

## Report on the Study Tour to Oman, 2007

### Wadi Hinna – Dry Forest Vegetation and Baobab Trees

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Wadi Hinna is located at 240m altitude within the Dhofar limestone mountains. The mists of the Indian monsoon supply the area with humidity during the summer months, enabling a unique dry forest vegetation to grow. These closed forests have a high biodiversity; about 200 wooden species have been classified here, of which many are endogenous species. Succulents and thorny shrubs are typical for this vegetation; besides the famous baobab, we identify *Anogeissus dhofarica*, *Acacia*, *Ficus*, *Euphorbia cactus* and a flowering *Euphorbia balsamifera*, a species which can store water in its swollen trunk. As we could observe, the trees shed their leaves during the dry and hot winter. Due to these xeric conditions, a great majority of the trees grow not more than two to three meters tall, except for the baobabs. The forest is also an important habitat for animals. We can hear and see a great number of different birds, and observe termites for the first time in Oman. In a gorge with a small water basin, the trees retain their leaves, ferns and reeds grow close to the water, we hear cicadas and see dragonflies and weaverbirds with their impressing nests hanging in the trees.

We find pathways proving that the area is grazed with goats, cattle and camels. Many shrubs and trees protect themselves with thorns and spines against the various animals feeding on them. Some branches of *anogeissus* and baobabs have been torn down by camels and livestock herders. On the way we see Bedouins herding Dhofari Goats, which are short-haired, showing a big variety of colors (brown, white, grey, black) and prints (speckled, dotted) and the Dhofari Cattle, a small landrace (maximum 200 kg) with similar colors.

The tourist attraction of the region are the many baobab trees (*Adansonia digitata* L.). While the tourist guide mentions a population of about 40 trees growing here, we could find a much larger number, at least more than hundred of them. They grow in closest density on the tops of the rocky hills.

The baobab tree belongs to the family of the *bombaceae* and is divided into nine species: *A. digitata* of tropical Africa, *A. gregori* of Western Australia and seven species of Madagascar. *A. digitata* mainly occurs in Savannah regions, but is distributed in a wide range of soil types, altitudes and rainfall areas between 200 and 800 mm. Western Sudan is

supposed to be the northern limit of its natural distribution, but its occurrence in other regions, like Egypt, Yemen and Oman is not totally clarified. With the big genetic and phenologic variability, the existence of subspecies is very likely.

Baobabs can grow up to 25 m tall and 8 m in diameter. In Wadi Hinna they reach a height of 10 to 15 meters and a trunk diameter of up to 2 meters, thus overlooking the smaller vegetation of the area, and being probably the biggest (non-irrigated) trees in all Oman. Also a great number of smaller individuals could be found. The big pendulous flowers open over night to attract bats for pollination, but wind pollination is also possible. We find no sign indicating that they are used except for grazing, even the fruits are not harvested, while in Africa they are used to provide fibers (bark), medicine, forage (leaves) and food (leaves, fruit pulp and seeds).

The baobab is in many different ways adapted to low and irregular water supply. It is able to store huge amounts of water between the xylem layers of its spongy wood. The trunk can expand and shrink up to one cm in girth in one season, depending on the amount of water stored. Baobabs develop an extensive root system to collect rainfall of a large area. The leaves are even more water effective than those of some sclerophyllous species. During dry seasons, they can be shed or a part may be retained. When they have to endure longer droughts without leaves, they can survive continuing a minimum photosynthesis through a green layer of their bark, using the water stored in the trunk.

There are different theories on how this small population of *Adansonia* came to Wadi Hinna. While some see it to be an endogenous population, the tourist guide and some of the literature on baobab mentions them to have been planted, being part of the African population. The latter seems less probable when looking at the irregular distribution of the trees in that remote area, but would explain their isolated appearance.

Different methods to clarify these speculations were discussed. The first steps might be a mapping of the trees and the distribution of height and trunk size. This map could then be analyzed in terms of influence of humidity and altitude. An examination of the age structure of the population would be most helpful, but it bears some difficulties.

Baobabs are reported to reach an age of more than 1000 years, although they are mostly younger than their appearance suggests, because they develop a big trunk very quickly. According to Breitenbach, they can be classified into four growth phases by their trunk shape, height and girth: Sapling (up to 15 years), Cone (15 to 70 years), Bottle (70 to 300 years) and Old (more than 300 years). If this classification fits also to the growth conditions in Wadi Hinna, all trees might not be older than 70 years. The large diameter of the trees makes it difficult to take core samples and cores are often rotten. Year rings of

baobabs often show discontinuities, so that ring counts are within 2% of real age. Estimations of yearly cambial growth must be cautious because of a declining growth rate with age and hydrostatic expansion and shrinking. Maybe genetic analyses or C14 age determination could clarify the provenance and relation of the trees.

Altogether, visiting Wadi Hinna was a very interesting opportunity to get a grasp of how diverse the vegetation is in the different parts of Oman and of the influence of the local natural conditions. The dry forests in Dhofar are considered the only real forests of the country and the baobabs are its most prominent trees. It would be very interesting to find out if they are a planted part of the African population or even an endemic subspecies.

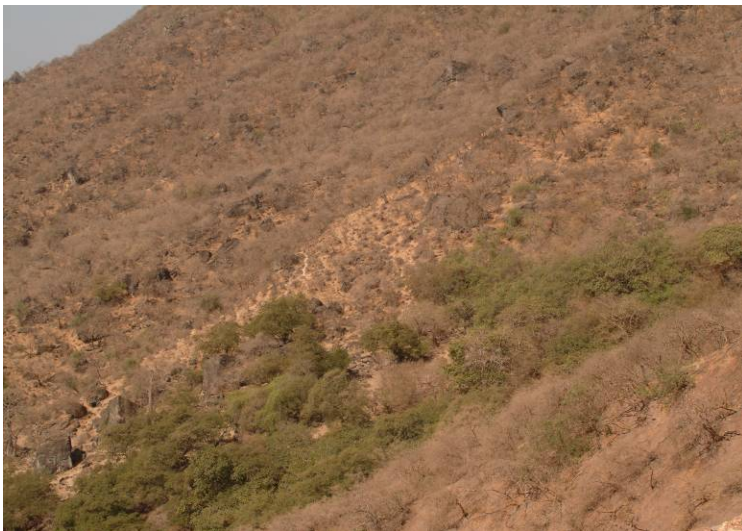
#### Literature:

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Picture 1: Dry forest and gorge with green trees



Picture 2: Young baobabs



Picture 3: Baobab fruit and its edible fruit pulp



Picture 4: Grazing Dhofari Goat



Picture 5: *Euphorbia balsamifera*