

## 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.

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## 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  $\frac{1}{3}$  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.).

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 *Carpino-Fagetea sylvaticae* Jakucs 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); 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 (Thrace, Evros, Dadia forest, 08.05.2007, G. Pastrokos) 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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