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Traditional Chinese medicine — *Lycium barbarum* and *Lycium chinense* fruit

Médecine traditionnelle chinoise — Baie de goji (baie de Lycium barbarum *et de* Lycium chinense*)*

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Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 249, *Traditional Chinese medicine*.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

Lycium barbarum and *Lycium chinense* fruit, commonly called Lycium fruit or *Lycii Fructus*, is the dried fruit of *Lycium barbarum* Linné or *Lycium chinense* Mill. (Fam. Solanaceae). Lycium fruit was firstly recorded in the book '*Divine Farmer's Classic of Materia Medica*', and it has a long history in China, Korea, Japan and other Southeast Asian nations, where it is used to nourish the liver and kidneys and replenish essence to improve vision. Clinically, owing to its medicinal properties, it plays an important role in the treatment of diseases such as immune suppression, cancer and diabetic retinopathy.

Additionally, *Lycium barbarum* and *Lycium chinense* fruit, with its sweet taste and warming property, is widely used in functional food and cosmetics. Lycium fruit and its finished products also have a very high reputation worldwide for their effectiveness, and account for a large market share in the international trade of Chinese herbal medicines.

Lycium barbarum and *Lycium chinense* fruit is widely cultivated in the northwest of China, Korea and Canada, among other places. However, the quality of Lycium fruit provided from different areas or by different cultivators is quite different. In addition, though *Lycium barbarum* and *Lycium chinense* fruit has been recorded in several pharmacopeia and standards, specifications and quality requirements in these standards vary. Thus, there is a clear and urgent need to develop an international standard for harmonizing the existing standards, as well as ensuring the safety and effectiveness of *Lycium barbarum* and *Lycium chinense* fruit.

As national implementation may differ, national standards bodies are invited to modify the values given in 5.3, 5.4, 5.5, 5.6, 5.8 and Clause 9 in their national standards. Examples of national and regional values are given in Annex E.

Traditional Chinese medicine — *Lycium barbarum* and *Lycium chinense* fruit

1 Scope

This document specifies the minimum requirements and test methods for *Lycium barbarum* and *Lycium chinense* fruit, which is derived from the plant of *Lycium barbarum* L. or *Lycium chinense* Mill.

It is applicable to *Lycium barbarum* and *Lycium chinense* fruit that is sold and used as herbal raw materials in the international trade, including unprocessed and traditionally processed materials.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 1575, *Tea — Determination of total ash*

ISO 1577, *Tea — Determination of acid-insoluble ash*

ISO 18664, *Traditional Chinese Medicine — Determination of heavy metals in herbal medicines used in Traditional Chinese Medicine*

ISO 20409, *Traditional Chinese medicine — Panax notoginseng root and rhizome*

ISO 21371, *Traditional Chinese medicine — Labelling requirements of products intended for oral or topical use*

ISO 22258, *Traditional Chinese medicine — Determination of pesticide residues in natural products by GC*[1)]

ISO 22590, *Traditional Chinese medicine — Determination of sulfur dioxide in natural products by titration*[2)]

World Health Organization *Quality control methods for herbal materials,* 2011

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

3.1
***Lycium barbarum* fruit**
dried ripe fruit of *Lycium barbarum* L. (Fam. Solanaceae)

3.2
***Lycium chinense* fruit**
dried ripe fruit of *Lycium chinense* Mill. (Fam. Solanaceae)

1) Under preparation. Stage at the time of publication: ISO/FDIS 22258:2020.

2) Under preparation. Stage at the time of publication: ISO/DIS 22590:2020.

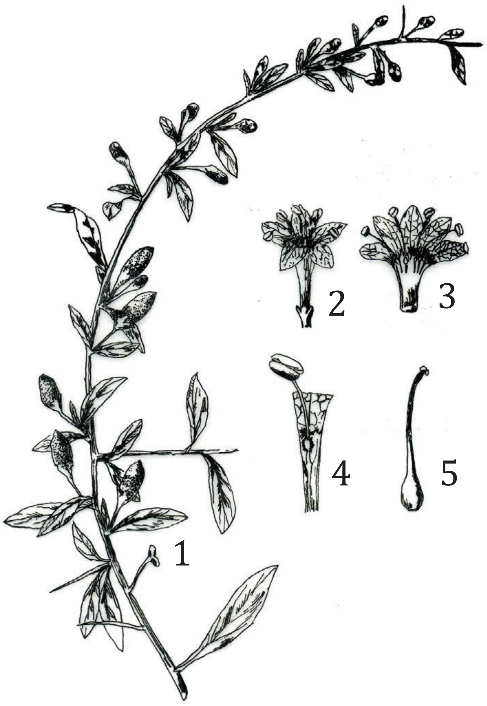
3.3
batch
samples collected from the same particular place at the same time, of no more than 1 000 kg

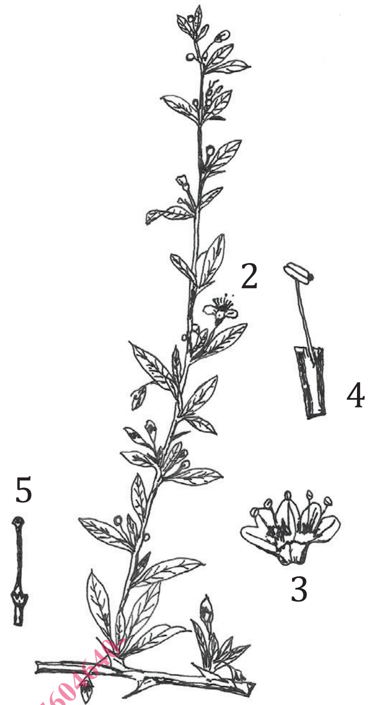
3.4
final sample
samples for the test required in this document

Note 1 to entry: Final samples may be packed in different materials meeting conditions for specific tests (e.g. moisture or total ash).

4 Descriptions

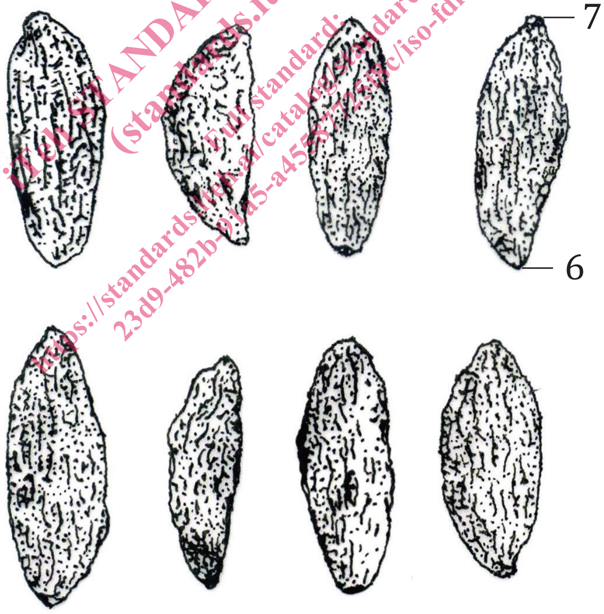
The structure of *Lycium barbarum* L., *Lycium chinense* Mill. and the dried ripe fruit are shown in Figure 1. Different features such as leaves, flowers and fruits in *Lycium barbarum* L. and *Lycium chinense* Mill., and methods for differentiating these two species, are given in Annex F.





a) Plant of *Lycium barbarum* L.

b) Plant of *Lycium Chinese* Mill.



c) Dried ripe fruits (upper: *Lycium barbarum* fruit; lower: *Lycium chinense* fruit)

Key

1 fruit spur

2 flower

3 corolla expended to show stamens

4 stamen

5 pistil
6 pistil stalk scar
7 fruit stalk scar

Figure 1 — Structure of *Lycium barbarum* and *Lycium chinense* fruit

5 Requirements

5.1 Morphological features

5.1.1 Appearance

The fruit is nearly fusiform or elliptical. Pericarp is soft and externally roughly wrinkled. Sarcocarp is pulpy, soft and tender.

5.1.2 Colour

The external surface is red or dark red with a pistil stalk scar (6) at the apex and a white fruit stalk scar (7) at the base, as in Figure 1 c).

5.1.3 Dimensions

The fruit is 6 mm to 20 mm in length measured from the base to the end of the fruit and 3 mm to 10 mm in diameter measured at the base of the fruit.

5.1.4 Fracture

20 to 50 seeds are present inside one fruit, kidney-shaped and nearly flat, ca. 2 mm; the external surface of the seeds is pale yellow or yellowish brown in the fruit of *Lycium barbarum* L., while the seeds in one fruit of *Lycium chinense* Mill. are numerous, kidney-shaped and nearly flat, 2,5 mm to 3 mm; the external surface colour of the seeds is yellow.

5.1.5 Odour

The odour is slight, and the taste is at first sweet and then slightly bitter for *Lycium chinense* fruit, and sweet and not bitter for *Lycium barbarum* fruit.

5.2 Microscopic characteristics

See Figure 2. The powder is yellowish-orange or reddish-brown. Epidermal cells of outer pericarp (1) are polygonal or elongated-polygonal, about 60 µm in diameter, with straight or slightly wavy walls, covered with a thick cuticle, with distinct, more-or-less parallel striations. Parenchymatous cells of mesocarp (2) are thin-walled subpolygonal, containing reddish-orange or brownish-red spherical aleurone granules (3). Fragments of starchy endosperm cells (4) contain oil droplets. Stone cells of testa (5) are irregular polygonal, with distinct striations, thickened or slightly wavy walls.