

Brief analysis of the use of flowers *Filipendula ulmaria* (L.) Maxim. in folk traditional medicines and some of its pharmacological properties

O.D. Barnaulov

(Institute of the Human Brain named after N.P. Bekhtereva RAS, St. Petersburg)

Short analysis of using *Filipendula ulmaria* (L.) Maxim. flowers in folk and traditional medicines and its some pharmacological properties

OD Barnaulov

NP Bechtereva Human Brain Institute RAS (St.Petersburg, Russia)

RESUME

Filipendula ulmaria is an eatable plant and tea substitute. Its low toxicity was confirmed experimentally in mice, when flowers and leaves infusions 1:10 were introduced enterally. DL₅₀, DL_{min} and minimal neurotoxic doses can't be reached. Wide indications for use (rheumatism, arthritis, cholecystitis, cystitis, nephrite, respiratory and intestinal infections, and fevers) may be summarized as inflammatory and infectious diseases. Flower infusion decreased inflammatory exudation and proliferation in our experiments. *Filipendula ulmaria* is used in folk and traditional medicines for treating patients with neurological diseases: strokes, paralyses, neuroses, neuroinfections. Discovering cerebroprotective properties galenic preparations from *Filipendula* species confirm that such use is correct. The galenic preparation from *Filipendula* species has no anticonvulsant properties, but they decrease toxicity of certain convulsants. The assimilation folk and traditional medicines experience is a basis for correct investigation of plant remedies.

keywords: traditional and folk medicines, phytopharmacology, *Filipendula ulmaria*.

SUMMARY

Meadowsweet is a food plant and tea surrogate. Experimentally confirmed that for the infusion 1:10 flowers and leaves DL₅₀, DL_{min}, the minimum neurotoxic dose for enteral administration cannot be determined. Many indications for use (rheumatism, arthritis, cholecystitis, gastritis, cystitis, nephritis, SARS, intestinal infections, fevers) can be summarized as inflammatory and infectious diseases. In the experiment, the infusion of meadowsweet flowers limits inflammatory exudation and proliferation. In folk and traditional medicine, *L. elmifolia* is used for neurological diseases: strokes, paralysis, epilepsy, neurosis, and neuroinfections. The legitimacy of such use is confirmed by the discovery of the cerebroprotective properties of galenic preparations of *Labaznik* species. Anticonvulsant properties have not been identified, but the toxicity of some convulsants is reduced by preparations from the species of the Meadowsweet.

Key words: traditional and folk medicine, phytopharmacology, *Labaznik elmous*.

Among the people, this widespread, popular medicinal plant and related species are not called meadowsweet, but affectionately - meadowsweet, since it grows in humid, volgly places. According to legend, the classification renaming of meadowsweet species into meadowsweet began with the fact that some of the botanists did not like the aroma of flowers, revered by the people, and supposedly resembled the smell of herring sold in storehouses.

The Latin name of the genus comes from *filum* - thread and *pendula* - hanging on those nodules that hang on filamentous roots. The specific Russian and Latin names are the same: the leaves are similar in shape to elm leaves. Roots with nodules were more often used for oncological diseases in another, less common species - *Filipendula vulgaris* (F. *hexapetula*). It is included in the standard, in fact,

anti-oncogenic collection Zdenko, which is a pharmacy, is approved for use. Formal indications for the use of the collection are anacid gastritis and papillomatosis of the bladder. As for the aroma of flowers and, to a lesser extent, the leaves of *L. elmifolia*, since ancient times, meadowsweet (flower) tea has been popular, which they drank, appreciating the aroma, and just like that, and to calm down, with sleep disturbances, various unrest, as they would say now, in stressful situations. With a therapeutic purpose, an infusion of flowers was prescribed for hysteria, arousal, aggressiveness, mental trauma. Information about the use of meadowsweet tea for mental illness in the primary sources could not be found. This tea was drunk with overwork, physical fatigue. In particular, it was traditional among mowers, which was reflected in fiction, because it prevented aches after heavy physical exertion and made it possible to better endure the heat. Obviously, tea smelling like herring would not be drunk. One of the popular names of meadowsweet is lungwort, lungwort [11, 12, 18], which removes questions about an unpleasant odor. For the North, apiaries are not so typical (3–3.5 months of honey flow, harsh winters), but the vast, as a rule, curtains of meadowsweet, a recognized honey plant, made it possible to count on a large amount of honey, which was especially valued for inflammatory diseases, fevers, as well as for a special flavor. At present, the tradition of consumption of meadowsweet tea, like many other tea surrogates, has almost disappeared. 18], which removes questions about an unpleasant odor. For the North, apiaries are not so typical (3–3.5 months of honey flow, harsh winters), but the vast, as a rule, curtains of meadowsweet, a recognized honey plant, made it possible to count on a large amount of honey, which was especially valued for inflammatory diseases, fevers, as well as for a special flavor. At present, the tradition of consumption of meadowsweet tea, like many other tea surrogates, has almost disappeared. 18], which removes questions about an unpleasant odor. For the North, apiaries are not so typical (3–3.5 months of honey flow, harsh winters), but the vast, as a rule, curtains of meadowsweet, a recognized honey plant, made it possible to count on a large amount of honey, which was especially valued for inflammatory diseases, fevers, as well as for a special flavor. At present, the tradition of consumption of meadowsweet tea, like many other tea surrogates, has almost disappeared.

In Russia, in the Scandinavian countries, meadowsweet was used in brewing to correct the taste of beer, and possibly to enhance its intoxicating effect, since at the household level, and subsequently experimentally, it was found that meadowsweet moderately enhances the effect of CNS depressant poisons: chloral hydrate, barbiturates, alcoholic beverages [4, 5]. In the absence of an obvious CNS depressant effect, both in the consumption of meadowsweet tea in humans and in enteral administration to animals (neurotoxic doses are unattainable on tests of standing on a vertical rod and behavior in an open field), the infusion of flowers, however, reduces the narcotic DE 50chloral hydrate. This simple test can be used as the basis for the biostandardization of raw materials by the presence of

and the preservation of its very moderate depressant effect on the central nervous system, which manifests itself only against the background of drugs that depress it. I omit the description of the conventional methods used, described in detail earlier [4, 6]. Given in table. 1 results confirm the possibility of proper storage of raw materials for 12 years without loss of activity, the ability to reduce the narcotic dose of chloral hydrate.

Table 1

Biological standardization of raw materials of meadowsweet flowers according to the ability of infusion
enhance the narcotic effect of chloral hydrate

Сроки хранения сырья	Наркотическая DE ₅₀ хлоралгидрата	
	в мг/кг	в процентах
Контроль (введение воды)	288 (273–303)	100
Настой цветков, хранившихся:		
3 мес.	219 (205–233)*	76
1 год и 3 мес.	215 (200–230)*	74,7
2 года и 3 мес.	230 (208–253)*	79,9
3 года и 3 мес.	223 (203–243)*	77,4
4 года и 3 мес.	223 (214–242)*	77,4
Контроль (введение воды)	290 (284–298)	100
Настой цветков, хранившихся:		
6 лет	212 (201–223)*	73,1
9 лет	222 (201–243)*	76,6
12 лет	240 (219–261)*	82,8

Примечания: 1) настой 1:10 цветков вводили энтерально самцам мышей SHR в дозе 5 г/кг за 40 мин. до введения хлоралгидрата; 2) приведены средние и в скобках доверительный интервал с расчетом по методу Милнера-Тэйтнера [8]; 3) * – различия с контролем достоверны при $p \leq 0,05$.

Young leaves and shoots also had a food use: they were seasoned with borscht, soups, used for salads [15]. The use of meadowsweet in food and as a substitute for tea logically suggests that the plant is not poisonous, and, indeed, it does not contain toxins, cardiac glycosides, alkaloids, DL₅₀ and even DL_{min} with multiple enteral administration of infusion, decoction of flowers 1:10 mice are not achieved. Without detailing the chemical composition, we note that it is well described in the 3rd volume "Plant Resources of the USSR" [22]. One of the versions of the origin of the Latin name meadowsweet is beloved by horses (fillos + hypos), which can be rejected without a doubt. Neither horses, nor cattle, nor small cattle eat meadowsweet even in hay, they do not like its smell. True, peasants sometimes mowed down a little meadowsweet to treat diarrhea, dyspepsia in calves (and in humans), which is adopted by veterinary medicine. We received this and other information in the Pskov, Novgorod, Leningrad regions, in Altai, in Belarus, Karelia, from the Vepsians of Mezhozero, as well as during a survey of botanists, pharmacognostics who have at least some information about the use of the plant. Information was orally transmitted about the high effectiveness of enemas with a concentrated infusion of flowers in exacerbation of hemorrhoids, about the possibility of expanding the diet against this background. These data were confirmed by us when observing 3 patients.

table 2

Comparative evaluation of the effect of preparations from plants of the genus Labaznik on convulsive lethal dose of corazol during intravenous titration

Сравнительная оценка Вид и часть растения	Лекарственная форма	Однократное введение		10-дневное введение	
		DL100 коразола		DL100 коразола	
		в мг/кг	в процентах	в мг/кг	в процентах
Контроль	вода	87,0 ± 8,0	100 ± 9,2	68,5 ± 15,5	100 ± 22,6
Л. вязолистный					
цветки	настой	99,0 ± 6,5*	114 ± 7,5*	125 ± 20,0*	183 ± 29,4*
листья	настой	92,5 ± 7,2	106 ± 8,2	97,1 ± 7,1*	147 ± 10,8*
корни	отвар	89,7 ± 6,8	103 ± 7,8	82,5 ± 14,3	120 ± 20,9
Л. обнаженный					
цветки	настой	91,0 ± 14,5	105 ± 16,6	111,0 ± 15,0*	162 ± 22*
листья	настой	94,2 ± 12,0	108 ± 13,7	90,2 ± 10,5*	132 ± 15,3*
корни	отвар	89,0 ± 8,5	102 ± 9,8	88,7 ± 12,0	124 ± 17,5
Л. дланевидный					
цветки	настой	92,0 ± 8,0	106 ± 9,2	96,0 ± 21,0*	140 ± 31*
листья	настой	88,5 ± 7,5	102 ± 8,6	89,7 ± 11,1	131 ± 16,2
корни	отвар	84,9 ± 6,7	97,6 ± 7,7	86,3 ± 13,2	126 ± 19,2
Л. камчатский					
цветки	настой	101,3 ± 7,7*	116 ± 8,9*	121,1 ± 14,5*	177 ± 21,2*
листья	настой	94,5 ± 8,3	109 ± 9,5	92,5 ± 9,3	135 ± 13,6

Примечания: 1) приведены значения средних \pm доверительный интервал; 2) * – результаты, достоверно отличающиеся от контроля по критерию Фишера-Стьюдента t при $p \leq 0,05-0,01$; 3) в группе использовано 12-35 (контроль) самцов мышей SHR; 4) препараты вводили внутрь через зонд в разовой дозе 5 г/кг в пересчете на массу сухого сырья; 5) водные извлечения из Л. степного, Л. обыкновенного, сухой спиртовой экстракт, сумма флавоноидов из цветков Л. вязолистного и выделенные из них флавоноиды (спирезид, кверцетин, кемпкемферол) были неэффективны в высоких дозах (50–100 мг/кг), в связи с чем цифровой материал опущен.

One of the reasons for the widespread use of meadowsweet in a vast geographical area, in addition to the main one - its high efficiency, is a wide range from the Pyrenees to the Far East, the growth of large clumps, a large phytomass, and the relative ease of mass harvesting. The latter is confirmed by our own many decades of experience in the constant harvesting of inflorescences, less often leaves for pharmacological studies that have successfully passed clinical trials, introduction as an anti-inflammatory agent [7], constant use in phytotherapeutic practice.

From the standpoint of efficiency and the availability of natural resources, meadowsweet is the most promising medicinal plant. It is no coincidence that meadowsweet is selected into the arsenal of traditional Tibetan medicine and its Mongolian branch [1, 3, 16], in which it is used for diseases of the digestive system: dyspepsia, intestinal infections, gastritis, peptic ulcer, as well as for bronchopulmonary diseases: from banal SARS to tuberculosis, pneumonia, bronchial asthma. Similarly, it is used in Bulgarian folk medicine, in Germany. An unsystematized list in a number of sources [2, 10, 14, 18, 22] of numerous nosologies in which meadowsweet is used (cystitis, pyelonephritis, arthritis, otitis media, tonsillitis, stomatitis, gastroenterocolitis, proctitis, cholecystitis, hepatitis, exacerbated hemorrhoids, pustular and others dermatoses, infected, inflamed wounds, etc.) allows in generalizing to single out one of the most significant areas: infectious and inflammatory diseases. Using a simple, generally accepted method of granulomas implanted under the skin, we registered the ability of a 1:10 infusion of meadowsweet flowers with a course of enteral preventive administration to limit the stage of exudation and proliferation of the inflammatory process in mice [4].

Even in the Middle Ages, meadowsweet was considered an effective remedy for diseases of the joints. In Denmark in the 1930s. a combination of St. John's wort with meadowsweet was patented for the treatment of patients with articular rheumatism (according to the current classification - non-specific rheumatoid arthritis). In our own phytotherapeutic practice, following the tradition of China, Korea, India, Tibet, regarding the multicomponent collections, we expanded this composition and obtained a high anti-inflammatory effect when using the block: flowers of meadowsweet, linden + nadz. part of St. John's wort, yarrow + licorice root + leaves of meadowsweet, raspberry, willow, sage, watch, linden + flower baskets of chamomile, calendula [5, 6]. Species names omitted, collection may be

expanded and narrowed according to specific circumstances. Since it has been established that inflammation is a pathogenetic link in a number of non-infectious, but, for example, autoimmune diseases (ulcerative colitis, autoimmune thyroiditis, multiple sclerosis [24], strokes), it was effective to include this block in multicomponent collections in specific cases with the listed neurological and other diseases [5, 6].

The effectiveness of collections with the inclusion of meadowsweet in multiple sclerosis, strokes, epilepsy, neurosis [6, 20] established by us confirms the validity of the indications of traditional medicine for its effective use in paralysis, epilepsy, hysteria, rabies [11, 12, 18, 19, 21, 22], encephalitis and other neuroinfections. In ancient Russia, meadowsweet flowers were used for epilepsy [21]. Information from folk medicine about the effectiveness of meadowsweet root juice in rabies was simply, but most convincingly confirmed by doctor S.O. Maldzinevich in the 60s of the XIX century. [nineteen]. Animals bitten by a rabid dog were divided into 2 groups. Those treated with root juice survived, those not treated died. In our repeatedly reproduced studies, it was found that a course, especially a single administration of an infusion of flowers, leaves, and a decoction of the roots does not stop convulsions in mice and rats, caused by corazole, bemegride, cordiamine, thiosemicarbazide, strychnine, nicotine, maximum electric shock (MES), strong sound (audiogenic convulsions in Krushinsky-Molodkina rats). In parallel, on some generally accepted models (corazol, MES, thiosemicarbazide, audiogenic convulsions), the anticonvulsants seduxen, trimetine, and depakine used in practice completely protected animals from convulsions. Infusion of meadowsweet flowers did not stop the arecoline tremor. All this led to the conclusion that the anticonvulsant, central M- and H-anticholinergic activity in the meadowsweet is absent. However, the infusion of the flowers lengthened the latent period and life time of animals in tests with strychnine, thiosemicarbazide, nicotine, bemegride, cordiamine, and increased the number of mice surviving after MES. one hundred corazol (0.5% solution) with slow intravenous titration of it (0.1 ml / 10 sec.). The effect registered for some phytopreparations is more correctly interpreted as an increase in the resistance of animals to the convulsive-lethal action of the convulsant, the manifestation of cerebroprotective, antitoxic, rather than anticonvulsant properties, since there was no complete protection against convulsions.

Taking into account the data of folk and traditional medicine, our own experimental and clinical data, it was suggested that the effectiveness of meadowsweet preparations in neurological diseases so different in etiology and pathogenesis is based not on the anticonvulsant or mildly depressing properties of the central nervous system that it lacks, but on cerebroprotective properties. One of the generally accepted methods for testing cerebroprotective properties, in particular for drugs from the group of nootropics, is to determine the persistence of the passive avoidance conditioned reflex (PACR) after MES. A mouse placed in a brightly lit arena immediately leaves for a shaded area, but, having received pain irritation from the current there, returns and endures bright illumination. Subsequently, the animal does not try to go into the shaded compartment. CPAR is produced at a time and is retained thereafter, but after MES, all or most mice lose it. The ability of the test drug to maintain CRPI, to exhibit anti-amnesic properties is regarded as cerebroprotective activity. Thus, it was first discovered in the extract of *Eleutherococcus* [13], which is classified as a classic adaptogen with their characteristic anti-alterative, anti-destructive properties [4, 6, 9]. The presence of an ability similar to *Eleutherococcus* to limit the volume and severity of damage (in this case, brain functions), to exhibit anti-destructive activity was subsequently confirmed by me on models of stress-induced and toxic-dystrophic erosions of the stomach, damage to the islet apparatus of the pancreas by alloxan, hepatocytes - carbon tetrachloride [4, 6].

The results are given in table. 3 hardly require explanation. It is obvious that water extracts from all parts of *L. elmous*, as well as from the flowers of *L. naked*, *L. palmate*, *L. kamchatsky* showed cerebroprotective, anti-amnesic activity, significantly reduced

damaging effect of MES on the conditioned reflex defensive behavior of animals. Such behavior is essential for the survival of the individual and the species. The starting point for the undertaken studies was data on the use of meadowsweet tea in folk medicine for neurosis, neuroinfections, and epilepsy. The expediency of such an application is largely confirmed by the results of our experiments. For *L. vyazolistny*, as well as for many other plants used in folk and traditional medicine for epilepsy, information about their effectiveness in rabies is characteristic (types of shiksha, bellflower, peony, etc.). We have not found anticonvulsant properties in drugs of the meadowsweet, as well as in other plants. It is obvious that the treatment of patients with epilepsy (especially neuroinfections) was not based on anticonvulsants, and on their cerebroprotective properties, on the ability to increase the body's resistance to damaging effects, which also manifested itself in the study of the effect of meadowsweet preparations on the toxicity of corazol and other convulsants. These results confirm the consistency, the significance of the theory of the state of non-specific (not anticonvulsants in a particular case) increased body resistance caused by herbal remedies, developed by N.V. Lazarev and his school [9, 17, 25]. The ability of plants to prevent violations of the conditioned reflex behavior of animals confirms the synergistic relationships in the symbiosis of representatives of flora and fauna, in biogeocinosis, which is part of the program for maintaining life on Earth. From these positions, the search for effective means of treating neurological patients should be based on biological laws, on revealing the biologically determined interest of plants in maintaining human capacity and health. In identifying such plants, the assimilation of the millennia-old experience of traditional and folk medicine, the analysis of the primary sources available to us, helps.

Table 3

Comparative evaluation of the effect of phytopreparations from plants of the genus Meadowsweet on survival, seizures in mice and amnesia of the passive avoidance conditioned reflex (PACR) after maximum electric shock (MESH)

Вид и часть растения, препарат	Количество мышей			
	в группе	выжило	без судорог	без амнезии УРПИ
Контроль МЭШ (введение воды)	80	20	0	0
Л. вязолистный				
настой цветков	40	30*	5	25 из 30*
листьев	40	13	3	9 из 13*
отвар корней	30	12	4	9 из 12*
Л. обнаженный				
настой цветков	30	15*	6	14 из 15*
листьев	30	10	4	2 из 10
отвар корней	20	5	0	0 из 5
Л. дланевидный				
настой цветков	30	16*	3	9 из 16*
листьев	30	7	2	1 из 7
отвар корней	20	2	2	0 из 2
Л. камчатский				
настой цветков	20	10	0	9 из 10*
листьев	20	9	0	2 из 9
Л. степной				
настой цветков	20	10	2	3 из 10
листьев	20	10	1	2 из 10
Л. обыкновенный				
настой цветков	20	10	6	3 из 10
листьев	20	7	2	2 из 7
отвар корней	20	8	0	1 из 8
Седуксен 10 мг/кг внутрь за 40 мин. до МЭШ	15	15	15	2 из 15

Примечания: 1) настои и отвары (1:10) вводили энтерально в течение 10 дней по 5 г/кг в пересчете на массу сухого сырья; 2) * – различия с контролем достоверны по критерию χ^2 при $p \leq 0,05-0,01$; 3) сумма флавоноидов и флавоноиды, выделенные из цветков Л. вязолистного, были неэффективны; 4) результаты воспроизведены.

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Author's address

MD Barnaulov O.D., leading researcher Institute of the human brain them. N.P. Bekhtereva RAS., corresponding member. RANH, honorary title: founder of the scientific school "Experimental and Clinical Phytotherapy"
barnaulovod@rambler.ru

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