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Ground (powdered) paprika (*Capsicum annuum* Linnaeus) — Microscopical examination

*Paprika (*Capsicum annuum *Linnaeus)* en poudre — *Examen au microscope*

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Foreword

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Ground (powdered) paprika (*Capsicum annuum* Linnaeus) — Microscopical examination

1 Scope and field of application

This International Standard describes the morphological and anatomical structure of paprika (*Capsicum annuum* Linnaeus) and specifies a method for the microscopical examination of ground (powdered) paprika.

2 Reference

ISO 7540, *Ground (powdered) paprika* (Capsicum annuum *Linnaeus) — Specification.*

3 Definitions

3.1 paprika : The whole fruit of paprika, consisting of the pericarp, the seeds, the peduncle, the calyx and the placenta.

3.2 ground [powdered] paprika : The product obtained by grinding varieties of dried ripe paprika.

4 Structure of paprika

4.1 Description and morphological structure

Paprika is an inflated berry. Several varieties of paprika having different shapes, are cultivated. Ground (powdered) paprika is produced from long or short cylindro-conical varieties.

The pericarp is relatively thin, slightly juicy, coriaceous on the outside, and with a smooth red or dark red surface when mature.

The fruit is loculated by a septum into two, three or, sometimes, four parts which are well developed in the lower part of the fruit and flatten towards the apex, so that the upper part of the fruit is unilocular.

The semi-spherical shaped central placenta is in the lower part of the fruit where the majority of the seeds develop. Seeds appear to a lesser extent on the septum. The seeds are 2,8 to 4,5 mm in length, flat ovoid or kidney shaped and thicker at the edges. The open-edged hilum is at the ventral side of the seed. The seeds are of a yellowish-white or yellowish-brown colour, with a fine, glittering surface, slightly darker towards the edges.

The calyx is attached to the lower part of the fruit; its shape is characteristic of the variety. In general, it is formed by five fused peaked sepals. The calyx is a prolongation of the peduncle, of which the shape and the length are characteristic of the variety. The fruit may be upright, hanging or side-ways.

The placenta, the calyx and the peduncle are together called the "stalk".

4.2 Anatomical structure (see figure 1)

The anatomical structure of paprika can be more or less recognized in the ground product. The cells of the epidermis (exocarp) of the pericarp are flat and polygonal when viewed from above, the walls being thicker at the corners and slightly pitted. Their outer surface is covered with a thick cuticula, where sharp, transverse furrows can be observed, especially in vertical sections.

In the mesocarp, two parts can be distinguished : on the outside, the hypodermis adjoining the epidermis, and on the inside, the fleshy pericarp.

The hypodermis is uni- or multi-seriate : its cells, like the epidermis, are thicker at the corners and are slightly pitted, the walls being suberized and yellow. Inside the hypodermis, there is a layer of wider parenchyma cells whose walls become progressively thinner, but which are not suberized and in which, in varieties of paprika which are red when mature, contain red chromatoplasts. When not quite mature, globoid starch particles may be seen.

Dispersed throughout the fleshy pericarp, fibro-vascular bundles of ringed, spiral and spotted vessels can be seen.

On the inner side of the mesocarp, so called "giant" cells, of diameter 1 to 2 mm, can be seen, separated by layers of thin walled cells which cannot be recognized in the ground product.

The endocarp, composed of a single layer of cells, is immediately adjacent to the giant cells. This consists of two kinds of cells :

a) thick walled, yellow "bead string" sclerous cells, which are more or less elongated and parallel to the axis of the fruit, and which appear undulated when viewed from above; they are slightly lignified and grouped under the giant cells;