

TECH OFFER

Next-Generation Cordyceps Cultivation and Bioactive Extraction Technology



KEY INFORMATION

TECHNOLOGY CATEGORY:

Foods - Ingredients

Foods - Processes

Healthcare - Pharmaceuticals & Therapeutics

TECHNOLOGY READINESS LEVEL (TRL): **TRL9**

COUNTRY: **THAILAND**

ID NUMBER: **TO175483**

OVERVIEW

Cordyceps are recognized as a premium adaptogen with strong consumer appeal and clinical potential, offering a clear edge over commoditized herbal ingredients. However, traditional wild harvesting of *Ophiocordyceps sinensis* and *Cordyceps militaris* is increasingly unsustainable due to scarcity, ecological impact, and inconsistent quality. Wild sources are also prone to contamination from herbicides, insecticides, and heavy metals in high-altitude habitats, raising consumer safety concerns.

To address these challenges, this technology enables the efficient and sustainable production of safe, potent bioactive compounds from Cordyceps through advanced fungal cultivation under controlled conditions with molecular authentication and a proprietary solvent-free, water-based extraction process, delivering standardized ingredients suitable across various industries. The technology provider is seeking collaborations and partnerships for ingredients, co-development, and clinical research with industry and institutional partners in the health, wellness, and biotechnology sectors.

TECHNOLOGY FEATURES & SPECIFICATIONS

The technology platform integrates three proprietary components:

- Artificial cultivation system: Controlled-environment production of Cordyceps strains using optimized growth parameters, ensuring consistent yields of active metabolites
- Strain authentication: Next-generation sequencing verification to ensure genetic authenticity and prevent adulteration
- Water-based extraction: Eco-friendly, solvent-free process yielding standardized extracts rich in cordycepin, polysaccharides, and adenosine

In addition to raw material and extract supply, the technology supports formulation development for various delivery formats — including capsules, tablets, powders, beverages, jellies, functional snacks, skincare emulsions, and topical creams. Each formulation is optimized for stability, bioactive retention, and compliance with nutraceutical and cosmetic regulations.

POTENTIAL APPLICATIONS

The technology can be applied in:

- Functional foods and beverages (TRL 4-9): Fortified jellies, drinks, teas, and energy gels
- Nutraceuticals: Capsules and tablets targeting immunity, metabolism, respiratory function, and cognitive health
- Cosmeceuticals and personal care: Anti-aging, antioxidant, and skin-repair formulations
- Pharmaceutical research: Source of bioactive compounds for drug discovery

The platform supports both B2B ingredient partnerships and co-development of consumer products.

MARKET TRENDS & OPPORTUNITIES

The global functional mushroom market is projected to exceed USD 19 billion by 2030. Within this, *Ophiocordyceps sinensis* is estimated to grow from USD 1.2 billion in 2024 to USD 1.94 billion by 2029 at a CAGR of 10.2 %. Meanwhile, the Cordyceps

militaris is forecast to grow from USD 1.02 billion in 2023 to USD 3.11 billion by 2033 at a CAGR of 11.8%. These trends are driven by rising consumer demand for natural, scientifically validated health products.

UNIQUE VALUE PROPOSITION

- Sustainability: Controlled cultivation eliminates ecological harm from overharvesting
- Consistency: Uniform growth and extraction ensure reproducible quality and efficacy
- Safety and purity: Free from herbicides, insecticides, and heavy metals commonly found in wild Cordyceps; solvent-free extraction enables clean-label applications
- Scalability: Modular production adaptable for commercial-scale manufacturing
- Scientific validation: Genomic authentication and standardized bioactive profiles (cordycepin, polysaccharides, adenosine)