

***ACHILLEA* × *TZVELEVII* NOM. NOV. (*ASTERACEAE*) AND  
*VERONICA TZVELEVII* COMB. NOVA (*PLANTAGINACEAE* s. l.  
/ *VERONICACEAE* s. str.): TWO TAXA COMMEMORATING  
NIKOLAI TZVELEV**

***ACHILLEA* × *TZVELEVII* NOM. NOV. (*ASTERACEAE*) И  
*VERONICA TZVELEVII* COMB. NOVA (*PLANTAGINACEAE* s. l.  
= *VERONICACEAE* s. str.): ДВА ТАКСОНА, НАЗВАННЫЕ  
В ЧЕСТЬ НИКОЛАЯ НИКОЛАЕВИЧА ЦВЕЛЁВА**

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One new name and one new combination are validated, respectively, in *Achillea* L. (*Asteraceae*) and *Veronica* L. (*Plantaginaceae* s. l. / *Veronicaceae* s. str.): *Achillea* × *tzvelevii* Mosyakin, nom. nov. (*A.* × *leptophylloides* Tzvelev, nom. illeg.) for the hybrid *A. leptophylla* M. Bieb. × *A. stepposa* Klokov et Krytzka, and *Veronica tzvelevii* (Ostapko) Mosyakin, comb. nova (*Pseudolysimachion tzvelevii* Ostapko; *Veronica pontica* Ostapko, nom. illeg.). The species epithets commemorate the outstanding plant taxonomist Nikolai Tzvelev (1925–2015). Information on type specimens (holotypes and isotypes at LE and KW) of these taxa (both described from Lugansk Region, Southeastern Ukraine) and brief taxonomic and nomenclatural notes are provided.

**Key words:** *Achillea*, *Veronica*, taxonomy, nomenclature, Ukraine, Nikolai Tzvelev.

In the course of the preparation of an updated version of the checklist of vascular plants of Ukraine to replace the previous published edition (Mosyakin, Fedoronchuk, 1999) I noticed that nomenclatural changes are needed for two taxa of angiosperms described from Ukraine. Both these taxa are associated with the name of Nikolai N. Tzvelev (1925–2015), an outstanding Russian botanist of the V. L. Komarov Botanical Institute of the Russian Academy of Sciences, who recently passed away on his 91<sup>st</sup> year of life. The relevant nomenclatural changes are presented below.

***Achillea* × *tzvelevii*** Mosyakin, nom. nov. (*Achillea leptophylla* M. Bieb. × *Achillea stepposa* Klokov et Krytzka).

Replaced name: *Achillea* × *leptophylloides* Tzvelev, 1994, во Фл. европ. части СССР [Fl. Европ. Часты СССР], 7: 122, nom. illeg., pro «*Achillea leptophylla* × *Achillea setacea*».

Type: [Ukraine] «Prov. Lugansk, distr. Melovskoi, pag. Ezhaczii, in sabuletis, 2 VII 1958, O. Dubovik» (as cited in the protologue). *Label in Russian*: «Луганская обл., Меловской р-н, х. Ежачий, на песках, 2 VII 1958, О. Дубовик». *Translation*: «Lugansk Region, Melovoe District, Ezhachiy [Yezhachiy] hamlet, on sands, 2 VII 1958, O. Dubovik» (holotype — LE, 4 isotypes — KW).

Tzvelev (1994) treated his *Achillea* × *leptophylloides* as a hybrid *A. leptophylla* M. Bieb. × *A. setacea* Waldst. et Kit.; however, the name he proposed is illegitimate because it is a later homonym of *A. leptophylloides* Prodan (1930, Contrib. Bot. Cluj, 1, Fasc. 17: 8). Moreover, a presumable hybrid between *A. leptophylla* and *A. setacea* has been already described as *A. × kummerleana* Prodan (1916, Magyar Bot. Lapok, 15: 64; see also Prodan, Nyárády, 1964). In my opinion, based on the study of four isotypes of *A. × leptophylloides* at KW and the digital image of the holotype from LE (kindly provided by Ivan V. Tatanov), Tzvelev's taxon is indeed a hybrid, but most probably not between *A. leptophylla* and *A. setacea* but between *A. leptophylla* and *A. stepposa* Klokov et Krytzka. The tetraploid species *A. stepposa* ( $2n = 36$ ) almost completely replaces the diploid *A. setacea* ( $2n = 18$ ) in southeastern regions of Ukraine (Klokov, Krytzka, 1984), including Lugansk (Luhansk) Region, from where *A. × leptophylloides* was described. According to Klokov and Krytzka (1978: 241, 243), *A. stepposa* morphologically differs from its diploid counterpart *A. setacea* in having larger leaves with a wider central undivided part along the main vein, wider and shorter terminal leaf segments, larger involucral fillaries, larger expanded portions of ligules in ray flowers, and larger achenes (1.3–2.3 mm long, as opposed to mainly 1.0–1.3(1.5) mm long in *A. setacea*). The plants collected by O. N. Dubovik (holotype and isotypes of *A. × leptophylloides*) are morphologically rather uniform (only with some variation), probably representing members of one vegetatively propagated clone (or several clones of the same origin); their characters are consistent with the hypothesis of their hybrid origin involving *A. stepposa*. Here the new name is proposed for this hybrid.

Ehrendorfer and Guo (2006) noted that in Eurasian species groups of *Achillea* L. «...“vertical” hybridizations between different ploidy levels are also possible through unreduced gametes and/or by anorthoploid progenies and backcrosses. All this contributes to the more complex reticulate relationships and much less clear differentiation of polyploid as compared to  $2x$  taxa». They recognized in Eastern Europe on the  $4x$  ploidy level (tetraploids) the following taxa of the *A. millefolium* aggregate: *A. collina* J. Becker ex Heimerl (relative to diploids *A. asplenifolia* Vent. +

*A. setacea*) in Central to Southeastern Europe; *A. euxina* Klokov (relative of *A. asplenifolia*), *A. inundata* Kondr. (diploid relative not identified) in Ukraine; *A. stepposa* (relative of diploid *A. setacea*) east of the Dnieper (Dnipro) River; and *A. submillefolium* Klokov et Krytzka (diploid relative uncertain) occurring from Eastern Europe to Siberia. According to Ehren-dorfer and Guo (2006), the group of *A. leptophylla* M. Bieb. (diploid), *A. biebersteinii* Afan. and *A. micrantha* Willd. (diploids and tetraploids) apparently exhibits polyploid links with the *A. millefolium* aggregate, as demonstrated by their analysis of morphology and nuclear and cpDNA sequences. Thus, occurrence of such hybrids within the contact zones of parental species is not surprising, especially considering that *A. micrantha* in Ukraine is mainly (or exclusively?) represented by tetraploids, and thus its hybridization with another tetraploid species, *A. stepposa*, is much more likely than with diploid *A. setacea* s. str.

**Veronica tzvelevii** (Ostapko) Mosyakin, comb. nova.

Basionym: *Pseudolysimachion tzvelevii* Ostapko, 2014, Ukrayins'k. Bot. Zhurn. [Укр. ботан. журн.], 71(6): 673. ≡ *Veronica pontica* Ostapko, 1994, Ukrayins'k. Bot. Zhurn. [Укр. ботан. журн.], 51(2/3): 88, nom. illeg.

Type: «Ucraina, prov. Lugansk, distr. Belovodsk, pagus Novolimarivka, steppa arenosa supra declivibus cretaceis, 3 VII 1987, V. M. Ostapko» (as cited in the protologue). *Label in Ukrainian*: «Україна, Луганська обл., Біловодський р-н, с. Новолімарівка, піщаний степ понад крейдяними схилами, 3 VII 1987, В. М. Остапко». *Translation*: «Ukraine, Lugansk Region, Bilovods'k District, Novolymarivka village, sandy steppe over chalk slopes, 3 VII 1987, V. M. Ostapko» (holotype — KW; 3 isotypes — DNZ, at present temporarily in KW).

Ostapko (1994) proposed the name *Veronica pontica* for his newly described taxon from the Southeast of Ukraine, being apparently unaware that this name was a later homonym of *V. pontica* Wettst. (1890, in Engler u. Prantl, Nat. Pflanzenfam. 4, 3b: 85) and *V. pontica* Velen. (1894, Abh. Boehm. Ges. Wiss. 1893 (publ. 1894), 37: 52). In the checklist of vascular plants of the Southeast of Ukraine (Ostapko et al., 2010) this taxon was tentatively recognized under the provisional name «*Pseudolysimachion subponticum* Ostapko, nom. nov. provis. (*Veronica subpontica* Ostapko, nom. nov. provis.)». In that checklist we intentionally refrained from validating new combinations and names, following Rec. 30A.3 of the *International Code of Nomenclature for Algae, Fungi, and Plants* (McNeill et al., 2012) (in 2010 — the *International Code of Botanical Nomenclature*): «To aid availability through time and place, authors pub-

lishing nomenclatural novelties should give preference to periodicals that regularly publish taxonomic articles...» In his recent article Ostapko (2014) proposed several new nomenclatural combinations in *Pseudolysimachion* Opiz for species of *Veronica* described from Ukraine and, following my recommendation (as the editor of the article), validated a new name, *P. tzvelevii*, to replace the illegitimate name «*Veronica pontica* Ostapko».

However, the recognition of *Pseudolysimachion* as a separate genus is rather problematic. Recent molecular data indicate that the *Pseudolysimachion* clade is phylogenetically rooted in *Veronica* s. l., most probably between sect. *Veronica* and the clade containing all remaining taxa of *Veronica*, including previously widely recognized genera *Hebe* Comm. ex Juss., *Syntherisma* Benth., and some others. After analyzing the available phylogenetic data (see, for example, Albach, 2008; Albach, Chase, 2004; Albach, Fischer, 2003; Albach et al., 2004) and our original evidence from pollen morphology (Mosyakin, Tsymbalyuk, 2008; Tsymbalyuk, Mosyakin, 2013), I strongly believe that the recognition of *Pseudolysimachion* as the genus separate from *Veronica* should not be recommended.

*Veronica tzvelevii* belongs to the species aggregate of *Veronica spicata* L. s. latiss. (*Veronica* subgen. *Pseudolysimachium* (W. D. J. Koch) Buchenau sect. *Pseudolysimachium* W. D. J. Koch), which shows a considerable morphological polymorphism and patterns of frequent hybridization and polyploidy, resulting in its outstanding taxonomic complexity (see Elenevskiy, 1968, 1971, 1978; Klokov, 1976; Trávníček, 1998; Assejeva, 2002; Albach, Fischer, 2003; Trávníček et al., 2004; Bardy et al., 2011; Kosachev et al., 2015). Our palynomorphological results for taxa of *Veronica* subgen. *Pseudolysimachium* (Mosyakin, Tsymbalyuk, 2008; Tsymbalyuk, Mosyakin, 2013) indicate that this group shows in its pollen morphology some parallel trends and patterns similar to those observed in pollen grains of *Plantago* L. Two main pollen groups were outlined, one containing *V. spicata*, *V. longifolia* L., *V. spuria* L., and *V. incana* L. («pure» species?), and another housing *V. viscosula* Klokov, *V. gryniiana* Klokov, *V. paczoskiana* Klokov (≡ *V. spicata* subsp. *paczoskiana* (Klokov) Kosachev), *V. maeotica* Klokov, *V. orchidea* Crantz, and *V. pseudoorchidea* (Pacz.) Klokov, with some minor distinctions between these «microspecies».

According to Ostapko (1994), his «*V. pontica*» (now *V. tzvelevii*) differs from *V. barrelieri* H. Schott ex Roem. et Schult. (≡ *V. spicata* subsp. *barrelieri* (H. Schott ex Roem. et Schult.) Elenevsky) in having glabrous stems and leaves totally lacking pubescence or nearly so, smaller flowers, bracts shorter than calyx, and some other minor characters. Recent stu-

dies (Bardy et al., 2011) demonstrated that there is an extensive gene flow between *V. barelieri*, *V. orchidea*, and *V. spicata* that considerably blurs species boundaries of these taxa in Southeastern Europe; consequently, the subspecies rank was proposed for the two mentioned segregates of *V. spicata*. No comprehensive experimental studies of the *V. spicata* complex have been done yet in the south-central and southeastern parts of Ukraine; however, such studies are planned for the future, depending on the availability of research support and the situation in the region. Probably *V. tzvelevii* also represents a local hybridogenous «microspecies», but its origin remains uncertain and further studies are needed to clarify its true identity. However, I believe that, until having results of more detailed studies, it is more convenient to have named species-rank taxa as distinct taxonomic operational units, which in the future may become further clarified in terms of their origin and status. Thus, at present I accept *V. tzvelevii* as a species, similar to the case of some other diverse and often taxonomically problematic taxa currently recognized for Eastern Europe and Western Asia.

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### References

- ALBACH D. Further arguments for the rejection of paraphyletic taxa: *Veronica* subgen. *Pseudolysimachium* (*Plantaginaceae*) // *Taxon*. 2008. Vol. 57(1). P. 1–6.
- ALBACH D., CHASE M. Incongruence in *Veroniceae* (*Plantaginaceae*): evidence from two plastid and a nuclear ribosomal DNA region // *Molec. Phylogen. Evol.* 2004. Vol. 32. P. 183–197.
- ALBACH D., FISCHER M. AFLP- and genome size analyses: contribution to the taxonomy of *Veronica* subg. *Pseudolysimachium* sect. *Pseudolysimachion* (*Plantaginaceae*), with a key to the European taxa // *Phytol. Balcan.* 2003. Vol. 9(3). P. 401–424.
- ALBACH D., MARTINEZ-ORTEGA M., FISCHER M., CHASE M. A new classification of the tribe *Veroniceae* — problems and a possible solution // *Taxon*. 2004. Vol. 53(2). P. 429–452.

- ASSEJEVA L. A. [System of the genus *Veronica* L. (*Scrophulariaceae*) of the flora of Russia] // *Novosti Sist. Vyssh. Rast.* 2002. Vol. 34. P. 159–173. [In Russ.] (АСЕЕВА Л. А. Система рода *Veronica* L. (*Scrophulariaceae*) флоры России // *Новости систематики высших растений.* 2002. Т. 34. С. 159–173.)
- BARDY K. E., SCHÖNSWETTER P., SCHNEEWEISS G. M., FISCHER M. A., ALBACH D. C. Extensive gene flow blurs species boundaries among *Veronica barrelieri*, *V. orchidea* and *V. spicata* (*Plantaginaceae*) in southeastern Europe // *Taxon.* 2011. Vol. 60(1). P. 108–121.
- EHRENDORFER F., GUO Y.-P. Multidisciplinary studies on *Achillea* sensu lato (*Compositae* — *Anthemideae*): new data on systematics and phylogeography // *Willdenowia.* 2006. Vol. 36 (Spec. Iss.). P. 69–87.
- ELENEVSKIY A. G. [Notes about *Veronica* of section *Pseudolysimachia* C. Koch] // *Biol. Nauki.* 1968. № 11. P. 65–69. [In Russ.] (ЕЛЕНЕВСКИЙ А. Г. Заметки о верониках секции *Pseudolysimachia* C. Koch // *Биол. науки.* 1968. № 11. С. 65–69.)
- ELENEVSKIY A. G. [On systematics of *Veronica spicata* L. s. l.] // *Novosti Sist. Vyssh. Rast.* 1971. Vol. 8. P. 215–227. [In Russ.] (ЕЛЕНЕВСКИЙ А. Г. К систематике *Veronica spicata* L. s. l. // *Новости сист. высш. раст.* 1971. Т. 8. С. 215–227.)
- ELENEVSKIY A. G. [Systematics and geography of *Veronica* of the USSR and the adjacent countries.] Moscow, 1978. 259 p. [In Russ.] (ЕЛЕНЕВСКИЙ А. Г. Систематика и география вероник СССР и прилежащих стран. М., 1978. 259 с.)
- KLOKOV M. V. [On spicate veronicas] // *Novosti Sist. Vyssh. Nizsh. Rast.* (1975) [Novit. Syst. Pl. Vasc. non Vasc. (1975)]. Kiev, 1976. P. 92–111. [In Russ.] (КЛОКОВ М. В. О верониках колосистых // *Новости систематики высших и низших растений.* (1975). Киев, 1976. С. 92–111.)
- KLOKOV M. V., KRYTZKA (KRITSKAYA) L. I. [Systematics and geographical distribution of representatives of the genera *Ptarmica* Mill. and *Achillea* L. of the flora of the Ukrainian SSR] // *Tsuyachelistniki [Yarrows] / K. M. Sytnik (ed.).* Kiev, 1984. P. 190–249. [In Russ.] (КЛОКОВ М. В., КРИЦКАЯ Л. И. Систематика и географическое распространение представителей родов *Ptarmica* Mill. и *Achillea* L. флоры УССР // *Тысячелистники / ред. К. М. Сытник.* Киев, 1984. С. 190–249.)
- KOSACHEV P. A., ALBACH D., EBEL A. L. Check-list of *Veronica* subg. *Pseudolysimachium* (*Plantaginaceae*) of Siberia // *Turczaninowia.* 2015. Vol. 18(3). P. 84–95.
- MCNEILL J., BARRIE F. R., BUCK W. R., DEMOULIN V., GREUTER W., HAWKSWORTH D. L., HERENDEEN P. S., KNAPP S., MARHOLD K., PRADO J., PROUD'HOMME VAN REINE W. F., SMITH J. F., WIERSEMA J. H., TURLAND N. J. (eds.). *International Code of Nomenclature for algae, fungi and plants (Melbourne Code): Adopted by the Eighteenth International Botanical Congress, Melbourne, Australia, July 2011.* Königstein, 2012. 274 p. (Regnum Vegetabile. Vol. 154.).
- MOSYAKIN S. L., FEDORONCHUK M. M. *Vascular plants of Ukraine: A nomenclatural checklist.* Kiev, 1999. xxiv + 346 p.

- MOSYAKIN S. L., TSYMBALYUK Z. M. [Peculiarities of pollen grains of *Veronica* L. sect. *Pseudolysimachium* W. D. J. Koch] // Scientific Contributions of the XII All-Russian Palynological Conference (29 September — 4 October 2008, St. Petersburg). St. Petersburg, 2008. Vol. 1. P. 92–98. [In Russ.] (Мосякин С. Л., Цымбалюк З. Н. Особенности пыльцевых зерен секции *Pseudolysimachium* W. D. J. Koch рода *Veronica* L. // Сб. науч. тр. XII Всерос. палинол. конф. (29 сентября — 4 октября 2008 г., Санкт-Петербург). СПб., 2008. Т. 1. С. 92–98.)
- ОСТАПКО В. М. [New species of *Galium* L. (*Rubiaceae*) and *Veronica* L. (*Scrophulariaceae*) from the Southeast of Ukraine] // Ukrayins'k. Bot. Zhurn. 1994. Vol. 51(2/3). P. 84–91. [In Ukr.] (Остапко В. М. Нові види *Galium* L. (*Rubiaceae*) та *Veronica* L. (*Scrophulariaceae*) з південного сходу України // Укр. ботан. журн. 1994. Т. 51(2/3). P. 84–91.)
- ОСТАПКО В. М. New nomenclatural combinations and a new name in *Pseudolysimachion* (*Plantaginaceae* s. l. = *Veronicaceae* s. str.) and *Phlomidoides* (*Lamiaceae*): taxa occurring in Ukraine // Ukrayins'k. Bot. Zhurn. [Укр. ботан. журн.]. 2014. Vol. 71(6). P. 673–675.
- ОСТАПКО В. М., БОЙКО А. В., МОСЯКИН С. Л. [Vascular plants of the Southeast of Ukraine.] Donetsk, 2010. 247 p. [In Russ.] (Остапко В. М., Бойко А. В., Мосякин С. Л. Сосудистые растения юго-востока Украины. Донецк, 2010. 247 с.)
- PRODAN I., NYÁRÁDY E. I. *Achillea* L. // Flora Republicii Populare Romine [Flora Reipublicae Popularis Romanicae]. Vol. 9. Bucureşti, 1964. P. 362–408.
- TRÁVNÍČEK B. Notes on the taxonomy of *Pseudolysimachion* sect. *Pseudolysimachion* (*Scrophulariaceae*) in Europe. I. *P. incanum* and *P. spicatum* // Preslia. 1998. Vol. 70. P. 193–223.
- TRÁVNÍČEK B., LYSÁK M. A., ČIHÁLÍKOVÁ J., DOLEŽEL J. Karyo-taxonomic study of the genus *Pseudolysimachion* (*Scrophulariaceae*) in the Czech Republic and Slovakia // Folia Geobot. 2004. Vol. 39. P. 173–203.
- TSYMBALYUK Z. M., MOSYAKIN S. L. [Atlas of pollen grains of representatives of *Plantaginaceae* and *Scrophulariaceae*.] Kyiv, 2013. 276 p. [In Ukr.] (Цымбалюк З. М., Мосякин С. Л. Атлас пилоквих зерен представників родин *Plantaginaceae* та *Scrophulariaceae*. Київ, 2013. 276 с.)
- TZVELEV N. N. [Genus Yarrow — *Achillea* L.] // Flora Partis Europaeae URSS [Fl. Evrop. Chasti SSSR]. St. Petersburg, 1994. Vol. 7. P. 117–127. [In Russ.] (Цвелёв Н. Н. Род тысячелистник — *Achillea* L. // Флора европейской части СССР. Т. 7. СПб., 1994. С. 117–127.)

## Резюме

Новое название и новая комбинация обнаружены в родах *Achillea* L. (*Asteraceae*) и *Veronica* L. (*Plantaginaceae* s. l. / *Veronicaceae* s. str.): *Achillea* × *tzvelevii* Mosyakin, nom. nov. (*Achillea* × *leptophylloides* Tzvelev, nom. illeg.) для гибрида *A. leptophylla* M. Bieb. × *A. stepposa*

Klokov et Krytzka и *Veronica tzvelevii* (Ostapko) Mosyakin, comb. nova (*Pseudolysimachion tzvelevii* Ostapko; *Veronica pontica* Ostapko, nom. illeg.). Видовые эпитеты посвящены выдающемуся систематику растений Николаю Николаевичу Цвелёву (1925–2015). Представлена информация о типовых образцах (голотипах и изотипах, хранящихся в LE и KW) этих таксонов (оба описаны из Луганской области, юго-восточная часть Украины), даны таксономические и номенклатурные замечания.

Ключевые слова: *Achillea*, *Veronica*, систематика, номенклатура, Украина, Н. Н. Цвелёв.