Tinofend® is a proprietary Tinospora cordifolia extract standardised to active polysaccharides, with clinical studies showing positive benefits on immune function, antihistamine support and adaptogenic benefits.

PRODUCT PROFILE SHEET

Tinospora cordifolia has long been used in Ayurvedic medicine and is largely considered a Rasayana (rejuvenator) due to its adaptogenic benefits. It was thought to increase body's resistance to stress, anxiety and illness and used on skin, for digestion, circulatory system, respiratory system, reproductive system and more.

Growing interest in the plant for its active components and biological functions has brought Tinospora **to the forefront.**

Tinofend®, clinically studied ***Tinospora cordifolia*** extract, has shown potential for supporting immune health associated with histamine.[1-2] With these benefits, Tinofend® may be a beneficial component of an immune nutritional regimen.

Research has shown that Tinofend® may regulate several immune mediators and support the activation of white blood cells such as macrophages, which are an important part of the body's immune response.[1]

Furthermore, ***Tinospora cordifolia*** provides polysaccharides to help optimize the immune system's normal defenses, including neutrophil (type of white blood cell) function.[3,4]

Manufactured by our partners Verdure Sciences®, Tinofend® extract is standardized to total bitters and total polysaccharides which has shown potential in supporting a healthy immune response through impacts to the adaptive (learned/remembered response to specific pathogens) and innate (rapid response to microbes/pathogens) immune systems.

Product Advantages

- ✔ **Clinically researched**
  to support innate and adaptive immune health and allergies.
- ✔ **Proprietary complex of polysaccharides and polyphenols**
  Standardised to minimum 20% active polysaccharides
- ✔ **Natural antihistamine**
- ✔ **Adaptogenic immune-regulating principles**
  Clinical research has found that helps to support the activity that regulates immune response.
- ✔ **Long history of safety and traditional use**
- ✔ **Produced in a GMP certified, botanicals-only facility**
- ✔ **Full traceability**
- ✔ **Kosher & Halal Certified**

Research

Key studies on Tinofend®

A randomized, double-blind and placebo controlled study (2006) evaluated the efficacy and safety of Tinofend® in people suffering from hay fever (allergic rhinitis).

75 subjects (18-65 years) diagnosed to be suffering from allergic rhinitis, were given 300mg of Tinofend® three times a day or placebo.

Results showed that Tinofend® significantly reduced symptoms of allergic rhinitis after 15 days with further improvements seen over 30 days. It was also demonstrated

that Tinofend® stimulated peritoneal macrophages in a dose dependent manner, suggesting activation of the macrophage system.[1] Macrophages play a key role in the generation of immune responses.

Specifically, the study reported:

- A significant improvement in nasal mucosa was observed in **34.28%** of Tinofend® participants compared to only 3.57% with placebo.
- The Tinofend® group exhibited a significant decrease in the number of people with nasal discharge and inferior turbinate hypertrophy after 15 days, and after 30 days of Tinofend® the middle turbinate hypertrophy was not seen in any of the patients.
- The number of people showing symptoms of allergic rhinitis was significantly less with 15 and 30 days of Tinofend® compared to placebo.
- Tinofend® was **well tolerated** and no serious adverse effects were observed.

Another randomized, double-blind, placebo controlled clinical trial (2004) was done to evaluate efficacy and safety of Tinofend® in people suffering from hay fever (allergic rhinitis)[2].

75 subjects (18-65 years) diagnosed to be suffering from allergic rhinitis, were given 300mg of Tinofend® three times a day or placebo.

Results demonstrated that Tinofend® significantly decreased all symptoms of allergic rhinitis and stimulated the activity of white blood cells, which regulate the immune response and reduced the number of eosinophils (immune cells that release histamine).

Specifically, the study reported:

- **100% relief** from sneezing was reported in 83% of Tinofend® subjects compared to no relief in 79% of placebo subjects.
- **100% relief** from nasal discharge was reported in 69% of subjects taking Tinofend® compared to no relief in 84.4% of placebo subjects.
- **100% relief** from nasal obstruction was reported in 61% of Tinofend® subjects compared to no relief in 83% of placebo subjects.
- **100% relief** from nasal pruritus was reported in 71% of subjects taking Tinofend® compared to no relief in 88% of placebo subjects.
- In the Tinofend® group, eosinophil and neutrophil count decreased and goblet cells were absent in nasal smear; however, in the placebo group, decrease in eosinophil and neutrophil count was marginal and goblet cells were present.
- Overall, differences between the Tinofend® group and placebo group were highly significant.
- Tinofend® was **well tolerated** and no serious adverse effects were observed

Figure 1
Immune Response with Tinofend®

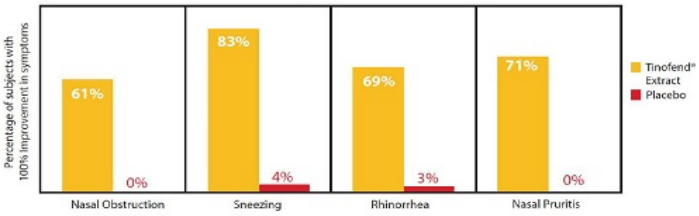


Figure 2
Percent Reduction in Allergy Symptoms

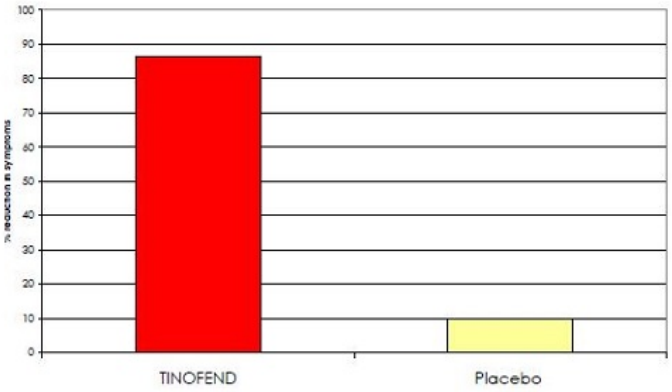
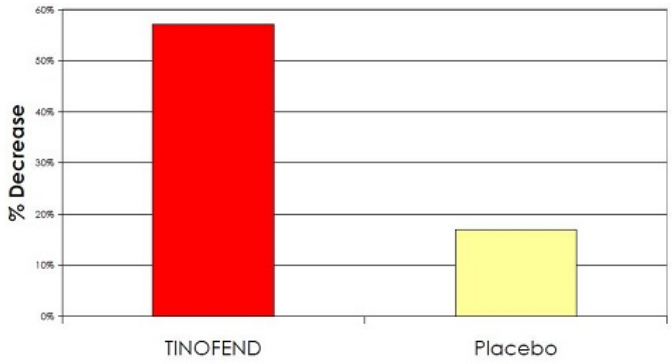


Figure 3
Balancing Immune Response: Decrease in histamine-containing eosinophils in nasal smear after clinical treatment



Note on Fig.3: Polymorphonuclear leukocytes (PMN) and eosinophils (Eos) are important cellular participants in a variety of acute and chronic inflammatory reactions in the airway. Histologic evidence has implicated direct interactions between these two subsets of leukocytes and airway epithelial cells during inflammation.

New scientific review on Tinospora cordifolia

Recently (2021), researchers conducted a comprehensive review of *Tinospora cordifolia* extracts' potential for immunomodulatory health benefits.[5]

In this review, authors highlighted the immunomodulatory properties of *Tinospora cordifolia* while acknowledging that "it has been used historically to combat acute and chronic inflammation as well as to promote a balanced immune response."

In this summary it is also mentioned that "*Tinospora cordifolia* represents a potential botanical option for augmenting the body's natural defence mechanisms, particularly against bacterial threats, based upon a wealth of immunomodulatory preclinical and clinical substantiation data."

Reviewers mentioned that immunomodulatory activity is mediated by a variety of key bioactive phytochemicals from diverse chemical classes including polysaccharides, alkaloids, cadinane sesquiterpenes, and phenylpropanoid glycosides which are found the aerial parts of *Tinospora cordifolia*.[5]

The data supports the safety of *Tinospora cordifolia* and poses minimal risk with regard to herb-drug interactions. The vast majority of preclinical and clinical substantiation data support the notion that *Tinospora cordifolia* increases the host defence response to bacterial infection.[5]

In concluding their review, researchers suggested that *Tinospora cordifolia* promotes PMN phagocytosis and alters the balance of Th1 (type 1 helper) and Th2 (type 2 helper) cytokines, stating that pharmacologic activity is mediated through diverse signalling networks that leads to the regulation of the balance between Th1 and Th2 cytokines; a key feature of the so-called "cytokine storm".[5]

Polymorphonuclear leukocytes (PMNs) are immune cells that possess small granules filled with enzymes (e.g. myeloperoxidase and lysozyme) and molecules (e.g. superoxide and histamine) that are released during infections, allergic reactions, and asthma. The PMN family includes neutrophils, eosinophils, mast cells, and basophils.

In addition to their secretory defence mechanisms, neutrophils and mast cells protect the body by phagocytizing ("devouring") foreign particles and bacteria. Monocytes and macrophages, which represent agranulocytic leukocytes, also possess phagocytic activity. The review outlined that *Tinospora cordifolia* represents a potential botanical option to support the body's natural defence mechanisms, particularly against bacterial threats, based upon a wealth of immunomodulatory preclinical and clinical substantiation data.[5]

Tinofend® and WokVel™ Synergy

WokVel™, *Boswellia serrata* extract, in tandem with Tinofend®, *Tinospora cordifolia* extract, may offer synergistic tangible health applications.

WokVel™ extract contains a proprietary, natural complex of boswellic acids. Clinical research supports its ability to mediate pro-inflammatory biomarkers.

Tinofend® offers a proprietary complex of adaptogenic polysaccharides and polyphenols associated with immuno-supportive properties.

Together, WokVel™ and Tinofend® may offer a robust immune support solution through impact to both inflammatory and immune responses.

Sustainability

Verdure Sciences® works with associations, companies, organizations, and people around the globe to promote public awareness of initiatives and strategies of sustainable, traceable, and certifiable practices.

This integration, Verdugration®, is their commitment to these responsibilities. Ingredients with the Verdugration® logo are vetted by their sustainable, traceable, and corporate mission initiatives to provide not only high quality ingredients, but a system rooted in responsible practices and care for these ingredients and our environment.

Product Safety

Tinospora cordifolia has long been in Ayurvedic medicine for many years.

Furthermore, scientific data supports the safety of *Tinospora cordifolia* and poses minimal risk with regard to herb-drug interactions.[3]

Product Range

Ingredient	Active Content	Grade	Mesh Size
Tinofend	Min 20% Polysaccharides	Powder	NLT 80% thru 80 mesh

Product Applications

Tinofend® can be used in capsules, tablets and liquids applications. Please note *Tinospora cordifolia* has a bitter and astringent taste, and is often used with honey or ghee – typically taken with a meal.

Product Dosage

300 – 900mg day pending indications.

About

With headquarters in Noblesville, IN, USA, Verdure Sciences® is a supplier of plant-based, botanical ingredients with an emphasis on intrinsic synergies and clinically backed, tangible health applications. Tinofend® *Tinospora cordifolia* is a registered trademark of Verdure Sciences®.

References

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5. *Yates C et al.* Tinospora Cordifolia: A review of its immunomodulatory properties. Journal of Dietary Supplements, *2021. DOI 10.1080/19390211.2021.1873214.*