

NATURAL HEALTH PRODUCT

CASSIA – *CINNAMOMUM AROMATICUM*

This monograph is intended to serve as a guide to industry for the preparation of Product Licence Applications (PLAs) and labels for natural health product market authorization. It is not intended to be a comprehensive review of the medicinal ingredient.

Notes

- ▶ Text in parentheses is additional optional information which can be included on the PLA and product label at the applicant's discretion.
- ▶ The solidus (/) indicates that the terms and/or statements are synonymous. Either term or statement may be selected by the applicant.

Date December 18, 2018

Proper name(s), Common name(s), Source material(s)

Table 1. Proper name(s), Common name(s), Source material(s)

Proper name(s)	Common name(s)	Source material(s)		
		Proper name(s)	Part(s)	Preparation(s)
<i>Cinnamomum aromaticum</i>	<ul style="list-style-type: none">▶ Cassia▶ Cassia cinnamon▶ Chinese cinnamon▶ Chinese cinnamon tree▶ Rou Gui	<i>Cinnamomum aromaticum</i>	<ul style="list-style-type: none">▶ Branch bark▶ Stem bark▶ Trunk bark	Dried

References: Proper name: USDA 2018, McGuffin et al. 2000; Common name: USDA 2018, Brinker 2010, Chen and Chen 2004, Blumenthal et al. 2000, McGuffin et al. 2000; Source material: PPRC 2010, Crawford 2009, BHC 2006, Mang et al. 2006, Bensky et al. 2004, Chen and Chen 2004, Khan et al. 2003, Blumenthal et al. 2000, 1998.

Route of administration

Oral

Dosage form(s)

This monograph excludes foods or food-like dosage forms as indicated in the Compendium of Monographs Guidance Document.

Acceptable dosage forms for the age category listed in this monograph and specified route of administration are indicated in the Compendium of Monographs Guidance Document.

Use(s) or Purpose(s)

BRANCH, STEM or TRUNK BARK

- ▶ Helps to support/maintain healthy blood glucose levels (Davis and Yokoyama 2011; Crawford 2009; Mang et al. 2006).
- ▶ Source of/Provides antioxidants (Gruenwald et al. 2010; Roussel et al. 2009; Halvorsen et al. 2006; Shan et al. 2005).
- ▶ (Traditionally) used in Herbal Medicine for digestive disturbances/dyspeptic complaints/indigestion, such as mild spasms of the gastrointestinal tract, bloating and flatulence (BHC 2006; Blumenthal et al. 2000, 1998).
- ▶ (Traditionally) used in Herbal Medicine for loss of appetite (BHC 2006; Blumenthal et al. 2000, 1998).

TRUNK BARK only

- ▶ Used in Traditional Chinese Medicine to dispel cold, relieve pain, open channels and collaterals (PPRC 2010; Bensky et al. 2004; Chen and Chen 2004).
- ▶ Used in Traditional Chinese Medicine to dispel cold, warm the spleen and relieve pain (PPRC 2010; Bensky et al. 2004; Chen and Chen 2004).
- ▶ Used in Traditional Chinese Medicine to encourage production of Qi and blood (PPRC 2010; Bensky et al. 2004; Chen and Chen 2004).
- ▶ Used in Traditional Chinese Medicine to tonify kidney yang, augment *ming men* (life gate) fire (PPRC 2010; Bensky et al. 2004; Chen and Chen 2004).

The following combined use(s) or purpose(s) is/are also acceptable:

- ▶ Used in Traditional Chinese Medicine to dispel cold, relieve pain, open channels and collaterals and warm the spleen (PPRC 2010; Bensky et al. 2004; Chen and Chen 2004).
- ▶ Used in Traditional Chinese Medicine to encourage production of Qi and blood, augment *ming men* (life gate) fire and tonify kidney yang (PPRC 2010; Bensky et al. 2004; Chen and Chen 2004).

Note

Claims for traditional use must include the term “Herbal Medicine”, “Traditional Chinese Medicine”, or “Ayurveda”.

Dose(s)

Subpopulation(s)

Adults 18 years and older

Quantity(ies)

BRANCH, STEM or TRUNK BARK

Methods of preparation: Dry, Powder, Non-Standardised Ethanolic Extracts (Dry extract, Tincture, Fluid extract)

Antioxidant

Not to exceed 6 grams of dried bark, per day and 4 grams per single dose (Gruenwald et al. 2010; Roussel et al. 2009; Halvorson et al. 2006; Shan et al. 2005).

Appetite loss; Digestive disturbances/Indigestion

1 - 6 grams of dried bark, per day; Not to exceed 4 grams per single dose (Gruenwald et al. 2010; Al Jamal et al. 2009; Crawford 2009; Mang et al. 2006; Safdar et al. 2004; Khan et al. 2003).

Healthy glucose

3 - 6 grams of dried bark, per day; Not to exceed 4 grams per single dose (Davis and Yokoyama 2011; Gruenwald et al. 2010; Crawford 2009; Mang et al. 2006).

TRUNK BARK only

Traditional Chinese Medicine claims

Method of preparation: Decoction

2 - 5 grams of dried trunk bark, per day (PPRC 2010; Bensky et al. 2004; Chen and Chen 2004).

Methods of preparation: Dry, Powder, Non-Standardised Ethanolic Extracts (Dry extract, Tincture, Fluid extract)

1 - 2 grams of dried trunk bark, per day (PPRC 2010; Bensky et al. 2004; Chen and Chen 2004).

Direction(s) for use

Appetite loss

Take 30 minutes before meals.

Digestive disturbances/Indigestion

Take with food/meal (Crawford 2009).

Duration(s) of use

Products providing 4-6 g of branch, stem or trunk bark, per day

Consult a health care practitioner/health care provider/health care professional/doctor/physician for use beyond 6 weeks (Safdar et al. 2004; Khan et al. 2003).

Risk information

Caution(s) and warning(s)

Appetite loss; Digestive disturbances/Indigestion; Traditional Chinese Medicine claims

Consult a health care practitioner/health care provider/health care professional/doctor/physician if symptoms persist or worsen.

Products providing 1 g or more of branch, stem or trunk bark, per day

Consult a health care practitioner/health care provider/health care professional/doctor/physician prior to use if you are breastfeeding or have diabetes (NS 2018; Brinker 2010; Blumenthal et al. 2000; WHO 1999).

Contraindication(s)

Products providing 1 g or more of branch, stem or trunk bark, per day

Do not use this product if you are pregnant (Brinker 2010; PPRC 2010; BHC 2006; Chen and Chen 2004; Blumenthal 2000, 1998).

Traditional Chinese Medicine claims

Do not use this product if you have excess heat, yin-deficient fire, or bleeding caused by heat in the blood (PPRC 2010; Chen and Chen 2004).

Known adverse reaction(s)

Stop use if hypersensitivity/allergy occurs (Blumenthal 2000; WHO 1999; McGuffin et al. 1997).

Non-medicinal ingredients

Must be chosen from the current Natural Health Products Ingredients Database (NHPID) and must meet the limitations outlined in the database.

Storage conditions

No statement required.

Specifications

- ▶ The finished product specifications must be established with the requirements described in the Natural and Non-prescription Health Products Directorate (NNHPD) Quality of Natural Health Products Guide.
- ▶ The medicinal ingredient must comply with the requirements outlined in the NHPID.

References cited

Al Jamal AR. Effects of cinnamon on blood glucose and lipid levels in diabetic patients (type 1). African Journal of Biochemistry Research 2009;3(5):181-184.

Bensky D, Clavey, Stöger E, Gamble A. Chinese Herbal Medicine: Materia Medica. 3rd edition. Seattle (WA): Eastland Press, Incorporated; 2004.

BHC 2006: Bradley PR, editor. British Herbal Compendium Volume 2: A Handbook of Scientific Information on Widely Used Plant Drugs—Companion to the British Herbal Pharmacopoeia. Bournemouth (GB): British Herbal Medicine Association; 2006.

Blumenthal M, Goldberg A, Brinckmann J. Herbal Medicine: Expanded Commission E Monographs. Boston (MA): American Botanical Council; 2000.

Blumenthal M, editor. The Complete German Commission E Monographs: Therapeutic Guide to Herbal Medicines. Austin (TX): American Botanical Council in cooperation with Integrative Medicine Communications; 1998.

Brinker F. Herb Contraindications and Drug Interactions, 4th edition. Sandy (OR): Eclectic Medical Publications; 2010.

Chen JK, Chen TT. Chinese Medical Herbology and Pharmacology. Crampton L, editor. City of Industry (CA): Art of Medicine Press Inc.; 2004.

Crawford P. Effectiveness of cinnamon for lowering hemoglobin A1C in patients with type 2 diabetes: a randomized, controlled trial. Journal of the American Board of Family Medicine 2009; 22(5):507-512.

Davis PA, Yokoyama W. Cinnamon intake lowers fasting blood glucose: meta-analysis. Journal of Medicinal Food 2011;14(9):884-889.

Gruenwald J, Freder J, Armbruester N. Cinnamon and health. Critical Reviews in Food Science and Nutrition 2010;50(9):822-834.

Halvorsen BL, Carlsen MH, Phillips KM, Bohn SK, Holte K, Jacobs DR Jr, Blomhoff R. Content of redox-active compounds (ie, antioxidants) in foods consumed in the United States. American Journal of Clinical Nutrition 2006;84(1):95-135.

ITIS 2018: *Cinnamomum aromaticum* [2011] Integrated Taxonomic Information System (ITIS) [Internet]. [Accessed 2018 September 21]. Available from: <http://www.itis.gov>

Khan A, Safdar M, Ali Khan MM, Khattak KN, Anderson RA. Cinnamon improves glucose and lipids of people with type 2 diabetes. Diabetes Care 2003;26(12):3215-3218.

Mang B, Wolters M, Schmitt B, Kelb K, Lichtenhagen R, Stichtenoth DO, Hahn A. Effects of a cinnamon extract on plasma glucose, HbA_{1C}, and serum lipids in diabetes mellitus type 2. European Journal of Clinical Investigation 2006;36(5):340-344.

McGuffin M, Kartesz JT, Leung AY, Tucker AO, editors. Herbs of Commerce. 2nd edition. Silver Spring (MD): American Herbal Products Association; 2000.

McGuffin M, Hobbs C, Upton R, Goldberg A, editors. American Herbal Products Association's Botanical Safety Handbook. Boca Raton (FL): CRC Press LLC; 1997.

NS 2018: Cinnamon (*Cinnamomum* spp.) Natural Standard Professional Monograph [Internet]. Natural Standard Inc; 2018 [Accessed 2018 September 21]. Available from: <http://www.naturalstandard.com/>

PPRC 2010: Pharmacopoeia of the People's Republic of China. Volume 1, English edition 2010. Beijing (CN): The State Pharmacopoeia Commission of the People's Republic of China.

Roussel AM, Hininger I, Benaraba R, Ziegenfuss TN, Anderson RA. Antioxidant effects of a cinnamon extract in people with impaired fasting glucose that are overweight or obese. Journal of the American College of Nutrition 2009;28(1):16-21.

Safdar M, Khan A., Khan MMA, Siddique M. Effect of various doses of cinnamon on blood glucose in diabetic individuals. Pakistan Journal of Nutrition 2004;3:268-272.

Shan B, Cai YZ, Sun M, Corke H. Antioxidant capacity of 26 spice extracts and characterization of their phenolic constituents. Journal of Agricultural and Food Chemistry 2005;53(20):7749-7759.

USDA 2018: USDA, ARS, National Genetic Resources Program. Germplasm Resources Information Network (GRIN) [Internet]. National Germplasm Resources Laboratory, Beltsville (MD). [*Cinnamomum aromaticum* Nees (Lauraceae) Diels. Last updated: 28-Nov-2015; [Accessed 2018 September 2018]. Available from: <http://www.ars-grin.gov/>

WHO 1999: World Health Organization. WHO Monographs on Selected Medicinal Plants, Volume 1. Geneva (CH): World Health Organization; 1999.

References reviewed

American Society of Health-System Pharmacists. American Hospital Formulary Service (AHFS) Drug Information. Philadelphia (PA): Lippincott Williams and Wilkins; 2005.

Altschuler JA, Casella SJ, MacKenzie TA, Curtis KM. The effects of cinnamon on A1C among adolescence with type 1 diabetes. *Diabetes Care* 2007;30:813-816.

Anderson RA, Broadhurst CL, Polansky MM, Schmidt WF, Khan A, Flanagan VP, Schoene NW, Graves DJ. Isolation and characterization of polyphenol type-A polymers from cinnamon with insulin-like biological activity. *Journal of Agricultural and Food Chemistry* 2004;52(1):65-70.

Baker W, Gutierrez-Williams G, White CM, Kluger J, Coleman CI. Effect of cinnamon on glucose control and lipid parameters. *Diabetes Care* 2008;31:41-43.

Bandara T, Uluwaduge I, Jansz ER. Bioactivity of cinnamon with special emphasis on diabetes mellitus: a review. *International Journal of Food Sciences and Nutrition* 2012;63(3):380-386.

Blevins SM, Leyva MJ, Brown J, Wright J, Scofield RH, Aston CE. Effect of cinnamon on glucose and lipid levels in non-insulin dependent type 2 diabetes mellitus. *Diabetes Care* 2007;30:2236-2237.

Brinker F. *Herb Contraindications and Drug Interactions* (3rd Ed.). Sandy (OR): Eclectic Medical Publications; 2001.

Brinker F. *The Toxicology of Botanical Medicines*. Sandy (OR): Eclectic Medical Publications; 2000.

Broadhurst CL, Polansky MM, Anderson RA. Insulin like biological activity of culinary and medicinal plant aqueous extracts in vitro. *J Agric Food Chem* 2000;48:849-852.

Canada Vigilance Adverse Reaction Online Database. Ottawa (ON): Marketed Health Products Directorate, Health Canada; 2011. [Accessed 2011 October 27]. Available from: <http://webprod3.hc-sc.gc.ca/arquery-rechercheei/index-eng.jsp>

Canadian Nutrient File (CNF), 2012 [Internet]. Ottawa (ON): Food and Nutrition, Health Canada. [Date Modified 2012 February 2; Accessed 2012 April 12]. Available from: <http://webprod3.hc-sc.gc.ca/cnf-fce/index-eng.jsp>

Carter JS, Pugh JA, Monterrosa A. Non-insulin-dependent diabetes mellitus in minorities in the United States. *Ann Intern Med*. 1996;125(1):221–232.

Clinical Practice Guidelines for the Prevention and Management of Diabetes in Canada. Canadian Journal of Diabetes 2008;32(suppl 1).

Dugoua JJ, Seely D, Perri D, Cooley K, Forelli T, Mills E, Koren G. From type 2 diabetes to antioxidant activity: a systematic review of the safety and efficacy of common and cassia cinnamon bark. *Can. J. Physiol. Pharmacol.* 2007;85:837-847.

Facciola S. *Cornucopia II A Source Book of Edible Plants*. Vista (CA): Kampong Publications; 1998.

Hlebowicz J, Darwiche G, Björgell O, Almé LO. Effect of cinnamon on postprandial blood glucose, gastric emptying, and satiety in healthy subjects. *American Journal of Clinical Nutrition* 2007;85:1552-1556.

Hlebowicz J, Hlebowicz A, Lindstedt S, Björgell O, Höglund P, Holst JJ, et al. Effects of 1 and 3g cinnamon on gastric emptying, satiety, and postprandial blood glucose, insulin, glucose-dependent insulinotropic polypeptide, glucagon-like peptide 1, and ghrelin concentrations in healthy subjects. *American Journal of Clinical Nutrition* 2009;89:815-821.

Imparl-Radosevich J, Deas S, Polansky MM et al. Regulation of PTP-1 and insulin receptor kinase by fractions from cinnamon: implications for cinnamon regulation of insulin signalling. *Horm Res* 1998;50:177-182.

Jarvill-Taylor KJ, Anderson RA, Graves DJ. A hydroxychalcone derived from cinnamon functions as a mimetic for insulin in 3T3-L1 adipocytes. *J Am Coll Nutr.* 2001;20(4):327-326.

JEFCFA Evaluation. Summary of Evaluations Performed by the Joint FAO/WHO Expert Committee on Food Additives: Cinnamaldehyde. [Accessed 2011 October 31]. Available from http://www.inchem.org/documents/jecfa/jeceval/jec_418.htm

Joint Food and Agriculture Organization of the United Nations (FAO)/World Health Organization (WHO) Expert Committee on Food Additives. WHO Food Additives Series: 60. Safety evaluation of certain food additives. Geneva (CH): World Health Organization. 2009. Available from <http://www.inchem.org/documents/jecfa/jecmono/v60je01.pdf>

Qin B, Nagasaki M, Ren M, Bajotto G, Oshida Y, Sato Y. Cinnamon extract (traditional herb) potentiates in vivo insulin-regulated glucose utilization via enhancing insulin signaling in rats. *Diabetes Res Clin Pract.* 2003;62:139-148.

Solomon TPJ, Blannin AK. Effects of short-term cinnamon ingestion on in vivo glucose tolerance. *Diabetes Obes Metab* 2007;8:895-901.

Solomon TPJ, Blannin AK. Changes in glucose tolerance and insulin sensitivity following 2 weeks of daily cinnamon ingestion in healthy humans. *Eur J Appl Physiol.* 2009;105:969-976.

Soni R, Bhatnagar V. Effect of cinnamon (*Cinnamomum cassia*) intervention on blood glucose of middle aged adult male with non-insulin dependent diabetes mellitus (NIDDM). *Ethno-Med* 2009;3:141-144.

United Kingdom Prospective Diabetes Study (UKPDS) Group. Intensive blood-glucose control with sulphonylureas or insulin compared with conventional treatment and risk of complications in patients with type 2 diabetes (UKPDS 33). Lancet 1998;352:837-853.

USDA Nutrient Database 2011: United States Department of Agriculture (USDA), Agricultural Research Service. Nutrient Data Laboratory. Spices, cinnamon, ground. NDB. No: 02010. 2011. [Accessed 2011 October 31st]. Available from: <http://www.nal.usda.gov/fnic/foodcomp/cgi-bin/measure.pl>

Vanschoonbeek K, Thomassen BJW, Senden JM, Wodzig WKWH, van Loon LJC. Cinnamon supplementation does not improve glycemic control in postmenopausal type 2 diabetic patients. J Nutr 2006;136:977-980.

WHO 2010: World Health Organization. WHO Food Additives Series 46: Cinnamyl Alcohol and Related Substances. 2010. [Accessed 2011-10-31]. Available from: <http://www.inchem.org/documents/jecfa/jecmono/v46je07.htm>

WHO 2010: World Health Organization. WHO Food Additives Series 14: Cinnamaldehyde. 2010. [Accessed 2011 October 31st]. Available from: <http://www.inchem.org/documents/jecfa/jecmono/v14je07.htm>

Ziegenfuss TN, Hofheins JE, Mendel RW, Landis J., Anderson RA. Effects of a water-soluble cinnamon extract on body composition and features of the metabolic syndrome in pre-diabetic men and women. J Int Soc Sports Nut. 2006;3:45-53.