

6 EFFECT OF FRESH LILY AND RHUBARB POWDER ON CHRONIC STRESS DEPRESSION IN RATS

Yan Li, Tan Wang, Peng Xi, Mingsan Miao*. *Department of Pharmacology, Henan University of Traditional Chinese Medicine, Zhengzhou, China*

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Objectives To examine the effect of fresh lily and rhubarb powder on chronic stress depression on rats.

Methods A chronic unpredictable mild stress rat model of depression was established. Body mass, sugar consumption and open-field behavior were measured to assess the effect of fresh lily and rhubarb powder on rat behavior. Plasma MDA levels and erythrocyte SOD activity were measured using a kit, the fluorescence of brain tissue homogenates was measured to determine the 5-HT, NE and DA content of amine neurotransmitters, and the thymus and spleen were also examined for any changes.

Results In the rat chronic stress depression model, rats administered large and small doses of fresh lily and rhubarb powder over 3 weeks significantly increased their body weight ($p < 0.05$), while rats administered large, medium and small doses of fresh lily and rhubarb powder significantly increased their consumption of sucrose ($p < 0.05$). There was also a trend towards reduced plasma levels of MDA ($p < 0.01$) and the 3 min vertical motion score was significantly increased ($p < 0.05$). Large doses of fresh lily and rhubarb powder significantly increased erythrocyte SOD activity ($p < 0.05$), while small doses of fresh lily and rhubarb powder significantly increased rat brain NE, 5-HT and DA levels ($p < 0.01$) and significantly increased the rat 3 min horizontal motion score ($p < 0.05$).

Conclusions Fresh lily and rhubarb powder exhibited a therapeutic effect on rats with depression.

7 ANTIOXIDATION FUNCTION EVALUATION OF BLACK RICE ANTHOCYANIN AND FORMULATION PROCESS OF BLACK RICE FILM TABLETS

¹Lu Chen, ^{1,2}Bo Gao*. ¹*School of Life Sciences, Jilin University, Changchun, China;* ²*Department of Chemistry and Pharmacy, Zhuhai College of Jilin University, Zhuhai, China*

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Objectives The objective of this investigation was to evaluate the antioxidant function of black rice anthocyanins and to prepare black rice anthocyanin film tablets.

Methods The DPPH radical scavenging test and FRAP method were used to evaluate antioxidant function. Trolox and ascorbic acid were used as control. A wet granulation process was used to prepare the film tablets. The effect of excipients on black rice anthocyanin content, including starch, dextrin, tartaric acid and magnesium stearate, was investigated. Based on orthogonal testing, three factors, namely the ratio of excipient to main drug (w/w), the ratio of starch to dextrin (w/w), and the percentage of magnesium stearate, were used to investigate the amount of excipient.

Results Black rice anthocyanins showed favorable antioxidant activity. The four excipients had no effects on black rice anthocyanin content. The best ratio of excipient to main drug (w/w) was 1.2:1, while that of starch to dextrin (w/w) was 2:3. The optimum amount of magnesium was 1%.

Conclusions We investigated the antioxidant activity of black rice anthocyanin, and the effect of excipients on black rice anthocyanin content. We used orthogonal testing to investigate the

amount of excipient, and a wet granulation process to prepare black rice anthocyanin film tablets.

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8 THE EFFECT OF REPLENISHING KIDNEY YANG MEDICINE ON GYNECOLOGICAL DISEASES

Shuo Tian, Mingsan Miao*, Ming Bai, Liling Xiang, Xin Lou. *Department of Pharmacology, Henan University of Traditional Chinese Medicine, Zhengzhou, China*

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Objectives To study the effect of replenishing kidney yang medicine on the prevention and treatment of gynecological disease, and provide a reference for further clinical studies.

Methods A comprehensive literature search was conducted to determine the effect of replenishing kidney yang medicine on the prevention and treatment of gynecological diseases, in order to understand current research and development, and provide a reference for clinical treatment.

Results The study has found that most replenishing kidney yang medicine has an estrogenic effect, such as the traditional Chinese medicines Epimedium, Antler, Eucommia, Psoralea, Dodder, Cnidium, *Cistanche deserticola* and *Astragalus complanatus*, and traditional Chinese patent medicine such as Gulingji capsules, Erxian decoction, Bushen Huoxue prescription and Yougui pills. Replenishing kidney yang medicine is often used to treat female disease such as perimenopausal syndrome, polycystic ovary syndrome, uterine hypoplasia, kidney deficiency type of infrequent menstruation, breast hyperplasia, kidney deficiency caused by ovulation disorders, premature ovarian failure and perimenopausal osteoporosis, and has a good therapeutic effect.

Conclusions Replenishing kidney yang medicine has a good therapeutic effect for the treatment of gynecological diseases, but the mechanism of drug action as it relates to the etiology and pathogenesis of these diseases has not yet been clearly elucidated. Therefore we recommend in-depth scientific clinical observation to determine the effect of replenishing kidney yang medicine on gynecological diseases so that better treatment programs can be developed.

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9 STUDIES ON THE OPTIMIZATION OF SUBMERGED FERMENTATION MEDIUM AND CONDITIONS FOR TRICHOLOMA MATSUTAKE

Yanzhen Wang, Yao Zhang, Liang Wang, Dongsheng Yang, Wenjun Wang, Lirong Teng*. *Department of Chemistry and Pharmacy, Zhuhai College of Jilin University, Zhuhai, China*

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Background *Tricholoma matsutake*, a popular food and biopharmaceutical in Asia, displays various pharmacological activities. Submerged fermentation is an efficient way to produce mycelia and bioactive metabolites. Consequently, research groups are working to optimize submerged fermentation conditions. This

study was conducted in an attempt to optimize the fermentation parameters for *T. matsutake* and its active ingredients by using statistical and mathematical techniques.

Methods Chemometrics methods were employed to optimize the fermentation medium and conditions. Based on a single-factor optimization strategy, suitable carbon and nitrogen sources were obtained. The key medium components were then identified using a Plackett-Burman design (PBD) and further optimized using a Box-Behnken design (BBD). Response surface methodology (RSM) was further used to optimize the experimental results obtained from BBD. Based on the optimum medium, the culture conditions were further optimized using a single-factor optimization strategy.

Results The optimum components of nutrient medium comprised (g/L): glucose 43.2, peptone 26.9, NaNO₃ 0.18, (NH₄)₂SO₄ 0.36, KH₂PO₄ 2.0, MgSO₄ 7 H₂O 0.5, and vitamin B1 0.15. The best production of mycelium was 22.66 g/L, which was 59% higher than that of the original culture. The suitable culture conditions were: initial pH 4.25, temperature 26° C, culture time 6 days, seed age 3 days, rotating speed 225 rpm, inoculation amount 5%, and 75 mL liquid volume in a 250 mL flask. The best production of mycelium was 24.2 g/L, which was 7.0% higher than that of the original culture.

Conclusions In this study, we used chemometrics methods to optimize the fermentation medium and conditions for *T. matsutake*. Our finding provides experimental evidence that PBD, BBD and RSM are effective tools for mathematical modeling and factor analysis of a medium optimization process.

10 EFFECTS OF *EUPATORIUM ADENOPHORUM* (FLAVONOIDS) IN THE RAT MODEL OF BENIGN PROSTATIC HYPERPLASIA

Mingsan Miao*, Tan Wang, Jing Liu, Lin Guo. *Department of Pharmacology, Henan University of Chinese Medicine, Zhengzhou, China*

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Objectives This study investigated the effect of total flavonoids on benign prostatic hyperplasia (BPH) rats through the administration of *Lycopus* decoction and *Eupatorium adenophorum*.

Methods Ninety male Wistar rats, weighing 280–300 g, received an intraperitoneal injection of hydrazine hydrate, and the testes were removed bilaterally. Another 10 rats underwent a sham operation. Intramuscular injections of penicillin 200 000 units/kg were given. The rats were randomly and evenly divided into a control group, model group, Longbishu group, large, medium and small doses of *Lycopus* decoction groups, and large, medium and small doses of *E. adenophorum* flavonoids groups. On the 8th day after castration, rats were injected with testosterone propionate 4 mg/kg/day and irrigated with large, medium and small water decoctions of *E. adenophorum* (4 g/kg, 2 g/kg and 1 g/kg, 0.2 mL/100 g), large, medium and small doses of total *E. adenophorum* flavonoids (400 mg/kg, 200 mg/kg and 100 mg/kg, 0.2 mL/100 g) and Longbishu capsule suspension (300 mg/kg, 0.2 mL/100 g). The model group and blank control group were given the same volume of normal saline, continuing for 30 days. Then 2 hours after the last administration, the rats were weighed and euthanized. Prostate tissue was removed, the wet weight was measured, and the prostate index was calculated. Testosterone and oestradiol levels in prostate homogenate, and the levels of bFGF, TGF-β1, IGF-I and EGF were determined. Other samples

of prostate tissue were fixed in formalin solution, and cytological morphology was examined under a light microscope.

Results *E. adenophorum* water decoction and total flavonoids significantly reduced the rat prostate index, decreased serum testosterone levels, increased serum oestradiol levels, decreased bFGF, EGF and IGF levels in the rat prostate, elevated TGF-β1 levels, reduced rat prostate density, and increased the specific surface area.

Conclusions The results of this study showed that treatment of benign prostatic hyperplasia (BPH) had a good effect and suggest a new therapy for BPH.

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11 RESEARCH STATUS AND DEVELOPMENT TRENDS IN NAVEL THERAPY

Mingsan Miao*, Xiaoli Yan, Huan Li, Tang Wang. *Department of Pharmacology, Henan University of Chinese Medicine, Zhengzhou, China*

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Objectives This article summarizes the modern development of navel therapy, analyses future trends and puts forward suggestions for future development.

Methods This paper provides a history of the development of navel therapy, describes the theory of traditional Chinese medicine and reports the clinical application of umbilical therapy in detail.

Results The author describes some problems in modern navel therapy development, for instance there is no unified national standard and proprietary Chinese medicine products are not listed or promoted.

Conclusions Navel therapy is a unique TCM treatment. Doctors apply the particular drug externally to the navel or to the appropriate external stimulus on the navel in order to treat disease. This method is also called 'green therapy'. In future research, we will apply modern science and technology to explore the mechanisms of navel therapy, establish an optimization scheme for navel therapy and develop a unified national standard to promote this traditional Chinese treatment worldwide.

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12 EXPERIMENTAL STUDY ON THE EFFECT OF *PERILLA* SEED IN THE RAT MODEL OF ASTHMA

Yan Li, Tang Wang, Tao Yu, Peng Xi, Mingsan Miao*. *Department of Pharmacology, Henan University of Traditional Chinese Medicine, Zhengzhou, China*

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Objectives To investigate the effects of *Perilla* seed in the rat model of bronchial asthma.

Methods To observe the effect of ovalbumin (OVA) on the behavior of rats, NO and IL-6 levels in serum and in the lungs were measured using aluminium hydroxide sensitisation and an