**Jacobaea taurica (Asteraceae), the new combination for a Crimean protected species**

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**Abstract.** *Senecio tauricus* (Asteraceae) was described as an endemic species restricted to the mountain plateaus (yailas) of the Crimean Peninsula, growing only in meadow-steppe plant communities. The species status for this taxon was accepted in all relevant floras, identification manuals, and checklists; it is also listed in the current edition of the *Red Data Book of Ukraine* (2009) and some other lists of protected plant species. Following the results of recent molecular phylogenetic studies that justified the segregation of several genera housing taxa earlier placed in *Senecio sensu lato*, the new nomenclatural combination *Jacobaea taurica* is proposed. Basic information on morphology, ecology and distribution of *J. taurica* and related taxa is also briefly discussed and summarized.

**Keywords:** *Senecio, Jacobaea, Asteraceae, nomenclature, taxonomy, Crimea, endemic species*

**Introduction**

There are four species of *Senecio* L. [*S. glaucus* L. subsp. *coronopifolius* (Maire) C. Alexander, *S. leucanthemifolius* Poir. subsp. *vernalis* (Wallst. & Kit.) Greuter, *S. tauricus* Konechn., *S. vulgaris* L.] and four species of *Jacobaea* Mill. [*J. borysthenica* (DC.) B. Nord. & Greuter; *J. erucifolia* (L.) Gaertn., B. Mey. & Scherb. (incl. subsp. *arenaria* (Soó) B. Nord. & Greuter and subsp. *erucifolia*), *J. vulgaris* Gaertn., and *J. maritima* (L.) Pelser & Meijden subsp. *maritima*] currently reported for and taxonomically recognized in the Crimean Peninsula (Yena, 2012). However, one of these taxa, *Senecio tauricus* Konechn. (Konechnaya, 1985: 230), in fact belongs to the species aggregate of *Jacobaea vulgaris* Gaertn. (= *Senecio jacobaea* L.), which embraces also several other species, such as *J. ambracea* (Turcz. ex DC.) B. Nord., *J. andrzejowskyi* (Tzvelev) B. Nord. & Greuter, *J. borysthenica* (DC.) B. Nord. & Greuter, and *J. ferganensis* (Schischk.) B. Nord. & Greuter. The Crimean taxon currently known as *S. tauricus* appears to be nomenclaturally "neglected", even after the recent restoration of *Jacobaea*, now recognized as a genus phylogenetically distinct from *Senecio* (Pelser et al., 2002, 2007, 2010; Nordenstam, 2006; Nordenstam et al., 2009). There are several possible reasons for this "negligence": (1) the phytogeographical status of the taxon as a little-known local endemic of Crimea; (2) the lack of its specimens in major herbaria, especially those collected by local botanists, and (3), the lack of relevant sources on the Crimean plants published in languages other than Russian and Ukrainian (see e.g. Cordova, 2015). Here we provide information currently available on this taxon and propose its formal transfer to *Jacobaea*.

**Phylogenetic distinctiveness of Jacobaea**

Recent molecular phylogenetic studies of *Senecio* and related taxa (Pelser et al., 2002, 2007, 2010, etc.; see also an overviews in Nordestam et al., 2009 and Kadereit et al., 2016) justified the segregation of several genera, including *Jacobaea*, housing taxa earlier placed in *Senecio sensu lato*. For most of these taxa, new
combinations or names in the currently recognized genera either were available earlier or have been validated recently. In particular, new combinations for taxa transferred to Jacobaea and other segregates of Senecio have been proposed by Pelser et al. (2006), and then Nordenstam (2006) and Nordenstam and Greuter (in Greuter, Raab-Straube, 2006, 2007) in the course of preparation of the treatment of Asteraceae for the Euro+Med PlantBase Project (Greuter, 2006—onward; Greuter, Raab-Straube, 2008). Totally more than 90 new combinations in Jacobaea were published for species and infraspecific taxa since 2006 (IPNI, 2017—onward). However, no transfer of Senecio tauricus (at any rank) to Jacobaea has been proposed yet, and the species is still recognized in Senecio in the Euro+Med PlantBase (Greuter, 2006—onward) and The Plant List (2013—onward), as well as in recent basic reference publications covering the flora of Crimea (Yena, 2009, 2012; Rudenko, 2016, etc.).

**Taxonomic history of Senecio tauricus**

In Flora Taurica (Privalova, 1969), there was only a note under Senecio jacobaea with some considerations regarding peculiarities of the plants from the Crimean treeless mountain plateaus locally called yailas (yaila in singular; derived from the Crimean Tatar [Qırımtatar] language, meaning summer pasture or summer rangeland; also jaila or yayla in some other Turkic languages): "Plants from the yaila are often of stocky habit, with large heads and long ray florets that are twice as long as the involucre" (Privalova, 1969: 228; in Russian: "Яйлинские растения часто имеют более приземистый рост, крупные корзинки и длинные язычковые цветы, вдвое превышающие длину обертки").

Konechnaya (1985) later described those plants as Senecio tauricus, an endemic species restricted to the Crimean Mountains. According to the protologue, this species differs from S. jacobaea (now Jacobaea vulgaris) in having lower height, lesser number of heads (capitulae) within the terminal corymb, and noticeably larger heads, longer ray florets and involucral bracts. It was also compared in the protologue with S. ambracea Turcz. ex DC. (Candolle, 1838: 348; now Jacobaea ambracea (Turcz. ex DC.) B. Nord.: Nordenstam, 2006: 13) known to occur mainly in southeastern Siberia, the Russian Far East (south), Mongolia, northern China, and Korea (Chen et al., 2011; Zuyev, 2012), from which the Crimean species was reported to differ in a lesser number of ray florets and of inner involucral bracts ("13, not 21", as given in the protologue).

Following its description in 1985, S. tauricus was accepted as a distinct species in all relevant floras, identification manuals, and checklists covering plants of Ukraine and Eastern Europe in general (Katina, 1987; Konechnaya, 1994; Mosyakin, Fedoronchuk, 1999; Yena, 2012). In his analysis of endemism of the Crimean flora, Yena (2001, 2008, 2012) also accepted this species and recognized it as a local endemic of the Crimean Peninsula.

**Ecology of Senecio tauricus**

Senecio tauricus seems to be geographically and ecologically restricted to meadow and meadow-steppe plant communities of the treeless plateaus (yailas) of the Crimean Mountains (see distribution maps and associated information in Yena, 2009; Rudenko, 2015), while Jacobaea vulgaris (= Senecio jacobaea) occurs in a much wider range of open habitats throughout the Crimean Peninsula, including steppe, flatland and foothill meadows, and ruderal plant communities. Judging from available herbarium specimens and field observations, J. vulgaris occurs on yailas very rarely, more likely accidentally due to human activities (transport, tourism etc.). It should be also noted that yaila areas are the most endemic-rich habitats of Crimea, with more than 50% of the currently recognized ca. 106 Crimean endemic vascular plant species occurring here (Yena, 2008). The high diversity of endemic plants in these habitats is partly explained by the diverse altitudes and complexity of landscapes therein, as well as by the complex patterns of geological and biogeographic history of the Crimean region (for further details see Yena, 2008, 2012; Cordova, 2015 and references therein).

According to the new classification proposed for habitats of the Crimean Mountains (Didukh et al., 2016), the actual and expected habitats of S. tauricus belong to the following categories and subcategories: E1.25 Crimean meadows (E1.251 Meadows on deforested areas, and E1.252 Meadow biotopes on yaila karst funnels) and E2.15 Mountain meadow steppe biotopes (E2.1512 Biotopes of mountain sod meadow-steppes on well developed chernozems of highland yailas). According to the EUNIS Habitat Classification (European Environment Agency, 2014—onward; Didukh et al., 2016; Onyshchenko, 2016), such habitats mainly belong to the category E2.251: Ponto-Pannonic mesophile hay meadows.
Morphology of the species, with considerations of its relationships

Judging from morphological characters of plants from the Crimean Mountains, they are indeed closely related to *Jacobaea vulgaris*, differing from the latter mainly in some quantitative characters, particularly those mentioned in the protologue (see above). As a result of examining numerous specimens of this and related species available in *KW* and *CSAU* (herbarium acronyms following Thiers, 2017–onward), we can additionally note that *S. tauricus* also differs from *J. vulgaris* in having rosettes more persistent at maturity, glabrous (almost totally hairless) leaves, wider ray florets, and especially well-developed black widely triangular marks on the tips of inner involucral bracts (in Crimean plants of *J. vulgaris sensu stricto* these black marks are narrowly triangular, hatched, or nearly absent).

Several good field photographs of *S. tauricus* (including close-ups) are available from the Plantarium website (http://www.plantarium.ru/page/view/item/35275.html). Two of these images (photographs by Ilya Turbanov) represent plants identified by Galina Yu. Konechnaya, the author of the species (http://www.plantarium.ru/page/image/id/25994.html; http://www.plantarium.ru/page/image/id/25995.html).

It was convincingly demonstrated recently that *J. vulgaris* is a morphologically and karyologically diverse and variable species (or species aggregate) represented by several cytotypes (ranging from diploids to octoploids, with occasional presence of some aneuploids) and weakly delimited morphotypes, now often treated as subspecies and/or varieties (Wysk et al., 2009; Hodálová et al., 2010, 2015; Conti et al., 2012; Mered’a et al., 2016a, b). Some ecological preferences of these entities were also reported, but their geographical ranges remain insufficiently known (Mered’a et al., 2016a, b). These studies already indicated that octoploids and hexaploids tend to have (among other characters) somewhat longer ray florets, involucral bracts and tubular florets, as compared to the tetraploid cytotype of *J. vulgaris* (Hodálová et al., 2015; Mered’a et al., 2016b). Rather long ray florets and involucral bracts are also peculiar to the Crimean montane plants, which may suggest their higher ploidy level(s). However, no ploidy information is available yet for these Crimean plants.

No synonyms or infraspecific entities have been reported or validated so far for *S. tauricus*. It also has been not yet treated as an infraspecific taxon of any other species. Judging from the information available from the cited and some other references and from selected herbarium specimens (consulted mainly in *CSAU* and *KW*), we were unable to establish possible identity of the Crimean plants with any currently recognized infraspecific taxon of *J. vulgaris* or related species occurring in the neighboring regions (mainland Ukraine, SW European Russia, Central Europe, the Caucasus, the Balkans, etc.). In terms of their gross morphology and especially habit, the stout but rather low-growing Crimean *yaila* plants are evidently different from typical forms of the tetraploid subspecies (*Jacobaea vulgaris* subsp. *vulgaris*) and also from octoploid subspecies [*J. vulgaris* subsp. *gotlandica* (Neuman) B. Nord. and *J. vulgaris* subsp. *pannonica* Hodálová & Mered’a]. The identity of *J. vulgaris* diploids remains taxonomically unresolved (Mered’a et al., 2016b). Crimean plants from *yailas* also differ from predominantly psammophytic taxa *Jacobaea borysthenica* (DC.) B. Nord. & Greuter (= *Senecio borysthenicus* (DC.) Andrz. ex Czern., *S. praetalus* Bertol. var. *borysthenicus* DC.) and *J. andrezejowskyi* (Tzvelev) B. Nord. & Greuter (*S. andrezejowskyi* Tzvelev) occurring mainly along large rivers of Eastern Europe (Tzvelev, 1986; Konechnaya, 1994; Greuter, Raab-Straube, 2006).

Thus, at present we prefer to maintain *S. tauricus* as a separate species of *Jacobaea*, pending further research. Additional comparative morphological, karyological, and molecular phylogenetic studies are needed for identifying the precise phylogenetic position, origin, and the best-suitable taxonomic rank of the Crimean montane plants related to *J. vulgaris* and accepted in recent literature as *S. tauricus*. We hope that this nomenclatural note will attract attention of researchers to this still poorly known taxon and will stimulate its much-needed further detailed studies in comparison with other taxa of the *J. vulgaris* aggregate.

Conservation status of *Senecio tauricus*

*Senecio tauricus* is listed in the 3rd (current) edition of the Red Data Book of Ukraine (Yena, 2009) with the conservation status "Rare"; it is also included in some other regional "red lists" (List..., 2013; Rudenko, 2015; the first list is part of the Ukrainian legislation; the second list has no legal status in Ukraine). The reported main threat factors for that species are its narrow
Holotype of *Senecio tauricus* Konechn. (*LE*01026036), now accepted as *Jacobaea taurica* (Konechn.) Mosyakin & Yena
ecological niche, afforestation of yailas, local livestock grazing, recreation, and potentially also climate changes that may result in aridification and transformation of yaila meadow-steppe plant communities. No special population studies of the species have been performed so far; thus, data on its populations are scarce.

Validation of the new nomenclatural combination

Considering the evident position of *S. tauricus* within the genus *Jacobaea* (in or near the *J. vulgaris* species aggregate), its morphological distinctiveness and partial geographical isolation, as well as the conservational importance and protected status of this taxon, a new combination is needed, which is validated below.

*Jacobaea taurica* (Konechn.) Mosyakin & Yena, **comb. nov.**

Basionym: *Senecio tauricus* Konechn. 1985, *Novitates Systematicae Plantarum Vascularium* 22: 230 (Konechnaya, 1985: 230).

Type (holotype, **LE**, Figure 1): UKRAINE [Crimean Region – Крым, Никитская яйла, 8. 8. 1968, Ю.[Л.]; Меницкий”].

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Мосякин С.Л.1, Ена А.В.2 Jacobaea taurica (Asteraceae), нова комбінація для крымського виду під охороною. Укр. бот. журн., 2017, 74(4): 303–309.

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Senecio tauricus (Asteraceae) був описаний як ендемічний вид, поширенний на гірських плато (яйлах) Кримського півострова, що трапляється лише в лугово-степових рослинних угрупованнях. Цей вид був прийнятий в усіх основних флорах, визначниках та флористичних списках, що стосуються регіону; він також включений до чинного видання Червоної книги України (2009) та деяких інших списків охоронених видів рослин. Згідно з результатами недавніх молекулярно-філогенетичних ісследований, обосновуючих виделення декількох родів, які включають таксони, що входили раніше до Senecio sensu lato, пропонується нова номенклатурна комбінація Jacobaea taurica. Також стисло обговорені та узагальнені основні відомості про морфологію, екологічні особливості та поширення J. taurica та деяких споріднених таксонів.

Ключові слова: Senecio, Jacobaea, Asteraceae, номенклатура, систематика, Крим, ендемічний вид