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STUDY OF SAFETY AND ANTIMICROBIAL, ANTI-INFLAMMATORY AND ANTI-INFLAMMATORY PROPERTIES OINTMENT FROM THE SAFFLOWER EXTRACT

Abstract. The objects of study were samples of CO_2-extract, obtained from the flowers of safflower (*Carthamus tinctorius L.*), collected in the flowering stage. Dried plant material (safflower flowers) collected in the summer, subjected to treatment and disposal of mechanical impurities, drying and then grinding to hyperfine state. Harvesting plants was made on the the territory of Almaty region. We have developed an antimicrobial, anti-inflammatory and wound-healing ointment from the flowers of safflower of the Kazakh species "Ak May". Pre-clinical studies were conducted to determine safety and study the pharmacodynamics of ointments.

Key words: flowers safflower, CO_2-extract, *Carthamus tinctorius L.,* preclinical studies.

The genus *Carthamus* from the Asteraceae family comprises 16 recognized species [10]. *C. tinctorius* is the only cultivated species of this genus, but the others are either wild or weeds. *Carthamus tinctorius L* as one of the wild species is widespread in Turkey, subtropical regions of western Iraq, Iran, Northwest India, throughout Kazakhstan, Turkmenistan, and Uzbekistan. It contains a high amount of polyunsaturated fatty acid linoleic acid (70%) and monounsaturated oleic acid (10%) with small amounts of stearic acid. The flowers of *C. tinctorius* are an important medicinal material in prescriptions used for cardiovascular, cerebrovascular and gynecological diseases. Pharmacopoeia raw materials abroad are flowers and seeds of safflower (European famakopeya, British Herbal Pharmacopoeia, Chinese Pharmacopoeia) (Turgumbayeva A.A., Ustenova G.O., Samir A. Ross, 2014) [5].

Safflower oil normalizes cellular functions, improves blood circulation, has anti-inflammatory action, high moisture-retaining and moisture-regulating ability. In addition, safflower oil serves as an active conductor of other components in the deeper layers of the skin and skin of the eyelids.

Oil and extract from safflower normalizes cellular functions, improves blood circulation, has anti-inflammatory action, high moisture-retaining and moisture-controlling ability.

The high content of tocopherol and other flavonoids in the extract from the flowers of safflower grown in Kazakhstan open up prospects of application in the development of medicinal, cosmetic and ophthalmological means.

Objects of the study served as CO_2 samples - the extract obtained from flowers subcritical conditions safflower (Carthamus tinctorius L.), collected in the flowering stage. Dry vegetable raw materials (flowers) collected in summer, processed and removal of mechanical impurities, drying, then grinding in a ball mill (flowers - up to 4-6 mm particles). Harvesting plants was carried out on the territory of Almaty oblast. CO_2-extraction at a pressure of 60 atm. and 22 ° C in carbon dioxide, a brown extract was obtained.

An ointment of essential oil the from safflower flowers grown Kazakhstan: for creating ointment of flowers safflower (*Carthamus tinctorius L.*) optimum composition of the excipients. So several models were created ointment bases - emulsion, a slurry, combined with application of various the excipients - sunflower oil, glycerol, paraffin oil, lanolin, etc., Emulsifiers - Tween-80, T-2 and others. The most effi-

cient composition of the technological parameters was ointment base with the following composition: essential oil obtained from the flowers of safflower, sunflower oil, T-2, Purified Water and peppermint oil.

Obtained an experimental industrial series of ointment based medicinal vegetative raw materials (*Carthamus tinctorius L*). Development of an optimal composition and rational technology medicinal products based on essential oil obtained from the flowers of safflower, - sunflower oil, emulsifiers T-2 and others. has antimicrobial, anti-inflammatory, regenerative, curative effect (Turgumbayeva A. A., Ustenova G.O., Rakhimov Kh.D.) [6].

The study of safety, local irritating and allergic action of the ointment was carried out using methods, described in the Manual on experimental study of new pharmacological substances Khabrieva RU [7].

Acute toxicity was assessed on non-native white mice (weight 18-25 g), which fasting once orally administered into the stomach using a special probe extract concentrate in an amount of 500 mg / kg. Before the introduction of the required amount of the test agents dissolved in DMSO (1:10). All animals remained alive, so the dose was increased (500, 1000, 2000 ... ..) according to the mass of mice. The study was performed on 30 mice at a time. Each dose was tested in acute experiments for 6 animals. Within 2 hours after the administration of the drug, the clinic of intoxication was constantly monitored, then the observation was carried out at the end of the working day, daily. The follow-up period was 14 days. During this time, the state of the animals was evaluated (frequency and depth of breathing, drowsiness, inhibition of reactions, coordination of movements, cyanosis of ears and tail, convulsions, water and feed intake, change in body weight, frequency of urination, amount, reaction to tactile , pain, sound and light stimuli, etc.).

Table 1 – Effect doses of concentrate on experimental animals in the determination of "acute" toxicity

Name of substance	Doses of substances, mg											
	500		1000		2000		3000		4000		5000	
	d	l	d	l	d	l	d	l	d	l	d	l
1	2		3		4		5		6		7	
Extract of safflower	0	6	0	6	0	6	0	6	0	6	0	6
Note. d – dead animals, l – live animals.												

As seen from the table, when administered various doses of the concentrate of 500 to 5000 mg/kg all animals survived.

The study of acute toxicity showed the absence of a pathological character of the changes in general indicators throughout the study period. Animals in all groups remained active, there were no cases of death or intoxication, no change in the respiratory, cardiovascular, central nervous systems. The condition of the hair, mucous membranes is unchanged. Consumption of food and water in the previous regime. There were no cases of animals among the animals, so the definition of LD50 was not possible.

Thus, the substances under study, when administered orally, did not exert a toxic effect on the animal organism. For the organism of experimental animals safflower extract concentrate according to the conventional combined tab toxicity classes Holden and Sterner - is harmless.

The study acute toxicity study ointment

Acute toxicity study ointment is studied in experimental animals for their skin-resorptive effect. Experiments were put on 24 rats weighing 200-260 g (6 animals in each group - separate males and females). They used the method of application of the tail. For the one half of the animals used ointment anticipated therapeutic dose (1.36 g to 100.0 drug concentrate), and for the other - agents containing concentrate 2-fold greater (2.72 g 100.0 concentrate preparation),

lubricants daily once, for 2 weeks. Pay attention to the presence of local reactions at the application site means (in the form of redness, swelling) of the outer cover of the tail of rats.

Results of the experiments showed the absence of pathological changes in the nature of general and specific indicators over the entire study period. Animals in all groups remained active, there was no case of death or poisoning.

So topical application of an effective and maximum doses of means did not have toxic effect, both common and local character. For the organism of experimental animals developed ointment is harmless.

Before the experiment, the animals were two-week quarantine on a standard ration the vivarium. To study the local irritating action used the method of skin applications. Experiments were used the guinea pigs weighing 300-400 g (15 animals, 3 groups).On clipped and depilate area of skin side surface of the trunk of guinea pigs, closer to the middle of the trunk was applied 500 mg. The ointment was applied for 2 weeks to 5 times a week. We take into account the reaction of the skin on a daily basis on the scale of evaluation of the skin tests. The reaction was observed on the outer surface of the skin or by means line calorimeter. Suvorov after 24 hours and evaluation in points on the following scale:

- 0 – no visible reaction;
- 1 – pale pink erythema around the area or its periphery;
- 2 – bright pink erythema around the portion or its periphery;
- 3 – red erythema throughout the site;
- 4 – infiltration and skin edema (thickening of the skin folds) in the presence or absence of erythema.

During the whole experience of research on local irritating effect showed that the application of ointments on the clipped and depilate area of skin of guinea pigs does not irritate the skin and does not affect the general condition of the animals (body temperature, the dynamics of body weight). The study allergenic effect The study allergenic effect ointment carried out by the conjunctival samples of 6 rabbits (weight 3.0-4.0 kg). For this using a syringe in the transition zone mucosal century and globe eye rabbits were injected with 1000 mg of ointment into the other eye (control) were administered placebo ointment. The reactions take account after 15 minutes (fast reactions) and 24-48 hours (hypersensitivity) and delayed type evaluated on the following scale (in points):

1 – slight reddening tear duct;

2 – redness and sclera tear duct in a direction towards the cornea;

3 – redness of the conjunctiva and sclera whole.

No signs of allergenic effect (hyperemia, swelling, and others.) From the skin and mucous membranes showed no sensitization to components of ointment.

Results of the experiments showed the absence of pathological changes in the nature of general and specific indicators over the entire study period. Animals in all groups remained active, there was no case of death or poisoning. So topical application of an effective and maximum doses of means did not have toxic effect, both common and local character. For the organism of experimental animals developed ointment is harmless.

Conclusions. From the result of the study, it could be concluded that the safflower collected from the Southern region of Kazakhstan is one of the best genotype available. *Carthamus tinctorius* is regarded as a valuable plant in Kazakh system of medicine, Chinese medicine and modern drug development areas for its versatile medicinal uses. The aim was designed to study the biological activity and chemical composition of volatile oil of *Carthamus tinctorius L.*

Applying the method of CO_2-extraction on a laboratory extractor for 45-60 minutes at a pressure of 60 atm. and 22 ^{0} C in carbon dioxide gas produced a brown extract of safflowers flowers.

Theoretically and experimentally, the composition and technology of the ointment was developed to meet the requirements of Pharmacopoeia of the Republic of Kazakhstan. The composition of the ointments is represented by the ingredients: sunflower oil, T-2 and mint oil, purified water.

Studies on animals (rabbits, guinea pigs, white rats) showed harmlessness, good tolerability.

In comparison with other studies in this area, since the flowers of safflower grown in Kazakhstan, with a large stock of raw materials in Kazakhstan are used as ornamental plants, have not previously been studied in the territory Republic of Kazakhstan.

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ИЗУЧЕНИЕ БЕЗОПАСНОСТИ И АНТИМИКРОБНЫХ, ПРОТИВОВОСПАЛИТЕЛЬНЫХ, РАНОЗАЖИВЛЯЮЩИХ СВОЙСТВ МАЗИ ИЗ ЭКСТРАКТА САФЛОРА

Аннотация. Объектами исследования послужили образцы CO_2-экстракта, полученные из цветков сафлора (*Carthamus tinctorius L.*), собранных в фазу цветения. Сухое растительное сырье (цветки сафлоры) собрано летом, подвергнуто обработке и удалению механических примесей, сушке, затем измельчению до сверхтонкого состояния. Заготовка растения производилась на территории Алматинской области. Нами был разработан антимикробный, противовоспалительный и ранозаживляющйх мазь из цветков сафлора казах-

станского вида «Ак Май». Провели доклинические исследования для определение безопасности и изучение фармакодинамику мазей.

Ключевые слова: цветки сафлор, CO_2-экстракта, *Carthamus tinctorius L.,* доклинические исследования.

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САФЛОРА СЫҒЫНДЫСЫНАН ЖАСАЛҒАН ЖАҚПАМАЙДЫҢ МИКРОБҚА ҚАРСЫ, ҚАБЫНУҒА ҚАРСЫ, ЖАРАНЫ ЖАЗАТЫН ӘСЕРЛЕРІН ЖӘНЕ ҚАУІПСІЗДІГІН ЗЕРТТЕУ

Аннотация. Зерттеу объектісі ретінде гүлдеу уақытында алынған сафлора гүлдерінің (*Carthamus tinctorius L.*) CO_2-сығындысы үлгілері қарастырылды. Жазда жиналған құрғақ өсімдік шикізаты (сафлора гүлдері), өңделді және механикалық қоспалардан тазартылды, кептіріліп, ұнтақталды. Өсімдік Алматы облысында дайындалды. Біз сафлора гүлдерінің қазақстандық «Ак Май» түрінен микробқа қарсы, қабынуға қарсы және жараны жазатын жақпамайын жасадық. Жақпамайдың қауіпсіздігін және фармакодинамикалық қасиеттерін анықтау үшін клиникаға дейінгі зерттеу жүргіздік.

Түйін сөздер: сафлора гүлдері, CO_2-сығындысы, *Carthamus tinctorius L.,* клиникаға дейінгі зерттеулер.

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