Lectotypification of *Orchis purpurea* Huds. × *O. punctulata* Steven ex Lindl. (Orchidaceae), described from Crimea, and data on its distribution

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Abstract: Lectotypification of *Orchis purpurea* Huds. × *O. punctulata* Steven ex Lindl. (Orchidaceae), described from the territory of Crimea, is proposed. The following data are presented: basionym, original nomenclatural citation, lectotype designated according to protologue and the repository of original specimen. Some taxonomical notes and data about its modern distribution are provided. The taxon was described as a hybrid, although later it was considered a species. In some publications the taxon is cited only in the remarks for *O. punctulata* or *O. purpurea*, or is not mentioned at all. The contemporary natural distribution of the hybrid is Crimea, Caucasus, Asia Minor and Balkan Peninsula.

Keywords: *Orchis punctulata*, *O. purpurea*, *O. ×wulffiana*, Orchidaceae, lectotypification, distribution.
Introduction

During more than two centuries of floristic investigations in the Crimean Peninsula, 14 taxa of Orchidaceae Juss. have been described, which include 8 species, 3 varieties and some hybrids from this territory (Protopopova et al. 2017). Later, some hybrids have been recognized as species, e.g. Orchis purpurea Huds. × O. punctulata Steven ex Lindl. obtained species name O. ×wulffiana Soó.

In this short communication, we present the results of lectotypification of O. purpurea × O. punctulata, and the data on its modern distribution. The presented work is based on the examination of relevant literature, the critical studies of herbarium specimens deposited in the YALT Herbarium, electronic databases. The nomenclatural treatment and the lectotypification follow the International Code of Nomenclature for algae, fungi, and plants (Turland et al. 2018). The acronyms of herbaria are given according to Thiers (2019 onwards).

Results and discussion

For the first time, the specimens of O. purpurea × O. punctulata were collected by the Crimean amateur-botanist Wankow (Wanjkow) from some localities of the Crimean Mountains (see protologue) in 1912–1913 and were identified as the hybrid: «O. purp. × O. punctu. hybr. nova Wankow» (in the draft herbarium note). On the herbarium label, however, he wrote only «O. purpurea × O. punctulata». The diagnosis of the hybrid was prepared also by Wankow. Now the type material of this taxon is deposited in the YALT Herbarium.

Later, in 1930, Wulf, a Crimean botanist, the author of the «Flora Taurica», described this plant as hybrid nova and indicated its morphological characteristics according to Wankow. The main diagnostic characters of O. purpurea Huds. × O. punctulata Steven ex Lindl. which were noted in the protologue are as follows: «Two tubers, one – 5.5 cm in length, 16 mm in width and 11 mm in thickness; other – 4.5 cm in length, 3 cm in width and 19 mm in thickness ... There are many roots (more than 17), more than 13 cm in length. Stem with inflorescence up to 75 cm in length, stem is faceted and thick, 8–9 mm in diameter. Leaf-like sheaths are two, leaves – 5–6, large, up to 6.5 cm wide, glossy. Inflorescence is oblong, up to 19 cm in length, multi-flowered (up to 100 flowers) ... Segments of perianth form pink-yellow galea, with purple dots and stripes inside. Spur is equal to ⅓ of the ovary, it is bifurcated at the tip, flat. The labellum is wide, as in O. purpurea, the size of lobe is very variable, but larger than O. punctulata, dark-bronze. The pollen is yellowish-green (in O. punctulata yellow), ...» (the original text of the protologue of the hybrid is Russian) (Wulf 1930).

The hybrid was described from several localities of the Crimean Mountains: Mangub-Kale (Mangup-Kale), Kokkozy (now Sokolyne), Laspi, Suuk-Su (now Lisne) (Wulf 1930).

In 2013 in YALT we found the type specimens, one of them was designated as lectotype. Later in 2019 in the herbarium we found two isolectotypes and some
syntypes. We also found another specimens of this hybrid, which were also collected by Wankow in 1911, 1913 and 1916 from Kokkozy, but it must be noted that Wulf did not cited them in the protologue.

_Orchis purpurea_ Huds. × _O. punctulata_ Steven ex Lindl. (Wulf 1930).

**According to the protologue:** «Hab. – Ju. Near Mangub-Kale, 7. V. 13 fl. (Wankow!). – Fa. Kokkozy, 3. V. 12 fl. (Wankow!). – Ju. Laspi, 11. V. 13 (Wankow!); Suuk-su, Theodosia Distr., 23. V. 13 fl. (Wankow!).»

**Lectotype and isolectotypes** (Shevera, Protopopova, Tymchenko, Ryff, designated here): «_Orchis punctulatus_ × _O. purpureus_, Laspi. 24 (11). V. 1913. Leg. & Det. I. Wankow» (YALT s.n.) (Fig. 1).

![Fig. 1 Lectotype of Orchis purpurea Huds. × O. punctulata Steven ex Lindl. (YALT, s.n.).](image-url)
Hungarian botanist Soó in the collaboration with Keller and Schlechter in the middle of 1920’s, commenced the revision of the Orchidaceae family in Europe, based on the materials of the European Herbaria. The name O. ×wulffianus was proposed by Soó for the O. purpurea × O. punctulata (Soó 1932) and he cited all localities of the taxa, which were also indicated by Wulf (1930). Probably, Soó received the herbarium materials from Crimea. However, in the YALT Soó’s critical notes on the specimens of O. purpurea × O. punctulata are absent. It is noteworthy that Soó’s notes are present in the herbarium specimens of some other species and hybrids that he consulted. It should be emphasized that Soó’s critical notes are missing in the material stored at LE, B and H (pers. comm. Efimov, Vogt, Pifkó). Later Soó (1980) in «Flora Europaea» did not mention this taxon, as well as other nothospecies. In the next floristic publications, e.g. «Flora of the USSR» (Nevsky 1935) and «Flora of the European part of the USSR» (Smolyaninova 1976) the hybrid is cited only in notes for O. punctulata and O. purpurea, respectively. In the floras and the manuals of vascular plants of Ukraine and Crimea, it is also omitted (Protopopova 1987; Privalova 1972; Yena 2012, etc.).

For the first time for the Eastern Europe (European part of the former USSR) this hybrid was entered into the nomenclatural list by Czerepanov (1995), later for Ukraine – in the publications of Mosyakin & Fedoronchuk (1999), Vakhrameeva et al. (2008), Fateryga & Kreutz (2014), etc., and in the studies of Hahn (2012) and Kreutz et al. (2018) the taxon was indicated as the hybrid.

For a long time the hybrid was known only from several localities in the Crimea. In addition to the Crimean localities noted by Wulf, the hybrid was confirmed in Laspi (Hahn 2012; Kreutz et al. 2018) and was recorded in new places of the region: vicinity of Theodosia (mountain range Tepe-Oba), near Vesele (Sudak district), Sevastopol, Balaklava, incl. «Cape Aya», near Oboronne, Honcharne and Ozerne (Bengus & Bengus 2011; Kreutz et al. 2018 and informations and photos of Hordiyenko 2006; Svirin 2008; Bronskov 2009; Heluta 2010; Yevseyenkov 2011, 2012, 2018; Fateryga A. 2016; Fateryga V. 2016; Mishustin 2017; Müllauer 2018; dates from Plantarium, Ukrbin, All flowers of Crimea and Flickr Electronic Databases).

The hybrid prefers margins of light oak, pine and juniper forests, artificial pine forests on disturbed steppe. In Crimea the parent’s species, O. punctulata and O. purpurea, grow in similar habitats in plants communities of the classes Quercetea pubescentis Doing-Kraft ex Scamoni et Passarge 1959 and Carpinio-Fagetea sylvatica ex Jakuc ex Passarge 1968; later species is noted also in the plant communities of the classes Trifolio-Geranietea sanguinei T. Müller 1962 and Festuco-Brometea Br.-Bl. et Tx. ex Soó 1947 (Protopopova 2009; Chorney & Protopopova 2009).

Outside Crimea the hybrid was found for the first time in Artvin in NE Turkey (Renz & Taubenheim 1984). Later, more reports appeared about new localities of O. ×wulffiana in the Caucasus, e.g. the Lygotsky forestry of the Sochi National Park (Timukhin 2010), and the vicinity of Tuapse in Krasnodar Region of the Russian Federation (Vakhrusheva & Alekseyev 1998; Chornovol 2006; Vakhrameeva et al. 2008).
2008); in Novomikhaylovka village, near «Orlyonok» Russian National Children Center was noted by Zemlyanoy (2015); in Ashe River basin in vicinities of the villages Kalezh and Makopse (Timukhin & Tuniev 2017; Litvinskaya 2018); and near Su-Psekh (Novorossiysk area) (iNaturalist 2018). The species was listed in the Red book of Krasnodar territory (Timukhin & Tuniev 2017). In 2007 the photo of hybrid from Greece (Thrake, Evros, Dadia forest, 08.05.2007, G. Pastrikos) was presented in DB «Orchids of Greece» (2019). This taxon is also noted in Azerbaijan (Kretzchmar et al. 2007; Hassler 2018). Therefore, the modern distribution area of the hybrid is Crimea, the East Mediterranean (Greece), Caucasus (Russia, Azerbaijan) and Asia Minor (Turkey).

According to Kretzchmar et al. (2007), *O. ×wulffiana* is represented by two nothosubspecies. According to Govaerts et al. (2019) *O. ×wulffiana* nothosubsp. *wulffiana* is known only from Crimea, but nothosubsp. *suckowii* (Kümpel) B. Baumann, H. Baumann, R. Lorenz & Ruedi Peter – from Caucasus and Turkey. The latter nothosubspecies was noted from Krasnodar Region, vicinity of Sochi (Mamaika Mountain), Varvarovka (near Anapa), Goryachiy Klyuch and Gelendzhik (Kümpel 1988; photos and data by Gaydash 2017; Luchkin 2017; Kostenko 2018). In Turkey *O. ×wulffiana* nothosubsp. *suckowii* is distributed only in NE region, where both of its parent taxa *O. punctulata* and *O. purpurea* subsp. *caucasica* (Regel) B. Baumann, H. Baumann, R. Lorenz & Ruedi Peter occur (Hassler 2018; Bizim Bitkiler 2019).

According to Vakhrusheva & Alekseyev (1998), Vakhrameeva et al. (2008) hybridization is possible due to similar time of flowering of both parent species, the presence of common pollinators and the absence of ecological, phytocoenotic and genetic isolations. All the above mentioned allows to make the conclusion about potentially wider distribution of the hybrid in the regions where its parent forms occur. Probably in future, new localities of *O. ×wulffiana* nothosubsp. *wulffiana* might be found in other regions (e.g. West Turkey), where *O. purpurea* subsp. *purpurea* and *O. punctulata* are growing sympatrically, whereas *O. ×wulffiana* nothosubsp. *suckowii* may occur in more eastern areas, where *O. purpurea* subsp. *caucasica* and *O. punctulata* are growing together.

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References

Bengus Yu. V. & Bengus L. M. (2011): Some species and the natural hybrids of the *Orchis* genus from environs of the Sevastopol. – In: Shamrov I. I. (ed): Protection and cultivation of orchids, p. 62–66. – KMK Scientific Press Ltd, Moscow. [in Russian]

BizimBitkiler (2019): Version 3.1. Available at: http://www.bizimbitkiler.org.tr/v3/demo/details.php?id=13682 [accessed March 17, 2019]

Bronskov A. (2009): *Orchis ×wulffiana* Soó. – In: Plantarium: open on-line atlas and key to plants and lichens of Russia and neighouring countries. 2007—2019. Available at: http://www.plantarium.ru/page/image/id/38960.html [accessed March 17, 2019]

Chorney I. I. & Protopopova V. V. (2009): *Orchis purpurea* Huds. – In: Didukh Ya. P. (ed.): Red Data Book of Ukraine, p. 208. – Globalconsaltyng, Kyiv. [in Ukrainian]

Chornovol V. (2006): Orchids of Tuapse District. Etudes about meetings with orchids. – Tuapse, 56 pp. [in Russian]

Czerepanov S. K. (1995): Vascular Plants of Russia and Adjacent States (the Former USSR). – Cambridge University Press, Cambridge, 516 pp.

Fateryga A. V. & Kreutz K. C. A. J. (2014): Checklist of the orchids of the Crimea (Orchidaceae). – J. Eur. Orch. 46 (2): 407–436.

Fateryga A. (2016): *Orchis ×wulffiana* Soó. – In: Plantarium: open on-line atlas and key to plants and lichens of Russia and neighouring countries. 2007—2019. Available at: http://www.plantarium.ru/page/image/id/448662.html [accessed March 17, 2019]

Gaydash T. (2017): *Orchis ×wulffiana* nothosubsp. *suckowii* (Kümpel) B. Baumann, H. Baumann, R. Lorenz & Ruedi Peter. – In: Plantarium: open on-line atlas and key to plants and lichens of Russia and neighouring countries. 2007—2019. Available at: http://www.plantarium.ru/page/image/id/507630.html [accessed March 17, 2019]

Hordiyenko A. (2006): *Orchis ×wulffiana* Soó. – In: All flowers of Crimea. Electronic Database. Available at: http://flora.crimea.ru/Orchidaceae/Orchis-wulffiana.html [accessed March 18, 2019]

Hassler M. (2018): Illustrated World Compendium of Orchids. Version 5.30. Available at: https://worldplants.webarchiv.kit.edu/orchids/ [accessed April 5, 2019]

Heltu V. (2010): *Orchis ×wulffiana* Soó. – In: Plantarium: open on-line atlas and key to plants and lichens of Russia and neighouring countries. 2007—2019. Available at: http://www.plantarium.ru/page/image/id/47157.html [accessed March 17, 2019]

Kostenko V. (2018): *Orchis ×wulffiana* nothosubsp. *suckowii* (Kümpel) B. Baumann, H. Baumann, R. Lorenz & Ruedi Peter. – In: Plantarium: open on-line atlas and key to plants and lichens of Russia and neighouring countries. 2007—2019. Available at: http://apps.kew.org/wcsp/ [accessed March 14, 2019]

iNaturalist DB (2018): *Orchis ×wulffiana*. Available at: https://www.inaturalist.org/observations/20037049 [accessed March 17, 2019]
and lichens of Russia and neighbouring countries. 2007—2019. Available at: http://www.plantarium.ru/page/image/id/586509.html [accessed March 16, 2019]

Kreutz K. C. A. J., Fateryga A. V. & Ivanov S. P. (2018): Orchids of the Crimea. – Kreutz Publishers, SintGeertruid, 576 pp.

Kretzchmar H., Eccarius W. & Dietrich H. (2007): The orchid genera Anacamptis, Orchis, Neotinea: phylogeny, taxonomy, morphology, biology, distribution, ecology, hybridization. – EchinoMediaVerlag, Bürgel, 544 pp.

Kümpe H. (1988): Über Orchis maxima C. Koch und ihre Hybridemit Orchis punctulata Stev. ex Lindl. – Feddes Repert. 99 (3–4): 87–95.

Litvinskaya S. A. (2018): Orchids of Western Caucasus: geography, ecology, sozology. – In: Shyrokov A. I. (ed): Protection and cultivation of orchids, p. 39–41. – Nizhny Novgorod State University press, Nizhny Novgorod. [In Russian]

Luchkin M. V. (2017): Orchis xwulffiana nothosubsp. suckowii (Kümpe) B. Baumann, H. Baumann, R. Lorenz & Ruedi Peter. – In: Plantarium: open on-line atlas and key to plants and lichens of Russia and neighbouring countries. 2007—2019. Available at: http://www.plantarium.ru/page/image/id/509678.html [accessed March 17, 2019]

Mishustin R. (2017): Orchis xwulffiana. – In: Ukrbin. Ukrainian Biodiversity Information Network [public project & web application]. Available at: http://www.ukrbin.com [accessed April 5, 2019]

Mosyakin S. L. & Fedoronchuk M. M. (1999): Vascular plants of Ukraine. A nomenclatural checklist. – M. G. Khododny Institute of Botany, Kiev, 345 pp. https://doi.org/10.13140/2.1/2985.0409

Müllauer H. (2018): Orchis xwulffiana. – In: Flickr DB. Available at: https://www.flickr.com/photos/149709328@N06/42269688631/in/photostream [accessed April 7, 2019]

Nevsky S. A. (1935): Orchidaceae. – In: Komarov V. L. (ed): Flora of the USSR 4, p. 589–730. – Publishers of Academy of Sciences of the USSR, Leningrad. [In Russian]

Orchids of Greece DB. Available at: http://www.greekorchids.gr/or_punctulata_x_purpurea.htm [accessed April 5, 2019]

Privalova L. A. (1972): Orchidaceae. – In: Rubtsov N. I. (ed): Manual of vascular plants of Crimea, p. 93–100. – Nauka, Leningrad. [In Russian]

Protopopova V. V. (1987): Family Orchidaceae.– In: Prokudin Yu. N. (ed): Manual of vascular plants of Ukraine, p. 405–412. – Naukova Dumka, Kiev. [In Russian]

Protopopova V. V. (2009): Orchis punctulata Steven ex Lindl. – In: Didukh Ya. P. (ed): Red Data Book of Ukraine, p. 207. – Globalkonsaltyng, Kyiv. [In Ukrainian]

Protopopova V. V., Tymchenko I. A., Efimov P. G. & Shevera M. V. (2017): Types of names of taxa of the family Orchidaceae described from the territory of Crimea. – Ukr. Bot. J. 74 (4): 326–333. DOI: https://doi.org/10.15407/ukrbotj74.04.326 [In Ukrainian]

Renz J. & Taubenheim G. (1984): Orchis L. (Orchidaceae). – In: Davis P. H. (ed): Flora of Turkey and the East Aegean islands 8, p. 451–600. – Edinburgh University Press, Edinburgh.

Smolyaninova L. A. (1976): Orchidaceae. – In: Fedorov An. A., Egorova T. V. (eds): Flora of the European part of the USSR 2, p. 10–59. – Nauka, Leningrad. [In Russian]

Soó R. (1932): Orchis xwulffianus Soó. – In: Keller G., Soó R. (eds): Monographie der Orchideen Europas und des Mittelmeergebietes. – Repertorium Specierum Novarum Regni Vegetabilis. Sonderbeiheft A. Berlin-Dahlem B 2: 194–195.

Soó R. (1980): Orchis L. – In: Tutin T. G. (ed): Flora Europaea 5, p. 337–342. – Cambridge University press, Cambridge.
Svirin S. (2008): *Orchis × wulffiana* Soó. – In: All flowers of Crimea. Electronic Database. Available at: http://flora.crimea.ru/Orchidaceae/Orchis-wulffiana.html [accessed March 17, 2019]

Thiers B. (2019): Index Herbariorum: A global directory of public herbaria and associated staff. New York Botanical Garden’s Virtual Herbarium. – New York. Available at: http://sweetgum.nybg.org/science/ih/ [accessed September 19, 2019]

Timukhin I. N. (2010): Natural hybrids of the genus *Orchis* (Orchidaceae) representatives in Tuapse-Adler floristic district of the Western Transcaucasia. – Botan. J. 95 (2): 187–190. [In Russian]

Timukhin I. N. & Tuniev B. S. (2017): *Orchis × wulffiana* Soó. – In: Litvinskaya S. A. (Ed.): Red book of the Krasnodar territory. Plant and Fungi. Ed. 3, p. 541–542. – Krasnodar region administration press, Krasnodar. [In Russian]

Turland N. J., Wiersema J. H., Barrie F. R., Greuter W., Hawksworth D. L., Herendeen P. S., Knapp S., Kubert W.-H., Li D.-Z., Marhold K., May T. W., McNeill J., Monro A. M., Prado J., Price M. J. & Smith G. F. (eds.) (2018): International Code of Nomenclature for algae, fungi, and plants (Shenzhen Code) adopted by the Nineteenth International Botanical Congress Shenzhen, China, July 2017. Regnum Vegetabile 159. – Koeltz Botanical Books, Glashütten. DOI: https://doi.org/10.12705/Code.2018

Vakhrusheva L. P. & Alekseyev A. A. (1998): Interspecific hydridization in populations of species of genus *Orchis* L. – Bull. I.S. Kosenko Bot. Gard. Kubsan’ Agricult. Univ. 7: 41–44. [In Russian]

Vakhrameeva M. G., Tatarenko I. V., Varlygina T. I., Totosyan G. K. & Zagulskii M. N. (2008): Orchids of Russia and adjacent countries (within the borders of the former USSR). – A.R.G. GantherVerlag, Ruggell, 690 pp.

Wulf E. W. (1930): Flora of the Crimea 1(3), p. 108–109. – Publishers of Nikitskiy Botanical Garden, Leningrad. [In Russian]

Zemlyanoy A. (2015): *Orchis × wulffiana* Soó. – In: Macroclub. Available at: http://macroclub.ru/gallery/showphoto.php/photo/202832/cat/ [accessed March 9, 2019]

Yena A. V. (2012): Spontaneous flora of the Crimean Peninsula. – N. Orianda, Simferopol, 232 pp. [In Russian]

Yevseyenkov P. (2011): *Orchis × wulffiana* Soó. – In: Plantarium: open on-line atlas and key to plants and lichens of Russia and neighbouring countries. 2007—2019. Available at: http://www.plantarium.ru/page/image/id/85906.html [accessed March 17, 2019]

Yevseyenkov P. (2012): *Orchis × wulffiana* Soó. – In: Plantarium: open on-line atlas and key to plants and lichens of Russia and neighbouring countries. 2007—2019. Available at: http://www.plantarium.ru/page/image/id/130576.html [accessed March 17, 2019]

Yevseyenkov P. (2018): *Orchis × wulffiana* Soó. – In: Plantarium: open on-line atlas and key to plants and lichens of Russia and neighbouring countries. 2007—2019. Available at: http://www.plantarium.ru/page/image/id/564881.html [accessed March 17, 2019]

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