

# NATURAL HEALTH PRODUCT

# **TRIBULUS** – *TRIBULUS TERRESTRIS*

This monograph is intended to serve as a guide to industry for the preparation of Product License 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

February 25, 2019

### 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)
Tribulus terrestris	<ul> <li>Caltrop</li> <li>Cat's-head</li> <li>Common dubbletjie</li> <li>Devil's-thorn</li> <li>Devil's-weed</li> <li>Goathead</li> </ul>	Proper name(s) Tribulus terrestris	Part(s) ► Fruit ► Root	Preparation(s) Dried
	<ul> <li>Gokshura</li> <li>Goksura</li> <li>Ji li</li> <li>Puncturevine</li> <li>Puncturevine caltrop</li> <li>Tribulus</li> </ul>			

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

References: Proper name: USDA 2018, PPRC 2010, API 2001, McGuffin et al. 2000; Common names: USDA 2018, PPRC 2010, Bensky et al. 2004, Chen and Chen 2004, API 2001, McGuffin et al. 2000; Source materials: PPRC 2010, Bensky et al. 2004, Chen and Chen 2004, API 2001, McGuffin et al. 2000, Kapoor 2001.

## **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.

The 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)

- ► Traditionally used in Ayurveda as Mutrala (diuretic) (Premila 2006; API 2001; Kapoor 2001).
- ▶ Traditionally used in Ayurveda as Vrsya (aphrodisiac) for men (Paranjpe 2005; API 2001).
- ► Traditionally used in Ayurveda to help relieve Arsa (haemorrhoids) (API 2001).
- Traditionally used in Ayurveda to help relieve Mutrakrcchra (difficult/painful urination) (Khare 2004; API 2001).
- Used in Traditional Chinese Medicine (TCM) for headache and dizziness, distending pain in the chest and the hypochondrium, acute mastitis, red eyes and nebula, itching caused by rubella (PPRC 2010).
- Used in Traditional Chinese Medicine (TCM) to calm the Liver and anchor the yang: for headache, vertigo, or dizziness from ascendant Liver yang (Bensky et al. 2004).
- ▶ Used in Traditional Chinese Medicine (TCM) to dispel wind and stop itching: for any kind of skin lesion with significant itching, such as hives (Bensky et al. 2004).
- ▶ Used in Traditional Chinese Medicine (TCM) to dispel wind-heat and brightens the eyes: for red, swollen, and painful eyes as well as increased tearing (Bensky et al. 2004).
- ▶ Used in Traditional Chinese Medicine (TCM) to dredge the Liver qi to smooth its flow while dispersing constraint and clumping: for pain and distention in the chest or flanks, irregular menstruation, or insufficient lactation, from constrained Liver qi (Bensky et al. 2004).
- Used in Traditional Chinese Medicine (TCM) to pacify the Liver, active blood and dispel wind, improve vision, and relieve itching (PPRC 2010).

### 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)



Traditional Chinese Medicine

Method of preparation: Decoction

6 - 10 grams of dried fruit, per day (PPRC 2010; Bensky et al. 2004; Chen and Chen 2004)

Traditional Ayurveda Medicine

Arsa (haemorrhoid)

Method of preparation: Decoction

20 - 30 grams of dried fruit, per day (API 2001)

Method of preparation: Powder

3 - 6 grams of dried fruit, per day (API 2001)

Mutrala (diuretic), Mutrakrcchra (painful urination) and Vrsya (aphrodisiac)

Method of preparation: Decoction

- ▶ 20 30 grams of dried fruit, per day (API 2001)
- ▶ 20 30 grams of dried root, per day (API 2001)

Method of preparation: Powder

3 - 6 grams of dried fruit, per day (API 2001)

# **Direction(s) for use**

No statement required.

# **Duration**(s) of use

Mutrala (diuretic)

For occasional use only (APhA 2002; CPhA 2002).

# **Risk information**

# **Caution**(s) and warning(s)



## All products except Vrsya (aphrodisiac for men)

- Consult a health care practitioner/health care provider/health care professional/doctor/ physician if symptoms persist or worsen.
- Consult a health care practitioner/health care provider/health care professional/doctor/ physician prior to use if you are pregnant (Chen and Chen 2004).

## Traditional Chinese Medicine

Consult a health care practitioner/health care provider/health care professional/doctor/physician prior to use in case of qi or blood deficiency (Bensky et al. 2004).

## **Contraindication(s)**

### Traditional Chinese Medicine

Do not use this product if you have hypotension or liver deficiency (Bensky et al. 2004; Chen and Chen 2004).

### Known adverse reaction(s)

### All Products

Stop use if hypersensitivity/allergy occurs (Bensky et al. 2004).

### All products except Mutrala (diuretic)

Diuretic effect may occur.

### **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 in accordance 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**

APhA 2002: Berardi RR, DeSimone EM, Newton GD, Oszko MA, Popovich NG, Rollins CJ, Shimp LA, Tietze KJ, editors. Handbook of Nonprescription Drugs: An Interactive Approach to Self-Care. 13th edition. Washington (DC): American Pharmaceutical Association; 2002.

API 2001: The Ayurvedic Pharmacopoeia of India. 1st edition, Part I, Volume I. Delhi (IN): The Controller of Publications; 2001 [Reprint of 1990 publication].

Bensky D, Clavey S, Toger E, Gamble A, editors. Chinese Herbal Medicine Materia Medica. 3<sup>rd</sup> edition. Seattle (WA): Eastland Press Inc; 2004.

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

CPhA 2002: Patient Self-Care: Helping Patients Make Therapeutic Choices. Ottawa (ON): Canadian Pharmacists Association; 2002.

Kapoor LD. Handbook of Ayurvedic Medicinal Plants. Boca Raton (FL): CRC Press; 2000.

Khare CP. Indian Herbal Remedies: Rational Western Therapy, Ayurvedic and Other Traditional Usage, Botany. New York (NY): Springer; 2004.

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

Neychev VK, Mitev VI. The aphrodisiac herb Tribulus terrestris does not influence the androgen production in young men. Journal of Ethnopharmacology 2005;101(1-3):319-323.

Paranjpe P. Indian Medicinal Plants: Forgotten Healers, A Guide to Ayurvedic Herbal Medicine. Delhi (IN): Chaukhamba Sanskrit Pratishthan; 2005 [Reprint of 2001].

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

Premila MS. Ayurvedic Herbs: A Clinical Guide to the Healing Plants of Traditional Indian Medicine. New York (NY): Haworth Press Inc.; 2006.

USDA 2018: United States Department of Agriculture, Agricultural Research Service, National Genetic Resources Program. Germplasm Resources Information Network (GRIN) [Internet]. Beltsville (MD): National Germplasm Resources Laboratory. [Accessed 2018 December 17]. Available from: https://npgsweb.ars-grin.gov/gringlobal/taxonomydetail.aspx?id=100965



### **References reviewed**

Adimoelja A, Adaikan PG. Protodioscin from herbal plant *Tribulus terrestris* L improves the male sexual functions, probably via DHEA [Internet]. Airlangga University, Indonesia and National University of Singapore in 6th Biennial Asian-Pacific Meeting on Impotence in Kuala Lumpur, Malaysia, International Journal of Impotence Research 1997;9(S1). [Accessed 2012 April 30]. Available from:

http://www.libilov.com/en/clinical\_studies/study\_Adimoelja\_Adaikan\_1997.htm

Adimoelja A, Setiawan L, Djojotananjo T. *Tribulus terrestris* (protodioscin) in the treatment of male infertility with idiopathic ologiasthenoteratozoospermia 1995 [Internet]. Academic Hospital Dr. Soetomo and Airlangga University, Surabaya, Indonesia in First International Conference of Medical Plants for Reproductive Medicine in Taipei, Taiwan. [Accessed 2012 April 30]. Available from: http://www.libilov.com/en/clinical\_studies/study\_Adimoelja\_1995.htm

Antonio J, Uelmen J, Rodriguez R, Earnest C. The effects of *Tribulus terrestris* on body composition and exercise performance in resistance-trained males. International Journal of Sport Nutrition and Exercise Metabolism 2000;10(2):208-215.

Arsyad KM. Effect of protodioscin (*Tribulus terrestris*) on the well-being and sexual response of men with diabetes mellitus. 1997 [Internet]. Medical Biology Division of Andrology, University of Sriwijaya, Indonesia. [Accessed 2012 April 19]. Available from: http://www.libilov.com/en/clinical\_studies/study\_Arsyad\_1997.htm

Arsyad KM. Effect of protodioscin on the quantity and quality of sperms from males with moderate idiopathic oligozoospermia. Medika 1996;22(8):614-618.

Brinker 2010: Brinker F. Final updates and additions for Herb Contraindications and Drug Interactions, 3<sup>rd</sup> 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. [Updated July 13, 2010; Accessed 2012 April 30]. Available from: http://www.eclecticherb.com/emp/updatesHCDI.html

Brinker F. Herbal Contraindications and Drug Interactions: Plus Herbal Adjuncts With Medicines, expanded 4<sup>th</sup> edition. Sandy (OR): Eclectic Medical Publications; 2010.

Brown GA, Vukovich MD, Martini ER, Kohut ML, Franke WD, Jackson DA, King DS. Endocrine and lipid responses to chronic androstenediol-herbal supplementation in 30 to 58 year old men. Journal of American College of Nutrition 2001a;20(5):520-528.

Brown GA, Vukovich MD, Martini ER, Kohut ML, Franke WD, Jackson DA, King DS. Effects of androstenedione-herbal supplementation on serum sex hormone concentrations in 30- to 59-year-old men. International Journal for Vitamin and Nutrition Research 2001b;71(5):293-301.



Chandler F, editor. Herbs: Everyday Reference for Health Professionals. Ottawa (ON): Canadian Pharmacists Association and the Canadian Medical Association; 2000.

Dinchev D, Janda B, Evstatieva L, Oleszek W, Aslani MR, Kostova I. Distribution of steroidal saponins in *Tribulus terrestris* from different geographical regions. Phytochemistry 2008;69(1):176-186.

Ganzera M, Bedir E, Khan IA. Determination of steroidal saponins in *Tribulus terrestris* by reversed-phase high-performance liquid chromatography and evaporative light scattering detection. Journal of Pharmaceutical Sciences 2001;90(11):1752-1758.

Gauthaman K, Adaikan PG, Prasad RN. Aphrodisiac properties of Tribulus Terrestris extract (Protodioscin) in normal and castrated rats. Life Sciences 2002;71(12):1385-1396.

Gauthaman K, Ganesan AP. The hormonal effects of *Tribulus terrestris* and its role in the management of male erectile dysfunction – an evaluation using primates, rabbit and rat. Phytomedicine 2008;15(1-2):44-54.

Jain SK, DeFilipps RA. Medicinal Plants of India. Michigan: Reference Publishers Inc; 1991.

Jameel JK, Kneeshaw PJ, Rao VS, Drew PJ. Gynaecomastia and the plant product "*Tribulis terrestris*". Breast 2004;13(5): 428-430.

Kohut ML, Thompson JR, Campbell J, Brown GA, Vukovich MD, Jackson DA, King DS. Ingestion of a dietary supplement containing dehydroepiandosterone (DHEA) and androstenedione has minimal effect on immune function in middle-aged men. Journal of American College of Nutrition 2003;22(5):363-371.

Kostova I, Dinchev D. Sappnins in *Tribulus terrestris* – chemistry and bioactivity. Phytochemistry Reviews 2005;4(2-3):111-137.

Milanov S, Maleeva E, Taskov M. Tribestan effect on the concentration of some hormones in the serum of healthy volunteers. Medico biologic information 1985;4:27-29.

Mills S, Bone K. Principles and Practice of Phytotherapy. Toronto (ON): Churchill Livingstone; 2000.

Mills S, Bone K. The Essential Guide to Herbal Safety. St. Louis (MO): Elsevier Churchill Livingstone; 2005.

Natural Standard. Tribulus terrestris (tribulus). Copyright 2012 [Internet]. [Accessed 2012 April 18]. Available from: http://www.naturalstandard.com.

Obreshkova D, Pangarova T, Milkov S, Dinchev D. Comparative analytical investigation of *Tribulus terrestris* preparations. Pharmacia 1998;15(2):11.



Poprzecki S, Zebrowska A, Cholewa J. Ergogenic effects of *Tribulus terrestris* supplementation in men. Journal of Human Kinetics 2005;13:41-50.

Premila MS. Ayurvedic Herbs: A Clinical Guide to the Healing Plants of Traditional Indian Medicine. Binghamton (NY): The Haworth Press inc: 2006.

Rogerson S, Riches CJ, Jennings C, Weatherby RP, Meir RA, Marshall-Gradisnik SM. The effect of five weeks of Tribulus terrestris supplementation on muscle strength and body composition during preseason training in elite rugby league players. Journal of Strength and Conditioning Research 2007;21(2):348-353.

Sengupta G, Hazra A, Kundu A, Ghosh A. Comparison of *Murraya koenigii* and *Tribulus terrestris*-based formulation versus tamsulosin in the treatment of benign prostatic hyperplasia in men aged > 50 years: a double-blind, double-dummy, randomized controlled trial. Clinical Therapeutics 2011;33(12):1943-1952.

Setiawan L. *Tribulus terrestris* L. extract improves spermatozoa motility and increases the efficiency of acrosome reaction in subjects diagnosed with oligoastheno-teratozoospermia. Journal of Panca Sarjana. University of Airlangga 1996;5(2-3):35-40.

Talasaz AH, Abbasi MR, Abkhiz S, Dashti-Khavidaki S. *Tribulus terrestris*-induced severe nephrotoxicity in a young healthy male. Nephrology, Dialysis, Transplantation 2010;25(11):3792-3973.

Talbott SM, Hughes K. The Health Professional's Guide to Dietary Supplements. Baltimore (MD): Lippincott Williams & Wilkins; 2007.

Williamson EM, editor. Major Herbs of Ayurveda. New York (NY): Churchill Livingstone; 2002.