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China Published Final Standard for Edible Vegetable Oil Seeds

Report Categories:
FAIRS Subject Report

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Report Highlights:

On November 13, 2015, China's National Health and Family Planning Commission (NHFPC) published the National Food Safety Standard for Edible Vegetable Oil Seeds (GB 19641-2015). This standard will be implemented on November 13, 2016. A draft of the standard was notified to the WTO as SPS CHN 648 in March 2014. Please note that the comment process has ended and that this standard is considered final. The following report contains an unofficial translation of the final standard.

General Information:
BEGIN TRANSLATION

National Food Safety Standard Edible Vegetable Oil Seeds

Preface

This standard replaces GB 19641-2005 "Hygiene Standard for Vegetable Oil Seeds". In comparison with the GB 19641-2005, this standard presents the following changes:

- Name of this standard was changed to "National Food Safety Standard - Edible Vegetable Oil Seeds";
- Modified the organoleptic requirements
- Modified the physical and chemical indexes;
- Added Appendix.

National Food Safety Standard Edible Vegetable Oil Seeds

1 Scope

This standard applies to the oil seeds for production of edible vegetable oil.

2 Terms and Definitions

2.1 Moldy kernels

Inedible kernels with obvious mildew; the embryo, endosperm or cotyledons are visibly damaged, which do not suit for consumption.

3 Technical Requirements

3.1 Organoleptic Requirements

The organoleptic requirements shall conform to the provisions of Table 1.

Table 1 Organoleptic Requirements

Items	Index	Analysis Method
Luster and smell	Has the normal luster and smell of this kind of products	GB/T5492
Moldy kernels /% Soybea	1.0	Pick out the moldy kernel according to the provisions for inspection of imperfect grain in GB/T5494, weigh and calculate the content

n ≤ Others ≤	2.0	

3.2 Limit of toxic and harmful fungi and plant seeds

Limits of toxic and harmful fungi and plant seeds shall comply with the provisions in Table 2.

Table 2 Limit of poisonous and harmful fungi and plant seeds

Items	Index	Analysis Method
Seeds of datura and other poisonous plants a/(grain/kg) Soybean, rapeseed ≤	1	Appendix A
Ergot /% Rapeseed ≤ Others	0.05 May not be detected	Appendix B
[a] Crotalaria spp., Agrostemma githago L., Ricinus communis L. and other recognized seeds that are harmful to health.		

3.3 Contaminant Limit and Mycotoxin Limit

3.3.1 The limits of contaminants shall comply with the provisions of GB 2762.

3.3.2 The limits of mycotoxins shall comply with the provisions of GB 2761.

3.4 Pesticide Residue Limits

The pesticide residue shall comply with provisions of GB 2763.

4 Others

Labeling of transgenic edible vegetable oil seeds shall comply with the relevant provisions.

Appendix A Test Methods for Datura Seed

A.1 Identification

A. 1.1 Morphological characteristics

Datura seeds are round, oblong, kidney-shaped, triangular kidney-shaped or oval-shaped broad ovate, and are about 3 mm~5 mm in length and 2.5 mm~4.0 mm in width. It is flat in both sides and rather thick or thicker in back, with smooth edges or sinuous ridges. It has leathery seed capsule and is pale yellow, brown, tan to dark brown, and has slightly wrinkled surface, or is slightly (obviously)

concave, with (or without) coarse texture and socket. Hila are long and triangular, deltoid or T-shape, and sometimes their surfaces are often covered with remnant white suspensor. Seed contains a wealth of white endosperm, and the embryo is often annular or campylotropous, and few are straight. Figure A.1 are all types of datura seeds photo.

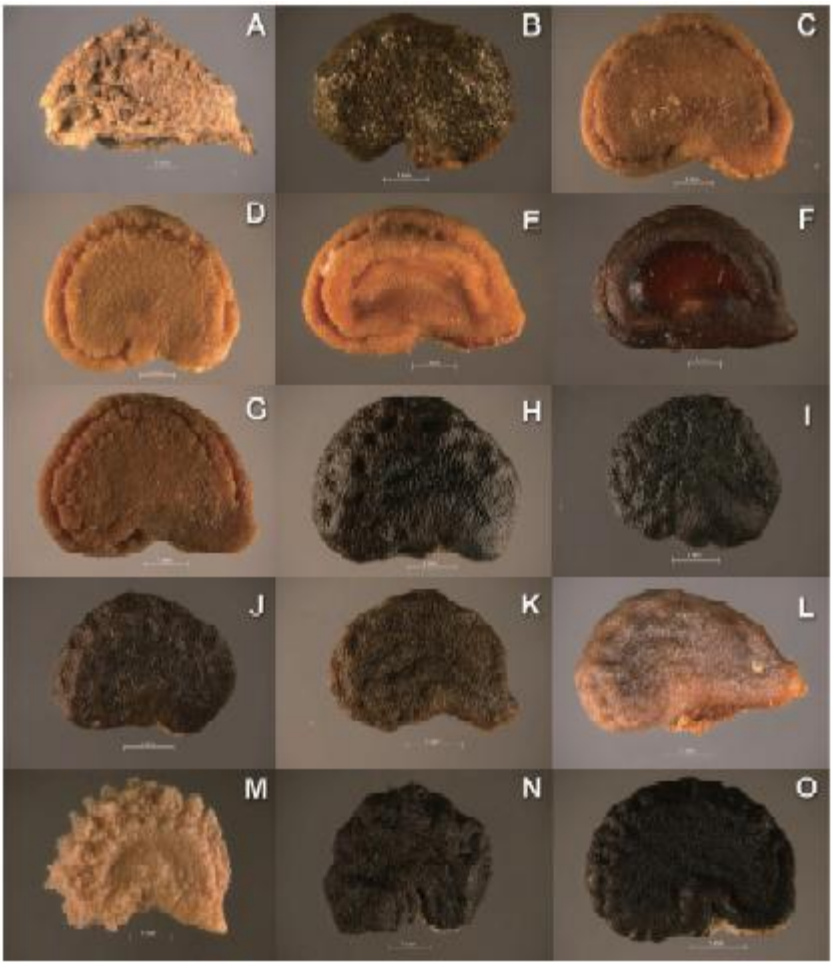

Figure A.1 Photo of Datura Seed [1]

A.1.2 Determination

One with morphological characteristics described in A.1.1 can be identified as Datura.

A.2 Alkaloids qualitative colorimetric test

A.2.1 Principle

Atropine and other alkaloids contained in samples have color reaction with fuming nitric acid and potassium hydroxide solution after they were extracted.

A.2.2 Reagents

A.2.2.1 Ammonia water (1 + 1).

A.2.2.2 Ether.

A.2.2.3 Hydrochloric Acid (1 + 5).

A.2.2.4 Chloroform.

A.2.2.5 Anhydrous Sodium Sulfate.

A.2.2.6 Fuming Nitric Acid.

A.2.2.7 KOH - Ethanol Solution (100g/L).

A.2.3 Analysis Step

Place approximately 30 datura seeds in a mortar, add ammonia water(1 + 1) to wet, then grind into a viscous state, add ether and grind for three times, 10mL in each time, combine ether in a separating funnel, add 10mL hydrochloric acid (1 + 5), shake and extract for 1min, separate hydrochloric acid layer to another separating funnel, add ammonia water(1 + 1) and adjust to alkalescence, shake and extract 1mm with 10mL chloroform, and repeat this step one more time, combine the obtained chloroform layers, concentrate with anhydrous sodium sulfate to 0.5mL, and set aside.

Take 0.2mL sample solution to a small evaporating dish, evaporate the solvent to dry, add 4 drops of fuming nitric acid to dissolve the residue, evaporate to dry on a water bath until the residue become yellow, add a few drops of potassium hydroxide - ethanol solution (100g/L) after its cooling, its color turns violaceum purple, then turns red. Atropine, hyoscyamine and scopolamine have all this reaction.

A.3 Qualitative TLC Method

A.3.1 Principle

After atropine and other alkaloids contained in the sample were extracted, separate by thin layer, then develop with chromogenic reagent, and finally compare with the control standards.

A.3.2 Reagents

A.3.2.1 Silica gel G thin layer plate: 0.3 mm~0.5 mm in thickness, activate under 105°C for 1h, set aside in a dryer.

A.3.2.2 Developing solvent: methanol - aqueous ammonia (200 + 3).

A.3.2.3 Reagent: Weigh 0.85g bismuth hypo-nitrate, add 10mL glacial acetic acid, and add 40mL water to dissolve. Take 5mL, add 5mL potassium iodide solution (4g potassium iodide dissolved in 5mL water), and add 20mL glacial acetic acid, and dilute with water to 100mL.

A.3.2.4 Atropine standard solution: Weigh 120.0mg atropine sulfate, dissolve in 10mL water, add ammonia (1 + 1) to alkaline, extract twice with chloroform, 8mL each; chloroform extract is dried with a small amount of anhydrous sodium sulfate, filter into 20mL colorimetric tube that has plug, and then wash the filter with a small amount of chloroform, and the wash liquid is combined into the colorimetric tube, add chloroform to 20mL, each milliliter of this solution is equivalent to 5.0mg atropine.

A.3.2.5 Scopolamine standard solution: Weigh 145.0mg scopolamine hydrobromide, dissolve in 10mL water, add ammonia water (1 + 1) to alkaline, extract twice with chloroform, 8mL each; chloroform extract is dried with a small amount of anhydrous sodium sulfate, filter into 20mL colorimetric tube that has plug, and then wash the filter with a small amount of chloroform, and the wash liquid is combined into the colorimetric tube, add chloroform to 20mL, each milliliter of this solution is equivalent to 5.0mg scopolamine.

A.3.3 Analysis Steps

At 2 cm of the lower end of TLC plate, drop 10 μL of atropine and scopolamine standard solution and 30 μL~100 μL concentrate extract of sample, each spacing 1.5 cm, which is placed in a developing slot that is pre-saturated with the developing agent, when the solvent front develops up to 10 cm~15 cm, remove and evaporate the developing agent to dry, spray chromogenic agent, when it shows orange-red spots, it is a positive reaction.

Appendix B Ergot Test Methods

B.1 Identification

B.1.1 Morphological Characteristics

Ergot is elongated strip or banana-shaped, and sometimes it is slightly flat, 3mm~10mm in length, and 1mm~7mm in thickness, and black or purple in outside, with longitudinal grooves and transverse cracks. It is brittle and easily broken, and its section is flat, blunt polygonal or oval, while the center is white, gray or pink and white. Sclerotia may germinate and produce stroma after dormancy; infertile stroma has a slender stalk and a flat spherical head, with 1mm~2 mm in diameter, which is red-brown, and grows raw perithecium at outer edge.

B. 1.2 Tissue sections

Soak ergot in water for 24h, expand it, nip in the middle of potato or carrot to secure and cut with small scalpel to into small slices that are thin as much as possible, color with methylene blue solution (1g/L) and observe under microscope, which shows its well organized tissue.

B.2 Qualitative Tests for Ergot Red Pigment and Ergot Alkaloids

B.2.1 Reagents

B.2.1.1 Tartaric Acid Solution (20g/L).

B.2.1.2 Anhydrous Ether.

B.2.1.3 Saturated Sodium Bicarbonate Solution.

B.2.1.4 Ammonia Water (1 + 1).

B.2.1.5 Chloroform.

B.2.1.6 p-Dimethylaminobenzaldehyde solution: Weigh 0.125g p-dimethylaminobenzaldehyde, add 100mL dilute sulfuric acid (pour 65mL sulfuric acid slowly into 35mL water, mix and cool) to dissolve, then add 0.1mL ferric chloride solution (50g/L), and mix.

B.2.1.7 Anhydrous ethanol: observe at 365nm wavelength under ultraviolet light, it is without fluorescence.

B.2.2 Analysis step

Place 20 suspected ergots in mortar, and adds tartaric acid solution (20g/L) and grind to viscous, grind carefully for three times with ether, 10mL each, combine ether layers in a test tube, and leave the residue in a mortar. Add 0.5mL saturated sodium bicarbonate solution in a test tube, shake, and the sodium bicarbonate solution layer turns red, which means that ergot red is detected.

Take the remained residues, add ammonia water (1 + 1) and grind to alkaline, extract for three times with chloroform, 10mL each, combine chloroform layer and divide into two parts. One part is carefully added with 2mL dimethylaminobenzaldehyde solution, and it shows a blue-violet ring at contact surface between the two liquid layers, after a few minutes, chloroform layer changes into blue, which means that ergot alkaloids are detected. Another part of chloroform extract is placed in a test tube, and chloroform evaporates out on a hot water bath, while the residue is dissolved with ethanol and is observed under UV light at a wavelength of 365nm, showing a strong blue fluorescence, which means that the ergot alkaloids are detected.

B.3 Formula

Weigh 1000g (rn1) sample, and weigh after ergot is detected (m2), both accurate to 1g. Ergot content (w) shall be represented in mass fraction (%), and shall be calculated according to the following formula (B.1):

$$w = m_1 / m_2 \times 100\% \qquad \text{(B.1)}$$

Where:

w-- Ergot content in sample, %;

m2-- Ergot mass in samples in grams (g);

m1-- Sample mass, in grams (g).

Results shall keep three significant figures.

Reference

[1] BYE, SOSAV. Molecular Phylogeny of the Jimsonweed Genus Datura (Solanaceae) [J].SystematicBotany,2013,38(3) :818-829.

END OF TRANSLATION