

Ethnoveterinary medicine based on Ayurveda plants

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Abstract

Traditional plants used for medicine exist for several thousand years ago in India to solve human health problems. The Ayurveda concept involved in the balancing of five basic elements including earth, water, fire, air, and space (ether) because of various active ingredients in remedies. Nowadays, traditional plant uses in veterinary medicine in many regions have been documented and reported such as in Spain, Italy, Argentina, Brazil and Kenya. *Catharanthus roseus* (Apocynaceae) is an important medicinal plant containing vincristine used in veterinary medicine for treatment of canine transmissible venereal tumor and canine lymphoma. Additional evidences in China showed that *Salacia oblonga* root in Ayurvedic recipe was able to ameliorate hypertriglyceridemia and excessive ectopic fat accumulation in laying hens. Moreover, crude extract from *Terminalia arjuna* L. (Combretaceae) bark decreased blood pressure in anaesthetized dogs. However, World Health Organization (WHO) recently focuses in standardization, safety and efficacy of Ayurveda medicine to establish this herbal medicine system. Ayurveda in veterinary medicine still need further clinical research to provide more clear, comprehensive, and practical pharmacological information to improve constantly therapeutic qualities.

Keywords: Ayurveda, ethnoveterinary, traditional medicines

การใช้สมุนไพรที่มีพื้นฐานจากอายุรเวทเพื่อรักษาโรคทางสัตวแพทย์

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บทคัดย่อ

ในประเทศอินเดีย มีการนำสมุนไพรท้องถิ่นมาใช้เป็นยารักษาโรคของมนุษย์มานานนับพันปี ซึ่งการรักษาด้วยพืชสมุนไพรในตำรับอายุรเวทนี้มีหลักการคือ เพื่อจัดสมดุลของธาตุพื้นฐานทั้งห้าในร่างกาย คือ ดิน น้ำ ไฟ ลม และช่องว่างต่างๆ นอกจากอายุรเวทจะใช้รักษาและบำบัดอาการต่างๆ ในมนุษย์แล้ว ยังมีหลักฐานบันทึกและเผยแพร่การนำพืชสมุนไพรมาใช้บำบัดรักษาโรคสัตว์ในหลายประเทศ เช่น สเปน อิตาลี อาร์เจนตินา บราซิล และเคนยา โดยมีตัวอย่างของพืชสมุนไพร เช่น ต้นแพงพวยฝรั่ง หรือ *Catharanthus roseus* (Apocynaceae) ซึ่งมีองค์ประกอบสำคัญ คือ vincristine ใช้รักษา transmissible venereal tumor และ lymphoma ในสุนัข รากของ *Salacia oblonga* ซึ่งอยู่ในตำรับของยาอายุรเวท ช่วยลดภาวะ hypertriglyceridemia และ ectopic fat accumulation ในไก่ไข่ นอกจากนี้ สารสกัดหยาบของเปลือกต้นสมอเทศ หรือ *Terminalia arjuna* L. (Combretaceae) ยังช่วยลดความดันโลหิตของสุนัขที่ถูกล้างยาสลบได้ อย่างไรก็ตาม องค์การอนามัยโลกได้เล็งเห็นความสำคัญของการจัดทำมาตรฐานการใช้พืชสมุนไพร ความปลอดภัยและประสิทธิภาพในการรักษาโรคแบบอายุรเวทเพื่อให้เกิดระบบการรักษาอย่างมีมาตรฐาน ในทางสัตวแพทย์นั้น ยังต้องการการศึกษาวิจัยที่เกี่ยวข้องเพิ่มเติมอีกมาก เพื่อทราบข้อมูลที่ชัดเจน ครอบคลุม และสามารถนำไปใช้ได้จริงในเชิงเภสัชวิทยา ทำให้การรักษาด้วยสมุนไพรที่มีพื้นฐานจากอายุรเวทมีประสิทธิภาพดียิ่งขึ้น

คำสำคัญ : อายุรเวท, การใช้สมุนไพรทางสัตวแพทย์, การแพทย์พื้นบ้าน

Concept of Ayurveda; the plant-based medicine

Ayurveda medicine, the traditional medicine was originated from India for several thousand years ago. The term of "Ayurveda" means "the science of life". It consists of the Sanskrit words *ayur* (life) and *veda* (science or knowledge). It is considered complementary and alternative medicine such as herbs, massage, and specialized diets. The aim of Ayurveda medicine is to integrate and keep the balance among body, mind, and spirit leading to be happy and healthy (Narayanasamy and Narayanasamy 2006).

The Ayurveda concept involves the five basic elements named *Prithvi* (earth), *Jala* (water), *Teja* (fire), *Vayu* (air) and *Akash* (space/ether). The basic elements are purposed to play a role in body functions and combine together to form 'Tridoshas' (humors) named as *Vata* (space air), *Pitta* (fire water) and *Kapha* (water earth), seven basic tissues (*sapthadhatus*)-*Rasa* (plasma), *Rakta* (formed blood cells), *Mamsa* (muscle tissues), *Meda* (fatty tissues), *Asthi* (bone), *Majja* (bone marrow and nervous tissues) and *Shukra* (reproductive tissues), and waste products of the body (*mala*) such as feces, urine and sweat. Moreover, healthy condition of the body represents the state of optimum equilibrium among these elements (Chopra and Doiphode 2002; Ravishankar and Shukla 2007).

Ayurveda was used as plant-based medicines for treatment of diseases. For example, some species of spices and herbs, garlic and turmeric, were reported that are appropriate in the treatment of heart disease or hypertension (Mamtani and Mamtani 2005). The special preparations called *Rasayanas* also have used for rejuvenation, promotion of longevity, and slowing of the aging process (Sharma et al 2007). The potential plants based on Ayurveda showed the relevant efficiency for cancer treatment in clinical trial including as green tea, turmeric and ginger extract (Poojari et al 2012). Ayurveda also showed the possibility to manage the set of complex clinical disorders, called *Prameha*. *Prameha* involve all

three of the *Tridoshas*. These disorders effect to material substance in the body, the body's immunity and vitality, digestive and metabolic processes. It is pathologic conditions happening on by unhealthy diet and lifestyle which closely correlate with obesity, metabolic syndrome, and diabetes mellitus (Sharma and Chandola 2011; Sridharan et al 2011).

Moreover, the cross-sectional experiential profiles of a longitudinal study of rheumatoid arthritis treatment were shown that classical Ayurveda was effective in rheumatoid arthritis patients (Krishna 2011). Therefore, Ayurveda-based plants shows high impact for medicine including human and veterinary medicine.

Ayurvedic medicine uncommonly use "singulars" or singles, individual herb as the herbal therapy for a patient but almost formulate a variety of herbs, minerals and trace metals in specific proportions. *Triphala* (Sanskrit tri = three and *phala* = fruits) is one example of these ancient combination formulas that has taken on a life of its own. It consists of three fruits that in combination have properties far different than each of its constituents; *Phyllanthus emblica* L. or *Embllica officinalis* Gaertn., *Terminalia chebula* Retz., and *Terminalia bellerica* Retz. *Triphala* is an antioxidant and widely prescribed Ayurvedic drug as a colon cleanser, diuretic, and laxative. It is also used in the prevention of cancer (Baliga 2010), antibacterial agents (Bajaj and Tandon 2011) and anti-cataract drug (Wiwanitkit 2011).

The active ingredients of many plants in Ayurvedic medicines are being identified and characterized. Plant alkaloids are the primary active ingredients of Ayurvedic drugs (Borchardt 2003). One of the most well-known originated plant alkaloids in veterinary medicine is vincristine. This vinca alkaloid is obtained from *Catharanthus roseus* (Apocynaceae). The studies since 1964 showed that vincristine was used as anti-cancer agent in Hodgkin's disease, reticulum cell sarcoma, lymphosarcoma, carcinoma of the breast, acute

leukemia and choriocarcinoma in human (Whitelaw and Kim 1964). Nowadays, vincristine also used to treat canine transmissible venereal tumor (CTVT) (Scarpelli et al 2010) and canine lymphoma (Fahey et al 2011).

Ethnoveterinary practices base on Ayurveda

In veterinary medicine, Herb-based medicine was closely related to animal husbandry systems and the treatment of livestock diseases. But traditional knowledge on ethnoveterinary practices was still in local tribal communities. Nowadays, ethnoveterinary uses of various species of plants such as *Acorus calamus*, *Cuscuta reflexa*, *Schima wallichii*, *Fraxinus floribunda* etc., are widely used by the ethnic people of Parbat district, Nepal (Malla and Chhetri 2012). Many species of plants were successfully used for management of health care problems of domestic animals in Uttar Pradesh, India. Some of crude drug formulations were able to maintain the cattle to be healthy, increase lactation, and reduce estrus interval and puberty period (Kumar et al 2012). The important ethnoveterinary plant species such as field mustard (*Brassica campestris*), sugar cane (*Saccharum officinarum*), indian gooseberry (*Embllica officinalis*), ajowan caraway (*Trachyspermum ammi*), sufedmusli (Asparagus adscendens), banana (*Musa paradisiac*), rice (*Oryza sativa*), turmeric (*Curcuma longa*), neem tree (*Azadirachta indica*), tamil (*Tinospora cordifolia*) and tamarind (*Tamarindusindica*) were found that cured the common milk yielding animals of Kathua district, India (Sharma et al 2012).

The plants used in traditional veterinary medicine have been world widely documented and reported. In Argentina, about 70 species of plants were used for disinfection and the treatment of digestive disorders by practitioners. The most commonly used plants are in Asteraceae family, followed by Lamiaceae, Malvaceae, Solanaceae, Zygophyllaceae, Rutaceae and Verbenaceae (Martínez and Luján 2011). The

ethnobotanical suspensions (prepared from one or more of over 150 documented plants) were used to kill the ticks and prevent re-infestation in western Kenya (Wanzala et al 2012). One of example plant in tick infestation control is *Datura stramonium* L. in Solanaceae family (Gakuubi et al, 2012). Furthermore, livestock and pets were found to be used to treat by ethnoveterinary practices in northeast region of Brazil (Souto et al 2011). In additional, *Salacia oblonga* (Celastraceae) root, an Ayurvedic medicinal plant, was used for obesity and diabetes ameliorates hypertriglyceridemia and excessive ectopic fat accumulation in laying hens (Wang et al 2012). Intravenous administration of crude extract from *Terminalia arjuna* L. (Combretaceae) bark showed dose-dependent to induce hypotension in anaesthetized dogs. The purposed mechanism of *T. arjunato* induced hypotension through adrenergic β_2 -receptor agonist action and/or that act directly on the heart muscle (Nammi et al 2003).

Conclusion

Ayurveda traditional veterinary medicine or the "science of life. is the ancient Indian practice focuses on maintaining a sense of equilibrium through a combination of the five basic elements named *Prithvi* (Earth), *Jala* (Water), *Teja* (Fire), *Vayu* (Air) and *Akash* (Space/Ether). Ayurvedic medicine was almost used as mixture of herb in the formula in specific proportions such as *Triphala*. In veterinary medicine, Ayurveda play the role in veterinary medicine within traditional therapeutic way for very long time, especially in originated country; India and other country around the world. Recently, herb-based medicine plays a key role in both animal livestock and pets for the healthcare management. WHO closely focus and initiatives to prepare consumer guidelines for appropriate use of Ayurveda medicines that will enhance quantities and qualities of this traditional medicine into global level.

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