

SAGARPA



SECRETARÍA DE AGRICULTURA,
GANADERÍA, DESARROLLO RURAL,
PESCA Y ALIMENTACIÓN

Graphic Handbook for the Variety Description of Cactus Pear and Xoconostle (*Opuntia* spp.)



Graphic Handbook for the Variety Description of Cactus Pear and Xoconostle (*Opuntia* spp.)

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Presentation

Presently, in a world globalized by commercial and economic relationships, genetic resources constitute an element generating power in agricultural goods markets and represent an important instrument in international political relations. These considerations acquire major relevance for Mexico, which is the place of origin of a great number of agricultural species that are tightly linked to the beginnings and evolution of our culture. As such, cactus pear (Opuntia spp.) is one of the plant genetic resources of greater significance in the historic-cultural development of the Mexican people.

Utilization of cactus pear (Opuntia spp.) as food by the Mesoamerican people dates between 7,000 and 9,000 years B.C. Available historic sources indicate that large patches of cactus pear were one of the significant natural resources in the processes leading to a sedentary lifestyle. As an example, according to the mythology of the Mexica people, one may recall a

settlement with a name reflecting the importance of the presence of cactus pear, the name of that founded city being: Tenochtitlan, which means the place of Tenochtli, the place of cactus pear.

Since then, cactus pear has been an important component, not only of the food for people living in the arid areas of Mexico, but also an important part of the complex of their culture; which nowadays translates into, aside from the species' diverse production systems and uses, its commercial exchange as raw material, products and derivatives. The rules that today norm this exchange, such as quality, inocuity, intellectual property, etc., have introduced new mechanisms for accessing genetic resources and their technology.

The knowledge and the most precise morphological, chemical, physiological and genetic description of plant genetic resources, represent one of the

best safeguarding devices for the protection of such resources. These concepts have been agreed upon at an international level within the International Union for the Protection of New Varieties of Plants (UPOV), of which Mexico has been a member since 1997.

The expression of these concepts results in the elaboration of technical guidelines for the description of varieties (UPOV, has 228 technical guidelines.) Guidelines contain a number of characteristics and variants, as well as norms for their application, which permit characterizing, for the purposes of identity and distinction, a plant population constituting variety.

Under the guiding principles of the UPOV, and considering the peculiarities of Mexican varieties, a Technical Guideline for Cactus Pear and Xoconostle was elaborated with the participation of the Mexican Group of Technical Support for Fruit Crops, which involved experts from academic and research institutions, government agencies, and growers. Nevertheless, the need for a

graphic reference permitting to define with greater objectivity the assignment of corresponding scores to the modalities of each descriptor, resulted in an agreement between the National Service of Inspection and Certification of Seeds (SNICS) and the Autonomous University of Chapingo for the elaboration of the "Graphic Manual for the Variety Description of Cactus Pear and Xoconostle (Opuntia spp.)".

The elaboration of this manual is intended for facilitating and harmonizing the characterization of varieties for registration purposes, either for the rights of the plant breeder or for the purpose of certifying propagation material.

The elaboration of the graphic manual was carried out considering the guidelines for the execution of the test of Distinction, Uniformity and Stability, proposed by Mexico, approved by the Technical Committee of the INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS (UPOV), and contemplated in the Guidelines for Cactus Pear and Xoconostle (Opuntia spp.).

Explanations covering several characteristics

Unless otherwise indicated, all observations should be made on 5 plants or parts taken from each of 5 plant. In the case of parts of plants, the number to be taken from each of the plants should be 2. In the case of fruit characteristics, the observations should be made on 20 fruits.

Cladodes: Unless otherwise stated all observations on the cladode should be made on mature cladodes, one to two years old.

Areoles, spines y glochides: Unless otherwise stated, all observations on the areole, spine and glochide should be made on intact cladodes or intact fruits as appropriate.

Flower: Unless otherwise stated all observations on the flower should be made at the peak of flowering time. All observations on the flower should be made at the first day of opening.

Fruit: All observations on the fruit should be made on 20 intact fruits which are fully mature for consumption.

Fruit diameter/thickness of peel/acidity/total soluble solids: The observations of fruit diameter, thickness of peel, acidity and total soluble solids should be made in the middle part of the fruit. For total soluble solids the middle part of the fruit must be used with the help of a refractometer.



Plant

Growth habit

<i>Upright</i>	1
<i>Spreading</i>	2
<i>Decumbent</i>	3
<i>Drooping</i>	4





Upright
1



Spreading
2



Decumbent
3



Drooping
4



Plant

Height

	(m)	
Very short	<1.37	1
	1.37 - 1.53	2
Short	1.531 - 1.69	3
	1.691 - 1.84	4
Medium	1.841 - 2.00	5
	2.001 - 2.15	6
Tall	2.151 - 2.31	7
	2.311 - 2.47	8
Very tall	>2.47	9



Short
3



Medium
5



Tall
7



Plant

Width

	(m)	
<i>Very narrow</i>	<1.41	1
	1.411-1.65	2
<i>Narrow</i>	1.651-1.89	3
	1.891-2.13	4
<i>Medium</i>	2.131-2.36	5
	2.361-2.60	6
<i>Broad</i>	2.601-2.84	7
	2.841-3.08	8
<i>Very broad</i>	>3.08	9



Narrow
3



Medium
5



Broad
7

4



Cladode

Length

	(cm)	
Very short	<27.38	1
	27.381-30.13	2
Short	30.131-32.88	3
	32.881-35.63	4
Medium	35.631-38.38	5
	38.38-41.13	6
Long	41.131-43.88	7
	43.881-46.63	8
Very long	>46.63	9



Very short
1



Short
3



Medium
5



Long
7



Very long
9



5



Cladode

Width

Very narrow

Narrow

Medium

Broad

Very broad

(cm)

<17.94	1
17.941-19.81	2
19.811-21.69	3
21.691-23.56	4
23.561-25.44	5
25.441-27.31	6
27.311-29.19	7
29.191-31.06	8
>31.06	9



Very narrow
1



Narrow
3



Medium
5



Broad
7



Very broad
9





Cladode

Length/width ratio

<i>Very small</i>	< 1.38	1
	1.380-1.53	2
<i>Small</i>	1.531-1.68	3
	1.681-1.83	4
<i>Medium</i>	1.831-1.98	5
	1.981-2.13	6
<i>Large</i>	2.131-2.28	7
	2.281-2.43	8
<i>Very large</i>	>2.43	9



Small
3



Large
7



Medium
5



7

Cladode

Shape

<i>Narrow elliptic</i>	1
<i>Medium elliptic</i>	2
<i>Broad elliptic</i>	3
<i>Circular</i>	4
<i>Rhombic</i>	5
<i>Narrow obovate</i>	6
<i>Broad obovate</i>	7





Narrow elliptic
1



Medium elliptic
2



Broad elliptic
3



Circular
4



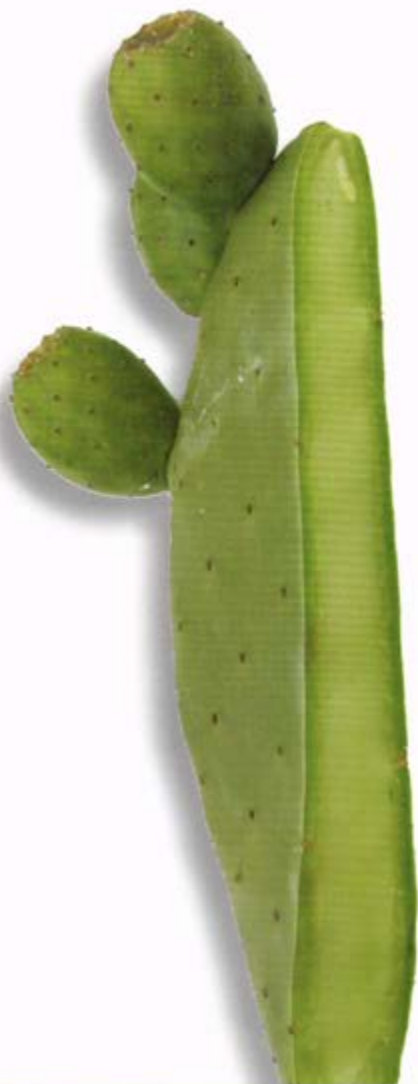
Rhombic
5



Narrow obovate
6



Broad obovate
7



Cladode

Thickness

	(cm)	
<i>Very thin</i>	<17.94	1
	17.94-19.81	2
<i>Thin</i>	19.811-21.69	3
	21.691-23.56	4
<i>Medium</i>	23.561-25.44	5
	25.441-27.31	6
<i>Thick</i>	27.311-29.19	7
	29.191-31.06	8
<i>Very thick</i>	>31.06	9



Thin
3



Medium
5



Thick
7



Cladode

Color



<i>Yellow green</i>	1
<i>Light green</i>	2
<i>Medium green</i>	3
<i>Dark green</i>	4
<i>Bluish green</i>	5



Yellow green
1



Light green
2



Medium green
3



Verde oscuro
4



Bluish green
5

10

Cladode

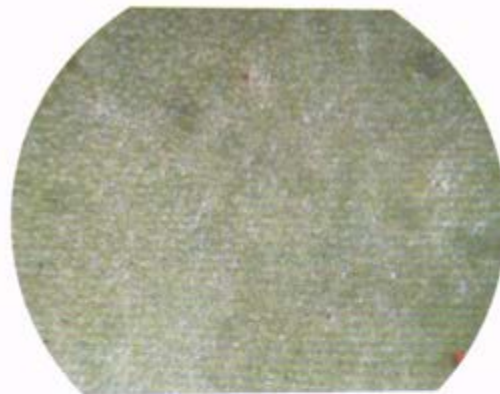
Waxiness



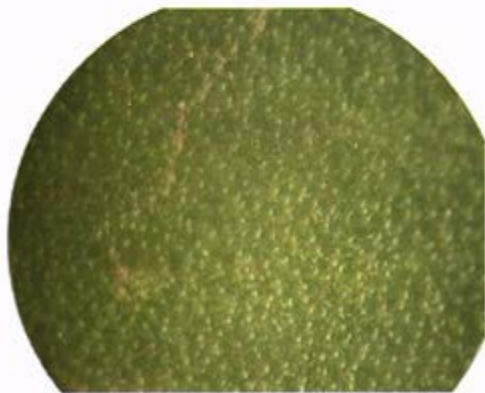
<i>Very weak</i>	1
<i>Weak</i>	3
<i>Medium</i>	5
<i>Strong</i>	7



Very weak
3



Weak
3



Medium
5



Strong
7

Cladode

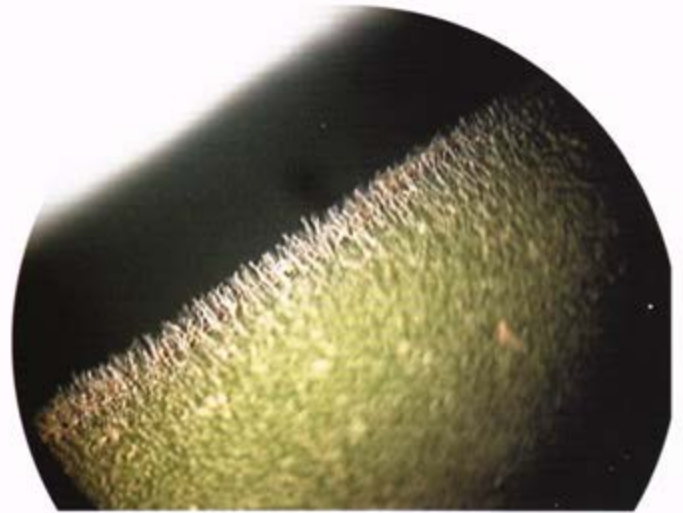
Pubescence of surface

Absent 1

Present 9



Absent
1



Present
9



Cladode

*Undulation of
margin*

Absent 1

Present 9



Absent
1



Present
9

Cladode

Number of areoles
in central row

<i>Very few</i>	<5.88	1
	5.88-6.43	2
<i>Few</i>	6.431-6.98	3
	6.98-7.53	4
<i>Medium</i>	7.531-8.08	5
	8.081-8.63	6
<i>Many</i>	8.631-9.18	7
	9.181-9.73	8
<i>Very many</i>	>9.73	9





Very few
1



Few
5



Medium
7



Many
7



Very many
9



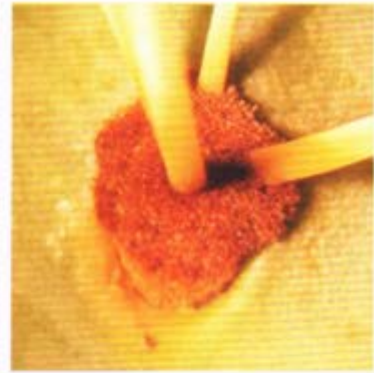
Cladode

Color of areoles

<i>Grey</i>	1
<i>Yellow brown</i>	2
<i>Brown</i>	3
<i>Black</i>	4



Grey
1



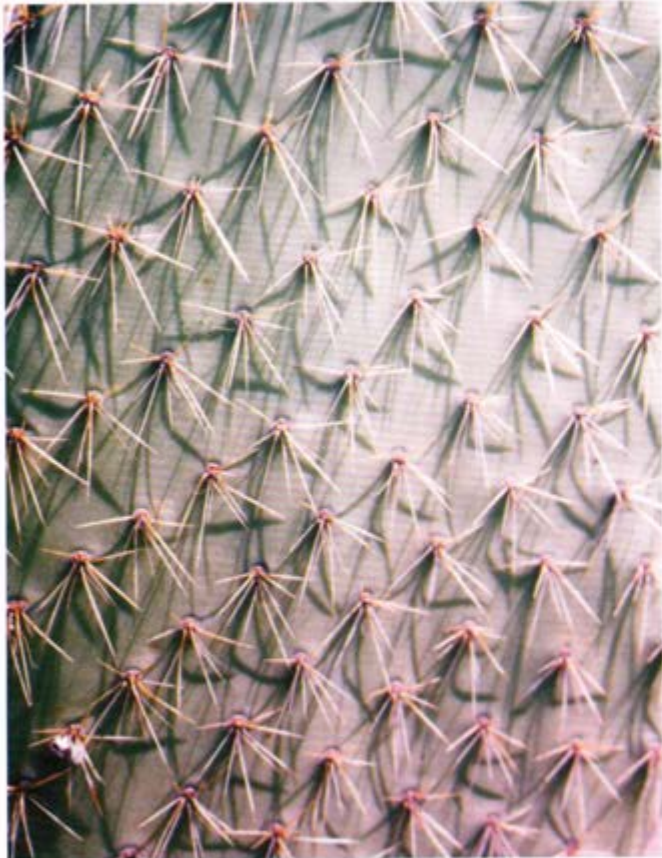
Yellow brown
2



Brown
3



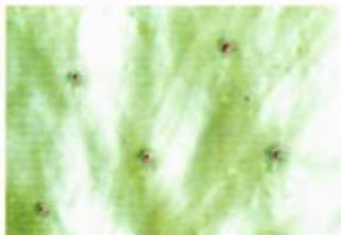
Black
4



Cladode

Number of spines
per areole

<i>None or very few</i>	< 1.28	1
	1.28-1.84	2
<i>Few</i>	1.841 - 2.41	3
	2.411-2.97	4
<i>Medium</i>	2.971-3.53	5
	3.531-4.09	6
<i>Many</i>	4.091-4.66	7
	4.661-5.22	8
<i>Very many</i>	< 5.22	9



None or very few
1



Few
3



Medium
5



Many
7



Very many
9

Cladode

Length of longest
spine



	(mm)	
<i>Very short</i>	<11.69	1
	11.69-15.06	2
<i>Short</i>	15.061-18.44	3
	18.441-21.81	4
<i>Medium</i>	21.811-25.19	5
	25.191-28.56	6
<i>Long</i>	28.561-31.94	7
	31.941-35.31	8
<i>Very long</i>	>35.31	9



Very short
1



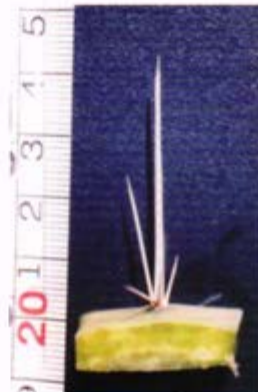
Short
3



Medium
5



Long
7



Very long
9

Spine

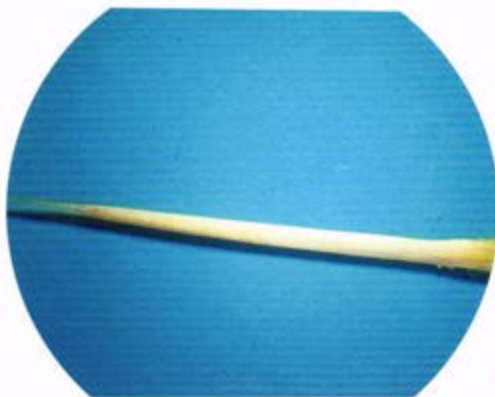
Main color



<i>Grey</i>	1
<i>White</i>	2
<i>Yellow</i>	3
<i>Brown</i>	4



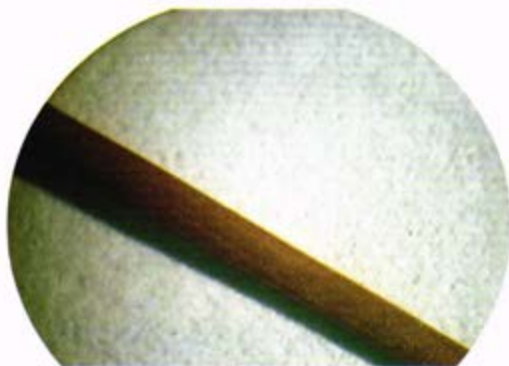
Grey
1



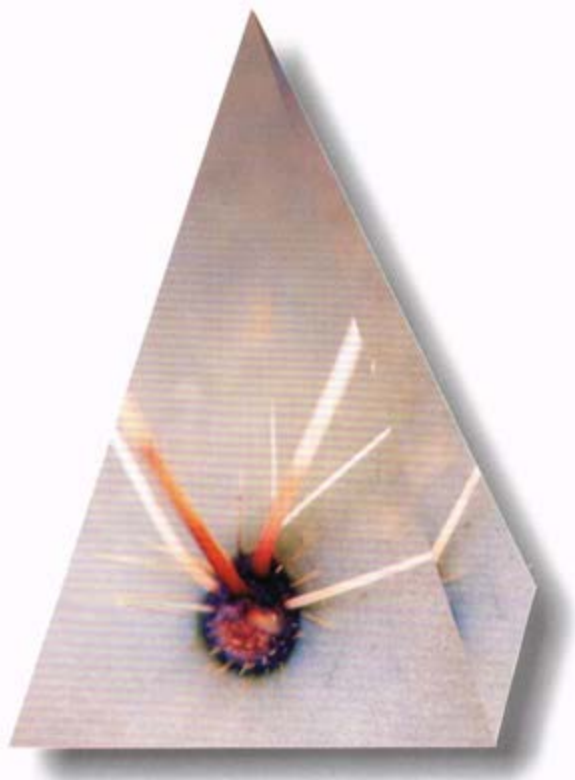
White
2



Yellow
3



Brown
4



Spine

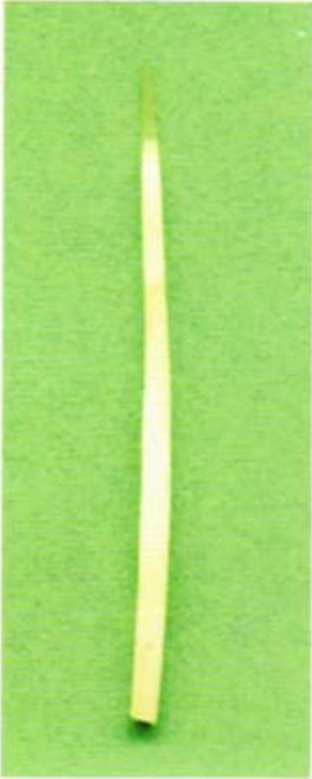
Number of colors

One

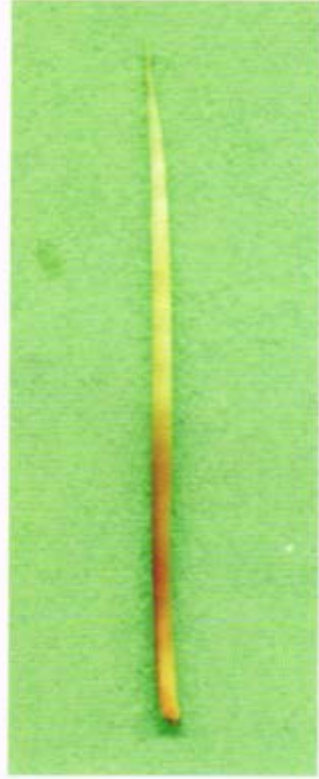
1

Two

2



One
1



Two
2

Spine

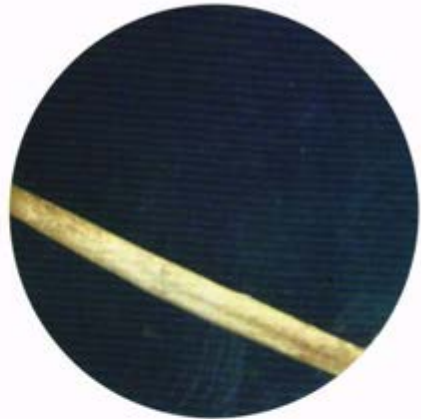
Surface



<i>Smooth</i>	1
<i>Grooved</i>	2
<i>Prickled</i>	3



Smooth
1



Grooved
2



Prickled
3

20



Central spine

Attitude

<i>Erect</i>	1
<i>Semi-erect</i>	2
<i>Horizontal</i>	3



Erect
1

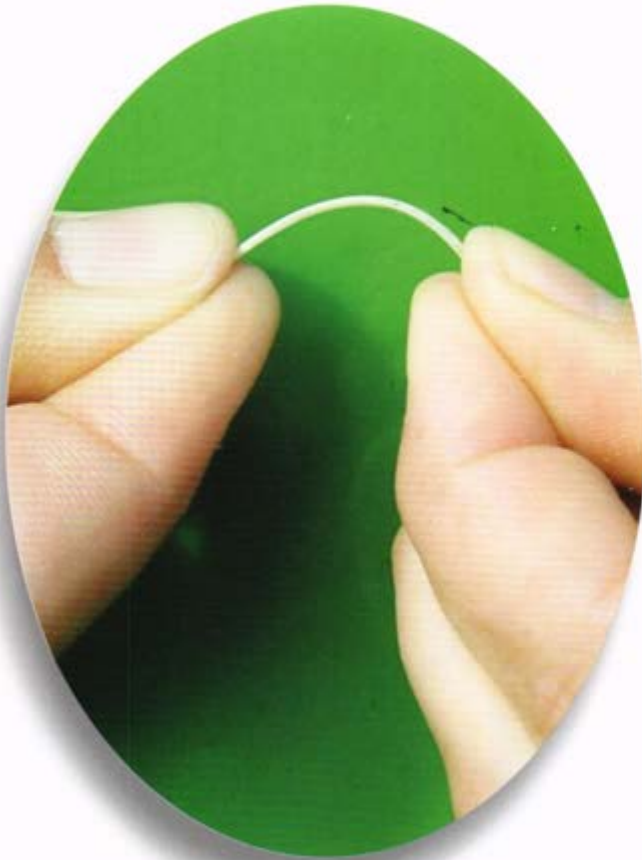


Semi-erect
2



Horizontal
3

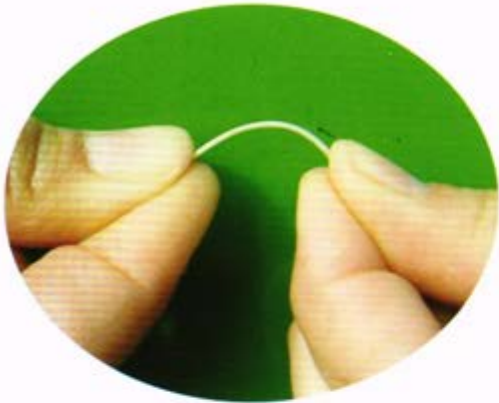
21



Central spine

Flexibility

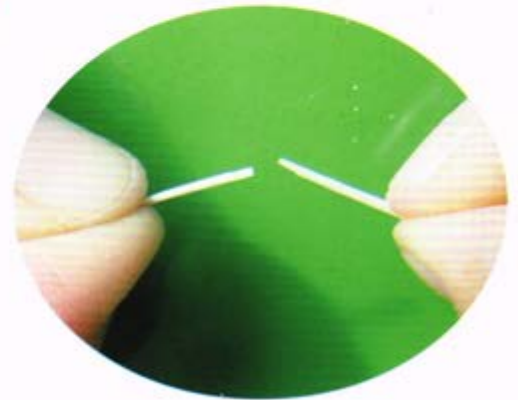
<i>Flexible</i>	1
<i>Firm</i>	2
<i>Brittle</i>	3



Flexible
1



Firm
2



Brittle
3

Central spine

Curvature
(excluding base)

<i>Absent</i>	1
<i>Present</i>	9





Absent
1



Present
9

23

Central spine

Twisting



Absent

1

Present

9



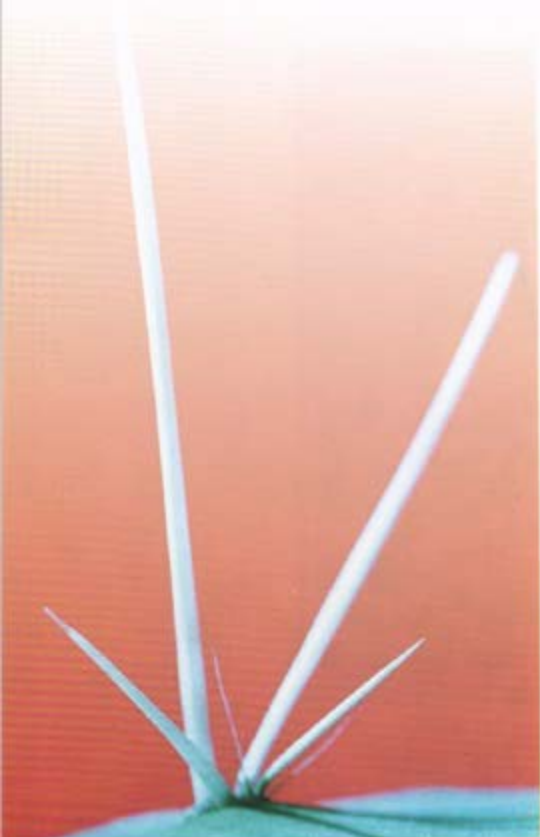
Absent
1



Present
9

Central spine

Shape in dorsal view



Aciculate

1

Narrow triangular

2



Aciculate
1



Narrow triangular
2



Central spine

Shape in cross
section

<i>Elliptic</i>	1
<i>Circular</i>	2
<i>Triangular</i>	3



Elliptic
1



Circular
2



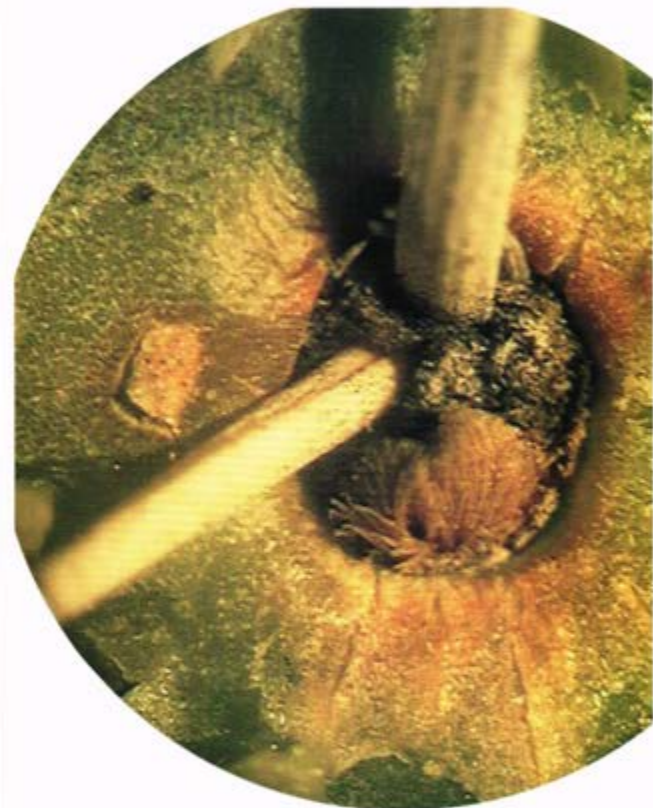
Triangular
3

26

Cladode

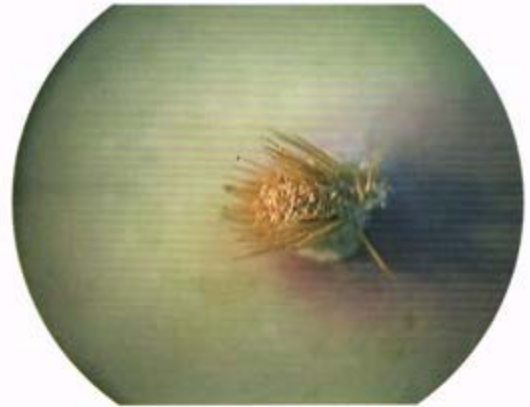
Number of glochides

<i>None or very few</i>	1
<i>Few</i>	2
<i>Many</i>	3





None or very few
1



Few
2



Many
3

27

Cladode

Color of glochides



Yellow

1

Brown

2



Yellow
1

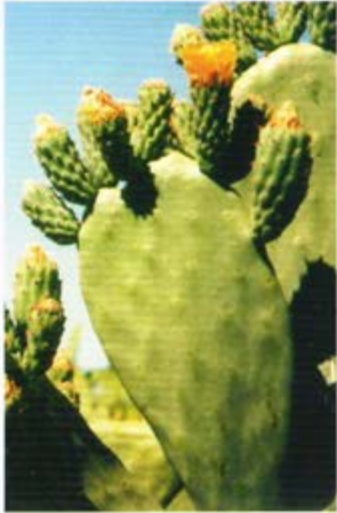


Brown
2

Cladode

Number of flowers

<i>Very few</i>	< 9.8	1
	9.81 - 11.76	2
<i>Few</i>	11.761 - 13.35	3
	13.351 - 15.57	4
<i>Medium</i>	15.571 - 17.67	5
	17.671 - 20.04	6
<i>Many</i>	20.041 - 21.62	7
	21.621 - 23.21	8
<i>Very many</i>	> 23.21	9



Few
3



Medium
5



Many
7



Flower

Length

	(mm)	
Very short	<5.66	1
	5.66-6.17	2
Short	6.171-6.68	3
	6.681-7.19	4
Medium	7.191-7.71	5
	7.711-8.22	6
Long	8.221-8.73	7
	8.731-9.24	8
Very long	>9.24	9



Very short
1



Short
3



Medium
5



Long
7



Very long
9



30

Flower

Color of perianth

<i>Greenish yellow</i>	1
<i>Yellow</i>	2
<i>Brownish yellow</i>	3
<i>Orange</i>	4
<i>Orange red</i>	5





Greenish yellow
1



Yellow
2



Brownish yellow
3



Orange
4



Orange red
5

31

Flower

Color of style

<i>Green</i>	<i>1</i>
<i>White</i>	<i>2</i>
<i>Yellow</i>	<i>3</i>
<i>Pink</i>	<i>4</i>
<i>Red</i>	<i>5</i>





Green
1



White
2



Yellow
3



Pink
4



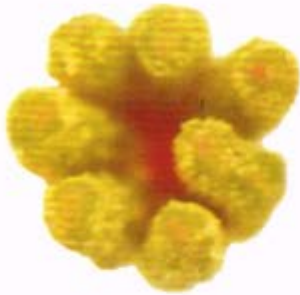
Red
5



Flower

Number of stigma
lobes

<i>Very few</i>	<5.38	1
	5.381-6.13	2
<i>Few</i>	6.131-6.88	3
	6.881-7.63	4
<i>Medium</i>	7.631-8.38	5
	8.381-9.13	6
<i>Many</i>	9.131-9.88	7
	9.881-10.63	8
<i>Very many</i>	>10.63	9



Few
3



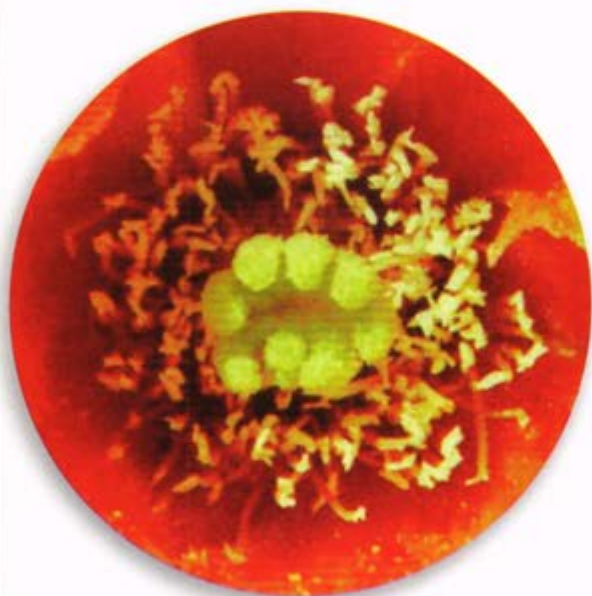
Medium
5



Many
7



Very many
9



Flower

*Color stigma
lobe*

Yellow 1

Green 2



Yellow
1



Green
2



Fruit

Length

Very short

Short

Medium

Long

Very long

(mm)

<52.44	1
52.44 - 59.31	2
59.311- 66.19	3
66.191-73.06	4
73.061-79.94	5
79.941-86.81	6
86.811-93.69	7
93.691-100.56	8
>100.56	9



Very short
1



Short
3



Medium
5



Long
7



Very long
9





Fruit

Maximum diameter

	(mm)	
Very narrow	<41.88	1
	41.88-45.63	2
Narrow	45.631-49.38	3
	49.381-53.13	4
Medium	53.131-56.88	5
	56.881-60.63	6
Broad	60.631-64.38	7
	64.381-68.13	8
Very broad	> 68.13	9



Very narrow
3



Narrow
3



Medium
5



Broad
7



Very broad
9



Fruit

Ratio length/maximum diameter



<i>Very small</i>	<1.06	1
	1.06-1.17	2
<i>Small</i>	1.171-1.28	3
	1.281-1.39	4
<i>Medium</i>	1.391-1.51	5
	1.511-1.62	6
<i>Large</i>	1.621-1.73	7
	1.731-1.84	8
<i>Very large</i>	>1.84	9



Very small
1



Small
3



Medium
5



Large
3



Very large
9





Fruit

Shape in longitudinal section

<i>Oblong</i>	1
<i>Narrow elliptic</i>	2
<i>Elliptic</i>	3
<i>Circular</i>	4
<i>Oblate</i>	5
<i>Obovate</i>	6



Oblong
1



Narrow elliptic
2



Elliptic
3



Circular
4



Oblate
5



Obovate
6



Fruit

Density of
areoles

<i>Very sparse</i>	<34.06	1
	34.06-42.19	2
<i>Sparse</i>	42.191-50.31	3
	50.311-58.44	4
<i>Medium</i>	58.441-66.56	5
	66.561-74.69	6
<i>Dense</i>	74.691-82.81	7
	82.811-90.94	8
<i>Very dense</i>	>90.94	9



Very sparce
1



Sparce
3



Medium
5



Dense
7



Very dense
9

39

Fruit

Number of glochides

<i>Few</i>	3
<i>Medium</i>	5
<i>Many</i>	7

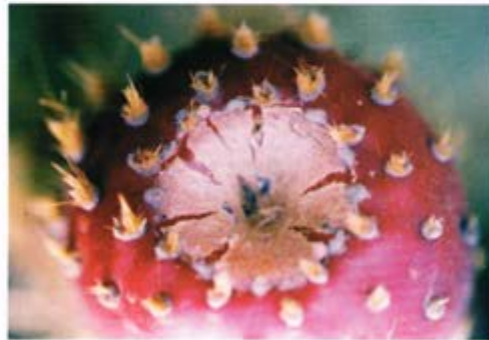




Few
3



Medium
5



Many
7

Fruit

Color of glochides

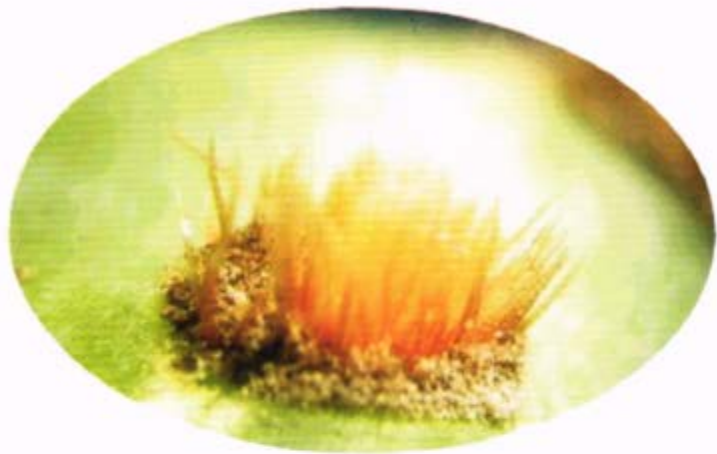
Yellow

1

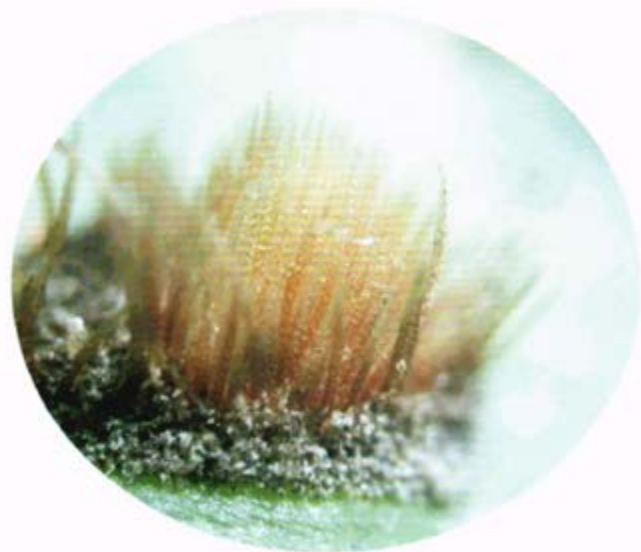
Brown

2





Yellow
1



Brown
2

41



Fruit

Length of stalk

	(mm)	
Very short	< 1.28	1
	1.28-2.84	2
Short	2.841-4.41	3
	4.411-5.97	4
Medium	5.971-7.53	5
	7.531-9.09	6
Long	9.091-10.66	7
	10.661-12.22	8
Very long	> 12.22	9



Very short
1



Short
3



Medium
5



Long
7



Very long
9





Fruit

*Depression of
receptacle scar*

*Absent or slightly
depressed*

(mm)

<0.83 - 3.14

1

*Moderately
depressed*

3.141 - 6.61

2

Strongly depressed

6.611- >8.92

3



*Absent or slightly
depressed*
1



Moderately depressed
2



Strongly depressed
3





Fruit

Diameter of
receptacle scar

	(mm)	
Very small	< 18.03	1
	18.03-20.09	2
Small	20.091-22.16	3
	22.161-24.22	4
Medium	24.221-26.28	5
	26.281-28.34	6
Large	28.341-30.41	7
	30.411-32.47	8
Very large	> 32.47	9



Very small
1



Small
3



Medium
5



Large
7



Very large
9





Fruit

Thickness of peel

	(mm)	
Very thin	< 2.44	1
	2.44-3.31	2
Thin	3.311-4.19	3
	4.191-5.06	4
Medium	5.061-5.94	5
	5.941-6.81	6
Thick	6.811-7.69	7
	7.691-8.56	8
Very thick	> 8.56	9



Thin
3



Medium
5



Thick
7

45

Fruit

Weight of peel

	(g)	
Very light	19.94	1
	19.94-29.81	2
Light	29.811-39.69	3
	39.691-49.56	4
Medium	49.561-59.44	5
	59.441-69.31	6
Heavy	69.311-79.19	7
	79.191-89.06	8
Very heavy	> 89.06	9

46

Fruit

Weight of flesh

	(g)	
Very light	< 20.06	1
	20.06-34.19	2
Light	34.191-48.31	3
	48.311-62.44	4
Medium	62.441-76.56	5
	76.561-90.69	6
Heavy	90.691-104.81	7
	104.811-118.94	8
Very heavy	> 118.94	9

Fruit

Ratio of weight of
flesh/peel



Very small	< 0.33	1
	0.33-0.58	2
Small	0.581-0.83	3
	0.831-1.08	4
Medium	1.081-1.33	5
	1.331-1.58	6
Large	1.581-1.83	7
	1.831-2.08	8
Very large	> 2.08	9

48



Fruit

*Evenness of color
surface*

Even

1

Uneven

2



Even
1



Uneven
2

Fruit

Main color of
surface

<i>White</i>	1
<i>Light green</i>	2
<i>Medium green</i>	3
<i>Dark green</i>	4
<i>Yellow</i>	5
<i>Orange</i>	6
<i>Pink</i>	7
<i>Medium red</i>	8
<i>Dark red</i>	9
<i>Purple</i>	10



White
1



Light green
2



Medium green
3



Dark green
4



Yellow
5



Orange
6



Pink
7



Medium red
8



Dark red
9



Purple
10



Fruit

Color of flesh

<i>Light green</i>	1
<i>Medium green</i>	2
<i>Yellow</i>	3
<i>Orange</i>	4
<i>Pink</i>	5
<i>Red</i>	6
<i>Purple</i>	7



Light green
1



Medium green
2



Yellow
3



Orange
4



Pink
5



Red
6



Purple
7

Fruit

Firmness of fruit

<i>Soft</i>	3
<i>Medium</i>	5
<i>Firm</i>	7

Fruit

Juiciness of pulp

<i>Low</i>	3
<i>Medium</i>	5
<i>High</i>	7

Fruit

Number of fully developed seeds



<i>Very few</i>	< 91.25	1
	91.25-133.75	2
<i>Few</i>	133.751-176.25	3
	176.251-218.75	4
<i>Medium</i>	218.751-261.25	5
	261.251-303.75	6
<i>Many</i>	303.751-346.25	7
	346.251-388.75	8
<i>Very many</i>	> 388.75	9



Very few
1



Few
3



Medium
5



Many
7



Very many
9





Seed

Size

Very small

Small

Medium

Large

Very large

(mm)

< 2.16

2.16-2.47

2.471-2.78

2.781-3.09

3.091-3.41

3.411-3.72

3.721-4.03

4.031-4.34

> 4.34

1

2

3

4

5

6

7

8

9



Very small
1



Small
3



Medium
5



Large
7



Very large
9

Fruit

Number of abortive seeds



<i>None or very few</i>	< 10.31	1
	10.31-24.94	2
<i>Few</i>	24.941-39.56	3
	39.561-54.19	4
<i>Medium</i>	54.191-68.81	5
	68.811-83.44	6
<i>Many</i>	83.441-98.06	7
	98.061-112.69	8
<i>Very many</i>	>112.69	9



None or very few
1



Few
3



Medium
5



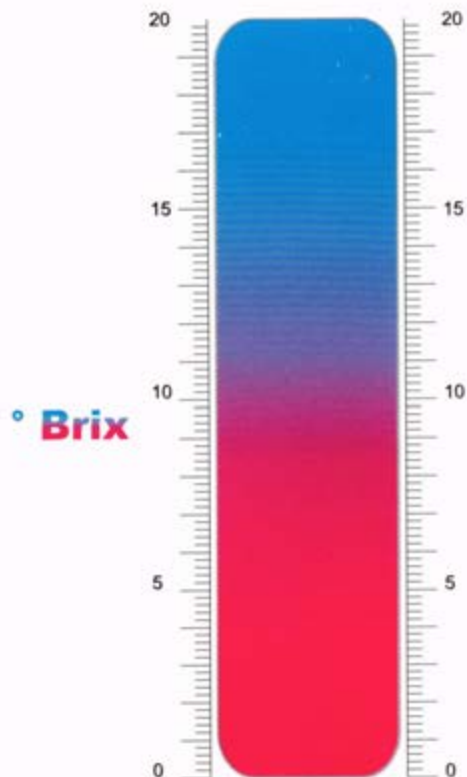
Many
7



Very many
9

Fruit

Total soluble solids



	(° Brix)	
Very low	< 6.63	1
	6.63-7.88	2
Low	7.881-9.13	3
	9.131-10.38	4
Medium	10.381-11.63	5
	11.631-12.88	6
High	12.881-14.13	7
	14.131-15.38	8
Very high	> 15.38	9

Fruit

Acidity

	(pH)	
<i>Very low</i>	> 6.312	
	5.938 - 6.312	2
<i>Low</i>	5.563 - 5.937	3
	5.188 - 5.562	4
<i>Medium</i>	4.813 - 5.187	5
	4.438 - 4.812	6
<i>High</i>	4.063 - 4.437	7
	3.688 - 4.062	8
<i>Very high</i>	< 3.687	9

*Time of beginning
of flowering*

<i>Early</i>	3
<i>Medium</i>	5
<i>Late</i>	7

Flowering habit

<i>Once flowering</i>	1
<i>Twice flowering</i>	2

*Time of harvest
maturity*

<i>Very early</i>	<i>1</i>
<i>Early</i>	<i>3</i>
<i>Medium</i>	<i>5</i>
<i>Late</i>	<i>7</i>
<i>Very late</i>	<i>9</i>

*Duration of harvesting
period of fruit*

<i>Short</i>	3
<i>Medium</i>	5
<i>Long</i>	7

Main Mexican varieties

Common name	Latin name	Synonym(s)
Rojo Vigor Montesa	<i>Opuntia ficus-indica</i> <i>Opuntia megacantha</i>	Rojo 45-90 Amarilla huesona, Amarilla Montesa, Centenario
Amarillo Plátano	Not determined	
Blanca San José	Not determined	
Burrona	<i>Opuntia albicarpa</i>	Fafayuca, de Castilla
Chapeada	<i>Opuntia albicarpa</i>	Cristal
Cristalina	<i>Opuntia albicarpa</i>	Nopal Chapeado Rojo, Chapeteada
Naranjón Legítimo	<i>Opuntia megacantha</i>	
Bolañera	<i>Opuntia undulata</i>	Amarillo Calabazón
Pico Chulo	<i>Opuntia megacantha</i>	Morada Jalpa, Oreja de Elefante
Torreaja	<i>Opuntia megacantha</i>	Apastillada, Copo de Oro, Naranjón
Amarilla Diamante	<i>Opuntia ficus-indica</i>	Frida, Frieda, Torrioja, COPENA XXXA
Fafayuco	<i>Opuntia albicarpa</i>	Amarilla Jalpa, Amarilla 33-89
Miquihuana	Not determined	Octubreña
Blanca de la Gavia	<i>Opuntia albicarpa</i>	Amarillo Miquihuana
Negrito	<i>Opuntia ficus-indica</i>	
Villanueva	<i>Opuntia albicarpa</i>	Atlixco, Verde, Tlaxcalancingo
Cuaresmeño	<i>Opuntia joconostle</i>	Criolla Blanca
Xoconostle Blanco	<i>Opuntia joconostle</i>	Xoconostle Cuaresmero
Xoconostle Colorado	<i>Opuntia joconostle</i>	
Xoconostle Chivo	<i>Opuntia joconostle</i>	
Tamazunchale	<i>Opuntia durangensis</i>	
Milpa Alta	<i>Nopalea cochenillifera</i>	
COPENA V-I	<i>Opuntia ficus-indica</i>	
COPENA F-I	<i>Opuntia ficus-indica</i>	Amarillo

Main Mexican varieties (continuation)

Common name	Latin name	Synonym(s)
Reyna	<i>Opuntia albicarpa</i>	Alfajayucan, Tuna Blanca, Taxa-kähä
Esmeralda	<i>Opuntia albicarpa</i>	COPENA XXA, L1
Rojo Pelón	<i>Opuntia ficus-indica</i>	Rojo Liso, Rosalito
Rojo Lirio	Not determined	
Rojo San Martín	<i>Opuntia ficus-indica</i>	Morada, Antiada, Priámides
Camueza	<i>Opuntia megacantha</i>	
Rubi Reyna	Not determined	Colorada
Bola de Masa	Not determined	Algodoncillo, Burra
Amarillo Oro	Not determined	Amarillo
Mango	Not determined	
Cardona de Castilla	<i>Opuntia streptacantha</i>	
Cardona	<i>Opuntia streptacantha</i>	Nopal Hartón
Rosa de Castilla	Not determined	
Cacalote	<i>Opuntia cochinera</i>	
Charola Tardía	Not determined	Charol
Amarillo Globo	Not determined	Amarilla Bola
COPENA Z-I	<i>Opuntia albicarpa</i>	Vaquera
Rojo Chicle	<i>Opuntia ficus-indica</i>	Rojo Tecamachalco
Tapón Mayero	<i>Opuntia robusta</i> var. <i>Larreyi</i>	Nopal Camueso, Tapona de Mayo
Zaponopal Roja	<i>Opuntia robusta</i> var. <i>Larreyi</i>	Tapona de Mayo
Zaponopal Blanca	<i>Opuntia robusta</i> var. <i>Larreyi</i>	Tapona de Mayo
Amarilla Jarro	Not determined	Amarilla Panzona
Roja Pitaya	Not determined	
Amarilla Zacatecas	Not determined	
Blanca Pepina	Not determined	Pepinilla
Rojo Iris	Not determined	
Roja Azteca	Not determined	
Roja Libertad	Not determined	

Main Mexican varieties (continuation)

Common name	Latin name	Synonym(s)
Duraznillo	<i>Opuntia leucotricha</i>	Nopal Duraznillo
Cascarona	<i>Opuntia hyptiacantha</i>	
Sanjuanera	<i>Opuntia lasiacantha</i>	
Chaveña	<i>Opuntia hyptiacantha</i>	
Tuna Mantequilla	Not determined	
Tuna Rosa	Not determined	
Pachón	<i>Opuntia hyptiacantha</i>	
Burrona Larga	<i>Opuntia albicarpa</i>	
Meloncillo Rosa	Not determined	
Tapón Aguanoso	<i>Opuntia robusta</i> var. <i>Robusta</i>	Nopal Tapón
Tapón Macho	<i>Opuntia robusta</i> var. <i>Robusta</i>	
Amarilla Santa Inés	Not determined	
Zarca	Not determined	
Solferino	<i>Opuntia ficus-indica</i>	Roja 25-89
Roja Jalpa	<i>Opuntia ficus-indica</i>	
Amarilla San Nicolás	Not determined	
Valtierrilla	<i>Opuntia undulata</i> x <i>O. tomentosa</i>	
Sangre de Toro	Not determined	
Pabellón	<i>Opuntia ficus-indica</i>	Liso Forrajero
Memelo	Not determined	
Cambray	<i>Opuntia joconostle</i>	
Rojo Papas	Not determined	
Tuna Mansa	<i>Opuntia albicarpa</i>	Blanca Paloalteña, Concha del Oro
Caidilla	Not determined	
Roja Sanjuanera	Not determined	

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