

## The First Information about Lichens of Kura Araks Lowland

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### Abstract:

*The paper introduces preliminary information about lichens of Kura Araks lowland. The list includes 58 species, 2 varieties of 26 localities. Out of this, 17 species were new to the Kura Araks lowland and 3 species for the lichen flora of Azerbaijan.*

**Key words:** diversity, lichen biota, lichens, Kura Araks lowland

### Materials and methods

The material for this work was the collection of lichens compiled by the author in various years considering publication data. Collection of material carried by a shuttle. Determination of samples was carried out by the usual method (Key to ..., 1974). Specimens are kept in the Lichenological herbarium (LH) at the Institute of Botany, ANAS (Baku). The nomenclature follows recent literature (eg, Blanco et al., 2004; Eriksson, 2006, Kirk et al., 2008) and the database: Index Fungorum ([www.indexfungorum.org/Names/Names.asp](http://www.indexfungorum.org/Names/Names.asp)).

Despite the long history of lichenological research in the region, lichen flora of the Kura Araks lowland is not explored fully. Since the literature contains only fragmentary information about the lichens of the researched lowland

[3,4,11,12,13,] material collected by us in different years is of interest; as it identified three species identified for the first time of the lichen flora of Azerbaijan, and 17 for the researched area.

Kura Araks lowland is the largest one in the Eastern Transcaucasia within Azerbaijan. It occupies a vast territory located on the lower reaches of the rivers Kura and Araks between the Greater and Lesser Caucasus mountains and Lankaran. Stretching out from the west to Mingechaur shores of the Caspian Sea in the east, it takes more than a quarter of the territory of Azerbaijan Republic. It can be attributed to the very flat and the driest region of the country. However, it is the largest area of irrigated agriculture.

Lowland climate refers to the subtropical, warm, continental. Dry and hot summers (average July temperature is +27 °C, sometimes up to +40 °C), relatively warm winter with little snow (average January temperature +1 °C). In the mountains, winter and summer cooler (at altitudes from 1 to 2 thousand meters the average January temperature is - 6 °C, average July +14 °C).

Kura Araks lowland refers to the botanical and geographical area of semi East Transcaucasian lowlands. Modern lowland vegetation is essentially secondary and much poorer than how it was in its infancy. [7].

Kura Araks lowland is dominated by dry steppes and semi-deserts with ephemera, thistles and wormwood, in the foothills - bushland. Forest vegetation of Iberian oak, red chestnut, beech, hornbeam, willow and poplar is present mainly in river valleys and lowlands.

Lichenoflora deserts and semi-deserts are poor, which is primarily due to the presence solonchaks, slightly saline and saline soils. It is known that the majority of lichen do not tolerate chloride and sulphate salinity unlike angiosperms group clearly expressed halophytes lichens are very numerous. Only a few species of the family mainly *Collemataceae*, *Verrucariaceae* growing on saline soils - it *Collema tenax* (Sw.)

Ach., *Endocarpon adscendens*, *Diploschistes gypsaceus* (Ach.) Zahlbr., *Teloschistes lacunosus* (Rupr.) Savicz. In areas of semi-desert sagebrush saltwort, winter pastures are marked: *Cladonia convoluta* (Lam.) Anders, *C. subrangiformis* Sandst., *Cetraria steppae* (Savicz) Kdrnefelt, *Squamarina lentigera* (Weber) Poelt

Steppe vegetation in Azerbaijan preserved only in fragments and islets. Most of the virgin soil of the steppe has long been plowed and used under rainfed agriculture. Anthropogenic impact, the cultivated area were led to a depletion of the lichen flora of the steppe. Many prairie species of lichens, being repressed by gradual development of steppe lands, settled in their respective ecological niches, in areas where habitat conditions are similar to the steppe. In general, the composition of the steppe lichenflora have got no special variety.

### List of species of lichens of Kura Araks lowland.

\* - Lichen species new to the lichen flora of Azerbaijan;

\*\* - Lichen species new to the Kura Araks lowland.

**Acarospora schleicheri** (Ach.) A. Massal.: Djebail regions: Geanskaya steppe. On solonchic soil [Voronov, 1915; Barkhalov, 1983].

\*\* **Alyxoria varia** (Pers.) Ertz & Tehler: Barda region, oak-hornbeam forest [15.07.2009, LH] , on *Quercus castaneifolia* C.A Mey.

\*\* **Anaptychia ciliaris** (L.) Körb. ex A. Massal.: Barda region, oak-hornbeam forest [10.07.2009, LH], on the rind of *Quercus castaneifolia* C.A Mey.

\***Arthopyrenia laburni** Leight. ex Arnold: Yevlakh region, in the forest, on *Quercus castaneifolia* C.A Mey. [Alverdieva, 2009].

**Caloplaca aurantia** (Pers.) Hellb.: Aghdash region, vicinity [10.07.2012, LH]; Shirvan: vicinity of Hadjigabul lake. On stones and rocks [Barkhalov, 1983].

**C. cerina** (Ehrh. ex Hedw.) Th. Fr.: Aghdash region, Turianchay village. On the bark of trees. [Barkhalov, 1983].

**C. cerinella** (Nyl.) Flagey: Aghdash region, Bozdagh Ridge. On tree trunks [Barkhalov, 1983].

**\*\*C. citrina** (Hoffm.) Th. Fr.: Barda region, oak- hornbeam forest [10.07.2009, LH]; Tartar region, forest, near the village of Beimsarov. On the bark of trees [05.07.2009, LH].

**C. flavorubescens** (Huds.) J.R Laundon: Aghdash region, Turianchay village; Tartar region, Experiment Station. On the trunks of trees, bushes and stones [Barkhalov, 1983].

**C. holocarpa** (Hoffm.) A.E. Wade: Tartar region, vicinity. On tree trunks and stones [Barkhalov, 1983].

**\*\*Candelariella. vitellina** (Hoffm.) Müll. Arg: Yevlakh region, in the forest [10.07.2009, LH]. On the bark of *Carpinus betulus* L.

**\*\* Catapyrenium cinereum** (Pers.) Körb.: Kurdemir region, vicinity. On the soil [15.07.2009, LH].

**\*\* Cetraria steppae** (Savicz) Kdrnefelt: Kurdemir region, vicinity. On the soil [15.07.2009, LH].

**Circinaria calcarea** (L.) A. Nordin, Savicz & Tibell: Shirvan: Hadjigabul, vicinity. On the limestone rocks [Barkhalov, 1983].

**Circinaria contorta** (Hoffm.) A. Nordin, Savicz & Tibell: Shirvan: Hadjigabul. On silicate rocks [Barkhalov, 1983].

**Cladonia convoluta** (Lam.) Anders: Yevlakh region: Bozdagh Ridge [Radde,1899; Prilipko, 1950]; Barda region, oak-hornbeam forest [15.07.2009, LH]; Mil steppe [Pakhunova, 1926]; Salyan: Kyzylagach reserve; Salyan vicinity; Aghdash region: Turianchay settlement; Shirvan: vicinity of Hadjigabul lake. On a sandy-limestone soil [Barkhalov, 1983].

**\*\* C. foliacea** (Huds.) Villd.: Barda region, oak- hornbeam forest. On the soil [15. 07. 2009, LH].

**C. rangiformis Hoffm.:** Barda region, oak- hornbeam forest. On the soil [15. 07. 2009, LH].

**C. rangiformis f. foliosa Flk.:** Steppe plateau: Bozdagh ridge. On limestone soil [Prilipko, 1950].

**C. subrangiformis Sandst.:** Aghdash region: near the village Turianchay. On the ground [Barkhalov, 1983].

**Collema crispum** (Huds.) F.H Wigg.: Kurdemir region, vicinity of Kerar station [Barkhalov, 1983]; Yevlakh region, vicinity. On the clay soil [10.07.2009, LH].

**Collema fuscovirens** (With.) J.R Laundon: Mil steppe. On steppe, dry meadows and rocky slopes, on soil [Grossgeim, 1929; Pakhunova, 1926].

**\*\* Collema tenax** (Sw.) Ach.: Tartar region, forest, near the village of Beimsarov. On the soil [10.08.2010, LH].

**Diploschistes gypsaceus** (Ach.) Zahlbr.: Shirvan: Hadjigabul, vicinity [10.06.2010, LH; Barkhalov, 1983]; Jabrail region, Soltanly village. On the soil [Voronov, 1915; Steiner, 1919].

**D. ocellatus** (Fr.) Norman: Shirvan: Hadjigabul village, vicinity. On limestone [Barkhalov, 1983].

**D. scruposus** (Shreb.) Norman: Shirvan : Hadjigabul village, vicinity. On limestone [Barkhalov, 1983].

**D. scruposus f. argillosus** (Ach.) DT. et Sarnth.: Geychay region: vicinity; Shirvan: vicinity; Mil steppe. On the soil [Pahunova, 1926; Barkhalov, 1983].

**Endopyrenium monstrosum** (Schaer.) Hazsl.: Shirvan: vicinity of Hadjigabul lake. On limestone and silicate rocks [Barkhalov, 1983].

**Evernia prunastri** (L.) Ach.: Aghdash region, Turianchay village, on *Paliurus spina-christi* Mill.[Barkhalov, 1983].

**Fulgensia bracteata** (Hoffm.) Räsänen: Djebail region: Geanskaya steppe. On the soil [Voronov, 1919; Steiner, 1919].

**Fulgensia fulgens** (Sw.) Elenkin: Goychay region, Gektaga mountain; Imishli region: vicinity. Agamamedli village; Shirvan: vicinity of Hadjigabul. On the soil [Barkhalov, 1983].

**\* Lecanactis amylicia** (Ehrh.) Arnold: Yevlakh region, in the forest. On *Quercus* L. [Alverdiyeva, 2009].

**\*\*Lecanora crenulata** Hook.: Tartar region, vicinity. On the hard rock [10.08.2010, LH].

**L. dispersa** (Pers.) Röhl: Mingechaur, Eldar steppe. On the stones. [Barkhalov, 1940; 1983].

**L. subfuscata** H. Magn.: Aghdash region : Turianchay village, on tree trunks [Barkhalov, 1983].

**L. muralis** (Schreb.) Rabenh.: Mingechaur: vicinity [14.08.2006, LH]; Shirvan: vicinity of the village. Hadjigabul; Tartar region: in the vicinity [Barkhalov, 1983]; Mil steppe, the vicinity. On limestone [Grossgeim, 1939; Pakhunova, 1926].

**Lecidella euphorea** (Flörke) Hertel: Aghdash region: Turianchay village, on the bark of trees [Barkhalov, 1983].

**\*\*Lepraria incana** (L.) Ach.: Tartar region, forest, near the village of Beimsarov. On *Quercus* L [10.08.2010, LH].

**\*\* Parmelia ryssolea** (Ach.) Nyl.: Tartar region, forest, near the village of Beimsarov. On the soil [10.08.2010, LH].

**\* Phaeophyscia hirsuta** (Mereschk.) Essl.: Barda region, oak-hornbeam forest, on the bark of *Quercus castaneifolia* C.A Mey. [10 . 07. 2009, LH].

**\*\* P orbicularis** (Neck.) Moberg: Tartar region, forest, near the village of Beimsarov. On the bark of hardwood [10.08.2010, LH].

**Physcia adscendens** (Fr.) H. Oliv.: Tartar region, Experiment Station; Shirvan, vicinity of Hajigabul lake. On the bark of trees [Barkhalov, 1969].

**P. aipolia** (Ehrh.) Fürnr.: Aghdash region, along the river bank Turianchay (Barkhalov, 1983); Tartar region, vicinity. On the bark of hardwood [Barkhalov, 1969].

**P. dubia** (Hoffm.) Lettau: Shirvan: vicinity of Hadjigabul lake. On the bark of hardwood [Barkhalov, 1969].

**P. desertorum** (Rupr.) Savicz: Shirvan: vicinity of Hajigabul lake. O the outputs of sandstones [Barkhalov, 1969].

**P. dimidiata** (Arnold) Nyl.: Shirvan: vicinity of Hadjigabul lake. On the bark of. hardwoods and stones [Barkhalov, 1969].

**P. stellaris** (L.) Nyl.: Aghdash region, Turianchay village; Tartar region, vicinity; Kurdemir region, vicinity of Kerar station. On the bark of hardwood [Barkhalov, 1983]

**P. tenella** (Scop.) DC.: Shirvan: vicinity of Hadjigabul lake; Aghdash region, Turianchay village [Barkhalov, 1983].

**Physconia grisea** (Lam.) Poelt: Tartar region, Experiment Station; Shirvan: vicinity of Hadjigabul lake (Barkhalov, 1969); Barda region, oak- hornbeam forest. On the bark of trees and stones [15. 07.2009, LH].

**Psora decipiens** (Hedw.) Hoffm.: Kurdemir region, vicinity of Kerar village [Barkhalov, 1969]; Mil steppe [Pahunova, 1926]; Djebrazil region: Geanskaya steppe [Voronov, 1915; Steiner, 1919]; Shirvan: vicinity of Hadjigabul lake. On limestone and clay soils [Barkhalov, 1969].

**\*\* Punctelia borreri** (Sm.) Krog: Aghdash region, near Turianchay village. On mossy cover. Barkhalov, 1983].

**Ramalina farinacea** (L.) Ach.: Aghdash region, vicinity of Turianchay village. On the bark of trees [Barkhalov, 1983].

**Romjularia lurida** (Ach.) Timdal.: Shirvan, vicinity [15.06. 2006, LH]; Aghdash region, vicinity. On the soil [10.07.2012, LH).

**Squamarina lentigera** (Weber) Poelt: Kurdemir region: vicinity of Kerar station [Barkhalov, 1940;1983]; Imishli, Alikulular village; Shirvan : Hadjigabul; Tartar region: vicinity. On limestone rocks, calcareous soils, on the plains and rocks. [Barkhalov, 1983].

**\*\* Teloschistes lacunosus** (P. Rupr.) Savicz: Salyan region, vicinity of Hilla village. On the volcanic hill; Babazanan Mountain [Barkhalov, 1969]. On alkaline soil on steppe and semideserum.

**\*\*Tephromela atra** (Huds.) Hafellner: Aghdash region, vicinity. On limestone [10.07.2012, LH].

**Toninia sedifolia** (Scop.) Timdal: Tartar; Imishli regions [Barkhalov, 1983]; Geychay region, Chahyrly village [Szatala, 1944]; Shirvan: vicinity of Hadjigabul village [Barkhalov, 1983]; Beylagan: Geanskaya steppe. On calcareous soil [Voronov, 1915; Steiner, 1919].

**Tornabea scutellifera** (With.) J.R Laundon: Aghdash region, near Turianchay village. On *Juniperus communis* L. [Barkhalov, 1983]; Tartar region, forest, near Beimsarov village, on the bark of hardwood [05.07.2010, LH].

**\*\* Xanthoparmelia conspersa** (Ehrh. ex Ach.) Hale: Tartar region, forest, near Beimsarov village. On hard rock [10.08.2010, LH].

**Xanthoria parietina** (L.) Beltr.: Aghdash region, Turianchay village; Kurdemir region, vicinity of Kerar village; Tartar region, vicinity [Barkhalov, 1983]; Yevlakh region, in the forest (05.07.2007, LH); Barda region, oak- hornbeam forest [15.07.2007, LH]; Mingechaur, vicinity. On tree bark [14.08.2006, LH].

## Results and discussion

According to preliminary data, lichen flora of the Kura- Araks lowland has 58 species. Among the identified lichens, 17 species were new to the Kura Araks lowland, and 3 species for the lichen flora of Azerbaijan, which are *Arthopyrenia laburni*, *Lecanactis amylacea* and *Phaeophyscia hirsuta*.

The lichen flora of the researched area represents 6 orders, which are Acarosporales, Arthoniales, Lecanorales, Ostropales, Teloschistales, Verrucariales, 15 families and 35 genera. Leading role in the lichen flora belongs to three families: *Teloschistaceae* - 10 species (17 % of total species), *Physciaceae* - 9 species (16 %), *Lecanoraceae* - 7 species (12%). Followed by family: *Cladoniaceae* - 3 species (5,17%), *Collemataceae* - 3 species (5,17%), *Thelotremaaceae* - 3 species (5,17%), *Hymeneliaceae* - 2 species (3,44%), *Parmeliaceae* - 2 species (3,44%), *Ramalinaceae* - 2 species (3,44%), *Psoraceae* - 2 species (3,44%), *Acarosporaceae* -1 species (1,72 %), *Arthopyreniaceae* -1 (1,72 %), *Roccelaceae* -1 view (1,72%), *Stereocaulaceae* -1 species (1,72%), *Verrucariaceae* -1 species (1,72 %). Among the identified species with predominance of epiphytic – there are 23 species of epigey - 20 species of lichens. The share accounted for 15 epilithic lichen species. Presented results of the research are preliminary, and further research results will be added to the list of species of lichens of Kura Araks lowland.



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