NEW ERA AGRICULTURE MAGAZINE

Keeda Jadi

Santosh*, Ratnakiran D. Wankhade[1] and Mohd Nayeem Ali[2]

Introduction:

Keeda Jadi, scientifically known as *Cordyceps sinensis* and popularly referred to as Yarsagumba in the Himalayan region, is a rare and valuable entomopathogenic fungus that parasitizes the larvae of ghost moths. Revered in traditional Chinese and Tibetan medicine for its therapeutic benefits, it is often dubbed the "Himalayan Viagra" or "soft gold" due to its high medicinal value and market price. This article explores the biology, ecology, distribution, harvesting practices, medicinal uses, economic significance, conservation issues, and cultivation prospects of Keeda Jadi, highlighting its role in Himalayan livelihoods and global nutraceutical markets. Keeda Jadi (literally "insect herb" in Hindi) is a unique fungus-insect complex that has fascinated scientists, traders, and traditional healers for centuries. It is the fruiting body of a parasitic fungus, *Ophiocordyceps sinensis*, which infects and mummifies the larvae of ghost moths (*Thitarodes* spp.) and sprouts a club-like stalk from the corpse. Primarily found in the alpine grasslands of the Himalayas, particularly in Nepal, Bhutan, India, and Tibet (China), Keeda Jadi is harvested annually between May and July and commands an astronomical price of ₹10–20 lakh per kilogram in international markets. With increasing demand and declining availability, concerns about sustainability, conservation, and ethical harvesting have emerged.

Taxonomy and Biological Identity:

a) **Kingdom**: Fungi
b) **Phylum**: Ascomycota
c) **Class**: Sordariomycetes
d) **Order**: Hypocreales
e) **Family**: Ophiocordycipitaceae
f) **Genus**: *Ophiocordyceps*
g) **Species**: *Ophiocordyceps sinensis* (formerly *Cordyceps sinensis*)

Life Cycle:

1. The fungus infects larvae of ghost moths in the soil.
2. It consumes the host from within,

Santosh*, Ratnakiran D. Wankhade[1] and Mohd Nayeem Ali[2]
**Assistant Professor (Genetics and Plant Breeding),*
[1] HOD and Assistant Professor, (Dairy Technology)
[2] Assistant Professor (Farm Machinery and Power Engineering),
Department of Agriculture,
Shri Ram College- Muzaffarnagar (Uttar Pradesh)-251001 (India)

mummifying it.

3. In spring, the fungal fruiting body emerges from the larva's head and appears above the ground.
4. The cycle repeats through spore dispersion.

This unique life cycle has earned Keeda Jadi mythical and medicinal status in Himalayan folklore and traditional medicine.

Habitat and Distribution:

Geographical Range: 1. India: Uttarakhand (Pithoragarh, Chamoli), Himachal Pradesh (Kinnaur, Lahaul-Spiti), Sikkim, Arunachal Pradesh. **2**. **Nepal**: Dolpa, Darchula, Rukum. **3**. **Tibet (China)**: Qinghai-Tibet Plateau. **4**. **Bhutan**: Alpine zones

Ecological Conditions: Altitude: 3,500–5,000 meters. Temperature: 5–15°C during fruiting season. Soil: Moist, humus-rich alpine meadows. Season: Emerges in May–June, collected until early July. Keeda Jadi is highly sensitive to climatic and ecological changes, which makes its distribution narrow and sporadic.

Morphological Features: Length: 5–15 cm (larval part 3–5 cm, stalk 2–10 cm). **Color**: Larval part is dark brown; stalk is reddish to black. **Appearance**: Resembles a mummified caterpillar with a thin fungal stalk growing from the head

Medicinal Properties and Traditional Uses:

1. Traditional Medicine: Used in **Traditional Chinese Medicine (TCM)** and **Tibetan medicine** for Treating respiratory disorders (asthma, bronchitis), Enhancing libido and fertility, Increasing stamina and energy, Strengthening kidneys and lungs and Delaying aging and improving vitality.

2. Pharmacological Effects: Scientific studies have validated several bioactivities: **Immunomodulatory**: Enhances white blood cell function, **Antioxidant**: Neutralizes free radicals, **Anti-tumor**: Induces apoptosis in certain cancer cells, **Anti-inflammatory**: Suppresses cytokine activity, **Hypoglycemic**: Regulates blood sugar in diabetic models and **Cardioprotective**: Reduces LDL cholesterol and improves heart function.

3. Active Compounds: Cordycepin: Adenosine analog with anti-cancer and antiviral activity, **Polysaccharides**: Immunity-enhancing agents, **Ergosterol**: Precursor of vitamin D2, and **Nucleosides**: Promote metabolism and energy synthesis.

Nutritional Composition:

Component	Per 100g (dry weight)
Protein	25–32 g
Carbohydrates	30–40 g
Fat	8–10 g
Fiber	6–8 g
Vitamins	B1, B2, E, K
Minerals	Zinc, Magnesium, Selenium

Economic Significance: Keeda Jadi is considered the **most expensive biological resource** harvested from the wild in India and Nepal.

Livelihood Impact: In Uttarakhand and Himachal, thousands of rural families rely on Keeda Jadi for income. A collector can earn ₹1–3 lakh during a single harvesting season.

Harvesting Practices: 1. Timing: May to early July. 2. Method: Manual digging using tools or bare hands, Specimens are cleaned, dried under shade, and packed for sale, Harvesters camp at high altitudes for weeks. **Issues:** Overharvesting, Soil degradation, Conflict over territories, Child labor and exploitation and No standard pricing or certification.

Legal and Policy Aspects: (a) India: Recognized as a **Minor Forest Produce (MFP)** in some states. Permits required for collection in protected areas. Lack of national policy on harvesting, trade, and conservation (b) **Nepal:** Regulated by the Yarsagumba Collection Guidelines (2009), Permit and royalty system in place. Community Forest User Groups (CFUGs) monitor collection

Conservation Concern: Listed as **vulnerable** by IUCN due to overexploitation and habitat loss.

Cultivation Attempts: Due to declining wild stocks and high demand, research into artificial cultivation is ongoing.

Success in Laboratory Conditions: Cultivation on artificial media using grain or silkworm pupae. Some Chinese companies sell lab-grown *Cordyceps militaris* as a substitute.

Limitations: *O. sinensis* has complex host dependency. Mycelial biomass may lack full medicinal properties of wild specimens. Ethical concerns over authenticity and adulteration.

Conservation Strategies:1. Community-Based Management: Empowering locals through cooperatives, training, and sustainable quotas. **2. Habitat Protection:** Restricting grazing, deforestation, and tourism in alpine meadows. **3. Research and Monitoring:** Long-term ecological and biological monitoring to guide harvest limits. **4. Awareness and Certification:** Encouraging ethical trade and promoting traceable, certified products.

Challenges and Threats:

Challenge	Impact
Overharvesting	Decline in wild populations
Climate change	Alters emergence and distribution
Illegal trade	Loss of revenue, encourages smuggling
Lack of regulation	Unsustainable harvesting, community conflict
Deforestation and habitat loss	Reduces insect host populations

Socio-cultural Importance: In Himalayan communities, Keeda Jadi holds

cultural significance: Gifting dried specimens during weddings or festivals, Believed to bring health, wealth, and longevity, Used in traditional rituals and medicine preparation.

Future Prospects: Scientific Cultivation: Use of alternative hosts and bioreactor technology may enable large-scale production. **Bioprospecting:** Further exploration of active compounds for drugs against cancer, COVID-19, and aging. **Eco-tourism Integration:** Trekking and mushroom foraging with local guides could generate alternative income. **Sustainable Trade:** GI tagging, branding, and cooperative marketing to promote fair trade.

Keeda Jadi, the "Himalayan herbal gold," stands at the intersection of ecology, economy, and ethnomedicine. Its immense medicinal potential, combined with socioeconomic dependence in the Himalayas, demands a careful balance between utilization and conservation. To ensure long-term availability, sustainable harvesting, legal regulation, scientific cultivation, and community involvement must be prioritized. With proper intervention, Keeda Jadi can become a model for high-value biotrade, traditional knowledge integration, and biodiversity conservation.

References:

1. Shrestha, B., & Bawa, K. S. (2014). Trade, harvest, and conservation of Himalayan medicinal plants. *Biological Conservation*, 166, 210–216.
2. Negi, C. S., & Pant, M. (2012). Cordyceps sinensis: The caterpillar fungus of the Himalayas. *Current Science*, 102(10), 1408–1413.
3. Winkler, D. (2009). Yarsagumba: Harvesting the fungus caterpillar in the Himalayas. *Field Mycology*, 10(2), 60–63.
4. ICIMOD (2020). *Yarsagumba and Livelihoods in the Himalayas: Trends, Opportunities, and Risks*. Kathmandu, Nepal.
5. Li, S. P., Yang, F. Q., & Tsim, K. W. K. (2006). Quality control of Cordyceps sinensis, a valued traditional Chinese medicine. *Journal of Pharmaceutical and Biomedical Analysis*, 41(5), 1571–1584.