Parasites Between the Ancient China and Western Culture

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Abstract. Ancient Chinese documents of the 2nd century BC were written with regard to the first parasites that can afflict the health of human beings. During the Chinese Sui dynasty, a book entitled Ch'ao-Scih-Ping-Yuan written by Ch'ao-Yuan-Fang, disseminated a medical theory describing, for the first time, nine worms responsible for various diseases. However, this theory was not supported by any microscopic studies. In addition to human parasites, the Far East also struggled with fleas, bugs, ticks, and lice. The Chinese used cinnabar smoke to combat these pests and peach tree extract to repel fleas. In the history of medicine, and in particular in the field of contagious diseases, ancient China was ahead of Western knowledge by centuries. The ancient Chinese understood that some diseases were contagious and had observed, for example, that those who had contracted smallpox, were no longer infected once they healed. Thus, they adopted the practice of infecting healthy children with the disease in order to build immunity.

Key words: Ancient Chinese documents, human parasites, ancient Chinese medical knowledge

An ancient Chinese document of the 2nd century BC, the Scih-Ci-Pen-Civan, written by Tsu-Ma-Cien, contains a chapter documenting an ancient Chinese theory, which states that the stagnation of food in the intestine produces worms responsible for many diseases in adults and children (1-3). Another book, the Cia-Yi-Cing, written by Huang-P'u-Mi, in 282 BC, during the Tsin dynasty (3), describes a singular parasitic genesis on the production of saliva. According to the book, the heat from food in the stomach causes worms to move and block the stomach's function, leading to the salivary glands producing saliva. The Chinese, about two thousand years ago, believed that intestinal parasites were common in the Far East and affected both the digestive and salivary production systems in both adults and children. They were convinced that these parasites were daily guests in these systems (5). During the Chinese Sui dynasty, Ch'ao-Yuan-Fang wrote a book on the etiology of diseases entitled "Ch'ao-Scih-Ping-Yuan" in which he described for the first time nine worms that were responsible for numerous diseases. These worms were: Fu-Ch'ung (hidden worm); Yu-Ch'ung (long worm); Pai-Ch'ung (white worm); Jao-Ch'ung (fleshy worm); Fei-Ch'ung (lung worm); Wei-Ch'ung (stomach worm); Jom-Ch'ung (weak worm); Ch'ih-Ch'ung (red worm); Jao-Ch'ung (writhing worm).

The theory of the nine worms, which were believed to be the cause of the principal diseases in humans, remained prevalent for around a thousand years and greatly influenced ancient Chinese medical knowledge (1-3). Fu-Ch'ung, the head of all other worms, was thought to be at the top of this list. For example, the Fei-Ch'ung worm was held responsible for coughing, the Wei-Ch'ung caused vomiting, and the Joh-Ch'ung was believed to cause hypersalivation, which can be a symptom of several diseases such as Wilson's disease (6).

The Jao-Ch'ung was believed to be responsible for hemorrhoids and diseases of the anus according to the

ancient Chinese medical belief. They believed that not all individuals were parasitized by worms, and many subjects were completely devoid of their presence. They thought that worms lived between the stomach and the intestine and when the digestive system was working well, it was able to prevent worms from causing disease. However, when they moved to the bowels, they were responsible for the onset of all kinds of symptoms. Of the nine worms listed, two of them were associated with known pathogens today: the Yu-Ch'ung is thought to be similar to ascaris and the Jao-Ch'ung is associated with pinworm. The Chinese described it as very small, like the last portion of a wiggling worm, a common guest of the intestine, and also responsible for hemorrhoids, abscesses, and scabies. The ancient Chinese, expert observers of the action of oxyuriosis (pinworms or oxyuriasis), responsible for anal pruritis, confused this disease with scabies, also responsible for intense skin itching. Chao Yuanfang, a Chinese doctor, who was the first among his predecessors to conclude that "*There are worms that are not habitual guests of the digestive system*", also stressed that "*There are people completely free from them*". The doctor Sun Simiao, who lived at the time of the Tang dynasty, in his treatise, entitled Ch'ien-Cin-Fang (652 CE), described the action of the nine worms and added only one new worm, the "Sci-Ch'ung" or "worm of corpses", which "lives in the abdomen and causes the damage of death" after the host dies (1).

In 752 D.C. the doctor Wang Tao, author of the Wai-T'ai-Mi-Jao treaty, followed the theories on the nine worms, already elaborated by his predecessors. The lack of progress in medicine, specifically in parasitology, in China for centuries is evident from the medical treaty called "Ch'ung-Ciao-Sceng-Ci-Tsun-Lu," written by the Chinese emperor Huein-Tsun of the Sung dynasty in 1111, and reissued in 1785 by Ch'eng Lin during the Ch'ing dynasty (5). This book includes an entire chapter on parasitology, which is based on the theory of the nine worms and contains no significant new information compared to what was written by earlier Chinese physicians. Moreover, it is mentioned that the Yu-Ch'ung worm, which is thought that can cause ascariasis, is also associated with epilepsy. In the 16th century, at the time of the Ming dynasty, Hsueh-Li-Ciai, in the book Hsue-Li-Ciai, described many pediatric diseases, dedicating considerable space to the worm Yu-ch'ung, or ascaris (1; 3). In the same century, Wan-ch'uan, in the book Wan-Mi-Ciai-Ch'uan-Scin listed the nine worms in a chapter on pediatric diseases, dedicating particular space to the description of Yu-Ch'ung and stating that children contracted it by ingesting "uncooked or even raw food" (5). In 1600, still in the Ming era, the physician Wang-K'En-T'Ang, in his book Cieng-Cih-Ci-un-Sceng confirmed the list, naming them as agents responsible for many diseases. In the same period, in Japan, theories on the pathogenic action of parasites were developed. Ryoan Terashima, a Japanese scholar of Osaka, focused on the theory of nine worms, relying on the famous Chinese medical encyclopedia of the time written by Wan-Yuan-Han (2).

In the second half of 1700, Wang Ci, in his text "Yi-Lin-Chih-Yueh", which was published in 1767 during the Ch'ing dynasty, described the existence of three worms: Lo Hueich'ung, Jaoch'ung, and The T'sun-Pai-Ch'ung. He stated that "the infection of worms is due to raw foods, hard foods, or the ingestion of too much fish in childhood". He also mentioned that eating beef in excess can lead to the onset of infection caused by the worm T'sun-Pai-Ch'Ung and that the worm Hueich'ung is responsible for heart disease. A book by an unspecified author, in 1800, summarizing the ancient Chinese medical knowledge, focuses on the description of scabies, imagining an impossible dialogue with the same pathogen of the disease: "I came to the world without a mother, generated by humidity and drought. I visit all the classes of society, from the prince to the beggar, and I oblige a great painter to lay his brush and a beautiful woman to lay down her needle". From this description, it is clear that scabies was widespread in ancient China. This book also describes the role of the spleen in the circulation of blood and the role of the stomach in the digestion of food (5). An important Chinese medical treatise of the late 1500s, written by Li-Schih-Cen, influenced Chinese Medicine for three centuries (4). It contains many remedies, used as medicines against intestinal worms. Therapy against tapeworms was as follows: lead powder together with pork cooked in water and sugar; or lead carbonate to be mixed in any beverage; or the roots of pomegranate, cooked in a half liter of water, ingested

in the evening; extracts of plants and oriental roots, with impossible names, macerated in water or white wine, were very popular remedies against intestinal parasites. To counteract the roundworms activities, it is recommended to use decoction of Ai-Yeh (*Artemisia Vulgaris*) or Ci-li-tzu (*Tribulusterrestris*) or Lu-Lu root (*Cardo sfericus*) seed powder. Against the pinworms it is suggested to use the decoction of portulaca taken together with salt and vinegar (3; 4). Recently, infusions of Canada or Ruta seeds, Burmah nuts, and Sci-Ci-un-Tze (*Quisqualis indica*) have been used as anti-helminthic. In the Far East, cinnabar smoke was used to combat fleas, bugs, ticks, and lice, and peach tree extract was used to repel fleas (5).

In the history of medicine, particularly in the field of contagious diseases, ancient China had a deep understanding of these concepts centuries before Western knowledge. The ancient Chinese recognized that some diseases were contagious and observed that those who contracted smallpox, after healing, were no longer infected. They therefore adopted a system of infecting healthy children with the disease as a form of variolation, an immunity practice that for centuries remained confined to the Far East. This practice was well described by William Reginald Morse, (3) who observed that the ancient Chinese used scabby crusts from those who had healed from smallpox, reducing them to powder, and then putting small amounts of the powder into the nose with a stick or blowing it into the nostrils with a bamboo tube. The inoculation of the powder was done for the males in the left nostril, for the females in the right nostril (3). The ancient Chinese Medicine in the field of parasitology documents that the knowledge, which occurred between the 2nd century BC and the 7th century BC, remained for centuries anchored to speculative doctrines. These doctrines remained almost unchanged before the arrival of European culture in the Far East. Moreover, the ancient Chinese doctors, with the practice of the technique of variolation (1; 3), remained for centuries confined only to the Far East. They had sure historical record of the first empirical remedy of vaccination and much happened before Jenner and western medicine carried out the important findings on vaccines.

Ethical statement

The present article does not require any statement about ethics.

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