

Lichens of the alpine region in Araklı - Sürmene district, Trabzon province (Turkey)

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Abstract – From 15 sampling stations in Polot Mountain, Polot Yayla (Araklı) and Mador hill (Sürmene), in SE Trabzon, Turkey, 116 lichen taxa are reported. five species are new to Turkey: *Anaptychia bryorum* Poelt, *Cladonia phyllophora* Hoffm., *Lecanora marginata* (Schaer.) Hertel & Rambold, *Porpidia flavicunda* (Ach.) Gowan and *Rhizocarpon effiguratum* (Anzi) Th.Fr., 22 species are new to the province of Trabzon.

Biodiversity / lichens / Mador hill / Polot Mountain / Turkey

Résumé – 116 taxa de lichens sont rapportés de 15 localités du Mont Polot, Yayla Polot (Araklı) et de la colline de Mador (Sürmene), SE de Trabzon en Turquie. Cinq espèces sont nouvelles pour la Turquie: *Anaptychia bryorum* Poelt, *Cladonia phyllophora* Hoffm., *Lecanora marginata* (Schaer.) Hertel & Rambold, *Porpidia flavicunda* (Ach.) Gowan et *Rhizocarpon effiguratum* (Anzi) Th.Fr.; 22 Espèces sont nouvelles pour la province de Trabzon.

Biodiversité / lichens / colline de Mador / Mont Polot / Turquie

INTRODUCTION

The lichen flora of Trabzon province in the eastern part of the Black Sea Region, with its perhumid mountain slopes, has attracted more attention than that of other provinces of Turkey (Anşin, 1979; Aslan *et al.*, 2005; Cevahir, 1991; Feige & Lumbsch, 1993, 1994; Gönülol *et al.*, 1995; John & Nimis, 1998; John & Breuss, 2004; John 1992, 1999, 2000, 2002; John *et al.*, 2000; Kinalioğlu *et al.*, 1994; Steiner, 1909; Szatala, 1960; Yazıcı, 1995a, 1995b, 1996, 1999, 2002). In these studies 493 taxa are reported between sea level and 2550 m. The lichen flora of Trabzon above 2550 m is still poorly known.

This study wants to contribute to the knowledge of the lichen flora of Turkey in Trabzon province with emphasis on the alpine belt.

MATERIAL AND METHODS

The study area is the alpine belt of Araklı and Sürmene districts in the province of Trabzon in the eastern part of the Black Sea region of Turkey, between 40°00'15" to 40°03'25" E and 40°38'15" to 40°40'22" N at an elevation of 2520 to 2740 m. The collecting stations are presented in Table 1 and their situation is shown in Figure 1.

Table 1. Collecting sites.

<i>Localities</i>	<i>Altitude (m)</i>	<i>Date of collection</i>
1. N side of Polot yaylaşı	2520	4.8.2002
2. Polot yaylaşı	2540	4.8.2002
3. E side of Polot yaylaşı, stream bank	2550	5.8.2002
4. E side of Polot yaylaşı	2550	6.8.2002
5. N slopes of Polot mountain	2650	6.8.2002
6. E slopes of Polot mountain	2600	18.8.2002
7. Slope of Mador hill	2670	18.8.2002
8. S side of Mador hill	2700	20.8.2002
9. N side of Mador hill	2650	20.8.2002
10. E side of Mador hill	2600	1.8.2003
11. Top of Mador hill	2740	2.8.2003
12. SW side of Polot yaylaşı	2570	12.8.2003
13. S slopes of Polot mountain	2680	14.7.2003
14. SE slopes of Polot mountain	2680	15.7.2003
15. W slopes of Polot mountain	2630	17.8.2003

Humid and cold conditions prevail in the study area (Atalay, 1997). Our observation showed that the study area is covered by snow from November till April and partly in October and May. Precipitation in the form of drizzle and fog is prevalent in the other months.

The alpine zone starts at the elevation of 1900-2000 m in this part of the eastern Black Sea Region (An_in, 1981). The alpine vegetation is deprived of plants in the form of trees and has grasses prevailing (Şahin *et al.*, 2005).

Siliceous rocks of Upper Cretaceous and Tertiary age, in particular andesite, basalt agglomerate and granodiorite predominate in the study area. In particularly andesite is widespread. In addition, oolitic calcareous rocks are rarely present (Gattinger, 1962).

A total of 396 samples were collected. The specimens are kept in the herbarium of Faculty of Sciences and Arts, Giresun University, Giresun.

RESULTS

The taxa are listed in alphabetical order, followed by locality numbers, collection numbers (in brackets) and substrates. An asterisk (*) indicates a new record for Turkey, the number sign (#) a new record for Trabzon province.

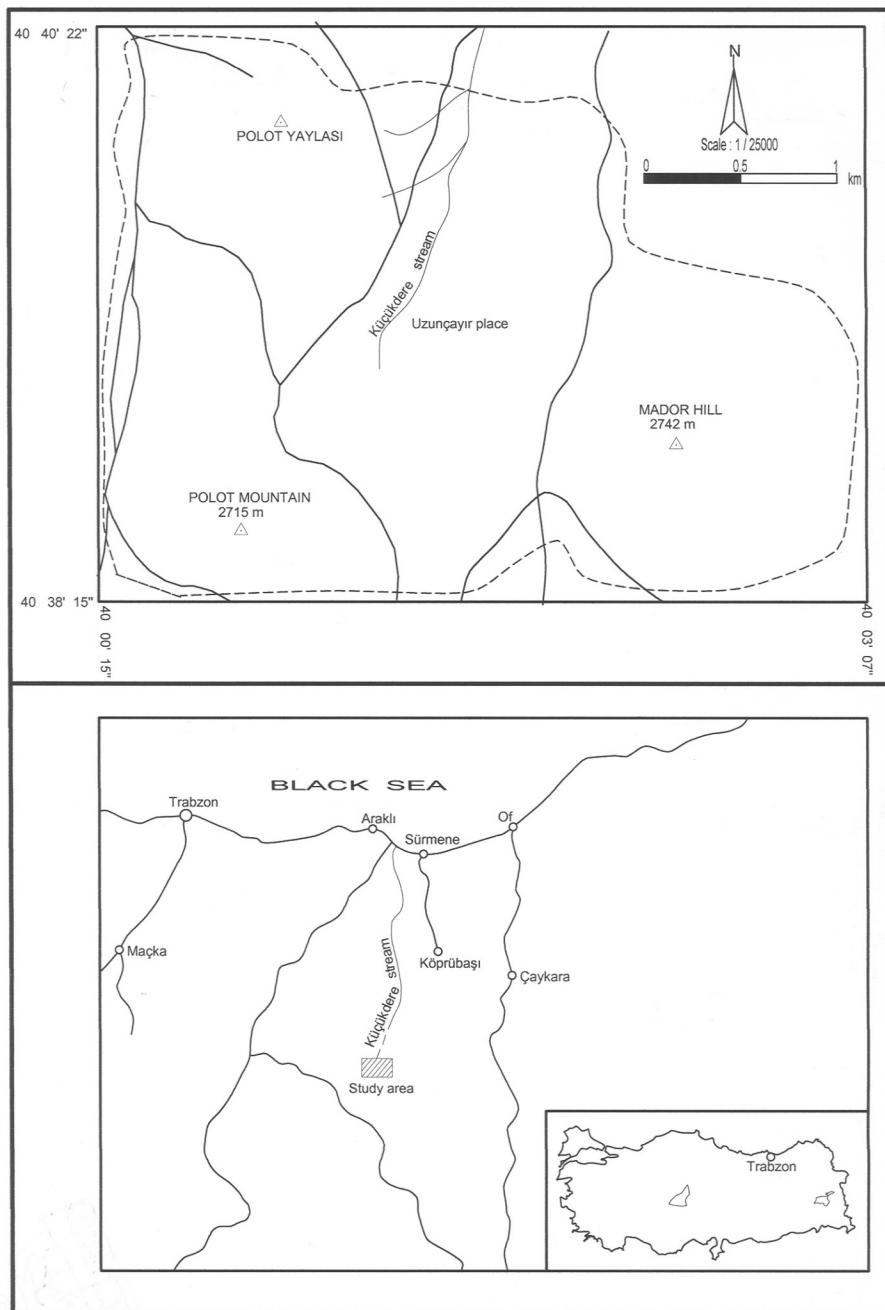


Fig. 1. Map of the study area showing the collecting sites in Polot Mountain, Polot Yayla and Mador hill. The number of the localities should be included into the map, in the present form it is rather useless.



Fig. 2. Study area: A view from the N side of Mador hill (Loc. 9).

- *# **Anaptychia bryorum** Poelt - Loc. 8 (2000, det. H. Sipman): on mosses over rock.
- A. ciliaris** (L.) Körb. ex A.Massal. - Loc. 1 (1138, det. H. Sipman): on siliceous rock.
- Aspicilia caesiocinerea** (Malbr.) Arnold - Loc. 1 (2065), 3 (2229), 8 (2325): on siliceous rock.
- A. cinerea** (L.) Körb. - Loc. 4 (2256), 12 (2313): on siliceous rock.
- A. contorta** (Hoffm.) Kremp. - Loc. 1 (2067), 3 (2102): on calcareous rock.
- Brodoa intestiniformis** (Vill.) Goward - Loc. 4 (1136, det. H. Sipman), 6 (1137, det. H. Sipman), 10 (2076): on siliceous rock.
- Bryoria bicolor** (Ehrh.) Brodo & D.Hawksw. - Loc. 9 (2028, 2029, det. H. Sipman): on siliceous rock.
- B. chalybeiformis** (L.) Brodo & D.Hawksw. - Loc. 4 (2027, det. H. Sipman): on siliceous rock.
- # **Buellia insignis** (Naegeli ex Hepp) Th.Fr. - Loc. 5 (1151, det. H. Sipman): on soil.
- Caloplaca ammiospila** (Wahlenb.) H.Olivier - Loc. 4 (2049), 6 (2314), 15 (2321): on mosses.
- C. cerina** (Ehrh. ex Hedw.) Th.Fr., Loc. 2 (2252), 3 (2315): on siliceous rock.
- C. crenularia** (With.) J.R.Laundon - Loc. 4 (2250): on siliceous rock.
- Calvitimela armeniaca** (DC.) Hafellner - Loc. 6 (2056), 9 (2070): on siliceous rock.
- Candelariella aurella** (Hoffm.) Zahlbr. - Loc. 1 (2045), 2 (2069), 12 (2088): on calcareous rock.
- C. coralliza** (Nyl.) H.Magn. - Loc. 7 (2057), 11 (2093), 13 (2257): on siliceous rock.

- C. vitellina** (Hoffm.) Mull.Arg. - Loc. 1 (2107), 2 (2220), 4 (2227), 11 (2237), 15 (2293): on siliceous rock.
- Catapyrenium cinereum** (Pers.) Körb. - Loc. 8 (1181, det. H. Sipman): on soil.
- Cetraria aculeata** (Schreb.) Fr. - Loc. 12 (2021, det. H. Sipman), 7 (2203): on soil
- C. ericetorum** Opiz - Loc. 12 (2201): on soil.
- C. islandica** (L.) Ach. - Loc. 1 (2106), 3 (2117), 4 (2119), 5 (2123), 6 (2131), 7 (2158), 8 (2167), 9 (2247), 10 (2324), 12 (2326), 13 (2330), 15 (2336): on soil.
- Cladonia arbuscula** (Wallr.) Flot. - Loc. 4 (2023, det. H. Sipman): on soil.
- C. cervicornis** (Ach.) Flotow ssp. **verticillata** (Hoffm.) Ahti - Loc. 1 (2145), 15 (2170): on soil.
- C. coccifera** (L.) Willd. - Loc. 3 (2084): on soil.
- C. coniocraea** (Flörke) Spreng. - Loc. 5 (2091), 14 (2143): on soil.
- C. convoluta** (Lam.) P.Anders - Loc. 10 (2211), 12 (2344): on soil.
- C. fimbriata** (L.) Fr. - Loc. 2 (2047): on soil.
- C. furcata** (Huds.) Schrad. - Loc. 3 (2063), 5 (2081): on mosses. Loc. 9 (2231), 12 (2255): on soil.
- C. gracilis** (L.) Willd. - Loc. 11 (2024, det. H. Sipman): on soil.
- C. maxima** (Asah.) Ahti - Loc. 11 (2025, det. H. Sipman): on soil.
- *# **C. phyllophora** Hoffm. - Loc. 14 (2026, det. H. Sipman): on soil.
- C. pyxidata** (L.) Hoffm. - Loc. 1 (2046), 2 (2240), 3 (2289), 5 (2312), 10 (2332), 15 (2338): on soil.
- C. rangiferina** (L.) Weber ex F.H.Wigg. - Loc. 3 (2072), 9 (2087), 14 (2113): on mosses.
- C. rangiformis** Hoffm. - Loc. 1 (2053), 2 (2094), 3 (2104), 4 (2138), 5 (2166), 7 (2179), 9 (2196), 10 (2213), 14 (2236), 15 (2348): on soil.
- C. stellaris** (Opiz) Pozar & V_zda - Loc. 1 (2060), 3 (2079), 4 (2099), 5 (2127), 7 (2137), 9 (2165), 10 (2180), 14 (2210), 15 (2254): on soil.
- C. subulata** (L.) F.H.Wigg. - Loc. 6 (2055): on soil.
- C. uncialis** (L.) Wigg. ssp. **uncialis** - Loc. 9 (2139): on soil Loc. 15 (2022, det. H. Sipman): on soil.
- Cornicularia normoerica** (Gunnerus) Du Rietz - Loc. 4 (2050), 5 (2061), 8 (2080), 10 (2111), 12 (2135), 15 (2183): on siliceous rock.
- Dermatocarpon miniatum** (L.) W.Mann - Loc. 1 (1131, det. H. Sipman), 3 (2110), 4 (2115), 5 (2128), 9 (2186), 11 (2206), 12 (2292), 15 (2343): on siliceous rock.
- D. intestiniforme** (Körb.) Hasse - Loc. 1 (2155), 3 (2161), 11 (2185): on siliceous rock.
- Dimelaena oreina** (Ach.) Norman - Loc. 7 (2007, det. H. Sipman), 9 (1145, det. H. Sipman): on siliceous rock.
- Diploschistes muscorum** (Scop.) R.Sant. - Loc. 4 (2243): on mosses.
- D. scruposus** (Schreb.) Norm. - Loc. 4 (2218), 10 (2223), 12 (2238), 13 (2246): on siliceous rock.
- Flavocetraria nivalis** (L.) Kärnefelt & Thell - Loc. 1 (2154), 5 (2162), 7 (2171), 9 (2177), 12 (2197), 15 (2248): on soil.
- Fuscidea kochiana** (Hepp) V.Wirth & V_zda - Loc. 12 (2068): on siliceous rock.
- Hypogymnia physodes** (L.) Nyl. - Loc. 1 (2101), 7 (2116), 10 (2323): on siliceous rock.
- # **Ingvariella bispora** (Bagl.) Guderley & Lumbsch - Loc. 1 (1142, det. H. Sipman): on siliceous rock. Loc. 4 (1176, det. H. Sipman): on calcareous rock
- Lecanora bolcana** (Poll.) Poelt - Loc. 1 (1147, det. H. Sipman), 6 (2290): on siliceous rock.

- L. campestris** (Schaer.) Hue - Loc. 4 (2075), 5 (2089), 10 (2192), 11 (2215): on siliceous rock.
- L. cenisia** Ach. - Loc. 12 (2193), 15 (2228): on siliceous rock.
- *# **L. marginata** (Schaer.) Hertel & Rambold - Loc. 14 (1199, det. H. Sipman): on calcareous rock. Loc. 12 (1172, det. H. Sipman), 13 (1154, det. H. Sipman): on siliceous rock.
- L. polytropa** (Ehrh. ex Hoffm.) Rabenh. - Loc. 7 (1155, det. H. Sipman), 10 (1146, det. H. Sipman): on calcareous rock. Loc. 8 (1162, det. H. Sipman), 9 (2020, det. H. Sipman): on siliceous rock.
- L. rupicola** (L.) Zahlbr. - Loc. 1 (2103), 2 (2133), 3 (2190), 4 (2199), 5 (2222), 9 (2253), 10 (2291), 12 (2316), 14 (2337): on siliceous rock.
- Lecidea atrobrunnea** (Lam. & DC.) Schaer. - Loc. 3 (2225), 6 (2230), 7 (2302), 10 (2318), 13 (2322), 15 (2339): on siliceous rock.
- # **L. fuscoatra** (L.) Ach. - Loc. 13 (2074): on siliceous rock.
- # **L. tesselata** Flörke - Loc. 1, 5 (1157, det. H. Sipman), 8 (1164, det. H. Sipman), 12 (1178, det. H. Sipman): on siliceous rock.
- Lecidella carpathica** Körb. - Loc. 2 (2194), 8 (2303), 10 (2334): on calcareous rock.
- L. stigmatea** (Ach.) Hertel & Leuckert - Loc. 10 (2086): on siliceous rock.
- Lobothallia radiosa** (Hoffm.) Hafellner - Loc. 1 (1149, det. H. Sipman): on calcareous rock. Loc. 3 (2258): on siliceous rock.
- # **Melanelia hepatizon** (Ach.) Thell - Loc. 1 (2212), 9 (1141, det. H. Sipman): on soil.
- M. stygia** (L.) Essl. - Loc. 1 (2132), 10 (2151), 15 (2346): on siliceous rock.
- Mycobilimbia hypnorum** (Lib.) Kalb & Hafellner - Loc. 8 (2018, det. H. Sipman): on mosses.
- Nephroma parile** (Ach.) Ach. - Loc. 3 (2085): on mosses. Loc. 5 (2144): on soil.
- Ophioparma ventosa** (L.) Norman - Loc. 6 (2059), 8 (2078), 13 (2096): on siliceous rock.
- Pannaria pezizoides** (Weber) Trevisan - Loc. 1 (2200), 3 (2310): on soil.
- Parmelia saxatilis** (L.) Ach. - Loc. 1 (2054), 2 (2122), 5 (2157), 7 (2181), 10 (2198), 12 (2209), 13 (2221), 14 (2226), 15 (2244): on siliceous rock.
- P. sulcata** Taylor - Loc. 2 (2207): on siliceous rock.
- Parmeliella triptophylla** (Ach.) Müll.Arg. - Loc. 8 (2001, det. H. Sipman): on calcareous rock. Loc. 4 (1153 (cf.), det. H. Sipman), 14 (1185, det. H. Sipman): on siliceous rock.
- Peltigera didactyla** (With.) J.R.Laundon - Loc. 3 (2105): on soil.
- P. leucophlebia** (Nyl.) Gyeln. - Loc. 5 (2120): on soil.
- P. polydactylon** (Neck.) Hoffm. - Loc. 2 (2114), 5 (2306), 6 (2345): on soil.
- P. praetextata** (Flörke ex Sommerf.) Zopf - Loc. 1 (1139, det. H. Sipman), 2 (2136), 5 (2214), 9 (2242): on soil.
- P. rufescens** (Weiss) Humb. - Loc. 1 (2217), 5 (2347): on soil.
- P. venosa** (L.) Hoffm. - Loc. 4 (1134, det. H. Sipman): on soil.
- Pertusaria flavicans** Lamy - Loc. 1 (2150), 2 (2235), 3 (2301): on siliceous rock.
- P. lactea** (L.) Arnold - Loc. 3 (2204): on siliceous rock.
- P. leucosora** Nyl. - Loc. 3 (2090): on siliceous rock.
- P. pertusa** (Weigel) Tuck. - Loc. 3 (1119, det. H. Sipman), 8 (2141), 10 (2219), 15 (2311): on siliceous rock.
- Physcia dubia** (Hoffm.) Lettau - Loc. 8 (2108), 12 (2251), 14 (2019, det. H. Sipman): on siliceous rock.
- # **Physconia subpulverulenta** (Szat.) Poelt - Loc. 4 (1130, det. H. Sipman): on soil.
- Pleopsidium flavum** (Bellardi) Körb. - Loc. 7 (2159), 15 (2229): on siliceous rocks.

- *# **Porpidia flavicunda** (Ach.) Gowan - Loc. 1 (1183, det. H. Sipman), 4 (1182, det. H. Sipman): on semi-inundated, siliceous rock.
- Protoparmelia badia** (Hoffm.) Hafellner - Loc. 1 (2073), 4 (2147), 10 (2152), 11 (2189), 15 (2294): on siliceous rock.
- Protoparmeliopsis muralis** (Schreb.) M.Choisy - Loc. 1 (2058), 2 (2066), 3 (2083), 4 (2129), 5 (2169), 6 (2195), 9 (2241), 10 (2245), 11 (2331), 13 (2341): on siliceous rock.
- # **Psora decipiens** (Hedw.) Hoffm. - Loc. 3 (2174): on soil.
- Ramalina pollinaria** (Westr.) Ach. - Loc. 1 (2153), 3 (2163), 5 (2178), 7 (2208), 10 (2249), 15 (2304): on siliceous rock.
- R. polymorpha** (Lilj.) Ach. - Loc. 3 (2164), 7 (2233): on siliceous rock.
- # **Rhizocarpon badioatrum** (Flörke ex Spreng.) Th. Fr. - Loc. 4 (1121, det. H. Sipman): on calcareous rock. Loc. 1 (2014, det. H. Sipman): on siliceous rock.
- *# **R. effiguratum** (Anzi) Th. Fr. - Loc. 7 (1175, det. H. Sipman): on calcareous rock.
- R. geographicum** (L.) DC. - Loc. 1 (2052), 2 (2062), 3 (2077), 4 (2095), 5 (2126), 6 (2134), 7 (2140), 8 (2156), 9 (2168), 10 (2175), 11 (2182), 12 (2188), 13 (2202), 14 (2234), 15 (2335): on siliceous rock.
- # **R. lavatum** (Fr.) Hazsl. - Loc. 3 (2118): on siliceous rock.
- R. lecanorinum** Anders - Loc. 6 (2051): on siliceous rock.
- # **R. polycarpum** (Hepp) Th. Fr. - Loc. 4 (1168, det. H. Sipman): on siliceous rock.
- Rhizoplaca chrysoleuca** (Sm.) Zopf - Loc. 4 (2031, 2032, det. H. Sipman), 7 (2033, det. H. Sipman), 9 (2030 (cf.), det. H. Sipman), 10 (2305), 12 (2319), 14 (2340): on siliceous rock.
- R. melanophthalma** (DC.) Leuckert & Poelt - Loc. 8 (2071), 11 (2149), 12 (1169, det. H. Sipman): on siliceous rock.
- R. peltata** (Ramond) Leuckert & Poelt - Loc. 1 (2100), 5 (2328): on calcareous rock.
- Rinodina mniaraea** (Ach.) Körb. - Loc. 5 (1148, det. H. Sipman): on mosses.
- Schaereria fuscocinerea** (Nyl.) Clauzade & Cl. Roux - Loc. 5 (1158, det. H. Sipman), 7 (1156, det. H. Sipman), 14 (2006, det. H. Sipman): on siliceous rock.
- Sporastatia testudinea** (Ach.) A.Massal. - Loc. 5 (1152, det. H. Sipman): on calcareous rock.
- Squamaria cartilaginea** (With.) P.James - Loc. 1 (1132, 1133, det. H. Sipman): on calcareous rock.
- # **Staurothele areolata** (Ach.) Lettau - Loc. 3 (1166, det. H. Sipman), 12 (1193, det. H. Sipman): on calcareous rock.
- Tepromela atra** (Huds.) Hafellner - Loc. 10 (2121), 13 (2191): on siliceous rock.
- Thamnolia vermicularis** (Sw.) Ach. ex Schaer. - Loc. 4 (2148), 7 (2172), 12 (2176), 14 (2184), 15 (2205): on soil.
- # **Tremolecia atrata** (Ach.) Hertel - Loc. 3 (1177, det. H. Sipman): on siliceous rock.
- # **Umbilicaria cinerascens** (Arnold) Frey - Loc. 10 (2036, det. H. Sipman), 14 (2038, det. H. Sipman): on siliceous rock.
- U. cylindrica** (L.) Delise ex Duby - Loc. 8 (1128, det. H. Sipman): on calcareous rock. Loc. 1 (2048), 2 (2146), 3 (2187), 4 (2295), 5 (1124, 1125, det. H. Sipman), 6 (2300), 7 (2308), 9 (2320), 10 (2327), 11 (1126, 1127, det. H. Sipman), 12 (2329), 13 (2333), 14 (2037, det. H. Sipman), 15 (2041, det. H. Sipman): on siliceous rock.

- U. decussata** (Vill.) Zahlbr. - Loc. 3 (2259, confirm O. Larsson), 11 (2125), 15 (2034, 2035, det. H. Sipman): on siliceous rock.
- U. deusta** (L.) Baumg. - Loc. 6 (1122, det. H. Sipman): on calcareous rock, Loc. 3 (2097), 5 (1123, det. H. Sipman): on siliceous rock
- U. nylanderiana** (Zahlbr.) H.Magn. - Loc. 3 (2360, det. O. Larsson), 4 (2043, det. H. Sipman), 7 (2098), 12 (2040, det. H. Sipman): on siliceous rock.
- U. subglabra** (Nyl.) Harm. - Loc. 9 (2042, det. H. Sipman), 15 (2039, det. H. Sipman): on siliceous rock.
- U. vellea** (L.) Hoffm. - Loc. 5 (2044, det. H. Sipman), 10 (2298): on siliceous rock.
- Xanthoparmelia conspersa** (Ehrh. ex Ach.) Hale - Loc. 1 (2124), 2 (2130), 4 (2173), 7 (2216), 14 (2309): on siliceous rock.
- Xanthoparmelia pulla** (Ach.) O.Blanco et al. - Loc. 1 (2142), 5 (2224), 10 (2239), 15 (2307): on siliceous rock.
- X. stenophylla** (Ach.) Ahti & D.Hawkes. - Loc. 4 (2109): on siliceous rock.
- Xanthoria candelaria** (L.) Th.Fr. - Loc. 1 (2092), 2 (2342): on calcareous rock.
- X. elegans** (Link) Th.Fr. - Loc. 1 (2064), 2 (2082), 8 (2112), 10 (2160), 11 (2296), 12 (2297), 13 (2317): on siliceous rock.

DISCUSSION

40 samples had to be left unnamed because they belong to incompletely known groups for which no good keys are available.

As to substrate, 290 samples were saxicolous, 91 terricolous and 15 muscicolous. The substrate preferences of the species collected from the study area are apparently similar to those reported in the literature (Purvis *et al.* 1992; Wirth, 1995).

Due to the dominancy of siliceous rocks in the study area, as expected, siliceous lichen samples (254) are more common than calcareous samples (36).

22 species new for Trabzon province brings the total up to 513 taxa known so far from this province. Five species are new records for Turkey. These are *Anaptychia bryorum*, *Cladonia phyllophora*, *Lecanora marginata*, *Porpidia flavigunda* and *Rhizocarpon effiguratum*.

Four species are only recorded for the second time from Turkey: *Buellia insignis*, *Melanelia hepaticola*, *Cladonia maxima* and *Parmeliella triptophylla*.

Candelariella vitellina, *Dermatocarpon miniatum*, *D. intestiniforme*, *Protoparmelia badia*, *Protoparmeliopsis muralis*, *Rhizocarpon geographicum* and *Umbilicaria cylindrica* have the widest altitudinal range in the study area. These species were observed from the lowest (2520) to the highest part (2740), followed by *Aspicilia caesiocinerea*, *Candelariella coralliza*, *Cetraria islandica*, *Lecanora campestris*, *Lecidea tessellata*, *Lecidella carpathica*, *Rhizoplaca melanophthalma* and *Umbilicaria decussata*.

Cladonia gracilis and *C. maxima* species only were found at the higher altitude (2740 m) while *Anaptychia ciliaris*, *Squamaria cartilaginea* and *Xanthoria candelaria* were seen only at the lowest altitude (2520).

The following species are frequent in alpine regions: *Brodoa intestiniformis*, *Caloplaca ammiospila*, *Calvitimela armeniaca*, *Cladonia arbuscula*, *Flavocetraria nivalis*, *Lecanora polytropa*, *Pleopsidium flavum*, *Rhizoplaca chrysoleuca*, *R. melanophthalma*, *Sporastatia testudinea*, *Schaereria fuscocinerea*, *Thamnolia vermicularis*, *Umbilicaria nylanderiana* and *U. decussata*.

The fruticose species *Cetraria* spp., *Cladonia arbuscula*, *C. rangiferina*, *C. stellaris*, *C. uncialis* ssp. *uncialis* and *Flavocetraria nivalis* prefer open wind exposed alpine grasslands.

Cladonia coniocraea, *C. fimbriata*, *C. gracilis*, *C. maxima* and *Peltigera* spp. prefer humid and shady soil near to rocks.

Our list includes two species which, according to Galun (1988), are the most resistant lichens to snow cover in alpine zones, *Rhizocarpon geographicum* and *Sporastatia testudinea*. The saxicolous *Pleopsidium flavum* was found on dry parts of siliceous rocks which get little sunshine, and *Porpidia flavicunda* on semi inundated siliceous rocks.

Umbilicaria cinerascens, *U. decussata*, *U. subglabra* and *U. vellea* grow on the dry and south-exposed and *U. nylanderiana* on the humid and north-exposed parts of siliceous rocks. *U. deusta* grows on siliceous and calcareous rocks.

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