

Technical Working Party for Vegetables**TWV/52/14****Fifty-Second Session
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EXPERIENCES WITH NEW TYPES AND SPECIES*Document prepared by the Office of the Union**Disclaimer: this document does not represent UPOV policies or guidance*

This document contains presentations to be made at the fifty-second session of the Technical Working Party for Vegetables (TWV), as follows:

- Annex I: Presentation on *Solanum sisymbriifolium* Lam. by an expert from France
- Annex II: Presentation on *Solanum torvum* Sw. by an expert from France
- Annex III: Presentation on a new type of Kale in Japan by an expert from Japan

[Annexes follow]

GEVES DUS Expériences

NEW Species



Solanum sisymbriifolium Lam.

is commonly known as **Sticky Nightshade**,
the **Fire-and-Ice** plant, **Litchi Tomato**, or
Morelle de Balbis





Presentation at the TWV 52 – September 2018

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Some general information 1/2

included in <http://eol.org/pages/581198/details>
https://en.wikipedia.org/wiki/Solanum_sisymbriifolium

- **Plant:** annual, up to 1.5 m tall.
 - covered of **sticky hairs** that are barely visible to the naked eye and give the plant its common name of *viscid nightshade* or *sticky nightshade*.
- **Leaves :** highly dissected and both sides are covered with sharp **prickles**.
 - These are sometimes called spines or thorns, but *technically* they are **prickles** as they are outgrowths of the epidermis and not modified branches (spines).
- **Inflorescence :** in cyme of five to ten flowers, yellow stamens protruding
 - **Flowers:** large (diameter of about 5 cm), white, sometimes tinged with purple, with 5 yellow anthers held in the centre.
- **Fruits:** enclosed by a **prickly calyx**, until they are ripe, when they turn **bright red** and the calyx peels back to expose the fruit to birds and other animals which eat them and disperse the seeds.
 - A edible **red** and **globose berry** at maturity.
 - It grows in **clusters of 10 to 12 units** and looks like cherry tomato but its **sweet sour taste** is between sour cherry, lychee and tomato.
 - It contains many **seeds** about **2 mm** in diameter often resembling naturally.



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des Variétés Et des Semences

Some general information

1/2

included in <http://eol.org/pages/581198/details>
https://en.wikipedia.org/wiki/Solanum_sisymbriifolium

● Possible use

- a **trap crop** or **companion crop** to protect potatoes from potato cyst nematode.
- The **stems** and **leaves** contain **solasodine** (*poisonous alkaloid chemical compound* which makes the plant **very resistant** to many **pests and diseases**.
 - ✓ With **the exception** of  *potato beetles*
 - ✓ and *tomato worms*. 
- It can also be used as a **hedge plant** to keep animals out of a garden, because it is covered with prickles.

GEVES Experiences on the matter...

- Definition of a **National protocol** in 2018 To finalize

DUS test for **National listing** (*then UE listing*).

- **sowing**: mi- April
- **planting**: end of May

- Clearly inspired by characteristics of the **Eggplant TG/ 117/4**
- Close to the *S. torvum* National protocol

GEVES DUS Expériences

NEW Species



Solanum torvum Sw.

also known as **turkey berry, prickly nightshade, shoo-shoo bush, wild eggplant, pea eggplant, pea aubergine...and many other names**



Presentation at the TWV 52 – September 2018

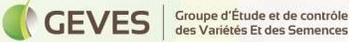
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Some general information

1/2

included in https://en.wikipedia.org/wiki/Solanum_torvum

- a **bushy, erect** and **spiny** perennial plant used horticulturally as a rootstock for eggplant.
- The **plant**: usually 2 or 3 m in height and 2 cm in basal diameter, but may reach 5m in height and 8 cm in basal diameter.
 - The **shrub** usually: a **single stem at ground level**, but it **may branch** on the lower stem.
 - The **stem bark** is **gray** and **nearly smooth** with **raised lenticels**. The inner bark has a green layer over an ivory color. The **plants** growing on firm soil, have **weak taproots and well-developed laterals**. The roots are white. **Foliage** is confined to the **growing twigs**.
 - The **twigs** are **gray-green** and covered with star-shaped hairs. The **spines** are **short and slightly curved** and vary from **thick** throughout the plant, including the leaf midrib, to entirely absent.
- The **leaves** are **opposite** or **one per node**, **broadly ovate** with the **border entire** or **deeply lobed**. The **petioles** are 1 to 6 cm long and the **blades** are 7 to 23 by 5 to 18 cm and covered with **short hairs**.



Groupe d'Étude et de contrôle
des Variétés Et des Semences

Some general information

2/2

included in https://en.wikipedia.org/wiki/Solanum_torvum

- The **flowers** are **white**, tubular with 5 pointed lobes, and grouped in **corymbiform cymes**. They are shed soon after opening.
- The **fruits** are **berries** that grow in clusters of **tiny green spheres** (ca. 1 cm in diameter) that look like **green peas**. They become **yellow** when fully ripe. They are thin-fleshed and contain numerous **flat, round, brown seeds**.
- **Reproduction**
 - **Flowering and fruiting:** **continuous** after the shrubs reach about 1 to 1.5 m in height. The seedlings are common in recently disturbed ground. Frugivorous birds eat the fruits and spread the seeds.
 - It can be **propagated vegetatively** by placing branch cuttings, with or without leaves, in a mist chamber for one month.
- **Hybrids**
 - crossed with **eggplant** in an attempt to incorporate genes for resistance to **Verticillium wilt** into the vegetable.

GEVES Experiences on the matter...

- **Definition of a National protocol in 2012**

DUS test for **National listing**
(then **UE listing**).

- **sowing:** mi-March
- **planting:** end of May

➤ Clearly inspired by some characteristics of the **Eggplant TG/ 117/4**

Seedling

- 1 anthocyanin coloration of hypo cotyl
- 2 intensity of anthocyanin coloration of hypo cotyl

Leaf blade

- 3 growth habit
- 4 height

Stem

- 5 distance from cotyledons to the node of the first flower
- 6 anthocyanin coloration
- 7 intensity of anthocyanin coloration
- 8 pubescence

Leaf blade

- 9 size
- 10 situation of margin
- 11 blistering
- 12 intensity of green colour

Inflorescence

- 13 number of flowers

Flower

- 14 size
- 15 colour of corolla

Spines

- 16 on stems
- 17 on leaves
- 18 on calyx

New type of Kale in Japan and study about Kale

Takayuki NISHIKAWA

Plant Variety Protection Office, Intellectual Property Division,
Ministry of Agriculture, Forestry and Fisheries (MAFF) Japan

New type of Kale Variety in Japan



Denomination: PURPLE VARIE

Registration number: 26981

Special characteristic: Variegation of leaf

Process of Breeding : Mutant of Curry

Kale "Scarlet"

Usage: Ornamental

Propagation method: vegetative propagation



New type of Kale Variety in Japan

Useful characteristics for describe 'PURPLE VARIE '

- 1 Variegation of leaf
- 2 Incision of margin(development of lobes) of leaf



Study about Kale

1. DUS examination for Kale in Japan
2. Basic Information about Kale
3. Possibility to expand the application range of current UPOV TG for Kale
4. Useful new characteristics for current UPOV TG for Kale
5. Interspecific/intergeneric hybrid including Kale in Japan



DUS examination for Kale in Japan

Grouping for examination

Botanical name “*Brassica oleracea* L. var. *acephala* DC.” is used for Kale in Japan.
We divide Kale to 2 groups as Hobotan(Traditional Ornamental Kale) and Kale(Vegetable Kale) for DUS examination.

Hobotan(Traditional Ornamental Kale)
National TG had been developed in 1981.
27 varieties had been registered till the end of 2017.



Kale(Vegetable Kale)
National TG had been developed in 2004 based on UPOV TG.
6 varieties had been registered till the end of 2017.



DUS examination for Kale in Japan

The application range of the National TG for Kale includes all variants in below table.

UPOV code	Botanical name (USDA_GRIN)	common name(USDA_GRIN)
BRASS_OLE_ALB	<i>Brassica oleracea</i> var. <i>alboglabra</i>	Chinese broccoli, Chinese kale
BRASS_OLE_COS	<i>Brassica oleracea</i> L. var. <i>costata</i> DC.	Bedford cabbage, braganza, Portuguese cabbage, Portuguese tree kale, seakale cabbage, Tronchuda cabbage; Tronchuda kale
BRASS_OLE_GAM	<i>Brassica oleracea</i> L. convar. <i>acephala</i> (DC.) Alef. var. <i>medullosa</i> Thell. <i>Brassica oleracea</i> L. var. <i>medullosa</i> Thell.	Marrow-stem Kale
BRASS_OLE_GAR	<i>Brassica oleracea</i> L. var. <i>ramosa</i> DC.	branching bush kale, branching cabbage, bush kale, perennial kale, perpetual kale, thousand-head kale
BRASS_OLE_GAS	<i>Brassica oleracea</i> L. convar. <i>acephala</i> (DC.) Alef. var. <i>sabellica</i> L. <i>Brassica oleracea</i> L. var. <i>sabellica</i> L.	borecole; curled kitchen kale, curly kale, Scotch kale, ornamental cabbage, ornamental kale
BRASS_OLE_GAV	<i>Brassica oleracea</i> L. convar. <i>acephala</i> (DC.) Alef. var. <i>viridis</i> L. <i>Brassica oleracea</i> L. var. <i>viridis</i> L.	Collards; Cow cabbage; Fodder Kale; Kale; Portuguese kale; Spring-heading cabbage, Tree kale
	<i>Brassica oleracea</i> L. var. <i>palmifolia</i> DC.	giant Jersey kale, Jersey kale, palm kale, palm-tree kale, tree kale



DUS examination for Kale in Japan

This table shows the number of Kale varieties which had examined and are examining in Japan. Botanical name is checked by the parent varieties.

Botanical name	number of registration variety	number of under examination variety
<i>Brassica oleracea</i> L. var. <i>sabellica</i> L.	1	1
<i>Brassica oleracea</i> L. var. <i>viridis</i> L.	0	3
<i>Brassica oleracea</i> L. var. <i>costata</i> DC x <i>viridis</i> L.	2	0
<i>Brassica oleracea</i> L. var. <i>palmifolia</i> DC x <i>viridis</i> L.	1	0
<i>Brassica oleracea</i> L. var. <i>sabellica</i> L. x <i>viridis</i> L.	0	1
(<i>Brassica oleracea</i> L. var. <i>costata</i> DC x <i>viridis</i> L.) x var. <i>palmifolia</i> DC	1	0
details unkown	1	0



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DUS examination for Kale in Japan

Basic cultivation way of examination for Kale at the Unzen station

Type of cultivation: open field

Cultivation period: August to November (4 months)

Sowing: Sowing to tray (128 cells) at the end of July

Transplanting: Transplanting to 7.5cm pot about 10days after sowing

Planting: Planting at the beginning of September about 30days after sowing

Number of plant: seed propagation variety: 32, vegetative propagation variety: 17

Spacing: 1row, interval:60cm, bed width:100cm

Observation: Observation at the beginning of November, when the plants grow enough for harvest and leaf color is still green.



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Basic Information about Kale

The range of Kale is very wide

Life cycle: annual~perennial

Height: 0.3~4m

Flowering: 1st year ~ 3rd year

Main Use part: leaf



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GRIN Taxonomy for *Brassica oleracea* L. and rape kale

Botanical name	Commonname
<i>Brassica oleracea</i> var. <i>alboglabra</i>	Chinese broccoli, Chinese kale
<i>Brassica oleracea</i> var. <i>botrytis</i>	cauliflower
<i>Brassica oleracea</i> var. <i>capitata</i>	cabbage, red cabbage, white cabbage
<i>Brassica oleracea</i> L. var. <i>costata</i> DC.	Bedford cabbage, braganza, Portuguese cabbage, Portuguese tree kale, seakale cabbage, Tronchuda cabbage, Tronchuda kale
<i>Brassica oleracea</i> var. <i>gemmifera</i>	Brussels sprouts
<i>Brassica oleracea</i> var. <i>gongylodes</i>	cabbage turnip , kohlrabi,
<i>Brassica oleracea</i> var. <i>italica</i>	asparagus broccoli, broccoli, sprouting broccoli
<i>Brassica oleracea</i> var. <i>medullosa</i>	marrow-stem kale
<i>Brassica oleracea</i> var. <i>oleracea</i>	wild cabbage
<i>Brassica oleracea</i> var. <i>palmifolia</i>	giant Jersey kale, Jersey kale, palm kale, palm-tree kale, tree kale
<i>Brassica oleracea</i> var. <i>ramosa</i>	branching bush kale, branching cabbage, bush kale, perennial kale, perpetual kale, thousand-head kale
<i>Brassica oleracea</i> var. <i>sabauda</i>	Savoy cabbage
<i>Brassica oleracea</i> var. <i>sabellica</i>	borecole; curled kitchen kale, curly kale, Scotch kale, ornamental cabbage, ornamental kale
<i>Brassica oleracea</i> var. <i>viridis</i>	Collards; Cow cabbage; Fodder Kale; Kale; Portuguese kale; Spring-heading cabbage, Tree kale
<i>Brassica napus</i> L. subsp. <i>napus</i> var. <i>pabularia</i> (DC.) Alef.	Hanover-salad, rape kale, Siberian kale



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Possibility to expand the application range of current UPOV TG for Kale

**It would be difficult to make a common TG for Kale
because the range of Kale is very wide.
But if it is possible
to set limited cultivation for DUS examination
it is possible
to cover wider range of kale by one TG.**

**We never cultivate tomato
for over one year
for DUS examination.**



Possibility to expand the application range of current UPOV TG for Kale



Possibility to expand the application range of current UPOV TG for Kale

Merit

to promote international harmonization for kale
to make it easy to choice TG
for unknown variant varieties
for interviant hybrid varieties

Demerit

Difficult to make TG (we need long time and much information)
Completeness lowers and the needs to revise becomes higher

**If we agree with above demerit and limited cultivation approach,
I would like to make a draft TG for kale.**

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Possibility to expand the application range of current UPOV TG for Kale

Our experience of examination for Kale

Brassica oleracea L. var. sabellica L. :
34 registration varieties (include NL:24)

Brassica oleracea L. var. viridis L. :
5 registration varieties (GB)

Brassica oleracea L. var. medullosa Thell.
5 registration varieties(include DE:3)

Data from Pluto database

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Possible range to discuss to apply the TG for kale based on our experience

UPOV code	Botanical name (USDA_GRIN)	common name(USDA_GRIN)	common name (UPOV_GENIE)
BRASS_OLE_ALB	Brassica oleracea var. alboglabra	Chinese broccoli, Chinese kale	Chinese broccoli; Chinese kale
BRASS_OLE_COS	Brassica oleracea L. var. costata DC.	Bedford cabbage, braganza, Portuguese cabbage, Portuguese tree kale, seakale cabbage, Tronchuda cabbage; Tronchuda kale	Bedford cabbage; Braganza; Portugese cole; Portuguese kale; Seakale cabbage; Tronchuda cabbage; Tronchuda kale
BRASS_OLE_GAM	Brassica oleracea L. convar. acephala (DC.) Alef. var. medullosa Thell. Brassica oleracea L. var. medullosa Thell.	Marrow-stem Kale	Marrow-stem Kale
BRASS_OLE_GAR	Brassica oleracea L. var. ramosa DC.	branching bush kale, branching cabbage, bush kale, perennial kale, perpetual kale, thousand-head kale	branching bush kale; branching cabbage; perennial kale; perpetual kale; thousand-head kale
BRASS_OLE_GAS	Brassica oleracea L. convar. acephala (DC.) Alef. var. sabellica L. Brassica oleracea L. var. sabellica L.	borecole; curled kitchen kale, curly kale, Scotch kale, ornamental cabbage, ornamental kale	Borecole; Curly Kale; Dwarf Siberian kale; Kitchen kale; Scotch kale
BRASS_OLE_GAV	Brassica oleracea L. convar. acephala (DC.) Alef. var. viridis L. Brassica oleracea L. var. viridis L.	Collards; Cow cabbage; Fodder Kale; Kale; Portuguese kale; Spring-heading cabbage, Tree kale	Collards; Cow cabbage; Fodder Kale; Kale; Spring-heading cabbage; Tall kale; Tree kale
	Brassica oleracea L. var. palmifolia DC.	giant Jersey kale, Jersey kale, palm kale, palm-tree kale, tree kale	
BRASS_NAP_PAB	Brassica napus L. subsp. napus var. pabularia (DC.) Alef.	Hanover-salad, rape kale, Siberian kale	Hanover-salad, rape kale, Siberian kale



Useful new characteristics for current UPOV TG for Kale

At least following characteristics are necessary to be added to current TG for Curry Kale.

1. **Variegation of leaf for assessment of PURPLE VARIE**
2. **Incision of margin (development of lobes) of leaf**



Interspecific/intergeneric hybrid including Kale in Japan



Brussels sprouts × Habotan
TG: Habotan



Broccoli × Kale
TG: Broccoli



for BUS examination



Daikon × Kale
TG: (Pending)



Brussels sprouts × Kale
TG: Brussels sprouts



Kale × Wild rocket
TG: Kale (provisional)



for Commercial

Cabbage × Kale
TG: Kale



Thank you for your attention