

Supplementary Table 2. Loss-of-function Mutant Lines Screened						
BL#/VRDC#	CG#	Gene Name	Wing Defect % Penetrance Male	Wing Defect % Penetrance Female	Wing Defect % Penetrance Total	Defect Phenotypes
Calcium Channels						
BL14156	CG12295	straightjacket (stj)	48	60	54	Bristle and pigment defects
BL13682	CG3725	Sarco/endoplasmic reticulum Ca(2+)-ATPase (SERCA)	67	76	40	Ectopic veins, ectopic bristles, pigment defect
BL19957	CG34322; CG42447; CG34321	inaF-A; B; C	15	50	31	PCV bifurcation
BL38067	CG16793	brivido-2 (brv2)	20	34	28	PCV bifurcation
BL24768	CG4536	Inactive (iav)	0	25	15	Incomplete L5 (wings in females had very little pigment)
BL44364	CG10844	Ryanodine receptor (RyR)	0	32	13	
BL41799	CG34322; CG42447; CG34321; CG42563	InaF-A; B; C; D	2	16.1	7.4	PCV bifurcation
BL19179	CG15899	Ca2+-channel protein α 1 subunit T (Ca- α 1T)	7.6	3.2	5.2	Incomplete L5, L4 bifurcation
BL13282	CG4894	Ca2+-channel protein α 1 subunit D (Ca- α 1D)	2	5	3.6	PCV bifurcation, ectopic vein
BL32776	CG4587	N/A	0	0	0	N/A
BL21983	CG6151	Flower (Few)	0	0	0	N/A
BL23636	CG7875	Transient receptor potential (trp)	0	0	0	N/A
BL60807	CG42314	plasma membrane calcium ATPase (PMCA)	0	0	0	N/A
BL25629	CG5996	Transient receptor potential cation channel γ (Trpy)	0	0	0	N/A
Sodium Channels						
BL37430	CG34405	Na channel protein 60E (NaCP60E)	81	100	90	PCV bifurcation, pigment abnormality
BL13221	CG12806	tipE homolog 1 (Teh1)	70	91	81	Black spots below L5
BL38075	CG3478	pickpocket (ppk)	42	52	47	PCV bifurcation
BL42469	CG18437	Uncoordinated 80 (unc80)	62	24	43	PCV bifurcation, ectopic vein, pigment defect
BL58557	CG13278	pickpocket 17 (ppk17)	18.1	31.3	25	PCV bifurcation, L2 bifurcation, L3 bifurcation
BL23397	CG5237	Uncoordinated 79 (Unc79)	9	36	23	PCV bifurcation
BL74	CG1517	narrow abdomen (na)	37	5	22	Bristle defects, ectopic vein
BL42372	CG15004	tipE homolog 2 (Teh2)	0	31	18	L4 & PCV bifurcation, black spots on wgs, PCV incomplete

BL20643	CG34369	pickpocket 9 (ppk9)	7.3	26.8	17	PCV bifurcation, pigment defects
BL60687	CG9907	Paralytic (Para)	10	20	15	ACV/PCV bifurcation, incomplete L5, L5 bifurcation, ectopic vein
BL25571	CG44152	pickpocket 18 (ppk18)	20.3	5.4	13.3	Bristle defects, pigment defects, ectopic vein
BL23071	CG7577	pickpocket 20 (ppk20)	0	17.7	8.5	Vein pigment defects
BL19016	CG13568	pickpocket 29 (ppk29)	11	3	7	Vein pigment defects
BL55548	CG18110	pickpocket 30 (ppk30)	13	0	7	Bristle defect, PCV bifurcation
BL33300	CG8527	pickpocket 23 (ppk23)	9	0	5	Vein pigment defects
BL33559	CG4805	pickpocket 28 (ppk28)	0	5	3	PCV incomplete
BL26701	CG9907	Paralytic (Para)	0	3	2	L5 incomplete
BL29179	CG10972	pickpocket 12 (ppk12)	0	2.9	1.1	Ectopic veins
BL44998	CG10858	pickpocket 27 (ppk27)	0	0	0	N/A
BL37590	CG12048	pickpocket 21 (ppk21)	0	0	0	N/A
BL27869	CG34059	pickpocket 16 (ppk16)	0	0	0	N/A
BL55464	CG42253	Na+-driven anion exchanger 1 (Ndae1)	0	0	0	N/A
BL25293	CG18287	pickpocket 19 (ppk19)	0	0	0	N/A
BL23781	CG34058	pickpocket 11 (ppk11)	0	0	0	N/A
Potassium Channels						
BL59167	CG9637	TWIK-related acid-sensitive K ⁺ channel 6 (Task6)	100	100	100	PCV bifurcation
BL22837	CG12348	Shaker (Sh)	21	85	54	PCV bifurcation
BL37284	CG33135	KCNQ potassium channel	20	51	29	PCV bifurcation
BL59589	CG42732	slowpoke 2 (SLO2)	6	37	23	PCV incomplete
BL15623	CG32810	insomniac (inc)	0	38	18	PCV bifurcation
BL18766	CG34366	Shaw-like (ShawI)	10.8	20.6	15.5	Bristle defect
BL59687	CG43155	N/A	6.4	13	10.4	PCV bifurcation
BL42329	CG42701	Cyclic nucleotide-gated ion channel subunit A (CngA)	0	12	6	Ectopic vein
BL21935	CG3182	Seizure (Sei)	0	6	3	Curvy PCV
BL22786	CG2822	Shaker cognate w (Shaw)	0	6	2	PCV bifurcation
BL55	CG43388	Hyperkinetic (Hk)	0	4	2	PCV bifurcation
BL19302	CG11984	Potassium channel modulatory factor 1 (Kcmf1)	3.2	0	1.6	Crumpled
BL34450	CG1615	Open rectifier K+ channel 1 (Ork1)	0	2	1	PCV bifurcation

BL24326	CG9262	Shaker cognate I (Shal)	0	0	0	N/A
BL59746	CG42340	N/A	0	0	0	N/A
BL18379	CG2121	N/A	0	0	0	N/A
BL23791	CG1688	N/A	0	0	0	N/A
BL24184	CG10952	ether a go go (eag)	0	0	0	N/A
BL55477	CG4928	N/A	0	0	0	N/A
BL12878	CG42594	N/A	0	0	0	N/A
BL41481	CG43395	Cyclic nucleotide-gated ion channel-like (Cngl)	0	0	0	N/A
BL23623	CG8585	Ih channel (Ih)	0	0	0	N/A
BL24797	CG5076	Eag-like K ⁺ channel (Elk)	0	0	0	N/A
BL23585	CG43128	Shaker cognate b (Shab)	0	0	0	N/A
BL29918	CG10693	Slowpoke (Slo)	0	0	0	N/A
BL51246	CG10706	Small conductance calcium-activated potassium channel (SK)	0	0	0	N/A
Chloride Channels						
BL1687	CG10537	Resistant to dieldrin (Rdl)	92	95	94	L2 incomplete, ectopic bristles, pigment defect
BL6879	CG6264	Bestrophin 1 (Best1)	70	100	85	PCV bifurcation
BL6353	CG7535	GluCl α	60	100	80	Bristle defects
BL27157	CG5284	Chloride channel-c (CIC-c)	48	48	48	Ectopic vein, incomplete L5
BL30596	CG7446	Glycine receptor (Grd)	15.2	23.5	19.5	PCV bifurcation, abnormal L5, ectopic vein
BL56318	CG12344	N/A	9.4	19.2	15.2	PCV & L2 bifurcation, ectopic veins, thickened veins
BL26996	CG8594	Chloride channel-b (CIC-b)	10	12	11	Incomplete PCV & L5, ACV bifurcation
BL14209	CG10997	Chloride intracellular channel (Clic)	0	11.6	6	Crumpled
BL23072	CG6938	N/A	9	0	4	PCV bifurcation, thickened veins
BL13793	CG10353	N/A	0	0	0	N/A
BL23622	CG7259	Bestrophin 4 (Best 4)	0	0	0	N/A
BL17827	CG11340	pH-sensitive chloride channel 2 (pHCl-2)	0	0	0	N/A
BL42433	CG31116	Chloride channel-a (CIC-a)	0	0	0	N/A
Ligand-gated Cation Channels						
BL56583	CG12525	Ionotropic receptor 67a (Ir67a)	80	75	77	PCV bifurcation, L3 bifurcation, thick veins

BL24880	CG32538	nicotinic Acetylcholine Receptor $\alpha 7$ (nAChR $\alpha 7$)	42	67	52	PCV bifurcation
BL37066	CG7234	Glutamate receptor IIB (GluRIIB)	31	56	44	PCV bifurcation
BL44812	CG13225	Odorant receptor 47a (Or47a)	32	51	42	PCV bifurcation
BL59216	CG4356	muscarinic Acetylcholine Receptor, A-type (mAChR-A)	21	56	38	PCV bifurcation, L4 incomplete
BL31033	CG10101	Ionotropic receptor 84a (Ir84a)	50	34	34	PCV bifurcation, thick veins
BL20783	CG4128	nicotinic Acetylcholine Receptor $\alpha 6$ (nAChR $\alpha 6$)	26	32	29	PCV bifurcation
BL41424	CG32975	nicotinic Acetylcholine Receptor $\alpha 5$ (nAChR $\alpha 5$)	15	43	26	PCV bifurcation
BL43017	CG15685	Ionotropic receptor 92a (Ir92a)	19.6	23.4	21.7	Bristle defects, abnormal vein pigment
BL25551	CG17381	Ionotropic receptor 94g (Ir94g)	29.5	8.6	20.3	Bristle defects, abnormal vein pigment
BL23130	CG10609	Odorant receptor co-receptor (Orco)	25	13	20	ectopic vein, pcv defect
BL42420	CG15325	Ionotropic receptor 7g (Ir7g)	8.5	31	18.7	PCV bifurcation
BL18860	CG8442	Glutamate receptor IA (GluRIA)	2	24	12	Incomplete PCV
BL24590	CG11775	Ionotropic receptor 85a (Ir85a)	14.2	0	7.4	Bristle defect, dark veins
BL38037	CG44240	Transient receptor potential cation channel, subfamily M (Trpm)	4	7	6	L5 incomplete, p-cv bifurcation
BL51274	CG33513	NMDA receptor 2 (Nmdar2)	8	4	6	PCV bifurcation, incomplete L5
BL17177	CG2657	Ionotropic receptor 21a (Ir21a)	2.3	4	3.2	Wing failed to expand
BL56692	CG2902	NMDA receptor 1 (Nmdar1)	0	6	3	PCV bifurcation, L5 incomplete, ectopic vein
BL30697	CG14585	Ionotropic receptor 75a (Ir75a)	3.3	0	1.6	-
BL17952	CG18039	Glutamate receptor IID (GluRIID)	0	3	1	L5 abnormality
BL35084	CG6798	nicotinic Acetylcholine Receptor $\beta 2$ (nAChR $\beta 2$)	0	0	0	N/A
BL26031	CG6185	Ionotropic receptor 68a (Ir68a)	0	0	0	N/A
BL60983	CG42297	Ionotropic receptor 94d (Ir94d)	0	0	0	N/A
BL23473	CG13195	Ionotropic receptor 48b (Ir48b)	0	0	0	N/A
BL44208	CG30468	Ionotropic receptor 52c (Ir52c)	0	0	0	N/A
BL23417	CG43743	Glutamate receptor IB (GluRIB)	0	0	0	N/A
BL51309	CG7385	Ionotropic receptor 76b (Ir76b)	0	0	0	N/A
BL27789	CG15627	Ionotropic receptor 25a (Ir25a)	0	0	0	N/A

BL29090	CG12303	Ionotropic receptor 67b (Ir67b)	0	0	0	N/A
BL24332	CG5621	Grik	0	0	0	N/A
BL18663	CG3822	Kainate-type ionotropic glutamate receptor subunit 1D (KaiR1D)	0	0	0	N/A
BL23757	CG6992	Glutamate receptor IIA (GluRIIA)	0	0	0	N/A
BL27818	CG15121	Ionotropic receptor 56b (Ir56b)	0	0	0	N/A
BL23404	CG42260	N/A	0	0	0	N/A
BL60827	CG9935	Eye-enriched kainate receptor (Ekar)	0	0	0	N/A
BL42295	CG5610	nicotinic Acetylcholine Receptor $\alpha 1$ (nAChR $\alpha 1$)	0	0	0	N/A
BL24610	CG10633	Ionotropic receptor 64a (Ir64a)	0	0	0	N/A
BL24205	CG14076	Ionotropic receptor 75d (Ir75d)	0	0	0	N/A
BL59748	CG30469	Ionotropic receptor 52b (Ir52b)	0	0	0	N/A
BL23842	CG34143	Ionotropic receptor 10a (Ir10a)	0	0	0	N/A
BL24810	CG42315	Ionotropic receptor 93a (Ir93a)	0	0	0	N/A
BL36422	CG12414	nicotinic Acetylcholine Receptor $\alpha 4$ (nAChR $\alpha 4$)	0	0	0	N/A
BL14320	CG2302	nicotinic Acetylcholine Receptor $\alpha 3$ (nAChR $\alpha 3$)	0	0	0	N/A
BL31853	CG11575	Ionotropic receptor 100a (Ir100a)	0	0	0	N/A
Other						
BL59187	CG18549	N/A	69	97	83	PCV bifurcation
BL26124	CG5685	Na/Ca-exchange protein (Calx)	8.5	6	7.4	Black spots on wing
BL24524	CG34358	shaking B (ShakB)	0	5	3	PCV bifurcation
BL1595	CG4722	Big brain (bib)	0	2	1	Incomplete L5
BL29134	CG18345	transient receptor potential-like (trpl)	0	0	0	N/A
BL23470	CG44122	Piezo	0	0	0	N/A
BL43356	CG6647	Porin	0	0	0	N/A