



Hemp in History: An Evolutionary Perspective on its Types and Uses

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ABSTRACT

Hemp (*Cannabis sativa* L.) has played an integral role to human civilization from an ancient crop used for fiber and food into modern plant with diverse applications in industries ranging from textile to medicines. As one of the earliest domesticated crops, its uses have varied from textile production to medicinal applications, and in modern times, its revival has generated renewed interest for industrial, environmental, and therapeutic purposes. This review explores the historical trajectory of hemp, its geographic spread, key historical periods, industrial uses, challenges, and its present-day resurgence.

INTRODUCTION

Hemp (*Cannabis sativa* L.) is one of the earliest domesticated crops, with evidence of its use dating back over 8,500 years [1]. Historically, hemp has been a cornerstone of ancient and modern civilizations, valued primarily for its strong fibers, edible seeds, and medicinal properties. In ancient China, hemp was used to create textiles, ropes, and even paper, revolutionizing early industry and culture [2]. As hemp cultivation spread across Asia, the Middle East, Europe, and eventually the Americas, it became a vital resource in various industries including shipbuilding, construction, and clothing production [3].

Hemp's adaptability across different climates and its multiple uses as a fiber crop, oilseed crop, and medicinal plant have made it invaluable throughout history [4]. However, its association with marijuana, another variety of *Cannabis sativa*, has often complicated its legal status [5]. For centuries, hemp was a major agricultural

commodity, but its cultivation faced substantial setbacks in the 20th century, particularly with the passing of laws such as the Marihuana Tax Act of 1937 in the United States [6]. These legal challenges, combined with the rise of synthetic fibers and changes in agricultural practices, led to a steep decline in global hemp production as shown in Table 1.

Table 1

Key Milestones in the Historical Evaluation and Use of Hemp

Year	Key Event	Additional Information	References
8500 BC	Earliest evidence of hemp fiber use in China	Hemp remnants were found in archaeological sites, during investigation gave evidence to investigator, in northern China.	[7], [8]
4000 BC	Hemp cultivation	One of the major crop in united State of	[9], [10]

	begins in India	America was Hemp		
2800 BC	The fiber of Hemp were introduced for making of sails of ships in china	Hemp's strong, durable fibers were ideal for sails and ropes.	[11], [12]	
1000 BC	Hemp used in ancient Egypt for textiles, paper, and medicine	The Ebers Papyrus, an ancient Egyptian medical text, mentions hemp as a medicinal plant.	[13], [15]	[14],
1 st Century CE	Roman Empire uses hemp for rope, sails, and clothing	Pliny the Elder, a Roman naturalist, described hemp as a valuable agricultural crop.	[16], [18]	[17],
16 th Century	Hemp introduced to North America by European colonists	Hemp as a crop started its uses as numerous purposes in colonial states of America.	[19], [21]	[20],
19 th Century	Hemp crossed the millstone in food as well as industrial crop recognition and becomes a major cash crop in the United States	Hemp not only proved its existence as industrial cope to be use as rope, sails, paper and clothing but also registered its place in food sector also.	[22]	
1937	The Marihuana Tax Act in the US restricts the growth and use of hemp	The Act was largely motivated by racist stereotypes about marijuana use.	[23], [25]	[24],
2014	The Farm Bill legalizes the cultivation of hemp for research purposes	The Act was largely motivated by racist stereotypes about marijuana use.	[26], [28]	[27],
2018	The Farm Bill removes hemp from the Controlled Substances Act, allowing for commercial cultivation	This legalization has led to a surge in hemp production and the development of new hemp-based products.	[29], [31]	[30],

In recent decades, however, hemp has seen a remarkable resurgence. It's potential as a sustainable resource, its medicinal properties, and its use in new industrial applications have sparked renewed interest among policymakers, researchers, and farmers [32]. Today, as the world faces growing environmental challenges, hemp is once again being recognized for its ecological and industrial benefits. This review delves into the rich history of hemp, its decline and revival in the modern era, and the challenges it faces in the future.

Geographical Origins of Hemp
Early Evaluation of Hemp

The precise geographical origin of hemp has long been a matter of scholarly contention, with several hypotheses suggesting Central, East, and South Asia as likely native regions for the species [33]. Archaeological evidence traces hemp's early domestication to temperate regions of Asia, with its use in China dating as far back as 8500 BCE. Records indicate that early humans primarily cultivated hemp for its durable fibers, which played a crucial role in textile production. While Cannabis is generally believed to have originated in Central and East Asia, supporting its

eventual spread across various regions, the challenging terrain of the Himalayan and Hindu Kush mountain ranges raises doubts about South Asia as an original source.

The earliest known usage of hemp in China includes its application in producing textiles, ropes, and early forms of paper. According to ancient Chinese medical texts, hemp was also used as a remedy for various ailments. Hemp's role in early Chinese agriculture contributed significantly to the country's early technological advancements, including the invention of hemp-based paper around 150 BCE [34].

Hemp's cultivation spread westward from Asia into Central Asia and the Middle East, where it became a key agricultural crop. The movement of hemp through trading routes like the Silk Road ensured its spread across continents. The plant's adaptability allowed it to thrive in diverse environments, making it a critical resource for nomadic and settled societies alike [35]. Hemp's role in India and Persia was not only agricultural but also spiritual. Known as "bhang" in ancient India, hemp was used in religious rituals and traditional Ayurvedic medicine. Its psychoactive properties were recognized, but it was cultivated primarily for its fibers and seeds. Persian civilizations, particularly during the reign of Darius I, valued hemp for its strong fibers, which were used in military and domestic applications [36].

Hemp in Ancient Greece and Rome

Hemp (*Cannabis sativa*) played a significant role in the ancient civilizations of Greece and Rome [37]. The plant's utility as a source of fiber for making ropes, textiles, and sailcloth was recognized early on, contributing to its widespread use in both societies [38]. Ancient Greek records indicate that hemp was primarily used to produce ropes for ships, which were crucial for maritime expeditions and trade. As a seafaring society, the Greeks relied on sturdy materials, and hemp's durability and strength made it an indispensable resource for naval purposes.

Herodotus, the famous Greek historian, provided one of the earliest written accounts of hemp use among the Scythians, a nomadic people who lived near the Black Sea [39]. He described how the Scythians used hemp to make clothing and also documented their use of hemp for ritualistic and recreational purposes. According to Herodotus, the Scythians would burn hemp seeds and inhale the smoke during purification rites, which suggests that hemp was not only an industrial material but also had cultural and potentially psychoactive applications in ancient times.

In Rome, hemp's utility was similar. The Roman Empire, with its vast networks of trade and military expeditions, depended heavily on strong materials for shipbuilding and warfare. Hemp was used to create ropes, sails, and clothing for soldiers and laborers. Roman texts, including those by the naturalist Pliny the Elder, highlight the importance of hemp in everyday Roman life. Pliny's *Natural History* describes how hemp was grown for its fibers and mentions its medicinal applications, such as using hemp seed oil for pain relief and treating wounds [40]. This dual-use of hemp for both practical and

medicinal purposes made it an invaluable crop in Roman society.

Additionally, Roman authors like Galen and Dioscorides referenced hemp in their medical writings [41]. Dioscorides, in his renowned text *De Materia Medica* [42], mentioned that hemp's seeds were used to ease pain, though he warned against excessive consumption, which could affect male reproductive health. This illustrates that even in ancient times, people were aware of hemp's potent properties and its potential side effects.

The widespread use of hemp in Greece and Rome laid the foundation for its continued cultivation across Europe. As the Roman Empire expanded, so did the use of hemp, spreading its cultivation and applications to newly conquered territories. This early adoption of hemp for naval, agricultural, and medicinal purposes would influence future generations and contribute to its enduring legacy in European industry [43].

The Introduction of Hemp to the Americans

The introduction of hemp to the Americas occurred during the age of exploration and colonization, fundamentally influencing agricultural practices and economies in the New World [44]. As European settlers arrived, they brought with them not only their culture and traditions but also the agricultural knowledge and crops that had sustained them, including hemp.

Hemp was first introduced to South America by Spanish explorers in the early 16th century. By 1545, the Spanish had cultivated hemp in Chile, recognizing its potential for producing durable fibers [45]. The plant adapted well to the diverse climates and soils of South America, and its cultivation soon spread to other regions. In South America, hemp was used to produce ropes and textiles, which were essential for the burgeoning maritime trade. The natural fibers provided a reliable resource for shipbuilding and agricultural implements, reinforcing hemp's status as a vital crop in colonial economies [33].

Hemp was introduced to North America shortly after European settlement began. By the 1600s, hemp cultivation was established in Jamestown, Virginia, where it became a crucial crop for the early colonists [46]. The robust fiber of hemp was essential for producing ropes, sails, and clothing, which were critical for both daily life and maritime activities. Colonial governors encouraged the cultivation of hemp due to its economic value. Records from the time indicate that hemp was considered so valuable that it was accepted as a form of tax payment in some colonies. For example, in 1631, the Virginia Assembly enacted a law requiring farmers to grow hemp, emphasizing its importance to the colony's economy and survival.

Hemp in the Early Modern Period

The Early Modern Period, roughly spanning from the late 15th century to the late 18th century, was marked by significant social, political, and economic changes in Europe and the Americas. This era saw the advent of exploration, the rise of capitalism, and technological advancements, all of which influenced the cultivation and utilization of hemp. During this time, hemp solidified its status as a crucial agricultural commodity, with its

applications expanding into various industries [47].

As European nations embarked on voyages of exploration, the demand for durable materials for shipbuilding and navigation grew exponentially. Hemp became increasingly important in maritime economies, particularly in countries like England, Spain, and the Netherlands [48]. The British Empire, in its quest for dominance over global trade routes, relied heavily on hemp for producing ropes, sails, and other essential maritime equipment.

In North America, colonial farmers recognized the economic potential of hemp, leading to its widespread cultivation. By the 18th century, it was a common crop in Virginia, Pennsylvania, and Kentucky. Colonial governments actively encouraged hemp farming, enacting laws that mandated its cultivation [49]. This legislative support reflected the crop's importance to the colonial economy, particularly for producing materials needed for the burgeoning shipping industry.

The Role of Hemp in the American Revolution

Hemp's significance extended into the American Revolutionary War (1775-1783) [50], where it played a vital role in supporting the colonial effort against British rule. The Continental Army relied on hemp for producing durable materials needed for uniforms, tents, and equipment. Prominent figures like George Washington and Thomas Jefferson actively promoted hemp cultivation during this period, understanding its strategic importance for the war effort.

The importance of hemp during this tumultuous time underscored its status as a key agricultural product. The desire for independence and self-sufficiency fueled the push for domestic hemp production, as the colonies aimed to reduce their reliance on British imports [51]. This sentiment reinforced the cultural and economic significance of hemp in early American society.

Hemp in the 19th Century

The 19th century was a transformative period for hemp, marked by both its widespread use and significant challenges that would later impact its cultivation and perception. The Industrial Revolution, advancements in agricultural techniques, and changes in societal attitudes toward hemp and its psychoactive counterparts shaped the trajectory of hemp production during this century [52].

The Impact of the Industrial Revolution

The Industrial Revolution, which began in the late 18th century and continued into the 19th century, brought profound changes to agriculture and industry [53]. As mechanization and new manufacturing processes emerged, the demand for raw materials, including hemp, surged. Hemp was increasingly used in the production of ropes, textiles, and paper, which were essential for industrial applications.

During this period, the development of new processing techniques, such as the decorticator [54], allowed for more efficient extraction of fibers from the hemp plant. This mechanization significantly reduced labor costs and increased the quality and quantity of hemp products available on the market. As a result, hemp became a staple material in industries ranging from shipbuilding to textile manufacturing, solidifying its

economic importance.

The Growth of the American Hemp Industry

In the United States, hemp cultivation continued to flourish during the 19th century. The crop became increasingly integrated into the agricultural landscape, particularly in states like Kentucky, Missouri, and Illinois. Farmers recognized hemp's profitability and versatility, leading to an expansion of its cultivation across the Midwest [55].

By the mid-1800s, the American hemp industry was thriving. The invention of the cotton gin and other agricultural innovations contributed to a boom in hemp production, as farmers adopted more efficient practices [56]. Hemp was also promoted as a valuable cash crop, with various government initiatives aimed at supporting its cultivation. The versatility of hemp made it a popular choice for farmers looking to diversify their crops. Culturally, hemp maintained its status as an important crop in both Europe and America. It was celebrated for its numerous applications, from textiles and ropes to medicinal uses. However, the increasing association of cannabis with recreational drug use began to shift societal perceptions of hemp.

In the late 19th century, the rise of the temperance movement and concerns over public health contributed to a growing stigma surrounding cannabis [57]. The negative perceptions of marijuana, particularly as it became linked with immigrant populations and countercultural movements, began to overshadow hemp's positive attributes. This shift in public perception would later culminate in legislative actions that severely restricted hemp cultivation.

The Legal and Economic Decline

As the 19th century progressed, the burgeoning hemp industry faced challenges from competing fibers such as jute and sisal, which were cheaper to produce and more readily available. The introduction of synthetic fibers at the dawn of the 20th century further threatened the viability of hemp in the textile industry [53].

The Marihuana Tax Act of 1937 marked a significant turning point, effectively criminalizing the cultivation of hemp alongside its psychoactive counterpart, marijuana. This act reflected the growing anti-drug sentiment of the time, leading to a rapid decline in hemp production in the United States and other countries [58]. The legal restrictions imposed by this act stemmed from the mischaracterization of hemp as merely a drug crop, overshadowing its agricultural and industrial potential.

Hemp in the 20th Century

The 20th century was a tumultuous period for hemp, characterized by significant shifts in legal, economic, and social landscapes that ultimately led to a dramatic decline in its cultivation and use [59]. The first half of the century saw hemp being criminalized in the wake of the marihuana prohibition movement, while the latter half experienced a revival of interest in hemp as a sustainable resource, although significant challenges remained.

The Criminalization of Hemp

The early 20th century marked the beginning of widespread criminalization of hemp, primarily driven by

the association of cannabis with marijuana and negative societal perceptions. The 1937 Marihuana Tax Act in the United States placed severe restrictions on the cultivation of all forms of *Cannabis sativa*, including industrial hemp [60]. The act required farmers to register and pay taxes for growing hemp, which effectively discouraged its cultivation due to bureaucratic hurdles and legal ramifications.

The anti-cannabis sentiment intensified in the 1940s, fueled by propaganda campaigns that portrayed marijuana as a dangerous substance. This period witnessed a significant decline in hemp production, as farmers shifted to other crops perceived as more profitable and less risky [61]. The U.S. government's stance against cannabis culminated in the Controlled Substances Act of 1970, which classified all forms of cannabis as a Schedule I drug, further entrenching hemp's illegal status.

The Hemp for Victory Campaign

Despite the challenges, hemp saw a brief revival during World War II, when the U.S. government launched the "Hemp for Victory" campaign [62]. Facing shortages of natural fibers for military supplies, the government encouraged farmers to grow hemp again, promoting it as a crucial resource for producing ropes, uniforms, and other materials necessary for the war effort. Thousands of farmers were recruited to cultivate hemp, and production peaked in the early 1940s.

However, this resurgence was short-lived. After the war, the demand for hemp plummeted as synthetic fibers and alternative materials gained popularity. The legal restrictions imposed by the Marihuana Tax Act and the subsequent Controlled Substances Act meant that the industry could not sustain itself, leading to a rapid decline in hemp cultivation once again [27].

By the late 20th century, however, the tide began to turn. Environmental awareness and the search for sustainable alternatives to petroleum-based products sparked a renewed interest in hemp. Researchers and entrepreneurs started to explore the potential of hemp as a source of biodegradable materials, health food, and even biofuel [63]. The growing market for organic and eco-friendly products opened new doors for hemp, albeit within a still-restricted legal framework.

In the 1990s, countries like Canada began to relax their regulations surrounding hemp cultivation, recognizing its potential economic and environmental benefits [64]. This shift set the stage for the gradual resurgence of hemp as a viable agricultural product in various parts of the world.

Hemp in the 21st Century

The 21st century has ushered in a remarkable revival for hemp, characterized by its renewed status as a versatile crop with significant potential for industrial, environmental, and medicinal applications [65]. As legal restrictions have eased and societal attitudes have shifted, hemp has emerged as a key player in the global movement towards sustainability and innovation.

Legalization and Policy Changes

The early years of the 21st century saw significant changes in legislation regarding hemp cultivation. In 2014, the U.S. Farm Bill included provisions that allowed for the

cultivation of hemp for research purposes, paving the way for farmers to begin experimenting with the crop again [66]. This legislative change marked the first step towards the re-establishment of hemp as a legitimate agricultural commodity in the United States.

In 2018, the passage of the Agriculture Improvement Act (commonly referred to as the 2018 Farm Bill) legalized hemp cultivation at the federal level, removing it from the list of controlled substances [24]. This landmark legislation allowed states to regulate hemp production, leading to a rapid increase in hemp farming across the country. As of 2021, many states had embraced hemp cultivation, recognizing its potential economic benefits and applications.

Cannabis Classification and Taxonomy

Because of its psychotropic characteristics, *C. sativa* has gathered the public's attention more than any other genus within the *Cannabaceae* family [67][68]. Cannabis is difficult to categorize due to its genetic adaptability, and the best way to classify it is still up for debate. The creator of modern taxonomy, Carl Linnaeus, defined the genus *C. sativa* as consisting of just one species, *C. sativa*, in 1737. Because of his experience with fiber-type crops that were widespread in Europe, Linnaeus categorised cannabis as a single species and was unaware of the drug-type cultivars that were abundant in Asia [69]. If he had known about the new cannabis varieties from Asia and India during his time, it's unclear how he would have categorized them. Jean-Baptiste Lamarck was motivated to categorize the Indian cultivars as a distinct species, *Cannabis indica*, after conducting comparative assessments between the European and Indian hemp types based on factors such as shape, size, leaf structure, and psychoactive properties [70].

The polytypic (multi-species) perspective was re-examined by Soviet botanist Janischevsky after he realized that native Russian plants belonged to the Cannabis taxon rather than the *C. sativa* or *C. indica*. He separated the genus into three different species, *C. sativa* L., *C. indica* Lam., and *C. ruderalis* Janisch, and designated the tiny, wild Russian autoflowering plants *C. ruderalis* (Small, 1975). *C. sativa* L. was traditionally grown to be tall, and the American Herbal Pharmacopoeia states that it is mostly used for seed and fiber ([71][72]. The primary psychoactive component of *C. sativa indica* Lam. is strong Δ9-tetrahydrocannabinol (Δ9-THC), and the plant has a short, densely branching structure (Upton et al., 2014).

Figure 1

Subspecies of Cannabis (a) Cannabis Sativa, (b) Cannabis Indixa, (c) Cannabis Ruderalis

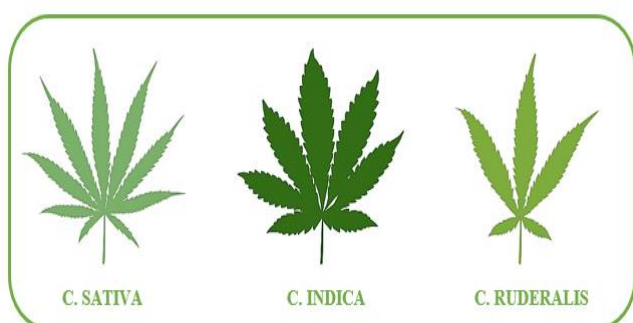


Table 2

Characteristics, Common Uses and Origins of Cannabis Sativa, Indica and Ruderalis

Types	Plant Character	Common Uses	Origin	References
Cannabis Sativa	Tall, thin leaves, grows up to 20 feet, High fiber content, Low THC	Hemp products, recreational	Central Asia	[73], [74], [75], [76]
Cannabis Indica	Short, bushy, wide leaves, High THC content	Medicinal, recreational	Hindu Kush region	[77], [78], [79]
Cannabis Ruderalis	Small, rugged, autoflowering	Breeding, low THC products	Central Russia, Eastern Europe	[80], [81], [82]

The classification of cannabis remains a topic of debate among scholars, with two main schools of thought. The monotypic school argues that all cannabis cultivars fall under a single species, *C. sativa*, with various subspecies. Meanwhile, the polytypic school supports the multi-species classification, which includes *C. sativa*, *C. indica*, and *C. ruderalis*. The ongoing hybridization of *sativa* and *indica* cultivars to create new phenotypes with desirable traits lends weight to the monotypic view, as interbreeding suggests these types may be classified as subspecies of *C. sativa* (i.e., *C. sativa sativa*, *C. sativa indica*, and *C. sativa ruderalis*) [83].

CONCLUSION

Hemp (*Cannabis sativa*) has travelled through history as a valuable resource for human civilization, initially cultivated for its fiber, seeds, and medicinal applications. Its classification has evolved as various species and subspecies were identified, while its cultural and industrial uses spread globally, from textiles in ancient China to shipbuilding materials in Europe and the Americas. Although hemp's association with psychoactive cannabis led to legal and societal challenges in the 20th century, recent legislative changes have enabled its resurgence. Today, hemp's ecological benefits and diverse applications make it a promising resource for sustainable development, positioning it once again as an important crop in modern industries.

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