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Quanzhen Wang

*Northwest A&F University, China*

Tianming Hu

*Northwest A&F University, China*

Yamei Xu

*Tibet Agricultural and Animal Husbandry College, China*

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The XXI International Grassland Congress / VIII International Rangeland Congress took place in Hohhot, China from June 29 through July 5, 2008.

Proceedings edited by Organizing Committee of 2008 IGC/IRC Conference

Published by Guangdong People's Publishing House

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## Anti-microbial activities of root extracts of *Cichorium intybus* L .

Wang Quanzhen<sup>1\*</sup> Hu Tianming<sup>1</sup> Xu Yamei<sup>1,2</sup>

<sup>1</sup>College of Animal Sciences , Northwest A & F University , Yangling 712100 , Shaanxi , China , <sup>2</sup> Department of Animal Husbandry and Veterinary , Tibet Agricultural and Animal Husbandry College , Linzhi 8600000 , Tibet

**Key words :** *Cichorium intybus* L . extract , anti-microbial activity

**Abstract** Inhibitory activities of root extracts of *Cichorium intybus* L . extracted by petroleum ether , ethyl acetate and ethanol to seven pathogenic fungi and three pathogenic bacteria were determined *in vitro* . The preventative and controlling effects of root extracts of *Cichorium intybus* L . on wheat powdery mildew were tested with wheat growing in pots . Extracts by ethanol and ethyl acetate were able to inhibit the fungi and bacteria to some extent , and the extract by ethyl acetate to a stronger extent at 10g · L<sup>-1</sup> . The extract by ethyl acetate significantly inhibited mycelium growths of wheat fusarium head blight , corn northern leaf blight and Tobacco brown spot at an inhibition rate of more than 80% , and spore germinations of wheat root rot , corn northern leaf blight , and tobacco brown spot at an inhibition rate of more than 80% . The diameters of their inhibition zones to *Bacillus subtilis* and *Staphylococcus aureus* reached 20 .01mm and 17 .23 mm , respectively ; their preventative and controlling effects on wheat reached 50 .93% and 65 .82% , respectively .

**Main conclusions** Gao Yunyan et al and Zhang Bing et al reported that root extracts of *Cichorium intybus* L . had the effect of blood sugar and fat reductions , and Chen Lianguan used extract extractums of *Cichorium intybus* L . roots for charging and perfuming in cigarette manufacturing , but there have been no systematical reports about their anti-microbial activities . The study presented in the paper indicated that root extracts of *Cichorium intybus* L . did not only show favorable anti-microbial activities to *Gibberella zeae* and *Exserohilum turcicum* but also favorable inhibitory effects to *Staphylococcus aureus* and *Bacillus subtilis* . This implied that *Cichorium intybus* L . had great potential value in the prevention and control of plant diseases .

The study also showed that root extracts of *Cichorium intybus* L . performed better in *in vitro* anti-microbial activity , and the root extract of *Cichorium intybus* L . by ethyl acetate had better microbe-inhibiting effects than the other extracts with its inhibition rates to *Exserohilum turcicum* and *Alternaria longipes* greater than 80% . indicating that inhibitory substances of *Cichorium intybus* L . roots mainly distributed in moderately polarized plant parts and thus further identification and isolation of the substances of the extracts from these polarized parts would probably result in the discovery of the substances of antimicrobial activity and exploitable value . The study was restricted to the study about *in vitro* effects and the effects in pot planting , so that whether root extracts of *Cichorium intybus* L . showed these effects in the field , what the action modes and mechanisms of the active gradients in these root extracts and how these active ingredients will be isolated still need further research and exploration .

**Fund and acknowledgement** Ministry of Science & Technology of Peoples' Republic of China , International Cooperation Research Project (No 2006DFA3360) , funded this work . We are grateful to my co-researcher , associate professor Zhang Chunli , and my postgraduate students Miss Wu Hongxing , Miss Yang Yali .