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# The Efficacy of Animal Horn as a Traditional Medicine in Asian Countries: A Review

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**ABSTRACT**

Since ancient times, animal horn, shell, and plant products have been used in widespread cross-cultural healing practices and traditional medicine across various regions of Asia, particularly in the Philippines and China. Not only are their clinical effects supported by historical evidence, but at the same time, it also promotes the development of traditional medicine. This review administered the use of journal databases such as PubMed, Greenfield Advanced Research Publishing House, ResearchersLink, and PLOS One Journal. Furthermore, this review shows how the preparation of the animal horn as traditional medicine was made. Based on the findings of the articles used, the Carabao horn effectively treats various types of skin diseases or wounds. The deer horn or the deer antler base is proven effective as antiviral and anti-inflammatory in traditional Chinese medicine. The water buffalo horn is also effective as an antipyretic medicine. As a result, animal horns mentioned in this review are effective traditional medicine in treating various diseases.

**Keywords:** Animal Horn, traditional medicine, efficacy, Asian countries

## 1.INTRODUCTION

Since ancient times, animal horns, shells, and plant products have been used in widespread cross-cultural healing practices and traditional medicine across various regions of Asia. Not only are their clinical effects supported by historical evidence, but at the same time, they also promoted the advancement of traditional medicine [1,2,3]. These animal-derived materials are generally available in powder or compound preparations [4,5].

Based on studies conducted in several neighboring countries of the Philippines, animal horns are chiefly used for cultural, medicinal, and social purposes. Water buffalo horn (WBH) has been known and utilized in Chinese traditional medicine for a millennium [6]. WBH is utilized for its antipyretic, antioxidant, dispelling heat, relieving convulsions, and cooling blood [7,8,12]. Previous studies on ethno-medicinal uses of Himalayan goral in Nepal also stated that the horn is kneaded and made into a fine paste, then used for curing stomach pain in the navel part [13]. In some areas of Indonesia, the practice of kop utilizes buffalo horn to pull the skin of the afflicted section of the body upward to generate an erythematous effect [14]. As also stated by another anthropological study in Singapore, *Saigatatarica* (Saiga antelope horn) is commonly utilized for fever [9] and was sold in various forms, which are mostly in shavings, as one piece, or as medicinal pill [10, 11]. Rhino horns also are frequently demanded from primary consumer countries (e.g., China and Vietnam) for medicinal purposes. These are predominantly utilized to cleanse the body and treat signs of internal heat (e.g., hangovers, fever, convulsions, and ulcers) [18, 19].

However, due to the cultural roots of animal product consumption, demands on horns (e.g., rhinos) have contributed to the decline and, to some extent, extinction of threatened animals. [15,16] This pushed the international animal protection organization to raise an international ban on the trading of horns under the Convention on International Trade in Endangered Species (CITES) [17].

Hence, this study aims to review the information and record animal-derived materials used by faith healers and the traditional "quack" doctors (hereafter collectively referred to as traditional healers) operating in some regions of the Philippines and China. It will provide insights into the extent and dynamics of the traditional healing enterprise through a literature study of several clinical studies on the utilization of animal horns in traditional medicine and its efficacy.

## METHODOLOGY

The majority of this review administered the use of journal databases such as PubMed, Greenfield Advanced Research Publishing House, ResearchersLink, and PLOS One Journal. The search started on May 9, 2022, where the search keywords include Animal Horn, traditional medicine, deer antler base, carabao horn, and water buffalo horn. This review was conducted using specific criteria focusing on the review and efficacy of the selected animal horn, specifically from the Philippines and China, like traditional medicine, which focuses on skin wounds, antipyretic, and inflammation.

Furthermore, this review will also address how the powdered horn and the deer antler base are formulated to determine how they can be applied to the infected and inflamed body area and how they can be used for fever. This method was obtained using the study of various journals found on journal databases, specifically in the Greenfield Advanced Research Publishing House, PubMed, Plos One Journal, and Google Patent.

### Powdered Carabao Horn Preparation

This preparation method was obtained from the study of carabao horns for skin wounds and diseases. The preparation of the formulation of powdered carabao horn is the following steps: 3 to 4 inches of Carabao horn was cut and washed thoroughly. The horn was scoured to produce thin pieces from it; the thin pieces were pounded to powdered form and were then placed in a clean container. Furthermore, this preparation can be utilized by washing the infected parts thoroughly with hydrogen peroxide and then placing enough powder on the clean surface of the infected skin [20].

### Deer Horn Preparation

As for the deer antler base, the preparation method was obtained from the review of Wu *et al.* (2013). To make a glue solution, a deer antler base was chopped into small pieces and was subjected to hot water for detection. The solution was filtered and blended with a small amount of potassium alum powder, then concentrated into a thick paste over a slow fire while adding additional ingredients such as rock sugar, soybean oil, and rice wine before being cut into tiny pieces. The resulting substance with high collagen content has a transparent yellow-brown or reddish-brown tint, known as antler glue, whereas the gray bone residue that contains no colloid is discarded [21].

### Powdered Buffalo Horn Preparation

As for the powdered buffalo horn, the preparation method was obtained using the Google Patent Database, which comprises the following steps: the horn was cleaned, sawed-off, removed, and pulverized. It is added to the barium hydroxide solution of 2mol/L, then subjected to heating hydrolysis for three days. The hydrolyzed solution was added with sulfur acid to adjust the pH value to 2 and made it settle for 24 hours. After that, the precipitation was removed, and sodium hydroxide was added to adjust the pH to 3.5. The formulation was settled for another 24 hours. The obtained precipitation was then subjected to a filter by filtrating it with sodium hydroxide, adjusting the pH to 7. Once it was concentrated to the right amount, ethanol was added to contain an alcohol content of 75% and let it settle for another 24 hours. Lastly, the precipitation was removed so that the ethanol would be left and be concentrated into a thick paste. It is then subjected to extraction and pulverized [22].

### Powder of Carabao Horn as an Alternative Traditional Medicine For Skin Disease And Wounds

All horns consist of keratin protein, a pair of firm, sharp, often permanent bulge on the head of various hoofed mammals such as carabao, goats, antelopes, and cattle [23]. The technical use of the Carabao horn was known for its uses, like the handle of knives and *'bolos'* and beauty accessories. The Carabao horn was employed as a herbal cure for venom extraction from snake bites in ancient times. Furthermore, the Igorots also utilized the powder of horn as a weapon and an emergency skin medication. Due to the keratin content of the carabao (buffalo) horn, it is proven to be effective for skin wounds and diseases [20]. Following treatment with the samples of keratin peptide, hydration and elasticity improvement were observed because the skin zones treated with the formulations had greater initial water absorption values and have been shown to govern critical biological functions, including cell proliferation and protein synthesis [23, 24].

### Deer Antler Base as an Alternative Traditional Medicine For Antiviral and Microbial Infection

Although it is not a horn, a Deer antler can only be found in deer where it grows as an animal's skull extension just like a horn and is seen on members of the deer family [25,26]. Various medicinal studies of deer antler base include mammary gland hyperplasia, breast swelling, mastitis therapy, anti-fatigue, analgesic, anti-inflammatory, hypoglycemia, and antioxidant effects [27]. Deer antler base is used for antiviral effects because its polysaccharide is under a range of non-toxic concentrations. The antiviral activity improves with the increase of polysaccharides of deer antler base. As for the inflammatory effects, deer antler base polypeptides and proteins are significant anti-inflammatory properties and show visible anti-inflammatory and analgesic properties in vivo [21].

**Water Buffalo Horn as an Antipyretic**

Water buffalo horn (WBH), has been utilized to treat various diseases. It is classified by TCM as a cold drug and indicated for hot diseases [28]. Due to its high-quality protein content, various medical studies recorded that horns have several roles; for example, if they are in decoct form, the horns may take away the heat from the body and blood and eliminate poisonous chemicals from the patients [29]. It has convulsion-relieving, anti-inflammatory, anti-infections, bleeding-time shortening, and can also treat a matter of high temperature and coma with delirium [29,30]. The levels of several prostaglandins, leukotrienes, amino acids, purines, and sphingolipids, have shown substantial contrast prior to treatment with water buffalo horn [30]. Furthermore, the antipyretic effects of the buffalo horn may be due to amino acid metabolism, arachidonic acid, or oxidative stress [28,30].

Table 1. **Powdered CarabaoHorn[20]**

| **Comorbidity or diagnoses** | **Treatment Duration** | **Number of Application** | **Estimated percentage healing achieved after application** | **Extent of effects** |
|---|---|---|---|---|
| Ingrown infection or inflammation | two days | once | 90% | markedly efficient |
| Viral infection | seven days | four times | 85% | efficient |
| Knife Accident- Skin cut | five days | three times | 80% | efficient |
| Car Accident- Skin cut | ten days | four times | 80% | efficient |
| Boil | two days | once | 85% | efficient |

***Definition of *"healed", "markedly efficient ", "efficient", and "inefficient"*: [20,34]**

- **100%- healed**: the clinical symptoms vanished, with no accompanying pain.
- **99-90%- markedly efficient**: vanished more than 70%, and the existing pain almost disappeared.
- **89-75%- efficient:** vanished 30%–69%, where the existing pain was alleviated.
- **75% below- inefficient**: vanished less than 30%, with no mitigation of the existing pain.

As shown in the table, Ingrown infection or inflammation has a two days duration of treatment where it is only applied once. Its estimated healing percentage is 90% making it "markedly efficient. "As for the viral infection, it has a seven-day duration of treatment where it is applied four times. It has an 85% healing percentage making its extent of effects "efficient." As for the knife cut accidents, the duration of treatment was five days, where it was applied three times. It has an 80% healing percentage making it "efficient." For the car accident-skin out, it has a ten days duration of effect where it is applied four times. It has 80% percentage healing making it also "efficient". Lastly, for the boil, it has a two days duration of treatment where it is applied once. It has an 85% healing percentage, making it "efficient" [20].

The powdered carabao horn applications show that the horn, when processed into powder, is beneficial as medicine for skin illnesses, skin infections, and wounds. According to scientific studies, the horn includes several antibiotic and cell renewing properties [20].

Table 2. **Deer Antler Base [20,21,31]**

| **Comorbidity or diagnoses** | **Treatment Duration** | **Number of Application** | **Estimated percentage of Healing achieved after application** | **Extent of effects** |
|---|---|---|---|---|
| Viral infection (herpes zoster) | ten days | left in place for up to 5 or 10 minutes everyday | 95 % | markedly effective |
| Infection or Inflammation | eight days | left in place for up to 3 minutes every day | 86 % | effective |

***Definition of *"healed", "markedly efficient ", "efficient", and "inefficient"*: [20,34]**

- **100%- healed**: the clinical symptoms vanished, with no accompanying pain.
- **99-90%- markedly efficient**: vanished more than 70%, and the existing pain almost disappeared.
- **89-75%- efficient:** vanished 30%–69%, where the existing pain was alleviated.
- **75% below- inefficient**: vanished less than 30%, with no mitigation of the existing pain.

Based on the table above, deer horns might be used for viral infection (herpes zoster), an infection, or inflammation. As for the viral infection (herpes zoster), the duration of treatment is ten days, and it is only left in place every 5 - 10 minutes every day, where its estimated healing percentage is 95% making the deer horn "markedly efficient" [31]. Lastly, as for the infection or inflammation, the duration of treatment was reportedly ten days, where it is applied to the infected or inflamed area for three minutes every day. It has an estimated healing percentage of 86%, making it "efficient" [21].

Table 3. **PowderedBuffalo Horn [20]**

| **Comorbidity or diagnoses** | **Treatment Duration** | **Number of Application** | **Estimated percentage of healing achieved after application** | **Extent of effects*** |
|---|---|---|---|---|
| Infection or inflammation | two days | once | 90 % | Markedly efficient |
| Fever | six hours | intravenous, once | 90 % at higher dosage | Markedly efficient |

***Definition of *"healed", "markedly efficient ", "efficient", and "inefficient"*: [20,34]**

- **100%- healed**: the clinical symptoms vanished, with no accompanying pain.
- **99-90%- markedly efficient**: vanished more than 70%, and the existing pain almost disappeared.
- **89-75%- efficient:** vanished 30%–69%, where the existing pain was alleviated.
- **75% below- inefficient**: vanished less than 30%, with no mitigation of the existing pain.

Based on table three above, the powdered-buffalo horn formulation can be used for antiviral infection, infection or inflammation, and fever. The inflammation also has a two-day treatment duration, where it is also applied once, having an 86% percentage of healing. The formulation is

considered to be "efficient"[20]. Lastly, the fever has a 6 hours duration of treatment, which is orally administered once, having a healing percentage of 90%. The buffalo horn formulation is considered "markedly efficient"[32].

## CONCLUSION

Following the articles or studies regarding the animal horn as a traditional medicine in Asia, specifically in the Philippines and China, animal horns have various medicinal uses and efficacy. Animal horn, as traditional medicine, is proven effective in alleviating pain caused by viral infections, inflammation, and skin cut infections but has proven ineffective with fever. However, the powdered horn is effective at a higher dosage of water buffalo horn formulation and induces an antipyretic effect. This review obtained the traditional medicinal uses of various animal horns as traditional medicine. By compiling its medicinal uses and efficacy, traditional uses of these horns are proven effective scientifically.

### CONFLICT OF INTEREST

The authors have no conflict of interest.

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