

The history of beer additives in Europe – a review

Karl-Ernst Behre

Niedersächsisches Institut für historische Küstenforschung, Viktoriastraße 26/28, D-26382 Wilhelmshaven, Germany

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Abstract. The many excavations of medieval sites during recent years have resulted in a strong increase in archaeobotanical records including species which were used as beer additives. Since the first compilation of records by the author in 1984 relating to the two main species, namely *Myrica gale* and *Humulus lupulus*, the number of finds has quadrupled. Distribution maps of the sites with fossil occurrence of these two species are presented and this evidence is complemented by that from written sources. *M. gale* seems to have been used for brewing as early as the centuries immediately before and after the birth of Christ in a small area at the Rhine estuary in the northern Netherlands. During the early and high Middle Ages there are records of this plant, in what are potentially brewing contexts, across its north-west European area of natural distribution. Written sources confirm its use in brewing as early as the tenth century. The finds of *H. lupulus* indicate that this species has been used in brewing from the early Middle Ages and this hypothesis is supported by documentary evidence. Cultivation of hop began around A.D. 859. In the late Medieval period, strong competition developed between both kinds of beer, which resulted in the take-over by *H. lupulus* in the eighteenth century. Many other herbs of secondary importance have been used to flavour beer or to prepare medicinal beers. These are mentioned in old herbals and have been compiled in this paper. These various flavouring agents, combined with the use of all available species of cereals led to a variety of beers that is unimaginable today.

Key words: Beer additives – Brewing – *Myrica gale* – *Humulus lupulus* – Middle Ages

Introduction

In contrast to wine which is made from sugars derived from fruit that often have distinctive tastes, starch is the starting point for beer production, and hence cereals are mainly used in brewing. Starch, however, does not have much taste, so additional flavouring agents are necessary

to improve the quality and taste of beer. Apart from flavour, the alcohol content of beer is much lower than that of wine, and hence beer is more perishable. Preservatives are necessary to increase the stability or 'shelf-life' of beer and selected plants have been used in the past for this purpose.

Firstly, a brief review of the history of beer itself is appropriate. Beer production is depicted in reliefs, paintings and inscriptions from Mesopotamia and Egypt from as early as Neolithic times. There is evidence that malt from barley and emmer and additives such as dates and other herbs, the identity of which is unknown, were used (Helck 1971). Beer was known in ancient Greece and Rome, but wine has been the preferred drink in these regions. Beer, however, was the main drink of the Germanic and Celtic tribes as has been recorded in Roman sources, in particular by Tacitus. But there is also considerable archaeobotanical evidence for sprouted cereal grain mainly from Roman sites in north-west Europe (cf. van Zeist 1991) and there are records also from a Celtic context (Hochdorf) in southern Germany (Stika 1996).

In former times most cereals were used for malting. Apart from barley, which is to-day the cereal preferred by the brewing industry, emmer, oats, spelt wheat, bread wheat were widely used and, in Estonia, rye was used up until the nineteenth century (Moora 1991). Outside Europe, millet, rice, maize and tuber plants have been, and are still, commonly used.

Another necessary ingredient is yeast as there is no fermentation without it. The role that this fungus played was, however, unknown in older times. Success was therefore dependent on the spores of yeast, which are carried in the air, infecting the brew by chance; otherwise the brew was a failure. This important aspect was recognised only much later. It is first mentioned as late as 1551 in Munich.

The topic of the paper presented here is the use of additives to flavour beer and as preservative agents. There are only a few written sources from the early and high Middle Ages that indicate that certain plants were used to improve the beer. These occasional passages, however, are very important in that they serve to shed light on the evidence from archaeobotanical sources.

Otherwise, it is difficult to establish beyond doubt that remains recovered from archaeological contexts are indeed connected with brewing. In this review, only those species that are mentioned in written sources, in the context of beer and beer-making, are regarded as beer additives or beer spices. Species, other than those referred to here, may also have been used during particular periods or in regions where there are few written records.

Some 15 years ago, a first compilation of the occurrence of the most important beer additives was published by the author (Behre 1984). Due to the considerable progress in archaeological and archaeobotanical studies of the Medieval period, the available fossil evidence has quadrupled since that time and so gives a solid basis for charting the history of the various relevant species.

Plants used in the past as beer additives

Among the many species which have been used as beer additives, two plants were of special importance, namely, sweet gale or bog myrtle (*Myrica gale* L.) and hops (*Humulus lupulus* L.). One or other of these was used in the case of all beers in Europe during the Middle Ages and later. They were complemented by other species to give a variety of special flavours to beer. As will be shown below, there are numerous records of *M. gale* and *H. lupulus* from Medieval and post-Medieval excavations. Some of the finds are so numerous or the detailed context is such that the conclusion that they were used for brewing is inescapable. However, not every single record of the fruitlets of sweet gale or hops points to a brewery as both species belong to the natural flora of rather extensive parts of Europe. Records from contexts such as raised bogs, e.g. *M. gale* recovered with other raised bog taxa such as *Sphagnum* and *Calluna*, or from burials, where hop is known to have been used as bedding material for the corpse, are not included.

It is important to note that the remains of both *M. gale* and *H. lupulus* are generally found uncarbonized. Charred finds of fruitlets of sweet gale or hops are very rare. This means that the fossil evidence is connected with waterlogged sites where fruitlets, leaves, etc., are preserved. Fortunately, many of the Medieval sites that have been investigated yield waterlogged material. It should, however, be borne in mind that the records are probably somewhat skewed insofar as sites on sandy soils outside urban contexts normally yield only carbonized remains.

The archaeobotanical record of sweet gale, Myrica gale L.

Nowadays, it is almost forgotten that in former times *M. gale* played a very important role in the beer industry of several countries. This shrub, referred to as sweet gale or bog myrtle in English and *Gagel* in German and Dutch, grows on acid bogs and sandy soils in north-west Europe. It is an oceanic species and its distribution area includes the northernmost parts of the central European mainland as well as north-west Europe and the coastal

zone of the Baltic Sea (Fig. 1). All parts of this plant have an aromatic smell due to the gale oil which is excreted through glands in the leaves and flowers.

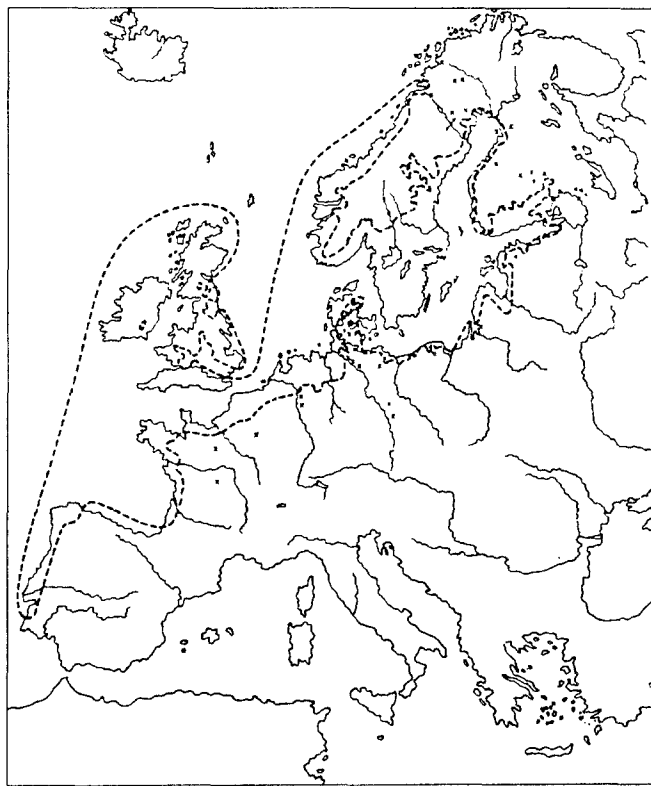


Fig. 1. Natural distribution area of sweet gale, *Myrica gale* (after Meusel, from Hegi 1957)

Twigs, leaves and fruitlets as well as pollen are commonly recorded in the context of palaeoecological investigations of peat deposits within the present-day range of *M. gale*. These numerous records from natural contexts are excluded from the distribution map (Fig. 3) which is based exclusively on records from archaeological sites and consists mainly of fruitlets and sometimes leaves.

In some excavations, the remains of *M. gale* are so abundant that it is clear that they were intended for beer making. This is the case, for example, at 'Alte Boom-

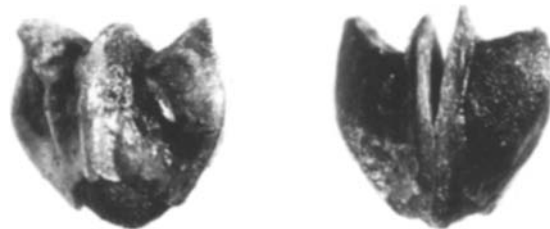


Fig. 2. Subfossil *Myrica gale* from Haithabu, ninth century (left) and Bremen, thirteenth century (right); both 15:1