSGRRCCGSGTALVAVTAAALVCCEDKDKKNGGGOVTEGLTERRALNLCVIVRDIETTINGLTD-- 514

ccacCYP93A113 DE-TGKIQIDVRGCHFLIPGSGRRCCGSGTALVAVTAAALVCCEDKDKKNGGGOVTEGLTERRALNLCVIVRDIETTINGLTD-- 517

lJaCY93A108 GN--GWNNDVVRGCHFLIPGSGRRCCGSGTALVAVTAAALVCCEDKDKKNGGGOVTEGLTERRALNLCVIVRDIETTINGLTD-- 310

NmuCY93A49 GN--GWNNDVVRGCHFLIPGSGRRCCGSGTALVAVTAAALVCCEDKDKKNGGGOVTEGLTERRALNLCVIVRDIETTINGLTD-- 310

CarCY93E1 DE-PSKSIDVRGCHFLIPGSGRRCCGSGTALVAVTAAALVCCEDKDKKNGGGOVTEGLTERRALNLCVIVRDIETTINGLTD-- 325

MtrCY93E1 DE-PSKSIDVRGCHFLIPGSGRRCCGSGTALVAVTAAALVCCEDKDKKNGGGOVTEGLTERRALNLCVIVRDIETTINGLTD-- 325

lJaCY93E1 DE--RRVDVRGCHFLIPGSGRRCCGSGTALVAVTAAALVCCEDKDKKNGGGOVTEGLTERRALNLCVIVRDIETTINGLTD-- 509

GmuCY93E1 DE-PGKSIDVRGCHFLIPGSGRRCCGSGTALVAVTAAALVCCEDKDKKNGGGOVTEGLTERRALNLCVIVRDIETTINGLTD-- 511

PvuCY93E1 DG--KGIDVRGCHFLIPGSGRRCCGSGTALVAVTAAALVCCEDKDKKNGGGOVTEGLTERRALNLCVIVRDIETTINGLTD-- 509

CcaCY93E2 DD-PGKSIDVRGCHFLIPGSGRRCCGSGTALVAVTAAALVCCEDKDKKNGGGOVTEGLTERRALNLCVIVRDIETTINGLTD-- 222

CcaCY93E1 SG--GTNVVRGCHFLIPGSGRRCCGSGTALVAVTAAALVCCEDKDKKNGGGOVTEGLTERRALNLCVIVRDIETTINGLTD-- 510

AtCY93A371 SG--GSNVDVRGCHFLIPGSGRRCCGSGTALVAVTAAALVCCEDKDKKNGGGOVTEGLTERRALNLCVIVRDIETTINGLTD-- 501

PeCY93A393 DD-DGIDVRGCHFLIPGSGRRCCGSGTALVAVTAAALVCCEDKDKKNGGGOVTEGLTERRALNLCVIVRDIETTINGLTD-- 443

PeCY93A394 ED--NGNVLDVRGCHFLIPGSGRRCCGSGTALVAVTAAALVCCEDKDKKNGGGOVTEGLTERRALNLCVIVRDIETTINGLTD-- 415

AccCY93H2 DD-DNQNVLDVRGCHFLIPGSGRRCCGSGTALVAVTAAALVCCEDKDKKNGGGOVTEGLTERRALNLCVIVRDIETTINGLTD-- 420

AccCY93H3 CSEGNDVLDVRGCHFLIPGSGRRCCGSGTALVAVTAAALVCCEDKDKKNGGGOVTEGLTERRALNLCVIVRDIETTINGLTD-- 599

AccCY93H1 SKEGDNDVLDVRGCHFLIPGSGRRCCGSGTALVAVTAAALVCCEDKDKKNGGGOVTEGLTERRALNLCVIVRDIETTINGLTD-- 599

MguCY93B36 EN--SADIDVRGCHFLIPGSGRRCCGSGTALVAVTAAALVCCEDKDKKNGGGOVTEGLTERRALNLCVIVRDIETTINGLTD-- 530

MguCY93B37 AG--SADIDVRGCHFLIPGSGRRCCGSGTALVAVTAAALVCCEDKDKKNGGGOVTEGLTERRALNLCVIVRDIETTINGLTD-- 530

PeCY93B40 GEDDGMSVLDVRGCHFLIPGSGRRCCGSGTALVAVTAAALVCCEDKDKKNGGGOVTEGLTERRALNLCVIVRDIETTINGLTD-- 523

PeCY93B41 GEDDGMSVLDVRGCHFLIPGSGRRCCGSGTALVAVTAAALVCCEDKDKKNGGGOVTEGLTERRALNLCVIVRDIETTINGLTD-- 523

PeCY93B42 SEGDCGMSVLDVRGCHFLIPGSGRRCCGSGTALVAVTAAALVCCEDKDKKNGGGOVTEGLTERRALNLCVIVRDIETTINGLTD-- 523

PeCY93B45 GSDGNKNSVLDVRGCHFLIPGSGRRCCGSGTALVAVTAAALVCCEDKDKKNGGGOVTEGLTERRALNLCVIVRDIETTINGLTD-- 520

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MdoCY93B15 PSGGRDGLIDVRGCHFLIPGSGRRCCGSGTALVAVTAAALVCCEDKDKKNGGGOVTEGLTERRALNLCVIVRDIETTINGLTD-- 516

MdoCY93B44 LGGDGARLDLRGCHFLIPGSGRRCCGSGTALVAVTAAALVCCEDKDKKNGGGOVTEGLTERRALNLCVIVRDIETTINGLTD-- 506

MdoCY93B47 LGGDGARLDLRGCHFLIPGSGRRCCGSGTALVAVTAAALVCCEDKDKKNGGGOVTEGLTERRALNLCVIVRDIETTINGLTD-- 516

MdoCY93B47 LGGGDGLALDRGCHFLIPGSGRRCCGSGTALVAVTAAALVCCEDKDKKNGGGOVTEGLTERRALNLCVIVRDIETTINGLTD-- 496

FveCY93B51 GD--QITEPVRGCHFLIPGSGRRCCGSGTALVAVTAAALVCCEDKDKKNGGGOVTEGLTERRALNLCVIVRDIETTINGLTD-- 514

FveCY93B52 GD--QTSNGVVRGCHFLIPGSGRRCCGSGTALVAVTAAALVCCEDKDKKNGGGOVTEGLTERRALNLCVIVRDIETTINGLTD-- 514

FveCY93B48 DGDSPANGVVRGCHFLIPGSGRRCCGSGTALVAVTAAALVCCEDKDKKNGGGOVTEGLTERRALNLCVIVRDIETTINGLTD-- 513

FveCY93B49 DA-DDSTNIDVRGCHFLIPGSGRRCCGSGTALVAVTAAALVCCEDKDKKNGGGOVTEGLTERRALNLCVIVRDIETTINGLTD-- 515

FveCY93B50 DGGGDKAARDVRGCHFLIPGSGRRCCGSGTALVAVTAAALVCCEDKDKKNGGGOVTEGLTERRALNLCVIVRDIETTINGLTD-- 513

MtrCY93B10 SS--NGVIDVRGCHFLIPGSGRRCCGSGTALVAVTAAALVCCEDKDKKNGGGOVTEGLTERRALNLCVIVRDIETTINGLTD-- 511

MtrCY93B11 SS--NGVIDVRGCHFLIPGSGRRCCGSGTALVAVTAAALVCCEDKDKKNGGGOVTEGLTERRALNLCVIVRDIETTINGLTD-- 511

CcaCY93B61 GG--EGCIDVRGCHFLIPGSGRRCCGSGTALVAVTAAALVCCEDKDKKNGGGOVTEGLTERRALNLCVIVRDIETTINGLTD-- 507

GmuCY93C5 GE--EAGLIDVRGCHFLIPGSGRRCCGSGTALVAVTAAALVCCEDKDKKNGGGOVTEGLTERRALNLCVIVRDIETTINGLTD-- 516

GmuCY93C12 GE--EAGLIDVRGCHFLIPGSGRRCCGSGTALVAVTAAALVCCEDKDKKNGGGOVTEGLTERRALNLCVIVRDIETTINGLTD-- 516

BvuCY93C31 GAGEARALDLRGCHFLIPGSGRRCCGSGTALVAVTAAALVCCEDKDKKNGGGOVTEGLTERRALNLCVIVRDIETTINGLTD-- 492

BvuCY93C33 GAGEARALDLRGCHFLIPGSGRRCCGSGTALVAVTAAALVCCEDKDKKNGGGOVTEGLTERRALNLCVIVRDIETTINGLTD-- 498

PvuCY93C25 EAGEAGHLDLRGCHFLIPGSGRRCCGSGTALVAVTAAALVCCEDKDKKNGGGOVTEGLTERRALNLCVIVRDIETTINGLTD-- 418

PvuCY93C28 --RCPGCVSTSGGCHFLIPGSGRRCCGSGTALVAVTAAALVCCEDKDKKNGGGOVTEGLTERRALNLCVIVRDIETTINGLTD-- 479

PvuCY93C26 GGEVGVHLDLRGCHFLIPGSGRRCCGSGTALVAVTAAALVCCEDKDKKNGGGOVTEGLTERRALNLCVIVRDIETTINGLTD-- 515

CcaCY93C32 GGEVGVHLDLRGCHFLIPGSGRRCCGSGTALVAVTAAALVCCEDKDKKNGGGOVTEGLTERRALNLCVIVRDIETTINGLTD-- 515

MtrCY93C31 GGEVGEASVLDLRGCHFLIPGSGRRCCGSGTALVAVTAAALVCCEDKDKKNGGGOVTEGLTERRALNLCVIVRDIETTINGLTD-- 223

MtrCY93C20 VGEVGEASVLDLRGCHFLIPGSGRRCCGSGTALVAVTAAALVCCEDKDKKNGGGOVTEGLTERRALNLCVIVRDIETTINGLTD-- 512

MtrCY93C19 AGEVGEASVLDLRGCHFLIPGSGRRCCGSGTALVAVTAAALVCCEDKDKKNGGGOVTEGLTERRALNLCVIVRDIETTINGLTD-- 512

CarCY93C3 GAGEDAGSVLDLRGCHFLIPGSGRRCCGSGTALVAVTAAALVCCEDKDKKNGGGOVTEGLTERRALNLCVIVRDIETTINGLTD-- 528

CarCY93C31 AD--SIDLRGCHFLIPGSGRRCCGSGTALVAVTAAALVCCEDKDKKNGGGOVTEGLTERRALNLCVIVRDIETTINGLTD-- 514

lJaCY93C17 AD--SIDLRGCHFLIPGSGRRCCGSGTALVAVTAAALVCCEDKDKKNGGGOVTEGLTERRALNLCVIVRDIETTINGLTD-- 514

lJaCY93C29 AD--SIDLRGCHFLIPGSGRRCCGSGTALVAVTAAALVCCEDKDKKNGGGOVTEGLTERRALNLCVIVRDIETTINGLTD-- 514

lJaCY93C30 EG--GATSIDLRGCHFLIPGSGRRCCGSGTALVAVTAAALVCCEDKDKKNGGGOVTEGLTERRALNLCVIVRDIETTINGLTD-- 399

GmuCY93B16 EG--SADIDVRGCHFLIPGSGRRCCGSGTALVAVTAAALVCCEDKDKKNGGGOVTEGLTERRALNLCVIVRDIETTINGLTD-- 527

GmuCY93B19 EG--SADIDVRGCHFLIPGSGRRCCGSGTALVAVTAAALVCCEDKDKKNGGGOVTEGLTERRALNLCVIVRDIETTINGLTD-- 527

PvuCY93B24 EG--KVIDVRGCHFLIPGSGRRCCGSGTALVAVTAAALVCCEDKDKKNGGGOVTEGLTERRALNLCVIVRDIETTINGLTD-- 525

CcaCY93B62 ER--SIDIDVRGCHFLIPGSGRRCCGSGTALVAVTAAALVCCEDKDKKNGGGOVTEGLTERRALNLCVIVRDIETTINGLTD-- 525

CarCY93B60 KE--GSIDIDVRGCHFLIPGSGRRCCGSGTALVAVTAAALVCCEDKDKKNGGGOVTEGLTERRALNLCVIVRDIETTINGLTD-- 5

S2 Fig. Alignment of the plant CYP93 proteins used in this study. MAFFT software was used to apply the for amino acid sequence alignment of the 214 CYP93 proteins. The shading of the alignment represents different degrees of conservation among sequences. The P450 motifs and substrate recognition sites are underlined.