

Non-native Species

at *M*edieval Castles as Cultural Heritage

Katharina Dehnen-Schmutz, TU Berlin,
Rothenburgstr. 12, D - 12165 Berlin, Germany
Dehnen-Schmutz@tu-berlin.de

Introduction

The present study focused on non-native plant species occurring at medieval castles. In Central Europe castles are among the oldest buildings. On top of hills and rocks they were built during the 11th - 13th century in the Middle Ages. Since that time they are centers of spread of non-native plants. Waste, transportation of goods, visitors and castle gardens were the first sources of diaspores of non-native plants which colonized the surroundings of the castles assisted by the accumulation of nutrients from mortar, waste and livestock. With the end of the Middle Ages, the castles lost their function, most of them were destroyed or became dilapidated, only some were used as residential buildings. In the 19th century a new interest in the castles began and some of them were reconstructed. Today they are ruins or used as museum, restaurant, hotel or residential building. But in general castles were much less changed during the centuries than towns or settlements. Castles were intensively used over a period of up to 400 years and than often unused over a period of the same extension. Therefore they



Fig. 1: The five investigation areas in Germany and the number of investigated castles.



are suitable objects to study the question, if it is possible to explain the occurrence of non-native species at castles today with their use in the Middle Ages or later historic periods.

Study areas and methods

Five areas in Southern and south-eastern Germany were investigated:

parts of the river valleys of the Saale, Altmühl and Neckar, and parts of the regions Fränkische Schweiz and Schwäbische Alb (Figure 1). These landscapes have a high density of medieval castles all built on limestone rocks.

Plant species of walls and rocks of 56 castles were recorded from 1994 - 1997. The investigation was limited to the plants of rocks and walls because especially non-native species occurring in natural or semi-natural vegetation should be recorded. Cultivated plants were consequently excluded.

Non-native species are defined as species that have not evolved in the investigation area since the last Ice Age and whose introduction or immigration was supported deliberately or involuntarily by human activities (Kowarik 1995). They are divided by time of introduction in archaeophytes (invading before 1500 AD) and neo-

phytes (invading after 1500 AD).

Information about time of introduction, area of origin and use of the plants were taken from literature (DÜLL & KUTZELNIGG (1992), FISCHER-BENZON (1894), FISCHER (1929), HEGI (1906-1998), SCHLOSSER et al. (1991), WILLERDING (1992)).

Results

A total of 371 plant species occurred on the rocks and the walls of the castles, 97 of them non-native. According to their time of introduction they could be separated into 66 archaeophytes and 31 neophytes. Neophytes occurred with a higher frequency (4.2 localities per species) than archaeophytes (3.1). The origin of 75 non-native species is Europe or Europe and Asia and most species in these two groups are of Mediterranean origin. These species occurred with the highest frequency (3.6 / 3.5 localities per species), whereas species of Asian or American origin had lower numbers of localities per species (3.3 and 2.8 respectively).

The most frequent non-native spe-

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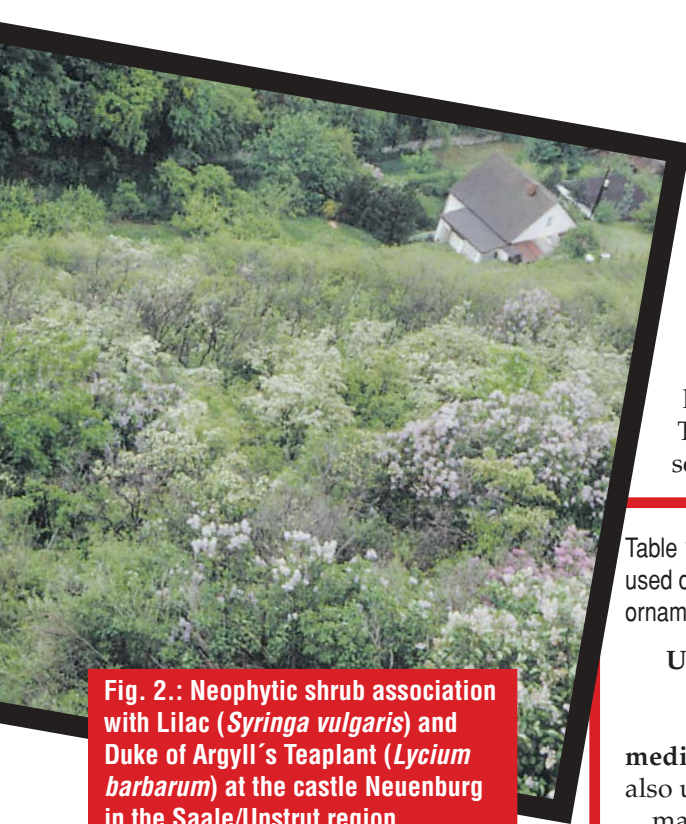


Fig. 2.: Neophytic shrub association with Lilac (*Syringa vulgaris*) and Duke of Argyll's Teaplot (*Lycium barbarum*) at the castle Neuenburg in the Saale/Unstrut region.

cies were Viper's bugloss (*Echium vulgare*) and Lilac (*Syringa vulgaris*) occurring at 40 -60% of the castles. At several castles the Lilac is the dominating plant in neophytic shrub associations (Figure 2) accompanied by Duke of Argyll's Teaplot (*Lycium barbarum*), Robinia (*Robinia pseudoacacia*), Snowberry (*Symphoricarpos albus*), Laburnum (*Laburnum anagyroides*) and several native shrubs. Also, in the herbaceous layer under the shrubs non-native plants occur (e.g.: Barren Brome (*Bromus sterilis*), Pellitory-of-the-wall (*Parietaria officinalis*), Bur Chervil (*Anthriscus caucalis*)). More conspicuous are the populations of Iris, mostly *Iris germanica* (Figure 3), covering areas of up to 20 m_ on the rocks of some castles. On the walls, Wallflower (*Erysimum cheiri*, Figure 4), Snapdragon (*Antirrhinum majus*), Yellow Corydalis (*Corydalis lutea*) or Ivy-leaved Toadflax (*Cymbalaria muralis*) are colourful examples of non-native plants established in the seminatural wall-vegetation.

Utilisation of the plants during the Middle Ages was analysed for non-native (archaeophytes) and native species. In the evaluation, uses were taken into consideration which are verified by historical documents from the Middle Ages (FISCHER-BENZON 1894,

FISCHER 1929) or archaeobotanical results from excavations (WILLERDING 1992). Altogether 91 species were usable plants during the Middle Ages, 33 species of them are archaeophytes. This means that of 66 archaeophytes occurring at the castles 50% have a possible use in that time. Table 1 shows most plants served as medicinal plants of-

ten with a widespread area of applications:

- Henbane (*Hyoscyamus niger*) was used during the Middle Ages as a drug in magic potions, as anaesthetic for dental treatment or as intoxicating herb for beer-brewing
- Rue (*Ruta graveolens*) for gynecological disorders, eye complaints, abortions, and as magical plant against enemies and devils.

Table 1: Native and non-native (only archaeophytes) species at the castles, which were used during the Middle Ages and their possible use as medicinal -, food -, technical - or ornamental plant.

Use	total	native	non-native (archaeophytes)
medicinal	66	49	17
also used:			
magical	3	1	2
food	9	5	4
spice	5	3	2
ornamental	1	-	1
food	11	6	5
also used:			
medicinal	4	1	3
technical	5	1	4
also used:			
medicinal	2	1	1
ornamental	10	3	7
also used:			
medicinal	2	1	1

Others were spices or food plants and others had a technical use – e.g. the Yellow Chamomilla (*Anthemis tinctoria*) for dyeing or the Pellitory-of-the-wall (*Parietaria officinalis* and *P. judaica*) for cleaning. An important tree for the inhabitants of the castles in these times might be the Yew (*Taxus baccata*) from whose wood bows were built. Some of the old food plants are still used today like the Walnut (*Juglans regia*) or the Chives (*Allium schoenoprasum*), others are unknown today like the use of the hot leaves of the Pepperweed (*Lepidium latifolium*) or eating leaves of Mallows (*Malva neglecta* and *M. sylvestris*) like spinach.

In contrast, most of the neophytes introduced later (after the end of the Middle Ages in 1500 AD) were used as ornamentals (24 of 31 species). Table

2 shows the comparison between the potential uses of archaeophytes and neophytes.

Discussion

Rocks around medieval castles and castle walls are places with a high portion of non-native plant species. 26% non-native species were found at these sites, while in the total flora of Germany there are only 16% (Jäger 1991). The portions of archaeophytes and neophytes were also different: 68% of the non-native species at the castles were archaeophytes, while in the total non-native flora they contribute only 40%.

With the methods of this investigation it is not possible to explain localities of non-native species at the castles with their use at the same castles in the Middle Ages or later times but there

Table 2: Comparison of potential uses of archaeophytes and neophytes at the castles. (absolute number and percentage). Multiple uses of some species are not regarded. Information about uses is taken from literature (DÜLL & KUTZELNIGG (1992), FISCHER-BENZON (1894), FISCHER (1929), HEGI (1906-1998), SCHLOSSER et al. (1991), WILLERDING (1992)).

Use	Archaeophytes		Neophytes	
medicinal	24	36%	1	3%
food	7	11%	0	-
forage	1	2%	0	-
technical	4	6%	0	-
ornamental	8	12%	24	78%
without use	22	33%	6	19%

are some reasons which underline this hypothesis. At first this is the occurrence of vegetatively propagated plants like the iris-species. Their localities are often limited to rocks near the castles and no way of long distance dispersal is known. Second, it is the limitation to castles of species used especially in the Middle Ages e.g. Rue or Iris (*Iris* sp.). Medieval documents verifying concrete localities of non-native species at castles are not known but for some species and localities it is possible to find references in literature more than 100 years old.

Species of different times of introduction represent different uses of the castles during the centuries. In the Middle Ages the castles were built and used for protection and demonstration of power. In the castle area there were stables, working areas and gardens. People living in the castles had to work in the fields too. Plants which were used in these times were mostly plants useful for daily life at the castles. Consequently the non-native species introduced in or before the Middle Ages could be used for these purposes. With the end of the Middle Ages the function of castles changed. Some were used as prestigious residential buildings. Now ornamental plants became more important for the inhabitants of the castles. This could explain why the portion of neophytes (introduced after the Middle Ages) occurring at the castles are used mostly as ornamental plants (24 of 31 species). Also, this might be one reason for the higher number of neophytes at castles used until today than at castles which are ruins (Dehnen-Schmutz 1998).

Non-native species have changed the vegetation of rocks around castles. There might be cases of local displacing of native species but in general non-native species do not belong to the reasons endangering rock-vegetation in Germany (Witschel 1998). The results of this study show that these non-native species are a cultural heritage documenting medieval culture and the history of use of the castles like the walls and towers of the castles themselves.

References:

DEHNEN-SCHMUTZ, K. (1998): Medieval castles as centers of spread of non-native plant species. - In: Starfinger, U., Edwards, K., Kowarik, I. & Williamson, M. [Ed.]: Plant

Invasions: Ecological Mechanisms and Human Responses. - Leiden (Backhuys Publishers) p. 307-312.

DÜLL, R. & KUTZELNIGG, H. (1992): Botanisch-ökologisches Exkursionsatlasbuch. 4. Aufl. - Heidelberg (Quelle & Meyer) 546 S.

FISCHER, H. (1929): Mittelalterliche Botanik. (Nachdruck 1967) - Hildesheim (Georg Olms) 326 S.

FISCHER-BENZON, R. von (1894): Altdeutsche Gartenflora - Untersuchungen über die Nutzpflanzen des deutschen Mittelalters, ihre Wanderung und ihre Vorgeschichte im klassischen Altertum. - Kiel und Leipzig (Verlag von Lipsius & Tischer) 254 S.

HEGL, G. [Begr.] (1906-1998): Illustrierte Flora von Mitteleuropa. - Band I - VI, z.T. 3. Auflage. München (Lehmann), Berlin (Parey).

JÄGER, E.J. (1988): Möglichkeiten der Prognose synanthroper Pflanzenausbreitungen. - Flora 180: 101-131.

KOWARIK, I. (1995): On the role of alien species in urban flora and vegetation. - In: Pysek, P., Prach, K., Rejmanek, M. & Wade, M. [Ed.]: Plant Invasions - General Aspects and Special Problems. - Amsterdam (SPB Academic Publishing) p. 85-103.

SCHLOSSER, S., REICHHOFF, L. & HANELT, P. (1991): Wildpflanzen Mitteleuropas - Nutzung und Schutz. - Berlin (Deutscher Landwirtschaftsverlag) 550 S.

WILLERDING, U. (1992): Gärten und Pflanzen des Mittelalters. - In: Carroll-Spillecke, M. [Hrsg.]: Der Garten von der Antike bis zum Mittelalter. - Mainz (von Zabern) S. 249-284.

WITSCHEL, M. (1998): Gefährdung der Felsflora - Ursachen, Handlungsbedarf und Ergebnisse aus der Naturschutzpraxis. - Schr.-R. f. Vegetationskde. 29: 251-260.



Fig. 4 & 4b: Wallflower (*Erysimum cheiri*) on the wall of the castle Horneck (Neckar).