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INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS
Geneva

TECHNICAL WORKING PARTY FOR VEGETABLES

Forty-Ninth Session
Angers, France, June 15 to 19, 2015

ADDENDUM TO

EXPERIENCES WITH NEW TYPES AND SPECIES

Document prepared by the Office of the Union

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1. The Annexes to this document contain the following presentations made at the forty-ninth session of the Technical Working Party for Vegetables (TWV):

- ANNEX I Stevia (France)
- ANNEX II DUS test seaweed at Naktuinbouw (Netherlands)
- ANNEX III Domestication of *Zataria multiflora* Boiss. (Shirazi Thyme) in Oman - Proposed Protocol for DUS Test (Oman)
- ANNEX IV *Solanum pimpinellifolium* x *Solanum habrochaites* - A new interspecific cross for tomato rootstock (Spain)

[Annexes follow]


ANNEX I

Stevia




49th TWV – Annex June 2015

HISTORY




- This plant has been used for more than 1 500 years by the Garani people to sweeten their yerba mate tea as well as medicine.
- End of XIXth century : botanist M.S. Bertoni first described the plant and its sweet taste
- In 30's , the glycoside stevioside and rebaudioside were isolated .
 - Produced in the leaf tissues and give the leaves their sweet taste



CLASSIFICATION

- Order: **Asterales**
- Family: **Asteraceae**
- Tribe: **Eupatorieae**
- Genus: **Stevia**
- Species: ***Stevia rebaudiana* (Bertoni) Bertoni**


Synonymy : *Eupatorium rebaudianum* Bertoni
Vernacular name : Commonly named "**Stevia**", it is also called
 In Paraguay : **Caà-éhè, Kaa-hée, Caa-hée** or **Kaa-héo**, (indien name),
Yerba dulce (spanish name)
 In France : **Herbe Sucrée du Paraguay**
 In english : **Stevia, honey grass, sweet plant, sweet herb, sugar leaf**



USE


Stevia rebaudiana Bert. could be interesting because of stevioside contained in its leaves :

- ✓ Stevioside could be beneficial in the prevention of dental caries and obesity associated with high sucrose consumption
- ✓ It may also have therapeutic value in the treatment of patients with diabet-related obesity, hypertension or cardiac disease
- ✓ Moreover, it is non-mutagenic and non-carcinogenic
- ✓ However stevioside seems to be nephrotoxic and bibliography is quite discordant concerning the possible effects of steviol on reproduction



Cultivation

- Found in the wild in semiarid habitats ranging from grassland to mountain area (north-east of Paraguay)
 - Seed have a low germination rate
- Cloned stevia plant → more effective method of reproduction
- Cultivated and used to sweeten food elsewhere in East Asia including China (since 1984), Korea, Thailand and Malaysia. It can also be found in Brazil, Colombia, Peru, Paraguay, Uruguay, Israel...
- And recently in France (source of diversification for tobacco producer)



The plant

In our Brion's condition





Theoretical collection reference

35 varieties which are / were applied for :

- NLI
- PBR
- PLP

In 10 countries : Argentina, Bulgaria, Brazil, Georgia, Japan, Kenya, Peru, Russia, Ukraine and USA



GEVES Groupe d'Etude et de contrôle
des Variétés Et des Semences

Thank you for your sweet attention



GEVES
Expertise & Performance

[Annex II follows]

ANNEX II



DUS test seaweed at Naktuinbouw

Trial phase 2013-2014
Judith Meijles,
Amanda van Dijk

Seaweed culture

Potential use of seaweed:

- Sustainable fish culture (to absorb waste from fish farm)
- Contents: proteins, vitamins, minerals (as vegetable, fish food, medicin, cosmetics, pigments)
- Other: bio energy, fertilizer, construction material (roofs, dikes)

“breaking news” 4 June 2015

Start of the project

- Breeding activities at PRI Wageningen and Hortimare in several seaweed species:
 - *Saccharina latissima*
 - *Alaria esculenta*
 - *Ulva lactuca*
- To develop a (national) DUS protocol for future applications

Possible problems

- Identity material
- Trial lay-out
- Number of plants
- Characteristics
- Uniformity level
- Stability
- Common knowledge


Method

2013:

- Orientation at NIOZ and Hortimare at growing of seaweed and characteristics of several species
- Literature study
- Contact with colleagues in Japan (brown and red seaweed varieties prototected: *Porphyra yezonis*, *Porphyra tenera*, *Porphyra tenera* x *Porphyra yezonis*, *Nemacystus decipiens*)

2014:

- Small test facility at NIOZ to test DUS trial circumstances

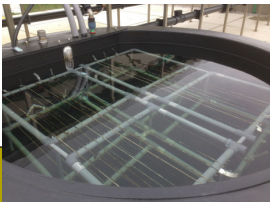


Facility at NIOZ






Test facility

- Frame work with 2 lines per variety
- 7 varieties: 4 wild origins, 3 crosses between them
- Sowing of sporophytes at the line by breeder, January 2014
- Lines at frame moved to the test facility, April 2014
- Observations June 2014



Results (regarding test facility)

- Plants too small and not even in size
- Upper line larger plants

Results (regarding characteristics)

- All varieties distinct
- 12 characteristics described
- Comparable with full grown plants
- Influence of temperature, aeration (bubbles) and speed of growth on leaf width, leaf thickness, blistering, undulation of margin: need of controlled and stable test facility.


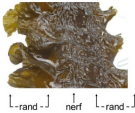



Frans, Noors, Faroer

Results (regarding characteristics)

Characteristics:

- Leaf: color, shape, length, width, shape of base, thickness, surface (coarse, smooth), width of margin, undulation of margin.
- Stalk: length, width


To be continued

- To improve growing method at lines (more uniform size)
- Test stability in 2 water basins and compare with 2014 results
- Costs? €€€
- Use of DNA markers
- To build and maintain reference collection



[Annex III follows]

ANNEX III




TRANSFORMING GENETIC RESOURCES INTO VALUE

Domestication of *Zataria multiflora* Boiss. (Shirazi Thyme) in Oman- Proposed Protocol for DUS Test

Ali H. Al Lawati

UPOV TECHNICAL WORKING PARTY FOR WORKING PARTY FOR VEGETABLE CROPS

Forty-Ninth Session, Angers, France, June 15 to 19, 2015




Overview of the presentation

- General introduction
- Collection and domestication
- General characteristics and uses
- Proposed DUS Protocol
 - Characteristics
- Conclusion




Zataria multiflora

- *Zataria* is a genus of flowering plant in the Lamiaceae family, first described in 1876.
- It contains only one known species, *Zataria multiflora*, native to southwestern Asia (Iran, Afghanistan, Pakistan)
- In Iran, they call it Shirazi Thyme
- It is found, as well, wild in northern part of Oman (Ghazanfar, 1992)


Collection from wild

- Collections of this thyme was done in the northern mountains (West Hajar and East Hajar) of the country.





Domestication






General Information about the plant


- Seed propagated
- Self-pollinated species
- Perennial
- Flowering start May and seed maturity end of June
- A shrub with maximum height of 40 cm
- Three cuts per year for foliage



Observed Characteristics



- Plant:
 - Growth habit: erect,
 - Medium tall (maximum 40 cm),
 - Medium diameter
- Stem:
 - Medium length
 - Leaves distributed in the whole plant
 - Flowering covering the whole plant





Observed Characteristics

- Leaf:
 - No variegation
 - Grey green
 - Rhombic shape
 - Short length
 - Width at the basal part broad
- Flower:
 - Small size
 - White petal






Uses


- Culinary-aromatic properties
- Medicinal plants-
 - Traditional healing-stomachache, prepared as warm tea
 - Antibacterial and other medicinal values-essential oils, e.g. (Eftekhar et.al., 2011) and (Hadian et.al., 2011)






New Species

- Not recorded in UPOV databases (GENIE database, accessed in May 22, 2015)
- Document TGP/13 "Guidance for new types and species", new species could be considered in following situations:
 - (a) species for which there have been no previous applications for protection and/or no DUS testing has been performed by the authority concerned;
 - (b) species for which there have been no previous applications for protection within UPOV







Questions

Do we need Distinctness for new species?

Do we need check for distinctness against its wild population?






Answer



TGP/13/1 (Testing distinctness)

"A variety obtained by propagation from a plant, originating from a population in the wild, of a species not in cultivation, in such a case, if the population(s) in the wild does not (do not) meet the definition of a variety according to Article 1(vi) of the 1991 Act of the UPOV Convention it is possible that there are no varieties of common knowledge".




Protocol for DUS Test

- To follow the test guideline of *Thymus vulgaris* L which include:
 - Materials required for the test
 - Procedure to conduct required tests
 - Procedures for methods and observations
 - Characteristics to be used




Materials Required

- Seed propagated: 2 grams
 - Requirements for germination, purity, health, and moisture content need to be determined and met by the applicant
- Healthy seeds means not lacking vigor or affected by any important pests or diseases.
- Information on cultural practices, e.g. date of planting, agronomic requirements... etc.




Conduct of Tests

- Growing trials over two independent growing cycles.
 - In one location
- The test should be carried out under conditions ensuring satisfactory growth for the expression of the relevant characteristics and for conduct of the examination
- Each test should be designed to result in a total of, at least 60 plants, which should be divided between two or more replicates.



Methods and Observations

- All observations determined by measurements or counting should be made on 60 plants or parts taken from each 60 plants.
- Uniformity: 1% of the tested plants within the population; for 60 plants, 3 off-types are allowed.




Characteristics

Plant

- Growth habit: erect, semi erect, prostrate
- Height: very short, short, medium, tall, very tall
- Diameter: small, medium, large

Foliage

- Density: sparse, medium, dense



Characteristics

Stem

- Length: short, medium, long
- Distribution of leaves: only at base, only in middle, only in upper part, along whole stem
- Position of flowering part: at tip, along upper quarter, along upper half, along upper two thirds, along whole stem

Time of beginning of flowering

- Very early, early, medium, late, very late



Characteristics

Leaf

- Variegation: absent, present
- Main color: yellow green, green, blue green, grey green
- Intensity of main color: light, medium, dark
- Shape: elliptic, ovate, rhombic
- Length: short, medium, long
- Width at basal part: narrow, medium, broad

Flower

- Size: small, medium, large
- Color of petal: white or slightly pink, pink, light violet, violet
- Length of style: short, medium, long




Conclusion

Ready to go..

- Other requirements for initiating the process of registration in the responsible authority will be followed.
- The breeder/developer is ready to start the process of PVP.

[Annex IV follows]

ANNEX IV


 Instituto Nacional de Investigación
 y Tecnología Agraria y Alimentaria
 CENTRO DE EVALUACIÓN DE VARIEDADES DE VALENCIA (SPAIN)
***Solanum pimpinellifolium x
 Solanum habrochaites***
A new interspecific cross for tomato rootstock
 (TWV/49 June of 2015)

There are actually 2 different guidelines for tomato rootstocks:

TG 44/11 rev. (Tomato):
 For *Solanum lycopersicum*
Solanum lycopersicum x Solanum pimpinellifolium

TG 291/1 corr. (Tomato Rootstock):
 For *Solanum lycopersicum* L. x *Solanum habrochaites*
Solanum lycopersicum L. x *Solanum peruvianum*
Solanum lycopersicum L. x *Solanum cheesmaniae*

➔ New application for National List of tomato rootstocks
Solanum pimpinellifolium x Solanum habrochaites.

Options:

- To use the TG 44/11 rev.
 - as it is
 -with additional characteristics or additional notes.
- To use the TG 291/1 corr.
 - as it is
 - with additional characteristics or additional notes.
- Need for a new TG

Differential characteristics between both TGs

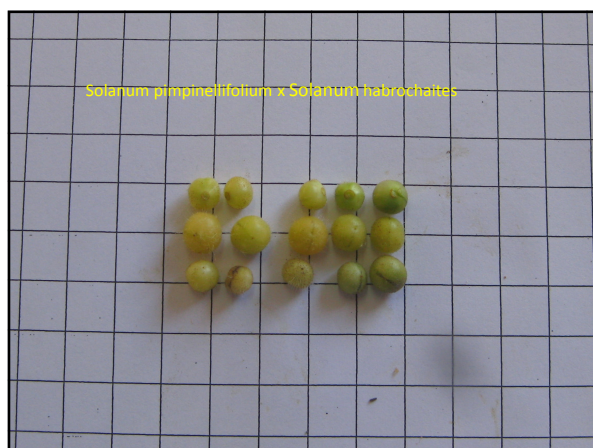
1. Characteristics in the **TG 291/1 corr.** but not in the **TG 44/11 rev.**

	<u>Variety of the new species</u>
• 14 Fruit: conspicuousness of meridian stripes	medium
• 21 Auto-necrosis	absent

2. Common characteristics but with different notes

• 26/16 Fruit: size	very small
• 37/19 Fruit: color at maturity	yellowish

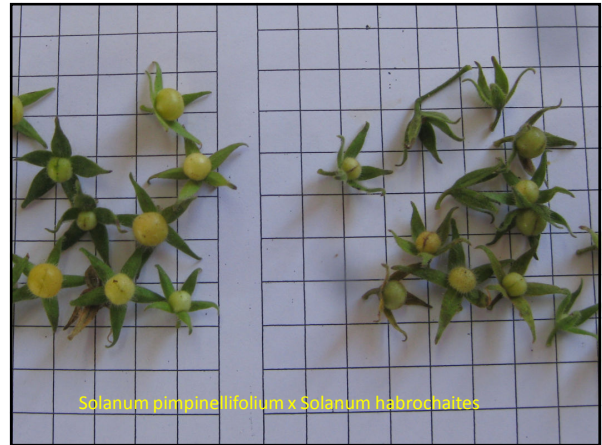
Therefore in principle the TG 291 (tomato rootstocks) seems more appropriate



Differential characteristics between both TGs

3. Characteristics in the **TG 44/11 rev** but not in the **TG 291**

2	Plant: growth type
7	Leaf: attitude
10	Leaf: type of blade
15	Leaf: attitude of petiole of leaflet in relation to main axis
16	Inflorescence: type
17	Flower: color
18	Flower: pubescence of style
19	Peduncle: abscission layer
24	Fruit: intensity of green color excluding shoulder (before maturity)
25	Fruit: green stripes (before maturity)
27	Fruit: ratio length/diameter
29	Fruit: ribbing at peduncle end
30	Fruit: depression at peduncle end
31	Fruit: size of peduncle scar
32	Fruit: size of blossom scar
33	Fruit: shape at blossom end
34	Fruit: diameter of core in cross section in relation to total diameter
35	Fruit: thickness of pericarp
38	Fruit: color of flesh (at maturity)
39	Fruit: glossiness of skin
40	Fruit: color of epidermis
42	Fruit: shelf-life



Observations on the trial

- The **leaf** is similar to those of *S. lycopersicum* L. x *S. habrochaites*
No needs the differential characteristics of leaf
- The **flower** is similar to those of *S. lycopersicum* L. x *S. habrochaites*
No needs the differential characteristics of flower
- The **fruit** is similar to those of *S. lycopersicum* L. x *S. habrochaites*
Except the *size of the fruit* that is smaller than the smallest of them
Should be needed a modification of the actual scale for the characteristic size of fruit to add the note 1 (very small)
- The percentage of flowers that develop fruit is very low compared with varieties of other interspecific cross. May be that in the future will be suitable to add a new characteristic to describe this trait.

PROVISIONAL CONCLUSIONS:

- The TG 291/1 corr. of Tomato Rootstocks should be modified to include the species *Solanum pimpinellifolium* x *Solanum habrochaites* in the scope of the TG.
- The table of characteristics should be slightly modified .

