

Review of *Cervi Cornu Parvum* Pharmacopuncture in Korean Medicine

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Key Words

aqua-acupuncture, *Cervidae*, deer antler, Korean medicine, pharmacopuncture, review

Abstract

Objective: The endpoint of this review is to investigate existing studies of *Cervi cornu parvum* (CCP) pharmacopuncture within Korean medicine journals in order to present a better research method in the future.

Methods: We searched all the papers through six Korean electrical databases that included the title of "*Cervi cornu parvum pharmacopuncture*" or "*Cervi cornu parvum aqua-acupuncture*". Articles that had been published until December 2012 were largely divided into experimental studies and clinical studies.

Results: Fifty-three (53) experimental studies and six clinical studies were found. The number of published articles has been constantly increasing. Many of the experimental studies demonstrated anti-inflammatory effects for arthritis, and most of the clinical studies dealt with musculoskeletal problems.

Conclusion: Various therapeutically significant effects of the CCP pharmacopuncture have been found through this review; however, more systematic clinical studies on the CCP pharmacopuncture seem to be necessary to substantially support its clinical effects.

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1. Introduction

Pharmacopuncture therapy is a treatment that is applied by injecting a certain amount of a herbal extract on an acupoint or a hypersensitive epidermal point [1]. It has been used as an identical term with "aqua-acupuncture" in the sense that it combines acupuncture and herbal medication. Recently, direct injection of herbal medicine into an affected tissue has drawn global attention and is thought to have the great merit of being able to enhance therapeutic effects even with small dosage [2].

Cervi cornu parvum (CCP) is a major blood-tonifying restorative traditional medicine that is commonly used nowadays as a pharmacopuncture material, and relevant clinical or experimental studies are continuously being reported. In this context, only two review papers concerning CCP, one in Korea and one overseas, respectively have been found. One is a biochemical and nutritional review [3], and the other is a review of deer antler base in Chinese literature [4].

To date, experimental and clinical studies have been undertaken to show the objective effects of CCP pharmacopuncture. Therefore, a review article addressing the objective effects of CCP pharmacopuncture is needed. Because of this, we analyzed existing research trends on CCP

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Table 1 Korean electric databases used for this study

Korean electric databases for this review	Domain
Korean Traditional Knowledge Portal	http://www.koreatk.com
Oriental Medicine Advanced Searching Integrated System	http://oasis.kiom.re.kr
Research Information Services	http://www.riss.kr
Koreanstudies Information Service System	http://kiss.kstudy.com
Korean Medicine Database	http://kmbase.medic.or.kr
National Discovery for Science Leader	http://scholar.ndsl.kr
Total	6

Table 2 List of journals and the number of published papers

Journals	Number of published papers
The Journal of Korean Acupuncture & Moxibustion Medicine Society	31
Journal of Pharmacopuncture	5
The Journal of Korean Oriental Medicine	5
Journal of Oriental Rehabilitation Medicine	4
The Korean Journal of Meridian & Acupoint	3
The Journal of Korean Oriental Internal Medicine	3
Korean Journal of Oriental Physiology and Pathology	2
The Korea Journal of Herbology	2
The Journal of Korean Oriental Medical Ophthalmology , Otolaryngology and Dermatology	1
The Journal of Korea CHUNA Manual Medicine for Spine and Nerves	1
The Journal of the Korea Institute of Oriental Medical Informatics	1
Journal of Pharmaceutical Investigation	1

pharmacopuncture in Korean literature in the hope of finding better study methods and expanding the scope of clinical practice in the future.

2. Research methods

This research was carried out by surfing the following Korean electric databases: Korean Traditional Knowledge Portal (KTKP), Oriental Medicine Advanced Searching Integrated System (OASIS), Research Information Services (RISS), Korean studies Information Service System (KISS), Korean Medicine Database and National Discovery for Science Leader (NDSL) (Table 1). Articles titled "CCP pharmacopuncture" or "CCP aqua-acupuncture" in Korean were included in the study. Additionally, papers

including other treatments were selected if CCP pharmacopuncture had been used as a main intervention. This review only covers articles published until December 2012. Forty-nine CCP pharmacopuncture articles and ten CCP aqua-acupuncture articles were chosen for this study.

3. Research results

Fifty-nine (59) articles were found in 14 kinds of journals. Thirty-one (31) articles were found in the Journal of Korean Acupuncture & Moxibustion Medicine Society, which accounts for 53% of all articles, 5 articles each in the Journal of Pharmacopuncture and the Journal of Korean Oriental Medicine, 4 articles in the Journal of Oriental Rehabilitation Medicine, 3 articles each in the Korean

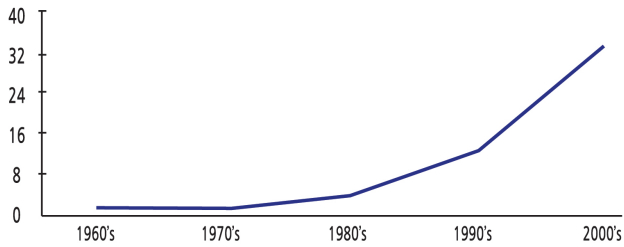


Figure 1 The number of papers published per decade.

Journal of Meridian & Acupoint and the Journal of Korean Oriental Internal Medicine, and one or two articles in the remaining journals (Table 2).

Beginning with 1 article in the 1960's, 1 article in the 1970's, 4 articles in the 1980's, 13 articles in the 1990's and 34 articles in the 2000's, the number of publications has been constantly increasing (Fig. 1). There are 53 experimental articles and 6 clinical articles. Clinical articles consist of 4 case reports, one experiment-control group comparative study and one clinical trial.

Of the 53 experimental articles, 12 addresses the effect on arthritis-induced models [5-16], 9 articles address anti-osteoporosis effects [17-25], and 6 anti-oxidation and anti-aging effects [26-31]. In addition, 4 articles reported on safety studies [32-35], and 4 articles on the promotion of hormone production [36-39]. Furthermore, two articles each were published in the following areas: component analysis [40, 41], modulation of the autonomic nervous system [42, 43], anti-ischemic effects [44, 45], anti-cancer effects [46, 47], promotion of growth [48, 49], increased immunity [50, 51], and neuranogenesis [52, 53], for a total of 14 articles. Finally, one article was found in each of the following four areas for a total of four articles: analgetic effect [54], anti-stress effect [55], Sasang topology [56], and acupuncture sensation [57].

Of the six clinical studies [58-63], one is on otorhinolaryngological disease while the rest are all on musculoskeletal pain disease. Also, two studies were performed only with CCP pharmacopuncture whereas four studies combined pharmacopuncture with other traditional therapies.

4. Discussion

In recent years, Korean medicine has been undergoing a variety of academic developments and studies on pharmacopuncture may be one of the conspicuous changes. Pharmacopuncture therapy, first introduced in Korea by the book named "Meridians" and written by Sang-chun Nam in the 1960's, is a unique treatment that

combines the physical stimulation of classic acupuncture at valid acupoints with the pharmacological action of biochemical substances obtained from various herbs in order to alleviate symptoms and to prevent diseases by modulating the biofunction. From the late 1970's, active research in this field has been ongoing within Korean medicine community, and in 1991, the Korean Institute of Pharmacopuncture was established, thereby contributing more systematically to the development of pharmacopuncture.

Because of its convenience, accessibility and efficiency, pharmacopuncture is widely used by many doctors of Korean medicine and has great potential for the future [64]. *Cervi cornu parvum* (CCP), belonging to the Cervidae family, is an unossified horn that contains many vessels inside the tissue. It was first recorded in the Chinese medical classic *Shen Nong Ben Cao Jing* (神農本草經), in which it was described as having a warm nature, and a sweet taste; it was also reported to be non-toxic, to tonify the kidney yang, to replenish blood and essence, and to strengthen bones and muscles, thus, it has the ability to treat impotence, incontinence, infertility, aversion to cold, cold extremities, lower limb weakness, lumbar pain, tinnitus and gradual loss of hearing [65].

Also, immunity improvement, and anti-cancer, anti-fatigue, anti-stress, anti-oxidation, anti-inflammation and analgesic effects have been pharmacologically proven in many studies [4]. Furthermore, CCP helps to make up for deficiencies of qi, blood, Yin and Yang, allowing its use in treating a wide range of diseases.

CCP pharmacopuncture is a sort of meridian pharmacopuncture and is manufactured by the process of alcohol immersion. However, when it is exposed to air, it becomes fiberized, causing burning pain in the injected patients [1]. Although much research on CCP is available in Korean, not a single review article has been found yet in Korean literature. Wu et al. [4] recently reviewed deer antler base in Chinese literature while Kang et al. [3] reviewed only the biochemical and the nutritional parts of CCP, all of which had limitations on understanding the overall research trends of CCP pharmacopuncture in Korea. Thus, we collected all the relevant articles published until December 2012 and analyzed its research trends. This study processed 59 articles from 6 Korean electric databases. There were 53 experimental articles and 6 clinical articles. The number of experimental studies obviously overwhelmed that of clinical studies. Aqua-acupuncture, so-called acupoint injection therapy in China, has the same meaning as pharmacopuncture by definition [66] and was also included as a search term. It is strongly recommended that these two terms be unified into pharmacopuncture in order to avert confusion.

Based on topics, experimental studies address the anti-inflammation effect on arthritis (12 articles, 20%), anti-osteoporosis effect (9 articles, 15%), anti-oxidation and anti-aging effects (6 articles, 10%), and safety and increased hormone production (4 articles each, 7%). Two articles each (3%) were published on component analysis, autonomic nerve modulation, anti-ischemic effect, anti-cancer effect, increased immunity, growth promotion, and neuranogenesis effects. The remaining studies reported on different topics. On the other hand, clinical studies addressed musculoskeletal pain diseases (5 articles, 8%) and otorhinolaryngological disease (1 article, 2%) (Table 3).

Based on journals, The Journal of Korean Acupuncture & Moxibustion Medicine Society published 31 articles while the Journal of Pharmacopuncture and the Journal of Korean Oriental Medicine respectively, published 5 articles. Beginning with 1 article in the 1960's, 1 article in the 1970's, 4 articles in the 1980's, 13 articles in the 1990's, 34 articles in the 2000's and 6 articles from 2010 to 2012, the number of publications has been constantly increasing. Especially, clinical articles started to be published from 2000.

An overall review showed that the various effects of CCP recorded in medical classics were scientifically proven, though we suggest several opinions on the problems of this study.

Above all, the number of clinical studies is very insufficient compared to that of experimental studies, and the subjects are too weighted on musculoskeletal problems despite broad clinical coverage of CCP. Thus, more clinical studies should be focused on other kinds of diseases, such as, the endocrine system, the nervous system, gynecology, pediatrics, and so on. Secondly, in case of clinical studies, demonstrating the authentic clinical effects of CCP pharmacopuncture is difficult because many of them were combined with other therapies. Therefore, future case reports and RCTs should be solely designed with CCP pharmacopuncture. Thirdly, the method of syndrome differentiation (辨證) is not clearly stated, and clinical reproducibility is suspect. Diagnostic standards should be suggested for future studies. Lastly, although the safety of CCP pharmacopuncture has already been proven, CCP has a constitutional specificity from a Sasang typological point

Table 3 The number of each kind of article classified by topics

	Topics	Number of articles
Experimental articles	Anti-inflammatory effect on arthritis-induced models	12
	Anti-osteoporosis effect	9
	Anti-oxidation and anti-aging effect	6
	Safety studies	4
	Promoting hormone production	4
	Component analysis	2
	Modulating autonomic nerve	2
	Anti-ischemic effect	2
	Anti-cancer effect	2
	Promoting growth	2
	Increasing immunity	2
	Neuranogenesis	2
	Analgetic effect	1
	Anti-stress effect	1
	Study related with Sasang typology	1
Study on acupuncture sensation	1	
Clinical articles	Musculoskeletal disease	5
	Otorhinolaryngological disease	1

of view. Therefore, constitutional differences should be considered in further safety studies. Sincerely, we hope that this review will lead to better research and clinical applications in the future.

5. Conclusion

Various effects of CCP have been proven by many experimental studies; on the other hand, the number of clinical articles is insufficient. Through this review, more clinical studies seem to be necessary to substantially support the experimental effects of CCP. At present, it is a matter of fact that clinical trials of pharmacopuncture are limited due to inadequate pharmaceutical legislation; however, more aggressive research is needed on a variety of diseases within the possible bounds of the law.

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References

1. Korean Pharmacopuncture Institute. Pharmacopunctureology: principles and clinical applications. Seoul: Elsevier Korea LLC; 2012. Chapter 01, Definition and history; p. 3.
2. Lee JH, Jo DC, Moon SJ, Kong JC, Park TY, Ko YS, et al. [Narrative review of clinical trial on *Hominis placenta* pharmacopuncture in Korean literature]. J Oriental Rehab Med. 2012;22(3):79-88. Korean.
3. Kang CK, Kim SW. [A study on the biochemical and nutritional inquiry of antler]. Korean J Food & Nutr. 1989;2(2):65-71. Korean.
4. Wu F, Li H, Jin L, Li X, Ma Y, You J, et al. Deer antler base as a traditional Chinese medicine: A review of its traditional uses, chemistry and pharmacology. J Ethnopharmacol. 2013;145(2):403-15.
5. Kim WY, Choi JB. [Effects of bee venom and *Cervi Corvu Parvum* pharmacopuncture in monosodium iodoacetate (MIA)-induced osteoarthritis rat]. J Oriental Rehab Med. 2010;20(1):61-77. Korean.
6. Lee HJ, Cho HS, Hwang MS, Jung CY, Lee DG, Kim EJ, et al. [Effect of *Cervi Pantotrichum Cornu* pharmacopuncture on suppressing the expression of iNOS and production of NO in type- II collagen-induced arthritis mice]. The Journal of Korean Acupuncture & Moxibustion Medicine Society. 2008;25(5):105-16. Korean.
7. Chung YR, Lee SD, Byun H, Park IS, Jung CY, Lee CH, et al. [The effect of deer antler herbal acupuncture control to hyper-inflammatory responses on synovial membrane by LPS-induced arthritis]. The Journal of Korean Acupuncture & Moxibustion Medicine Society. 2007;24(4):167-81. Korean.
8. Kim EJ, Kim GY, Cung HW. [Effect of *Achyranthis Radix* administration and *Cervi Cornu Parvum* acupuncture in experimental osteoarthritis rats]. Korean J Oriental Physiology & Pathology. 2007;21(5):1194-99. Korean.
9. Ahn HJ, Kim KS. [Inhibitory effect of deer antler aqua-acupuncture (DAA) on cathepsin S activity and rheumatoid arthritis in rats]. The Journal of Korean Acupuncture & Moxibustion Medicine Society. 2003;20(3):104-16. Korean.
10. Kim JG, Kim KS. [Inhibitory effects of *Cervi Pantotrichum Cornu* herbal acupuncture on type- II collagen-induced arthritis]. The Journal of Korean Acupuncture & Moxibustion Medicine Society. 2002;19(6):155-70. Korean.
11. Choi YH, Choi WS, Song IK, Park JS, Lee SD, Kim KS. [Protective and anti-arthritic effects of *Cervi Pantotrichum Cornu* herbal acupuncture, inhibiting *Dihydroorotate Dehydrogenase*, on Phosphate-ion-mediated *Chondrocyte Apoptosis* and rat collagen-induced arthritis]. The Journal of Korean Acupuncture & Moxibustion Medicine Society. 2002;19(5):10-27. Korean.
12. Choi BJ, Kim MJ, Park SD, Lee AR, Jang JH, Kim KH. [Modulation of bone mass, strength and turnover by a *Cervi Pantotrichum Cornu* herbal acupuncture in adjuvant-induced arthritic rats]. The Journal of Korean Acupuncture & Moxibustion Medicine Society. 2002;19(5):219-33. Korean.
13. Park SD, Kim MJ, Lee AR, Jang JH, Kim KH. [Effect of *Cervi Pantotrichum Cornu* herbal acupuncture on protease activities, antioxidant in rheumatoid arthritis rats]. The Journal of Korean Acupuncture & Moxibustion Medicine Society. 2002;19(2):51-64. Korean.
14. Hwang JS, Hwang JH, Lee HJ, Lee DG, Kang MJ, Back SO, et al. [The ability of *Cervus Elaphus Sibiricus* herbal acupuncture to inhibit the generation of inflammatory enzymes on collagen-induced arthritis mice]. The Journal of Korean Acupuncture & Moxibustion Medicine Society. 2007;24(6):1-14. Korean.
15. Kim JK, Lee SD, Jeong YR, Kim KS. [Protective action of cartilage and bone destruction by deer

- antler herbal-acupuncture solution, the pilose antler of *Cervus Korean TEMMINCK Var. Mantchuricus Swinhoe*, on Type- II collagen-induced arthritis in mice]. The Journal of Korean Acupuncture & Moxibustion Medicine Society. 2006;23(2):73-90. Korean.
16. Kim WY, Lee SD, Kim KH, Baek ST, Kim KS. [The efficiency of deer antler herbal acupuncture on modulation and prevention of IL-1 mediated activation in rat chondrocytes at a receptor level]. The Journal of Korean Acupuncture & Moxibustion Medicine Society. 2006;23(2):113-23. Korean.
17. Kim JK, Kim KS. [Effects of the pilose antler of *Cervus Korean TEMMINCK var. mantchuricus Swinhoe* (DAS), herbal acupuncture solution on suppression of collagenolysis and bone resorption in mouse calvarial osteoblasts]. The Journal of Korean Acupuncture & Moxibustion Medicine Society. 2004;21(4):225-36. Korean.
18. Kim MJ, Lee SD, Kim KH, Byun H, Kim KS. [Effects of deer antler water extract (pilose antler of *Cervus Korean TEMMINCK var. mantchuricus Swinhoe*) on chondrocytes]. The Journal of Korean Acupuncture & Moxibustion Medicine Society. 2004;23(2):103-11. Korean.
19. Abadjieva DK, Kang SK. [Effect of *Cervi Cornu* aqua-acupuncture on lipid metabolism and osteoporosis in ovariectomized rats]. The Journal of Korean Oriental Medicine. 1996;17(2):168-77. Korean.
20. Han SW, Lee YH, Kim CH. [A study on effects of the *Cervi Pantotrichum Cornu* herb-acupuncture on the osteoporosis induced by ovariectomy in rats]. Pharmacopuncture. 2000;3(1):177-91. Korean.
21. Kee YB, Kim DH, Kang DH, Kim SJ, Choi JB. [Effects of *Yukmijihwang-tang* (*Liuweidihuang-tang*) and *Cervi Pantotrichum Cornu* pharmacopuncture on fracture healing in diabetic rats]. J Oriental Rehab Med. 2012;22(3):49-63. Korean.
22. Yook TH, Lee CH, Lee HI. [A study on the effects of the *Carthamisemen*, *Cervi Pantotrichum Cornu*, *Hominis* placenta aquacupuncture on the osteoporosis in rats]. The Journal of Korean Acupuncture & Moxibustion Medicine Society. 2001;18(1):61-75. Korean.
23. Han SW, Choi JY, Lee YH. [Healing of bony defects by *Cervi Pantotrichum Cornu* herbal acupuncture]. The Journal of Korean Acupuncture & Moxibustion Medicine Society. 2001;18(5):135-46. Korean.
24. Kim SH, Kim KS. [Effect of *Cervi Cornu Parvum* aqua-acupuncture in contents of female sexual hormone of women and osteoporotic change in ovariectomized rats]. The Journal of the Korea Institute of Oriental Medical Informatics. 1997;3(1):95-122. Korean.
25. Jang SJ, Lee CH, Yook TH. [Effects of Laennec · N · HO (*Hominis* placenta · *Cervi Pantotrichum Cornu* · *Carthami* semen) aqua-acupuncture on the ovariectomized osteoporotic rats]. The Journal of Korean Oriental Medicine. 1998;19(1):5-18. Korean.
26. Yoon CH, Jeung JC, Shin US. [Antioxidative effects of *Cervus elaphus* aqua-acupuncture on damage of rat's kidney induced by bromobenzene]. Korean J Orient Int Med. 1999;20(2):287-302. Korean.
27. Lee KB, Park SK. [Effects of *Cornu Cervi Parvum* pharmacopuncture on the blood picture and antioxidative activity in rats]. The Korean Journal of Meridian & Acupoint. 2010;27(2):25-34. Korean.
28. Lee JH, Lee KM, Kim JS. [Anti-wrinkle effects of *Cervi Pantotrichum Cornu* pharmacopuncture solution]. The Journal of Korean Acupuncture & Moxibustion Medicine Society. 2010;27(4):1-8. Korean.
29. Yoon CH, Jeong JC, Shin US. [Effects of *Cervuselaphus* aqua-acupuncture's solution on damage of rat's kidney induced by ischemia and reflow]. Korean J Orient Int Med. 1999;20(1):111-21. Korean.
30. Jeong JC. [Effects of *Cervus elaphus* extract solution for aqua-acupuncture on antioxidation in rat's brain induced by ischemia and reflow]. Korean J Orient Int Med. 1999;20(1):167-80. Korean.
31. Yoon CH, Jeong JC, Shin US. [Effects of *Cervus elaphus* for herb-acupuncture solution on antioxidation in rat's liver]. Journal of Korean Oriental Medicine. 1996;17(2):191-202. Korean.
32. Byun BH, Seo BI. [Safety study on genetic toxicity of *Cervi Pantotrichum Cornu* herbal acupuncture solution (CPCA)]. Kor J Herbology. 2005;20(2):1-6. Korean.
33. Byun BH, Seo BI. [Safety study on general cell cytotoxicity effects of *Cervi Pantotrichum Cornu* herbal-acupuncture solution (CPCA)]. Korea J Herbology. 2003;18(3):51-6. Korean.
34. Choi MK, Lee YH. [Studies on the safety assessment of *Cervus elaphus* extract for aqua-acupuncture (antigenicity test)]. Journal of Korean Oriental Medicine. 1993;14(1):103-13. Korean.
35. Cho SH, Lee YH, Park YB. [Acute toxicity study of aqua-acupuncture of *Cervi Cornu Parvum* and *Ganoderma Lucidum Karsten* in mice]. The Journal of Korean Acupuncture & Moxibustion Medicine Society. 1992;9(1):71-83. Korean.
36. Kwak DG, Yang CH. [A regulatory effect of *Cervi*

- Cornu Parvum* aqua-acupuncture on serum estradiol level after ovariectomy]. The Journal of Korean Acupuncture & Moxibustion Medicine Society. 1998;15(2):29-41. Korean.
37. Yang HT, Yoon JW, Kim KS, Song CH, Ahn CB. [Study of effect of *Cervus Nippon Temminck* aqua-acupuncture on the hypothyroidism induced by thiourea in rats]. The Journal of Korean Acupuncture & Moxibustion Medicine Society. 1992;9(1):215-27. Korean.
 38. Kim KR, Lee YH. [A study of the effect of *Cervus elaphus* aqua-acupuncture on the adrenal cortical insufficiency in rats]. The Journal of Korean Acupuncture & Moxibustion Medicine Society. 1987;4(1):49-62. Korean.
 39. Lee SM, Ahn BC, Lee YH. [Study of the effects of aqua-acupuncture with *Ginseng* radix, *Cervi Cornu* and *Saussureae* radix extract solution on the weight increase and secretion of gastric hormone in mice]. The Journal of Korean Acupuncture & Moxibustion Medicine Society. 1988;5(1):1-13. Korean.
 40. Han SW, Seo JC, Lee YH, Choi JY. [Gene expression analysis using cDNA microarray assay by *Cervi Pantotrichum Cornu* herbal acupuncture]. The Journal of Korean Acupuncture & Moxibustion Medicine Society. 2003;20(3):34-44. Korean.
 41. Yong JI, Pack NH. [Studies on deer horn (鹿茸) : free amino acids of deer horn water extract]. Yakhak Hoeji. 1960;5(1):1-2. Korean.
 42. Lee HY, Lee JB, Cho YH, Song BY, Yook TH. [The effects of *Cervi Pantotrichum Cornu* pharmacopuncture and *Bovis Calculus • FelUrsi* pharmacopuncture on the heart rate variability]. The Journal of Korean Acupuncture & Moxibustion Medicine Society. 2010;27(1):65-74. Korean.
 43. Kim HJ, Song BY, Yook TH. [The effects of distilled *Cervi Pantotrichum Cornu* pharmacopuncture and *Zizyphispinosi* semen pharmacopuncture on the heart rate variability]. Pharmacopuncture. 2009;12(3):31-40. Korean.
 44. Lee SJ, Jeong HW. [Effects of pharmacopuncture therapy using *Cervi Pantotrichum Cornu* at BL23, BL52 on the cerebral hemodynamics in rats]. Korean J Oriental Physiology & Pathology. 2009;23(1):50-6. Korean.
 45. Kim SO, Yoon DH, Na CS. [Effect of *Cervus elaphus* herbal acupuncture on focal ischemia induced by inserted intraluminal filament in MCA of rats]. The Korean Journal of Meridian & Acupoint. 2005;22(4):67-81. Korean.
 46. Ryu SH, Lee KM, Lee BH, Lim SC, Jun TY, Seo JC. [Oligonucleotide chip analysis of *Cervi Parvum* *Cornu* herbal-acupuncture solution (CPC-HAS) on SNU484 carcinoma cells]. The Korean Journal of Meridian & Acupoint. 2006;23(2):137-48. Korean.
 47. Ryu SH, Lee KM, Lee BH, Lim SC, Jung TY, Seo JC. [DNA and proteomic expression of *Cervi Parvum Cornu* herbal-acupuncture solution (CPC-HAS) in HepG2 carcinoma cells]. Pharmacopuncture. 2006;9(2):5-16. Korean.
 48. Lee JM, Kim YT, Lee HI, Son YS, Jin SH, Lee HS, et al. [The effects of *Cervus elaphus* aquacupuncture and *Ginseng* radix aquacupuncture on the growth of animals]. Pharmacopuncture. 2000;3(2):131-52. Korean.
 49. Kim YT, Son YS, Jin SH, Han SW, Shim IS, Lim S, et al. [The effects of *Cervus elaphus* on the growth and the intellectual development of animals]. The Journal of Korean Acupuncture & Moxibustion Medicine Society. 2001;18(5):122-34. Korean.
 50. Kim YW, Moon JY, Lim JK, Park WH, Park SD, Nam KS. [Effects of CCP (*Cervi Cornu Parvum*) aqua-acupuncture on glucocorticoid-Induced immunosuppression in Murine Lymphocyte]. The Journal of Korean Acupuncture & Moxibustion Medicine Society. 1997;14(2):245-52. Korean.
 51. Kim YW, Moon JY, Lim JK, Nam KS. [Effects of CCP (*Cervi Cornu Parvum*) aqua-acupuncture on MA-HRP induced antibody production and lysozyme activity in mouse]. The Journal of Korean Acupuncture & Moxibustion Medicine Society. 1997;14(1):409-19. Korean.
 52. Ahn HL, Yang MS, Shin MS, Choi JB, Kim SJ. [The experimental study of electroacupuncture and *Cervi pantotichum Cornu* pharmacopuncture on pain decrease and nerve regeneration after crush injury of the sciatic nerve]. J Oriental Rehab Med. 2009;19(1):39-55. Korean.
 53. Sul JU, Chu MK, Kim SJ, Choi JB, Shin MS, Kim SI. [Effects of *Yanghyuljanggeungunbo-tang* (*Yangxuezhuangjinjianbu-tang*) and electrical acupuncture on spinal nerve injury and motor function]. J Oriental Rehab Med. 2009;19(2):1-25. Korean.
 54. Kim YJ, Park DS, Kang SG. [Studies on the analgesic effect of aqua-acupuncture with *Cervus elaphus* extract solution in mice]. The Journal of Korean Acupuncture & Moxibustion Medicine Society. 1987;4(1):63-74. Korean.
 55. Ko GI. [Effect of the antler (deer horn) water extract on the stress resistance in mice]. J Korean Pharm Sci. 1981;11(2):211-15. Korean.
 56. Seo JY, Um TS. [The effects of aqua-acupuncture with *Cervus nippon Temminck* at meridian point

- KyOksu* (BL17) on RBC, Hgb, Hct in healthy person with four types of physical constitution]. The Journal of Korean Acupuncture & Moxibustion Medicine Society. 1995;11(2):219-29. Korean.
57. Seo JC, Yoon JS, Park HJ, Lee HJ, Han SW. [The clinical study on acupuncture sensation in CC, CF and BV herbal acupuncture - The basic study on placebo herbal acupuncture]. Pharmacopuncture. 2004;7(1):63-9. Korean.
58. Yu MK, Bae JS, Park YH, Kim JH, Choi JH. [A case study of three patients who have tinnitus that is diagnosed as weakness of the kidney, treated with *Cervi Pantotrichum Cornu* herbal-acupuncture.] The Journal of Korean Oriental Medical Ophthalmology & Otolaryngology & Dermatology. 2006;19(2):249-55. Korean.
59. Kim SJ, Sul JU, Kim SJ, Shin MS, Choi JB. [Clinical case report of polyneuritis: with *Cervus elaphus* herbal-acupuncture]. The Journal of Korea CHUNA Manual Medicine for Spine & Nerves. 2006;1(1):35-43. Korean.
60. Park JS, Kim WY, Baek ST, Lee SD, Kim KS. [The clinical observations of 4 cases of De Quervain`s disease treated with *Cervus elphus* herbal-acupuncture]. The Journal of Korean Acupuncture & Moxibustion Medicine Society. 2004;21(6):259-68. Korean.
61. Kim WY, Paek ST, Park JS, Lee SD, Kim KS. [The clinical study of the herbal acupuncture on Tarsalgia and plantar faciitis]. The Journal of Korean Acupuncture & Moxibustion Medicine Society. 2004;21(6):121-26. Korean.
62. Park EJ, Shin JC, Na GH, Lee DH, Han SG, Yoon YC, et al. [Study on clinical effects of *Cervus elaphus* herbal-acupuncture on osteoarthritis in knee joint]. The Journal of Korean Acupuncture & Moxibustion Medicine Society. 2004;21(2):275-86. Korean.
63. Ryu HS, Kim SP, Chun HS, Ryu MS, Shin JC, Wei TS. [The comparative study of effects between acupuncture treatment and cotreatment with mixed pharmacopuncture of *Jungsongouhyul* and *Cervi Pantotrichum Cornu* on Low Back Pain Patients]. The Journal of Korean Acupuncture & Moxibustion Medicine Society. 2011;28(6):149-57. Korean.
64. Lee JY, Han YJ, Kim JH, Kim YJ, Kwon KR. [Type analysis of pharmacopuncture papers published in the Journal of Korean Institute of Pharmacopuncture]. Pharmacopuncture. 2006;9(3):147-52. Korean.
65. Bensky D, Gamble A. Chinese herbal medicine: materia medica. Revised ed. Seattle: Eastland Press; 1992. p. 32-44.
66. Choi MS, Ko HK, Kim CH. [The study of aqua-acupuncture]. The Journal of Korean Acupuncture & Moxibustion Medicine Society. 1990;7(1):315-29. Korean.