https://doi.org/10.33380/3034-3925-2026-3-2-54-61

ВЭТСХ-скрининг фенольных соединений и сапонинов сырья синюхи голубой

Е. С. Кириллова, В. С. Шуракова, А. Р. Валиуллина, Е. В. Жохова, И. И. Тернинко

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На странице 11 в исходную версию статьи редакция внесла изменение в английскую аффилиация авторов.

Вместо:

[1] Saint-Petersburg State Chemical and Pharmaceutical University. letter A, 14, Professora Popova str., ext. ter. Aptekarsky Island municipal district, Saint-Petersburg, 197022, Russia

[2] Limited Liability Company "Ekoler". Apartment 21, Building 11, Yablochkova str., Astrakhan, Astrakhan Region, 414041, Russia

Исправлено на:

[1] Saint-Petersburg State Chemical and Pharmaceutical University. 14, lit. A, Professora Popova str., Aptekarsky Ostrov Municipal Okrug, Saint Petersburg, 197022, Russia

[2] Limited Liability Company "Ekoler". Apt. 21, 11, Yablochkova str., Astrakhan, Astrakhan Region, 414041, Russia

На этой же странице в исходную версию статьи редакция внесла изменение в Abstract.

Вместо:

Introduction. *Polemonium caeruleum* L. is a promising medicinal plant with multivector therapeutic effect. However, the limited data on its phytochemical composition makes it difficult to develop modern medicines based on it. The need for a detailed study of chemical composition and optimization of standardization methods is due to the growing interest in the use of bluegill for the treatment of diseases of the nervous system and the demand of the socium for neurotropic phytodrugs.

Aim. Conducting HPTLC analysis for phytochemical screening of *Polemonium caeruleum* L. extracts.

Materials and methods. This study utilized samples of rhizomes and roots of *Polemonium caeruleum*, collected in the Leningrad region. Standard samples of flavonoids, hydroxycinnamic acids, and β-aescin were used for phytochemical analysis. Purified (preliminary defatting with chloroform in a Soxhlet apparatus) and crude extracts were obtained from the raw material by extraction with 80 % ethanol using an ultrasonic bath. HPTLC analysis was performed on Silica gel 60 F_{254} plates in the following solvent systems: toluene – ethyl acetate – formic acid – water (for phenolic compounds) and *n*-butanol – acetic acid – water (for saponins). Detection was performed under UV light and using detection reagents.

Results and discussion. On the basis of a HPTLC-analysis carried out in roots with bluegill roots, chlorogenic acid has been identified. It has been established that the procedure of degreasing the raw material leads to a decrease in the content of phenolic compounds, and acid hydrolysis significantly changes their chromatographic profile. For the detection of saponins, the ineffectiveness of the method regulated by the GF of the Russian Federation is shown, and a solution of 50 % sulfuric acid was proposed as the detecting agent, which allowed to uniquely identify β-aescin (Rf = 0.32). The chromatographic analysis revealed a complex multicomponent composition of extractions, including several groups of BASs.

Conclusion. In view of the growing need for effective and safe phyto-drugs with a neurotropic and expectorant action, as well as insufficient knowledge of the chemical composition of bluegill, its complex phytochemical screening was carried out. By HPTLC method in the underground organs of the plant was identified chlorogenic acid, and also confirmed the presence of a marker saponine – β-aescin, for the detection of which the selection of the detecting agent is optimized. The data obtained fill a lack of modern scientific knowledge about this type of raw material and form the basis for the development of standardized LDC based on it.

Исправлено на:

Introduction. *Polemonium caeruleum* L. is a promising medicinal plant with multivector therapeutic effect. However, the limited data on its phytochemical composition makes it difficult to develop modern medicines based on it. The need for a detailed study of chemical composition and optimization of standardization methods is due to the growing interest in the use of *Polemonium caeruleum* L. for the treatment of diseases of the nervous system and the societal demand for neurotropic phytodrugs.

Aim. To conduct HPTLC analysis for phytochemical screening of blue cornelian fern extracts.

Materials and methods. This study utilized samples of rhizomes and roots of *Polemonium caeruleum*, collected in the Leningrad region. Standard samples of flavonoids, hydroxycinnamic acids, and β-aescin were used for phytochemical analysis. Purified (preliminary defatting with chloroform in a Soxhlet apparatus) and crude extracts were obtained from the raw material by extraction with 80 % ethanol using an ultrasonic bath. HPTLC analysis was performed on Silica gel 60 F_{254} plates

in the following solvent systems: toluene – ethyl acetate – formic acid – water (for phenolic compounds) and *n*-butanol – acetic acid – water (for saponins). Detection was performed under UV light and using detection reagents.

Results and discussion. On the basis of HPTLC-analysis carried out in rhizomes with *Polemonium caeruleum* L. roots, chlorogenic acid has been identified. It has been established that the procedure of degreasing the raw material leads to a decrease in the content of phenolic compounds, and acid hydrolysis significantly changes their chromatographic profile. For the detection of saponins, the ineffectiveness of the method regulated by the State Pharmacopoeia of the Russian Federation is shown, and a solution of 50 % sulfuric acid was proposed as the detecting agent, which allowed the unambiguous identification of β-aescin (Rf = 0.32). The chromatographic analysis revealed a complex multicomponent composition of extractions, including several groups of bioactive compounds.

Conclusion. In view of the growing need for effective and safe phyto-drugs with a neurotropic and expectorant action, as well as insufficient knowledge of the chemical composition of *Polemonium caeruleum* L., its complex phytochemical screening was carried out. By HPTLC method in the underground organs of the plant chlorogenic acid was identified, and also confirmed the presence of a marker saponin – β-aescin, for the detection of which the selection of the detecting agent was optimized. The data obtained fill the gap in modern scientific knowledge about this type of raw material and form the basis for the development of standardized medicinal plant raw materials based on it.

На 12 странице в исходную версию статьи редакция внесла изменение в Funding.

Вместо:

Funding. The analysis was carried out on the basis of the Collective Use Center (CCU) “Analytical Center” of the Federal State Budgetary Educational Institution of Higher Education (SPKhFU) of the Ministry of Health of Russia.

Исправлено на:

Funding. The analysis was carried out on the basis of the Shared Use Center «Analytical Center» of the Federal State Budgetary Educational Institution of Higher Education «Saint Petersburg State Chemical and Pharmaceutical University» of the Ministry of Health of Russia

На 13 странице в исходную версию статьи редакция внесла изменения в рисунок 1 и подрисуночную подпись

Вместо:

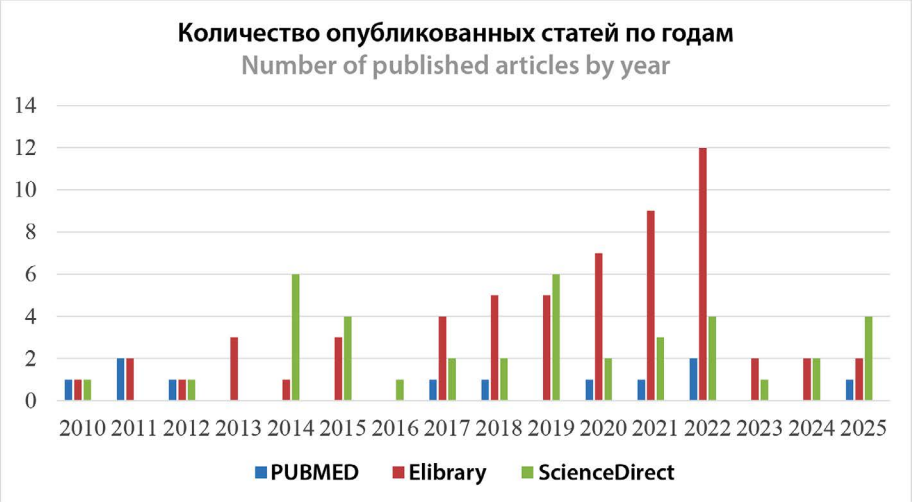

Рисунок 1. Данные наукометрических баз PubMed, Elibrary и ScienceDirect по количеству публикаций в год по запросу «Polemonium caeruleum» (глубина поиска – 15 лет)

Figure 1. Data from the scientometric databases PubMed, Elibrary and ScienceDirect on the annual number of publications retrieved using the search term «Polemonium caeruleum» (search depth: 15 years)

Исправлено на:

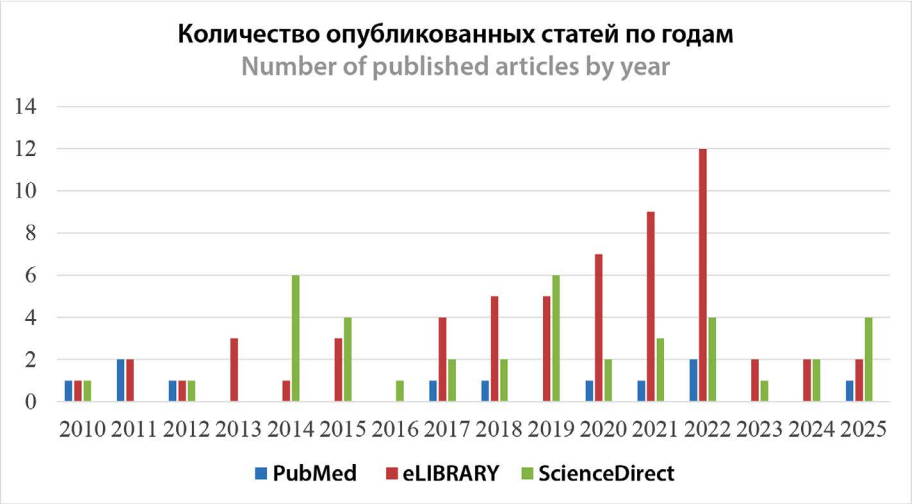

Рисунок 1. Данные наукометрических баз PubMed, eLIBRARY и ScienceDirect по количеству публикаций в год по запросу «Polemonium caeruleum» (глубина поиска – 15 лет)

Figure 1. Data from the scientometric databases PubMed, eLIBRARY and ScienceDirect on the annual number of publications retrieved using the search term «Polemonium caeruleum» (search depth: 15 years)

На 16 странице в исходную версию статьи редакция внесла изменения в таблицу 1 в столбеце "CO / пятно в треке испытуемого образца"

Вместо:

CO / пятно в треке испытуемого образца **CO / spot on test sample track**
Рутин Routine
Кверцетин Quercetine
Кемпферол Kaempherol
Розавин Rosavine

Исправлено на:

CO / пятно в треке испытуемого образца **RS / spot on test sample track**
Рутин Rutin
Кверцетин Quercetin
Кемпферол Kaempferol
Розавин Rosavin

На 19–21 страницах в исходную версию статьи редакция внесла изменения в таблицу 2 в столбеце "Трек, №, название"

Вместо:

Трек 1. СО β-эсцина Track 1. B-escin standard solution
Трек 2. Неочищенное извлечение Track 2. Unrefined extraction
Трек 3. Неочищенное извлечение после гидролиза Track 3. Unrefined extraction after hydrolysis
Трек 4. Очищенное извлечение Track 4. Refined extraction
Трек 5. Очищенное извлечение после гидролиза Track 5. Refined extraction after hydrolysis

Исправлено на:

Трек 1. СО β-эсцина Track 1. B-escin reference standard
Трек 2. Неочищенное извлечение Track 2. Unpurified extraction
Трек 3. Неочищенное извлечение после гидролиза Track 3. Unpurified extraction after hydrolysis
Трек 4. Очищенное извлечение Track 4. Purified extraction
Трек 5. Очищенное извлечение после гидролиза Track 5. Purified extraction after hydrolysis

На 19 странице в исходную версию статьи редакция внесла изменения в таблицу 2 в столбеце "Окраска в видимой области"

Вместо:

Слабо-желтая Light blue
–
Слабо-желтая Light blue

Исправлено на:

Слабо-желтая Light yellow
–
Слабо-желтая Light yellow

На 22 странице в исходную версию статьи редакция внесла изменения в References.

Вместо:

4. May N., De Sousa Alves Neri J. L., Clunas H., Shi J., Parkes E., Dongol A., Wang Z., Jimenez Naranjo C., Yu Y., Huang X.-F., Charlton K., Weston-Green K. Investigating the Therapeutic Potential of Plants and Plant-Based Medicines: Relevance to Antioxidant and Neuroprotective Effects. *Nutrients*. 2023;15(18):3912. DOI: 10.3390/nu15183912.
8. Khozhayenko E. V., Pak P. A., Shokur O. A., Kondrateva G. K., Podkorytova E. A. Development of a complex phytopreparation based on cyanosis blue, St. John's wort, Astragalus membranous. *Traditsionnaya Meditsina*. 2022;3(69):47–51. (In Russ.) DOI: 10.54296/18186173_2022_3_47.

Исправлено на:

4. May N., de Sousa Alves Neri J. L., Clunas H., Shi J., Parkes E., Dongol A., Wang Z., Jimenez Naranjo C., Yu Y., Huang X.-F., Charlton K., Weston-Green K. Investigating the Therapeutic Potential of Plants and Plant-Based Medicines: Relevance to Antioxidant and Neuroprotective Effects. *Nutrients*. 2023;15(18):3912. DOI: 10.3390/nu15183912.

8. Khozhaenko E. V., Pak P. A., Shokur O. A., Kondrateva G. K., Podkorytova E. A. Development of a complex phytopreparation based on Cyanosis blue, St. John's wort, Astragalus membranous. *Traditsionnaya Meditsina*. 2022;3(69):47–51. (In Russ.) DOI: 10.54296/18186173_2022_3_47.

Внесение исправление не повлияло на содержание статьи.

Обновлена онлайн-версия статьи на сайте журнала.

HPTLC screening of phenolic compounds and saponins in *Polemonium caeruleum* L. raw material

Elizaveta S. Kirillova, Valeriya S. Shurakova, Alina R. Valiullina, Elena V. Zhokhova, Inna I. Terninko

Herbarium. 2026;3(1):10–22. (In Russ.) https://doi.org/10.33380/3034-3925-2026-3-1-56. Published: 12.01.2026.

On page 11 of the original version of the article, the editors made a change to the English affiliation of the authors.
Instead:
[1] Saint-Petersburg State Chemical and Pharmaceutical University. letter A, 14, Professora Popova str., ext. ter. Aptekarsky Island municipal district, Saint-Petersburg, 197022, Russia
[2] Limited Liability Company "Ekoler". Apartment 21, Building 11, Yablochkova str., Astrakhan, Astrakhan Region, 414041, Russia
Corrected to:
[1] Saint-Petersburg State Chemical and Pharmaceutical University. 14, lit. A, Professora Popova str., Aptekarsky Ostrov Municipal Okrug, Saint Petersburg, 197022, Russia
[2] Limited Liability Company "Ekoler". Apt. 21, 11, Yablochkova str., Astrakhan, Astrakhan Region, 414041, Russia

On the same page, the editors made a change to the Abstract in the original version of the article.
Instead:
Introduction. *Polemonium caeruleum* L. is a promising medicinal plant with multivector therapeutic effect. However, the limited data on its phytochemical composition makes it difficult to develop modern medicines based on it. The need for a detailed study of chemical composition and optimization of standardization methods is due to the growing interest in the use of bluegill for the treatment of diseases of the nervous system and the demand of the socium for neurotropic phytodrugs.
Aim. Conducting HPTLC analysis for phytochemical screening of *Polemonium caeruleum* L. extracts.
Materials and methods. This study utilized samples of rhizomes and roots of *Polemonium caeruleum*, collected in the Leningrad region. Standard samples of flavonoids, hydroxycinnamic acids, and β-aescin were used for phytochemical analysis. Purified (preliminary defatting with chloroform in a Soxhlet apparatus) and crude extracts were obtained from the raw material by extraction with 80 % ethanol using an ultrasonic bath. HPTLC analysis was performed on Silica gel 60 F_{254} plates in the following solvent systems: toluene – ethyl acetate – formic acid – water (for phenolic compounds) and *n*-butanol – acetic acid – water (for saponins). Detection was performed under UV light and using detection reagents.
Results and discussion. On the basis of a HPTLC-analysis carried out in roots with bluegill roots, chlorogenic acid has been identified. It has been established that the procedure of degreasing the raw material leads to a decrease in the content of phenolic compounds, and acid hydrolysis significantly changes their chromatographic profile. For the detection of saponins, the ineffectiveness of the method regulated by the GF of the Russian Federation is shown, and a solution of 50 % sulfuric acid was proposed as the detecting agent, which allowed to uniquely identify β-aescin (Rf = 0.32). The chromatographic analysis revealed a complex multicomponent composition of extractions, including several groups of BASs.
Conclusion. In view of the growing need for effective and safe phyto-drugs with a neurotropic and expectorant action, as well as insufficient knowledge of the chemical composition of bluegill, its complex phytochemical screening was carried out. By HPTLC method in the underground organs of the plant was identified chlorogenic acid, and also confirmed the presence of a marker saponine – β-aescin, for the detection of which the selection of the detecting agent is optimized. The data obtained fill a lack of modern scientific knowledge about this type of raw material and form the basis for the development of standardized LDC based on it.

Corrected to:
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a detailed study of chemical composition and optimization of standardization methods is due to the growing interest in the use of *Polemonium caeruleum* L. for the treatment of diseases of the nervous system and the societal demand for neurotropic phytodrugs.

Aim. To conduct HPTLC analysis for phytochemical screening of blue cornelian fern extracts.

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Results and discussion. On the basis of HPTLC-analysis carried out in rhizomes with *Polemonium caeruleum* L. roots, chlorogenic acid has been identified. It has been established that the procedure of degreasing the raw material leads to a decrease in the content of phenolic compounds, and acid hydrolysis significantly changes their chromatographic profile. For the detection of saponins, the ineffectiveness of the method regulated by the State Pharmacopoeia of the Russian Federation is shown, and a solution of 50 % sulfuric acid was proposed as the detecting agent, which allowed the unambiguous identification of β-aescin (Rf = 0.32). The chromatographic analysis revealed a complex multicomponent composition of extractions, including several groups of bioactive compounds.

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On page 12 of the original version of the article, the editors made a change to Funding.

Instead:

Funding. The analysis was carried out on the basis of the Collective Use Center (CCU) "Analytical Center" of the Federal State Budgetary Educational Institution of Higher Education (SPKhFU) of the Ministry of Health of Russia.

Corrected to:

Funding. The analysis was carried out on the basis of the Shared Use Center «Analytical Center» of the Federal State Budgetary Educational Institution of Higher Education «Saint Petersburg State Chemical and Pharmaceutical University» of the Ministry of Health of Russia

On page 13 of the original version of the article, the editors made changes to Figure 1 and the caption.

Instead:

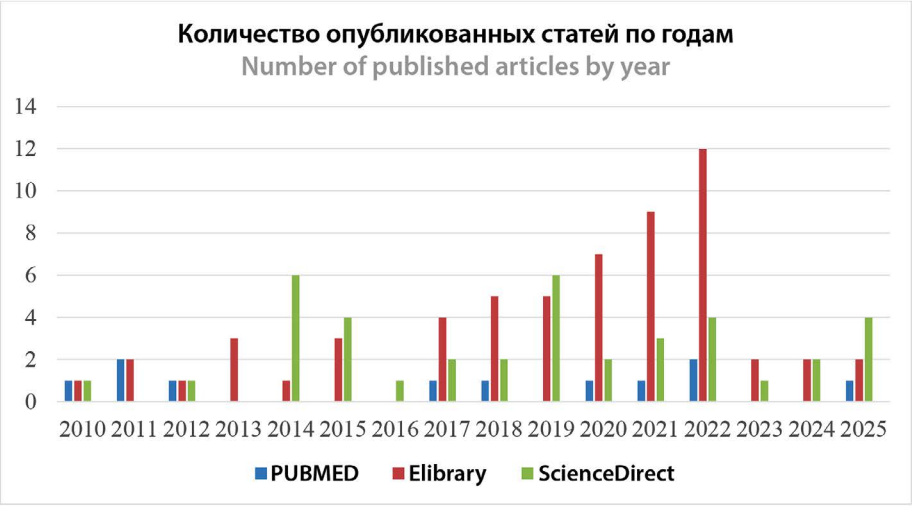

Figure 1. Data from the scientometric databases PubMed, Elibrary and ScienceDirect on the annual number of publications retrieved using the search term «Polemonium caeruleum» (search depth: 15 years)

Corrected to:

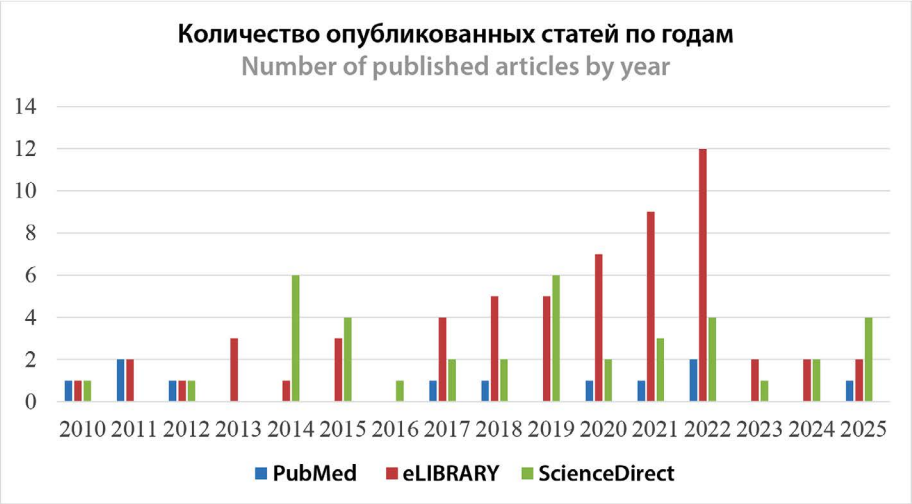

Figure 1. Data from the scientometric databases PubMed, eLIBRARY and ScienceDirect on the annual number of publications retrieved using the search term «Polemonium caeruleum» (search depth: 15 years)

On page 16 of the original version of the article, the editors made changes to Table 1 in the column "CO / spot on test sample track"

Instead:

CO / spot on test sample track
Routine
Quercetine
Kaempherol
Rosavine

Corrected to:

RS / spot on test sample track
Rutin
Quercetin
Kaempferol
Rosavin

On pages 19–21 of the original version of the article, the editors made changes to Table 2 in the column “Track №, name”

Instead:

Track 1. B-escin standard solution
Track 2. Unrefined extraction
Track 3. Unrefined extraction after hydrolysis
Track 4. Refined extraction
Track 5. Refined extraction after hydrolysis

Corrected to:

Track 1. B-escin reference standard
Track 2. Unpurified extraction
Track 3. Unpurified extraction after hydrolysis
Track 4. Purified extraction
Track 5. Purified extraction after hydrolysis

On page 19 of the original version of the article, the editors made changes to Table 2 in the column "Coloring in visible area"

Instead:

Light blue
–
Light blue

Corrected to:

Light yellow
–
Light yellow

On page 22 of the original version of the article, the editors made changes to the References.

Instead:

4. May N., De Sousa Alves Neri J. L., Clunas H., Shi J., Parkes E., Dongol A., Wang Z., Jimenez Naranjo C., Yu Y., Huang X.-F., Charlton K., Weston-Green K. Investigating the Therapeutic Potential of Plants and Plant-Based Medicines: Relevance to Antioxidant and Neuroprotective Effects. *Nutrients*. 2023;15(18):3912. DOI: 10.3390/nu15183912.
8. Khozhayenko E. V., Pak P. A., Shokur O. A., Kondrateva G. K., Podkorytova E. A. Development of a complex phytopreparation based on cyanosis blue, St. John's wort, Astragalus membranous. *Traditsionnaya Meditsina*. 2022;3(69):47–51. (In Russ.) DOI: 10.54296/18186173_2022_3_47.

Corrected to:

4. May N., de Sousa Alves Neri J. L., Clunas H., Shi J., Parkes E., Dongol A., Wang Z., Jimenez Naranjo C., Yu Y., Huang X.-F., Charlton K., Weston-Green K. Investigating the Therapeutic Potential of Plants and Plant-Based Medicines: Relevance to Antioxidant and Neuroprotective Effects. *Nutrients*. 2023;15(18):3912. DOI: 10.3390/nu15183912.
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The correction did not affect the content of the article.

The online version of the article on the journal's website has been updated.