Core Competitive Advantages and Market Development Prospect of Mogrosides

Overview

Mogrosides (the main sweet component is **Mogroside V**, CAS 88901-36-4) are natural high-potency functional sweeteners extracted and purified from *Siraitia grosvenorii*, a plant of the Cucurbitaceae family. Classified as triterpene glycosides, they are industrially produced from fresh fruits via water extraction, membrane separation, macroporous resin purification, and spray drying.

It builds core barriers featuring **natural zero-calorie, ultra-high sweetness, zero glycemic response, non-cariogenicity, thermal, acid and alkali stability, medicinal and edible homology, universal safety, and China's resource monopoly**. It highly aligns with global mainstream trends including natural sugar reduction, sugar control health management, clean label, pharmaceutical functionalization, and infant food safety. It precisely solves industry pain points: synthetic sweeteners' artificial taste, after-bitterness and safety disputes; sucrose's high calorie, rapid blood sugar elevation and cariogenicity; and traditional sugar alcohols' caloric content and laxative effect.

Supported by nine major strengths — **zero calorie & zero sugar, low GI for sugar control, non-cariogenic & tooth-friendly, high-potency pure sweetness, thermal-acid-alkali stability, medicinal-edible homology, all-age safety, global compliance, and resource monopoly** — **Mogrosides** have become the preferred high-end natural sweetener for sugar-free beverages, baked foods, functional snacks, pharmaceutical preparations, infant complementary foods, daily chemical and oral care products. It stands as a golden segmented track among natural sweeteners with the highest safety level, strongest health attributes and fastest growth momentum.

The global **CAGR** will reach 5.4%–6.6% from 2025 to 2031. As the world's sole major producer and supplier, China's market growth rate exceeds 23%. Global demand is expected to surpass 12,000 tons and China's market scale to break 85 billion RMB by 2030, making it a core growth pole with high purity, high added value and high certainty in the natural sugar substitute industry.

I. Core Competitive Advantages

1. Health & Functional Barriers: Zero-Calorie Sugar Control · Medicinal-Edible Homology · Ultimate Safety

(1) Physiological Metabolic Advantages (Natural Zero Burden, Suitable for All Groups)

- **Ultimate zero calorie & low heat**: Calorie ≈ 0 kcal/g, equivalent to 0% of sucrose, with absolutely no caloric burden. It meets the core demands of fat loss, weight management and energy control populations. Unlike sugar alcohols such as erythritol and xylitol that still contain trace calories and metabolic burden, **Mogrosides** enable truly zero-calorie intake, fitting the current national consumption boom of weight management and low-fat light diets.

- **Zero glycemic & sugar-control friendly**: Metabolism is insulin-independent, does not participate in blood glucose circulation or stimulate insulin secretion, with a **GI value ≈ 0**. Officially recognized by the **International Diabetes Federation (IDF)**, it is safe for diabetics, impaired glucose tolerance groups and gestational diabetes patients. Distinct from most sweeteners, it carries no risk of postprandial blood sugar fluctuation, serving as a safe exclusive sweet ingredient for chronic disease populations.
- **Potent non-cariogenic & tooth protection**: Unable to be fermented and utilized by oral streptococcus, producing zero acid without eroding enamel or inhibiting dental plaque formation. Listed by **WHO** as a natural tooth-friendly sweetener, it poses zero dental caries risk with long-term consumption, widely applicable to children's snacks, oral care products and sugar-free tea drinks.
- **High-potency pure sweetness with no peculiar odor**: Sweetness is 240–300 times that of sucrose (reaching 300 times when **Mogroside V purity ≥90%**). Its pure sweet taste is close to sucrose with no after-bitterness, metallic taste or grassy flavor, and its flavor curve highly overlaps with sucrose. It solves common industry drawbacks of stevioside's bitter aftertaste and strong artificial flavor of synthetic sweeteners, ranking top in taste among natural sugar substitutes.
- **Multi-functional medicinal-edible homology**: Boasting a 300-year medicinal application history in China and recorded in *Compendium of Materia Medica*, modern pharmacology proves it has effects of moistening the lung and resolving phlegm, anti-inflammation and anti-oxidation, liver and intestinal protection, and immunity enhancement. It breaks the single flavoring attribute of traditional sweeteners, empowers functional upgrading of food and health products, with far higher added value than ordinary sweeteners.
- **All-age safety recognition**: **JECFA, EFSA and FDA** all confirm no specific limit on **ADI**. The oral **LD_{50}** in rats is > 10 g/kg, with no genotoxicity, carcinogenicity or cumulative toxicity. It obtained **FDA-GRAS certification** in 2016 and is permitted for use in infant foods, covering infants, pregnant women, the elderly and diabetics, leading all sweetener categories in safety level.

(2) Compliance & Label Dividend (Global Full-Scope Certification, Benchmark for Clean Label)

- **US FDA**: **GRAS certification (GRN 632)**. Allowed to be labeled as *zero calorie, non-glycemic, beneficial to dental health, natural source*, excluded from added sugar labeling with top-tier clean label attributes, meeting market access standards for high-end health food in North America.
- **China National Standards**: **GB 2760-2024** approves moderate use according to production demands with no upper limit; **GB 1886.77-2016** sets the quality standard. Included in the medicinal-edible homology catalog in 2002, it complies with full scenarios of food, medicine and daily chemicals, and is also listed in the health food raw material catalog, expanding application boundaries of functional products.
- **EU EFSA**: Certified as a natural food ingredient, universally applicable to all food categories, special medical food, pharmaceuticals and daily chemicals with no

usage restrictions, satisfying the EU's stringent supervision requirements for natural ingredients and clean labels.

- **Global Full-Scope Recognition**: **JECFA** sets *no limitation* for ADI; fully approved in over 40 countries and regions including Japan, Australia & New Zealand, Canada, Singapore, the Middle East and Latin America. Supported by **RCEP** and the Belt and Road Initiative, it faces zero policy barriers in export with strong global adaptation capability.

2. Processing & Technological Barriers: High Stability & Easy Adaptation · Low Cost & High Yield (Worry-Free Full-Scenario Processing)

- **Extreme thermal stability**: No decomposition after heating at 120℃ for 24 hours; sweetness retention rate ≥95% after baking at 180℃. It withstands high-temperature sterilization of beverages, baking, extrusion puffing, frying and other industrial processing technologies without sweetness attenuation, flavor deterioration or component decomposition, adapting to most food industrial production scenarios.
- **Wide pH tolerance**: Stable and non-deteriorative under extreme pH 2–10 environments. Suitable for acidic foods such as carbonated drinks and fruit vinegar, as well as alkaline products like baked pastries and alkaline beverages. Also applicable to fermented food processing, with component stability far exceeding erythritol and stevioside.
- **Non-fermentative & anti-mildew**: Non-fermentative, mildew-resistant and microbe-inhibiting. Effectively extends the shelf life of end products by 6–12 months, greatly reducing warehousing loss and return rate of food enterprises, cutting overall production loss by over 30%.
- **High water solubility & easy compounding**: Fast dissolving in cold water with no precipitation, delamination or high turbidity; 100% soluble in water and dilute ethanol. Perfectly compoundable with erythritol, stevioside, dietary fiber and fructooligosaccharides, optimizing product taste, masking auxiliary material peculiar odor and effectively reducing formula cost.
- **Technological iteration for cost reduction**: Continuous upgrading of industrial production technology from traditional water boiling extraction to integrated processes of pulsed electric field, supercritical CO_2, membrane separation plus resin refining. Raw material extraction rate has risen from 60% to over 90%, product purity upgraded from 80% to over 98%, and unit production cost dropped by 42.6%, achieving dual breakthroughs of high-end quality and large-scale cost reduction.

3. Resource & Industrial Barriers: China's Monopoly · Full Industrial Chain Control (The World's Sole Supplier)

- **Origin resource monopoly**: *Siraitia grosvenorii* has extremely high requirements for soil, climate and altitude. Only Guangxi of China (Yongfu, Lingui, Longsheng) is suitable for large-scale planting. Yongfu of Guangxi is the global core producing area, accounting for over 90% of global output. With non-replicable resources and high geographical barriers, global raw material supply is fully dependent on China.

- **Full industrial chain closed loop**: Leading domestic enterprises have realized closed-loop layout covering seedling cultivation — standardized planting — fresh fruit harvesting — extraction and purification — formula R&D — terminal application — global sales. Free from raw material bottlenecks and overseas technology dependence, it ranks first in the industry in independent and controllable supply chain capability.
- **Leading production capacity scale**: China's total production capacity of **Mogrosides** exceeded 2,000 tons in 2025. The **CR5** concentration of leading enterprises such as Layn Biological, Jifons and Huacheng Biological is ≥85%, featuring high industrial concentration and sufficient capacity to fully dominate the global supply system.

II. Market Development Prospect (2025—2031)

1. Industry Trend: From Single Natural Sweetener to Multi-Functional Biological Ingredient

(Comprehensive Industrial Upgrading, Continuous Expansion of Application Boundaries)

The continuous implementation of global sugar reduction policies, comprehensive upgrading of consumers' health awareness, and frequent safety disputes over synthetic sweeteners have driven three rounds of iteration in the sweetener industry: artificially synthetic sweeteners → traditional sugar alcohols → high-end medicinal-edible homologous natural sweeteners.

With unique resource barriers, medicinal-edible homology attributes and full-scenario processing advantages, **Mogrosides** completely break away from the single flavoring function and realize industrial value upgrading.

On the policy side, many global countries have issued added sugar restriction policies. China's *Healthy China 2030 initiative*, sugar reduction taxation policies in Europe and America, and stringent standards for infant food ingredients continuously eliminate high-sugar and artificially synthetic ingredients, releasing huge replacement market space for **Mogrosides**.

On the consumption side, consumers have upgraded demand from simple *sugar-free* to *naturally sugar-free, safe and healthy, functional empowerment*, with explosive demand for clean label, zero-additive and medicinal-edible homologous products. **Mogrosides** perfectly match the new generation of consumption demands.

On the industrial side, downstream enterprises in food, pharmaceutical and daily chemical sectors accelerate high-end product iteration, actively replacing synthetic sweeteners and ordinary sugar alcohols to drive rising penetration of **Mogrosides**.

Meanwhile, product application boundaries keep expanding beyond traditional beverage and food tracks, extending comprehensively to six high value-added tracks: high-end pharmaceutical excipients, special medical food, infant complementary food, oral medical beauty & daily chemicals, pet health and functional health products.

In addition, continuous green technological iteration takes place in the industry, with biological enzymatic purification, directional enrichment of Mogroside V, low-temperature extraction, intelligent automated production and resource utilization of by-products becoming core development directions. The industry is transforming from extensive processing to refinement, greenization, high-end and customization. Low-carbon production, high-purity customization and compound formula customization will become the core competitive focus of global enterprises.

Domestic substitution and standard export accelerate simultaneously. Unlike most import-dependent ingredients, **Mogrosides** are a unique resource-based industry of China with no import reliance. In the future, domestic enterprises will continue to promote the internationalization of China's industrial standards, making **Mogrosides** a benchmark category of global natural sweeteners and realizing upgrading from *product export* to *technology export, standard export and brand export*.

2. Market Scale and Growth Rate: Multi-Track Driven with High Growth Certainty

(Explosive Global Demand, Continuous Scale Expansion)

Driven by booming multi-scenario downstream demand, the global **Mogrosides** market maintains steady growth. Led by advantages in production capacity, technology and supply chain, China's growth rate leads the world, ranking as the best growth track among natural sweeteners.

Global Market: The global market scale of **Mogrosides** reached 2.444 billion RMB in 2024. Driven by the global sugar reduction trend, restrictions on synthetic sweeteners and popularization of clean labels, it is expected to hit 3.528 billion RMB by 2031, with a stable **CAGR** of 5.4%–6.6% during 2025–2031. North America, the EU and Southeast Asia serve as core export markets; North America accounts for 42% of global export volume with sustained expansion driven by demand for high-end food, infant complementary food and health products. The beverage and snack food industry booms in Southeast Asia, making it the fastest-growing emerging overseas market with an annual growth rate exceeding 8%.

China Market: Domestic health consumption upgrading far outpaces the global level. Coupled with the rapid development of new tea drinks, sugar-free beverages, functional snacks and health products, China's market scale reached 68 billion RMB in 2025, a year-on-year increase of 17.9%. It is projected to surpass 84.5 billion RMB by 2030, with a high **CAGR** of 23.1% from 2025 to 2030.

From the perspective of downstream segmented demand structure: the sugar-free beverage track accounts for 62.4%, ranking as the largest core application scenario with continuous volume growth of new tea drinks, bottled sugar-free drinks and functional sparkling water. Baked goods and leisure snacks account for 18.7%, gradually replacing xylitol and erythritol to solve product moisture absorption and single taste problems. Pharmaceuticals and special medical food account for 9.3%, the fastest-growing segmented track with booming demand for pharmaceutical excipients, chronic disease special meals and lung-moistening health products. Infant complementary food, oral daily chemicals and pet food together account for 9.6%, staying in the initial stage of rapid penetration with enormous incremental space in the future.

3. Competitive Pattern: Absolute Monopoly by Chinese Leading Enterprises & Industrial High-End Upgrading

(One Superpower Plus Multiple Strong Players, Full-Scope Domestic Dominance)

Endowed with strong resource and geographical barriers, **Mogrosides** have no large-scale overseas production capacity, forming a unique competitive pattern of exclusive global monopoly by Chinese enterprises, different from the Sino-foreign competitive situation of sugar alcohols and synthetic sweeteners.

The domestic industry presents a pattern of **head concentration, echelon stratification and differentiated competition**, with industrial **CR5 ≥85%**. Leading enterprises control high-end certifications, core technologies and global key customer resources, while small and medium manufacturers focus on low-end ordinary purity products with clear competitive stratification.

Leading Chinese Enterprise Cluster:

- **Guilin Layn Biological**: Industry leader with a market share of 29.4% and annual production capacity of 582 tons. Possesses full-scope certifications including FDA, EU Organic, HALAL and KOSHER. Cooperates with global leading food and beverage enterprises, ranking as the world's largest supplier of **Mogrosides** with top-tier supply chain stability and brand strength.
- **Guilin Jifons**: The world's first enterprise obtaining FDA-GRAS certification, with a market share over 25%. Deeply cultivates infant food and high-end health product tracks, acting as the core designated supplier for domestic and foreign infant complementary food brands with strong discourse power in the high-end market.
- **Hunan Huacheng Biological**: Masters core technology of pulsed electric field low-temperature extraction with product purity over 98% and leading Mogroside V enrichment technology. Holding a 10.9% market share, it long serves international giants such as Nestlé and Coca-Cola.
- **Guangxi Senkang & Zhejiang Puli**: Form the second echelon of the industry, focusing on the mid-end food and ordinary health product markets, seizing the sinking market relying on cost-performance advantages.
- **International Competitive Pattern**: Overseas regions have no large-scale planting or production capacity. Global giants (Nestlé, PepsiCo, Starbucks, Danone) have no self-production capacity and all purchase raw materials from Chinese enterprises. Chinese enterprises fully control global pricing power and supply power.

The industry's competitive focus keeps upgrading: the industry completely bids farewell to low-end price wars. Competition dimensions upgrade comprehensively from simple production capacity and price competition to high purity (≥98%), directional enrichment of Mogroside V, green low-carbon production, pharmaceutical-grade GMP certification, customized compound formulas, full-chain traceability services and international high-end qualification certification. High-endization, differentiation and customization have become enterprises' core competitiveness.

4. Downstream Customer Value (Maximize Commercial Benefits & Empower End Product Value-Added)

● **High-End Product Premium**: Enable end products to upgrade from ordinary sugar-free ingredients to high-end attributes integrating zero-calorie, zero-sugar, sugar-control, tooth-protection, natural, medicinal-edible homology and all-age safety. Product premium can reach 50%–100%, covering full scenarios of sugar-free beverages, high-end baking, functional snacks, pharmaceutical preparations, infant complementary food and high-end daily chemicals, greatly enhancing end products' added value and market competitiveness.

● **Worry-Free Compliance & Safety**: Achieve full global compliance with zero policy risks, clean label and zero negative public opinion. Adapt to food supervision standards of countries worldwide, covering sensitive groups such as infants, pregnant women, chronic disease patients and the elderly. Significantly reduce downstream enterprises' compliance review costs, public opinion risks and product recall risks with 100% consumer trust.

● **Process Cost Reduction & Efficiency Improvement**: Its ultra-high sweetness leads to extremely low addition dosage (0.05%–0.1%), effectively cutting formula cost by over 60%. Meanwhile, its mildew-proof, moisture-absorption-resistant and high-stability features reduce production loss and extend shelf life by 6–12 months. It can directly replace various traditional sweeteners without production line renovation, remarkably improving production efficiency.

● **Absolute Differentiated Barriers**: Relying on seven core characteristics — natural zero-calorie, zero glycemic response, non-cariogenicity, full-scenario stability, medicinal-edible homology, all-age safety and China's exclusive resource monopoly — it builds multi-dimensional and non-replicable product barriers. Help downstream enterprises completely get rid of industrial homogenization involution and seize the blue ocean track of high-end clean label and functional health products.

5. Risks and Countermeasures (Accurately Avoid Industrial Risks & Consolidate Long-Term Growth Foundation)

- **Risk 1**: Intensified competition from natural sweeteners such as stevioside and erythritol → Continuously strengthen differentiated advantages including zero calorie & zero sugar, zero glycemic response, no after-bitterness, medicinal-edible homology, exclusive safety for infant complementary food and resource monopoly. Deeply cultivate high value-added core scenarios such as high-end sugar-free beverages, pharmaceutical excipients, infant complementary food, oral care and functional health products to avoid low-end sweetener price involution.
- **Risk 2**: Gastrointestinal flatulence caused by high-dose intake → Popularize the recommended daily intake of ≤30mg/kg body weight uniformly across the industry. Optimize formulas via scientific compounding with erythritol at 1:3 to weaken gastrointestinal irritation. Precisely layout high-end low-dose addition scenarios and continuously carry out consumer health education to popularize safe consumption knowledge.
- **Risk 3**: Price fluctuation of Siraitia grosvenorii raw materials (climate/planting cycle) → Enterprises adopt contract farming and long-term fixed-price cooperation models. Layout multi-regional planting bases in Guangxi, Yunnan and Guizhou. Promote high-mogroside improved varieties (Guitian No.1 with Mogroside V content

increased by 40%). Promote comprehensive utilization of fresh fruits and pomace by-products to hedge raw material price fluctuation risks and stabilize supply chain costs.

- **Risk 4**: Homogenized low-end production capacity (purity < 80%) → Leading enterprises continuously focus on high-purity (≥95%), Mogroside V ≥90%, pharmaceutical-grade, organic certified and customized functional products. Eliminate low-end extensive production capacity, raise industrial entry thresholds through technological iteration, and continuously improve product added value and technical barriers.
- **Risk 5**: International trade barriers / tariff fluctuations → Fully complete international high-end certifications including FDA, EFSA, HALAL, KOSHER and Organic. Deeply cultivate zero-tariff markets in the RCEP region, layout overseas warehouses and localized after-sales service systems, continuously promote the internationalization of China's Mogrosides industrial standards and reduce international trade policy risks.

III. Conclusion

With ultimate metabolic friendliness of natural zero-calorie, sugar-control attribute of zero glycemic response, tooth-protection efficacy of non-cariogenicity, sucrose-like pure high-potency sweetness, processing adaptability of thermal-acid-alkali full stability, multi-functional value of medicinal-edible homology, all-age safety endorsement, global full-scope compliance certification and China's exclusive resource monopoly, **Mogrosides** have become an irreplaceable high-end natural sweetener in global food, pharmaceutical, daily chemical and infant complementary food fields. It is the core track with the highest safety level, strongest health attributes and highest growth certainty in the natural sweetener industry.

Supported by resource monopoly, full industrial chain closed loop, technological breakthroughs, production capacity expansion, high-end certification and global layout, China's market growth rate continues to lead the world. By 2030, an industrial pattern will take shape featuring 100% global supply, dominance in the high-end market and leadership by Chinese standards.

For downstream enterprises, **Mogrosides** are not only a substitute for sucrose and synthetic sweeteners, but also a core strategic fulcrum for product high-end upgrading, building absolute differentiated barriers and expanding high value-added segmented markets (sugar control, tooth protection, infant complementary food, pharmaceuticals, natural clean label). It boasts clear long-term growth logic and enormous commercial and industrial potential.

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