

the monographs on essential oils which are presented in the Russian Pharmacopoeia XIII (Ph. Ru. XIII), the Kazakhstan Pharmacopoeia (Ph. Kaz), the Belarus Pharmacopoeia (Ph. Bel.) and the European Pharmacopoeia 8.0 (Ph. Eur. 8.0) [1–4].

The comparative analysis of pharmacopoeial articles on essential oils shows some differences. The criteria “Solubility of essential oils”, “Alcohol in essential oils”, “Packaging” and “Shelf-life” are given in the Ph. Ru. XIII only. The “Foreign esters” is given in the Ph. Eur. 8.0 only. The important difference between the pharmacopoeias that are studied is parameter “Chromatographic profile” which isn’t presented in Ph. Ru. XIII. Considering that for standardization of “marker compounds” may be used this parameter and using well-characterized marker compounds go beyond to reduce or eliminate counterfeit products. An important conclusion is the selection distinctive parameters (Chromatographic profile) of quality which need further studying

to develop general approaches to quality control for herbal drugs in the states of Eurasian Economic Union (EAEU).

Reference:

1. The State Pharmacopoeia of the Russian Federation, 13th ed. — Moscow: Russian Ministry of Health, 2016. (<http://femb.ru/feml>).
2. The State Pharmacopoeia of the Republic of Kazakhstan — Almaty: Publishing house “Zhibek Zholy”. — Vol. 1, 2008. — 592 p.; Vol. 2, 2009. — 804 p.; Vol. 3, 2014. — 872 p.
3. The State Pharmacopoeia of the Republic of Belarus — RUE “Centre for Expertise and Testing in Health Care” of the Ministry of Health of the Republic of Belarus. Vol. 1 — 1345 p.; Vol. 2 — 471 p.; Vol. 3 — 728 p.
4. European Pharmacopoeia. — 8-th ed. — Strasbourg: EDQM Council of Europe, 2014.

DESIGN AND BIOPHARMACEUTICAL EVALUATION OF TOPICAL COMPOSITION OF FUCOIDAN

© *Terekhina Y.A.*¹, *Karlina M.V.*¹, *Obluchinskaya E.D.*², *Pozharitskaya O.N.*¹

¹*Saint-Petersburg Institute of Pharmacy, Leningrad region, Vsevolozhsky district, 188663, Kuzmolovo P 245, Russia*

²*Federal State Budgetary Institution “Murmansk Marine Biological Institute” Kola Scientific Center, Russian Academy of Sciences, Murmansk, Russia*

Fucoidan is a complex sulfated polysaccharide derived from *Fucus vesiculosus*. Fucoidans have a wide variety of biological activities such as anti-inflammatory, antithrombotic and others [1, 2]. The purpose of the present work was to develop a topical composition of fucoidan and its biopharmaceutical evaluation.

A topical composition containing 15% fucoidan and olive oil (hydrophobic phase), Transcutol P (penetrant), Kolliphor RH40 (emulsifier), PEG 400 (emollient), methylparaben and propylparaben (preservative agents), was prepared. Lutrol F127, lanolin, geleol, gelucire 43/01, cremophor A25 were investigated as possible base-forming agents. These topical formulations were tested for colloidal stability, drug release, in vitro diffusion and spreadability.

The formulations showed good colloidal stability. Spreadability was 32, 11, 30, 40, 25% for composition with lutrol, lanolin, geleol, gelucire and cremophor, respectively. Fucoidan release from topical compositions was different. Fucoidan release from composition with Lutrol was about 95% in 2 h, from composition

with geleol — 85% in 2 h, from composition with gelucire — 30% and from composition with lanolin and cremophor — 0%. The best results of the agar diffusion method also showed the composition with Lutrol. The following equations were calculated for description of fucoidan release from topical composition with lutrol: Higuchi law, the first order kinetics, the cube root law, and the Weibull function. The data have allowed assuming, that release of fucoidan from compositions occurs by diffusion and submits to Higuchi law. Thus, the results of biopharmaceutical study proved that drug release from topical composition depended on the base-forming agents. An optimal base for the topical composition with fucoidan is base that contains lutrol F127.

References:

1. T. Carvalho G. de Azevedo et al. (2009) *Biomedicine & Pharmacotherapy*. 63: 477-483.
2. Z. Zhang et al. (2014) *Thrombosis and Haemostasis*. 111(3): 381-564.