Investigating the origin of the Chinese name for alfalfa

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Abstract: It is assured that alfalfa (Medicago sativa L.) was introduced in Han dynasty. There are cognitive differences on whether Zhang Qian introduced alfalfa. Based on the previous studies, research inductive method was used. The relationship between Zhang Qian and alfalfa introduction was analyzed from the motivation, experience and influence of Zhang Qian to the Western Regions and the image generation of Zhang Qian brought back alfalfa’s seeds. Till to now, there are four opinions about Zhang Qian introducing Alfalfa seeds, including: (1) Zhang Qian introduced alfalfa seeds;(2) Zhang Qian did not introduce alfalfa seeds;(3) the information of Zhang Qian transferring alfalfa;(4) for commemoration Zhang Qian brought alfalfa seeds to the Western Regions. Although there are not direct historical materials to support Zhang Qian brought alfalfa seed to Han dynasty, it believes and confirms that the introducing of alfalfa is inextricably interwoven with Zhang Qian’s western travel. Zhangqian brought relative information from western regions during the introduction, which was the basis of non-native theory, and after that, Chinese began to plant alfalfa in Han dynasty. According to historical literatures, it is clear that the Chinese diplomat brought alfalfa seeds back to China. Alfalfa, as the favorite forage to Ferghana horse, have been already planted in Dawan in Han dynasty. Despite the debate, Zhangqian played an important pioneering role in introducing alfalfa.

The Silk Road was a network of trade routes, formally established during the Han Dynasty of China, which linked the regions of the ancient world in commerce. As the Silk Road was not a single thoroughfare from east to west, the term ‘Silk Routes’ has become increasingly favored by historians, though ‘Silk Road’ is the more common and recognized name. Both terms for this network of roads were coined by the German geographer and traveler, Ferdinand von Richthofen, in 1877 CE, who designated them 'Seidenstrasse' (silk road) or 'Seidenstrassen' (silk routes). The network was used regularly from 130 BCE, when the Han officially opened trade with the west, to 1453 CE, when the Ottoman Empire boycotted trade with the west and closed the routes (Figure1).
According to historical records, the land and maritime silk roads of ancient China has had huge influence on promoting eastern and western cultural and economic exchange. Meanwhile, crops originated from Europe, West Asia, America and other areas started to be introduced to China. More than 20 species of crops were imported through the land silk road including grape and alfalfa (forage) as two of the firsts. In the Song and Yuan Dynasties, introduced a lot of foreign crops are mainly through the Silk Road on the sea. The introduction of overseas crops has a profound impact on China's agriculture.

Figure 1. Main routes of the Silk Road

Alfalfa is not only an excellent forage worldwide, but also is a symbol of the cultural exchange between China and western regions, being regarded as a dazzling bright pearl on the Silk Road. Although alfalfa has more than 2000 years of cultivation history in China, scholars in pratacultural science, agricultural history, and China's history has different opinions on when alfalfa had been spread into China. China has a long history of alfalfa (Mu Xu in Chinese) cultivation. Because of the vast territories and the diverse ethnicities and dialects of the people in China, the Chinese names of alfalfa demonstrate diversity and hybridity, whether in people's interactions in the modern world, or in the vast literature of ancient classics, with the phenomenon of the long-term coexistence of official and alternative names. According to the Zhang Pingzhen’s research \[1\], alfalfa has more than 30 official names, alternative names, and nicknames in Chinese. In this paper, Xia Weiying \[2\] and Ding Guangqi’s \[3\] plant name authentication method would be used to explore the origin of the names of alfalfa in China. The formation of synonyms with the same sounds but different characters, or with different sounds, was also discussed, in order to understand the history of alfalfa names clearly and provide a theoretical basis of alfalfa history and culture in China.

1. Etymology of the Chinese word for alfalfa
Under the Records of the *Records of the Grand Historian-Ranked Biographies of Dayuan*, alfalfa was brought from Dayuan (Fergana) by an envoy in the Han Dynasty. The *Book of Han*Traditions of the Western Regions documented it as Mu Xu. Dayuan is the current Fergana basin in central Asia. In 1919, the famous American Sinologist Laufer \[4\] thought that the Dayuan language was an Iranian dialect, and that Mu Xu was a borrowed word from Iranian language. In 1961, the Polish Sinologist Chmielewki \[5\] doubted Laufer’s finding. According to Chmielewki, the word Mu Xu could not be found in the Iranian language and needed another etymology. He believed that the alfalfa found in the Han dynasty was likely from Kashmir. Kashmir also produced alfalfa, and the Han envoy had also seen alfalfa there. At that time,
the Kashmir language was an Indian dialect related to the Sanskrit language. Although the early corresponding word of Mu Xu could not be found in the Kashmir language, alfalfa was a honey-producing plant and the word “honey” in the Sanskrit language was translated as “māksika”, which was likely used as the name of honey-producing alfalfa. Thus Mu Xu was likely the translation of māksika in the Kashmir dialect. Chen [6] suggested that Mu Xu and its other names that had the same sounds but different characters were associated with the Sanskrit and Persian languages.

Based on the Chinese Dictionary of Foreign-origin Words, Mu Xu originated from * buksuk, * buxsux, and * buxsux of the Eland or Dayuan languages [7]. Sun [9] (2005) pointed out that Mu Xu was derived from * buksuk, or * buxsux (Old Persian or Tocharian (= Dayuan)). Laufer [5] suggested that Mu Xu might be associated with “buxsk” or “buxsux” in the old Eland language [9]. Feng [10] (2004) also thought that Mu Xu was the translation of “buxsk” in the ancient Dayuan language. Zhang [1] (2006) pointed out that Mu Xu was derived from the geographical introduction of the ancient Dayuan language. Because of the frequent exchanges between Central and Western Asia, and common national languages, Dayuan and Persian languages were very close to each another, thus Mu Xu was the transcribed name of “buxsk” or “buxsux” in the ancient Islamic and Dayuan languages. The Chinese Dictionary and Cihai (Agriculture Volume) also stated that Mu Xu was a translation of “buxsk” in the ancient Dayuan language [11-12]. Xu [13] (2002) believed that the different ways of writing Mu Xu in Chinese, as well as other names, such as Xu, Mao Xu, and Mu Su, were all different translations of the same foreign word [9,14,15]. Yu [15] (1958) also found that the Chinese term Mu Su corresponded to the pronunciation of Musu in Iran. Because of the etymology of alfalfa and the contrasting views concerning its origins, Xu [16] (2007) said the Chinese interpretation of "alfalfa" in the dictionary should include different opinions (Table 1).

2. Zhang Qian and alfalfa

2.1 Theory that Zhang Qian brought alfalfa seeds to China

In the Compendium of Materia Medica, Li [17] said, "Miscellanies recorded that alfalfa was from Dayuan and the Han envoy Zhang Qian brought it to China." Li Shizhen was a great botanist, and the Compendium of Materia Medica is recognized worldwide for its high status in botanical history. Thus, its broad and profound impact led to the world belief that "alfalfa was from Dayuan and the Han envoy Zhang Qian brought it to China." In 1881, De Candolle [18] clearly stated in the Origin of Cultivated Plants that Compendium of Materia Medica recorded that Zhang Qian returned with items not present in China, including cucumbers and alfalfa. In 1907, Japanese scholar Matsuda Sadahisa [19] stated, in the Records of the Grand Historian·Ranked Biographies of Dayuan, in the sentence that “grapes were fermented into wine and horses were fed with alfalfa; the Han envoy brought them back so the emperor began to grow alfalfa and grapes,” the emperor was Emperor Wu of Han and the Han envoy was Zhang Qian. The authors of Ranked Biographies of Dayuan were officers in the Han Dynasty, so this story is true. In the late Qing dynasty, Huang [20] also suggested that Zhang Qian brought alfalfa into China. In “Alfalfa planting,” a chapter in Qimin Yaoshu Translation and Annotation, Mou [21] said "Alfalfa is a plant brought back by the Han envoy Zhang Qian from the Western Regions." In the Complete History of China, Shi Zhongwen and Hu [22] also pointed out that the authors of the Book of Han-Traditions of the Western Regions wrote that the Kashmir area had alfalfa, the Han envoy Zhang Qian retrieved it, and that the emperor treated it as a rare plant species, planting it in the garden of an annexed palace for appreciation.

| Author | Dynasty | Literature | Name | Description |
|--------|---------|------------|------|-------------|
|        |         |            |      |             |
2.2 Theory that Zhang Qian did not bring alfalfa to China

It is indisputable that alfalfa was introduced to China in the Han Dynasty. However, there are no official records that support that Zhang Qian brought alfalfa to China from the Western Regions. According to Er Ya Yi, which was written by Luo Yuan in the Song dynasty [28], alfalfa was produced in the Western Regions and was introduced to China at the beginning of the Han Dynasty, but names of envoys that possibly brought alfalfa into China were not mentioned. Luo Yuan also said, "Naturalis Historia described that Zhang Qian made other envoys bring back grapes, Hu onions, and alfalfa seeds in the Western Regions, and because Qian was the most famous one, he was the one mainly mentioned." This is the earliest historical record that disputes the theory that Zhang Qian introduced alfalfa seeds to China. Shi Shenghan believed that Jin Zhanghua and Lu Ji had most likely repeated Wang Yi's statement or the legend based on Wang Yi, and that Ren Fang's record was wrong. Zhang [29] believed that Wang Yi lived in the period of the Emperor Shun of Han, and it was speculated that Zhang Qian introduced garlic, grapes, and alfalfa to China. Records of the Grand Historian and Book of Han detailed the earliest historical record of alfalfa, but only described two diplomatic events involving Zhang Qian and his exploration of the Western Regions, and did not mention Zhang Qian bringing alfalfa to China. Moreover, the Tongjian Chronicle [30] and Zizhi TongJian [31] did not mention Zhang Qian bringing alfalfa to China. However, all of these books recorded that Han envoys brought alfalfa seeds to China.

2.3 Theory of Zhang Qian’s delivery of information about alfalfa information

Li [31] believed that Zhang Qian was the first person in the Han Dynasty to discover Fergana horses and alfalfa in the Western Regions. He said when Zhang Qian first returned from the Western Regions, he not only had information on a special horse in Western Dayuan, but also knew about a favorite forage grass for horses, which was alfalfa. In Records of the Grand Historian-Ranked Biographies of Dayuan, the authors stated, “Dayuan is southwest of Xiongnu and straight west of the Han dynasty, thousands of miles from Han. The indigenous people live by farming, grow rice and wheat, and have grape wine and lots of good horses, including the Ferghana horse, a heavenly horse.” The authors also stated, “Around Dayuan, grapes are fermented into wine, and the rich store lots of wines, which do not deteriorate for a long time. people are addicted to wine, while horses to alfalfa” This is what Zhang Qian saw in Dayuan and shared with Emperor Wu of Han [32]. This was also the first record of Zhang Qian introducing agricultural
production or Dayuan products into China \[33-35\]. Li \[36\] pointed out that the theory of Zhang Qian introducing many Western products to China, such as grapes, alfalfa, and pomegranates, etc., might not be entirely true, but that it was certainly true that Qian introduced the information about alfalfa, Ferghana horses, and other Dayuan products to China.

2.4 Memorial theory of Zhang Qian’s opening of western regions
In Records of the Grand Historian·Ranked Biographies of Dayuan, the authors stated, “Around Dayuan, grapes are fermented into wine, and the rich store tons of wines, which do not rot for a long time. People are addicted to wine and horses are addicted to alfalfa. The Han envoy brought them back so the emperor began to grow alfalfa and grapes. Because of the many heavenly horses and foreign envoys that visited, large areas of grapes and alfalfa could be viewed from outside of the palace.” Li \[37\] (2011) believed that this was events that happened after the death of Zhang Qian, and Sima Qian did not state who was the Chinese envoy in the Records of the Grand Historian. Because of the habit of the Chinese to give the credit to famous people, and that Zhang Qian’s exploration of the Western Regions had made him famous, the credit of bringing alfalfa to China was given to him. Many studies stated that Zhang Qian did not really bring back seeds of alfalfa and other cultivated plants to China, but that he often talked about good products in the Western Regions, such as alfalfa, grapes, and Ferghana horses. Records of the Grand Historian and Book of Han both documented that he was also introduced to Emperor Wu of Han. At the same time, Zhang Qian’s visit to the Western Regions provided a precondition for the Han Dynasty to seek grapes, alfalfa, Ferghana horses, and other products from the Western Regions. This provided a good reason for why he was praised \[38-40\]. Zhang Qian was thought to be responsible for all the Chinese and Foreign exchanges during this period, and, with the development and prosperity of economic and cultural exchanges between China and the Western Regions, his impact has grown. According to the legend, Zhang Qian brought back grapes, alfalfa, pomegranates, walnuts, and flax seeds, etc. from the Western Regions, but this might not be true. However, Zhang Qian made outstanding contributions to the Silk Road, opening up the Western Regions to China, which is still a universally praised achievement \[36\].

3. Summary
Alfalfa is an exotic plant from the Western Regions. It was initially planted in China during the Han Dynasty and from then the word Mu Xu appeared in the Chinese language. So far, there is still a big difference between Chinese and other foreign scholars in understanding of the Chinese “alfalfa” etymology. It needs our more exploration and investigation in future to confirm whether Zhangqian introduced alfalfa to Han dynasty. Although the belief that “alfalfa was originally produced in Dayuan and brought to China by Han envoy Zhang Qian” has been widely accepted, it lacks direct historical evidence. Referring to Ranked Biographies of Dayuan, Zhang Qian and Li Guangli, Traditions of the Xiongnu, Traditions of the Western Regions, and Traditions of the Yi of the Southwest from Records of the Grand Historian and Book of Han, only two of Zhang Qian’s diplomatic events and exploration have been documented, but the plants that Qian might have brought back are not mentioned. The information that Zhangqian brought back helped the people learn how to produce alfalfa and raise Ferghana horses in DawWan. These, probably, finally facilitate the introduction. Thus, Zhang Qian played an important role in the process of introducing alfalfa to China.

As with other crops, researches of alfalfa have developed rapidly in modern China, although it is close to our life, we know litter about them because of a lack of relative knowledge. Lots of literature were consulted and a classification and summary was made. The results showed that lots of researches on alfalfa have been carried out, including original, species, utilization, etc. They also collected and identified the samples, such as Medicago sativa, M. Lupulina, M. Minima, and studied alfalfa nodule bacteria in
northwest of China, moreover, the habitat, adaptation and the requirement of moisture and fertilizer were studied. The western science and technology and local test results have been rapid and widespread dissemination, the results and scientific technological knowledge have been spread in the relevant journals, newspapers and other media. All of these have laid the foundation for the research and the construction of the discipline framework of alfalfa in modern China.

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