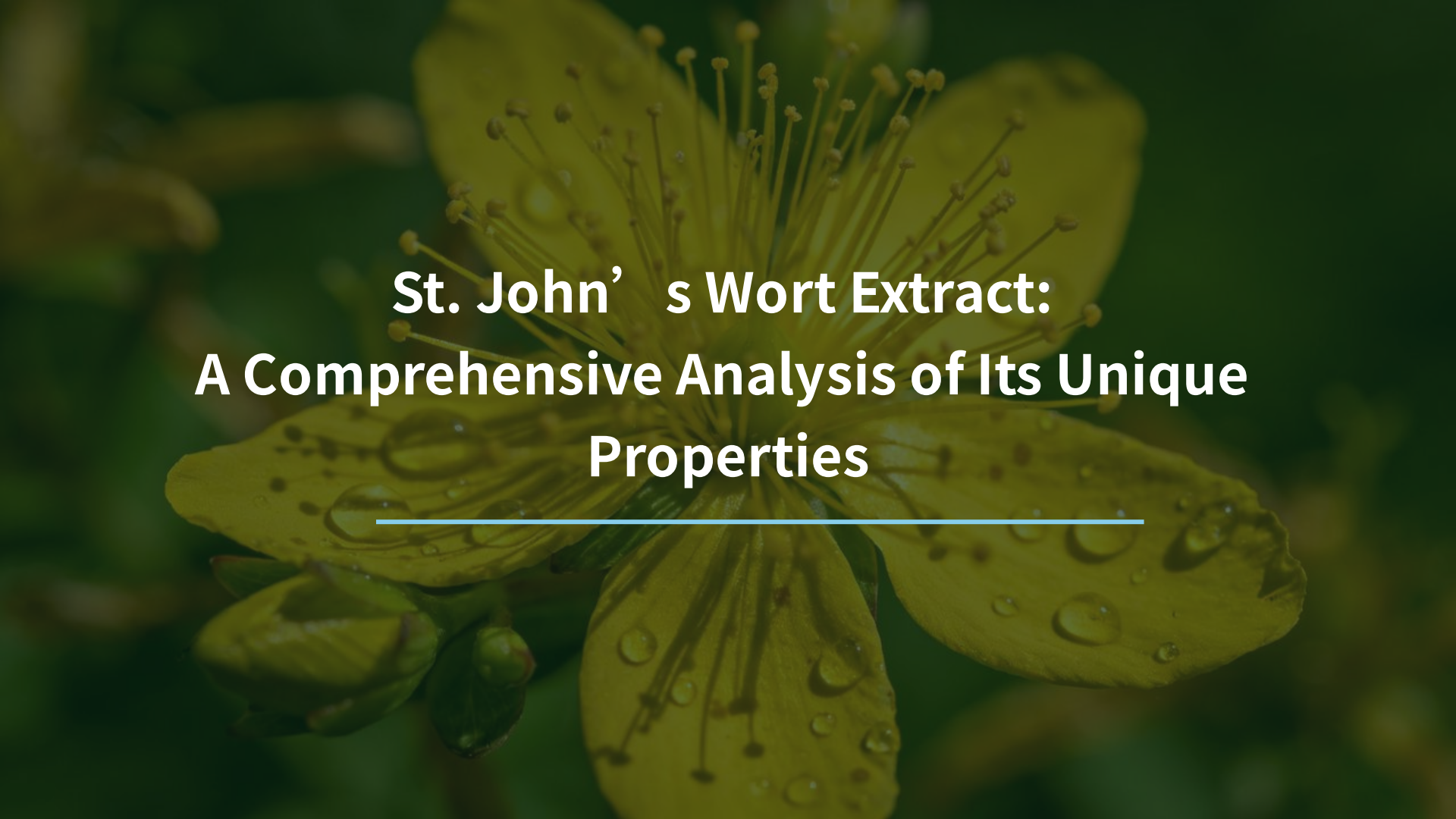


St. John’ s Wort Extract: A Comprehensive Analysis of Its Unique Properties

CONTENTS

01. Physicochemical Characteristics

02. Functional Features

03. Unique Properties & Competitive Advantages

04. Conclusion

I. Physicochemical Characteristics

The physical and chemical characteristics of Hypericum perforatum extract are the cornerstone of its functions and applications. This chapter will detailedly analyze its key components and physical properties, providing a scientific basis for subsequent application research.



(1) Appearance and Sensory Characteristics

Finished Product Form

Dark brown to brownish powder; some high-purity preparations appear as loose granules with good fluidity.

Odor and Taste

Has a characteristic fragrant odor of Hypericum perforatum, with a slightly bitter and astringent taste.

Microscopic Characteristics

In the powder, parallel stomata on stem epidermis, mesophyll oil gland cells, and pollen grains (subspherical, diameter about 20μm, with 3 pores) are visible; no calcium oxalate crystals.



Powder Form of Hypericum perforatum Extract

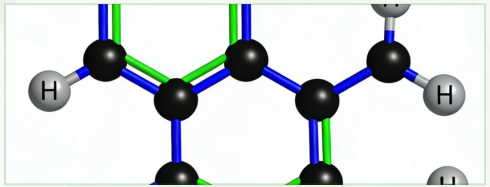


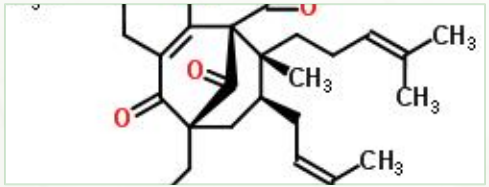
Microscopic Observation (Mesophyll Cells and Stomata)

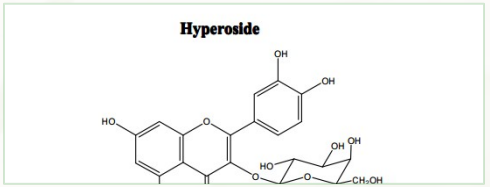
(2). Core Chemical Components and Content Standards

Active Component Category	Representative Substances	Content Standards (Mainstream)	Core Functions
Naphthodianthrones	Hypericin, Pseudohypericin	Chinese Pharmacopoeia: Hypericin ⩾0.3% EMA: Total Hypericins 0.1%-0.3%	Photodynamic antiviral, neuromodulation, anti-inflammatory
Hyperforins	Hyperforin, Adhyperforin	Commercial extracts typically standardized to 1%-3%	Core antidepressant, antibacterial
Flavonoids	Hyperoside, Quercetin, Rutin	Chinese Pharmacopoeia: Total Flavonoids ⩾5.0%	Antioxidant, anti-inflammatory, enhance bioavailability

Key Component Molecular Structures







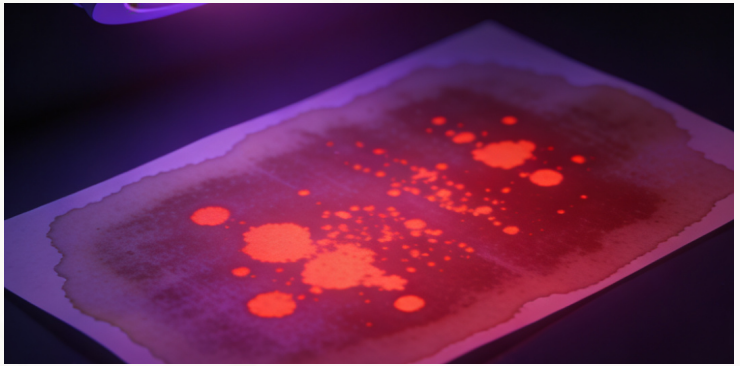
(3) Key Physicochemical Parameters

Solubility Characteristics



- **Hypericin:**Almost insoluble in water, soluble in ethanol and other organic solvents
- **Hyperforin:**Soluble in non-polar solvents such as chloroform
- **Flavonoids:**Soluble in aqueous ethanol

Photosensitivity Characteristics



- **Photosensitive:**Core components (e.g., hypericin) are photosensitive
- **Fluorescence:**Shows characteristic red fluorescence under UV light, an important quality control indicator
- **Storage:**Strictly protected from light

(3)Key Physicochemical Parameters

Stability

Dry powder is stable under sealed, light-protected, and low-temperature conditions with a validity period of 1-2 years; solutions require frozen storage.

pH Value

The pH value of a 5% ethanol aqueous solution is between 5.5–7.0, slightly acidic to neutral, meeting biocompatibility requirements.

Chromatographic Characteristics & Quality Control

TLC and HPLC are used for qualitative and quantitative analysis to ensure product standardization and quality control.



High Performance Liquid Chromatography (HPLC) - Core Quality Control Equipment

(4) Raw Materials and Preparation Correlation

Selection of High-Quality Raw Material Parts

The content of hypericin in the flowers is the highest. Therefore, standardized extraction must use the top 10–30 cm above-ground parts during the flowering period to ensure high activity and active ingredient content of the raw materials.

Safe and Efficient Preparation Process

Reflux extraction with 50%-70% ethanol aqueous solution combined with macroporous resin purification technology is adopted. This method can effectively enrich active ingredients while avoiding the use of highly toxic methanol, ensuring product safety.



II. Functional Features



1. Neuropsychiatric System Regulation (Core Function)



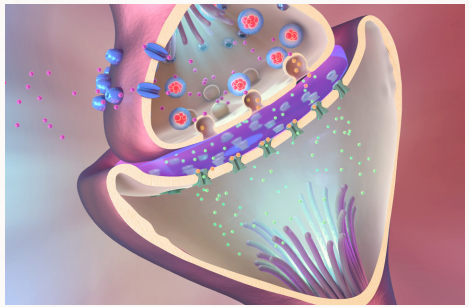
Treatment of Mild to Moderate Depression

Adequate evidence-based medical evidence, comparable efficacy to commonly used antidepressants, fewer side effects, and effectively reduces recurrence rate.



Improvement of Anxiety and Insomnia

By regulating GABA and cortisol levels, it effectively relieves anxiety, improves sleep quality, and is suitable for neurasthenia.



Neuroprotective Effects

Its components can enhance memory and synaptic function, inhibit neuroinflammation, and have potential auxiliary intervention value for neurodegenerative diseases.

2. Anti-inflammatory and Immunomodulatory Effects

Anti-inflammatory Mechanism

Synergistic action of multiple components inhibits key inflammatory pathways, reducing the release of pro-inflammatory factors, thereby exerting a potent anti-inflammatory effect.

Immunomodulatory Function

Activates mononuclear phagocytes, enhances non-specific immune function, and helps improve the body's resistance.

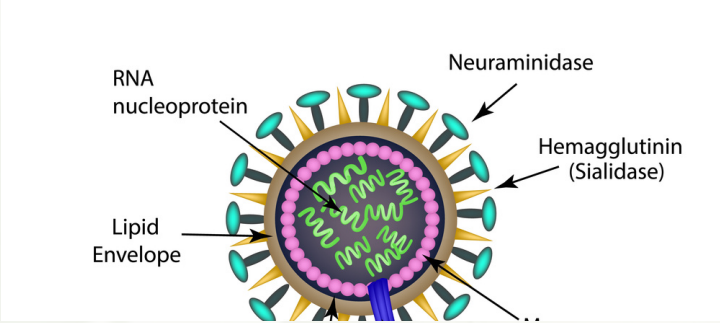


Immune Cell Activation Schematic

Enhances mononuclear phagocyte activity and improves immunity

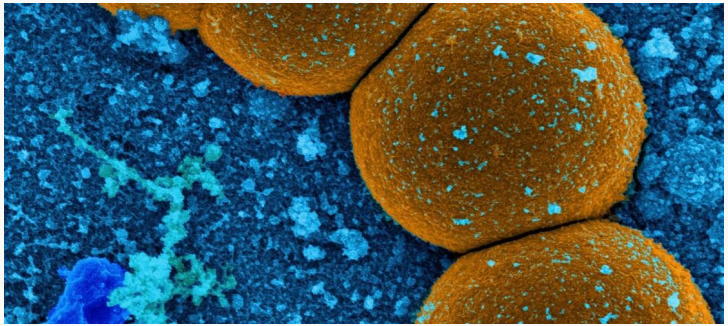
3.Antiviral and Antibacterial Activity

Antiviral Mechanism



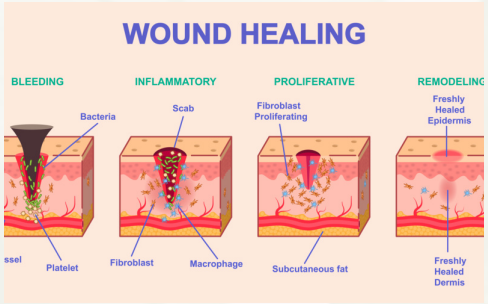
Its components, especially hypericin, possess unique photodynamic antiviral properties that directly damage viral genetic material, inhibiting various viruses such as herpes and influenza viruses.

Antibacterial Applications



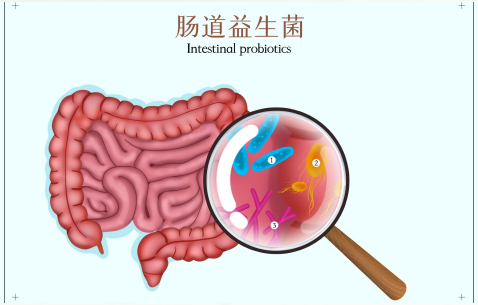
It inhibits common pathogenic bacteria like Staphylococcus aureus and Escherichia coli. Its oil extract can be used for topical treatment of skin bacterial infections.

4. Other Auxiliary Functions



Skin Health Promotion

Promotes wound healing and relieves symptoms of inflammatory skin conditions such as dermatitis and eczema.



Digestive Function Regulation

Improves functional dyspepsia, irritable bowel syndrome, and other gastrointestinal issues.



Natural Antioxidant

Rich in flavonoids and other antioxidants, effectively scavenges free radicals, reduces oxidative stress damage, and slows down aging.

III. Unique Properties



1. "Dual-Channel Synergy" of Antidepressant Mechanism

Rapid Onset Channel

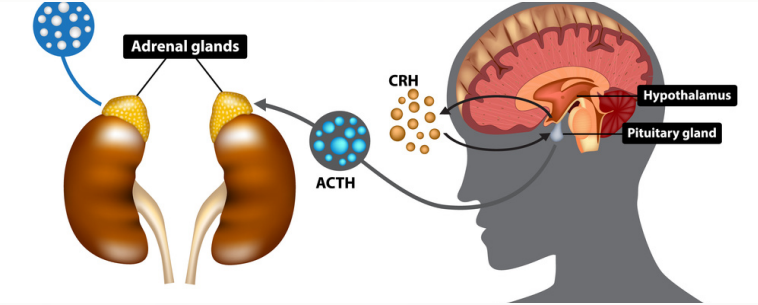
Hypericin acts as a potent monoamine reuptake inhibitor, rapidly increasing neurotransmitter concentrations in the brain to quickly alleviate depressive symptoms.

Long-term Regulation Channel

Hypericin and flavonoids regulate the HPA axis (Hypothalamic-Pituitary-Adrenal axis) to stabilize mood long-term and effectively reduce recurrence risk.

Dual-Channel Synergistic Effect

The two channels complement each other, achieving both rapid onset and long-term maintenance, avoiding tolerance issues of single-mechanism drugs for comprehensive and lasting therapeutic effects.



2. "Holistic Synergistic Effect" of Multiple Components



Antidepressant Synergy

Different components perform their respective duties: some are responsible for rapid onset, some for enhancing bioavailability, and others for relieving anxiety, forming a comprehensive emotional regulation network.



Safety Synergy

Components such as flavonoids can reduce the potential side effects of other components, lower the risk of drug interactions, and improve the overall safety and tolerability of medication.



Efficacy Expansion Synergy

Combining multiple functions such as neuroregulation, antiviral, and anti-inflammatory effects, it achieves the cross-boundary efficacy of "emotional regulation + immune enhancement", breaking through the functional boundaries of single drugs.

3. Functional Differentiation of "Light Response Dependence"

Photodynamic Enhancement Effect

Under light conditions, its antiviral and antibacterial activities are significantly enhanced. This characteristic makes it an ideal choice for photodynamic therapy, enabling precise exertion of stronger biological activity in the illuminated area.

Differentiated Adaptation of Application Strategies

Oral Preparation: Take in the dark

Strictly avoid light to prevent systemic photosensitive reactions and ensure medication safety.

Topical Ointment: Light-enhanced effect

Cleverly utilize photosensitive properties to enhance local therapeutic effects on skin issues under light.

4. "Cross-industry Adaptability" of Industrial Applications

Pharmaceutical Field: Raw Materials for Prescription and Traditional Chinese Medicine

Used as a prescription drug for antidepressant treatment or as a raw material for traditional Chinese medicine, it has definite curative effect and wide application.

Healthcare Product Field: Mood Regulation and Sleep Improvement

Utilizing its natural properties as a functional raw material for mood regulation and sleep improvement, the market demand is steadily growing.

Cosmetics Field: Skincare and Repair

Widely used in skincare products for sensitive skin repair, acne removal, and anti-aging, providing natural plant skincare solutions.

Animal Husbandry Field: Natural Feed Additives

As a natural antiviral feed additive, it is used for the prevention of livestock and poultry diseases, contributing to green breeding.

5. "International Compatibility" of Standardization and Regulations



Chinese Pharmacopoeia System

The "Pharmacopoeia of the People's Republic of China" clearly specifies the content standards for hypericin and total flavonoids, ensuring the basic quality of raw materials and preparations.



European EMA / Commission E

EMA and Germany's Commission E have established strict standardization requirements, focusing on regulating the clinical indications and safety evaluations of St. John's Wort extract.



US USP Standards

The United States Pharmacopeia (USP) has established TLC and HPLC detection methods, focusing on controlling the chemical consistency between product batches to ensure quality stability.

IV. Summary

Hypericum perforatum extract, with its unique active ingredients and significant pharmacological effects, shows great application potential in the field of medicine and health. Looking forward, we will continue to deepen technological research and development, commit to promoting the standardization and innovative application of natural products, and contribute to the cause of human health.

Core Value and Future Outlook

Core Value: Integration of Nature and Science

Natural Origin and Evidence-based Efficacy

Derived from Hypericum perforatum plant extract, with scientifically verified significant efficacy, safe and reliable.

Multi-target Synergistic Effect

Different from single ingredients, it has multi-dimensional regulatory capabilities to comprehensively improve health status.

Widespread Cross-domain Applications

Not limited to pharmaceuticals, but also extended to functional foods, skincare products and other health fields.

Future Outlook: New Heights Driven by Technology

Precision Component Enrichment

Using advanced extraction technology to achieve precise separation and enrichment of active ingredients, enhancing efficacy.

Scenario-based Application Development

Develop customized products for different populations and life scenarios to meet diverse health needs.

Connecting Clinical Practice and Daily Management

Build a complete ecological closed loop from professional medical intervention to daily health maintenance.

THANK YOU