Article

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Two new taxa for the flora of Georgia (Sakartvelo, Caucasus)

Abstract

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Two new species for the flora of Georgia - *Cerastium perfoliatum* and *Valerianella sclerocarpa* are recorded. They were found in the semiarid climate zone (BSxa) on the eastern ending of Iaghluja Ridge in the Rustavi vicinity (Kvemo Kartli region, East Georgia). They grow in the hemixerophytic and xerophytic shrubberies on the dry grey-cinnamonic soils. Coordinates, altitude and a map of the new location of target species are given in the article. The voucher herbarium specimens are housed at the National Herbarium of Georgia (TBI).

Key words: new records, *Cerastium perfoliatum*, *Valerianella sclerocarpa*, distribution area, Caucasus.

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Introduction

The flora of Georgia is distinguished by a great diversity. In this small area of 69.700 km² 4275 species of vascular plants are recorded (Davlianidze & al. 2018). However, the discovery of new taxa for the flora of Georgia continues to this day (Lachashvili & al. 2004, 2007; Lachashvili 2014; Jinjolia & Shakarishvili 2014; Lachahsvili & Eradze 2017; Kereselidze & al 2021, etc.). For comparison, we note that 4130 species are included in the first edition of the Checklist of the Flora of Georgia (Gagnidze 2005). Such a difference is related to new field and literature data.

During the phytosociological studies conducted in 2021-2023 two new species for the flora of Georgia were found on the Iaghluja Ridge (East Georgia, Kvemo Kartli). They are *Cerastium perfoliatum* L. (*Caryophyllaceae*) and *Valerianella sclerocarpa* Fisch. & C.A. Mey. (*Valerianaceae*).

The native range of *Cerastium perfoliatum* includes Mediterranean (Spain, Morocco, Lebanon-Syrian desert), Balkan peninsula (Bulgaria and Turkey-in-Europe), east part of Europe, Caucasus, Crimea, Anatolia, south part of Central Asia, South-West Asia (south-east of Iran, Iraq). In the South Caucasus it was known from Armenia and Azerbaijan until

now (Khalilov 1952; Shishkin & Avetisyan 1956; Sell & Whitehead 1964; Cullen 1967; Akhani 1998; Sokolova 2012; Euro+Med 2006-; POWO 2023).

Valerianella sclerocarpa is characterized by disjunctive distribution area. Its total native range includes Central Asia (Mountain Turkmenistan and Tajikistan), South-West Asia (north part of Iran, Afghanistan), Caucasus, East Mediterranean (Israel, Jordan and Palestine) and Arabian Peninsula. In the Caucasus it was known from Armenia, Azerbaijan and Russian Federation (south part of Dagestan) until now (Karyagin 1961; Avetisyan 1980; Galushko 1980; Akhani 1998; Mikheev 2008; Llewellyn & al. 2011; Euro+Med 2006-; Danin & Fragman-Sapir 2016+: Ali-Shtayeh & Jamous 2018; POWO 2023).

Materials and Methods

Collection of floristic and phytosociological data was carried out over 2021-2023. Phytosociological descriptions (relevés) of plant communities were carried out using the Braun-Blanquet method (1964). Observation and monitoring of target species, as well as phytosociological surveys of plots, were conducted flowering and fruiting periods. The number of individuals of the target species was counted in each plot. Target species were assessed using IUCN Red List (2021) categories and criteria.

Results

Description of the study area. – *Cerastium perfoliatum* and *Valerianella sclerocarpa* were found on the eastern ending of Iaghluja Ridge in the Rustavi vicinity (Kvemo Kartli region, East Georgia) (Fig. 1).

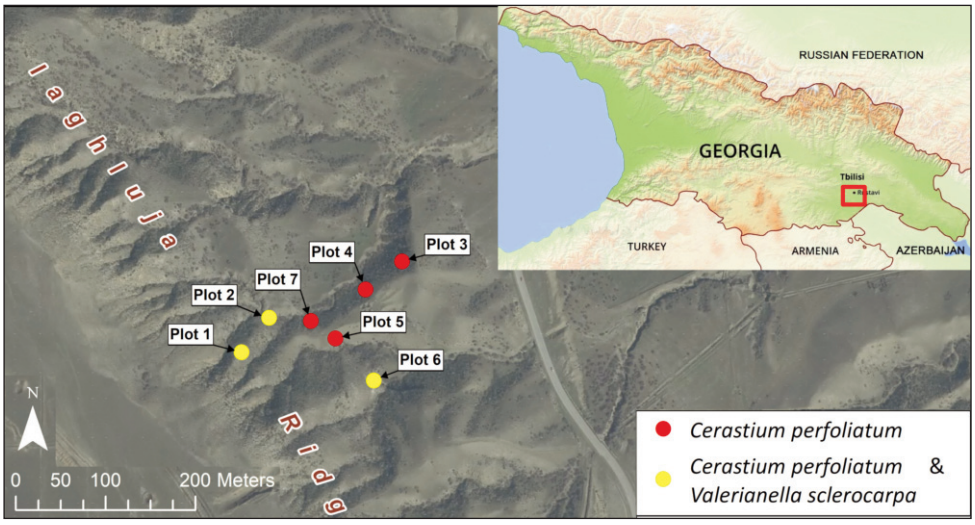

Fig. 1. Map of distribution of *Cerastium perfoliatum* and *Valerianella sclerocarpa* in Georgia.

The Iaghluja Ridge is located in the Kvemo Kartli lowland, which it divides into two parts. The new distribution area of these species is characterized by the alternation of slopes and ravines of different inclinations and exposures. The area belongs to moderately warm steppe climate zone with hot summer and precipitation with two minimum per year (BSxa). The average annual temperature is up to 13°C. The average annual precipitation is in the range of 400-440 mm. Evaporability exceeds 1000 mm. Humidity ratio is lower than 0.6 (Gobejishvili 2012; Bolashvili & al. 2018). Various modifications of gray-cinnamonic soils with varying degrees of salinity are developed. In most cases the soils are skeletal (stony) or clayey (Urushadze 1999, 2016).

This territory is used for pasture and are under permanent anthropogenic pressure.

New data on target species. – The key data on the distribution of the mentioned species in Georgia on the Iaghluja Ridge are presented below.

Cerastium perfoliatum grows on the dry slopes and ravines in the various hemixerophytic and xerophytic shrubberies, in particular in the plant communities of *Paliurus spina-christi* Mill., *Atraphaxis spinosa* L. and *Caragana grandiflora* (M. Bieb.) DC. both on the skeletal (stony) or clayey gray-cinnamonic soils.

- N 41.541667°, E 44.973889°; 475 m a.s.l.; approximately 100 individuals;
- N 41.541389°, E 44.973333°; 475; 4 individuals;
- N 41.540833°, E 44.973611°; 475-485 m a.s.l.; approximately 2300 individuals;
- N 41.540833°, E 44.972778°; 497 m a.s.l.; 7 individuals;
- N 41.541083°, E 44.972217°; 500-550 m a.s.l.; approximately 300 individuals;
- N 41.540833°, E 44.972222°; 498 m a.s.l.; approximately 100 individuals.

Total area of occupancy of *Cerastium perfoliatum* on the Iaghluja Ridge is about 14440 m². The total number of individuals of *C. perfoliatum* in the new sites is approximately 2850.

Valerianella sclerocarpa was found in the xerophytic shrubberies, in particular in the plant communities of *Atraphaxis spinosa* and *Caragana grandiflora*. Its individuals are recorded only on the gray-cinnamonic soil containing clay.

- N41.540833°, E44.973611°; 475-485 m a.s.l.; approximately 240 individuals;
- N41.541083°, E44.972217°; 500-550 m a.s.l.; approximately 200 individuals;
- N41.540833°, E44.972222°; 498 m a.s.l.; approximately 200 individuals.

Total area of occupancy of *Valerianella sclerocarpa* on the Iaghluja Ridge is about 6400 m² and total number of individuals is approximately 640.

It should be noted that no target species were observed outside the above plots.

Target species in the new distribution area are under permanent anthropogenic pressure (grazing). Nevertheless, the condition and vitality of both species are satisfactory. Most of their individuals blooms, bear fruit and complete their life cycle (Fig. 2).

In accordance with the IUCN regional assessment, *Cerastium perfoliatum* and *Valerianella sclerocarpa* were preliminarily assessed as critically endangered [CR B1ab(iii) + 2ab(iii)].

The herbarium specimens are housed at the National Herbarium of Georgia (TBI). Barcodes of the herbarium specimens are given below:

***Cerastium perfoliatum*:** TBI1068168, TBI1068169, TBI1068170, TBI1069321, TBI1069322, TBI1069323, TBI1069324, TBI1069325, TBI1069326

***Valerianella sclerocarpa*:** TBI1068162, TBI1068163, TBI1068164, TBI1068165, TBI1068166, TBI1068167, TBI1069327, TBI1069328, TBI1069329, TBI1069330, TBI1069331, TBI1069332, TBI1069333, TBI1069334

Fig. 2. *Cerastium perfoliatum* (a) and *Valerianella sclerocarpa* (b) in various phases on the Iaghluja Ridge (photos by N. Lachashvili).

Discussion

Cerastium perfoliatum and *Valerianella sclerocarpa* in Georgia are distributed in the characteristic of them semi-arid climate conditions and on the corresponding dry soils. Moreover, they grow in the natural plant communities. Their individuals were not observed in the ruderal areas, roadsides and other similar secondary habitats.

Therefore, in our opinion, they are not newly common in Georgia. We think that due to the smallness of the distributed area, these species did not fall into the field of view of scientists. Proof of this is *Tulipa biflora* Pall., which was found a few years ago in this exact location (Kereselidze & al. 2021). It must be noted that *Cerastium perfoliatum* and *Valerianella sclerocarpa* were found during the study of *Tulipa biflora*.

In addition, the distribution area of these species is far away from the highway and has no connection with it, which excludes the invasiveness of these plants. In case of invasion, these species should first spread on the roadsides and in the ruderal areas.

The discovery of new species with such a small area within Georgia is regular, because the country is located in the intersection area of different floristic centers, which conditions the natural distribution of typical and widespread species for different regions.

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