

# Effects of Herbal Supplement Tribulus Terrestris: A Mini Review

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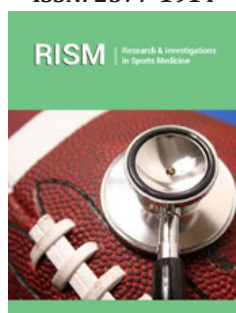
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ISSN: 2577-1914



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**Submission:**  August 01, 2019

**Published:**  September 19, 2019

Volume 5 - Issue 3

**How to cite this article:** Bruno N C, Miguel A C M, Oscar Albuquerque d M, Adriano d S, Erico Chagas C, et al. Effects of Herbal Supplement Tribulus Terrestris: A Mini Review. Res Inves Sports Med. 5(3). RISM.000611.2019.  
DOI: [10.31031/RISM.2019.05.000611](https://doi.org/10.31031/RISM.2019.05.000611)

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## Abstract

Terrestrial Tribulus is an herbaceous plant originally from India. It has been widely used as a natural sexual stimulant by the traditional medicine of China, India and Greece. Tribulus is now widely used mainly by athletes based on the belief that it can increase testosterone concentrations. However, there is no consensus on the real effects of this supplementation, so the aim of this research was to characterize the effects of Tribulus in experimental models. This mini review was performed in the PubMed database on 04/13/2019 with the terms: "Terrestrial Tribulus", "mice" and their related terms. Only studies in Portuguese, Spanish, English, Italian and French were included. In addition, all in vitro studies, studies that did not demonstrate in the methodology the use of Terrestrial Tribulus supplementation and studies that were not obtained in full were excluded. With this search strategy, 33 articles were identified, from which 18 studies were excluded based on the eligibility criteria. The results showed a protective effect on the male reproductive system, increased antioxidant agents and anti-inflammatory effect induced by supplementation of Terrestrial Tribulus.

**Keywords:** *Tribulus Terrestris*, Male reproductive system, Oxidative stress, Inflammation

## Introduction

The evidence of the positive effects of Terrestrial Tribulus supplementation in sexual performance, in decreasing oxidative stress and produce anti-inflammatory effects [1-3]. However, There is no consensus on the real benefits of supplementation, considering all its compounds. The aim of this mini review performed at PubMed was provide evidence in a controlled environment of the real effects, the search was performed in PubMed of on the day 13/04/2019 with Tribulus, Mice and their related terms. With this search strategy 33 articles were identified, from which 18 studies were excluded based on the eligibility criteria (were excluded studies in vitro and that not used Tribulus).

## Discussion

Regarding the methodology proposed in the 15 studies included in this review (Table 1). We identified a consensus on the dose of supplement application (100 or 200mg / kg), of these studies 73.33% performed gavage on animals and almost all studies 86.66% applied the supplement daily, there was no standard for the period of supplement application (Table 2). However, this mini review provided interesting results. Only 33,3% of studies identified some positive effect induced by Terrestrial Tribulus supplementation related to male sexual dysfunctions, in all these studies Tribulus supplementation aided the recovery of the reproductive system of the animals or produced a protective effect [4-8].

Although some studies relate benefits in the male reproductive system to increased testosterone production, a recent clinical trial has shown that this supplementation only increases the availability of testosterone associated with other substances, and its positive

effects on the male reproductive system would be associated with higher availability of nitric oxide [9]. An antioxidant effect was observed in three studies using different models (model of Parkinson disease, male sexual dysfunction model and chemo preventive model) [5,10,11]. The increased nitric oxide production and reduced oxidative stress may be and the determining mechanisms to reduce the inflammatory profile, it is worth mentioning that in models that induced some kind of inflammation (atopic dermatitis, acute pancreatitis and rheumatism) Tribulus supplementation was effective in reducing these deleterious effects [12-14]. Considering

the specificity of sports context, the main benefits of Tribulus (decreased stress oxidative and inflammatory) apply in exercise training of high intensity, where athletes present an imbalance in oxidative stress, increased of agents pro-inflammatory and energy imbalance [15,16]. These contexts, the supplementation with antioxidant and anti-inflammatory agents it's a strategy is effective in promotion protection for athletes, because it helps the return to homeostasis and consequently the maintenance of the performance [15,16].

**Table 1:** Characteristic and effects of the included studies.

Author	Year	Species	Model	Gender	Effects of <i>Tribulus terrestris</i> Extract
Alzahrani S [10]	2018	Swiss albino	Parkinson	male	High dosage of Tribulus induced benefits for the locomotor system of animals with Parkinson and decreasing oxidative stress
Kumari M [4]	2018	Swiss	Sexual dysfunction	male	High dosage of Tribulus induced decreasing of effects related to infertility
Pavin N [8]	2018	Swiss albino	Sexual dysfunction	male	Tribulus terrestris extract decreasing adaptations (infertility) induced for Cyclophosphamide
Abu-Gharbieh E	2018	BALB/c	hyperuricemia	male	Decreasing acid uric
Kang SY	2017	SKH-1 hairless	Atopic dermatitis	female	Decreasing dermatitis
Borran M [13]	2017	NR	Acute pancreatitis	male	200 and 400mg/kg decreasing acute pancreatitis markers

NR: Not Reported by the Author

**Table 2:** Information's of dosage, via of application, frequency and period of application supplement.

Author	Year	Dosage	Via	Application Frequency	Application Period
Alzahrani S [10]	2018	5 or 10mg/kg	Gavage	all days	17 days
Kumari M [4]	2018	100 or 200mg/kg	Gavage	all days	28 days
Pavin NF [8]	2018	11mg/kg	Gavage	all days	14 days
Abu-Gharbieh E	2018	100 or 200mg/kg	Gavage	all days	5 days
Kang SY [12]	2017	Tribulus terrestris extract was prepared with 30% ethanol as solvent. The 1% TF extract with or without 0.1%	i.p	all days	24 days
Borran M [13]	2017	3 doses of Tribulus terrestris (100, 200 and 400mg/kg)	Gavage/i.p	all days	5 days
Kumari M [5]	2015	100 or 200mg/kg	Gavage	all days	28 days
Raoofi A	2015	100mg, 300mg/kg or 500mg/kg	i.p	all days	5 days
Nishchal BS	2014	100 or 200mg/kg	Gavage	all days	10 days
Wei S [6]	2014	25 or 50mg/kg com 100µl of saline	i.p	3 x per week	4 weeks
Heidari MR [14]	2007	50, 100, 200, 400 or 800mg/kg	i.p	NR	
Jagadeesan G	2006	6mg/kg	Gavage	all days	7 days
Jagadeesan G	2005	NR	Gavage	all days	15 days
Kumar [11]	2006	800mg/kg	Gavage	all days	7 days
Rathore HS [7]	2000	Tribulus associated others substances (12.50mg/kg)	Gavage	all days	100 or 160 days

NR: Not reported by the author; i.p: Intraperitoneal

## Conclusion

The protection in male reproductive system was the main effects identified in this review, besides this, the increase in antioxidant agents and the anti-inflammatory effect induced by Terrestrial Tribulus supplementation also proved like to be as important effects. These results show that *Tribulus Terrestris* seems to be an effective supplement for recovery and protection of subjects after intense physical exercise. However, further studies are needed to determine the mechanisms that increase recovery and protection after high intensity physical training.

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