

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 xerophytic medicinal and aromatic shrub species

***Thymelaea hirsuta* (L.) Endl.: excellent medicinal benefits but classified as a toxic herb**

Thymelaea hirsuta is a perennial shrub (phanerophyte) known locally by the Arabic name of mithnan or mitnan, which means rope or sinew. Among the Bedouin the word mitnan connotes "strong." It belongs to the plant family Thymelaeaceae, which grows on sandy and stony steppe and desert areas, dry slopes of hills, sandy coasts, saline habitats, and sparse forests around the Mediterranean. *Thymelaea hirsuta*, which also grows in wadis, is indicative of the favorable water regime of bedded limestone lacking soil cover.

Benefits:

- Drought tolerant and used for dune stabilization
- It is used in manufacture of high-quality paper
- Contains excellent fibers from which fine strings, thick cords, and ropes may be made.
- It is used to prevent abortion in camels



Scientific name:

Thymelaea hirsuta (L.) Endl.

Common names: Shaggy sparrow-wort, mithnan (مثنان)

Locations:

Circum-Mediterranean: dry coastal regions of Southern Europe, Turkey & desert areas of the Levant & North Africa

It is a xerophytic, evergreen, microphyllous, heavily branched shrub, growing up to 2 m tall, with roots wide and extending to a depth of up to 3.5 m, helping the plant obtain water in harsh desert environments. Branches overhanging, and the young shoots are densely white hirsute. Leaves dark green, scaly, densely overlapping, outline triangular to ovate, 3–8 mm long, dense, cheeky, glabrous, glossy, white, and hirsute on the reverse. The flowers are in dense inflorescences, of which two to five are found at the ends of the young shoots and are oblong and single-headed, 4–5 mm in diameter, with yellow flowers, smooth inside, and outside white silky hirsute.



Evergreen leaves and branches of *Thymelaea hirsuta*



Thymelaea hirsuta flowers grouped in a condensed raceme with bright yellow perianth and orange anthers



Shrub of *Thymelaea hirsuta* densely growing in south-east of Tunisia

Thymelaea hirsuta is dioecious (male and female flowers are borne on separate plants) and sometimes monoecious, and both sexes produce clusters of yellow flowers at the end of young twigs during March–July.

Thymelaea hirsuta is often dominant in heavily grazed arid regions, is hard to cut, and is unpalatable. For nomads in deserts, it was a good source of fiber for making ropes to anchor tents. Today it is used to produce handmade paper and also for anchoring soil at the edges of the desert.

Thymelaea hirsuta has many medicinal benefits but few people know how to use it. However, it is classified as a toxic herb as it contains very toxic diterpenes. Simple contact with the skin or mucous membranes can cause an intense inflammatory reaction. The diterpenes are also potentially carcinogenic agents. Five 12-hydroxydaphnane diterpenes have been isolated from the leaves and branches (e.g. genidin, gniditrin, and genkwadaphnin).

Thymelaea hirsuta contains 95.6% dry matter, 92.8% organic matter 6.9% crude protein, 27.1% crude fiber, 7.2% Ash, 4.8% tannin, 50.9% neutral detergent fiber, 17.7% acid detergent lignin, 1.6%, 37.8% acid detergent fiber.

Contact

Dr. Mouldi Gamoun, International Center for Agricultural Research in the Dry Areas (ICARDA). M.Gamoun@cgiar.org

Dr. Mounir Louhaichi, International Center for Agricultural Research in the Dry Areas (ICARDA). M.Louhaichi@cgiar.org

www.icarda.org

Establishment and Management

The timing of germination in *Thymelaea hirsuta* may be responsive to the start of the rainy winter season and there is minimal inherent seed dormancy. A massive and sporadic germination of *Thymelaea hirsuta* seeds occurs every few years. Seedlings up to 20 cm tall have relatively large bluish leaves that are glabrous and spreading. The lower side (abaxial) of the small green adult leaves are shiny and glabrous and have no stomata. The upper leaf side (adaxial) is hairy, contains stomata, and is closely appressed to the stem. Seedlings are soon established because they are avoided by all livestock – even goats, which are known to eat nearly everything, avoid it. *Thymelaea hirsuta* is one of the most common xerophytic species and is planted for dune stabilization.

Effective Management

- Seed germination requires pretreatment
- Maximum germination percentage of 24% achieved by acid-pretreated seeds maintained at 15°C
- Maximum germination percentage of 42% achieved by 500 mg per L of gibberellic acid
- Higher relative growth during August and October

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.