

PRODUIT DE SANTÉ NATUREL

REISHI – *GANODERMA LUCIDUM*

La présente monographie vise à servir de guide à l'industrie pour la préparation de demandes de licence de mise en marché (DLMM) et d'étiquettes dans le but d'obtenir une autorisation de mise en marché d'un produit de santé naturel. Elle ne vise pas à être une étude approfondie de l'ingrédient médicinal.

Nota

- Les parenthèses contiennent des éléments d'information additionnels (facultatifs) qui peuvent être inclus dans la DLMM ou sur l'étiquette du produit à la discrédition du demandeur.
- La barre oblique (/) indique que les termes et/ou énoncés sont synonymes. Le demandeur peut utiliser n'importe lequel des termes ou énoncés indiqués.

Date 25 février 2019

Nom(s) propre(s), Nom(s) commun(s), Matière(s) d'origine

Tableau 1. Nom(s) propre(s), Nom(s) commun(s), Matière(s) d'origine

Nom(s) propre(s)	Nom(s) commun(s)	Matière(s) d'origine		
		Nom(s) propre(s)	Partie(s)	Préparation(s)
<i>Ganoderma lucidum</i>	► Reishi ► Ganoderma ► Ling zhi	<i>Ganoderma lucidum</i>	► Corps fructifère ► Mycélium cultivé ► Mycélium	Séchée

Références: Nom propre: CABI 2018, PPRC 2010; Noms communs: PPRC 2010, Bensky et al. 2004, Chen et Chen 2004, McGuffin et al. 2000; Matières d'origine: PPRC 2010, Leung et Foster 2003, Yarnell et al. 2003, Wasser 2002, Flynn et Roest 1995.

Voie d'administration

Orale

Forme(s) posologique(s)

Cette monographie exclut les aliments et les formes posologiques semblables aux aliments tel qu'indiqué dans le document de référence Compendium des monographies.

Les formes posologiques acceptables pour les catégories d'âge listées dans cette monographie et pour la voie d'administration spécifiée sont indiquées dans le document de référence

Compendium des monographies.

Usage(s) ou fin(s) recommandés

Corps fructifère

- ▶ Utilisé en médecine traditionnelle chinoise (MTC) pour disperser les mucosités, enrayer la toux et la respiration sifflante (PPRC 2010; Bensky et al. 2004; Chen et Chen 2004).
- ▶ Utilisé en médecine traditionnelle chinoise (MTC) pour nourrir le cœur et renforcer le qi et le sang afin de soigner les déficiences du cœur et de la rate se manifestant par de l'insomnie, des pertes de mémoire, de la fatigue, un manque d'attention et un appétit faible (PPRC 2010; Bensky et al. 2004; Chen et Chen 2004).
- ▶ Utilisé en médecine traditionnelle chinoise (MTC) pour renforcer le corps et tonifier le qi (PPRC 2010; Bensky et al. 2004; Chen et Chen 2004).

L'(Les) usage(s) combiné(s) suivant(s) est/sont aussi acceptable(s):

Utilisé en médecine traditionnelle chinoise (MTC) pour renforcer le corps, le qi et le sang afin de soigner les déficiences du cœur et de la rate se manifestant par de l'insomnie, des pertes de mémoire, de la fatigue, un manque d'attention et un appétit faible (PPRC 2010; Bensky et al. 2004; Chen et Chen 2004).

Corps fructifère; Mycélium cultivé; Mycélium

- ▶ Source d'antioxydants/Fournit des antioxydants (Wachtel-Galor et al. 2011; Godfrey et al. 2010; Wicks et al. 2007).
- ▶ Source de polysaccharides fongiques ayant des propriétés immunomodulatrices (Chan et al. 2009 ; Wasser 2002).
- ▶ Utilisé en phytothérapie comme tonique pour le foie (Godfrey et al. 2010, Yarnell et al. 2003; Saunders 2000; Peirce 1999; Belanger 1997; Hsu et al. 1986).
- ▶ Utilisé en phytothérapie pour soutenir le système immunitaire (Wachtel-Galor et al. 2011; Godfrey et al. 2010; Ko et Leung 2007; Lin 2005; Chen et Chen 2004; Wachtel- Galor et al. 2004; Hoffmann 2003; Yarnell et al. 2003; Peirce 1999; Belanger 1997; Hsu et al. 1986).
- ▶ Utilisé en phytothérapie comme adaptogène pour aider à accroître l'énergie et la résistance au stress (en cas de fatigue mentale ou physique due au stress) (Godfrey et al. 2010; Hobbs 2003; Hoffmann 2003; Leung et Foster 1996).

Nota

Les allégations concernant un usage traditionnel doivent inclure le terme « phytothérapie », « médecine traditionnelle chinoise » ou « Ayurvédâ ».

Dose(s)**Sous-population(s)**

Adultes 18 ans et plus

Quantité(s)

Antioxydant; Source de polysaccharides

Méthodes de préparation : Sec, poudre, extraits éthanoliques normalisés (extrait sec, teinture, extrait fluide)

Ne pas dépasser 6 grammes de Reishi séché, par jour (Godfrey et al. 2010).

Méthodes de préparation: Extraits éthanoliques normalisés (extrait sec, teinture, extrait fluide)

Ne pas dépasser 6 grammes de Reishi séché, par jour et 40% de polysaccharides (Godfrey et al. 2010).

Méthode de préparation : Décoction

Ne pas dépasser 15 grammes de Reishi séché, par jour (Wachtel-Galor et al. 2011).

Méthode de préparation : Décoction normalisée

Ne pas dépasser 15 grammes de Reishi séché, par jour et 40% de polysaccharides (Wachtel-Galor et al. 2011).

Tonique du foie; Adaptogène; Médecine traditionnelle chinoise - toux - cœur - tonique du qi

Méthodes de préparation : Sec, poudre, extraits éthanoliques non-normalisés (extrait sec, teinture, extrait fluide)

1,5 à 6 grammes de Reishi séché, par jour (Bensky et al. 2004; Chen et Chen 2004; Hobbs 2003; Upton 2000; Huang 1999).

Méthodes de préparation: Extraits éthanoliques normalisés (extrait sec, teinture, extrait fluide)

1,5 à 6 grammes de Reishi séché, par jour et ne pas dépasser 40% de polysaccharides (Bensky et al. 2004; Chen et Chen 2004; Hobbs 2003; Upton 2000; Huang 1999).

Méthode de préparation : Décoction

3 à 15 grammes de Reishi séché, par jour (Godfrey et al. 2010; PPRC 2010; Bensky et al. 2004; Chen et Chen 2004).

Méthode de préparation : Décoction normalisée

3 à 15 grammes de Reishi séché, par jour et ne pas dépasser 40% de polysaccharides (Godfrey et al. 2010; PPRC 2010; Bensky et al. 2004; Chen et Chen 2004).

Soutien du système immunitaire

Méthodes de préparation : Teinture, extrait fluide

1,5 à 6 grammes de Reishi séché, par jour (Godfrey et al. 2010).

Méthodes de préparation : Teinture normalisée, extrait fluide normalisé

1,5 à 6 grammes de Reishi séché, par jour et ne pas dépasser 40% de polysaccharides

(Godfrey et al. 2010). Méthode de préparation : Décoction

3 à 15 grammes de Reishi séché, par jour (Wachtel-Galor et al. 2011; Wasser 2002).

Méthode de préparation : Décoction normalisée

3 à 15 grammes de Reishi séché, par jour et ne pas dépasser 40% de polysaccharides (Wachtel-Galor et al. 2011; Wasser 2002).

Nota

- ▶ Pour les préparations en poudre qui ne sont pas des extraits, l'allégation ‘Utilisé en phytothérapie pour soutenir le système immunitaire’ n'est pas appuyée et n'est donc pas acceptable.
- ▶ Pour les extraits normalisés, étant donné que les preuves sont principalement basées sur la quantité brute équivalente de Reishi, à la fois la quantité brute équivalente et la concentration maximale de la composante d'activité doivent être respectées.

Mode(s) d'emploi

Prendre avec de la nourriture/un repas pour éviter les problèmes digestifs (Flynn et Roest 1995).

Durée(s) d'utilisation

Énoncé non requis.

Mention(s) de risques

Précaution(s) et mise(s) en garde

Médecine traditionnelle chinoise - toux

Consulter un praticien de soins de santé/fournisseur de soins de santé/professionnel de la santé/docteur/médecin si les symptômes persistent ou s'aggravent.

Contre-indication(s)

Énoncé non requis.

Réaction(s) indésirable(s) connue(s)

Cesser l'utilisation si une hypersensibilité/allergie se manifeste (derMarderosian et Beutler 2008; Bensky et al. 2004; Gao et al. 2003, 2002).

Ingédients non médicinaux

Doivent être choisis parmi ceux de la version actuelle de la Base de données des ingrédients des produits de santé naturels (BDIPSN) et respecter les restrictions mentionnées dans cette base de données.

Conditions d'entreposage

Énoncé non requis.

Spécifications

- ▶ Les spécifications du produit fini doivent être établies conformément aux exigences décrites dans le Guide de référence sur la qualité des produits de santé naturels de la Direction des produits de santé naturels et sans ordonnance (DPSNSO).
- ▶ L'ingrédient médicinal doit être conforme aux exigences mentionnées dans la BDIPSN.

Références citées

Albers R, Antoine JM, Bourdet-Sicard R, Calder PC, Gleeson M, Lesourd B, Samartín S, Sanderson IR, Van Loo J, Vas Dias FW, Watzl B. Markers to measure immunomodulation in human nutrition intervention studies. *British Journal of Nutrition* 2005;94(3):452-481.

Belanger CA. The Chinese Herb Selection Guide: A Traditional and Modern Clinical Repertory with a Summary Materia Medica for the Health Care Practitioner. Richmond (CA): Phytotech Database Publishing Co.; 1997.

Bensky D, Clavey S, Stöger E, Gamble A, editors. Chinese Herbal Medicine: Materia Medica. 3^e édition. Seattle (WA): Eastland Press Inc; 2004.

CABI 2018: Centre for Agriculture and Bioscience International. Index Fungorum [Internet]. Wallingford (GB): CABI (Centre for Agriculture and Bioscience International); 2018. [Consulté le 28 novembre 2018]. Disponible à: <http://www.speciesfungorum.org>.

Chan GCF, Chan WK, Sze DMY. The effects of β-glucan on human immune and cancer cells. Journal of Hematology & Oncology 2009;2:25.

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

Chu TT, Benzie IF, Lam CW, Fok BS, Lee KK, Tomlinson B. Study of potential cardioprotective effects of *Ganoderma lucidum* (Lingzhi): results of a controlled human intervention trial. British Journal of Nutrition 2012;7(7):1017-1027.

derMarderosian A, Beutler JA, editors. The Review of Natural Products. “Reishi Mushroom: Date of Issue August 2008” St Louis (MO): Facts and Comparisons, Wolters Kluwer Health; Printed in 2008 and Updated to May 2012.

Flynn R, Roest M. Your Guide To Standardized Herbal Products. Prescott (AZ): One World Press; 1995.

Gao Y, Dai X, Chen G, Ye J, Zhou S. A randomized, placebo-controlled, multicenter study of *Ganoderma lucidum* (W.Curt.:Fr.) Lloyd (Aphylloromycetidae) polysaccharides (Ganopoly R) in patients with advanced lung cancer. International Journal of Medicinal Mushrooms 2003;5(4):369-381.

Gao Y, Zhou SH, Chen G, Dai X, Ye J. A phase I/II study of a *Ganoderma lucidum* (Curt.: Fr.) P. Karst. Extract (ganopoly) in patients with advanced cancer. International Journal of Medicinal Mushrooms 2002;4(3):207-214.

Godfrey A, Saunders PR, avec Barlow K, Gilbert C, Gowan M, Smith F. Principles and Practices of Naturopathic Botanical Medicine. Volume 1: Botanical Medicine Monographs. Toronto (ON): CCNM Press; 2010.

Hobbs C. Medicinal Mushrooms: An Exploration of Tradition, Healing, & Culture. Summertown (TN): Book Publishing Company; 2003.

Hoffmann D. Medical Herbalism: The Science and Practice of Herbal Medicine. Rochester (VT): Healing Arts Press; 2003.

Hsu HY, Chen YP, Shen SJ, Hsu CS, Chen CC, Chang HC. Oriental Materia Medica: a concise guide. Long Beach (CA): Oriental Healing Arts Institute; 1986. P. 640-641.

Huang KC. The Pharmacology of Chinese Herbs. Second edition. Boca Raton (FL): CRC Press; 1999.

Ko KM, Leung HY. Enhancement of ATP generation capacity, antioxidant activity and immunomodulatory activities by Chinese Yang and Yin tonifying herbs. *Chinese Medicine* 2007;27;2(3): (doi:10.1186/1749-8546-2-3).

Leung, AY, Foster, S. Encyclopedia of Common Natural Ingredients Used in Food, Drugs and Cosmetics. Second edition. Hoboken (NJ): John Wiley & Sons, Inc.; 2003.

Lin ZB. Cellular and molecular mechanisms of immuno-modulation by *Ganoderma lucidum*. *Journal of Pharmacological Sciences* 2005;99(2):144-153.

Matsumoto K. The mysterious reishi mushroom. Santa Barbara (CA): Wood bridge Press Publishing; 1979. p. 31-42.

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

Peirce A. The American Pharmaceutical Association Practical Guide to Natural Medicines. New York (NY): William Morrow and Company Inc.; 1999.

PPRC 2010: Pharmacopoeia of the People's Republic of China 2010. Volume I. Beijing (PRC): Chinese Pharmacopoeia Commission; 2010.

Saunders PR. Reishi. In: Chandler F, Bombardier C, Briggs C, Carruthers SG, McCutcheon AR, Saleh A, Saunders PR, editors. Herbs: Everyday Reference for Health Professionals. Ottawa (ON): Canadian National Printers; 2000. p. 181-184.

Upton R, editor. American Herbal Pharmacopoeia and Therapeutic Compendium: Reishi Mushroom, *Ganoderma lucidum*: Standards of Analysis, Quality Control, and Therapeutics. Santa Cruz (CA): American Herbal Pharmacopoeia; 2000.

Wachtel-Galor S, Tomlinson B, Benzie IF. *Ganoderma lucidum* ("Lingzhi"), a Chinese medicinal mushroom: biomarker responses in a controlled human supplementation study. *British Journal of Nutrition* 2004;91(2),263-269.

Wachtel-Galor S, Yuen J, Buswell JA, Benzie IFF. Chapter 9 *Ganoderma lucidum* (Lingzhi or Reishi): A Medicinal Mushroom. In: Benzie IFF, Wachtel-Galor S, editors. *Herbal Medicine: Biomolecular and Clinical Aspects*. 2nd edition. Boca Raton (FL): CRC Press; 2011.

Wasser SP. Medicinal mushrooms as a source of antitumor and immunomodulating polysaccharides. *Applied Microbiology and Biotechnology* 2002;60(3):258-274.

Wicks SM, Tong R, Wang CZ, O'Connor M, Garrison T, Li S, Moss J, Yuan CS. Safety and tolerability of *Ganoderma lucidum* in healthy subjects: a double-blind randomized placebo-

controlled trial. The American Journal of Chinese Medicine 2007;35(3):407-414.

Yarnell E, Abascal K, Hooper CG. Clinical Botanical Medicine. Larchmont (NY): Mary Ann Liebert Inc.; 2003.

Références consultées

Aydin S, Aytac E, Uzun H, Altug T, Mansur B, Saygili S, Buyukpinarbasi N, Sariyar M. Effects of *Ganoderma lucidum* on obstructive jaundice-induced oxidative stress. Asian Journal of Surgery 2010;33(4):173-180.

Bao X, Liu C, Fang J, Li X. Structural and immunological studies of a major polysaccharide from spores of *Ganoderma lucidum* (Fr.) Karst. Carbohydrate Research 2001;332(1):67-74.

Bisby FA, Roskov YR, Orrell TM, Nicolson D, Paglinawan LE, Bailly N, Kirk PM, Bourgoin T, Baillargeon G, Ouvrard D, editors. Species 2000 & ITIS Catalogue of Life: 30th April 2012 [Internet]. Reading (GB): Species 2010. [Source database Species Fungorum, 9.0, Sep 2010; Consulté le 22 mai 2012]. Disponible à: <http://www.catalogueoflife.org>

Brinker 2010: Brinker F. Final updates and additions for Herb Contraindications and Drug Interactions, 3rd edition, including extensive Appendices addressing common problematic conditions, medications and nutritional supplements, and influences on Phase I, II & III metabolism with new appendix on botanicals as complementary adjuncts with drugs. [Internet]. Sandy (OR): Eclectic Medical Publications. [Mis à jour le 13 juillet 2010; Consulté le 19 avril 2012]. Disponible à: <http://www.eclecticherb.com/emp/updatesHCDI.html>

Brinker F. Herbal Contraindications and Drug Interactions: Plus Herbal Adjuncts With Medicines, expanded 4^e édition. Sandy (OR): Eclectic Medical Publications; 2010.

Calvino E, Manjon JL, Sancho P, Tejedor MC, Herraez A, Diez JC. *Ganoderma lucidum* induced apoptosis in NB4 human leukemia cells: involvement of Akt and Erk. Journal of Ethnopharmacology 2010; 120(1):71-78.

Chan WK, Cheung CCH, Law HKW, Lau YL, Chan GCF. *Ganoderma lucidum* polysaccharides can induce human monocytic leukemia cells into dendritic cells with immuno-stimulatory function. Journal of Hematology & Oncology 2008;(1):9.

Chang HM, But PPH, editors. Pharmacology and Applications of Chinese Materia Medica. Singapore (SG): World Scientific Publishing Co.; 1986.

Chang ST, Miles P. Mushrooms: Cultivation, Nutritional Value, Medicinal Effect, and Environmental Impact. Boca Raton (FL): CRC Press; 2004.

Chang YH, Yang JS, Yang JL, Wu CL, Chang SJ, Lu KW, Lin JJ, Hsia TC, Lin YT, Ho CC, Wood WG, Chung JG. *Ganoderma lucidum* extracts inhibited leukemia WEHI-3 cells in

BALB/c mice and promoted an immune response in vivo. *Bioscience, Biotechnology, and Biochemistry* 2009;73(12):2589-2594.

Chen AW, Miles PG. Biomedical research and the application of mushroom nutraceuticals from *Ganoderma lucidum*. In: Royse DJ, editor. *Mushroom biology and mushroom products*. 1996: Proceedings of the 2nd international conference on mushroom biology and mushroom products; 1996 Jun 9-12; University Park. University Park; Penn State University; 1996. p. 161-170.

Chen WC, and Hau DM. 1995. Effects of *Ganoderma lucidum* on cellular immunocompetence in γ -irradiated mice. *Phytotherapy Research* 1995;9(7):533-535.

Cheng Z, Wang J, Shao Y, Liang Z, Ning Y, Bai Z, Dong S, Ye YV, Mori M. 1993. Effects of ling zhi on hemorrheology parameters and symptoms of hypertension patients with hyperlipidemia and sequelae of cerebral thrombosis. In: Zhu S, Mori M, editors. *The research on Ganoderma lucidum (part one)*, Volume 1, pp 339-342. Shanghai: Shanghai Med University.

Cherian E, Sudheesh NP, Janardhanan KK, Patani G. Free-radical scavenging and mitochondrial antioxidant activities of Reishi-*Ganoderma lucidum* (Curt: Fr) P. Karst and Arogyapacha-Trichopus zeylanicus Gaertn extracts. *Journal of basic and clinical physiology and pharmacology* 2009;20(4):289-307.

Chu TT, Benzie IF, Lam CW, Fok BS, Lee KK, Tomlinson B. Study of potential cardioprotective effects of *Ganoderma lucidum* (Lingzhi): results of a controlled human intervention trial. *British Journal of Nutrition* 2011;105(1):1-11. [publication électronique sous impression].

Cutten AE, Hasnain SM, Segedin BP, Bai TR, McKay EJ. The basidiomycete ganoderma and asthma: collection, quantitation and immunogenicity of the spores. *The New Zealand Medical Journal* 1988;101(847 Pt 1):361-363.

Duke JA, Godwin MJB, duCellier J, Duke PAK. *Hand Book of Medicinal Herbs*. 2^e édition. CRC Press LLC; 2002.

Folkers K, Langsjoen P, Willis R, Richardson P, Xia LJ, Ye CQ, Tamagawa H. Lovastatin decreases coenzyme Q levels in humans. *Proceedings of National Academy of Science* 1990;87(22):8931–8934.

Galor WS, Szeto YT, Tomlinson B, Benzie IF. *Ganoderma lucidum* ('Lingzhi'); acute and short-term biomarker response to supplementation. *International Journal of Food Science and Nutrition* 2004;55(1):75-83.

Galor WS, Tomlinson B, Benzie IF. *Ganoderma lucidum* ("Lingzhi"), a Chinese medicinal mushroom: biomarker responses in a controlled human supplementation study. *British Journal of Nutrition* 2004;91(2):263-269.

Gao Y, Lan J, Dai X, Ye J, Zhou SH. A phase I/II study of Ling Zhi mushroom *Ganoderma*

lucidum. (W. Curt.: Fr.) Lloyd (Aphyllophoromycetideae) extract in patients with type II diabetes mellitus. International Journal of Medicinal Mushrooms 2004;6(1):33-39.

Gao Y, Zhou S, Chen G, Dai X, Ye J, Gao H. A phase I/II study of a *Ganoderma lucidum* (Curt.:Fr.) P.Karst. (Ling Zhi, Reishi mushroom) extract in patients with chronic hepatitis B. International Journal of Medicinal Mushrooms 2000;4(4):2321-2327.

Gao Y, Zhou S. The immunomodulating effects of *Ganoderma lucidum* (Curt.:Fr.) P.Karst (LingZhi, Reishi Mushroom) (Aphylloromycetidae). International Journal of Medicinal Mushrooms 2002;2(4):1-11.

Gao Y, Zhou SH, Huang M, Xu A. Antibacterial and antiviral value of the genus Ganoderma P. Karst. Species (Aphyllophoromycetideae): a review. International Journal of Medicinal Mushrooms 2003(b);5(3):235-246.

Gau JP, Lin CK, Lee SS, Wang SR. The lack of antiplatelet effect of crude extracts from *Ganoderma lucidum* on HIV-positive hemophiliacs. American Journal of Clinical Medicine 1990;18(3-4):175-179.

Hajjaj H, Mace C, Roberts M, Niederberger P, Fay LB. Effect of 26-oxygenosterols from *Ganoderma lucidum* and their activity as cholesterol synthesis inhibitors. Applied and Environmental Microbiology 2005;71(7):3653–3658.

Hikino H, Mizuno T. Hypoglycemic actions of some heteroglycans of *Ganoderma lucidum* fruit bodies. Planta Medica 1989;55(4):385.

Hsu MJ, Lee SS, Lee ST, Lin WW. Signaling mechanisms of enhanced neutrophil phagocytosis and chemotaxis by the polysaccharide purified from *Ganoderma lucidum*. British Journal of Pharmacology 2003;139(2):289-298.

Hsu TL, Cheng SC, Yang WB, Chin SW, Chen BH, Huang MT, Hsieh SL, Wong CH. Profiling Carbohydrate-Receptor Interaction with Recombinant Innate Immunity Receptor-Fc Fusion Proteins. Journal of Biological Chemistry 2009;284(50):34479–34489.

Huie CW, Di X. Chromatographic and electrophoretic methods for Lingzhi pharmacologically active components. Journal of Chromatography B 2004;812(1-2):241-257.

Hus HY, Lian SL, Lin CC. Radioprotective effect of *Ganoderma lucidum* (Leyss ex Fr) Karst after X-ray irradiation in mice. American Journal of Clinical Medicine 1990;18(1-2):61-69.

Jan RH, Lin TY, Hsu YC, Lee SS, Lo SY, Chang M, Chen LK, Lin YL. Immuno-modulatory activity of *Ganoderma lucidum*-derived polysaccharide on human monocyteoid dendritic cells pulsed with Der p 1 allergen. BMC Immunology 2011;12(31):1-10.

Jiang J, Slivova V, Sliva D. *Ganoderma lucidum* inhibits proliferation of human breast cancer cells by down-regulation of estrogen receptor and NF-κB signaling. International Journal of

Oncology 2006;29(3):695-703.

Jin H, Zhang G, Cao X, Zhang M, Long J, Luo B, Chen H, Qian S, Mori M, Wang Z. Treatment of Hypertension by Linzhi Combined with Hypotensor and Its Effects on Arterial, Arteriolar and Capillary Pressure Microcirculation, in Microcirculatory Approach to Asian Traditional Medicine: Strategy for the Scientific Evaluation. Excerpta Medica, International Congress Series Elsevier: Amsterdam, NY; 1996. p. 131-138.

Jong SC, Birmingham JM. Medicinal benefits of the mushroom Ganoderma. Advances in Applied Microbiology 1992;37:101-134.

Joseph S, Sabulal B, George V, Simina TP, Janardhanan KK. Antioxidative and anti-inflammatory activities of the chloroform extract of *Ganoderma lucidum* found in South India. Scientia Pharmaceutica 2009;77:111-121.

Karaman MA, Mimica-Dukic NM, Matavulj MN. Lignicolous fungi as potential natural sources of antioxidants. Archives of Biological Sciences 2005;57(2):93-100.

Kawagishi H, Fukuhara F, Sazuka M, Kawasima A, Mistsubori T, Tomita T. 5'deoxy-5'-methylsulphinyladenosine, a platelet aggregation inhibitor from *Ganoderma lucidum*. Phytochemistry 1993;32(2):239-241.

Kim DH, Shim SB, Kim NJ, Jang IS. Beta-glucuronidase inhibitory activity and hepatoprotective effect of *Ganoderma lucidum*. Biological & Pharmaceutical Bulletin 1999;22(2),162-164.

Kim HS, Kacew S, Lee BM. In vitro chemopreventive effects of plant polysaccharides (Aloe barbadensis miller, *Lentinus edodis*, *Ganoderma lucidum*, and *Coriolus versicolor*). Carcinogenesis 1999;20(8):1637-1640.

Kupin V. A new biological response modifier *Ganoderma lucidum* and its application in oncology. In: Proceedings of the 4th international symposium on *Ganoderma lucidum*; 1992 June 10; Seoul, Place of publication unavailable: Cancer Res Ctr; 1992. P. 49-50.

Lee JM, Kwon H, Jeong H, Lee JW, Lee SY, Baek SJ, Surh YJ. Inhibition of lipid peroxidation and oxidative DNA damage by *Ganoderma lucidum*. Phytotherapy Research 2001;15(3):245-249.

Lei LS, Lin ZB. Effects of ganoderma polysaccharides on T cell subpopulations and production of interleukin-2 in mixed lymphocytes response. Yao Hsueh Hsueh Pao 1992;27(5):331-335.

Li EK, Tam LS, Wong CK, Li WC, Lam CW, Wachtel-Galor S, Benzie IF, Bao YX, Leung PC, Tomlinson B. Safety and efficacy of *Ganoderma lucidum* (lingzhi) and San Miao San supplementation in patients with rheumatoid arthritis: a double-blind, randomized, placebo-controlled pilot trial. Arthritis and Rheumatism 2007;57(7):1143-1150.

Li F, Zhang Y, Zhong Z. Anti-hyperglycemic Effect of *Ganoderma Lucidum* Polysaccharides on Streptozotocin-Induced Diabetic Mice, International Journal of Molecular Science 2011;12(9):6135-6145.

Lieu CW, Lee SS, Wang SY. The effect of *Ganoderma lucidum* in induction of differentiation in leukemic U937 cells. Anticancer Research 1992;12(4):1211-1215.

Lin JM, Lin CC, Chen MF, Ujie T, Takada A. Radical scavenger and hepatotoxic activity of ganoderma formosum, *Ganoderma lucidum*, and Ganoderma neo-japonicum. Journal of Ethnopharmacology 1995;47(1):33-41.

Lin JM, Lin CC, Chiu HF, Yang JJ, Lee SG. Evaluation of the anti-inflammatory and liver protective effects of *Anoectochilus formosanus*, *Ganoderma lucidum* and *Gynostemma pentaphyllum* in rats. American Journal of Clinical Medicine 1993;21(1):59-69.

Lin ZB, Wang MY, Liu Q, Che QM. Effects of Total Triterpenoids Extract from *Ganoderma lucidum* (Curt.: Fr.) P. Karst. (Reishi Mushroom) on Experimental Liver Injury Models Induced by Carbon Tetrachloride or D-Galactosamine in Mice. International Journal of Medicinal Mushrooms 2002;4(4):112-118.

Liu C, Tseng A, Yang S. Chinese Herbal Medicine. Boca Raton (FL):CRC Press; 2005.

Liu G, Bao T, Niu X, Li S, Sung Z. Some pharmacological action of the species of *Ganoderma lucidum* and the mycelium of *Ganoderma capense* (Lloyd) Teng cultivated by submerged fermentation. Chinese Medical Journal 1979(a);92(7):496-500.

Liu G, Bao T, Wei HL, Zong ZY. Some pharmacological actions of *Ganoderma lucidum* and *G. japonicum* (FR) Lioyd on mouse liver. Yao Hsueh Pao 1979(b);14(5):284-287.

Liu J, Kurashiki K, Shimizu K, Kondo R. Structure-activity relationship for inhibition of 5alpha-reductase by triterpenoids isolated from *Ganoderma lucidum*. Bioorganic & Medicinal Chemistry 2006;14:8654-8660.

Lu ZW, and Lin ZB. Antagonistic effect of ganoderma polysaccharides peptide on inhibition of immune response caused by repetitive in vivo treatments of morphine. In: Proceedings of the international symposium on ganoderma research; 1994(b) Oct 24-24; Beijing, Beijing Med Univ; 1994. p. 82-84.

Luu B. Chemistry and biology of oxysterol and oxytriterpenes. In: Proceedings of the 4th international symposium on *Ganoderma lucidum*; 1992 June 10; Seoul, Place of publication unavailable: Cancer Research Ctr; 1992. p. 36-37.

Mau JL, Lin HC, Chen CC. Antioxidant properties of several medicinal mushrooms. Journal of Agricultural & Food Chemistry 2002;50(21):6072-6077.

Mekkaway SRE, Meselhy M, Nakamura N, Tezuka Y, Hattori M, Kakiuchi N, Shimotohno K, Kawahata T, Otake T. Anti-HIV-1 and anti-HIV-protease substances from *Ganoderma lucidum*. *Phytochemistry* 1998;49(6),1651-1657.

Min BS, Nakamura N, Miyashiro H, Bae KW, Hattori M. Triterpenes from the spores of *Ganoderma lucidum* and their inhibitory activity against HIV-1 protease. *Chemical & Pharmaceutical Bulletin* 1998;46(10):1607-1612.

Mizuno T, Wang G, Zhang J, Kawagishi H, Nishitoba T, Li J. *Ganoderma lucidum* and *Ganoderma tsugae*: Bioactive substances and medicinal effects. *Food Rev. Intern* 1995;11:151-166.

Mohammed A, Adelaiye1, AB, Abubakar MS, Abdurahman EM. Effects of aqueous extract of *Ganoderma lucidum* on blood glucose levels of normoglycemic and alloxan induced diabetic wistar rats. *Journal of Medicinal Plants Research* 2007;1(2):34-37.

Muller CI, Takashi K, James O, Navindra P, Seeram DH, Koeffler HP. *Ganoderma lucidum* causes apoptosis in leukemia, lymphoma and multiple myeloma cells. *Leukemia Research* 2006;30(7):841-848.

Pieper KK, Patil SP, Busse P, Yang N, Sampson H, Li XM, Wisnivesky JP, Kattan M. Safety and Tolerability of an Antiasthma Herbal Formula (ASHMI™) in Adult Subjects with Asthma: A Randomized, Double-Blinded, Placebo-Controlled, Dose-Escalation Phase I Study. *The Journal of Alternative and Complementary Medicine* 2009;15(7):735-743.

Qing BW, Lin SL, Li SS, Shu QY. Effect of Ganoderma polysaccharides on IL-2 and IL-3 mRNA expressions in murine splenocytes in vitro. *Chinese Pharmacological Bulletin* 1998;14(4):342-344.

Russell R, Paterson M. *Ganoderma* - A therapeutic fungal biofactory. *Phytochemistry* 2006;67(18):1985-2001.

Reishi mushroom (*Ganoderma lucidum*) Natural Standard Professional Monograph, Copyright © 2012 [Internet]. [Consulté le 18 juillet 2012]. Disponible à : <http://naturalstandard.com/>

Sato N, Zhang Q, Ma CM, Hattori M. Anti-human immunodeficiency virus-1 protease activity of new lanosane-type triterpenoids from *Ganoderma sinense*. *Chemical & Pharmaceutical Bulletin* 2009;57(10):1076-1080.

Shang D, Li Y, Wang C, Wang X, Yu Z, Fu X. A novel polysaccharide from Se-enriched *Ganoderma lucidum* induces apoptosis of human breast cancer cells. *Oncology Reports* 2011;25(1):267-272.

Shiao MS, Lee KR, Lin LJ, Wang CT. 1994. Natural products and biological activities of the Chinese medicinal fungus *Ganoderma lucidum*. In: Ho CT, Osawa T, Huang MT, Rosen RT, editors. *Food Phytochemicals for Cancer Prevention II*, pp. 342-354. New Jersey (NJ) American

Chemical Society.

Su CH, Lai MN, Chan MH. Hepatoprotective triterpenoids from *Ganoderma tsugae* Murill. In: Chang ST, Busweii JA, Chiu SW, editors. *Mushroom Biology and Mushroom Products*, Hong Kong (HK): Chinese University press; 1993. p. 275-283.

Su CY, Shiao MS, Wang CT. Differential effects of ganoderic acid S on the thromboxane A2-signaling pathways in human platelets. *Biochemical Pharmacology* 1999;58(4):587-95.

Tang W, Gao Y, Chen G, Gao H, Dai X, Ye J, Chan E, Huang M, Zhou S. A randomized, double-blind and placebo-controlled study of a *Ganoderma lucidum* polysaccharide extract in neurasthenia. *Journal of Medicinal Food* 2005;8(1):53-58.

Tao J, Feng KY. Experimental and clinical studies of *Ganoderma lucidum* on platelet aggregation. *Journal of Tongji Medical University* 1990;10(4):240-243.

Tierra M. *The Way of Herbs*. New York (NY): Pocket Books; 1998.

Tomoda M, Gonda R, Kasahara Y, Hakino H. Glycan structures of ganoderans B and C, hypoglycemic glycans of *Ganoderma lucidum* fruit bodies. *Phytochemistry* 1986;25(12):2817-2820.

Tran MT, Mitchell TM, Kennedy DT, Giles JT. Role of coenzyme Q10 in chronic heart failure, angina, and hypertension. *Pharmacotherapy* 2001;21(7):797-806.

Wang C, Zheng YH. A new kind of preparation of *Ganoderma lucidum* in treating 35 patients with coronary cardiac disease. In: Proceedings of the international symposium on ganoderma research; 1994 Oct 24-26; Beijing, China. Beijing Med University; 1994. P. 85-86.

Wang MY, Liu Q, Che QM, Lin ZB. Effects of total triterpenoids extract from *Ganoderma lucidum* (Curt.: Fr.) P. Karst. (Reishi Mushroom) on experimental liver injury models induced by carbon tetrachloride or d-galactosamine in mice. *International Journal of Medicinal Mushrooms* 2002;4(4):337-342.

Wang SY, Hsu ML, Hsu HC, Tzeng CH, Lee SS, Shiao MS, Ho CK. The anti-tumor effect of *Ganoderma lucidum* is mediated by cytokines released from activated macrophages and T lymphocytes. *International Journal of Cancer* 1997;70(6):699-705.

Wasser SP. Reishi. In: Coates PM, Betz JM, Blackman MR, Cragg GM, Levine M, Moss J, White JD, editors. *Encyclopedia of Dietary Supplements*. Second Edition. New York (NY): Informa Healthcare; 2010. p. 680-690.

Weant KA, Smith KM. The role of coenzyme Q10 in heart failure. *The Annals of Pharmacotherapy* 2005;39(9):1522-1526.

Weng CJ, Chau CF, Yen GC, Liao JW, Chen DH, Chen KD. Inhibitory effects of ganoderma lucidum on tumorigenesis and metastasis of human hepatoma cells in cells and animal models. Journal of Agricultural and Food Chemistry 2009;57(11):5049-5057.

Wu Y, Wang D. A new class of natural glycopeptides with sugar moiety-dependent antioxidant activities derived from *Ganoderma lucidum* fruiting bodies. Journal of Proteome Research 2009;8(2):436-442.

Xiao JJ, Lei LS, Zhao X, Lin ZB. Changes of nuclear DNA, RNA contents and ratio of nucleus to cytoplasm of murine splenocytes induced by *Ganoderma lucidum*. Chinese Journal of Pharmacology and Toxicology 1994;8(3):198.

Yang HL. Ganoderic acid produced from submerged culture of *Ganoderma lucidum* induces cell cycle arrest and cytotoxicity in human hepatoma cell line BEL7402. Biotechnology Letters 2005;27(12):835-838.

Yarnell E, Abascal K, Hooper CG. Clinical Botanical Medicine. Larchmont (NY): Mary Ann Liebert Inc; 2003.

Yeung HC. Handbook of Chinese Herbs. Rosemead (CA): Institute of Chinese Medicine; 1996.

Zhang LX, Mong H, Zhou HB. Effect of Japanese *Ganoderma lucidum* on production of interleukin-2 from murine splenocytes. Zhongguo Zhong Xi Yi Jie He Za Zhi 1993;13(10):613-615.

Zhu M, Chang Q, Wong LK, Chong FS, Li RC. Triterpene antioxidants from *Ganoderma lucidum*. Phytotherapy Research 1999;13(6):529-531.

Zhu M, Lin KF, Yeung RY, Li RC. Evaluation of the protective effects of Schisandra chinensis on phase 1 drug metabolism using a CCl₄ intoxication model. Journal of Ethnopharmacology 1999(b);67(1):61-68.