

**Supplemental Table 3. Seed sequence information statistics.**

Superfamily	Gene	EC number	EC number of outgroup	BLASTP seed file name	seed length		
					average value	standard deviation	min_iden
	4CL	EC:6.2.1.12	EC:6.2.1.1	4CL.fa	551	10.97	47.9
	CHI	EC:5.5.1.6	EC:5.5.1.9	CHI.fa	225	14.7	38.08
	CHS	EC:2.3.1.74	EC:2.3.1.-	CHS.fa	396	12.36	68.53
	LAR	EC:1.17.1.3	EC:1.17.1.1	LAR.fa	342	16.5	48.07
	PAL	EC:4.3.1.24	EC:4.3.1.25	PAL.fa	714	13.45	64.92
	PPO	EC:1.10.3.1	EC:1.10.3.3	PPO.fa	574	19.67	66.16
	SCPL4	EC:2.3.1.-	EC:3.4.16.-	SCPL4.fa	478	8.18	72.56
	SCPL5	EC:2.3.1.-	EC:3.4.16.-	SCPL5.fa	484	5.65	78.57
	UGT84A	EC:2.4.1.120, EC:2.4.1.177	EC:2.4.1.324	UGT84A.fa	487	9.27	55.2
SDRs	DFR	EC:1.1.1.219	EC 1.1.1.225	DFR.fa	348	13.2	64.13
	ANR	EC:1.3.1.77	EC:1.3.1.78	ANR.fa	344	8.42	50.26
	F3H	EC:1.14.11.9	EC:1.13.12.19	F3H.fa	362	13	64.54
2OGD	FLS	EC:1.14.20.6	EC:1.13.12.19	FLS.fa	332	5	72.4
	LDOX	EC:1.14.20.4	EC:1.13.12.19	LDOX.fa	331	0.7	53.7
	ANS	EC:1.14.20.4	EC:1.13.12.19	ANS.fa	359	8.37	74.4
	F3'H	EC:1.14.14.82	EC:1.14.19.41	F3'5'H.fa	518	9.56	61.04
CYP450s	F3'5'H	EC:1.14.14.81	EC:1.14.19.41	F3'H.fa	511	5.78	67.04
	C4H	EC:1.14.13.11	EC:1.14.19.41	C4H.fa	515	15.93	64.68
	FNSII	EC:1.14.11.22	EC:1.14.19.41	FNSII.fa	521	11.86	57.01

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