

# TRADITIONAL ECOLOGICAL KNOWLEDGE AND SKILLS: HEMP PLANTS CULTIVATION AND USE BY A LOCAL COMMUNITY (VELČICE VILLAGE CASE)

Pavol ELIÁŠ

Slovenská poľnohospodárska univerzita v Nitre, Mariánska 10, 949 76 Nitra

e-mail: pavol.elias@uniag.sk

***Abstract:** Hemp (*Cannabis sativa* L. subsp. *sativa*) was an important and beneficial crop which provided textile raw material – fibre and food – seeds and seed oil for local communities in southern Slovakia for centuries. Cumulative community knowledge, practice and belief of the industrial hemp were transferred from one generation to next ones orally and by sharing practical experiences, being integral part of every day work of people, including folk saying. The people recognized and established areas/sites most suitable for the hemp cultivation which were used as crops for many years (in Slovak language the site is called „konopisko“). Sowing in high density by hands from a sheet resulted in tall hemp plants and controlled weeds in the crops. The crop was harvested in two different periods – male (first harvesting) and female (second harvesting) plants separately. Water retting by submerging bundles of hemp stalks in meandred brook Čerešňový potok. In the paper individual elements of TEK of hemp growing/cultivation, primary processing and usage by a local community in Velčice village (district Zlaté Moravce, southwest Slovakia, Central Europe) are described and discussed in details.*

***Key words:** industrial hemp, *Cannabis sativa*, cultivation, primary processing, treatment, use, local community, Velčice village, Slovakia*

## Introduction

Hemp is one of the oldest sources of textile fiber in Asia and the Middle East, with extant remains of hempen cloth trailing back 6 millennia (Small, 2015). It was harvested by the Chinese 8500 years ago (Schultes & Hofmann, 1980). Hemp is such one of the earliest domesticated plants known (Clarke and Merlin, 2013; Small, 2015). Hemp was an important crop also in many European countries. Earliest findings of hemp products in Europe date back to the Hallstatt culture (800-400 B.C.) (Sponner et al., 2005). In the territory of Slovakia the hemp was cultivated long in the past, documented in Latén Etape (420 BCE and beginning of first century) in Devín near Bratislava and in Puchov near Považská Bystrica, prior to the Roman invasion (Hajnalová, 1993; Tempír, 1969). Hemp was one of the leading fiber crops of temperate regions from the 16th through the 18th centuries (Small, 2015). The plant species has been used for its bast (phloem) fibre in the stem (Franck, 2005), the multi-purpose fixed oil in the seeds (achenes), and an intoxicating resin secreted by epidermal glands (Small and Marcus, 2002). Items

manufactured from it include food, textiles, paper, rope, fuel, oil, stockfeed, medicine, and spiritual and recreational products (Franck, 2005; Adamicová, 2011; Carus et al., 2013). In second half of 20th century hemp textiles and rope were being replaced by synthetics and blends. The commercial cultivation of hemp declined sharply.

Hemp, also called industrial hemp (*Cannabis sativa* L. subsp. *sativa*)\* is a tall, herbaceous annual plant with a deep tap root which grows to a height of up to 5 metres, depending on variety and growing conditions (cf., Small, 2015). People have cultivated *C. sativa* throughout recorded history as a source of industrial fibre, seed oil, food recreation, religious, spiritual moods and medicine (Adamicová, 2011; Carus et al., 2013; Clarke and Merlin, 2013; Deitch, 2003; Small and Marcus, 2002; Sponner et al., 2005). Each part of the plant is harvested differently, depending on the purpose of its use.

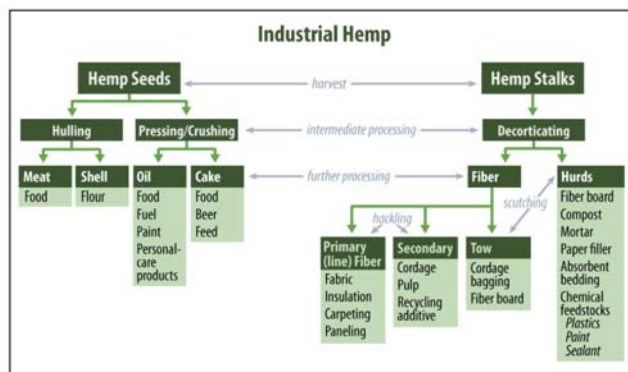
\* In this paper, “hemp” refers to industrial hemp, “marijuana” (or “marihuana” as it is spelled in the older statutes) refers to the psychotropic drug (whether used for medicinal or recreational purposes), and “cannabis” refers to the plant species that has industrial, medicinal, and recreational varieties. The industrial hemp plants are primarily grown as an agricultural crop (such as seeds and fiber, and by-products such as oil, seed cake, hurds). Industrial hemp is genetically different from marijuana (*Cannabis sativa* subsp. *indica*) and distinguished by its use and chemical makeup, and has long been cultivated for non-drug use in the production of industrial and other goods (Small and Marcus, 2002; Deitch, 2003; Carus et al., 2013; Small, 2015). Among the visual plant differences are plant height (hemp is encouraged to grow tall, whereas marijuana is selected to grow short and tightly clustered); cultivation (hemp is grown as a single main stalk with few leaves and branches, whereas marijuana is encouraged to become bushy with many leaves and branches to promote flowers and buds); and planting density (hemp is densely planted to discourage branching and flowering, whereas marijuana plants are well-spaced) (Johnson, 2015). Industrial hemp is an agricultural commodity that is cultivated for use in the production of a wide range of products, including foods and beverages, cosmetics and personal care products, and nutritional supplements, as well as fabrics and textiles, yarns and spun fibers, paper, construction and insulation materials, and other manufactured goods (Johnson, 2015).

*C. sativa* is wind-pollinated plant, predominantly dioecious (with pistillate plants bearing only female flowers and staminate plants developing only male flowers) and dimorphic, although sometimes monoecious (Holuby, 1878; Small, 2015). The flowers of the female plant are arranged in racemes and can produce hundreds of seeds. Male plants shed their pollen and die several weeks prior to seed ripening on the female plants. Male plants tend to be 10–15 % taller, although less robust than the female plants, with slimmer stems, less branching, smaller leaves, and a more delicate appearance, and they die after shedding their pollen. Female plants protected from frost can remain alive for years (gradually losing vitality), although the species is normally an annual (Small, 2015).

Hemp cultivation and processing is very complex serie of many individual steps/elements of management wich is traditionally predominantly employed to extract fiber from hemp stems and prepare it for weaving (Fig. 1, cf. Johnson, 2013; Small, 2015). After labor-

intensive handharvesting, fiber was crudely separated by “retting”, handstripping and/or beating, scutching (removal of smaller bits of adhering woody tissues from the phloem fiber, accomplished in the past with mechanical tools), hackling (“hackles” were the steel “brushes” traditionally used to separate the fibers), and perhaps additional combing to remove the remaining pieces of stalks, broken fibers and extraneous material (Sponner et al., 2005; Small, 2015). Domestical production of fibre needed specific knowledge, practical experiences, home-made equipments. Specialized looms and other equipment were developed for the specific purpose of producing hemp textiles, and the industry also had important social elements (Sponner et al., 2005).

Fig. 1: Flowchart of Potential Hemp Products. CRS, adapted from D. G. Kraenzel et al., “Industrial Hemp as an Alternative Crop in North Dakota,” AER-402, North Dakota State University, July 23, 1998



Peasant (small-farmers) hemp cultivation, home-processing and usage by local communities represent cumulative bodies of knowledge, belief, and practice, evolving by accumulation of traditional ecological and/or environmental knowledge (TEK) as well as other empirical knowledges and handed down through generations through traditional songs, stories and beliefs (Holuby, 1914; Dobšinský, 1993; Berkes et al., 2000; Hernández-Morcillo, M. et al., 2014). This type of "empirical" knowledge consists of a set of generalized observations conducted over a long period of time and reinforced by accounts of other (Berkes et al., 2000). Individual elements of TEK are most frequently preserved as oral tradition. Oral history is also used to transmit cultural heritage through generation to generation to maintain the sense of family and community (Berkes et al., 2000; Varga and Molnár, 2014).

Carriers (holders) of traditional knowledge are communities, farmers and their families who used hemp fibre and food products. Traditional knowledge transfer was transmitted to future generations orally or by practical experiences (Berkes et al., 2000). Hemp producers learnt how to farm, produce hemp fibre and food from their parents and grandparents. Work with hemp was very serious and women were busy with it during whole year. Every individual element of hemp processing required specific knowledge, skills and endurance but also physical condition (Holuby, 1914; Adamicová, 2011). Manual home-production of fiber was laborious.

Traditionally, peasant farming communities produced hemp that they processed, spun and wove into high-quality textiles of a fineness and texture equalling or even exceeding that of linen (Sponnar et al., 2005). Hemp is an integral part of the weaving culture that remains a source of pride to many Slavs in Slovakia and elsewhere. Spinning and weaving hempen and flaxen cloth at home, along with the arduous manual labour associated with production of the fibre, was ubiquitous throughout the Slavic world until very recently. The sowing and harvesting of the plant itself were important group activities for the (young?) people of the villages.

Traditional cultivation and processing of industrial hemp in Slovakia and in Slovak local communities abroad were described by Holuby (1914), Podolák (1952), Okál (1962), Adamicová (2011), Lamiová (1979), Šingliarová (1997). Hemp fibre was widely used by peasants to make folk costume (cloth, clothes) and as textile used by small farmers at working the past, as well as household goods (e.g. interior textile). Hemp seeds, after different kinds of processing, and hemp seed oil, were used as food and for technical purposes (Holuby, 1914; Adamicová, 2011; Holobordko, 2012; Sponnar et al., 2005). Hemp seeds can be eaten raw, ground into a meal, sprouted, or made into dried sprout powder. Particular Slovak terminology was developed to describe the individual elements/steps of hemp cultivation and processing as well as specialised equipments and goods used (Holuby, 1914; Majtán, 1996; Balleková, 1997; Ferečniková, 1999; Zátarecký, 1974). Hemp has been such an integral part of the culture that it is mostly used for tailoring the Slovak national costumes. Unmarried girls of the village community gathered together for spinning various products from hemp, and the male population was employed in the seed and in the collection of hemp harvest. Colorful costumes, which in Slovakia are in special cases, as a rule, made of hemp and flax (Adamicová, 2011; Sponnar et al., 2005). Decline of traditional hemp cultivation and textile production in Slovakia, the ecological knowledge is vanishing. There is urgent need to know, record and document this knowledge (Burgi et al., 2013).

Eliáš (1965, 1997) described shortly technology of cultivation and use of hemp (*Cannabis sativa* L.) in Velčice village. Individual elements of the traditional small-scale hemp management were recognized and described.

In the paper individual elements of TEK of hemp growing/cultivation, primary processing and usage by a local community in Velčice village (district Zlaté Moravce, southwest Slovakia, Central Europe) are described and discussed in details.

## **Material and Methods**

Village Velčice is situated in southwest Slovakia (Central Europe), in district Zlaté Moravce, Nitra region. In the past it was part of the Tekov county (Eliáš et al., 1997). The village was established at the Čerešňový potok brook in hilly area of Žitava river (branch of Nitra river), called Žitavská pahorkatina hilly area, in northeastern part of Podunajská nížina (Danubian Lowland) and souther foothill of Trábeč Mts. Climate, soil and vegetation were described for the region by Rakovský et al. (1969) a Bátor and Zaľko (1998) and for Velčice village by Eliáš (1971, 1977, 1997). The average yearly summ of precipitation

is about 660 mm, whereas the mean annual temperature is 9,1 °C. The original vegetation were deciduous forests (Michalko et al., 1986). The area has been used for cultivation of cereals and vineyards for centuries. Traditional extensive farming, small-scale farming, household farming using small areas, family-owned small holdings were described by Eliáš et al. (2007). An ethnographical study of the village Velčice and two neighbouring villages Mankovce and Zlatno was published by Medvecký (1902).

Hemp was cultivated by inhabitants of the village, peasants (small-scale farmers) to home-produce fiber and hemp textiles, folk costumes, interior textiles, seeds and other products were by-products, secondary goods used in the local community. The labourous technology were supported by the community and group activities, large families (Botíková et al., 1997) involved, predominantly of young unmarried women.

Data on the individual elements of hemp growing and processing were collected in the village by interviews of local poeple, but predominantly in my large family (Eliáš and Eliáš, 1999). In end of fifties I participated personally in several steps of hemp treatment, helping my motther in her work. The participant observation (participatory field work) and informations of my mother Anna Eliášová on components of traditional hemp management were the basic data for analysis of growing (cultivation) and primary processing of industrial hemp in Velčice village.

## **Results and discussion**

### *1. Suitable sites for hemp plants cultivation/growing*

The poeple recognized and established areas / sites most suitable for the hemp cultivation which were used as crops for many years. The most suitable sites (habitats) for cultivation of hemp are called in Slovak language „konopisko“ or „konopnisko“ (Holuby, 1914; Majtán, 1996; Adamicová, 2011). In the sites hemp was successfully grown continuously for several years on the same land.

Recognition of the suitable sites in a cadaster required knowledge of natural environment in the cadaster and long-term practical experiences of a local community with hemp cultivation. Land for cultivation of hemp plants was selected as „common site“ for small farmers and accepted by the local community for hemp cultivation. Hemp cultivation was supported by cooperation of local community. Cooperation in the hemp cultivation included prenájom parcel/land.

Sites suitable for hemp plants were selected on the basis of hemp ecology. Hemp prefers warm growing conditions, it best develops in full sun. It is photoperiodically adapted to flowering in southern Europe, which provides seasons of at least 4 months for fiber, and 5.5 months for seed production (Sponner et al., 2005). It is tolerant of hot, arid conditions provided that the roots are adequately supplied with water (Small, 2015). The hemp was thus cultivated in the agricultural crops, in fertile soil – deep, humus-rich and nutrient-rich soil. Hemp grows best on a loose, well-aerated loam soil with high fertility and abundant organic matter.

In Velčice the suitable site for hemp cultivation was found in location „Za Velkostraňanskými humnami“. It is upper part of hill of Žitavská pahorkatina, oriented to west/southwest at altitude ca 300 m. Eliáš et al. (2007) reported the „konopisko“ in southern part of the Velčice village, now occupied with private houses, on the right site of the Čerešňový potok brook. Similar sites were selected also in neighbouring villages. In Žikava arable part of the cadaster the location suitable for hemp cultivation was called „Lásky“. The name of the site is due that young unmarried women manually collected hemp stems and young men visited the site in the period of harvesting (Kolektiv, 2000). In Jedlové Kostofany the hemp was growing in Kapustnice (Turčániová et al., 2001). In Kňazice and Opatovce the hemp was growing in Horeluže, in Prilepy in Doliny near Širočina brook, in Chyzerovce out of village near Žitava river (Mlynka, 1998).

In end of fifties large collective farms (JRD) and state farms (ŠM) replaced individual peasant farms. Hemp growing was concentrated on collective farms or state farms with 100-500 ha sown. In Velčice the collective farm cultivated hemp crops in land located in South of the village at Čerešňový brook.

## *2. Manual (hand) sowing in higher density*

Peasants experiences in Hemp growing showed that soil preparation and manuring, as well as manual hemp sowing at higher density are important to produce of high-quality fiber. Manure not only supplies nutrients, but the humus is important in retaining moisture that hemp demands (Špaldoň et al., 1982; Bosca and Carus, 1998; Small, 2015).

Hemp needed well-prepared soil and seeds were sown densely, sometime two times (Adamicová, 2011). Seedbed preparation required considerable effort. Fall plowing was recommended, followed by careful preparation of a seedbed in the spring (Špaldoň et al., 1982). Hemp plants grown for fiber or oilseed are planted densely to discourage branching and flowering, resulting in tall, slender plants with long fibers (Small, 2015).

In Spring the hemp was sowing by hand, usually by women (Turčániová et al., 2001) or men (Adamicová 2011). Hemp was usually planted between March and May. Generally hemp should be planted after danger of hard freezes, and slightly before the planting date of maize. Good soil moisture is necessary for seed germination, and plenty of rainfall is needed for good growth, especially during the first 6 weeks (Špaldoň et al., 1982; Bosca and Karus, 1998; Small, 2015).

Under optimal growing conditions, such as a well-prepared seed bed, adequate soil moisture, rapid germination, and a high plane of nutrition, canopy closure normally occurs 5 to 7 weeks after sowing (Špaldoň et al., 1982; Bosca and Karus, 1998). Strong, fast growing Hemp crops are able to suppress weeds without chemical support and the crop does not suffer from any pests or diseases that would warrant a spray (Carus et al., 2013). This competitive ability of industrial hemp plants against weeds usually obviates the need for herbicide application during the life of the crop (Small, 2015).

### 3. *Male and female plants separated harvesting*

The hemp crop was harvested in two different periods – male (first harvesting) and female (second harvesting) plants separately. Adamicová (2011) informed that hemp was dual and was plucked up in two terms. In labor-intensive times, the male plants (called „poskonní“, Holuby, 1914, or „prvé“, Eliáš, 1997) were harvested earlier than the females („materské“, Holuby, 1914, or „druhé“, Eliáš, 1997), to produce superior (fine) fiber. Female plants were harvested for seeds and fibre (Holuby, 1914; Eliáš, 1997; Mlynka, 1998). Smallholders (small-farmers) plots were harvested manually. The hemp plants were plucked up with roots by hands and grouped in bundles of stalks (called „hrste“).

First harvesting was harvesting of male plants for hemp fiber. It usually takes place at the beginning of July, before harvesting of cereals, at the time of flowering of the male plants, in the early flowering stage or while pollen is being shed, well before seeds are set. Male plants produce finer fibres than pistillate plants. In the time bark and fiber yield of industrial hemp plants reached their maximum, a stage of development that was called „technical maturity“ (Mediavilla et al., 2001). During the harvest only male hemp plants were plucked up selectively, it means that the crop was not cutted (Eliáš, 1997; Adamicová, 1998).

Second harvesting was harvesting of female plants for seeds and fiber. It was taken place later, in the time of seed maturity, before seeds are set. It was usually in the time when the harvesting of cereals was finished, in the end of August or beginning of September (Eliáš, 1997; Adamicová, 1998). A later harvest time at the beginning of seed maturity led to easier decortication (Keller et al., 2001). Female („green“) plants were plucked up by hands and then seeds were separated by hands (mrvením na plachte) or by mlátením cepmi, similarly as in cereals harvesting. Dry seeds were pressed to seedoil. Fiber from the second harvesting was harder, thicker and strong.

### 4. *Water retting in a brook*

Retting precedes mechanical separation (scutching) of the fibre from the stalk. Hemp long fiber requires water retting for preparation of high-quality spinnable fibers for production of fine textiles. In Velčice during retting the hemp stalks were submerged in water (water retting). The bundles of stalks were typically soaked in water of deep pits (pools) of meander of the Čerešňový potok brook out of the village, north of the village, near meadows and pastures, in cadaster locations called Kňazova lúka and Smatanova, as well as under the village called Slažianskô (Eliáš et al., 2007). In Summer, in the periods without rains (drought), brooks in the cadaster were dry, without water.

The same pits of meanders in the brook were used for years as suitable sites for water retting. After harvesting, the bundles of hemp stalks were transported from „konopisko“ to the pits in the brook and submersed into water. After hemp stalks submersion the bundles were stabilized in the water by branches of alder (*Alnus glutinosa*) and stones to protect them against flood. Sometimes, after heavy rains, bundles of stalks was flooded, transported by moving brook water and damaged. Water retting in brooks was also

reported from villages in the vicinity. In Zlaté Moravce (Mlynka, 1998) and Chyzerovce (Tomajko, 2009) hemp stalks were floated in Žitava river. In Jedľové Kostolňany the hemp stalks were soaking in pits with water (called „močila“) and then they were deeply showing in the brook Želena (Turčániová et al., 2001).

The water retting was seasonal work of women (unmarried and young married) as in other villages (Holuby, 1914; in Žikava (Kolektív, 2000) and in Chyzerovce (Tomajko, 2009).

The length of time for the retting process depended on the weather, but typically required one to 2 weeks. Determining when the stalks have become sufficiently retted required experience – the fibres should turn golden or greyish in colour, and should separate easily from the interior hurd.

After rippening the bundles of stalks were gathered and stooked in the open field (meadove) so that can dry. Retted stalks were dried, and baled, they were processed to extract the fiber. are loosely held together, and for highest quality fiber applications need to be decorticated, scutched, hackled, and combed to remove the remaining pieces of stalks, broken fibers, and extraneous material. The equipments for this were prepared at home, and consequently use of domestically-produced fiber for high quality textile applications (Spohner et al., 2005).

## **Conclusions**

Home production of hemp fibre and food is very complex and year lasting work of women in small-farmers families.

Traditional hemp growing and primary processing consists of many individual elements/steps of the complex home small-farmers production of hemp fibre and by-products (seeds, hurds etc.). They depend on community knowledge of the plant species and environment, community activity and cooperation. The poeple recognized and established areas the most suitable for the cultivation of hemp (called „konopisko“ or „konopnisko“ in Slovak language). Manual home-production of fiber was laborious and long-lasting. Family members and neighbours helped during hemp growing and processing.

Every individual element of the hemp processing required specific knowledge, skills and endurance but also physical condition (fitness). Cumulative community knowledge, practice and belief of the industrial hemp were transfered from one generation to next ones orally and by sharing practical experiences, being integral part of every day work of poeple, including folk costumes and songs.

## **Acknowledgments**

I should like to thanks Dr. Otmar Gergely, a historian in the Slovak Museum of Agriculture in Nitra for initiation and stimulation me to collect data and informations on hemp



cultivation, processing and usage in Velčice village and to describe write paper on hemp cultivation and use in Velčice village and to write the paper on this topic. He visited my family in Velčice to document the equipments which were use in primary processing. He obtained as gifts some equipments (e.g. „stopa“ used for decortication of hemp stems) to be exhibited in the museum.

*The preparation of the manuscript and presentation of the lecture at the conference was supported by the Slovak Agency for Science (VEGA) Grant No. 1/0813/14.*

## References

- ADAMICOVÁ, B., 2011: Konopná nostalgia. Agrobiodiverzita. SPU Nitra, 127 pp.
- BALLEKOVÁ, K., 1997: Ondreju, Ondreju, d'že konope seju. Kultúra slova, 31, p. 165 – 171.
- BÁTORA, M., ZAŤKO, M., eds., 1998: Zlaté Moravce. Mestský úrad Zlaté Moravce, 376 pp.
- BERKES, F., COLDING, J., FOLKE C., 2000: Rediscovery of traditional ecological knowledge as adaptive management. Ecological Applications, 10, 5, p. 1251 – 1262.
- BÓCSA, I., KARUS, M., 1998: The cultivation of hemp: botany, varieties, cultivation and harvesting. Hemptech, Sebastopol, CA.
- BOSCA, I., KARUS, M., 1998: The Cultivation of Hemp: Botany, Varieties, Cultivation and Harvesting. Sebastopol, CA: Hemptech.
- BOTÍKOVÁ, M., ŠVECOVÁ, S., JAKUBÍKOVÁ, K., 1997: Tradície slovenskej rodiny. VEDA, Bratislava, 244 pp.
- CARUS, M., KARST, S., KAUFFMANN, A., HOBSON, J., BERTUCELLI, S., 2013: The European Hemp Industry: cultivation, processing and application for fibres, shivs and seeds. EIHA 2013, p. 1 – 9.
- CLARKE, R. C., MERLIN, M. D., 2013: Cannabis. Evolution and Etnobotany. University of California Press Ltd., London, 452 pp.
- DEITCH, R., 2003: Hemp. American history revised: the plant with the divided history. Algora Publishing.
- DOBŠINSKÝ, P., 1993: Slovenské obyčaje, povery a čary. Ed. Pramene. Pictus Publ. Ltd., Bratislava.
- ELIÁŠ, M., ELIÁŠ, K., ELIÁŠ, P., 1977: Velčice – z dejín, prírody a kultury obce. Obecný úrad Velčice, Velčice, 179 pp.
- ELIÁŠ, M., ELIÁŠ, K., ZEMAN, M., GAHÍR, Ľ., 2007: Velčice 1232-2007. Národopisná monografia. Matica slovenská, Martin, 320 pp.
- ELIÁŠ, P., 1965: Pestovanie a spracovanie konopí vo Velčiciach. MSc. Velčice.

- ELIÁŠ, P., 1971: Synantropná vegetácia Velčíc a blízkeho okolia. Prírodovedecká fakulta, Univ. Komenského, Bratislava, 70 pp. Mscr.
- ELIÁŠ, P., 1997: Prírodné pomery. In: Eliáš, M. et al., Velčice – z dejín, prírody a kultúry obce. p. 58 – 78.
- FEREČNÍKOVÁ, A., 1999: Konopa, konopa, zelená konopa, ktože mi dnes večer na oblok zaklopá? Kultúra slova, 32, p. 282 – 289.
- FRANCK, R. R., ed., 2005: Bast and other plant fibres. Cambridge, Woodhead Publ. Lmt.
- HAJNALOVÁ, E., 1993: Obilie v archeologických nálezoch na Slovensku. Acta Interdisciplinaria Archeologica, Tom. VIII, 148 pp.
- HERNÁNDEZ-MORCILLO, M. et al., 2014: Traditional ecological knowledge in Europe: Status quo and insights for the environmental policy agenda. Environment, 56, p. 3 – 17.
- HOLOBORODKO, P., 2012: Hemp research and growing in Ukraine. Agai Ukraine, The paper was presented at the Bioresource Hemp symposium in Frankfurt, Germany, March 2 - 5, 1995.
- HOLUBY, J. L., 1878: *Cannabis sativa monoica* „Sverepá konopa“ der Slovaken. Oesterreich. Bot. Zeitschr., 28, p. 367 – 369.
- HOLUBY, J. L., 1914: Pravda a povera o konope. Nár. Hlásnik 1914/1915 (Vianočná príloha, 4 p.).
- JOHNSON, R., 2015: Hemp as an agricultural commodity. CRS Report, 29 pp.
- KOLEKTÍV AUTOROV, 2000: Obec Žikava. 925 rokov prvej písomnej zmienky o obci Žikava. Obecný úrad Žikava, 156 pp.
- LAMIOVÁ, E., 1979: Spracovanie konopí v niektorých slovenských obciach Peštianskej a Novohradskej župy. In: www.sulinet.hu. 20 pp.
- MAJTÁN, M., 1996: Z lexiky slovenskej toponymie. Veda, Bratislava, 192 pp.
- MEDVECKÝ, K. A., 1902: Velšice, Mankovce a Zlatnô. Miestopisné črty. In: Sborník MSS, 7, p. 109 – 115.
- MLYNKA, L., 1998: Ľudová kultúra. In: Bátora, M., Zaťko, M., eds., 1998: Zlaté Moravce. Mestský úrad Zlaté Moravce, p. 201 – 244.
- OKÁL, K., 1962: Spracovanie ľanu a konopí. Bratislava.
- PALO, K., 2009: Spracovanie konopných vlákien v minulosti. Zaujímavé informácie z obce Kanianka. In www.kanianka.sk
- PIOTROWSKI, S., CARUS, M., 2011: Ecological benefits of hemp and flax cultivation and products. nova-Institute, EIHA/Org, 6 p.
- PODOLÁK, J., 1952: Spracovanie konopí v Dolnej Súči. In: Národopisný sborník, 11, p. 291 – 319.

- RAKOVSKÝ, Š. a kol., 1969: Zlaté Moravce a okolie. Slavín, Bratislava, 184 pp a obrazová príloha.
- SMALL, E., MARCUS, D., 2002: Hemp: A new crop with new uses for North America. p. 284 – 326. In: Janick, J., Whipkey, A. (eds.), Trends in new crops and new uses. ASHS Press, Alexandria, VA.
- SMALL, E., 2015: Evolution and Classification of *Cannabis sativa* (Marijuana, Hemp) in Relation to Human Utilization. Bot. Rev. 81, p. 189 – 294.
- SPONNER, J., TÓTH, L., CZIGER, S., FRANCK, R. R., 2005: Hemp. In: Bast and other plant fibres. Cambridge, Woodhead Publ. Lmt., p. 176 – 206.
- ŠINGLIAROVÁ, A., 1997: Výroba a spracovanie konope. Ornamentika tkanín. In: [http://www.sulinet.hu/oroksegtar/data/magyarorszagi\\_nemzetisegek/szlovakok/a\\_magyarorszagi\\_szlovakok\\_neprajza\\_1997/pages/szlovak/06\\_andrea.htm](http://www.sulinet.hu/oroksegtar/data/magyarorszagi_nemzetisegek/szlovakok/a_magyarorszagi_szlovakok_neprajza_1997/pages/szlovak/06_andrea.htm).
- ŠIŠKA, S., HAJNALOVÁ, E., 1983: Stredoveké obydlie a depot semien konopy siatej zo Šarišských Michalian. In: Štud. Zvesti Archeolog. Ústavu SAV, Nitra 1983, s. 303 – 317.
- ŠPALDON, E. a kol., 1982: Rastlinná výroba. 1. vyd. Príroda, Bratislava, 628 pp.
- STEINHUBEL, G., 1969: Prírodné a introdukované rastlinstvo Zlatých Moraviec a okolia. In: Rakovský, Š. a kol., 1969. Zlaté Moravce a okolie. p. 37 – 53.
- TEMPÍR, Z., 1969: Archeologické nálezy zemědělských rostlin a plevelu na Slovensku. Agrikultúra, 8, p. 7 – 66.
- TOMAJKO, M., 2009: Chyzerovce (1209-2009). Turisticko-informačná kancelária mesta Zl. Moravce, Zlaté Moravce, 76 pp.
- TURČÁNIOVÁ, D., HUBAČOVÁ, D., KOVÁČOVÁ, I., 2001: Jedľové Kostolany – príroda, história, zvyky a obyčaje. KMP-A projekt VOCA, Nitra, 191 pp.
- USHER, P. J., 2000: Traditional Ecological Knowledge in environmental assessment and management. ARCTIC, 53, 2, p. 183 – 193.
- VALACH, O., 2014: Pestovanie konôp v minulosti, ich spracovanie a používané nástroje. In: [zitava.sk](http://zitava.sk), regionálny portál Požitavia, 10. január 2014.
- VARGA, A., MOLNÁR, Z., 2014: The role of traditional ecological knowledge in managing wood-pastures. In: Hartel, T., Plieninger, T. (eds.) European Wood-pastures in Transition. p. 187-202. Routledge.
- VARGA, A., MOLNÁR, Z., 2014: The role of traditional ecological knowledge in managing wood-pastures. In: Hartel, T., Plieninger, T. (eds.) European Wood-pastures in Transition. p. 187-202. Routledge.
- ZÁTURECKÝ, A. P., 1974: Slovenské príslovia, porekadlá a úslovia. Tatran, Bratislava, 760 pp.