Indian J Microbiol (Jan–Mar 2021) 61(1):108–110
https://doi.org/10.1007/s12088-020-00911-5

CORRESPONDENCE

Sukshmjeevanu in Vedas: The Forgotten Past of Microbiology in Indian Vedic Knowledge

Urvashi Kuhad[1] · Gunjan Goel[2] · Pawan K. Maurya[2] · Ramesh C. Kuhad[2]

Received: 21 July 2020 / Accepted: 3 October 2020 / Published online: 19 October 2020

Abstract No one questions the existence of presumptive knowledge of invisible organisms causing disease, decay and destruction mentioned before the discovery of the microbial world by Antonie Van Leeuwenhoek, who was the first to describe the invisible world as per literature available today. However, the knowledge about microbial world by Indian Rishis presented in Sanskrit shlokas or suktas of our traditional manuscripts such as Vedas remained unseen, where the Rishis had predicted the role of microorganisms known as Krimi or Jeevanu years before Leeuwenhoek. This note is an attempt to bring an emphasis to revisit our traditional Vedic knowledge and establish them through research based facts for wider acceptance globally.

Keywords Microbiology · Vedas · Krimi · Kanva

India is treasure of traditional knowledge which has been disseminated through non-institutional means from generation to generation and is, for the most part, undocumented. In this context, the 'invisible' world of microorganisms, inhabiting different components of biosphere, is also not an exception. Indian ancient Vedic literature reveals the presence of these tiny creatures named as 'Krimis', a term coined by Rishi Kanva and as well described about their beneficial and harmful effects [1, 2]. Moreover the Krimis have been represented by other names like *Adrishta, Jantuanava, Sudrajantu, Pischach* and *Durnamaha* [2]. The discoveries of Rishi Kanva and his descendants Atri, Yamadagnni and Agasti against microbial infection are highlighted in Atharvaveda. However, the branch of Microbiology is not well established in Ayurveda in comparison with the modern science. In modern age, Antonie Van Leeuwenhoek, known as 'Father of Microbiology' was the first person to observe microorganisms with the help of primitive microscope he developed and called them as 'animalcules'. This work was published by the Royal Society of London in the year 1677, while the discovery of Sage Scientist Kanva and other saints remained unseen within the Sanskrit shlokas of Vedic texts. If we look back to the Atharvaveda (thousands of year BC) we come across three chapters where the description of microbial world is available [3]. Apart from Vedas, the ethno-ecological introspection into Bhagawatgeetaa also reports the relationship of human with the available bioresources [4].

Rishi Kanva and his descendants have composed many mantras in 'Suktas': krimijmahanam, kriminasanam and krimighnam, which gives information about the microbes and their characteristics [5]. The word 'Krimi' points to the microbes and Jamvana / Naasana / Ghanna meaning by their death, spoilage or end. In the kriminasanam, there is another Sukta by Rishi Badarayana, which provides information on both microorganisms as well as antimicrobial herbs (cited in [1]). Although the *Sukshmajeeva* (microorganisms) have known to our ancient Rishiis as reported in Veda & Ayurvda, the term '*Jeevanu*' has been used to translate bacteria at first time in the nineteenth century [6].

Rishi Kanva and his followers also described different morphologies and colors of microbes, their presence on different parts of human, plants and animals as well as their

✉ Ramesh C. Kuhad
kuhad85@gmail.com

[1] Department of English, Ram Lal Anand College, University of Delhi, New Delhi 110021, India

[2] Central University of Haryana, Mahendergarh, Haryana 123031, India

prevalence in different ecological niches such as earth, water and upper strata of atmosphere, forests and mountains (AV-2.31.5, cited in [5]). Rishi Agastya was also a pioneer in providing details about the shape, size and motility of microorganisms as detailed in Gavande et al. [7]. He stated that 'Krimi' also possess organs/ organelles that work as sense organs. The sages also reported the inactivation of these 'Krimi' by early morning ultraviolet light rays emanating from sun as *krimijanya-vyadhis* [8]. According to Rishi Agastya fumes of yajna also inactivate the 'Krimis', which is also reported in the modern scientific literature. All such studies have been well documented in different suktas of Atharvaveda.

Moreover, Rishi Agastya in the Rigveda, named two types of poisonous creatures: extremely poisonous and less poisonous. Some of these creatures are visible, live in water where as others are invisible ones and live in water and earth [1]. Perhaps Rishi Agastya was the first person to state that the invisible creatures are also toxin producers. Further in the Atharvaveda, it is reported that whenever there is accumulation of toxins in the body, it results in illness or diseases. The same has been reported by the Germ Theory of disease described around 200 years ago. The theory established by Robert Koch states about the presence of the microorganisms to cause diseases [1]. A similar theory had been already established in our Vedic literature. The Ayurveda, the traditional Vedic literature on Indian medical system encompasses various logical and rational concepts related to human health and diseases which are also being validated by modern scientific texts [9].

The Athravaveda scripts speak emphatically about following the sanitization and hygienic practices for wellbeing of the society. It further describes that if disease causing microbes enters into food, water and milk, and are consumed can cause diseases [10]. Yajurveda talks about the ability of the microorganisms to adhere to containers, but could not describe conclusively to the process of formation of biofilms, which is now well established fact. It further stated that if such containers were used without proper washing caused illness among people (Yajur Veda 13/7, cited in [11]).

Apart from the contributions of Rishi Agastya and Rishi Kanav and his followers, two eminent Rishis, Charak and Sushruta contributed their knowledge about microbes in the *Charak Samhita* and *Sushruta Samhita* [1]. These two ancient Vedic medical treatises of the Vedic period serve as an excellent resource dealing with modern concepts of microbiology in Ayurvedic contributions. Charak (the first physician) presented the concept of digestion, metabolism and immunity and discussed about physiology, etiology and embryology in *Charak Samhita* [12]. He described illness as a result of imbalance among the three dosha namely, bile, phlegm and wind. *Charak Samhita* describes the causes of diseases, their diagnosis, treatments, and necessary medicines for controlling them. It also includes sections on the importance of diet, hygiene, prevention, and medical education, the teamwork of physicians, nurses, and patients which are necessary for recovery of health. Rishi Charak has also classified microorganisms in his *Charak Samhita* as internal and external microorganisms. These microorganisms were further subdivided on the basis of their place of origin such as dirt, phlegm, blood or stool. The literature describes the etiologies, signs and symptoms of different diseases [12]. The knowledge about communicable diseases (Sankramak roga) which are due to microbial invasions has been reported in these Samhitas [13].

Rishi Sushruta is regarded as the 'Father of Surgery' for inventing and developing surgical procedures in ancient India, as cited in the *Sushruta Samhita*. Dhanvantari, the practitioner of this art of healing was deified as the God of Medicine. Lord Dhanvantari passed the medical insight to his follower Divodasa, who then instructed Sushruta. The surgical operations performed during Vedic periods were completely done under aseptic conditions where the wounds were washed and made germ free using warm water and antimicrobial herbal pastes. This shows that the concept of sterilization or disinfection was existing during that period. The 'havan kundas' were the integral part of the hospitals which were used to produce fumes, beneficial in disposing off the nosocomial infections [5]. Ayurveda claims that about twenty-two types of diseases are effectively controlled by Agni Hotra with curative and preventive power. Agnihotra-Yagnas are very well described in Rigveda, the most ancient compilation of knowledge which stated that the sublimating the havana samagri (mixture of wood and odoriferous and medicinal herbs) in the fire accompanied by the chanting of Vedic mantras possess antimicrobial activity [14]. The theory of antimicrobial action of the agnihotra has been scientifically reported by Nautiyal et al. [15]. The study reported over 94% reduction in aerial bacterial population and absence of pathogens with 60 min treatment. The cleanliness of the environment in the room was maintained up to 24 h in the closed room. A recent study by Singh and Singh [16] has demonstrated the role of chanting mantras during agnihotra resulting in higher antimicrobial activity of the smoke. The authors suggested that chanting of mantras might had generated electric charge which had changed the properties of phytomedicines present in Yagya smoke contributing to enhanced antimicrobial properties.

The observations, inferences and discussions about origin, prevalence and different roles of microbes in our ancient Vedic literature emphasise that the science of microbiology originated in India thousands of years ago

and has been practiced actively since then. This store house of knowledge present in our Vedas and other traditional scientific manuscripts was acknowledged as the 'Science of life' as these resources have been created and developed based on thousands of years of observations and practice [17]. At this junction of modern versus indigenous knowledge, the Vedic sciences are gaining more recognition and respect. Further, synergism between traditional and modern microbiological knowledge should be exploited to counter the future challenges ahead in environment, agriculture, energy and human health. Nevertheless, we need to revisit these scientific contributions of our ancient Rishis and establish them based on research based facts, so that these are widely accepted to the scientific community for the benefit of mankind.

Acknowledgement The authors are highly grateful to Prof. P. Tauro, Retd. Professor of Microbiology, C.C.S. Haryana Agricultural University, Hisar, Haryana, India for diligently going through the article.

References

1. Frend C (2006) Microbiology in the Veda. In: Ravi Prakash Arya (ed) Vedic sciences
2. Rishi Kanva Vedic Microbiology Research Institute (2013) Vedic microbiology. Rishi Kanva Vedic Microbiology Research Institute. http://eai.eu/organization/rishi-kanva-vedicmicrobiology-research-institute. Accessed Dec 2019
3. Acharya SS, Sharma BD (1999) Atharva Veda Samhita (Odia). Yagashakti Gayatree, Bhoi Nagar, Bhubaneswar
4. Padhy SN (2013) Ethno-ecological introspection into Bhagawatgeetaa. 3: conservation and ramification of biodiversity. J Hum Ecol 45:41–48
5. Padhy SN (2016) Vedic Indians were aware of the microbial biodiversity, demanding 'Kannva' as the father of microbiology. J Biodiver 2:101–103
6. Saini S, Porte SM (2015) Ayurvedic aspect of bacteria and bacterial food poisoning. Int. J Pharm Sci Res 6:2281–2290
7. Gavande SS, Josh AH, Sardeshmukh SP, Deshmujh VV (2020) Concept of Krimi, from Vedic and Ayurvedic perspective—a review. Nat J Res Ayurved Sci 8:1–10
8. Jakhmola RK (2010) Micro-organisms in Vedas. Ayu 31:114–120
9. Jain AK, Jain JK, Diwedi OP (2018) Various historical aspect of communicable diseases described in ancient kala of veda and samhita. J Drug Deliv Ther 8:83–86
10. Kashinath SP, Chaturvedi G. (2007) Hindi commentary: Charak Samhita Chikitsasthan 3/110-111. Chaukhambha Bharati Akadami Publication, Varanashi, Reprint edition 7; 124
11. Raghuveer Rao VN (2014) Ayurvedic concept of Krimi. J Biotechnol Biosaf 2:150–155
12. Panja AK, Patra A, Chaudhuri S, Chattopadhyaya A (2011) Clinical consequences of microbial infections in Charaka Samhita. Int J Ayurvedic Med 2:107–114
13. Vidyarthi AK, Khodre S (2020) Pandemic infectious diseases with respect to Sankramak Roga: a review based on Ayurveda Samhitas. World J Pharm Med Res 6:262–264
14. Kalyanraman (2004) Sarasvati (7 volumes), Baba Saheb (Umakanta Keshava) Apte Smarak Samiti, Bangalore
15. Nautiyal CS, Chauhan PS, Nene YL (2007) Medicinal smoke reduces airborne bacteria. J Ethnopharmacol 114:446–451
16. Singh R, Singh SK (2018) Gayatri mantra chanting helps generate higher antimicrobial activity of yagya's smoke. Interdisc J Yagya Res 1:09–14
17. Andreeva N (2012) Ayurveda and Dosha types for Beginners. https://prizedwriting.ucdavis.edu/sites/prizedwriting.ucdavis.edu/files/users/snielson/95arecipeformedoroga.pdf. Accessed Dec 2019