Phalaenopsis Harlequin Breeding – Past, Present and Future

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In 1983, I registered the cross of *Phal.* Misty Green and *Phal.* Liu Tuen-Shen as *Phal.* Golden Peoker. This clone ‘Brother’ is the best one among the seedlings.
The parents of *Phal*. Golden Peoker ‘Brother’

*Phal*. Misty Green ‘Brother’

*Phal*. Liu Tuen- Shen ‘Brother’
The pedigree of *Phal.* Golden Peoker

The species contributed to *Phal.* Golden Peoker:

- *Phal. gigantea*
- *Phal. fasciata*
- *Phal. lueddemanniana*
- *Phal. amboinensis*
- *Phal. amabilis*
- *Phal. schilleriana*
- *Phal. sanderiana*
- *Phal. stuartiana*
- *Phal. equestris*
About 300 plants of the clone ‘Brother’ was first propagated in vitro via PLB system. One mutated clone was bloomed by Ever-Spring Nursery, and was named ‘ES’, received JC/AOS.
The clone ‘ES’ was further mericloned. Among the 1000 plants, 30% plants had ‘ES’ phenotype flowers, 40% plants had ‘Brother’ phenotype flowers, and 30% plants mutated and displayed asymmetrical spots and blotches with dark maroon color. The further mutated clone was named ‘BL’.
The species of Sections Amboinenses and Zebrinae have the large to medium chromosomes and small chromosomes in their karyotypes.
The species of Sections Phalaenopsis and Stauroglottis have small chromosomes in their karyotypes, whereas *Doritis pulcherrima* has the large chromosomes. Bar = 10 μm
The karyomorphological study of ‘Brother’ (left) and ‘BL’ (right) indicated the chromosome count of both clones are about 2n = 78, containing large, medium and small chromosomes. It seems that no chromosome variation occurred in ‘BL’.
Flower tepal histological observation of the clones—‘Brother’, ‘ES’ and ‘BL’

The color occurs only in the mesophyll

epidermis to mesophyll
In petunia, the transposon insertion may cause the flower color mutation. In this case, the same mechanism may also happen in *Phal*. Golden Peoker.
The progenies of *Phal.* Golden Peoker ‘Brother’

*Phal.* Brother Peacock = *Phal.* Paifang’s Queen ‘B’ x *Phal.* Golden Peoker ‘B’

*Phal.* Brother Delight = *Phal.* Brother Peacock x *Phal.* Chiayi Spots

*Phal.* Super Stupid = *Phal.* Brother Peacock x *Phal.* Brother Fancy

Flower tepal histological observation of *Phal.* Super Stupid.
It’s the same as the clone ‘Brother’
Flower tepal histological observation of *Phal.* Golden Peoker ‘BL’ progenies.

*Phal.* Golden Peoker × *Phal.* Kuntrarti Rarashati

*Phal.* Golden Peoker × *Doritis pulcherrima*

*Phal.* Sunrise Red Peoker × *Phal.* Brother Sara Gold
In my breeding experience, there are some species contributed to the color aggregation of spots, such as

*Phal. amboinensis* (common type)
*Phal. equestris* (Iloco type)
*Phal. violacea* (*bellina*)
*Phal. venosa.*
The effect of *Phal. amboinensis* on color aggregation

*Phal. Carnival*  \( x \)  *Phal. amboinensis*  \( \rightarrow \)  *Phal. Carnival Queen*
The effect of *Phal. equestris* on color aggregation

- *Phal. Super Stupid* × *Phal. equestris*
- *Phal. Brother Yew* × *Phal. Cassandra*
- *Phal. Brother Glamour* × *Phal. Carmela’s Pixie*
The effects of *Phal. violacea* and *Phal. venosa* on color aggregation

*Phal. violacea* (Phal. bellina) $\times$ *Phal. gigantea* = *Phal. Mok Choi Yew*

$\times$

*Phal. venosa* $\times$ *Phal. Brother Stripes* =
Phal. Sunrise Red Peoker = Phal. Golden Peoker × Phal. Kuntrarti Rasashati

Phal. Golden Peoker ‘BL’

×

Phal. Kuntrarti Rasashati, this clone may be tetraploidy

Phal. Sunrise Red Peoker
Different clones of *Phal.* Sunrise Red Peoker
102 *Phal.* Sunrise Red Peoker x *Phal.* Taipei Gold ‘GS’
Different clones of *Phal.* (Sunrise Red Peoker x Taipei Gold ‘GS’)

![Phal. flower images](image-url)
The hybrids of *Phal.* Golden Peoker ‘BL’ with species

*Phal. Golden Peoker ‘BL’ x Phal. equestris*

*Phal. Golden Peoker ‘BL’ x Phal. celebensis*

*Phal. Golden Peoker ‘BL’ x Phal. gigantea*
Phal. Golden Peoker ‘BL’ x Phal. mannii

Phal. Golden Peoker ‘BL’ x Doritis pulcherrima

Phal. Golden Peoker ‘BL’ x Phal. violacea
The crosses of *Phal.* Golden Peoker ‘BL’ with multiple flower types

*Phal.* Golden Peoker ‘BL’ x *Phal.* Brother Trekkie

*Phal.* Golden Peoker ‘BL’ x *Phal.* Kuntrarti Rarashati
Phal. Golden Peoker ‘BL’ x Phal. Timothy Christopher

Phal. Golden Peoker ‘BL’ x Dtps. Inferno
The F1 of *Phal.* Golden Peoker 'ES' – *Phal.* Ever-spring King

*Phal.* Golden Peoker ‘ES’

*Phal.* Ever-spring King ‘King’

About 1/300 of the seedlings has the harlequin pattern.

*Phal.* Chih Shang’s Stripes
The F1 of *Phal.* Golden Peoker ’ES’ – *Phal.* Ever-spring Light

About 1/300 has the harlequin pattern.
The F1 of *Phal.* Golden Peoker ‘ES’ or ‘BL’ – *Dtps.* Ever-spring Prince

IF use ‘ES’ as the parent, about 1/300 has the harlequin pattern. IF use ‘BL’, the ratio is about 1/3.
F1 *Phal.* Ever-spring Fairy = *Phal.* Golden Peoker ‘BL’ x

*Phal.* Taisuco Kochdian
F1 *Phal.* Haur Jin Diamond =  
*Phal.* Golden Peoker x *Phal.* Ching-Her Buddha

*Phal.* Golden Peoker ‘BL’

*Phal.* Haur Jin Diamond

*Phal.* Ching-Her Buddha
F1 *Phal.* I-Hsin Canary =

*Phal.* Golden Peoker ‘BL’x *Phal.* I-Hsin Gold Coin
F1 *Phal. Sogo Pearl* = *Phal. Golden Peoker ‘BL’* × *Phal. Sogo Manager*

F1 *Phal. Nobby’s Shaowy* = *Phal. Golden Peoker ‘BL’* × *Phal. Nobby’s Fox*
F1 *Dtps*. I-Hsin Black Jack =
*Phal*. Golden Peoker x *Dtps*. Leopard Prince

*Phal*. Golden Peoker ‘BL’

*Dtps*. Leopard Prince

*Dtps*. I-Hsin Black Jack
F1 *Dtps.* Chain Xen Diamond = *Phal.* Golden Peoker ‘BL’ x *Dtps.* Judy Valentine
The F2 generation of *Phal.* Golden Peoker ‘ES’

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Dtps. Ching Hua Spring = Dtps. Minho Princess \times Phal. Ever-spring Light
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Phal. Yu-Pin Pearl = Phal. Ever-spring King \times Phal. Musashino
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F2 *Dtps.* Happy UFO =

*Dtps.* King Shaing’s Rose x *Phal.* Ever-spring King
F2 *Dtps.* Brother Love Rosa = *Phal.* Ever-spring King x *Dtps.* Sinica Knight
F2 *Dtps.* Yu-Pin Red Angel = *Phal.* Ever-spring King x *Dtps.* Taisuco Pixie
The F2 generation of *Phal.* Golden Peoker ‘BL’

*Phal.* Haur Jin Princess =
*Phal.* Haur Jin Diamond x *Phal.* Dou-dii Golden Princess

*Phal.* Haur Jin Diamond

*Phal.* Haur Jin Princess

*Phal.* Dou-dii Golden Princess
F2 *Phal. Shin-Yi Diamond* = *Phal. Haur Jin Diamond* x *Phal. Ching-Her Buddha*

*Phal. Haur Jin Diamond*

*Phal. Ching-Her Buddha*

*Phal. Shin-Yi Diamond*
F2 *Phal.* Diamond Beauty = *Phal.* Haur Jin Diamond x *Phal.* Chingruey’s Beauty

*Phal.* Haur Jin Diamond

*Phal.* Diamond Beauty

*Phal.* Chingruey’s Beauty
F2 *Phal.* Tai-I Yellow Bird = *Phal.* Haur Jin Diamond x *Phal.* Salu Peoker ‘#2’

*Phal.* Haur Jin Diamond

*Phal.* Tai-I Yellow Bird

*Phal.* Salu Peoker ‘#2’
F2  *Dtps.* Yu-Pin Natsume =  
*Dtps.* Autumn Sun x *Phal.* Haur Jin Diamond

*Phal.* Golden Peoker ‘BL’

*Dtps.* Autumn Sun

*Dtps.* Yu-Pin Natsume
F 2 *Phal.* Haur Jin Diamond x *Phal.* Black Rose
F2 *Phal.* (I-Hsin Canary x Sunrise Delight)
The F3 generation of *Phal.* Golden Peoker ‘ES’

*Dtps.* Chain Xen Pearl =
*Dtps.* Ching Hua Spring X *Dtps.* Nobby’s Pink Lady
102 *Phal.* Sunrise Red Peoker x *Phal.* Taipei Gold
104 *Phal.* Sunrise Red Peoker x *Phal.* Sogo Lisa
252 *Phal.* Sunrise Red Peoker x *Phal.* Brother Stage
Phal. Sunrise Red Peoker x Phal. violacea
Phal. Sunrise Red Peoker x Phal. Salu Peoker ‘#1’
Phal. Sunrise Red Peoker x Phal. Brother Sara Gold

Phal. Sunrise Red Peoker

Phal. Brother Sara Gold
F3 *Dtps*. Ching Hua Magic =
*Dtps*. Ching Hua Spring X *Dtps*. Hsingying City
F3 *Phal.* Diamond Beauty x *Phal.* Sogo Yukidian
F3 *Phal. I-Hsin Sun Flower* x *Phal. Tai-I Yellow Bird*
F3 *Dtps.* Yu-Pin Burbundy =

*Dtps.* Yu-Pin Red Angel x *Dtps.* Little Gem Stripe

This hybrid has received the AQ/AOS in 2007
F4 *Dtps.* Yu-Pin Lady = *Dtps.* Chain Xen Pearl x *Dtps.* Yu-Pin Lover
F4 Dtps. Chain Xen Mammon = 
*Dtps.* Chain Xen Pearl x *Dtps.* Mount Beauty
F4 *Dtps.* Ching Hua Magic x *Phal.* Taisuco Kochdian
F4 *Dtps.* Chain Xen Pearl x ‘Large Pink Flower’
F4 Dtps. Chain Xen Pearl x Phal. Sogo Yukidian
F4 *Dtps.* Chain Xen Pearl x *Phal.* Haur Jin Princess
F4 *Dtps.* Chain Xen Pearl x *Phal.* Elice de Valec
F4 *Phal.* (Sunrise Red Peoker x Sogo Lisa) x *Phal.* Sogo Pride

*Phal.* Sunrise Red Peoker

*Phal.* Sogo Pride
F5 Dtps. Yu-Pin Lady’s Progenies

*Dtps. Yu-Pin Lady x Phal. Sogo Yukidian*

*Dtps. Yu-Pin Lady x Phal. Sogo Yukidian*

*Dtps. Yu-Pin Lady x Phal. Brother Success*
The flower size of F4 progenies has increased above 10 cm, and the flower type and arrangement are almost the same as the standard white flowers.

Recently, there are some mutations of pink standard type. If these pink mutation clones cross with the *Phal. Yu-Pin Lady* (F4), what will happen?

*Phal. Yu-Pin Lady* This mutated clone is called ‘**Red Cat**’

Recently, there are some mutations of pink standard type. If these pink mutation clones cross with the *Phal. Yu-Pin Lady* (F4), what will happen?
In the future, more and more materials will contribute to the harlequin type breeding…….

Phal. Sunrise Red Peoker x Phal. Taipei Gold

x multiple flower type = ??

Phal. Sunrise Red Peoker x Phal. Sogo Lisa

x ‘Red Cat’ = ??
Thank you for your attention