

University of Central Asia

The University of Central Asia (UCA) was founded in 2000 as a private, not-for-profit, secular university through an International Treaty signed by the Presidents of Kazakhstan, Kyrgyzstan and Tajikistan, and His Late Highness Aga Khan IV; ratified by their respective parliaments and registered with the United Nations. UCA's mission is to promote the social and economic development of Central Asia, particularly its mountain communities, by generating world class research and offering an internationally recognised standard of higher education, to help transform lives and livelihoods across the region, including through the celebration and preservation of Central Asia's rich cultural heritage.

UCA Graduate School of Development

GSD is a School of Development Studies conducting multidisciplinary research and education on the mountainous regions of Central Asia, where communities, economies, and environments are experiencing the effects of rapid climate change. The school has three disciplinary 'hubs': social and economic sciences; environmental and climate sciences; and cultural studies. Together, they address the most significant obstacles to the sustainable development of Central Asia with a particular focus on the challenges presented by climate change.

Mountain Societies Research Institute

The Graduate School's Mountain Societies Research Institute (MSRI) applies scientific expertise to the study of earth surface and environmental processes and interactions that affect mountain societies. MSRI is present at UCA's Khorog campus in Tajikistan, Bishkek, and Dushanbe. MSRI staff also work with UCA's undergraduate Earth and Environmental Sciences Programme and are actively engaged in developing executive and postgraduate education.

The Swiss Cooperation Office, Tajikistan

Within its Cooperation Program for Central Asia (2022-2025), the Government of Switzerland focuses on supporting economic, social, and democratic development, promoting an integrated and regional approach in the complex field of transboundary water management, strengthening economic ties, and promoting good governance. For more info:

www.eda.admin.ch/tajikistan

Join us in protecting the Bitter Almond!

How You Can Help:

- Support conservation initiatives.
- Spread awareness about endangered species.
- Promote sustainable land-use practices.



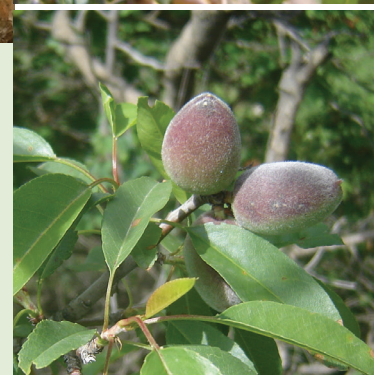
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Conserving Plant Biodiversity for Future Generations

Bitter Almond



UNIVERSITY OF CENTRAL ASIA



Bitter Almond

(*Amygdalus bucharica*)

Taxonomy:

- **Scientific Name:** *Amygdalus bucharica*
- **Family:** Rosaceae
- **Common Name:** Bitter Almond
- **Synonyms:** *Prunus bucharica*

Description:

- **Habit:** A shrub or small tree that is erect with an open canopy and gnarled branches, deciduous, and generally varies in height from three to ten meters.
- **Leaves:** These bright green serrated leaves emerge between early spring and spring and are lance-shaped.
- **Flowers:** Appearing before the emergence of leaves, these showy flowers possess five petals that are white or pink in color.
- **Fruit:** The seed (kernel) is small and dry gout with a hard shell that is extremely bitter because of the amygdalin content

Distribution:

- **Geographic Range:** The species is originally from Central Asia and mainly occurs in Tajikistan and Uzbekistan and bordering regions.
- **Altitude Range:** 2500m above sea level.
- **Habitat:** It thrives on dry rocky slopes, semi desert, and montane scrubland.

Ecological role:

- **Pollination:** Predominantly by other pollinators and bees, this type of plant is known to be insect pollinated.
- **Seed Dispersal:** This plant typically experiences natural seed dispersal by birds and small mammals.
- **Associations:** Usually associated with pistachios and Turkestan maple (*Acer turkestanicum*) and hawthorn *Crataegus* spp.)

Conservation Status:

Bitter Almond is not listed in the Red Data Book of Tajikistan. Indeed, *Amygdalus bucharica* was most recently assessed for the International Union for Conservation of Nature (IUCN) Red List of Threatened Species in 2007, where it was listed as “Vulnerable” considering habitat destruction and overexploitation of natural resources.

Conservation actions taken were:

In-situ protection through habitat improvement, control heavy grazing and cutting of trees from the wild are being implemented by the community. For ex-situ conservation, the trees are raised in nurseries and the botanical garden Kulob and are disseminated among the community.

Chemical Properties:

Amygdalin is noticed in extremely high concentrations in the seeds, leading to hydrolysis resulting in cyanic acid.

Possible uses: Extracts harvested could contain traits that are pesticidal in nature, and that is still to undergo further research.

Threats:

- Habitat loss due to deforestation and agricultural expansion.
- Over-harvesting of fruits and wood.
- Climate change affecting its growth zones
- Overgrazing.
- Limited natural regeneration.

Research needs:

- What are the possibilities for genetically altering almond breeding?
- Research on proper collection and detoxification processes of bitter almond that are environmentally friendly.
- Studies that explain the functioning of the species in dryland ecosystems.

Uses

Traditional Uses:

- Practitioners of culture utilise this plant for its medicinal properties; however, it must detoxify before use.
- Furniture is made in a very limited quantity, and wood is available for fuel.
- Economic Potential: Drought resilient almond varieties can be developed through genetic selection and breeding programmes.

Cultural Significance:

- Almond trees flower early in the Spring, making them a symbol of rebirth and new life. Trees that are blooming and flowering announce the beginning of Spring and new life. It is domesticated and valued among local cultures for its oil, which is used in various traditional healing and remedies.

Morphology:

- **Root System:** Expert in withstanding drought due to its enormous, gnarled, and deep root system.
- **Bark:** The bark is thin and rough and of gray-brown color, and as age more advanced become gnarled, it does.
- **Hybridisation:** Bursts of flowers are noted during the flowering period in early spring, usually around March - April.
- **Fruiting period:** summer, specifically July - August.
- **Propagation:** Vegetative methods are feasible for cultivation, but reproduction is primarily accomplished through seeds.

Ongoing Conservation Efforts:

- Protection within botanical gardens and conservation areas.
- Seed collection and propagation programs.
- Community-based conservation projects.

