The Oldest Evidence of *Nigella damascena* L. and its Possible Introduction in Central Europe

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Fig. 1. Location of the excavation site at Mauken near Schwaz, Tyrol, Austria

Fig. 2. The Moosschrofen near the excavation site. Its faces are perforated with fire-set prehistoric ore mines (photo: Gert Goldenberg)

Investigating Bronze Age Metallurgic History in the Alps

First steps in metal processing were taken in Asia Minor during the Neolithic. As of the 9th / 8th millennium BC solid gold and copper were tempered into objects for ritual and status purposes. The subsequent improvements of metallurgic techniques are reported from the same region: mining and smelting of copper ore, casting solid copper, and creating bronze alloys.

During the 5th millennium BC the new technology was introduced into Europe. Prospectors travelled the lands in search of profitable ore deposits, and immigrants were bringing with them the knowledge of metallurgy (Krause 2004). Archaeological evidence also indicates cultural influence from East Mediterranean civilisations on the inhabitants of Southeast, Southern and Central Europe.

Fig. 3. Fire-setting created impressive dome structures inside Moosschrofen (photo: Gert Goldenberg)

The Alpine ore deposits of Schwaz were one of the most important sources for copper ore throughout Europe. They had been exploited since the early to middle Bronze Age (Goldenberg 1998, 2001). Traces of prehistoric mining are still visible everywhere on the south bank of the lower Inn Valley (**Figs. 2, 3**). Palaeoethnobotanical investigation of a slag-washing site near Schwaz now supplied plant material that proved an unexpected insight into Bronze Age mining history.

Fig. 4. The excavation at Mauken near Schwaz, transect 5a (1997 excavation campaign). The thick grey slag layers and the remains of the wooden slag-washing device are visible.

Materials and Methods

We investigated a middle to late Bronze Age (1390-930 years cal. BC) slag-washing site located in the low mountain ranges of the Inn Valley in Tyrol, Austria. Excavation revealed a wooden flotation device, embedded in the slag-dump (**Fig. 4**). Samples were taken from inside the trench, and from its perimeter.

A total volume of 21.5 l (21.1 kg) of soil material was retrieved and the macroremains were extracted using flotation technique. The samples contained both carbonised and uncarbonised plant remains. The macroremains were in an excellent state of preservation due to the water saturated soil enriched with toxic salts of copper, arsenic, and antimony. Decomposition of the plant material had thus been slowed down significantly.

Results

The samples contained remains of wild and cultivated plants (**Fig. 9**). The identified wild plants characterised the site's surrounding vegetation during middle and late Bronze Age: Parts of the area had been covered by zonal climax forest dominated by spruce, fir and beech, with sporadic occurrence of pine and larch. The local area had been partially cleared, the treeless patches indicated by plants as stinging nettle, black elder, and the two pioneer tree/shrub taxa birch and willow.

Cultivated plants were represented by a carbonised caryopsis of *Panicum miliaceum* L. (common millet). Having been an important cereal of the time, it was grown in the Alpine region during Bronze Age. *P. miliaceum* was usually consumed as millet gruel.

Fig. 5. *Nigella damascena* L., flower and capsule (photo: Markku Savela)

Among the other plant remains we found a seed of *Nigella damascena* L. (love-in-a-mist, wild fennel flower). It was identified by its characteristic features: a triangular-ovate seed with tubercled surface, three longitudinal and several transverse ridges forming a conspicuous reticulum (**Fig. 9a**).

N. damascena is an annual mainly occurring on disturbed ground. Initially it was of East Mediterranean distribution, but today it is a common ruderal plant in many parts of the Mediterranean (**Fig. 6**). Outside this area *N. damascena* may form only ephemeral populations after escaping from cultivation. The time of its introduction in Central Europe is however unknown, as until now no archaeological data of *Nigella damascena* has been available. The *N. damascena* seed from the site near Schwaz is actually **the oldest archaeological evidence in Central Europe**.

Like *Nigella sativa* (black cumin), *N. damascena* is cultivated for its aromatic seeds. They are used as a condiment in bread, cheese, and sweets. Both species also are largely used as natural remedies in the Near and Middle East (e.g. as emmenagogue and diuretic). Today *N. damascena* is also often cultivated as an ornamental plant.

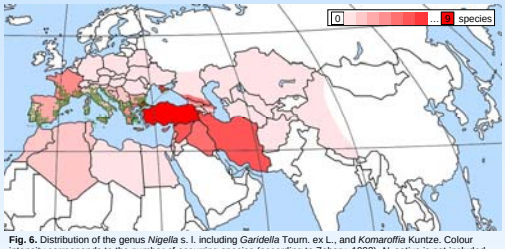

Fig. 6. Distribution of the genus *Nigella* s. l. including *Garidella* Tourn. ex L., and *Komaroffia* Kuntze. Colour intensity corresponds to the number of occurring species (according to Zohary, 1983). *N. sativa* is not included due to unknown native distribution. The centre of diversity is clearly visible in Near East. Spots indicate the native occurrence of *N. damascena*.

Discussion

The *Nigella damascena* seed that has been retrieved from the Bronze Age slag-washing site near Schwaz is definitely an outstanding find. Considering the archaeological context of an ore processing site, the seed had obviously been brought to its place of discovery by someone involved in mining, ore processing, or metal trade.

The retrieval of a *Panicum* caryopsis from the same place raises questions about the deposition of the *Nigella* seed. Was it part of a Bronze Age miner's diet, flavouring his millet gruel? Or had this ruderal plant been brought to the mining site by accident, just like the other weeds as *Stellaria* and *Urtica*?

At any rate, chorology of *N. damascena* is clear evidence of a connexion between Alpine copper ore mining and the Mediterranean. The find effectively indicates migrations from Southern or South-eastern regions to Central Europe during middle to late Bronze Age.

Fig. 7. The spread of copper smelting techniques among European culture groups during the Eneolithic. Numbers show the earliest evidence in years cal. BC, based on ^{14}C data.

Earlier cultural and technological interconnexions to the Eastern and South-eastern regions of Europe are documented from the Eneolithic. The techniques for copper mining and smelting had spread throughout Europe, coming from the southeast (**Fig. 7**).

The continuity of these cultural and trade bonds during the following centuries is proven by several finds of artefacts, as e.g. of imported prestige weapons. Three one-piece handle daggers ("Vollgriffdolche") have been found near Schwaz up to now. One of them is of Únětice origin, but had been forged mimicking archetypes from Italy (Schwenzer 2004). Likewise, metallurgical analysis of a spectacular gold find at the Alpine foothills in Bavaria (**Fig. 9**) has shown that this jewellery had been cast in the Aegean region. Moreover, their ritual purpose refers unambiguously to East Mediterranean cultures.

Basing on the given evidences for migrations between the Mediterranean and Central Europe during middle to late Bronze Age it is plausible to assume that *Nigella damascena* had been brought to the Alps by the same routes.

Fig. 8. The Únětice "Vollgriffdolch" found at the Buchberg near Schwaz (photo: Jörg Moser)

Fig. 9. The gold find from Bernstorf, Freising, Germany (Gebhard 1999)

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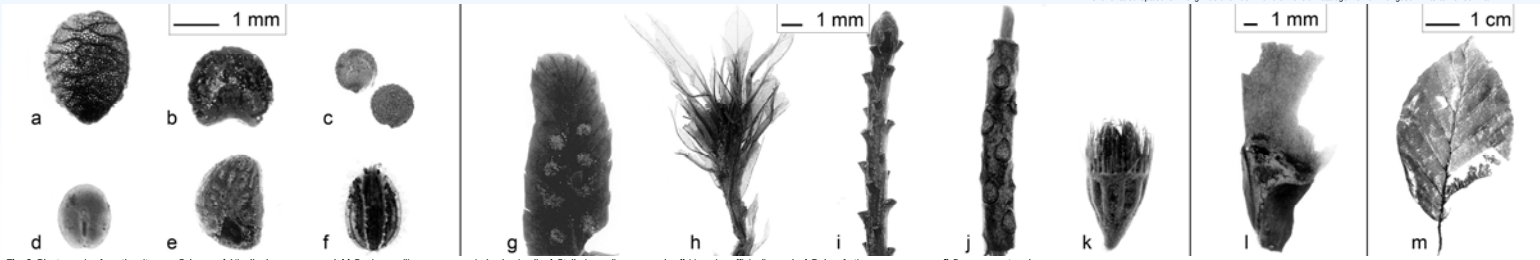

Fig. 9. Plant remains from the site near Schwaz. **a)** *Nigella damascena* seed, **b)** *Panicum miliaceum* caryopsis (carbonised), **c)** *Stellaria media* agg. seeds, **d)** *Veronica officinalis* seed, **e)** *Rubus fruticosus* agg. pyrene, **f)** *Daucus carota* achene, **g)** *Dryopteris* sp. leaflet, **h)** *Plagiomnium ellipticum* stem, **i)** *Picea abies* twig, **j)** *Abies alba* twig, **k)** *Agrimonia eupatoria* pseudocarp, **l)** *Abies alba* winged seed, **m)** *Fagus sylvatica* leaf