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***Tolumnia xpulchella* (Hooker) Rafinesque (Orchidaceae) is Established as the Proper Name for a Jamaican Hybrid Swarm (Syngameon) and a New Species, One of The Parents of the Hybrid swarm, *Tolumnia hamiltonii* Sauleda is described.**

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Abstract

Tolumnia xpulchella (Hooker) Rafinesque (Orchidaceae), is established as the proper name for a Jamaican hybrid swarm (syngameon) of *Tolumnia* Rafinesque and one of the parents, *Tolumnia hamiltonii* Sauleda, is described as a new species.

The Jamaican species *Tolumnia pulchella* (Hooker) Rafinesque has long been a source of confusion. It was believed to be a highly variable species in color as well as morphology (Ackerman, 2014). However, intermediates between what was reported as *T. pulchella* and *Tolumnia guttata* (Linnaeus) Nir were common. Withner and Stevenson (1968) suggested that these intermediates are due to hybridization and the populations are a hybrid swarm (syngameon) involving introgressive hybridization with both parents. However, the type of *T. pulchella* represents one of the morphs found in the hybrid swarm. *Tolumnia guttata* is one of the parents of the hybrid swarm, the other parent is unnamed. Both parental species can be found in their genetically pure form in isolated localities.

The parents have been self-pollinated several times and the resulting plants are always morphologically similar to the parents without any evidence of hybridization. Selfing is an excellent taxonomic tool to determine if hybridization or introgression has occurred (Sauleda, 2016). Selfing individuals that normally outcross results in a high level of homozygosity due to the expression of recessive alleles in the first generation. Many of the suppressed alleles in a species may be from introgression. Selfing results in the expression of these suppressed alleles giving a glimpse of the evolutionary history of a species (Sauleda, 2016).

A similar situation occurs with a hybrid swarm of *Encyclia* Hooker in the Bahama Islands. *Encyclia xgracilis* (Lindl.) Schltr. was found to be the name of a hybrid swarm between *Encyclia fehlingii* (Sauleda) Sauleda and Adams and what was an undescribed species, which was named *Encyclia correllii* Sauleda.

Another similar situation occurs with *Tolumnia lucayana* (Nash ex Britton & Millsp.) Braem. It is a hybrid swarm found in the Bahama Islands and Cuba. In the Bahama Islands it is not possible to discern what the parents are. *Tolumnia lucayana* probably evolved in Cuba and migrated to the Bahama Islands. However, in Cuba it is possible that both parents, *Tolumnia moiriana* (Osment)

Braem, and *Tolumnia guibertiana* (A. Rich.) Braem, are still present (Saulea and Esperon, 2016). Selfings of morphs of *T. lucayana* from both Cuba and the Bahama Islands produces the full range of variation found in the populations, but selfings of the parents gives results consistent with the parents.

Moir published a number of hybrid and species names based on single plants sent to him from the hybrid swarm at St. Ann Parish: *Oncidium xjamaicense* Moir (*O. pulchellum* X *O. tetrapetalum*), *Oncidium xsanctae-anae* Moir (*O. berenyce* X *O. pulchellum*), *Oncidium xwithnerianum* Moir (*O. berenyce* X *O. tetrapetalum*), *Oncidium concavum* Moir regarded by Withner (1980) as (*O. tetrapetalum* X *O. pulchellum*), *Oncidium xhartii* Moir (*O. concavum* and *T. pulchella*). *Oncidium concavum* Moir and *Oncidium apiculatum* Moir have been named as new species. These names fall within the range of variation found in the syngameon. This confusion was due to the lack of field studies and led to a proliferation of superfluous literature. All of the names are part of the hybrid swarm and are synonyms of *T. xpulchella*.

Extensive field observations by both authors verifies that a natural hybrid between (these species were originally in the genus *Oncidium*) what was being included in *Oncidium pulchellum* Hooker and *Oncidium tetrapetalum* (*Oncidium guttatum*) occurs. This natural hybrid crosses back to both of the parents producing a hybrid swarm (syngameon) as proposed by Withner and Stevenson (1968). The earliest name of the hybrid swarm is *Oncidium berenyce* Reichenbach f. (Withner 1980). A careful examination of the type illustration of *O. pulchellum* demonstrates that *O. berenyce* and *T. pulchella* are conspecific. The type illustration of *T. pulchella* corresponds to one of the morphs found at St. Ann Parish. This would indicate that *T. pulchella* is the correct name for the hybrid swarm and the species that hybridized with *T. guttata* is unnamed.

Ackerman (2014) considers both *O. berenyce* and *O. concavum* “as just part of the multidimensional spectrum of variation in *T. pulchella*, hybrids between these and *T. pulchella* are nothing more than hybrids among individuals of the same species”.

However, Ackerman (2014) is reluctant to dismiss *Oncidium xjamaicense* Moir. He states that the type specimen (AMES) looks intermediate between the two species. *Oncidium xwithnerianum* Moir (Type AMES) he states should be regarded as a synonym of *O. xjamaicense* because “the types are very similar and the alleged parents of *O. xwithnerianum* are *T. guttata* and *O. berenyce*, the latter of which I regard as a synonym of *T. pulchella*”. Ackerman was correct when he stated that “we need both morphological and genetic verification” which we now have due to extensive fieldwork and results of selfings.

Nir (2000) lists *O. berenyce*, *O. cuneilabum* and *O. apiculatum* as synonyms of *T. guttata* without explanation.

Based on the field observations by both authors, we here designate *Tolumnia xpulchella* as the name of the hybrid swarm involving *T. guttata* and an unnamed species, which we will here name *Tolumnia hamiltonii* Saulea. Selfings of morphs from the hybrid swarm of what has been considered *T. pulchella* resulted in a variation similar to that found in the natural population. In addition the type description of *O. pulchellum* by Hooker describes more closely one of the morphs observed in the hybrid population: “Lip large, spreading horizontally, cut into four, nearly equally rounded, white lobes, having a tinge of pink near the base and some yellow spots upon the trifid crest”.

Tolumnia xpulchella (Hooker) Rafinesque stat. nov., Flora Telluriana 2: 101. 1837.
Oncidium pulchellum Hooker, Botanical Magazine 54: t. 2773. 1827.
Type: Original illustration, (Lectotype K [Withner and Stevenson, 1968]).



Original type illustration (Lectotype) of *Oncidium pulchellum* Hooker, in Curtis's Botanical Magazine 54: t. 2773. 1827.



Illustration of *Tolumnia hamiltonii* Sauleda by Rebeka Sauleda.

Synonyms of *Tolumnia xpulchella* represented in the hybrid swarm (syngameon).

Tolumnia berenyce (Reichenbach f.) Braem.

Type: Antilles, *Low s. n.*, (Holotype W).

Basionym: *Oncidium berenyce* Reichenbach f., *Botanische Zeitung* 20: 215. 1862.

Synonym: *Oncidium pulchellum* Hooker forma *berenyce* (Reichenbach f.) Withner, *Orchid Digest* 44: 91. 1980.

Tolumnia concava (Moir) Braem, *Die Orchidee* 37: 58. 1986.

Type: Jamaica, St. Ann Parish, near Claremont, collected by G. Hart, flowered in cultivation, 1957, *W. W. G. Moir s. n.*, photograph (Neotype AMES).

Oncidium concavum Moir, *Phytologia* 17: 432. 1968. et emend *Phytologia* 19: 53. 1969.

Oncidium pulchellum Hooker forma *concavum* (Moir) Withner, *Orchid Digest* 44: 91. 1980.

Oncidium xsanctae-anae Moir, *Phytologia* 15: 11. 1967, et emend *Phytologia* 19: 52. 1969.

Type: Jamaica, south of Brownstown, elev. 2000 ft., 16 Apr 1958, flowered in cultivation, 20 May 1969, *W. W. G. Moir s. n.* (Neotype [Moir 1969] AMES).

Oncidium xhartii Moir, *Phytologia* 17: 433. 1968.

Type: Jamaica, Parish St. Ann, near Claremont, collected in March 1955, flowered in cultivation, 9 Oct 1969, *W. W. G. Moir s. n.* (Holotype AMES), nomen illegitimum (holotype submitted consists of photographs).

Oncidium xwitheranum Moir, *Phytologia* 15: 12. 1967.

Type: Jamaica, Parish St. Ann, near Brownstown, collected in 1955, flowered in cultivation, 1967, *Moir s. n.* (Type Herbarium of Bishop Museum).

Oncidium xjamaicense Moir & A. D. Hawkes, *Phytologia* 15: 9. 1967.

Type: Jamaica, Parish St. Ann, near Brownstown, collected in 1955, flowered in cultivation, 1967, *Moir s. n.* (Type Herbarium of Bishop Museum).

Oncidium cuneilabium Moir, *Phytologia* 17: 431. 1968.

Type: Jamaica, St. Ann Parish in triangular area between Alexandria, Claremont and Brown's Town, flowered in cultivation, *Moir s. n.*, nomen illegitimum, no type designated.

Oncidium apiculatum *Phytologia* 17: 431. 1968.

Type: Jamaica, St. Ann Parish in triangular area between Alexandria, Claremont and Brown's Town, flowered in cultivation, *Moir s. n.*, nomen illegitimum, no type designated.

New species here described:

***Tolumnia hamiltonii* Sauleda, sp nov.**

Holotype: Jamaica, near Troy, 1,400 feet altitude, growing on trees and shrubs, April 20, 1904, *Harris, 8656* (NY, barcode 00060479). Type is specimen is the large plant in center of sheet.

Description

Plants erect, caespitose, epiphytic. Roots cannecent white, numerous. Rhizome short; secondary stem enclosed by imbricated leaf bases. Leaves triquetrous, fleshy, acuminate, conduplicate, to 9 cm long, 8 mm wide. Inflorescence usually erect, terete, distantly bracteate, to 35 cm tall; racemes or branched panicle, to 22-flowered; floral bracts lanceolate, acuminate to 3 mm long, 1 mm wide. Flowers light purple to reddish-purple; pedicellate ovary slender, to 1.5 cm long; dorsal sepal concave, obovate-spatulate, acute, apically cuspidate, to 7 mm long, 3 mm wide, lateral sepals connate to near apex, elliptic-obovate, to 10 mm long, 5 mm wide; petals unguiculate, obovate-pandruate, obtuse, to 10 mm long, 8 mm wide; labellum light purple to reddish-purple, yellow-brown spots around the callus, trilobed, lateral lobes entire overlapping with the midlobe, obovate to quadrate-obovate, to 8 mm long, 9 mm wide, isthmus to 5 mm wide, midlobe reniform, deeply emarginate, to 2.8 cm wide, midlobe spotted around callus, callus white with yellow lines or spots, callus two spreading horns, with smaller apical horn, all are connected by central ridge; column white, erect, 3.5 mm long, 1.5 mm wide, wings purple, basally rounded, apex acuminate, to 3 mm long, 2 mm wide.

Diagnosis

Tolumnia hamiltonii is distinguished from *Tolumnia xpulchella* by the shape of the labellum. The midlobe of the labellum of *T. hamiltonii* overlaps with the two lateral lobes of the labellum and the midlobe is much larger than the lateral lobes. The flowers of *T. hamiltonii* vary from light pink to deep reddish-purple, rarely white forms are found. Flowers of *T. xpulchella* can be light pink but are usually white with a pink blush, dark reddish-purple forms are rare. In many plants of *T. xpulchella* the midlobe is divided into two lobes each nearly the same size as the lateral lobes. The flowers of *T. xpulchella* are usually taller than wide where the flowers of *T. hamiltonii* are nearly round. There is usually a space between the midlobe and the lateral lobes in *T. xpulchella*, which is reduced depending on the amount of introgression of the hybrid back to *T. hamiltonii* which does not have the space.

This species is named in honor of Claude W. Hamilton of Hamlyn Orchids of Kingston, Jamaica. Claude W. Hamilton is a world famous hybridizer using Jamaican species and has been instrumental in making available to hobbyists many rare Cuban and Jamaican species by propagating them from seed in his laboratory.



Holotype of *Tolumnia hamiltonii* Saulea, Harris, 8656 (NY, barcode 00060479).



Variation in *Tolumnia guttata* (Linnaeus) Nir.



Tolumnia hamiltonii Saulea.



Tolumnia xpulchella (Hooker) Rafinesque.

Morphs in population observed by senior author with Cicely Tobish, Noel Gauntlett and Ancile Gloudon, 3 May 1985, Jamaica, St. Ann Parish, 2 mi W of Brown's Town along road to Keith, elev. 1600 ft.



Tolumnia xpulchella var. Hamlyn. This plant represents introgression back to *Tolumnia hamiltonii* Saulea. Plant is from another hybrid population discovered in the central hill area of Jamaica near Mile Gully in Manchester Parish .

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