

## BotaniCERT® Botanical Reference Materials

Increase accuracy and efficiency of your identity and authenticity assessment of plant materials



Plant-based products are widely used for herbal medicinal drugs, dietary supplements or cosmetic applications. The complexity and the natural variations of the chemical composition of plants pose big challenges to quality control and authenticity confirmation of botanical products.

It can be very challenging to confirm the plant species and the correct plant part of a botanical material. This opens door for intended or unintended adulteration or mislabeling of materials of plant origin.

Chemical analysis testing for plant-specific markers is crucial but often not sufficient to unambiguously confirm the species and plant parts. Other characteristics like aspect and DNA data must be considered as well to complement chemical fingerprint data.

With the recent addition of BotaniCERT® botanical reference materials, we are enriching our already comprehensive offering of phytochemical standards

BotaniCERT® botanical reference materials are samples of plants or plant parts (leaf, root, rhizome, fruit,

flower, seed etc.) authenticated by organoleptic criteria, macroscopic and microscopic examination, HPTLC and HPLC phytochemical fingerprint and genetic markers by PCR. They are given with 2 or 3 markers (ITS, matK, rbcL) and DNA sequences are reported.

The materials are sourced from botanical gardens, collected by botanical experts during the flowering period, and analyzed by seasoned phytochemists and geneticists.

All products are provided as 5g samples and a detailed Certificate of Analysis — with related pictures, chromatograms, and DNA sequences, is available.

Using a Botanical Reference Material in an identification analysis allows for calibration of methods and improves the accuracy of the result obtained.

Find all BotaniCERT® products at [SigmaAldrich.com/botanicert](https://sigmaaldrich.com/botanicert)

Find our entire range of phytochemical reference materials at [SigmaAldrich.com/medicinalplants](https://sigmaaldrich.com/medicinalplants)

| Product  | Name                              | Plant Part           | Family          | English Name (US)    |
|----------|-----------------------------------|----------------------|-----------------|----------------------|
| BOTB9121 | <i>Allium ursinum</i>             | Leaf                 | Amaryllidaceae  | Wild garlic          |
| BOTB9282 | <i>Apium graveolens</i>           | Leaves and stems     | Apiaceae        | Celery               |
| BOTB9142 | <i>Artemisia annua</i>            | Aerial parts         | Asteraceae      | Sweet wormwood       |
| BOTB9089 | <i>Artemisia vulgaris</i>         | Leaf                 | Asteraceae      | Mugwort              |
| BOTB9092 | <i>Bixa orellana</i>              | Seed                 | Bixaceae        | Achiote              |
| BOTB9081 | <i>Calendula officinalis</i>      | Flower               | Asteraceae      | Pot-marigold         |
| BOTB9073 | <i>Calluna vulgaris</i>           | Flower               | Ericaceae       | Heather              |
| BOTB9007 | <i>Carum carvi</i>                | Fruit                | Apiaceae        | Caraway              |
| BOTB9040 | <i>Citrus × aurantium</i>         | Pericarp             | Rutaceae        | Bitter orange        |
| BOTB9038 | <i>Cola nitida</i>                | Seed                 | Malvaceae       | Cola                 |
| BOTB9384 | <i>Coriandrum sativum</i>         | Fruit                | Apiaceae        | Coriander            |
| BOTB9059 | <i>Desmodium adscendens</i>       | Leaf                 | Fabaceae        | Clover savannah      |
| BOTB9009 | <i>Echinacea purpurea</i>         | Root                 | Asteraceae      | Purple coneflower    |
| BOTB9011 | <i>Eleutherococcus senticosus</i> | Root                 | Araliaceae      | Siberian ginseng     |
| BOTB9118 | <i>Eschscholzia californica</i>   | Aerial parts         | Papaveraceae    | Californian poppy    |
| BOTB9058 | <i>Eucalyptus globulus</i>        | Leaf                 | Myrtaceae       | Blue gum             |
| BOTB9052 | <i>Frangula purshiana</i>         | Bark                 | Rhamnaceae      | Cascara buckthorn    |
| BOTB9032 | <i>Fraxinus excelsior</i>         | Leaf                 | Oleaceae        | European ash         |
| BOTB9024 | <i>Glycyrrhiza glabra</i>         | Root                 | Fabaceae        | Liquorice            |
| BOTB9106 | <i>Griffonia simplicifolia</i>    | Seed                 | Caesalpiniaceae | Griffonia            |
| BOTB9103 | <i>Gymnema sylvestre</i>          | Leaf                 | Apocynaceae     | Gymnema              |
| BOTB9014 | <i>Hamamelis virginiana</i>       | Leaf                 | Hamamelidaceae  | American witch-hazel |
| BOTB9015 | <i>Harpagophytum procumbens</i>   | Root                 | Pedaliaceae     | Devil's claw         |
| BOTB9062 | <i>Hibiscus sabdariffa</i>        | Calyx and epicalyx   | Malvaceae       | Jamaican sorrel      |
| BOTB9114 | <i>Hoodia gordonii</i>            | Stem slice           | Apocynaceae     | Hoodia               |
| BOTB9405 | <i>Humulus lupulus</i>            | Female inflorescence | Cannabaceae     | Hops                 |
| BOTB9080 | <i>Illicium anisatum</i>          | Fruit                | Schisandraceae  | Japanese star anise  |
| BOTB9082 | <i>Lamium album</i>               | Flowering top        | Lamiaceae       | White nettle         |
| BOTB9018 | <i>Lepidium meyenii</i>           | Root powder          | Brassicaceae    | Maca                 |
| BOTB9150 | <i>Melilotus officinalis</i>      | Aerial parts         | Fabaceae        | Yellow melilot       |
| BOTB9016 | <i>Melissa officinalis</i>        | Leaf                 | Lamiaceae       | Lemon balm           |
| BOTB9217 | <i>Mentha spicata</i>             | Leaf                 | Lamiaceae       | Spearmint            |
| BOTB9037 | <i>Mentha x piperita</i>          | Leaf                 | Lamiaceae       | Peppermint           |
| BOTB9056 | <i>Ocimum basilicum</i>           | Leaf                 | Lamiaceae       | Basil                |
| BOTB9151 | <i>Orthosiphon aristatus</i>      | Leaf                 | Lamiaceae       | Java Tea             |
| BOTB9130 | <i>Panax ginseng</i>              | Flower               | Araliaceae      | Ginseng              |
| BOTB9135 | <i>Panax japonicus</i>            | Root                 | Araliaceae      | Japanese ginseng     |
| BOTB9020 | <i>Pimpinella anisum</i>          | Fruit                | Apiaceae        | Anise                |
| BOTB9061 | <i>Piper methysticum</i>          | Rhizome and Root     | Piperaceae      | Kava kava            |
| BOTB9071 | <i>Plantago lanceolata</i>        | Leaf                 | Plantaginaceae  | Narrow-leaf plantain |
| BOTB9070 | <i>Plantago major</i>             | Leaf                 | Plantaginaceae  | Great plantain       |
| BOTB9397 | <i>Rhodiola crenulata</i>         | Root and rhizome     | Crassulaceae    |                      |
| BOTB9119 | <i>Ribes nigrum</i>               | Leaf                 | Grossulariaceae | Blackcurrant         |
| BOTB9029 | <i>Rosa canina</i>                | Hips                 | Rosaceae        | Rose hip             |
| BOTB9064 | <i>Sambucus nigra</i>             | Flower               | Adoxaceae       | Elder                |
| BOTB9243 | <i>Silybum marianum</i>           | Aerial parts         | Asteraceae      | Milk thistle         |
| BOTB9244 | <i>Silybum marianum</i>           | Seeds                | Asteraceae      | Milk thistle         |
| BOTB9046 | <i>Taraxacum officinale</i>       | Root                 | Asteraceae      | Dandelion            |
| BOTB9060 | <i>Thymus vulgaris</i>            | Leaf                 | Lamiaceae       | Garden Thyme         |
| BOTB9160 | <i>Urtica dioica</i>              | Root and rhizome     | Urticaceae      | Common nettle        |
| BOTB9254 | <i>Vaccinium myrtillus</i>        | Leaves               | Ericaceae       | Bilberry             |
| BOTB9047 | <i>Valeriana officinalis</i>      | Rhizome and root     | Caprifoliaceae  | Common valerian      |
| BOTB9098 | <i>Verbena officinalis</i>        | Aerial parts         | Verbenaceae     | Vervain              |
| BOTB9021 | <i>Vitis vinifera</i>             | Leaf                 | Vitaceae        | Wine grape           |
| BOTB9057 | <i>Zingiber officinale</i>        | Rhizome              | Zingiberaceae   | Ginger               |

A list of BotaniCERT® Botanical Reference Materials (BRMs) is available at [SigmaAldrich.com/botanicert](https://SigmaAldrich.com/botanicert)  
All products are provided in quantities of 5g.

