RESEARCH PROGRAM ON Livestock

CGIAR

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Science for resilient livelihoods in dry areas

RESILIENT AGROSILVOPASTORAL SYSTEMS

CGIAR RESEARCH PROGRAM ON LIVESTOCK

Aims to increase the productivity of livestock agri-food systems in sustainable ways across the developing world.

Managing agrosilvopastoral systems: promoting edible fungi species

Tirmania pinoyi (Maire) Malençon: an important component of the mycological flora in arid and semi-arid rangelands and represent a good indicator of rangeland health

Scientific names:
Tirmania pinoyi (Maire) Malençon
Tirmania nivea (Desf. : Fr.) Trappe
Terfezia boudieri Chatin

Common names:
Desert truffle, Terfezia, Tirmania
Terfes (ترفاس،كمأ)

Location:
Arid and semi-arid zones of MENA region

"Desert truffle" refers to members of the genera *Terfezia* and *Tirmania* in the family Terfeziaceae, order Pezizales. Known as terfes or kama, they represent an important belowground component of arid and semi-arid rangelands.

Desert truffle usually appears in the desert following the rainy season between February and April. They grow naturally in large in large quantities in virgin land in the Middle East and North Africa (MENA) region.

Truffles have physical characteristics making it very easy to distinguish them from the more commonly consumed mushrooms. In general, truffles have no stalk, no gills, and the mycelia grow underground. The Tirmania species (*Tirmania pinoyi* and *Tirmania nivea*) are locally known as white terfes; *Terfezia boudieri* is locally called red terfes. Tirmania grow in calcareous soil under *Helianthemum lipii* and are harvested during February. Desert truffle is harvested from the second half of February throughout southern Tunisia and forms ectomycorrhizal associations with its main host plant, *Helianthemum sessiliflorum* (Cistaceae), a small perennial shrub inhabiting the dunes and sandy soils of these areas, and sometimes under *Rhanterium suaveolens*.

Benefits:

- Source of high protein
- Low in fat
- Anti-microbial properties
- Reduce Inflammation
- Aromatic benefits
- Culinary uses

Desert truffle growing below ground in symbiotic association with the roots of *Helianthemum* causing soil surface to crack (Southern Tunisia)

White and red truffles collected from desert rangelands of Tataouine - Tunisia

Tirmania reached a good size, cracked the surface of the ground and appeared as bumps

Desert truffle has a high economic value and are the world's most expensive mushrooms. Truffle gatherers are still active and there is a well-organized export trade, with many Tunisian desert truffle very quickly finding their way to the markets of Europe and the Gulf States. Tunisian terfes are sold at a high price to the greatest chefs of the world because of their many virtues and special quality. In 2018, desert treffle was sold on the open market at €150–250 per kg depending on the species.

Desert truffle has also constituted an important nutritious food and medicine since ancient times for the people of North Africa and southwest Asia. They are used as a meat substitute and consumed in large quantities due to their delicious taste and musky aroma. They have a unique nutritional profile of unsaturated fatty acids, vitamins, minerals, and protein and have been used for eye treatment in folk medicine.

In modern medicine, truffle represents an unlimited source of therapeutic compounds with anti-inflammatory, immunosuppressive, antimutagenic, anticarcinogenic, antioxidant properties and antimicrobial.

Establishment and Management

Desert truffle of the genera *Terfezia* and *Tirmania* form fruiting-bodies and mycorrhizae with rangeland plants. Generally, desert truffles are harvested under *Helianthemum lippii* and *Helianthemum sessiliflorum* in desert plains (with arid to semiarid climate) of North Africa, in spring (March–April), generally on limestone and sandy soils.

Effective Management

- Heavy rain of more than 200 mm is optimal for growth of desert truffles
- Both thunder and lightning are considered essential requirements for truffle formation
- Grow best in the rhizosphere soil of *Helianthemum lippii* and *Helianthemum sessiliflorum* compared to soil with plants that are not hosts

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ICARDA's Rangeland Ecology and Forages unit (REF)
The REF team promotes advances in rangeland ecology and pasture management in the dry areas. This series of factsheets is dedicated to the characterization of promising range and forage species aimed at alleviating the feed gap, limiting water runoff and soil erosion, restoring degraded rangelands and maintaining a healthy ecosystem.