

A CONTRIBUTION TO THE LICHENIZED MYCOTA OF ZANJAN PROVINCE, IRAN

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A preliminary checklist of 56 species of lichenized fungi from Zanzan province, Iran, is presented. *Caloplaca agardhiana*, *Lepraria alpina*, *Lepraria nivalis* and *Staurothele areolata* are new entries to the mycota of Iran and 52 species are new records for the province. A second locality is discovered for the rare endemic species of *Aspicilia persica*.

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Key words. Lichens, Iran, New records, Taroum, Zanzan province.

مقدمه ای بر فارچهای گلشنکی استان زنجان

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فهرست اولیه از ۵۶ گونه فارچ گلشنکی از استان زنجان، ایران ارائه می گردد. از بین آن ها چهار گونه زیر برای نخستین بار برای ایران گزارش می شود.

Caloplaca agardhiana, *Lepraria alpina*, *Lepraria nivalis*, *Staurothele areolata*

تعداد ۵۲ گونه برای اولین بار از استان زنجان معرفی می گردد. هم چنین یک موقعیت جدید پراکنشی نیز برای گونه نادر *Aspicilia persica* گزارش می شود.

Introduction

Herbarium records show that the earliest collections of lichen species from Iran date back 185 years, when European botanists were interested in searching for what might have been the biblical manna and its habitat throughout the deserts and steppes of the Middle East. In spite of such an early attention to the lichen species of the Iranian plateau, there are still some provinces of Iran, which have not been explored or remain poorly known. One of the least investigated provinces of Iran is Zanzan, located in the NW of the country. The present contribution summarises the current knowledge

of the lichens and lichenicolous fungi from Zanzan province.

The history of lichen collecting in Zanzan province is very short. According to our information, the first collection of lichens from Zanzan dates back to 1974 when Reino Alava, a Finnish botanist, made a botanical excursion throughout the Zagross Mountains from the NW to the SW of Iran. During the preparation of the second revised lichen checklist for lichens and lichenicolous fungi of Iran by Seaward et al. (2008) some of his collections were studied, but only four lichen species, *Arthonia calcicola* Nyl. *Collema*

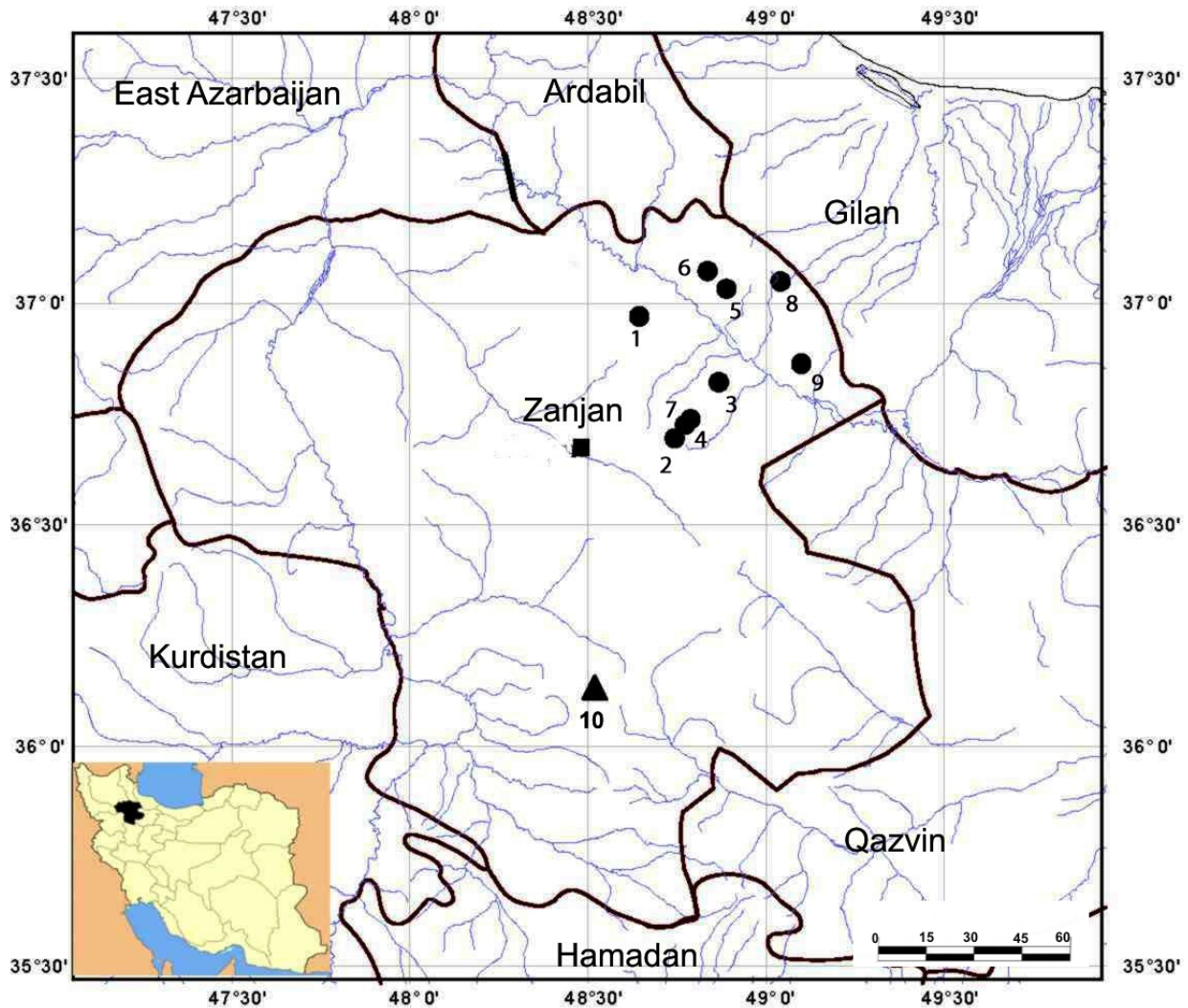


Fig. 1: Zanjan province, Iran, with the Alava collecting site marked by triangle and those of Toghranegar by dots.

polycarpon Hoffm. subsp. *corcyrense* (Arnold) Pisút, *Fulgensia schistidii* (Anzi) Poelt, and *Polysporina cyclocarpa* (Anzi) Vězda, were included in the checklist and published.

A second collection of lichens was made by Z. Toghranegar during 2007-2008. During fieldwork throughout Taroum district in the NE of the province many lichens specimens were collected. Parts of these lichen collections were sent to the senior author for identification. However, most of the collection remain unidentified because they were unavailable for study and the received specimens were scanty and difficult to identify and therefore, the present report deals with only part of the collection. In the present study, fifty-six lichenized fungi species were documented for the first time from Zanjan province.

Methods

The checklist is compiled primarily from voucher specimens identified or verified by the first and second authors. The part of this material collected by Reino Alava in 1974 is now housed in the Turku University Herbarium (TUR). The additional collection provided by the third author from the NE of the province, mainly from Taroum district, is deposited at the botanical herbarium of the Science and Research Branch of the Islamic Azad University of Tehran, with some duplicates in the herbarium of M. Sohrabi [hb. Sohrabi]. However, identifications are based only on duplicates sent to M. Sohrabi.

In general, specimens were identified with the use of light microscope and stereo-microscope and on the basis of morphological characters and spot tests (K, C, KC, P, N

and KOH/I). For some selected species, thin layer chromatography was performed following with solvent systems (A, B, C) in Orange et al. (2001). The following references were consulted: Ahti et al. (2007); Purvis et al. (1992); Wirth (1995) and Saag et al. (2009). Additionally some identifications were supported by comparison with authorized specimens in the lichen herbaria of Berlin (B) and Helsinki (H). The nomenclature used here follows Index Fungorum, CABI Bioscience et al. (2009) and the record status is in accordance with the recent checklist for Iranian lichens and lichenicolous fungi (Seaward et al. 2008). The new records for Iran are indicated with an asterisk (*).

Locality information

- (1): 135 Km NW of Zanjan, surroundings of Validar village, 36°57'58"N / 48°38'57"E; 1100-1200 m., 23 Nov. 2007.
- (2): 35 Km NW of Zanjan, surroundings of Galijeh Emâm village, 36°41'35"N / 48°44'56"E; 2300-2400 m., 02 May 2008.
- (3): 105 Km NW of Zanjan, surroundings of Hezarrod village, 36°49'5"N / 48°52'20"E; 600-950 m., 30 Mar. 2008.
- (4): 40 Km NW of Zanjan, surroundings of Khanchai village, 36°43'21"N / 48°46'39"E; 1800 m., 30 Nov. 2007.
- (5): 50 Km NW of Zanjan, surroundings of Duman village, 37° 1'38"N / 48°53'40"E; 2000-2100 m., 25 May 2008.
- (6): 140 Km NW of Zanjan, surroundings of Nokian village, 37° 4'1.13"N / 48°50'28"E; 700-900 m., 16 Nov. 2007.
- (7): 115 Km NW of Zanjan, surroundings of Vaznesar village, 36°44'7"N / 48°47'34"E; 1100-1200 m., 09 Nov. 2007.
- (8): 110 Km NW of Zanjan, surroundings of Jamal abad village, 37° 2'38"N / 49° 2'45"E; 2300 m., 01 June 2008.
- (9): 110 Km NW of Zanjan, surroundings of Charazeh village, 36°51'34"N / 49° 6'1"E; 700-850 m., 20 Nov. 2007.
- (10): Hills above Dashti, Qeydar mountain, c. 35 km SW of Soltaniyeh, 36° 8'N / 48°31'E (estimated from Google Earth); 2200-2600 m, 17 June 1974.

The Species

- Acarospora cervina* (Ach.) A. Massal. [s. lat.]
(4) Toghranegar 608, on calcareous rock [hb. Sohrabi].
- Arthonia calcicola* Nyl.
Seaward et al. 2008: 464. - (10) Alava 14613, on calcareous rock [TUR].

- Arthonia radiata* (Pers.) Ach.
(3) Toghranegar 763, on bark of deciduous tree, *Acer* sp. [hb. Sohrabi].

- Aspicilia calcarea* (L.) Körb.
(10) Alava 14620 (under *Lecidea tessellata*), 14621, 14627, on calcareous rock [TUR].

- Aspicilia persica* (Müll. Arg.) Sohrabi
(5) Toghranegar 343, 706, on calcareous rock [hb. Sohrabi].
This is the second report of this species, originally described from a locality near Tehran by Müller (1892). Misunderstanding and nomenclatural problems relating to this species are treated in Seaward et al. (2008).

- * *Caloplaca agardhiana* (Flot.) Flagey
(10) Alava 14604, on calcareous rock [TUR].

- Caloplaca biatorina* (Trevis.) J. Steiner
(10) Alava 14599, on calcareous rock [TUR].

- Caloplaca decipiens* (Arnold) Blomb. & Forssell
(1) Toghranegar 547, on calcareous rock [hb. Sohrabi];
(10) Alava 14594, on calcareous rock [TUR].

- Caloplaca fuscoatroides* J. Steiner
(5) Toghranegar 363, on calcareous rock [hb. Sohrabi].

- Caloplaca pyracea* (Ach.) Th. Fr.
(1) Toghranegar 635, on bark of deciduous tree, *Fraxinus* sp. [hb. Sohrabi].

- Caloplaca saxicola* (Hoffm.) Nordin [s. lat.]
(7) Toghranegar 488, on calcareous rock [hb. Sohrabi].

- Caloplaca schistidii* (Anzi) Zahlbr.
Seaward et al. 2008: 474. - (10) Alava 14669, on calcareous soil [TUR].

- Caloplaca stillicidiorum* (Vahl) Lynge
(5) Toghranegar 697b, on moss covered calcareous rock [hb. Sohrabi].

- Caloplaca trachyphylla* (Tuck.) Zahlbr.
(7, 8) Toghranegar 498, 299, 798, on calcareous rock [hb. Sohrabi].

- Candelariella rhodax* Poelt & Vězda
(2) Toghranegar 648b, on calcareous soil [hb. Sohrabi].

- Collema fuscovirens* (With.) J. R. Laundon
(4) Toghranegar 392, on calcareous rock [hb. Sohrabi].

Collema polycarpon subsp. *corcyrense* (Arnold) Pišút
Seaward et al. 2008: 479. - (10) Alava 14656, on
calcareous rock [TUR].

Dermatocarpon minutum (L.) W. Mann
(1, 4, 5) Toghranegar 450a, 351, 708, on calcareous
rock [hb. Sohrabi]; (10) Alava 14592, on calcareous
rock [TUR, Sohrabi].

Diploschistes ocellatus (Fr.) Norman
(6) Toghranegar 482, on calcareous rock [hb. Sohrabi].

Diploschistes scruposus (Schreb.) Norman
(3) Toghranegar 763a, on calcareous rock [hb.
Sohrabi].

Diplotomma venustum (Körb.) Lettau
(10) Alava 14610, 14611, 14613 (sub. *Arthonia*
calcicola), on calcareous rock [TUR].

Fulgensia subbracteata (Nyl.) Poelt
(4) Toghranegar 474, on calcareous soil [hb. Sohrabi].

Glypholecia scabra (Pers.) Müll. Arg.
(8) Toghranegar 279, on calcareous rock [hb. Sohrabi];
(10) Alava 14593, on calcareous rock [TUR].

Lecanora argopholis (Ach.) Ach.
(1, 5) Toghranegar 545, 285, on calcareous rock [hb.
Sohrabi].
TLC: zeorin, usnic acid, fatty acid.

Lecanora chlorotera Nyl.
(8) Toghranegar 793a, on bark of deciduous tree,
Quercus sp. [hb. Sohrabi].
TLC: atranorin, gangaleoidin.

Lecanora dispersa (Pers.) Röhl. [s.lat.]
(4) Toghranegar 711a, on calcareous rock [hb.
Sohrabi].

Lecanora garovaglii (Körb.) Zahlbr.
(4) Toghranegar 480, on calcareous rock [hb. Sohrabi];
(10) Alava 14607, 14640, on calcareous rock [TUR].

Lecanora horiza (Ach.) Linds.
(3) Toghranegar 734, on bark of deciduous tree [hb.
Sohrabi].

Lecidea tessellata Flörke
(10) Alava 14620, 14621, 14627, on calcareous rock
[TUR].

Lecidella carpathica Körb.

(1) on calcareous rock. Toghranegar 551 [hb. Sohrabi];
(10) Alava 14619, 14609 [TUR].

Lecidella stigmatea (Ach.) Hertel & Leuckert
(10) Alava 14597-a, on calcareous rock [TUR].

**Lepraria alpina* (B. de Lesd.) Tretiach & Baruffo
(4) Toghranegar 600, on moss covered calcareous rock
[hb. Sohrabi].
TLC: Atranorin, fatty acid.

**Lepraria nivalis* J. R. Laundon
(5, 6) Toghranegar 695, 467, on moss covered
calcareous rock [hb. Sohrabi].
TLC: Atranorin, psoromic acid.

Lepraria vouauxii (Hue) R. C. Harris
(9) Toghranegar 557, on moss covered calcareous rock
[hb. Sohrabi].
TLC: pannaric acid 6-methylester.

Lobothallia radiosa (Hoffm.) Hafellner
(10) Alava 14672, on calcareous rock [TUR].

Peltigera monticola Vitik.
(5) Toghranegar 694, on calcareous soil [hb. Sohrabi].

Physcia adscendens (Th. Fr.) H. Olivier
(3) Toghranegar 591, on bark of deciduous tree,
Quercus sp. [hb. Sohrabi].

Physcia tribacia (Ach.) Nyl.
(10) Alava 14616, on calcareous rock [TUR].

Physconia perisidiosa (Erichsen) Moberg
(5) Toghranegar 697a, on moss covered calcareous
rock [hb. Sohrabi].

Placidium semaforonense (Breuss) Breuss
(10) Alava 14643, on calcareous soil [TUR].

Placopyrenium bucekii (Nadv. & Servit) Breuss
(2) Toghranegar 678, on stone/moss [hb. Sohrabi].

Polysporina cyclocarpa (Anzi) Vězda
Seaward et al. 2008: 499. - (10) Alava 14659, on
calcareous rock [TUR].

Protoparmeliopsis muralis (Schreb.) M. Choisy
(1) Toghranegar 526, on calcareous rock [hb. Sohrabi];
(10) Alava 14675, 14595b, 14646, 14645, on
calcareous rock [TUR].

Ramalina capitata (Ach.) Nyl.

(8) Toghranegar 310, on siliceous rock [hb. Sohrabi].

Rhizocarpon geographicum (L.) DC.

(2) Toghranegar 661, on calcareous rock [hb. Sohrabi].

Rhizoplaca melanophthalma (DC.) Leuckert

(2, 4) Toghranegar 367a, 491a, on calcareous rock [hb. Sohrabi].

Rhizoplaca peltata (Ramond) Leuckert & Poelt

(2, 4) Toghranegar 367b, 491b, on calcareous rock [hb. Sohrabi].

Rinodina bischoffii (Hepp) A. Massal.

(10) Alava 14664, on calcareous rock [TUR].

Seiophora contortuplicata (Ach.) Frödén

(8) Toghranegar 309, on calcareous rock [hb. Sohrabi].

Squamarina cartilaginea (With.) P. James(9) Toghranegar 483, on calcareous soil [hb. Sohrabi].
TLC: Atranorin, psoromic acid, roccellic acid.* **Staurothele areolata** (Ach.) Lettau

(10) Alava 14655, on calcareous rock [TUR].

Toninia sedifolia (Scop.) Timdal

(6) Toghranegar 465a, 465b, on calcareous soil [hb. Sohrabi].

Tornabea scutellifera (With.) J. R. Laundon(8) Toghranegar 308, usually grows on bark of deciduous tree, but our examined specimen was collected on calcareous rocks, together with *Seiophora contortuplicata* [hb. Sohrabi].**Umbilicaria aprina** Nyl.

(2) Toghranegar 685, on siliceous rock [hb. Sohrabi].

Xanthoparmelia stenophylla (Ach.) Ahti & D. Hawksw.(7, 8) Toghranegar 327, 572, on calcareous rock [hb. Sohrabi].
TLC: usnic acid, salazinic acid, unknown substance.**Xanthoria parietina** (L.) Beltr.

(7) Toghranegar 410, on bark of deciduous tree [hb. Sohrabi].

Discussion

Over 130 specimens were examined from the province and as a result 56 lichenized fungi were identified. The map (Fig. 1) shows that the collecting sites are not covering the full area of the province. Thus the limited number of species encountered is perhaps the result of the rather restricted survey area and limited number of collecting trips to only a few localities in the northeast of the province. Further lichenological survey is highly needed to understand the lichen diversity of this fascinating region.

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