

# Role of Clements Robert Markham in the Introduction of *Hevea* Rubber into the British India

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Henry A Wickham, the British planter and entrepreneur is well known for the *Hevea* rubber seed collection during 1870s that eventually led to the rubber plantation industry in Asia. However, little is known about those who conceived the original idea of introducing rubber to the British India and consequently in Asia and who arranged for the South American expeditions. The role of Clements Robert Markham (1830-1916) in the historic domestication of natural rubber (NR) in the British India during the middle of the second half of the nineteenth century is reviewed. C R Markham, an India Office functionary who was personally involved in the successful transfer of the cinchona plants from its native Peru to British India in 1861, was the prime mover behind the introduction and domestication of NR yielding plants in British India in 1876. It was at his initiative that James Collins was appointed to prepare a report, on the utility of various species of rubber-bearing plants, which for the first time favoured cultivation of *Hevea*, *Castilla* and *Ficus elastica* and recommended the acquisition of their seeds. Markham was instrumental in arranging through the India Office, London and the Royal Botanic Gardens, Kew the first four expeditions (Charles Farris, Richardo Chavely, Henry Wickham and Robert Cross) to Tropical America for collecting planting materials of rubber-yielding plants. As the first attempt to grow rubber in Calcutta failed, Markham favoured the change in site for experimental planting to Ceylon and 1919 seedlings from Wickham collection were sent to Ceylon in 1876. A few *Hevea* plants were planted first at Peradeniya, and subsequently in more suitable site at Heneratgoda. Thus Ceylon became the principal supplier of seeds and seedlings to all the British colonies during the early days of rubber and subsequently experimental planting expanded in Ceylon, India, Malaysia and also in the then Netherlands East Indies. A brief biographical sketch of Clements Robert Markham is also provided.

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The successful domestication of rubber tree, *Hevea brasiliensis*, from the Amazon forests to South East Asia 125 years ago was a major historical event in the annals of modern rubber industry. Henry A Wickham, a British planter and entrepreneur, who lived in Santharam in the Amazon in 1876, successfully collected 700 seeds from Rio Tapajoz region of the upper Amazon and delivered to the Royal Botanic Garden, Kew, London. The seeds were

germinated there and the seedlings were sent to the Royal Botanic Gardens, Peradeniya, Ceylon and from there to Singapore and to other countries in South East Asia. Thus, by the beginning of the twentieth century, the world's source of natural rubber had shifted from the wild rubber trees in the rainforests of Tropical America to the organized *Hevea* plantations in Asia. Henry Wickham was later honoured and knighted for his contribution in this

successful rubber seed collection and transfer. However, little is known about those who conceived the original idea of introducing rubber to the British India. Even though the contributions of Clements Robert Markham (1830-1916) as a man of letters, explorer, naturalist, historian and geographer, have attained wide acclaim (Markham, 1866; 1870; Williams, 1962; 1968), his role as the initiator and prime mover in the historic domestication of natural rubber in the British India and consequently in Asia during the middle of the second half of the nineteenth century is not duly recognised.

By the nineteenth century, the search for wild plants that could be domesticated and the acclimatisation of exotic plants were the activities initiated and organised among ambitious youths in Europe. Of all the achievements of that era of botanical discovery, none was more imposing than that of the domestication of rubber, which involved many complex process and problems such as the botanical identification of the wild plants from which rubber could be obtained, the documentation of existing information on growing conditions and rubber extraction methods and developing most effective planting practices and exploitation methods. A re-evaluation of the domestication process of *Hevea* rubber reveals clearly the role C R Markham had played in one of the epoch making endeavours of the nineteenth century.

Born at Stillingfleet in the West Riding of Yorkshire, United Kingdom, on 20 July 1830, C R Markham had his schooling at Cheam and Westminster and joined in the Royal Navy in 1844. By the time he retired from the Navy, he had visited Madeira, Rio, The Falkland and Sandwich Islands, Chile, Peru, Mexico and California, and these travels stimulated his interest in exploration.

Markham entered the civil service in 1853 after retirement from the Navy and was posted to the Board of Control in the following year. He worked as an India Office functionary in the Revenue Department during 1858-62, and was transferred to the Public Works Department in 1862. In the India Office, he was in charge of geographical business. He was responsible for the reorganisation of the Marine Services and for the creation of the Central Meteorological Department. He was Private Secretary to T G Baring, the Parliamentary Under Secretary of States from July 1861 to August 1863. He was the Honorary Secretary (1863-68) and President (1893-1905) of the Royal Geographical Society and the Editor (1872-78) of the Geographical Magazine. In addition to numerous papers, addresses and lectures, he had to his credit 44 published works. He was the prime mover of the Abizenian expedition and is considered as the father of modern Antarctic research. His interests were manifold, his curiosity insatiable and his capacity for writing and translation enormous (Williams, 1968).

Markham was personally involved in the successful introduction of the cinchona plants from its native Peru to the British India in 1861 (Williams, 1962). The propagation of cinchona tree in India and the eventful production of the 'poor man's quinine', though viewed as a deed for the monopoly production under Imperial British control, must in itself entitle Markham to perpetual remembrance as a 'benefactor to mankind' (Williams, 1962). On 5 April 1859, Markham submitted a scheme for collection of plants and seeds of various species of cinchona plants from South America and their introduction into British India. At that time Cinchona plants were not cultivated in any part of the world. The bark of the plants grown in the South American forests was collected and



*Clements Robert Markham*

the trees disappeared rapidly over wide areas due to reckless felling. By 1876, there were large cinchona plantations in the Indian sub-continent, extending over the Nilgiris Hills, Sikkim and Ceylon, securing a permanent supply of this indispensable medicine (Markham, 1876). The introduction and cultivation of cinchona in India was an event of immense historic importance and it is to Markham's credit that he conceived his enterprise as a means of improving the

conditions of masses of Indian population and not merely that of the Armies of occupation (Dean, 1987).

During the 1850s, bulk of the rubber for the infant rubber industries of Europe and America, came from *Hevea*, *Ficus elastica* and *Castilla elastica*, which grew wild in the forests of Central and South America, and the rest from areas such as India, Africa and Madagascar. The flourishing rubber industry which found it difficult to sustain itself with the

limited supply of wild rubber from Tropical America, initiated search for other sources of supply the world over. Thomas Hancock, the father of British manufacturing industry, suggested the cultivation of rubber yielding plants as a plantation venture and an insurance against interruption of supply for the British (Hancock, 1857). Thus, during the 1850s, the British were in search of a scheme for introducing rubber not only as a plantation crop in the British India to feed the industries located in their metropolitan earlier but also to bring its entire world production under their control.

The idea of the collection of rubber yielding plants from the rainforests of America and its cultivation in the British India occurred to Markham in 1870 (Markham, 1876; Drabble, 1973). James Collins, the then Curator of the Museum of the Pharmaceutical Society, London, had published two articles (Collins, 1868, 1869) on rubber, which attracted Markham who was at that time an India Office functionary. Collins in his second article described the yeoman efforts of Markham for the introduction of cinchona into the British India. Markham decided that it was worthwhile to repeat the process he had adopted for cinchona for the introduction of rubber to India (Markham, 1870). He expected that the cultivated rubber brought to market could be more cheap than that gathered in the wild. Further, he had foreseen that the stock of the wild rubber might be insufficient to meet the growing demand the world over (Markham, 1876). His purpose might have been to achieve British monopoly in rubber, but his personal motive was merely to repeat his earlier adventure for the glory of it (Dean, 1987). The India Office was on the look out for potential commercial crops. However, Markham did not contemplate any export potential for rubber planted in India but suggested that it could be

utilised by Indian rail roads and telegraph (Markham, 1876).

In late 1871, at the initiative of Markham, Collins was appointed by the India Office to prepare a report on the utility of various species of rubber yielding trees. Collins' report favoured *Hevea* along with *Castilla* and *Ficus elastica*, (India species) and recommended acquisition of their seeds for domestication and planting in India (Collins, 1872). Markham arranged through Joseph Hooker, the then Director that the Royal Botanic Garden, Kew would receive the seeds sent from Brazil, initiate its propagation and arrange transport of the seedlings to India. At the initiative of Markham, the India Office in London, forwarded Collin's report to the then Consul at Belem with an instruction to arrange for the *Hevea* seeds (Dean, 1987). This request dated 10 May 1873 suggested that Henry A Wickham might be considered for collecting the seeds from South America. This is the first mention of Wickham in connection with the procurement of rubber seeds.

The first lot in the chain of shipment of seeds from the Amazon to London included 2000 seeds collected during 1873 by Charles Farris, a resident of Cametta, a town about 100 km south of Belem. Markham informed Hooker about the arrangements and authorised Collins to buy the seeds from Farris. Out of the seed lot received at Kew in June 1873, only 12 seeds germinated. On 22 September 1873, six seedlings from this were sent to the Superintendent of the Royal Botanic Garden, Calcutta, where an attempt was made to propagate them through cuttings. But the climate of Calcutta was unfavourable and only three seedlings survived for a year (Watt, 1890). In 1875, Richardo Chavez, a Bolivian 'Patrao' (a merchant intermediary who provided advances to tappers of wild trees sold them



supplies and bought their rubber) was interviewed by Markham through the Office of Consul Green in Belem for initiating the Trans Atlantic shipment of the rubber seeds. Markham had also obtained authorisation from the India Office to purchase any seeds Chavez might ship from the Amazon. On 6 July 1875, seeds weighing 220 kg packed in four barrels were received in the India Office, London. As Markham was away, the store department had consigned three of the barrels to Calcutta and one to Madras. In the Calcutta Botanic Garden, some of the seeds germinated but the climate proved unsuitable to rubber seedlings planted in most sheltered conditions and the plants failed. Some seedlings were sent to tea planters and some to the Conservator of Forests, Assam. The result obtained was 'not much different' (Watt, 1890). By the time the seeds arrived in Madras, they were no longer viable (Dean, 1987).

As the experimental planting in Calcutta failed, the need for a change in the location of planting became evident. Based on the recommendations of Dr King, the Director of the Royal Botanic Garden, Calcutta, subsequent supplies of planting materials from Kew were sent to Ceylon (now Sri Lanka). For further despatch of planting materials from Kew, Markham also favoured the Botanic Gardens, Peradeniya, which in turn had also proved its agroclimatic suitability through the role in the domestication of cinchona.

Markham commissioned two more collections of *Hevea* seeds, first by Henry A Wickham and the second by Robert Cross. The story of the Wickham collection is told many a times (Petch, 1914a; Lane, 1953, 1954; Wycherley, 1968). On 15 June 1876, 70 000 seeds were received at Kew Gardens, of which 2 700 seemed to have germinated and 1919 of these were sent in August 1876 to the

Peradeniya Botanic Gardens, Ceylon. On 13 September 1876 the shipment packed in portable green houses arrived at Colombo. The seedlings, which were planted in October 1876 at Peradeniya, were subsequently transferred to the more suitable site at Heneratgoda (RBGK, 1898). Later, Ceylon became the principal supplier of rubber seeds and seedlings to all the British Colonies.

Markham acknowledged the services of Wickham and supported his endeavours to display himself as an amateur Botanist in order to obtain a further assignment to accompany the seedlings to Ceylon. But Hooker, 'disinterested in Wickham, always tried to belittle the services of him and even expressed his doubt about his horticultural abilities' (Dean, 1987). In February 1877, Markham wrote a memorandum to the India Office recommending that Wickham be deputed to India to choose sites for the planting of the seeds sent from Kew. But this was not approved.

Markham, worried at the low survival of the rubber materials during the Trans Atlantic shipment, recommended in February 1876 that Robert Cross, a gardener at Kew be deputed to Belem for collecting *Hevea* seeds. Robert Cross along with Dr Richard Spruce had taken part in the successful introduction of cinchona (Williams, 1968) plants into the British India. Cross had already initiated another successful voyage commissioned by Markham to Central America and had introduced 134 *Castilla* seedlings from Panama in 1875. On 23 November 1876, seeds of *Hevea* and *Ceara* (*Manihot glaziovii*) numbering 1 080 and 60 respectively collected from Lower Amazon region by Robert Cross were received at Kew. Of these, 400 *Hevea* seeds were planted at Kew and the remaining 680 were given to William Bull, a commercial nursery man.

While the introduction of rubber to India

was reaching a successful culmination, Markham's bureaucratic career was entering into a crisis. Even though he was instrumental in introducing cinchona plants for the British Empire and was on the way of repeating the same feat with rubber, Markham was looked upon by his superiors in India Office as a 'dilettante' (Williams, 1987). His relationship with Louis Mallet, Secretary of State for India worsened and he was forced to resign in 1877.

The remaining part of the story of natural rubber till today is well known. Markham had conceived the idea and initiated steps for the domestication of natural rubber. During the early days of rubber, Ceylon became the center of activity for the distribution of seeds and seedlings and by the end of nineteenth century, experimental planting expanded in Ceylon, India, Malaysia and also in the Netherland East Indies. Scientific methods of rubber cultivation and exploitation were developed by H N Ridley (Ridley, 1897). Petch detailed the symptoms of rubber diseases and their control (Petch, 1911; 1912; 1914b). By the time Markham died in 1916, natural rubber had become one of the major plantation crops in South East Asia under the colonial patronage with the export oriented system of production and emigrant or indentured labour.

Markham's contributions in the introduction of cinchona in British India have received wide publicity. But it is a paradox that Clements Robert Markham has not yet attained the due credit he deserves as the prime mover and master-brain behind the historic introduction and domestication of natural rubber in the then British India and subsequently in South East Asia.

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