Tecoma stansとT. garrochaの種間交雑による新しい鉢物用品種の育成

誌名	園藝學會雜誌
ISSN	00137626
巻/号	731
掲載ページ	p. 69-71
発行年月	2004年1月

園学雑. (J. Japan. Soc. Hort. Sci.) 73 (1) : 69 71. 2004. SHORT COMMUNICATION

A New Pot Plant Variety Bred by Interspecific Crossing between *Tecoma stans* (L.) H. B. K. and *T. garrocha* Hieron.

Nobuo Kobayashi [1]*, Juan Carlos Hagiwara [2], Ikuo Miyajima [1], Gabriela Facciuto [2], Silvina Soto [2], Diego Mata [2] and Alejandro Escandon [2]

[1] *Technological Center on Floriculture, Fruits Culture and Horticulture of Japan International Cooperation Agency in Argentiná, (JICA - CETEFFHO), INTA Castelar, Buenos Aires, Argentina*

[2] *Instituto de Recursos Biológicos, Instituto Nacional de Tecnología Agropecuaria (INTA), INTA Castelar, De los Reseros y Las Cabañas s/n. 1712, Pcia. Buenos Aires, Argentina*

Summary

A new cultivar of *Tecoma*, originating in South America, was selected from among the interspecific hybrid progenies between *T. stans* and *T. garrocha*. The selected interspecific hybrid has an orange corolla, intermediate in color and size between *T. stans* (orange-yellow) and *T. garrocha* (orange-red). Although *T. stans* required uniconazole treatment to induce blossom formation, the selected interspecific hybrid did not. The newly selected hybrid is expected to be of horticultural value and interest in the Japanese flower markets.

Key Words: breeding, interspecific crossing, pot plant, *Tecoma garrocha*, *Tecoma stans*.

Introduction

In Japan, azaleas, camellias, chaenomeleses, hydrangeas, roses and some tropical species, such as poinsettias and bougainvillea, are mainly produced commercially for sale as potted plants (Goi, 1994). In 1991, the total number of potted herbaceous, trees and shrubs in commercial production was 13,194 thousand, worth 45 million dollars (Goi, 1994). Every year, many kinds of new ornamental trees and shrubs from all over the world have been introduced as potted plants to Japanese flower markets.

The genus *Tecoma* comprises 14 species: two are distributed in Africa and 12 in North and South America. *T. stans* is a small tree with vivid yellow, tubular-campanulate flowers (4.0-5.0 cm in diam.), borne on a terminal racemose panicle. *T. garrocha*, a small tree with red-orange flowers (2.0-2.5 cm in diam.), is endemic to the mountainous area (altitude 700-2,900 m) of Northwestern Argentina and Southern Bolivia (Gentry, 1992), but it has not yet been utilized as an ornamental plant. As a part of "The Horticultural Development Project in Argentina" started in 1999 between the National Institute for Agricultural Technology of Argentina (INTA) and Japan International Cooperation Agency (JICA), several wild strains of *T. garrocha* with suitable ornamental characteristics, such as flowering and growth habits, were collected. *T. stans* which has conspicuous yellow flowers has already been cultivated widely as an ornamental garden tree in South America. However, this species has not been improved by breeding. Because interspecific crossing can potentially expand morphological and physiological variations, several hybrids with ornamental values were selected among interspecific crosses between *T. stans* and *T. garrocha*.

In this paper, we describe an interspecific hybrid of *Tecoma* that may be of horticultural value.

Materials and Methods

Plant materials, crossings and sowing

The mother plants of *T. stans* and *T. garrocha* were obtained from private gardens in the outskirts of Buenos Aires, Argentina and from Salta province, located in northern Argentina, respectively.

Reciprocal crosses between these two species were made November 2000 in a greenhouse at the Technological Center on Floriculture, Fruit Culture and Horticulture of Japan International Cooperation Agency in Argentina (JICA-CETEFFHO). The flowers of maternal parents were emasculated about 3 days before anthesis and pollinated with fresh pollens from the paternal parent at anthesis. The mature seeds that were harvested 8-10 weeks after pollination were sown in a greenhouse on February 2001. Two weeks after germination, the seedlings were transplanted to the compost

Received ; June 6, 2003. Accepted; July 11, 2003.

*Corresponding author, Present address: Experimental Farm, Graduate School of Agriculture, Kyoto University, Takatsuki, Osaka 569-0096, E-mail: Kobayashi@farm.kyoto-u.ac.jp

(pine bark : loam : leaf mold : fallen leaves of pine = 1 : 1 : 1 : 1, v/v).

Floral characteristics

Fully expanded fresh flowers were collected; the horizontal and vertical diameters of petal limb and the length and maximum diameter of the petal tube were measured. Flower color descriptions (lower petal limb and outer petal tube) were based on the RHS Colour Chart (Royal Horticultural Society, 1966).

Flowering response to uniconazole treatment

The bases of softwood cuttings (7-10 cm long) of *T. stans*, *T. garrocha* and their interspecific hybrid were soaked in 20 mg·liter^{-1} of IBA for about 24 hr. Their bases were then imbedded in rooting beds (peat moss: perlite: vermiculite = 1: 1: 1, v/v). After watering, the cuttings were placed under tunnels covered with plastic film to prevent moisture loss. One month later, the rooted cuttings were transplanted into pots (15 cm in diam.) with the same compost as that for seedlings.

One month after transplanting, the plants were sprayed with an aqueous solution of uniconazole (0, 20, 30 and 40 mg·liter^{-1}) containing 0.01% Tween 20 on December 10, 2002; its effect on flowering and plant height was investigated on February 7, 2003.

Results and Discussion

Fertile seeds were obtained only from the crosses using *T. stans* as the seed parent although fruit set occurred in reciprocal crosses between *T. stans* and *T. garrocha* (data not shown). An interspecific hybrid with the most superior characteristics in flower color and floral morphology was selected, and its response to uniconazole treatment was investigated.

The selected interspecific hybrid had a corolla intermediate in color and size between *T. stans* and *T. garrocha* (Table 1, Fig. 1). The color of petal limb and that of outer petal tube in the selected hybrid were orange (RHSCC No. 26A) and orange-red (RHSCC No. 33A), respectively, whereas they were both yellow-orange (RHSCC No. 14A and 15A) in *T. stans*, and orange-red (RHSCC No. 31A) and red (RHSCC No. 42A), respectively, in *T. garrocha* (Table 1).

T. garrocha and the selected hybrid plants flowered without an uniconazole treatment, whereas the T. stans plants treated with 0 or 20 mg·liter^{-1} uniconazole did not flower (Table 2). This suggests that the *T. garrocha* and the selected hybrid plants had already completed flower-bud differentiation before uniconazole treatment, and that the flowering habit of the selected hybrid is similar to that of *T. garrocha*. Uniconazole is used not only to suppress growth but also to promote flower-bud differentiation (Bailey, 1989). Since the selected hybrid flowered without uniconazole treatment, this hybrid seems to have a desirable habit for pot plant production.

The effect of uniconazole on plant height of the selected hybrid was not clear, although plant height and shoot elongation were suppressed by uniconazole in *T. stans* (Kobayashi et al., 2003). The plant height of the

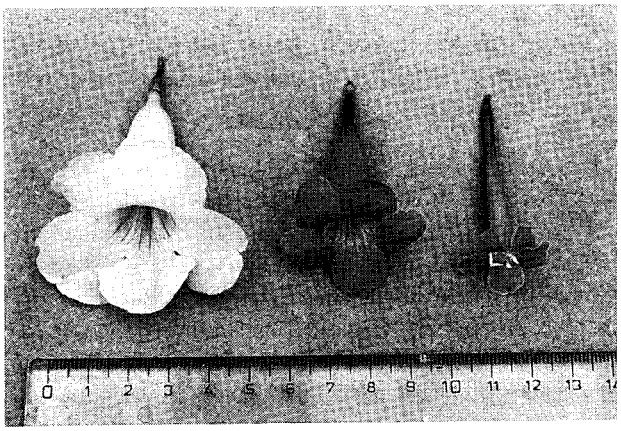

Fig. 1. Flowers of newly selected interspecific hybrid (center) between *Tecoma stans* (left) and *T. garrocha* (right).

Table 1. Floral characteristics of *Tecoma stans*, *T. garrocha* and their interspecific hybrid.

Species or strains	Color (RHSCC No.)[z]		Size (mm)[y]			
			Petal limb		Petal tube	
	Petal	Floral tube	Horizontal diameter	Vertical diameter	Length	Maximum diameter
T. stans	Yellow-orange (14A)	Yellow-orange (15A)	49.2 ± 1.3a[x]	47.3 ± 1.0a	33.7 ± 1.1b	15.5 ± 0.5a
T. garrocha	Orange-red (31A)	Red (42A)	22.4 ± 0.7c	22.2 ± 0.7c	42.5 ± 0.7a	6.7 ± 0.3c
Interspecific hybrid	Orange (26A)	Orange-red (33A)	35.4 ± 1.7b	31.3 ± 1.2b	43.9 ± 0.8a	11.5 ± 0.6b

[z]No. of the Royal Horticultural Society Colour Chart.
[y]Mean ± SE.
[x]The same letters within columns indicate no significant difference by Duncan's multiple range test at 5% level (n=10).

Table 2. Effect of uniconazole treatment on the flowering and plant height of *Tecoma stans*, *T. garrocha* and their interspecific hybrid.

Species or strain	Conc. of Uniconazole (mg・liter^{-1})	No. of plants flowering / No. of plants examined	Plant height
T. stans	0	0 / 12	NE[z]
	20	0 / 12	NE
	30	2 / 11	NE
	40	6 / 13	NE
T. garrocha	0	2 / 2	NE
	20	2 / 2	NE
	30	2 / 2	NE
	40	2 / 2	NE
Interspecific hybrid	0	3 / 3	32.3 ± 1.5[y]
	20	3 / 3	33.0 ± 1.5
	30	3 / 3	34.3 ± 1.0
	40	3 / 3	33.0 ± 2.5

Uniconazole was applied on December 10, 2002 and flowering and plant height were investigated on February 7, 2003.
[z]Not examined.
[y]Mean ± SE(n=3).

selected hybrid ranged from 30 to 35 cm, 2 months after uniconazole treatment, which is appropriate for potted plants (Table 2).

Genus *Tecoma* belongs to Bignoniaceae, which is distributed mainly in Central and South America (Gentry, 1992). Although the species belonging to Bignoniaceae is not distributed in Japan, *Campsis grandiflora* called 'Nozen-kazura' in Japan, *C. radicans*, and their hybrids with orange, orange-red or orange-yellow flowers are commonly cultivated in Japan as climbing woody plants (Tsukamoto, 1988). However, all of these plants are cultivated in the open field and are not suitable as pot plants. The newly created *Tecoma* cultivar with orange-red flowers and appearance similar to *Campsis*, may be attractive to the general public and draw attention at the flower markets in Japan.

Literature Cited

Bailey, D. A. 1989. Uniconazole effects on forcing of florists' Hydrangeas. HortScience 24: 518.

Gentry, A. H. 1992. Tecoma. p. 51-105. In: J. L. Luteyn and S. A. Mori (eds.). Flora Neotropica, Bignoniaceae part II, The New York Botanic Garden, New York.

Goi, M. 1994. Ornamental Trees and Shrubs. p. 174-176. In: Organizing Committee XXIVth International Horticultural Congress Publication Committee (ed.). Horticulture in Japan. Asakura Publishing, Tokyo.

Kobayashi, N., J. C. Hagiwara, G. Facciuto, I. Miyajima and A. Nakatsuka. 2003. Effect of growth retardants on the flowering responses in *Tecoma stans* (L.) Juss ex Kunth var. stans. J. Japan. Soc. Agr. Tec. Man. 10: 61-63. (In Japanese with English summary).

Tsukamoto, Y. 1988. Campsis. p. 526-527. In: T. Aiga (ed.). The Grand Dictionary of Horticulture 3. Shogakukan, Tokyo. (In Japanese).

Tecoma stans と *T. garrocha* の種間交雑による新しい鉢物用品種の育成

小林伸雄[1]*・Juan Carlos Hagiwara[2]・宮島郁夫[1]・Gabriela Facciuto[2]・Silvina Soto[2]・Diego Mata[2]・Alejandro Escandon[2]

[1]*Technological Center on Floriculture, Fruits Culture and Horticulture of Japan International Cooperation Agency in Argentine (JICA-CETEFFHO), INTA Castelar, Buenos Aires, Argentina*

[2]*Instituto de Recursos Biológicos, Instituto Nacional de Tecnología Agropecuaria (INTA), INTA Castelar, De los Reseros y Las Cabañas s/n. 1712, Pcia. Buenos Aires, Argentina*

摘　要

南米原産の *Tecoma* の鉢物用新品種を創出するために，*Tecoma stans* と *T. garrocha* の種間交雑を行った．選抜された種間雑種個体の花冠は両種の中間の大きさであった．花色は *T. stans* が橙黄色，*T. garrocha* が橙赤色であったのに対し，種間雑種個体のそれは橙色であった．*T. stans* の開花にはウニコナゾール処理が必要であったのに対し，選抜された種間雑種個体はその処理が必要でなかった．今回育成された *T. stans* と *T. garrocha* の種間雑種個体は観賞性に優れているため日本の花卉市場で注目を集めるものと思われた．

*現在：京都大学大学院農学研究科附属農場．