Gene List for *Cucurbita* species, 2014

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The genus *Cucurbita* L. contains 12 or 13 species (56). As far as is known, all have a complement of 20 pairs of chromosomes (2n = 40) (111).

This gene list for *Cucurbita* contains detailed sources of information, being modeled after the one for cucumber presented by Wehner and Staub (109) and its update by Xie and Wehner (115). In order to more easily allow confirmation of previous work and as a basis for further work, information has been included concerning the genetic background of the parents that had been used for crossing. Thus, in addition to the species involved, the cultivar-group for *C. pepo* L. (60), market type for *C. maxima* Duchesne and *C. moschata* Duchesne (26), and/or cultivar name are included in the description wherever possible.

The names and symbols of the genes, together with a concise description of their phenotypic effects, are listed alphabetically below. The data upon which are based identifications and concomitant assignment of gene symbols vary considerably in their content. No attempt is made here to assess the certainty of identifications, but gene symbols have been accepted or assigned only for cases in which at least some data are presented. Approximately 70 genes have been identified for *C. pepo*, 30 for *C. moschata*, and 19 for *C. maxima*. For the interspecific cross of *C. maxima* × *C. ecuadorensis* Cutler & Whitaker, 29 genes have been identified, of which 25 are isozyme variants (77). A few genes have also been identified in four of the wild species (*C. okeechobeensis* (Small) Bailey, *C. lundelliana* Bailey, *C. foetidissima* HBK and *C. ecuadorensis*) and in several other interspecific crosses.

Some genes are listed as occurring in more than one species. This does not necessarily indicate that these genes reside at identical locations in the genome of different species.

There are several new additions to the most recent list of *Cucurbita* genes (77), some of which require a modification of the gene symbols assigned to previously identified genes. Newly identified genes that have been published since the last update are: *mf* (*multiple flowering*), *Prv-2* (*Papaya ringspot resistance-2*, complementary to *prv-1*), W^S (*Weak fruit and stem color*), *slc-2* (*squash leaf curl* resistance-*2*), *td* (*tendrilless* plants), *ys* (*yellow seedling* in *C. moschata*), *Zym-4* (*Zucchini yellow mosaic* resistance-*4*), and *zym-5* (*zucchini yellow mosaic* resistance-*5*, complementary to *Zym-4*). The symbol *zym-6* (*zucchini yellow mosaic* resistance-*6*) replaces zym^{mos} and the symbol *m-zym-6* replaces $m\text{-}zym^{mos}$. The symbol *Prv-2* is herein assigned for the first time. Before choosing a gene name and symbol, researchers are urged to consult this Gene

List as well as the rules of Gene Nomenclature for the Cucurbitaceae that appears near the end of this Cucurbit Genetics Cooperative Report in order to avoid confusion arising from duplication of gene names and symbols. Please contact us if you find omissions or errors in this Gene List.

Several cases of genetic linkage have been reported: *D – mo-2* (65) and *M – Wt* (*C. pepo*) (80) and *Bi – Lo-2* (*C. ecuadorensis* × *C. maxima*) (33). Some of the isozyme variants observed by Weeden & Robinson (106) and Weeden et al. (107) were also found to be linked to one another. A list of the isozyme variants is found in the Gene List for *Cucurbita* species, 2009 (77).

Gene mapping in *Cucurbita* is not as far advanced as in *Cucumis* and *Citrullus*. The number of DNA markers has increased greatly in recent years and the list is too long to be included here. A map based on morphological and random amplified polymorphic DNA (RAPD) markers was constructed by Brown and Myers (7). Maps for *C. pepo* based on morphological, RAPD, AFLP (amplified fragment length polymorphism), and a few SSR markers were presented by Zraidi and Lelley (117) and Zraidi et al. (119). Gong et al. (27, 28), using many more SSRs, observed a high degree of macrosynteny between *C. pepo* and *C. moschata*. The SSR markers had conserved orders in the two species, representing orthologous loci. More recently, a single-nucleotide-polymorphism (SNP) based map for *C. pepo* that included several putative quantitative-trait loci related to vegetative and reproductive traits was constructed by Blanca et al. (4) for *C. pepo*.

Sequenced genes were included in the previous list (77). They can be valuable to breeders and geneticists, as the differences in the gene sequences that result in the phenotypes of interest can be used in marker-assisted selection. Unlike random markers, these gene-specific, allele-specific markers are completely linked to the genes of interest. Most of the genes sequenced in *Cucurbita* have been isolated by researchers doing comparative studies of specific genes across plant families; usually only a single allele is available. Their numbers increase steadily and are now too large to be included here.

List of genes in Cucurbita *with brief descriptions of their phenotypic effects*

Gene Symbol				
Preferred	Synonym	**Character**	**Species**	**Reference(s)**
a		*androecious*. Found in 'Greckie'; produces only male flowers, recessive to *A*.	*pepo*	39
ae		*androecy enhancer*. From cross between two vegetable-marrow cultivars, the strongly male 'Vegetable Spaghetti', *ae/ae* , and 'Bolognese', *Ae/Ae*.	*pepo*	49
B		*Bicolor*. Precocious yellow fruit pigmentation; pleiotropic, affecting fruit and foliage, modified by *Ep-1*, *Ep-2* and *Ses-B*. Originally from 'Vaughn's Pear Shaped' ornamental gourd. *B* in *C. moschata* 'Precocious PI 165561' derived from *C. pepo* through backcrossing. Complementary to *L-2* for intense orange, instead of light yellow, fruit-flesh color.	*pepo, moschata*	61, 78, 89, 96, 98, 101
B^{max}	*B-2*	*Bicolor*. Precocious yellow fruit pigmentation, from subsp. *andreana* PI 165558	*maxima*	97, 100
Bi^{max}	*Bi*	*Bitter* fruit. High cucurbitacin content in fruit. *Bi* from *C. maxima* subsp. *andreana* and *C. ecuadorensis*; *bi* from *C. maxima* subsp. *maxima*, including 'Queensland Blue'. Linked to *Lo-2*.	*maxima, maxima × ecuadorensis*	14, 33
Bi-0	*Bi*	*Bi-0* from wild Texan gourd; *bi-0* from zucchini squash. Might be identical with either *Bi-1* or *Bi-2*.	*pepo*	31
Bi-1		In cross of *C. pepo* × *C. argyrosperma*, three complementary dominant alleles are needed for bitterness. *Bi-1* from *C. pepo* straightneck 'Goldbar', *bi-1* from *C. argyrosperma* 'Green Striped Cushaw'.	*pepo* × *argyrosperma*	5
Bi-2		In cross of *C. pepo* × *C. argyrosperma*, three complementary dominant alleles are needed for bitterness. *Bi-2* from *C. pepo* straightneck 'Goldbar', *bi-2* from *C. argyrosperma* 'Green Striped Cushaw'.	*pepo* × *argyrosperma*	5
Bi-3		In cross of *C. pepo* × *C. argyrosperma*, three complementary dominant alleles are needed for bitterness. *Bi-3* from *C. argyrosperma* 'Green Striped Cushaw', *bi-3* from *C. pepo* straightneck 'Goldbar'.	*pepo* × *argyrosperma*	5
bl		*blue* fruit color. Incompletely recessive to *Bl* for green fruit color, in hubbard squash.	*maxima*	34
Bn		*Butternut fruit shape*, from 'New Hampshire Butternut', dominant to *bn* for crookneck fruit shape, as in 'Canada Crookneck'.	*moschata*	54
Bu	*D*	*Bush* habit. Short internodes; dominant to vine habit, *bu*, in young plant stage. In *C. pepo*, *Bu* in 'Giant Yellow Straightneck' and near-isogenic line of 'Table Queen', *bu* in 'Table Queen' acorn. Also, *Bu* and *bu* in ornamental pumpkins. In *C. maxima*, *Bu* from inbred line, *bu* from 'Delicious'. In *C. moschata*, *Bu* from inbred line, *bu* from undisclosed parent.	*pepo, maxima, moschata*	17, 32, 95, 112
Cmv		*Cucumber mosaic virus resistance*, from Nigerian	*moschata*	6

		Local. Dominant to *cmv* for susceptibility, from 'Waltham Butternut'.		
cr		*cream* corolla. Cream to nearly white petals, *cr* from *C. okeechobeensis*; *Cr* from *C. moschata* 'Butternut' incompletely dominant (yellow petals for *Cr/cr*, and orange for *Cr/Cr*)	*moschata* × *okeechobeensis*	86
Crr-1		*Crown rot* resistance. Resistance to *Phytophthora capsici*, introgressed from *C. lundelliana* and *C. okeechobeensis* subsp. *okeechobeensis* into a breeding line of *C. moschata*. One of three complementary dominant genes for resistance. Genotype of the susceptible *C. moschata* 'Butterbush' is *crr-1/crr-1*.	*moschata*	59
Crr-2		*Crown rot* resistance. Resistance to *Phytophthora capsici*, introgressed from *C. lundelliana* and *C. okeechobeensis* subsp. *okeechobeensis* into a breeding line of *C. moschata*, One of three complementary dominant genes for resistance. Genotype of the susceptible *C. moschata* 'Butterbush' is *crr-2/crr-2*.	*moschata*	59
Crr-3		*Crown rot* resistance. Resistance to *Phytophthora capsici*, introgressed from *C. lundelliana* and *C. okeechobeensis* subsp. *okeechobeensis* into a breeding line of *C. moschata*. One of three complementary dominant genes for resistance. Genotype of the susceptible *C. moschata* 'Butterbush' is *crr-3/crr-3*.	*moschata*	59
cu		*cucurbitacin*-B reduced; *cu* for reduced cucurbitacin-B content of cotyledons of 'Early Golden Bush Scallop'; *Cu* for high cucurbitacin content of cotyledons of 'Black Zucchini'.	*pepo*	94
D		*Dark* stem. Series of three alleles observed in *C. pepo*: *D* for dark stem and dark intermediate-age fruit, D^s for dark stem but fruit not affected, and *d* for light stem and fruit not affected, with dominance $D > D^s > d$. *D* from 'Fordhook Zucchini', D^s from 'Early Prolific Straightneck'; *d* from 'Vegetable Spaghetti'. Darkens the fruit surface over the carpellary tracts more than the rest of the fruit surface. Epistatic to genes *l-1* and *l-2* when either is homozygous recessive; linked to *mo-2*; hypostatic to W^S. In *C. maxima*, only the fruit was observed: *D* for dark intermediate-age fruit from the zapallito 'La Germinadora'; *d* for light intermediate-age fruit from a variant zapallito breeding stock.	*pepo, maxima*	25, 42, 45, 46, 64, 65, 68, 76, 81, 91
de		*determinate* plant habit; stem lacking tendrils and terminating with female flowers. Recessive to *De* for indeterminate plant habit. *De* from 'Jeju' and 'Sokuk', *de* from inbred designated "Det".	*moschata*	40
Di		*Disc* fruit shape. From scallop squash, dominant to spherical or pyriform.	*pepo*	102, 110
Ep-1		*Extender of pigmentation-1*; modifier of *B*. *Ep-1* incompletely dominant to *ep-1* and additive with *Ep-2*. *Ep-1* from 'Small Sugar 7 × 7' pumpkin; *ep-1* from 'Table King' acorn.	*pepo*	101

Ep-2		*Extender of pigmentation-2*; modifier of *B*. *Ep-2* incompletely dominant to *ep-2* and additive with *Ep-1*. *Ep-2* from 'Table King' acorn; *ep-2* from 'Small Sugar 7 × 7' pumpkin.	*pepo*	101
Fr		*Fruit fly* (*Dacus cucurbitae*) resistance. *Fr* from 'Arka Suryamukhi', dominant to *fr* for susceptibility.	*maxima*	55
fv		*fused vein.* Fusion of primary leaf veins, subvital male gametophyte; found in hull-less-seeded pumpkin breeding line.	*pepo*	10, 11
G	*a, m*	*Gynoecious* sex expression; dominant to *g* for monoecious sex expression.	*foetidissima*	18, 23
Gb		*Green band* on inner side of base of petal, from a scallop squash; dominant to *gb*, for no band, from a straightneck squash.	*pepo*	19
gc		*green corolla*. Green, leaf-like petals, sterile; in unspecified F2 population.	*pepo*	104
gl-1	*gl*	*glabrous*, lacking trichomes	*maxima*	37
gl-2		*glabrous*, lacking trichomes; *gl-2* mutant found in straightneck squash	*pepo*	114
Gr	*G*	*Green rind.* Dominant to buff skin of mature fruit. *Gr* from 'Long Neapolitan', *gr* from 'Butternut'.	*moschata*	84
grl		*gray leaf*. Recessive to green leaf. Recessive *grl* derived from cross of zapallito-type line of *C. maxima* and a butternut-type line of *C. moschata*. Dominant *Grl* from zapallito-type *C. maxima*.	*maxima* × *moschata*	41
Hi		*Hard rind inhibitor*. *Hi*, for hard-rind inhibition, from *C. maxima* 'Queensland Blue'; *hi*, for no hard-rind inhibition, from *C. ecuadorensis*.	*maxima* × *ecuadorensis*	33
Hr		*Hard rind. Hr* for hard (lignified) rind in ornamental gourd, straightneck squash, and zucchini; *hr* for soft (non-lignified) rind in 'Small Sugar' pumpkin and 'Sweet Potato' ('Delicata'). Complementary to *Wt* for *Warty* fruit. Also, *Hr* in *C. argyrosperma* subsp. *sororia*, *hr* in *C. moschata*.	*pepo, argyrosperma* × *moschata*	48, 90, 108
i		*intensifier* of the *cr* gene for cream flowers. *Cr/— I/—* for intense orange or yellow flowers, *Cr/— i/i* for light orange or yellow flowers, *cr/cr I/—* for cream flowers, *cr/cr i/i* for white flowers. *I* from *C. moschata* 'Butternut', *i* from *C. okeechobeensis*.	*moschata* × *okeechobeensis*	86
I-mc	I_{mc}	*Inhibitor* of *mature* fruit color; dominant to *i-mc* for no inhibition. *I-mc* in a scallop squash.	*pepo*	12
I-T		*Inhibitor* of the *T* gene for trifluralin resistance. *I-T* from 'La Primera'; *i-t* from 'Ponca' and 'Waltham Butternut'.	*moschata*	1
l-1	*c, St*	*light fruit coloration-1*. Light intensity of fruit coloration. Series of five alleles observed in *C. pepo* which, in complementary interaction with the dominant *L-2* allele, give the following results: *L-1* for uniformly intense/dark fruit coloration, from 'Fordhook Zucchini'; $l\text{-}1^{BSt}$ for broad, contiguous intense/dark stripes, from 'Cocozelle'; $l\text{-}1^{St}$ for narrow, broken intense/dark stripes, from 'Caserta';	*pepo, maxima*	3, 25, 42, 45, 46, 66, 71, 73, 76, 87, 96

		$l\text{-}1^{iSt}$ for irregular intense/dark stripes, from 'Beirut' vegetable marrow; *l-1* for light coloration, from 'Vegetable Spaghetti', with dominance of $L\text{-}1 > (l\text{-}1^{BSt} > l\text{-}1^{St}) \geq l\text{-}1^{iSt} > l\text{-}1$. In *C. maxima*, *L-1* from the zapallito 'La Germinadora'; *l-1* from a variant zapallito breeding stock.		
l-2	*r*	*light fruit coloration-2*. Light intensity of fruit coloration. Series of four alleles observed in *C. pepo*, which, in complementary interaction with dominant alleles at the *l-1* locus, give the following results: *L-2* for intense/dark fruit coloration, with *L-1* from 'Fordhook Zucchini' and intense/dark fruit stripes, with $l\text{-}1^{BSt}$ from 'Cocozelle'; allele $L\text{-}2^{w}$ has delayed and weaker effect than *L-2*, from *C. pepo* subsp. *fraterna*; *l-2* for light coloration, from 'Vegetable Spaghetti'. *L-2* is dominant to $L\text{-}2^{w}$ and *l-2*; $L\text{-}2^{w}$ is dominant to *l-2*. Allele $l\text{-}2^{R}$ confers reversal of color, that is, stripes lighter than the background in combination with any of the striping alleles at the *l-1* locus, or completely light fruit in the presence of *L-1*, from *C. pepo* subsp. *texana* 'Delicata'.Dominant *L-2* is also complementary with *B* for intense orange, instead of light yellow, fruit-flesh color and with recessive *qi* for intense exterior color of young fruit. In *C. maxima*, *L-2* from the zapallito 'La Germinadora'; *l-2* from a variant zapallito breeding stock.	*pepo, maxima*	3, 25, 42, 45, 46, 61, 67, 69, 72, 73, 76
lo-1	*l*	*lobed leaves-1*; recessive to *Lo-1* for non-lobed leaves	*maxima*	20
Lo-2		*Lobed leaves-2*. *Lo-2* for lobed leaves in *C. ecuadorensis* dominant to *lo-2* for unlobed leaves in *C. maxima*. Linked to *Bi*.	*ecuadorensis* × *maxima*	33
lt		*leafy tendril.* Tendrils with laminae; *lt* found in ornamental gourd.	*pepo*	88
ly		*light yellow corolla*. Recessive to orange yellow; *ly* found in ornamental gourd.	*pepo*	88
M		*Mottled* leaves. *M* for silver-gray areas in axils of leaf veins, dominant to *m* for absence of silver-gray. For *C. maxima*, *M* in 'Zuni' and *m* in 'Buttercup' and 'Golden Hubbard'. For *C. pepo*, *M* in 'Caserta' and inbred of 'Striato d'Italia' cocozelle; *m* in 'Early Prolific Straightneck' and 'Early Yellow Crookneck'. For *C. moschata*, *M* in 'Hercules' and 'Golden Cushaw', *m* in butternut type. Weakly linked to *Wt*.	*pepo, maxima, moschata*	16, 70, 87, 92
mf		*multiple flowering.* Differentiation of more than one flower bud at a leaf axil, in near-isogenic line of the 'True French' zucchini. Recessive to *Mf* for a single flower bud at each leaf axil, in 'True French'.	*pepo*	75
Mldg		*Mottled light* and *dark green* immature fruit color; germplasm unspecified. Dominant to *mldg* for non-mottled.	*moschata*	8
mo-1		*mature orange-1*; complementary recessive gene for loss of green fruit color prior to maturity. *Mo-1* from 'Table Queen' acorn; *mo-1* from 'Vegetable	*pepo*	65

		Spaghetti'.		
mo-2		*mature orange-2*; complementary recessive gene for loss of green fruit color prior to maturity. *Mo-2* from 'Table Queen' acorn; *mo-2* from 'Vegetable Spaghetti'. Linked to *D*.	*pepo*	65
ms-1	ms_1	*male sterile-1*. Male flowers abort before anthesis, derived from a cross involving 'Golden Hubbard', recessive to *Ms-1* for male fertile.	*maxima*	93
ms-2	ms_2	*male sterile-2*. Male flowers abort, sterility expressed as androecium shrivelling and turning brown; *ms-2* from 'Eskandarany' (PI 228241).	*pepo*	22
ms-3	*ms-2*	*male sterile-3*.	*maxima*	37
m-zym-6 *	$m\text{-}zym^{mos}$	*modifier* of dominance of *zucchini yellow mosaic* virus resistance; confers resistance to otherwise susceptible *Zym-6/zym-6* heterozygotes. *M-zym-6* in 'Soler', *m-zym-6* in 'Waltham Butternut' and 'Nigerian Local'.	*moschata*	57
n	*h*	*naked* seeds. Lacking a lignified seed coat, *n* from oil-seed pumpkin.	*pepo, moschata*	30, 91, 113, 118, 119
pl		*plain light* fruit color, *pl* from 'Beirut' vegetable marrow and 'Fordhook Zucchini'; *Pl* in 'Vegetable Spaghetti'.	*pepo*	62
Pm		*Powdery mildew* resistance. Resistance to *Podosphaera xanthii*; *Pm* from *C. lundelliana*.	*lundelliana*	83
Pm-0		*Powdery mildew resistance*. Resistance to *Podosphaera xanthii*; *Pm-0* from *C. okeechobeensis* and in *C. pepo*.	*okeechobeensis, pepo*	13, 15, 36
pm-1		*powdery mildew* resistance in *C. moschata*. Series of three alleles: $pm\text{-}1^P$ for susceptibility from 'Ponca' dominant to $pm\text{-}1^L$ for resistance from 'La Primera', which is dominant to $pm\text{-}1^W$ for susceptibility in 'Waltham Butternut'.	*moschata*	2
pm-2		*powdery mildew* resistance in *C. moschata* 'Seminole', recessive to *Pm-2* for susceptibility	*moschata*	2
prv-1 *	*prv*	*papaya ringspot virus resistance*, in Nigerian Local, recessive to *Prv* for susceptibility, in 'Waltham Butternut'.	*moschata*	6
Prv-2 *		*Papaya ringspot virus resistance*, in Nigerian Local, dominant to *prv* for susceptibility in 'Waltham Butternut' and tropical pumpkins 'Soler', 'Taina Dorada', and 'Verde Luz'. Complementary to *prv-1*, high resistance is expressed only in plants of *prv-1/prv-1, Prv-2/*— genotype.	*moschata*	51
qi		*quiescent intense*. Recessive to *Qi* for not intense and complementary to *L-2* for intense young fruit color; little or no effect on mature fruit. *Qi* from 'Vegetable Spaghetti'; *qi* from 'Jack O'Lantern' pumpkin and 'Verte non-coureuse d'Italie' cocozelle.	*pepo*	67, 70
Rd		*Red* skin. Red external fruit color; dominant to green, white, yellow and gray. *Rd* from 'Turk's Cap'; *rd* from 'Warted Hubbard'.	*maxima*	44
ro		*rosette* leaf. Lower lobes of leaves slightly spiraled, *ro* derived from an ornamental gourd.	*pepo*	48

s-1	*s*	*sterile.* Male flowers small, without pollen; female flower sterile. Derived from crossing 'Greengold' with 'Banana'.	*maxima*	35
s-2		*sterile.* Male flowers small, without pollen and female flower sterile; mutant in powdery mildew resistant, straightneck squash breeding line.	*pepo*	9
Ses-B		*Selective suppression* of gene *B*. Suppression in foliage of precocious yellowing conferred by *B*. *Ses-B* in straightneck breeding line dominant to *ses-B* in 'Jersey Golden Acorn'.	*pepo*	99
sl		*silverleaf* resistance. Recessive to *Sl* for susceptibility. In *C. moschata*, *Sl* from 'Soler'; *sl* from PI 162889 and butternut types. In *C. pepo*, *Sl* from 'Black Beauty' zucchini and *sl* from Zuc76 breeding line.	*moschata, pepo*	29, 116
Slc-1 *	*Slc*	*Squash leaf curl* virus resistance; derived from *C. moschata*. Dominant to the *slc-1* allele for susceptiblity.	*pepo*	52
slc-2		*Squash leaf curl* virus resistance; derived from *C. moschata*. Recessive to the *Slc-2* allele for susceptibility.	*pepo*	105
sp		*spaghetti* flesh, breaking into strands after cooking	*pepo*	50
T		*Trifluralin* resistance. Dominant to susceptibility to the herbicide; modified by *I-T*. *T* in 'La Primera'; *t* in 'Ponca' and 'Waltham Butternut'.	*moschata*	1
td		*tendrilless* plants; mutant in an ornamental pumpkin. Recessive to the *Td* allele for normal, tendril-bearing plants.	*pepo*	47
uml		*umbrella-like*; leaves shaped like partially opened umbrella. Recessive *uml* derived from a cross of *C. maxima* 'Warzywna' and a *C. pepo* inbred; dominant *Uml* from 'Warzywna'.	*maxima* × *pepo*	82
v		*virescent.* Yellow-green young leaves, *v* found in 'Golden Delicious'.	*maxima*	21
W		*Weak* fruit coloration. Dominant to *w* for intense-pigmented mature fruit, recessive to W^S for weak coloration of fruit and stem; *W* and W^S from scallop squash. Complementary to *Wf* for white external fruit color; W^S is epistatic to *D*.	*pepo*	63, 81, 96, 102
wc		*white corolla*. Derived from 'Ispanskaya' × 'Emerald'. Recessive to *Wc* for normal orange-yellow corolla	*maxima*	38
Wf		*White flesh.* Dominant to *wf* for colored flesh. *Wf* in a scallop squash, *wf* in a straightneck squash. Complementary to *W* for white external fruit color.	*pepo*	19, 45, 63, 102
Wmv		*Watermelon mosaic virus resistance*. From "Menina" and "Nigerian Local", dominant to *wmv* for susceptibility in 'Musquée de Provence' and 'Waltham Butternut'. May be linked with or identical to *Zym-1*.	*moschata*	6, 24
Wmv^{ecu}		*Watermelon mosaic virus* resistance. From *C. ecuadorensis*, in a cross with an unspecified *C. maxima*.	*maxima* × *ecuadorensis*	107
Wt		*Warty* fruit. Dominant to non-warted, *wt*, and	*pepo*	70, 90, 102

		complementary to *Hr*, with fruit wartiness being expressed only in the presence of the dominant *Hr* allele. *Wt* in straightneck, crookneck, and 'Delicata'; *wt* in zucchini, cocozelle, and 'Small Sugar' pumpkin. Weakly linked to *M*.		
wyc		*white-yellow corolla*; isolated in 'Riesen-Melonen'. Recessive to *Wyc* for normal orange-yellow corolla.	*maxima*	38
Y		*Yellow* fruit color. *Y* for yellow fruit color of intermediate-age fruits, from straightneck and crookneck squash, dominant to *y* for green intermediate-age fruit color, from vegetable marrow, ornamental gourd, and cocozelle.	*pepo*	80, 87, 95, 96, 102
yg		*yellow-green* leaves and stems	*maxima*	37
Ygp		*Yellow-green placenta*. Dominant to yellow placental color. *Ygp* in a scallop squash, *ygp* in a straightneck squash.	*pepo*	19
ys		*yellow seedling*. Lacking chlorophyll; lethal. In *C. maxima* 'Zapallito Redondo' and *C. moschata* 'Futtu'.	*pepo*, *maxima*, *moschata*	43, 48, 103
zym^{ecu}		*zucchini yellow mosaic* virus resistance, recessive to susceptibility; zym^{ecu} from *C. ecuadorensis*, Zym^{ecu} from *C. maxima* 'Buttercup'.	*ecuadorensis*	85
Zym-0		*Zucchini yellow mosaic* virus resistance. *Zym-0* from *C. moschata* 'Nigerian Local' dominant to *zym-0* for susceptibility from 'Waltham Butternut'. Perhaps one of two separate genes for resistance in 'Nigerian Local'.	*moschata*	6, 53, 57, 58
Zym-1		*Zucchini yellow mosaic* virus resistance. *Zym-1* from *C. moschata* 'Menina' dominant to *zym-1* for susceptibility from *C. moschata* 'Waltham Butternut'. *Zym-1* transferred via backcrossing to *C. pepo* 'True French' zucchini, in which it confers resistance through complementary interaction with *Zym-2* and *Zym-3*. *Zym-1* is either linked with *Wmv* or also confers resistance to watermelon mosaic virus.	*moschata, pepo*	24, 57, 58, 74, 79
Zym-2		*Zucchini yellow mosaic* virus resistance-*2*. Dominant to susceptibility and complementary to *Zym-1*. *Zym-2* from *C. moschata* 'Menina'. *Zym-2* in *C. pepo* derived from *C. moschata*, in near-isogenic resistant line of 'True French' zucchini; *zym-2* from *C. pepo* 'True French'.	*moschata, pepo*	74
Zym-3		*Zucchini yellow mosaic* virus resistance-*3*. Dominant to susceptibility and complementary to *Zym-1*. *Zym-3* from *C. moschata* 'Menina'. *Zym-3* in *C. pepo* derived from *C. moschata*, in near-isogenic resistant line of 'True French' zucchini; *zym-3* from *C. pepo* 'True French'.	*moschata, pepo*	74
Zym-4		*Zucchini yellow mosaic* virus resistance, dominant to susceptibility. Complementary to *zym-5*, resistance expressed only in *Zym-4/— zym-5/zym-5* genotypes. *Zym-4* from 'Nigerian Local, *zym-4* from 'Waltham Butternut'.	*moschata*	58
zym-5		*Zucchini yellow mosaic* virus resistance, recessive to susceptibility. Complementary to *Zym-4*, resistance	*moschata*	58

		expressed only in the presence of the *Zym-4* allele. *Zym-5* from 'Nigerian Local', *zym-5* from 'Waltham Butternut'.		
zym-6	zym^{mos}	*zucchini yellow mosaic* virus resistance, recessive to susceptibility; *zym-6* from 'Soler', *Zym-6* from 'Waltham Butternut'.	*moschata*	57, 58

*Proposed new gene symbol.

Literature Cited

1. Adeniji, A.A. and D.P. Coyne. 1981. Inheritance of resistance to trifluralin toxicity in *Cucurbita moschata* Poir. HortScience 16: 774–775.
2. Adeniji, A.A. and D.P. Coyne. 1983. Genetics and nature of resistance to powdery mildew in crosses of butternut with calabaza squash and 'Seminole Pumpkin'. J. Amer. Soc. Hort. Sci. 108: 360–368.
3. Biebel, N. and M. Mazourek. 2012–2013. Inheritance of rind color and reverse striping in a *Cucurbita pepo* (subsp. *texana*) cross. Cucurbit Genet. Coop. Rep. 35 –36: 16–17.
4. Blanca, J., J. Cañizares, C. Roig, P. Ziarsolo, F. Nuez, and B. Pico. 2011. Transcriptome characterization and high throughput SSRs and SNPs discovery in *Cucurbita pepo* (Cucurbitaceae). BMC Genomics 12: 104.
5. Borchers, E.A. and R.T. Taylor. 1988. Inheritance of fruit bitterness in a cross of *Cucurbita mixta* × *C. pepo*. HortScience 23: 603–604.
6. Brown, R.N., A. Bolanos-Herrera, J.R. Myers, and M.M. Jahn. 2003. Inheritance of resistance to four cucurbit viruses in *Cucurbita moschata*. Euphytica 129: 253–258.
7. Brown, R.N. and J.R. Myers. 2002. A genetic map of squash (*Cucurbita* sp.) with randomly amplified polymorphic DNA markers and morphological markers. J. Amer. Soc. Hort. Sci. 127: 568–575.
8. Cardosa, A.I.I., P.T. Della Vecchia, and N. Silva. 1993. Inheritance of immature fruit color in *C. moschata*. Cucurbit Genet. Coop. Rep. 16: 68–69.
9. Carle, R.B. 1997. Bisex sterility governed by a single recessive gene in *Cucurbita pepo*. Cucurbit Genet. Coop. Rep. 20: 46–47.
10. Carle, R.B. and J.B. Loy. 1996. Genetic analysis of the fused vein trait in *Cucurbita pepo* L. J. Amer. Soc. Hort. Sci. 121: 13–17.
11. Carle, R.B. and J.B. Loy. 1996. Fused vein trait in *Cucurbita pepo* L. associated with subvitality of the male gametophyte. J. Amer. Soc. Hort. Sci. 121: 18–22.
12. Clayberg, C.D. 1992. Reinterpretation of fruit color inheritance in *Cucurbita pepo* L. Cucurbit Genet. Coop. Rep. 15: 90–92.
13. Cohen, R., A. Hanan, and H.S. Paris. 2003. Single-gene resistance to powdery mildew in zucchini squash (*Cucurbita pepo*). Euphytica 130: 433–441.
14. Contardi, H.G. 1939. Estudios geneticos en *Cucurbita* y consideraciones agronomicas. Physis 18: 331–347.
15. Contin, M. 1978. Interspecific transfer of powdery mildew resistance in the genus *Cucurbita*. Ph.D. Thesis, Cornell Univ., Ithaca, New York.
16. Coyne, D.P. 1970. Inheritance of mottle-leaf in *Cucurbita moschata* Poir. HortScience 5: 226–227.
17. Denna, D.W. and H.M. Munger. 1963. Morphology of the bush and vine habits and the allelism of the bush genes in *Cucurbita maxima* and *C. pepo* squash. Proc. Amer. Soc. Hort. Sci. 82: 370–377.
18. Dossey, B.F., W.P. Bemis, and J.C. Scheerens. 1981. Genetic control of gynoecy in the buffalo gourd. J. Hered. 72: 355–356.
19. Dutta, L.P. and P. Nath. 1972. Inheritance of flower and fruit characters in squash, *Cucurbita pepo* L. 3rd Intl. Symp. Sub-Trop. Trop. Hort., pp. 69–74.
20. Dyutin, K.E. 1980. Spontaneous mutant of *Cucurbita maxima* Duch. squash with lobed leaves. Genetika 16: 176–178 (Russian).
21. Dyutin, K.E. and E.A. Afanas'eva. 1981. Inheritance of the yellow-green color of young leaves of the squash *Cucurbita maxima* Duch. Tsitologiya i Genetika 15(5): 81–82 (Russian).
22. Eisa, H.M. and H.M. Munger. 1968. Male sterility in *Cucurbita pepo*. Proc. Amer. Soc. Hort. Sci. 92: 473–479.
23. Fulks, B.K., J.C. Scheerens, and W.P. Bemis. 1979. Sex expression in *Cucurbita foetidissima* HBK. Cucurbit Genet. Coop. Rep. 2: 36.

24. Gilbert-Albertini, F., H. Lecoq, M. Pitrat, and J.L. Nicolet. 1993. Resistance of *Cucurbita moschata* to watermelon mosaic virus type 2 and its genetic relation to resistance to zucchini yellow mosaic virus. Euphytica 69: 231–237.
25. Globerson, D. 1969. The inheritance of white fruit and stem color in summer squash, *Cucurbita pepo* L. Euphytica 18: 249–255.
26. Goldman, A. 2004. The compleat squash. Artisan, New York.
27. Gong, L., G. Stift, R. Kofler, M. Pachner and T. Lelley. 2008. Microsatellites for the genus *Cucurbita* andan SSR-based genetic linkage map of *Cucurbita pepo* L. Theor. Appl. Genet. 117: 37–48.
28. Gong, L., M. Pachner, K. Kalai, and T. Lelley. 2008. SSR-based genetic linkage map of *Cucurbita moschata* and its synteny with *Cucurbita pepo*. Genome 51: 878–887.
29. Gonzalez-Roman, M. and L. Wessel-Beaver. 2002. Resistance to silverleaf disorder is controlled by a single recessive gene in *Cucurbita moschata* Duchesne. Cucurbit Genet. Coop. Rep. 25: 49–50.
30. Grebenščikov, I. 1954. Zur Vererbung der Dünnschaligkeit bei *Cucurbita pepo* L. Züchter 24: 162–166.
31. Grebenščikov, I. 1955. Notulae cucurbitologicae II. Über *Cucurbita texana* A. Gr. und ihre Kreuzung mit einer hochgezüchteten *C. pepo*-Form. Kulturpflanze 3: 50–59.
32. Grebenščikov, I. 1958. Notulae cucurbitologicae III. Kulturpflanze 6: 38–60.
33. Herrington, M.E. and J.P. Brown. 1988. Inheritance of leaf and fruit characteristics in *Cucurbita maxima* Duch. cv. Queensland Blue × *C. ecuadorensis* Cutler and Whitaker. Queensl. J. Agr. Anim. Sci. 45: 45–48.
34. Hutchins, A.E. 1935. The interaction of blue and green color factors in hubbard squash. Proc. Amer. Soc. Hort. Sci. 33: 514.
35. Hutchins, A.E. 1944. A male and female sterile variant in squash, *Cucurbita maxima* Duch. Proc. Amer. Soc. Hort. Sci. 44: 494–496.
36. Jahn, M., H.M. Munger, and J.D. McCreight. 2002. Breeding cucurbit crops for powdery mildew resistance. In: R.R. Bélanger, W.R. Bushnell, A.J. Dik, and T.L.W. Carver, Eds., The powdery mildews, a comprehensive treatise, pp. 239–248. American Phytopathological Society, St. Paul, MN.
37. Korzeniewska, A. 1992. New genes in *Cucurbita maxima* Duch. In: R.W. Doruchowski, E. Kozik, and K. Niemirowicz-Szczytt, eds. Proc. Cucurbitaceae '92: the 5th Eucarpia Meeting on Cucurbit Genetics & Breeding, pp. 75–78.
38. Korzeniewska, A. 1996. Two independent loci for white and white-yellow corolla in *Cucurbita maxima* Duch. In: M.L. Gomez-Guillamon, C. Soria, J. Cuartero, J. Tores, and R. Fernandez-Munoz, eds. Proc. Cucurbitaceae Towards 2000: The 6th Eucarpia Meeting on Cucurbit Genetics & Breeding. Graficas Axarquia, Velez-Malaga, Spain, pp. 78–81.
39. Kubicki, B. 1970. Androecious strains of *Cucurbita pepo* L. Genet. Polon. 11: 45–51.
40. Kwack, S.N. 1995. Inheritance of determinate growth habit in *Cucurbita moschata* Poir. J. Kor. Soc. Hort. Sci. 36: 780–784.
41. Lopez-Anido, F., E. Cointry, I. Firpo, S.M. Garcia, and S. Gattuso. 2002. Inheritance of gray leaf color in a material derived from a *Cucurbita maxima* Duch. × *C. moschata* Duch. hybrid. Cucurbit Genet. Coop. Rep. 25: 46–48.
42. Lopez-Anido, F., V. Cravero, P. Asprelli, E. Cointry, I. Firpo, and S.M. Garcia. 2003. Inheritance of immature fruit color in *Cucurbita maxima* var. Zapallito (Carrière) Millan. Cucurbit Genet. Coop. Rep. 26: 48–50.
43. Lopez-Anido, F., V. Cravero, E. Cointry, I. Firpo, and S.M. Garcia. 2005–2006. Inheritance of yellow seedling lethal in *Cucurbita maxima* Duch. Cucurbit Genet. Coop. Rep. 28–29: 73–74.
44. Lotsy, J.P. 1920. *Cucurbita* Strijdvragen. II. Eigen Onderzoekingen. Genetica 2: 1–21.
45. Loy, B. 2012–2013. Patterns of broad normal striping in egg gourd. Cucurbit Genet. Coop. Rep. 35–36: 18–21.
46. Loy, B. 2012–2013. Interaction of three loci, *l-1*, *l-2*, and *d*, in conferring the reverse stripe phenotype in egg gourd. Cucurbit Genet. Coop. Rep. 35–36: 22–26.
47. Loy, B. 2012–2013. A recessive tendrilless mutant in ornamental pumpkin. Cucurbit Genet. Coop. Rep. 35–36: 31–32.
48. Mains, E.B. 1950. Inheritance in *Cucurbita pepo*. Papers Mich. Acad. Sci. Arts Letters 36: 27–30.
49. Manzano, S., V.J. Dominguez, D. Garrido, P. Gomez, and M. Jamilena. 2008. A recessive gene conferring ethylene insensitivity and androecy in *Cucurbita pepo*. In: M. Pitrat, ed. Proc. Cucurbitaceae 2008: the 9th Eucarpia Meeting on Cucurbit Genetics & Breeding, pp. 563–567.

50. Mazurek, Z. and K. Niemirowicz-Szczytt. 1992. Inheritance of spaghetti traits in *Cucurbita pepo*. In: R.W. Doruchowski, E. Kozik, and K. Niemirowicz-Szczytt, eds. Proc. Cucurbitaceae '92: the 5th Eucarpia Meeting on Cucurbit Genetics & Breeding, pp. 70–74.
51. McPhail-Medina, R., L. Wessel-Beaver, and J.C.V. Rodrigues. 2012. Inheritance of resistance to papaya ringspot virus in tropical pumpkin is controlled by at least two genes. In: N. Sari, I. Solmaz, and V. Aras, eds. Cucurbitaceae 2012: the 10th Eucarpia Meeting on Genetics and Breeding of Cucurbitaceae, pp. 697–701.
52. Montes-Garcia, C.E., S. Garza-Ortega, and J.K. Brown. 1998. Inheritance of the resistance to squash leaf curl virus in *Cucurbita pepo* L. In: J.D. McCreight, ed. Cucurbitaceae '98: Evaluation and Enhancement of Cucurbit Germplasm. A.S.H.S., Alexandria, Virginia, pp. 328–330.
53. Munger, H.M. and R. Provvidenti. 1987. Inheritance of resistance to zucchini yellow mosaic virus in *Cucurbita moschata*. Cucurbit Genet. Coop. Rep. 10: 80–81.
54. Mutschler, M.A. and O.H. Pearson. 1987. The origin, inheritance, and instability of butternut squash (*Cucurbita moschata* Duchesne). HortScience 22: 535–539.
55. Nath, P., O.P. Dutta, S. Velayudhan, and K.R.M. Swamy. 1976. Inheritance of resistance to fruit fly in pumpkin. Sabrao J. 8: 117–119.
56. Nee, M. 1990. The domestication of *Cucurbita* (Cucurbitaceae). Econ. Bot. 44(3, Suppl.): 56–68.
57. Pachner, M. and T. Lelley. 2004. Different genes for resistance to zucchini yellow mosaic virus (ZYMV) in *Cucurbita moschata*. In: A. Lebeda and H.S. Paris (eds.), Proceedings of Cucurbitaceae 2004, pp. 237–243. Palacký Univ., Olomouc, Czech Republic.
58. Pachner, M., H.S. Paris, and T. Lelley. 2011. Genes for resistance to zucchini yellow mosaic in tropical pumpkin. J. Hered. 102: 330–335.
59. Padley, L.D. Jr., E.A. Kabelka, and P.D. Roberts. 2009. Inheritance of resistance to crown rot caused by *Phytophthora capsici* in *Cucurbita*. HortScience 44: 211–213.
60. Paris, H.S. 1986. A proposed subspecific classification for *Cucurbita pepo*. Phytologia 61: 133–138.
61. Paris, H.S. 1988. Complementary genes for orange fruit flesh color in *Cucurbita pepo*. HortScience 23: 601–603.
62. Paris, H.S. 1992. A recessive, hypostatic gene for plain light fruit coloration in *Cucurbita pepo*. Euphytica 60: 15–20.
63. Paris, H.S. 1995. The dominant *Wf* (*white flesh*) allele is necessary for expression of "white" mature fruit color in *Cucurbita pepo*. In: G. Lester and J. Dunlap (Eds.), Cucurbitaceae '94, pp. 219–220. Gateway, Edinburg, TX U.S.A.
64. Paris, H.S. 1996. Multiple allelism at the *D* locus in squash. J. Hered. 87: 391–395.
65. Paris, H.S. 1997. Genes for developmental fruit coloration of acorn squash. J. Hered. 88: 52–56.
66. Paris, H.S. 2000. Gene for broad, contiguous dark stripes in cocozelle squash. Euphytica 115: 191–196.
67. Paris, H.S. 2000. *Quiescent intense* (*qi*): a gene that affects young but not mature fruit color intensity in *Cucurbita pepo*. J. Hered. 91: 333–339.
68. Paris, H.S. 2000. Segregation distortion in *Cucurbita pepo*. In: N. Katzir and H.S. Paris (Eds.), Proceedings of Cucurbitaceae 2000. Acta Hort. 510: 199–202.
69. Paris, H.S. 2002. Multiple allelism at a major locus affecting fruit coloration in *Cucurbita pepo*. Euphytica 125: 149–153.
70. Paris, H.S. 2002. No segregation distortion in intersubspecific crosses in *Cucurbita pepo*. Cucurbit Genet. Coop. Rep. 25: 43–45.
71. Paris, H.S. 2003. Genetic control of irregular striping, a new phenotype in *Cucurbita pepo*. Euphytica 129: 119–126.
72. Paris, H.S. 2009. Genes for "reverse" fruit striping in squash (*Cucurbita pepo*). J. Hered. 100: 371–379.
73. Paris, H.S. and Y. Burger. 1989. Complementary genes for fruit striping in summer squash. J. Hered. 80: 490–493.
74. Paris, H.S. and S. Cohen. 2000. Oligogenic inheritance for resistance to zucchini yellow mosaic virus in *Cucurbita pepo*. Ann. Appl. Biol. 136: 209–214.
75. Paris, H.S. and A. Hanan. 2010. Single recessive gene for multiple flowering in summer squash. HortScience 45: 1643–1644.
76. Paris, H.S. and H. Nerson. 1986. Genes for intense pigmentation of squash. J. Hered. 77: 403–409.
77. Paris, H.S. and E. Kabelka. 2008–2009. Gene list for *Cucurbita* species, 2009. Cucurbit Genet. Coop. Rep. 31–32: 44–69.
78. Paris, H.S., H. Nerson, and Y. Burger. 1985. Precocious PI 165561 and Precocious PI 165561R pumpkin breeding lines. HortScience 20: 778–779.

79. Paris, H.S., S. Cohen, Y. Burger, and R. Yoseph. 1988. Single gene resistance to zucchini yellow mosaic virus in *Cucurbita moschata*. Euphytica 37: 27–29.
80. Paris, H.S., A. Hanan, and F. Baumkoler. 2004. Assortment of five gene loci in *Cucurbita pepo*. In: A. Lebeda and H.S. Paris (Eds.), Proceedings of Cucurbitaceae 2004, pp. 389–394.. Palacký Univ., Olomouc, Czech Republic.
81. Paris, H.S., A. Hanan, and F. Baumkoler. 2013. Another gene affecting fruit and stem color in squash, *Cucurbita pepo*. Euphytica 191: 99–107.
82. Rakoczy-Trojanowska, M. and S. Malepszy. 1999. Inheritance of umbrella-like leaf shape in materials derived form *Cucurbita maxima* × *C. pepo* hybrids. Cucurbit Genet. Coop. Rep. 22: 50–52.
83. Rhodes, A.M. 1964. Inheritance of powdery mildew resistance in the genus *Cucurbita*. Plant Dis. Rptr. 48: 54–55.
84. Robinson, R.W. 1987. Inheritance of fruit skin color in *Cucurbita moschata*. Cucurbit Genet. Coop. Rep. 10: 84.
85. Robinson, R.W., N.F. Weeden, and R. Provvidenti. 1988. Inheritance of resistance to zucchini yellow mosaic virus in the interspecific cross *Cucurbita maxima* × *C. ecuadorensis*. Cucurbit Genet. Coop. Rep. 11: 74–75.
86. Roe, N.E. and W.P. Bemis. 1977. Corolla color in *Cucurbita*. J. Hered. 68: 193–194.
87. Scarchuk, J. 1954. Fruit and leaf characters in summer squash. J. Hered. 45: 295–297.
88. Scarchuk, J. 1974. Inheritance of light yellow corolla and leafy tendrils in gourd (*Cucurbita pepo* var. *ovifera* Alef.). HortScience 9: 464.
89. Schaffer, A.A. and C.D. Boyer. 1984. The influence of gene *B* on fruit development in *Cucurbita pepo*. J. Amer. Soc. Hort. Sci. 106: 432–437.
90. Schaffer, A.A., C.D. Boyer, and H.S. Paris. 1986. Inheritance of rind lignification and warts in *Cucurbita pepo* L. and a role for phenylalanine ammonia lyase in their control. Z. Pflanzenzüchtg. 96: 147–153.
91. Schöniger, G. 1952. Vorläufige Mitteilung über das Verhalten der Testa- und Farbgene bei verschiedenen Kreuzungen innerhalb der Kürbisart *Cucurbita pepo* L. Züchter 22: 316–337.
92. Scott, D.H. and M.E. Riner. 1946. A mottled leaf character in winter squash. J. Hered. 37: 27–28.
93. Scott, D.H. and M.E. Riner. 1946. Inheritance of male sterility in winter squash. Proc. Amer. Soc. Hort. Sci. 47: 375–377.
94. Sharma, G.C. and C.V. Hall. 1971. Cucurbitacin B and total sugar inheritance in *Cucurbita pepo* related to spotted cucumber beetle feeding. J. Amer. Soc. Hort. Sci. 96: 750–754.
95. Shifriss, O. 1947. Developmental reversal of dominance in *Cucurbita pepo*. Proc. Amer. Soc. Hort. Sci. 50: 330–346.
96. Shifriss, O. 1955. Genetics and origin of the bicolor gourds. J. Hered. 46: 213–222.
97. Shifriss, O. 1966. Behavior of gene *B* in *Cucurbita*. Veg. Improv. Newsl. 8: 7–8.
98. Shifriss, O. 1981. Origin, expression, and significance of gene *B* in *Cucurbita pepo* L. J. Amer. Soc. Hort. Sci. 106: 220–232.
99. Shifriss, O. 1982. Identification of a selective suppressor gene in *Cucurbita pepo* L. HortScience 17: 637–638.
100. Shifriss, O. 1989. Relationship between the *B* genes of two *Cucurbita* species, II. Cucurbit Genet. Coop. Rep. 12: 75–78.
101. Shifriss, O. and H.S. Paris. 1981. Identification of modifier genes affecting the extent of precocious fruit pigmentation in *Cucurbita pepo* L. J. Amer. Soc. Hort. Sci. 106: 653–660.
102. Sinnott, E.W. and G.B. Durham. 1922. Inheritance in the summer squash. J. Hered. 13: 177–186.
103. Souza Neto, I.L. de, P.T. Della Vecchia, R.F. Kobori, and R.F. and M.S. de Lima. 2012–2013. Inheritance of lethal yellow seedling in *Cucurbita moschata* Duch. Cucurbit Genet. Coop. Rep. 35–36: 33–34.
104. Superak, T.H. 1987. A green corolla mutant in *Cucurbita pepo*. Cucurbit Genet. Coop. Rep. 10: 103.
105. Vilmorin & Cie. 2010. Squash leaf curl virus (SLCV) resistance in cucurbits. http://patents.justia.com/patent/8609928
106. Weeden, N.F. and R.W. Robinson. 1986. Allozyme segregation ratios in the interspecific cross *Cucurbita maxima* × *C. ecuadorensis* suggest that hybrid breakdown is not caused by minor alterations in chromosome structure. Genetics 114: 593–609.
107. Weeden, N.F., R.W. Robinson, and F. Ignart. 1984. Linkage between an isozyme locus and one of the genes controlling resistance to watermelon mosaic virus 2 in *Cucurbita ecuadorensis*. Cucurbit Genet. Coop. Rep. 7: 86–87.
108. Wessel-Beaver, L. 2008–2009. Confirmation of a dominant hard rind (*Hr*) locus in a *Cucurbita argyrosperma* ssp. *sororiai* × *C. moschata* cross. Cucurbit Genet. Coop. Rep. 31–32: 25–26.

109. Wehner, T.C. and J.E. Staub. 1997. 1997 gene list for cucumber. Cucurbit Genet. Coop. Rep. 20: 66–88.
110. Whitaker, T.W. 1932. Fertile gourd-pumpkin hybrids. J. Hered. 23: 427–430.
111. Whitaker, T.W. and G.N. Davis. 1962. Cucurbits. Interscience, New York.
112. Wu, T., J. Zhou, Y. Zhang, and J. Cao. 2007. Characterization and inheritance of a bush-type in tropical pumpkin (*Cucurbita moschata* Duchesne). Sci. Hort. 114: 1–4.
113. Xianglin, Z. 1987. A study on the breeding of naked kernel pumpkin and its genetic behavior. Acta Hort. Sin. 14: 115–118 (Chinese, with English summary).
114. Xiao, Q. and J.B. Loy. 2007. Inheritance and characterization of a glabrous trait in summer squash. J. Amer. Soc. Hort. Sci. 132: 327–333.
115. Xie, J. and T.C. Wehner. 2001. Gene list 2001 for cucumber. Cucurbit Genet. Coop. Rep. 24: 110–136.
116. Young, K. and E.A. Kabelka. 2009. Characterization of resistance to squash silverleaf disorder in summer squash. HortScience 44: 1213–1214.
117. Zraidi, A. and T. Lelley. 2004. Genetic map for pumpkin *Cucurbita pepo* using random amplified polymorphic DNA markers. In: A. Lebeda and H.S. Paris (Eds.), Proceedings of Cucurbitaceae 2004, pp. 507–514. Palacký Univ., Olomouc, Czech Republic.
118. Zraidi, A., M. Pachner, T. Lelley, and R. Obermayer. 2003. On the genetics and histology of the hull-less character of Styrian oil-pumpkin (*Cucurbita pepo* L.). Cucurbit Genet. Coop. Rep. 26: 57–61.
119. Zraidi, A., G. Stift, M. Pachner, A. Shojaeiyan, L. Gong, and T. Lelley. 2007. A consensus map for *Cucurbita pepo*. Mol. Breed. 20: 375–388.