

**Research**

## Aqueous extract of Sendeng-4 inhibit growth of microbial

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The current study was designed to evaluate the aqueous extract of Sendeng-4 activity. The aqueous extract of Sendeng-4 was obtained by zeolite dialysis membranes with different apertures. And the Antimicrobial assay was determined. The results showed that there was not any growth in *Microsporium canis* and *Trichophyton rubrum* form the 85.5 mg/ml aqueous extract Sendeng-4. And in 170 mg/ml aqueous extract Sendeng-4, the spores of *chaff*, *Microsporium canis*, *tinea spore* and *Trichophyton rubrum* did not grow. All the microbial did not grow in 350mg/ml aqueous extract Sendeng-4. It will give a new way to find antimicrobial drug.

**Keywords:** Sendeng-4; Aqueous Extract; Antimicrobial**Introduction**

Infectious diseases caused by pathogenic bacteria, such as *Staphylococcus aureus*, are a major threat to human health. The spread of antibiotic resistant strains, such as methicillin resistant *S. aureus* (MRSA), is particularly problematic with resistance having been developed to most penicillin-based Antibiotics [1]. Antibacterial consumption places strong selective pressure on the microbes that colonize people, and in developed countries is the major determinant of the rate of increase in the prevalence of antibacterial resistance [2,3,4]. At the individual level, recent treatment with an antibacterial increases the risk that subsequent infections will be caused by an organism resistant to that antibacterial [5]. Plant medicine was the main composition in Mongolian Medicine and Chinese Medicine [9,10]. The traditional plant use around the globe represents an invaluable reservoir of knowledge and a large potential of yet “undiscovered” use of natural resources. There are numerous examples for traditional knowledge of plant use as a starting point for the development of products used in modern societies, such as drugs, industrial resources or cosmetic products [6, 7, 8, 10]. Mongolian medicine Sendeng-4 is comprised of *Xanthoceras sorbifolia*, *Toosendan fructus*, *Gardeniae fructus*, and

*Chebulae fructus* at a ratio of 5:3:1:1. Sendeng-4 is mainly used in the treatment of gout, rheumatism, joint grasserie, and edema [11]. However, the antibacterial activity of Sendeng-4 was not explored. In this study, the aqueous extract of Sendeng-4 was obtained. And the antibacterial activity was detected. The novel function of Sendeng-4 was showed.

**Materials and methods**

Unless otherwise specified, all chemicals and reagents in this study were purchased from the Sigma Chemical Company (St. Louis, MO, USA). Sendeng-4 was purchased from the Chinese National Institute (Beijing, China).

**Aqueous Extract of Sendeng-4**

Sendeng-4 was crushed to powder, and the powder was soaked in water for 2-4h at room temperature. Sendeng-4 was extracted twice by low temperature physics sublimation. The supernatant was collected by centrifugation at 4,000 × g for 10 min and separated using zeolite dialysis membranes with different apertures.

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**Sub Date:** February 23<sup>rd</sup> 2019, **Acc Date:** March 28<sup>th</sup> 2019, **Pub Date:** April 05<sup>th</sup> 2019

**Citation:** Yadamsuren E, Wurina, Sharav B, Rina Du (2019) Aqueous extract of Sendeng-4 inhibit growth of microbial. BAOJ Microbiology 5: 041.

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## Antimicrobial assays

Sample concentration range was prepared from the stock solutions by two-fold dilutions in sterile broth. Five dilutions of the samples 0, 350mg/ml, 175mg/ml, 87.5mg/ml, 43.85mg/ml were tested. The inoculums of test strains prepared from fresh overnight cultures were adjusted to 0.5 McFarland standard, which equals to  $1-2 \times 10^6$  CFU ml<sup>-1</sup> for bacteria. The inoculums then were diluted in 1:100 ratio in case of bacteria in order to get  $1-5 \times 10^5$  CFU ml<sup>-1</sup> concentrations. The 75µl volume of samples were poured to each well of 96-well micro plate. Then 75µl volumes of test strain suspensions were added to them. The highest dilution of samples without visible growth after 24h incubation at 37 °C was considered as 0. And the 0 mg/ml dilution of samples growth after 24h incubation at 37 °C was considered as 100%. The others growth was obtain by others growth/0 mg/ml growth. The antifungal properties of aqueous extract of Sendeng-4 were tested against *Candida albicans*, *spores of chaff*, *Microsporium canis*, *tinea spore* and *Trichophyton rubrum*.

## Statistical Analysis

All experiments were independently repeated three times. Obtained data were processed; standard deviations were calculated using GraphPad Prism 5.03 (GraphPad Software, Inc.; USA) software.

## Results and Discussion

The antimicrobial properties of Aqueous extract Sendeng-4 were tested against *Candida albicans*, *spores of chaff*, *Microsporium canis*, *tinea spore* and *Trichophyton rubrum*. The result showed that there was not any growth in *Microsporium canis* and *Trichophyton rubrum* form the 85.5 mg/ml aqueous extract Sendeng-4. And in 170 mg/ml aqueous extract Sendeng-4, the spores of *chaff*, *Microsporium canis*, *tinea spore* and *Trichophyton rubrum* did not grow. However, the *Candida albicans* showed 25% growth rate. All the microbial did not grow in 350mg/ml aqueous extract Sendeng-4. The results were showed as following table1.

	0	43.85	87.5	175	350
<i>Candida albicans</i>	++++100%	++++100%	+++75%	+ 25%	— 0 %
<i>spores of chaff</i>	++++100%	++++ 100%	++ 50%	— 0 %	— 0 %
<i>Microsporium canis</i>	++++100%	+++75%	— 0 %	— 0 %	— 0 %
<i>tinea spore</i>	++++100%	++++100%	+++75%	— 0 %	— 0 %
<i>Trichophyton rubrum</i>	++++100%	+++75%	— 0 %	— 0 %	— 0 %

**Note:** - No bacterial growth, +25% bacterial growth, ++ 50% bacterial growth, ++ 75% bacterial growth, +++ 100% bacterial growth. Mongolian medicine has its own unique theory and method in clinic. Sendeng-4 as a Tradition Mongolia Medicine, mainly was used in the treatment of gout, rheumatism, joint grasserie, and edema(Wang, Li et al. 2018). In this study, the Antimicrobial properties of aqueous extract of Sendeng-4 were showed. And it can inhibit microbial growth. It will give a new way to find antimicrobial drug.

## Acknowledged

This work was support by Major science and technology projects in the Inner Mongolia Autonomous Region.

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