

SHORT COMMUNICATION

Barley Varieties Suitable for Production of the Czech-type Beer

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Abstract: In the course of the 20th century, the production of beer was substantially changed. Economic pressures led to the concentration, modernisation and automation of the beer and malt production. These changes were reflected in a new view of malting barley varieties' quality. In two last decades, the varieties possessing a strong enzymatic activity, high extract contents and high final attenuation have been promoted. Due to historical reasons, the traditional production of pale lager has been preserved in the Czech brewing. For the production of the Czech-type beer, those varieties of malting spring barley are suitable that enable the production of beer with a higher level of residual extract, strong and full palate, excellent foaming power, and relatively lower alcohol content.

Keywords: barley; malt; Czech-type beer

In the region of the Czech Republic, beer was made already by the Celtic Boii and the German Markomans who lived in this territory before the arrival of the Slavs. The tradition of barley growing in the region of the Czech Republic is connected with the tradition of brewing which was documented in this country as early as 993.

From the European and world points of view, contribution of our barley-growing can be seen mainly in the targeted and historically very early breeding. In its scope, genetically unique regional materials from Bohemia and Moravia were used. Even today, the name "Moravian" is used for the malting barley varieties. Systemic breeding in our countries was introduced by Emanuel Proskowetz, who in the end of the 19th century was improving the regional barley of Old-Haná agroecotype. As a result, the world-known variety Proskowetz Haná was formed. Other varieties that achieved world-wide reputation were Kneifl's barley, Valtice barley, and first of all the variety Diamant that became a world donor of short-stems at high and balanced malting quality. The variety Diamant is an X ray mutant of the variety Valtice barley.

The current world assortment of beers includes a much varied set of drinks. Local customs decide on the type of beer consumed in the given region. Nevertheless, a certain general dependence related to the quantity of beer consumed in the given country or region per person can be traced. At a low annual beer consumption when beer serves only for satisfying physiological thirst, the type of beer does not principally matter. High annual consumption of this drink per person, however, relates to certain specific features of beer. Even old Czech maltsters claimed that good beer must, after its consummation, urge for another drink. Though it is evident that the amount of the beer consumption is influenced by a number of factors, the influence of the type of the beer consumed cannot be eliminated in any case.

In the 19th century, in the area of the today's Czech Republic, the type of beer indicated as Czech or Pilsen was developed. Its success-local and all over the world-cannot be assigned only to the business abilities of salesmen and the efficiency of advertisement. In the present days of mass media, a consumer can be temporarily influenced by advertisements, in the nineteenth century, however,

this influence was evidently lower and the reputation of the Czech-type beer must be ascribed to a great extent to its ability to urge a consumer to have another drink. This type of beer still prevails in this country and the high consumption of beer per person and year corresponds to it.

The majority of lagers produced in Western Europe and North America were originally derived from the Czech-type beer and in numerous cases the indication “pils” is also used, in reality, however, they differ basically from this type. The main representative of the Czech-type beer is, in the traditional labelling, 12° pale lager. Its most significant characteristics are strong intensity of bitterness with slow fading of the bitter taste. The Czech-type beer should also have a weak odour intensity, strong and full palate and sharpness, excellent foaming power and a relatively lower content of alcohol. The Czech-type beer has won its high popularity all over the world mainly because it respects human physiology. The basic effective component of taste is the strong but during a longer time fading bitterness. It stimulates the activity of main sialadens and also other parts of the digestive system; it also evokes thirst and supports the intake of solid food. When the beer is strongly bitter, it must be palatable too as strong bitterness of empty flavour unpleasantly excels in beer. Therefore the Czech-type beer must be rather less fermented. Thus, it also has a relatively lower content of alcohol and is less intoxicating. Therefore it can be consumed in higher quantities.

For the historical reasons, in a long period from 1938 to 1990, the Czech breweries could not buy new technologies, which is the main reason why Czech beer is produced in all Czech breweries by the classical decoction technology of mashing, long hop boiling and bottom fermentation at low temperatures. At the same time, the Czech brewing industry also avoided the drastic cost reduction dominating in all advanced brewing countries since the sixties of the last century. Decrease of the production costs brought to the beers made in these breweries an aggravated sensory character resulting in their lowered drinkability.

In 1996, the Research Institute of Brewing and Malting began a project with the aim to preserve the sensory character of the Czech-type beer also under the new economic conditions. Today, we are aware of the immense effect of the beer production technology on its sensory character and drinkability. The sensory character of beer is influenced by the floor or pneumatic malting technology. We

also know the effect of the barley variety used. In the scope of this research, we succeeded in characterising beer from the aspect of the production technology and also from the chemical aspect.

The current requirements on the quality of the malting barley prefer only the varieties possessing a high enzymatic activity, a high content of extract and high values of final attenuation. On the contrary, lower final attenuation bringing residual extract is characteristic for the Czech-type beer lager. For the above-mentioned reasons, the basic features of the varieties suitable for the Czech-type beer were established.

The parameters of barley varieties suitable for the production of the Czech-type beer were specified based on the results of our research and on the technological characteristics of older and current malting barley varieties (PSOTA 2003).

Extract in malt d.m.	min.	81.5%
Relative extract at 45°C	max.	38%
Kolbach index		39.0 + 1%
Diastatic power	min.	220 u.WK
Final attenuation	max.	80%
Friability	min.	75%
β-glucans in wort	max.	250 mg/l

At the same time, brewing tests were conducted (MÍKYŠKA 2003) in some of the widely spread varieties of the current assortment of Czech spring barley malting varieties (PSOTA & JUREČKA 2003, 2004). The varieties Jersey and Prestige are typical modern varieties with a high extract, low portion of non-fermentable extract, lower content of proteins and low colour, which probably results in lower foaming power, colour, weak trend to a lower palateness of beers and a weak trend to a higher diacetyl production. In comparison with the varieties Kompakt and Akcent, fresh beers from the varieties Jersey and Prestige had a worse evaluation of the overall subjective impression after drinking (Table 1). These varieties are more suitable for the intensified beer production, especially that of dispensed beers. The advantage of the variety Jersey is a high colloid beer stability. The advantage of the variety Prestige is a very good sensory stability.

Varieties Kompakt and Akcent are the most suitable in terms of the Czech-type beer quality

Table 1. Pilot scale brewing trials – Results of beer analyses

		Barley variety			
		Jersey	Prestige	Kompakt	Akcent
Colour	(EBC u.)	8.1	7.7	10.0	10.8
Final attenuation	(%)	82.1	81.3	77.7	77.0
Foam stability (NIBEM)	(s/30 mm)	194	208	232	274
Filterability (Esser)	(g)	136	104	100	137
Colloidal stability*	(EBC u.)	2.7	9.1	6.4	18.4
Sensory quality	(points)	3.8	3.8	3.5	3.6
Sensory stability**	(points)	1.8	1.0	1.4	1.9

*Beer haze after forcing test

**Difference between fresh and forced aged beer

(colour, foaming power, palatfulness and overall subjective impression after drinking). Good colloid and sensory beer stability belongs to further advantages of these varieties. These varieties can be recommended as a certain standard for newly bred domestic varieties.

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Abstrakt

KOSAŘ K., PSOTA V., MIKYŠKA A. (2004): Odrůdy ječmene vhodné pro výrobu piva českého typu. Czech J. Genet. Plant Breed., **40**: 137–139.

V průběhu 20. století došlo k zásadní změně ve způsobu výroby piva. Ekonomický tlak vedl ke koncentraci, modernizaci a automatizaci výroby piva a sladu. Tyto změny se odrazily v novém pohledu na kvalitu odrůd sladovnického ječmene. V posledních dvou desetiletích se prosazují odrůdy se silnou enzymatickou aktivitou, s vysokým obsahem extraktu a vysokým stupněm dosažitelného prokvašení. Z historických důvodů se v českém pivovarství zachovala tradiční výroba světlého ležáku. Pro výrobu piva českého typu jsou vhodné odrůdy sladovnického jarního ječmene, které umožní výrobu piva s vyšší úrovní zbytkového extraktu, silnou plností, výbornou pěnivostí i relativně nižším obsahem alkoholu.

Klíčová slova: ječmen; slad; pivo českého typu

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