

ANCIENT ALIEN CROP INTRODUCTIONS INTEGRAL TO INDIAN AGRICULTURE: AN OVERVIEW

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ABSTRACT

One of the most important centers for agricultural plant biodiversity is in India. Since ancient times, a significant number of crop plants have been domesticated, and an even greater number have been introduced from other parts of the world. The sculptural depictions, archaeobotanical remains, and references to them in Sanskrit literature provide unambiguous proof that 65 crop species were introduced prior to the 8th century. It includes crops from Southeast Asia, the Americas, Africa, the Near East, Central Asia, and China. The geological and geographical fragmentation of the continental landmass, followed by drift, raises the possibility of introduction or occurrence; normal or man-made overseas development, and exchange and social trade. The new evidence dispels inaccurate notions regarding the date of the introduction of numerous crops like maize, sunflower, cashew, and others.

INTRODUCTION

Be careful when compiling research because history focuses on the living, not the dead. Archaeology is a time-consuming endeavor that requires the very gradual removal of soil from around the objects. Language genesis is also a slow process. One must exercise extreme caution when conducting revisionary studies and evaluating revelations from these fields. In such exercises, the reviewer must revisit the environment and social status of the time, fully comprehending their advantages and disadvantages. In the past, Indians acquired useful alien plant species and used them for their own benefit. Current as well as antiquated Indian way of thinking created by master Jivak in Buddhist period express that 'all plants have therapeutic temperances' (Charak Samhita, 1949). Additionally, the Vedic texts state that no root (plant) is useless. Indian culture embraces and absorbs everything that is positive. This has been additionally Vedic precept since antiquated times. In addition, the Indian subcontinent has been home to some of the oldest civilizations ever. All of these philosophies and histories point to the fact that both beneficial (intentional) and unusual (unintentional) alien plant species have previously colonized India.

HISTORY OF INDIAN AGRICULTURE

Early History

Wheat, grain and jujube were tamed in the Indian subcontinent by 9000 BCE. Shortly thereafter, goats and sheep were domesticated. During this time, elephants were also domesticated for the first time. By 8000-6000 BCE, Mehrgarh had established barley and wheat cultivation in addition to the domestication of cattle, primarily sheep and goat. Threshing, planting crops in rows of two or six, and storing grain in granaries were all part of agro pastoralism in India. In Kashmir, agricultural communities became widespread by the 5th millennium BCE. "The first evidence of cultivation of cotton had already developed," according to Zaheer Baber (1996)[1]. Cotton was developed by the fifth thousand years BCE-fourth thousand years BCE. The Indus cotton industry was well-developed, and some cotton spinning and fabrication techniques remained in use until India became industrialized. The Indian subcontinent is home to a number of tropical fruits, including mango and muskmelon. The Indians also domesticated hemp, which they used to make narcotics, fiber, and oil, among other things. Dates, sesame, and peas were grown by farmers in the Indus Valley. Sugarcane was initially from tropical South Asia and Southeast Asia. The *S. barberi* species probably came from India, while the *S. edule* and *S. officinarum* species probably came from New Guinea. Wild *Oryza* rice showed up in the Belan and Ganges valley locales of northern India as soon as 4530 BCE and 5440 BCE separately. Rice was developed in the Indus Valley Progress. In the second millennium BC, rice cultivation took place in the Kashmir and Harrappan regions. Blended cultivating was the premise of the Indus valley economy. Denis J. Murphy (2007)[2] subtleties the spread of developed rice from India into South-east Asia: The Vindhyan Hills were home to several wild cereals, including rice, and rice cultivation may have begun as early as 7000 BP at Chopani-Mando and Mahagara. It is likely that migrants from this region spread rice farming down the Ganges valley into the fertile plains of Bengal and beyond into south-east Asia because of the area's relative isolation and the early development of rice farming there. ChopaniMando and Mahagara are located on the upper reaches of the Ganges drainage system. Around 4500 BCE, the Indus Valley Civilization developed irrigation. As a result of this innovation, the Indus civilization grew in size and prosperity, eventually leading to more planned settlements with drainage and sewers. The Indus Valley Civilization developed sophisticated irrigation and water storage systems, including artificial reservoirs at Girnar from 3000 BCE and an early canal irrigation system from around 2600 BCE. The Indus Valley Civilization of 2500 B.C. bears archeological evidence of an animal-drawn plough.

Present Study

Their set of experiences, plausible time of presentation and acquaintance by Indians can be explored from different sources like prehistoric studies, archaeobotany, human sciences, antiquated artistic sacred writings and such different wellsprings of experimental data. This paper is an endeavor in research a few well known outsider plants and spotlight their reality in Indian Region and culture in light of their all-unavoidable assessment. A critical evaluation from an Indian perspective has been conducted on relevant literature based on the aforementioned sources.

Enumeration *Allium cepa* L. (Liliaceae)

It is a local of Western Asia (Sponsor and Edge, 1968), Persia and contiguous districts (Bailey, 1949). It is mentioned in the following ancient Sanskrit scripts: Sushrut Samhita, Bhava prkasham, Charak Samhita, Dhanvantari-Nighantu, Harit Samhita, Kaiyadeva Nighantu, Nighantu-sangraham, Rajavallabham, and In Sanskrit, it is referred to as "Palanduh," "Durgandha," "Mukhdushak," "Sukada," and "Yavaneshta." The Middle Gangetic Plains' archaeological remains indicate that it was cultivated between 800 and 1600 BC. (2005 Saraswat) Ashok, Emperor (ca. 268-232 BC.) was treated with onion bulb juice. In Divyavadan (200 AD), this is mentioned (Vaidya, 1959). It is referred to as "Pyaz" (in Hindi) or "Kanda" (in Marathi). All of these historical details point to its long history of cultivation.

Allium sativum L. (Liliaceae)

De Candolle (1882) thought it came from Western Temperate Asia, while Bailey (1949) said it came from Europe. Maab and Klaas (1995), employing the most recent technique isozyme and RAPD markers, identified the Mediterranean region as the secondary center of origin and the West to Middle Asia as the primary center of origin. It is believed that the Mohenjo-Daro period (nearly 3000 BC) saw the introduction of garlic into India. out of the trade ties that India, Egypt, and Mesopotamia have. According to Saraswat and Pokharia (2002), carbonized garlic cloves were also found at the Harappan site Balu in the district Kaithal (Haryana) area. This substantiates evidence of its cultivation in the past. It is mentioned in the following ancient Sanskrit scripts: Charak Samhita, Ashtanga hridayam, Bhava Prakasam, Dhanvantari Nighantu, Kaiyadeva Nighantu, Raja nighantu, Rajavallabham, and so forth. It is referred to as "Ransonah," "Ugragandha," "Yavanishta," "Malechakanda," "Lasunaha," "Granjanaba," "Mahakandaba," and so on in Sanskrit. Since ancient times, it has been widely used as a spice and medicine throughout the Indian subcontinent.

Anacardium occidentale Linn. (Anacardiaceae)

It is native to tropical America (Patil, 1995), particularly Venezuela and Brazil. It is accounted for presented in India in sixteenth Century Promotion by the Portuguese (Sauer, 1993). Rheede (1682) referenced its therapeutic (ethnomedicinal) properties, data got from Malabar district of India, in his Vol.3 of 'Horti Indici Malabarici' (Amsterdam) with a typical or vernacular nearby name in Malayalam 'Kapa-mava'. The species' local names and uses suggest that it was introduced to the Malabar region of India much earlier. and was deeply rooted in indigenous culture. Strangely, its Malayalam name 'kapa-mava' is likewise consolidated by Linnaeus (1753) in his Species Plantarum. Cunningham (1879) suggested that it was once grown in India. He noted formed portrayal of product of this species at the Bharhut Stupa dated ca.200 BC. Gupta (1996) additionally noticed portrayal of whole plant of cashew-nut with blossoms and natural products at the Jambukeshwara sanctuary in Tiruchirappalli, Tamil Nadu (India), which was developed 2500 years back. Sorenson (2005) brought up cashew-nut as one of the plant animal categories as conclusive proof of overseas carriage from America to India. He provides a drawing of cashew nuts on the balustrade of the Bharhut Stupa in Madhya Pradesh (India) in the early 1900s. Second century B.C. Sanskrit names for it are referred to as 'Kajutaka' (Pullaiah, 2002), 'Shoephahara' (Nadkarni, 1914) and 'Bijara Sala or Sula' (Balfour, 1871-1873). Other ancient Sanskrit works, such as, Some of the names in Rajavallabham and Sushruta Samhita Uttarasthanam include "Vrkkabijah," Anacardium occidentale Linn. Anacardiaceae) It is a local of tropical America (Patil, 1995) particularly Brazil and Venezuela. It is said that the Portuguese brought it to India in the 16th century AD (Sauer, 1993). In his Vol. 3 of "Horti Indici Malabarici" (Amsterdam), Rheede (1682) mentioned its medicinal (ethnomedicinal) properties, which he learned about in the Malabar region of India. He gave it the common or vernacular local name "Kapa-mava" in Malayalam. The species' local names and uses suggest that it was introduced to the Malabar region of India much earlier. and was deeply rooted in indigenous culture. Curiously, its Malayalam name 'kapa-mava' is likewise consolidated by Linnaeus (1753) in his Species Plantarum. Cunningham (1879) suggested that it was once grown in India. He noted molded portrayal of product of this species at the Bharhut Stupa dated ca.200 BC. Gupta (1996) likewise noticed portrayal of whole plant of cashew-nut with blossoms and organic products at the Jambukeshwara sanctuary in Tiruchirappalli, Tamil Nadu (India), which was built 2500 years back. Sorenson (2005) called attention to cashew-nut as one of the plant animal groups as unequivocal proof of overseas carriage from America to India. He provides a drawing of cashew nuts on the balustrade of the Bharhut Stupa in Madhya Pradesh (India) in the early 1900s. Second century B.C. It has been called "Kajutaka" (Pullaiah, 2002), "Shoephahara" (Nadkarni, 1914), and "Bijara Sala or Sula" (Balfour,

1871-1873) in Sanskrit. Other old Sanskrit compositions viz., Rajavallabham and Sushruta Samhita Uttarasthanam incorporate names, for example, 'Vrkkabijah',

Cannabis sativa L. (Cannabinaceae)

It hails from the Caucasus Mountains and the Caspian Sea (Watt, 1908). In India, particularly in Rigveda (1400-900 BC.), it is referenced as 'Bhang' and other antiquated Sanskrit texts viz., Kalpsutra, Brahmanas, and Astadhyayi and Vartik by Paninin (c. 6th-5th centuries). According to Nadkarni (1914), it is also known as "Vijaya" or "Siddapatri," among other names. It is deeply established in Indian folklore. Demons attempted to take control of Amrita following the sea's churning (Samudra Manthan), but the gods intervened and gave Cannabis the name Vijaya (Victory) to honor their victory. Lord Shiva holds it in high esteem. It has been used in tantrik practices and rituals since ancient times. Based on its narcotic qualities, each Indian name is distinctive. Its restorative ethicalness to fix uncleanliness is mentioned in Susruta Samhita (200 BC.). The Bhavaprakasha, written in 1600 AD genuinely reported its therapeutic utility. As far back as 100 AD, the archeological remains of Kunal (Haryana) contained flattened seeds. Saraswat and Pokharia, (2003). It was domesticated in India 200 years before Cai Lun in China actually invented papermaking about 2000 years ago. According to Sudhir Chandra (2017), it was utilized for oil, fiber, and narcotics. It is one of the plant species which tracked down place in food economy in the Pre-Harappan period. It was tracked down in archeological site in the Pre-Narhan Phase (Pre 1800-1400 BC.) (Savithri and Vishnu-Mittre, 1993). Intriguingly, Singh and Sardesai (2016) noted its use as an organic additive in the clay plaster of the Buddhist caves of Ellora (M.S., India) from the sixth century AD as a sustainable building material. The authors revealed valuable hemp property that the ancient Indians knew about. Its ancient cultivation is hence supported additionally by exact proof.

Capsicum annum Linn. (Solanaceae)

It hails from Chile (Bailey, 1928) and South America (Voight, 1845) as its native country. In his Hortus Malabaricus, Roxburgh (1814) mentioned that it was first seen in the Indian Botanical Garden in Calcutta (India) before 1798. Rheede (1682) gave it the Malayalam name "Capomolago." Additionally, he advised the local medicinal use of fruits for opening bails and toothache. Despite being thought to have been introduced to India by the Portuguese in the 16th century AD, its usage and local name indicate that it is more familiar to the Malayalam people. In the Sanskrit scripts Ayurvedavijnam, Gunapatham, Sivadatta nighantu, and Sushruta Samhita Uttarasthanam, its Sanskrit names are "Katuvirah" and "Raktamaricuh." According to Torkelson (1999), its Sanskrit name is "Marich-phalam." Chillies find place in Vamana Purana and Siva Purana dated

ca sixth - eighth century AD. and notice its application in aspiratory tuberculosis. Again, this provides evidence to support its cultivation in ancient India. Intriguingly, the Jambukeshvara Shiva temple in Tiruchirappalli, Tamil Nadu, depicts developing and mature fruits, leaves, and flowers in honor of the Hindu deity Lord Shiva (Gupta, 1996), which dates from the 6th to 8th century AD.

Cicer arietinum L. (Fabaceae)

According to Lardizinsky (1975), it is a native of southern Turkey. In India, it goes by many names, including: Chan, Chana (Hindi), Kariikadale (Kannada), Harbhara (Marathi), Channia(Gujarati), Chanaka, Harimantha, Khalva, Vajimantha, Saleapriya (Sanskrit), Kadalai (Tamil), Harimandakma(Telugu). It spread westward to the Mediterranean and eastward to India by the Western Aryans (the Pelasgians and Hellenes) (De Candolle, 1882). As per Allchin(1969), it was presented in India (somewhat) as of late. It was discovered in a layer that dated from 300 to 100 BC in Nevasa (Maharashtra). Sankalia and other, 1960; Allchin, cited in loc. It is mentioned in the Puranas and Aryan literature in the fourth century AD. It may have entered India through south Indian ports in addition to the northern side. The Dravidian utilize the names 'However', 'Buta', 'Kadalia' for chickpea. These are very different from the Sanskrit names like "Chennuka," "Chanak," and so on. In Hindi and other Indian languages, the name "Chana" was eventually given to Sanskrit names. From a variety of perspectives, its name "Kabuli" logically refers to Kabul (Afghanistan) on the historic "Silk Road" from Europe via Samarkand to India. The name was given to this variety because Indians believed it came from Kabul. It is called Pony gram. Watt (1908) believed that the name 'gram' started from the Portuguese 'grao' (for example grain).The name 'Bengal Gram', be that as it may, ought not be conceived as Bengali beginning. In India, it is a unique appropriation. According to De Candolle (1882), the crop's Sanskrit names would suggest that it has been under cultivated in India for longer than in any other nation. The Sanskrit name "Khalva" is mentioned in "Brahadaranyak," a commentary on the Rigveda, and in "Yajurved" (Sharma, 1989). "Athashastra" (Sharmashastry, 1961) also mentions this name. 700 BC, Charak Samhita states that chicken soup improved people's health. Samhita Sushruta (400 BC) asserts that cooked chickpeas and their leaves are wholesome foods (Krishna Murthy, 1991). In Karnataka, the chickpea is known as "Kadale," and in Kerala, it is known as "Kalala." Sanskrit name 'Harimantha' (Hari-horse, mantha-fomenting, chewing)indicates taking care of chickpea grains to ponies from ancient times. The name "Harabara" in Marathi (Har, Hari-horse; bhara, which means "to feed" in Sanskrit, is similar to the name "Harimantha." The Greek word 'evebinthos' is referenced in the Illiad of Homer (ca 1000-800 BC.) for the chickpea It's possible that the Sanskrit word "Harimantha" was derived from the Greek word "erebinthos," especially during the Greek-

Indian interaction [We know that Alexander III of Macedon tried to invade northern India in 326 BC].

Gossypium species (Malvaceae)

The types of the variety *Gossypium* are disseminated in both the Old and New Universes. They are likewise extensively Asiatic or American species. Synonyms for a variety of species and forms, and their etymology is somewhat convoluted. Their common names seem to be quite instructive. Assortments other than proper of *G. herbaceum* Linn. are found in India for example (I) *G. herbaceum* Linn. var. *Wightianum* Woodrow is also known as "Hinganghat" cotton in the region. Indian cotton is primarily sourced from this source. ii) *G. herbaceum* Linn. var. *Mast religiosum* is referred to as "Nankin" or "Khaki" cotton. Roxburgh (1832) thought that this assortment come to India from China. (*G. herbaceum* Linn. var. *hirsutum* Mast is referred to as "Upland Georgian," which hints at its exotic nature. *G. herbaceum* Linn. is also known as Levent Cotton or Asiatic Cotton (Bailey, 1999; Glove for purse, 1968). (loc. cit.) Bailey Cite its birthplaces as Arabia and Asia Minor, whereas Purseglove (loc. cit.) thought of it as local of Asia and Africa. *G. barbadense* Linn is an additional species. is one of the first (Dalzell and Gibson, 1861). Its variety, including, Linn. *G. barbadense* var. According to Dalzell and Gibson, loc. cit., Brazilian cotton is thought to have originated in Brazil or Peru from the Portuguese. *Gossypium arboretum* Linn. is known locally by the name Devakapas (Deva-god; kapas-cotton), which Hindus use as a sacred thread during the "Munj" ceremony because it is typically grown close to temples. *G. Linn Arboretum* var. According to Watt, 1889-1893, *neglectum* is grown in Bengal and is therefore referred to as Bengals (commercially). Rheede (1678) included *G. arboreum* L. under Malabar neighborhood name 'Cudu-pariti' in his 'Hortus Malabaricus'. According to Sorenson (2005), it is Asian in origin. 440 BC: Herodotus referenced in his 'Histories, Book 3, Part 106' that in India tree filled in the wild creating fleece. This can be thought to be an arborescent types of *Gossypium*, most likely *G. arboreum*. Linn's *Gossypium herbaceum*. in old Sanskrit sacred writings is mentioned as 'Karpash' viz ., Rajavallabham, BhavaPrakasam, Abhidhan Manjari, Charak Samhita, Chikitsa Stanum, Kaideva Nighantu, and Nighantu Sangraham Additionally, *G. arboretum* Linn. is referred to in ancient Sanskrit texts as "Karpus," including alpasutras, Vartik and Astadhyayi by Panini, and Mahabhasya by Patanjali. Despite its American origins, *Gossypium barbadense* L. is referred to in Sanskrit as "Maghani" (Torkelson, 1999) and is thought to have been cultivated prior to at least 1000 AD. Pokharia and Saraswat (1998–1999) reported finding seeds of *G. arboreum* L. and *G. herbaceum* L. at the ancient site of Sanghal in Punjab (India) that were dated between 100 and 300 AD. According to Kirit (2012), a Lord Buddha sculpted in Rani-Ki-Vav, Patan, Gujarat (India), dates to the 11th century AD. The region of Harappan encompasses the state of Gujarat. For instance, Lothal (Gujarat) was a Harappan port town that served as a hub

for trade between India and other countries at the time. This Harappan town goes back ca. 2500-1900 BC. (Rao,2008).

Republic of India (1947 CE onwards)

The Bhakra Dam, which was completed in 1963, is India's largest dam. Extraordinary projects were attempted to further develop food and money crops supply. The Develop More Food Mission (1940s) and the Incorporated Creation Program (1950s) zeroed in on food and money crops supply separately. Five-year plans of India — arranged towards rural turn of events — before long followed. Under government supervision, land reclamation, land development, mechanization, electrification, chemical use—particularly fertilizers—and the development of an agriculture-oriented "package approach" consisting of taking a series of actions rather than promoting a single aspect soon followed. The numerous "production revolutions" that began in the 1960s included the Indian Green Revolution and the Yellow Revolution (oilseed: From 1986 to 1990, Operation Flood From 1970 to 1996, Blue Revolution (fishing: 1973-2002) etc. The agricultural sector, which was already benefiting from the earlier reforms and the more recent innovations of agro-processing and biotechnology, experienced significant growth following the economic reforms of 1991. A strong middle class emerged as the primary consumer of fruits, dairy, fish, meat, and vegetables following India's economic reforms, a significant shift from the consumption of staples in the past. Changing patterns of consumption have resulted in a "revolution" in "high value" agriculture since 1991, while the demand for cereals has decreased. From 1977 to 1999, India's rural areas saw a 553 percent increase in fruit and vegetable consumption, 167% increase in vegetable consumption, 105% increase in dairy products consumption, and 85% increase in nonvegetarian food consumption. Metropolitan regions encountered a comparative increment. Through the 1990s, agricultural exports continued to expand at a rate well above 10.1% per year. The production of high-value agricultural products and contract farming, in which farmers produce crops on behalf of a company under contract, increased. Contract cultivating prompted a decline in exchange costs while the agreement ranchers created more gain contrasted with the non-contract labor force. Notwithstanding, little landholding kept on making issues for India's ranchers as the restricted land brought about restricted produce and restricted benefits. India has grown to be one of the world's largest producers of wheat, edible oil, potatoes, spices, rubber, tea, fishing, fruits, and vegetables ever since it gained independence. The Service of Agribusiness administers exercises connecting with farming in India. The Indian Council of Agricultural Research (est.) established a number of institutions in India to conduct research on agriculture. 1929). Others, like the National Dairy Development Board (founded in 1965), and the National Bank for Rural and Agricultural Development (founded 1982) improved financing and supported cooperative formation. From 75.9 percent in 1961 to 60 percent in 1999–2000, India's male workforce was

employed by agriculture. "There were about 45 million agricultural labor households in the country in 1999–2000," according to Dev (2006)[1]. From 1993 to 2000, these households had the highest poverty rate in India. The introduction of high-yielding crop varieties during the green revolution led to an increase in the use of fertilizers and pesticides. DDT and Lindane (BHC/HCH) account for about 90% of India's pesticide use. Organic farming is becoming more popular, especially for exporting goods.

Strategy Used in Agricultural Sector under Five Year Plans to boost agricultural output and rural employment in the following ways: setting up of local area advancement programs and rural augmentation administrations all through the country, development of water system offices, composts, pesticides, farming hardware, high-yielding assortments of seeds and extension of transportation, power, advertising, and of institutional credit. Establishing agro-based industries and handicrafts in rural areas, promoting rural transportation and communication, and encouraging people to move from agriculture to industries and service sectors were all part of the strategy used to alleviate population pressure on land. At last, to achieve fairness and equity in country India, the procedure utilized was land changes which incorporated the evacuation of go-betweens, similar to the Zamindars, the security of occupants through tenure regulation, roof of land holding and dispersion of excess land among landless workers and little and minor ranchers.

It would be evident that each Plan's total expenditures had increased, as had the expenditures for agriculture and irrigation. However. The level of expense on agribusiness and water system to add up to design cost was the most noteworthy in the Main Arrangement, viz, 31% however gone between 20 to 24% in any remaining plans. The various programs for increasing agricultural production, such as irrigation, soil conservation, dry farming, and land reclamation, supply of fertilizers and manures, improved agricultural implements and ploughs, adoption of scientific practices, and so on, were outlined by the Indian Planning Commission. The establishment of community development programs and agricultural expansion of transportation, power, marketing, and other fundamental facilities, as well as the enhancement of the cooperative credit system, were among the institutional changes to which the government paid a significant amount of attention. The green revolution that followed the Third Plan saw the greatest emphasis placed on irrigation, fertilizer, and seed technology.

CONCLUSIONS

Despite concerted industrialization over the past six decades, Indian agriculture is a source of pride. It is the backbone of the Indian economy. Being the biggest business in the country it gives occupations to around 65% of the all out labor force in the country. Yet, in the new year, its portion in the Gross domestic product has declined to 18% in 2008-09. This industry has a lot of room for

growth. We can conclude, based on the key points, that Indian agriculture must adopt a scientific approach instead of a traditional one. 2. Instead of pursuing food grain self-sufficiency, Indian agriculture ought to concentrate on products that are geared toward the market. 3. Instead of struggling in a traditional and superstitious environment, Indian agriculture must adapt to a technological and research-oriented environment. 4. The rural farmers of India should have access to cutting-edge technology, as well as information about markets and export opportunities. 5. The goal of Indian agriculture should be to establish direct market access for farmers and eliminate middlemen and trades. 6. Because it has the most resources, like human labor, and the greatest diversity in physiography and climate, Indian agriculture has a lot of potential. 7. Indian agriculture ought to make use of these resources and transform the sector into one of the fastest-growing and most important contributors to our economy.

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