INTERNATIONAL STANDARD

ISO 11178

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Star anise (*Illicium verum* Hook. f.) — Specification

*Badiane (Anis étoilé) (*Illicium verum *Hook. f.) — Spécifications*

Reference number
ISO 11178:1995(E)

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 11178 was prepared by Technical Committee ISO/TC 34, *Agricultural food products*, Subcommittee SC 7, *Spices and condiments*.

Annex A forms an integral part of this International Standard. Annexes B and C are for information only.

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Star anise (*Illicium verum* Hook. f.) — Specification

1 Scope

This International Standard specifies requirements for the dried fruits of the star anise tree (*Illicium verum* Hook. f.).

Recommendations relating to the conditions of storage and transport are given in annex B.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 927:1982, *Spices and condiments — Determination of extraneous matter content.*

ISO 928:1980, *Spices and condiments — Determination of total ash.*

ISO 939:1980, *Spices and condiments — Determination of moisture content — Entrainment method.*

ISO 948:1980, *Spices and condiments — Sampling.*

ISO 6571:1984, *Spices, condiments and herbs — Determination of volatile oil content.*

3 Description (see figures 1 and 2)

Star anise is the dried mature fruit of the evergreen tree *Illicium verum* Hook. f., of the family *Illiaceae*. The fruit usually comprises eight boat-shaped follicles, each 12 mm to 15 mm in length, arranged radially around a central stalk.

4 Requirements

4.1 Colour

The colour of star anise shall be brownish red or reddish brown.

4.2 Odour and flavour

Star anise has a characteristic odour and an aromatic, sweet and anise-like flavour.

4.3 Freedom from insects, moulds, etc.

Star anise shall be free from living insects and shall be practically free from moulds, dead insects, insect fragments and rodent contamination visible to the naked eye (corrected, if necessary, for abnormal vision) or with such magnification as may be necessary in any particular case. If the magnification exceeds × 10, this fact shall be mentioned in the test report.

4.4 Extraneous matter

For the purposes of this International Standard, all that does not belong to the star anise fruit and all other extraneous matter of animal, vegetable or mineral origin shall be considered as extraneous matter.

The total percentage of extraneous matter in star anise shall not be more than 2 % (*m/m*). The proportion of stalks shall not be more than 3 % (*m/m*) when determined by the method specified in ISO 927.

4.5 Broken and abnormal fruits

Broken fruits are classed as fruits which contain fewer than five follicles, while abnormal or undeveloped fruits are categorized as those containing three or more under-developed follicles. The proportion of

broken and abnormal fruits shall not be more than 25 % (*m/m*) when tested by the method specified in annex A.

4.6 Number of fruits per 100 g

The number of star anise fruits shall not be less than 130 per 100 g when tested by the method specified in annex A.

4.7 Chemical requirements

Star anise shall comply with the requirements specified in table 1 when tested by the specified method.

Table 1 — Chemical requirements of star anise

Characteristic	Requirement	Test method
Moisture content, % (*m/m*), max.	10	ISO 939
Total ash, % (*m/m*) on dry basis, max.	4	ISO 928
Volatile oils, % (ml/100 g) on dry basis, min.	8	ISO 6571

NOTE 1 An example of a typical gas chromatogram of the volatile oil of star anise is shown in annex C.

5 Sampling

Sampling shall be carried out as specified in ISO 948.

6 Test methods

Samples of star anise shall be analysed to ensure conformity with the requirements of this International Standard by following the methods of physical and chemical analysis specified in 4.3 to 4.7.

7 Packing and marking

7.1 Packing

Star anise shall be packed in clean and sound packages made of a material which does not affect the product but which protects it from the ingress or loss of moisture and volatile matter.

7.2 Marking

The following particulars shall be marked directly on each package or on a label attached to the package:

a) name of the product and tradename;

b) name and address of the producer or packer, or trademark;

c) code or batch number;

d) net mass;

e) producing country;

f) destination, i.e. name of the port or the city;

and, if required,

g) any other information requested by the purchaser, such as the year of harvest and the date of packing (if known);

h) reference to this International Standard.

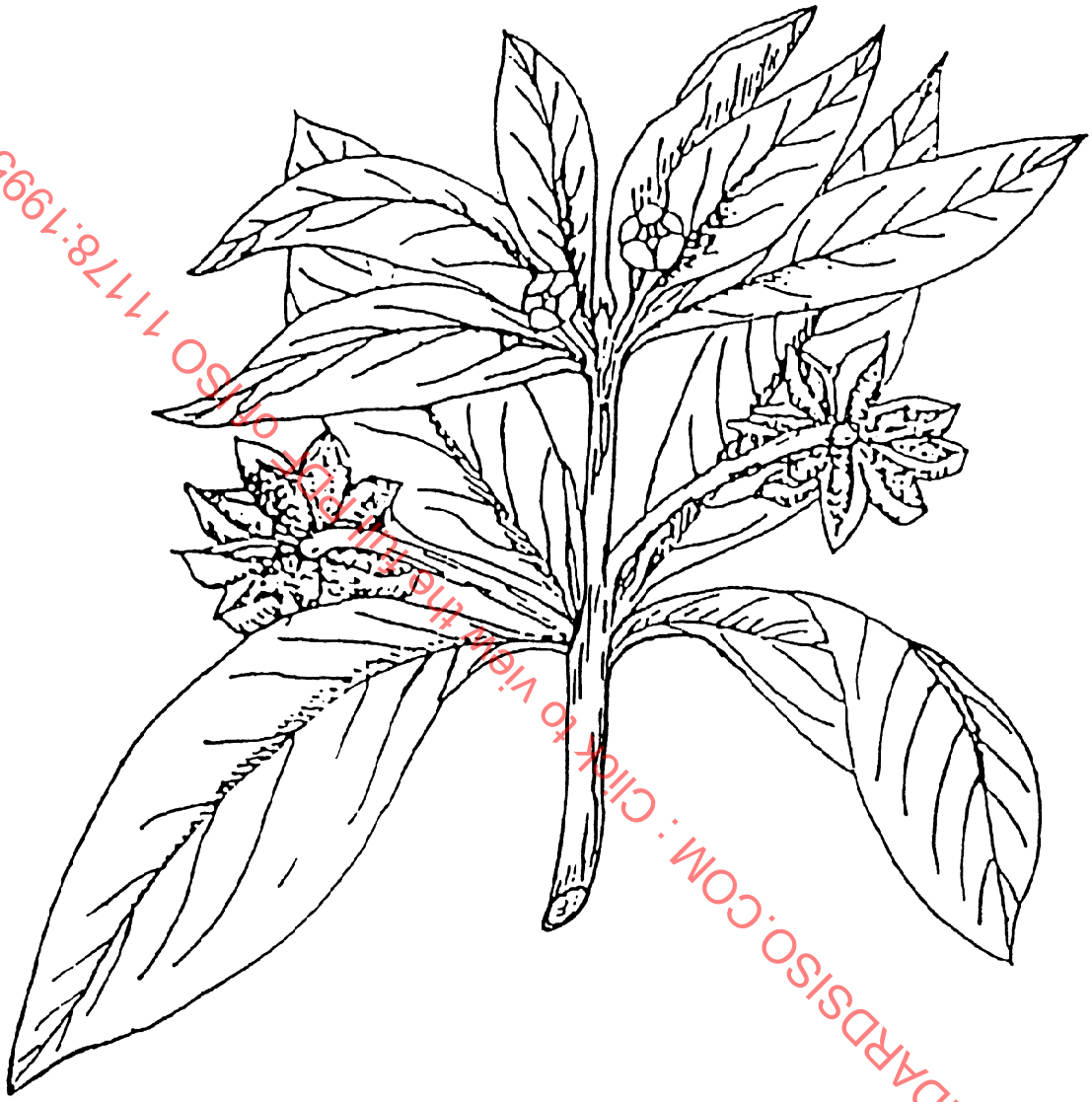
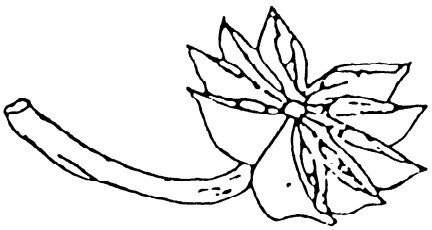
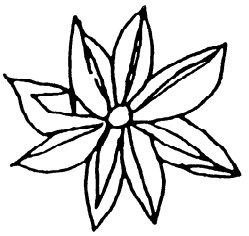


Figure 1 — Twig of star anise tree with fruit and flower



a) Back of fruit



b) Front of fruit

c) Stalk

d) Crushed fruit and seed

Figure 2 — Schematic details of various parts of the star anise fruit

Annex A
(normative)

Method for the determination of the number of fruits of star anise per 100 g and the content of broken and abnormal fruits

A.1 Principle

Determination by counting the number of whole fruits in a 100 g sample. Separation and weighing of the broken and abnormal fruits contained in that sample.

A.2 Apparatus

A.2.1 Weighing balance, capable of weighing to an accuracy of ± 1 g.

A.2.2 Cloth, for loading sample.

A.3 Number of fruits per 100 g

A.3.1 Procedure

Weigh a 100 g sample of star anise in accordance with the method given in ISO 948. Count the number of whole fruits (see 4.5).

A.3.2 Expression of results

A whole fruit has eight follicles. Fruit containing fewer than eight follicles can be regarded as a whole fruit if the number of follicles is made up to eight with the follicles in the broken fruit. If the number of follicles left at the end of counting equals or exceeds five, these can be considered as one fruit.

A.4 Content of broken and abnormal fruits

A.4.1 Procedure

Spread out the 100 g sample used in A.3, then place on the cloth (A.2.2) the broken and abnormal fruits. Weigh these and record the result.

A.4.2 Expression of results

The content of broken and abnormal fruits, expressed as a percentage by mass, is equal to

$$\frac{m_1}{m_0} \times 100$$

where

m_0 is the mass, in grams, of the sample of star anise (A.3.1);

m_1 is the mass, in grams, of broken and abnormal fruits of star anise (A.4.1).

Annex B
(informative)

Recommendations for the storage and transport of star anise

B.1 The storeroom should be dry, clean and well-ventilated, and free from objectionable odour.

B.2 If a stack of star anise is temporarily stored in the open air, covering materials should be used to protect the stack from rain and sun. The distance between the bottom of the stack and the ground level should be more than 30 cm.

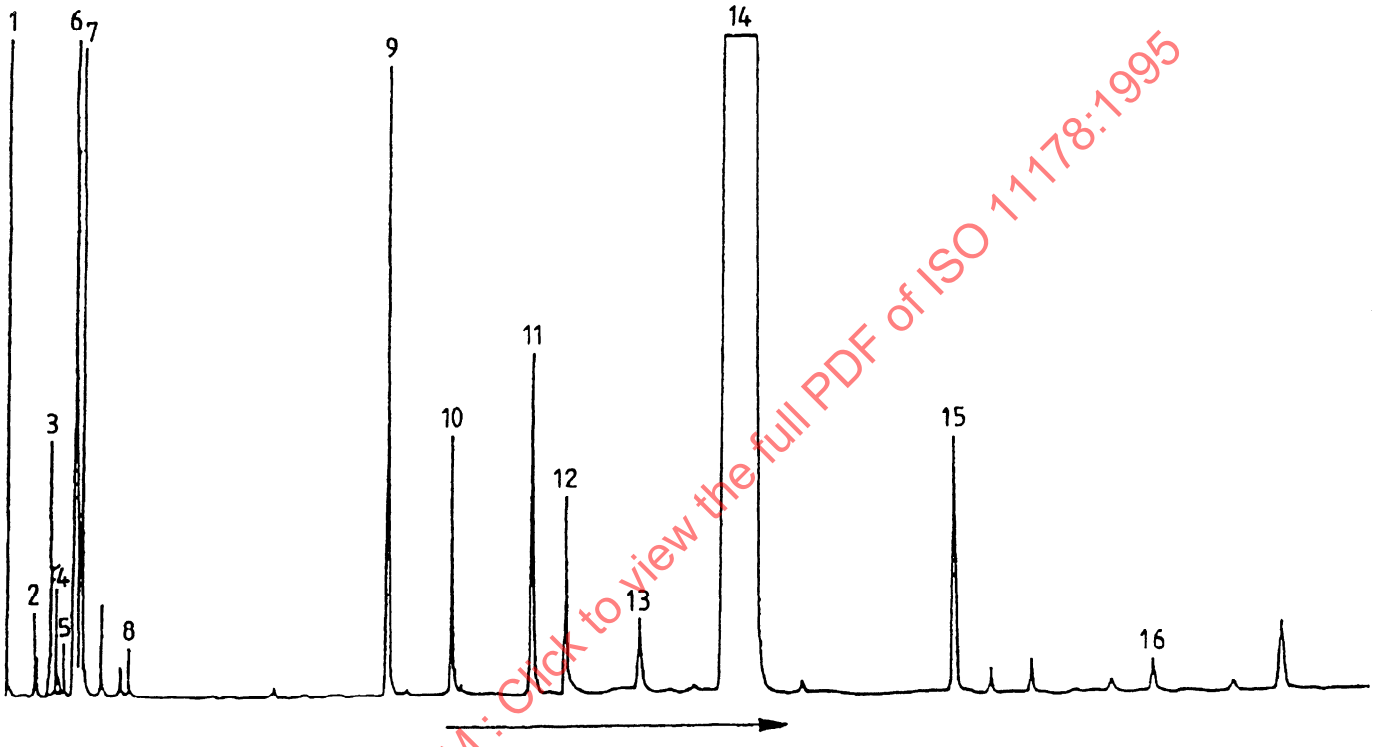
B.3 The transport carrier should be clean, dry and free from objectionable odour.

B.4 The containers of star anise should be protected from moisture and rain during transportation.

B.5 The containers of star anise should be carefully handled to avoid crushing.

Annex C
(informative)

Example of the gas chromatographic analysis of the volatile oil of star anise fruit



Operation conditions
Column: capillary, fused silica, length 60 m, internal diameter 0,24 mm
Stationary phase: polyethylene glycol 20 000
Oven temperature: initially 80 °C then increasing 2 °C/min up to 180 °C
Temperature of injector: 230 °C
Temperature of detector: 230 °C
Detector: flame ionization
Carrier gas: nitrogen
Volume injected: 0,2 µl

Peak identification

1	α-Pinene
2	Carene
3	β-Pinene
4	α-Phellandrene
5	α-Terpinene
6	Limonene
7	1,8-Cineol
8	*trans*-β-Ocimene
9	Linalol
10	Terpinen-4-ol
11	Methylchavicol
12	α-Terpineol
13	*cis*-Anethol
14	*trans*-Anethol
15	Anisaldehyde
16	Methyl-iso-eugenol