

***Athallia brachyspora* and *Peccania tiruncula*: two new lichen records for Turkey**

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Abstract. Two lichen species, namely *Athallia brachyspora* and *Peccania tiruncula*, collected from the Batman and Siirt provinces respectively, are reported as new to Turkey. Concise descriptions including the known geographic distribution and notes on similar taxa are provided.

Key words: Batman, lichenized fungi, new records, Siirt, Turkey

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Introduction

In Turkey, with presumably some 3000 lichen taxa, approximately 1750 of them have been reported so far. Recently, many studies have been carried out to assess the lichen flora of Turkey, and as a result new records and species have been added (John & al. 2020).

Despite these studies, there are areas to be investigated yet, especially in many parts of the southeastern and eastern Anatolia (e.g., Batman, Hakkari, Siirt, Şırnak, Mardin). In the course of the project “Lichen flora of Batman and Siirt provinces”, some interesting lichen taxa have been recorded. Only fourteen lichen taxa have been reported earlier from the Batman Province and thirty-six from the Siirt Province (John & Türk 2017; John & al. 2020).

Three taxa of the genus *Peccania* have been found in Turkey, in addition to the ten already known from the genus *Athallia* (John & Türk 2017; John & al. 2020).

In the present work, the authors report two newly-recorded lichen species for Turkey.

Material and methods

Collecting sites

Kenan Yazici has collected lichen samples in June and August 2021, during a lichenological survey of the Batman and Siirt regions.

The territory of the Batman Province is covered with steppes, with characteristic steppe vegetation. There are

Quercus L. trees, albeit few, in the mountainous regions. The slopes of the valleys are typically covered by *Fraxinus* L. and *Salix* L. trees, while scrub and grassland communities support also pockets of other vegetation types. The forest understory flora is generally very poor in these areas, while all nearby mountains contain a lot of rocky habitats (Baytop & Denizci 1963). In general, Mediterranean climate characteristics are observed in the Batman Province. Summers are hot and dry, and winters are relatively warm and rainy. Precipitation is in the form of snow in the highlands and rain in the plains. The annual average temperature is 16°C and the annual precipitation is 552 mm (Akman 1999).

A continental climate prevails in the Province of Siirt. Summers are hot and dry, winters are cold and rainy. The northern and eastern parts of the Province are colder in winter and cooler in summer. Annual precipitation averages 757 mm. Average annual humidity is 51%, higher (ca. 70 %) in January and December (Akman 1999). There are limited *Quercus* forests partly in the Taurus Mountains, eastwards of Kahramanmaraş and on the plateaus and mountains stretching northwards. Siirt Province is located in E Anatolia's leafy forest belt and SE Anatolia's steppe belt. The forests there morph into a cover of shrubs and dwarf trees near the steppe belt in the south. In some areas, *Juniperus* L., *Fraxinus* and *Platanus* L. trees are also found in the *Quercus* communities. The southwestern and western parts of the Province faqll into the steppe zone (Baytop & Denizci 1963).

Collecting, storage and processing of samples

Microscopical examination of hand-cut sections were carried out in water (including all measurements). Lichen samples were observed and studied with a Nikon Zeiss Stemi 2000-c stereomicroscope and a Zeiss Axio Imager A2 light microscope. Macro photographs and micro photographs were taken with the digital camera Zeiss AxioCam ERc5s. The lichen thalli were identified by consulting the relevant keys (Nash & al. 2007; Moreno & Egea 1992 Vondrák & al. 2016;). Specimens were stored in the lichen collection of the Biology Department, Faculty of Science, Karadeniz Technical University, Trabzon, Turkey (KTUB).

The descriptions have been based on Turkish specimens.

Taxonomic description

Athallia brachyspora (Mereschk.) Halici & Vondrák, in Vondrák, Halici, Güllü & Demirel, Turkish Journal of Botany 40: 322(2016)

Thallus crustose, up to 1.5–2 cm in diameter, grey to light-grey-brown, seldom areolate; areoles 0.2–0.9 mm wide, flat or slightly concave; apothecia abundant, crowded and aggregated, up to 0.6 mm wide, mostly 1 or 3 per areole (Fig. 1a, b); thalline margin yellow-orange; disc 0.3–0.4 mm in diameter, orange or orange-red; epihymenium yellow or yellow-brown, 38–45 µm (Fig. 1c, d); hymenium white or colourless, 110–120 µm high; hypothecium white or colourless, 100–110 µm high; thalline exciple yellow-brown; asci 8-spored, cylindrical or subcylindrical, 38–50 µm long (Fig. 1d); ascospores polarilocular, ellipsoid or ±broadly ellipsoid, 8.5–11 × 5.5–6.5 µm, septum 2.2–3.2 µm (Fig. 1e, f)

Specimen examined: Turkey, Batman: Sason, Soğanlı village, N 38°24'11.69" E 41°24'53.85", alt. 1485 m, on calcareous rock, 03.06.2021, leg. K.Yazıcı, det. K. Yazıcı and A. Aslan (KTUB-2479).

Notes: *Athallia brachyspora* is similar to *Caloplaca ferrarii*, but differs from *C. ferrarii* in its short and thick spores (Vondrák & al. 2016, 2017)

Based on the catalogues of John & Türk (2017) and John & al. (2020), that species is new for Turkey. The collection deviates slightly from the description in Vondrák & al. (2016).

Athallia brachyspora occurs mainly on calcareous rocks, nutrient-enriched brick-wall tops, roofing tiles and other calcareous habitats (Vondrák & al. 2016, 2017)

Other species associated with the present collection are *Aspicilia polychroma*, *Lecanora kjachtensis*, *Phaeophyscia orbicularis*, *Physcia dubia*, *Polyozosia hagenii*, and *Protoparmeliopsis muralis*. *A. brachyspora* has been known earlier from Europe (Crimea, Ukraine, Russia, South Europe – Slovakia - Slovaki-

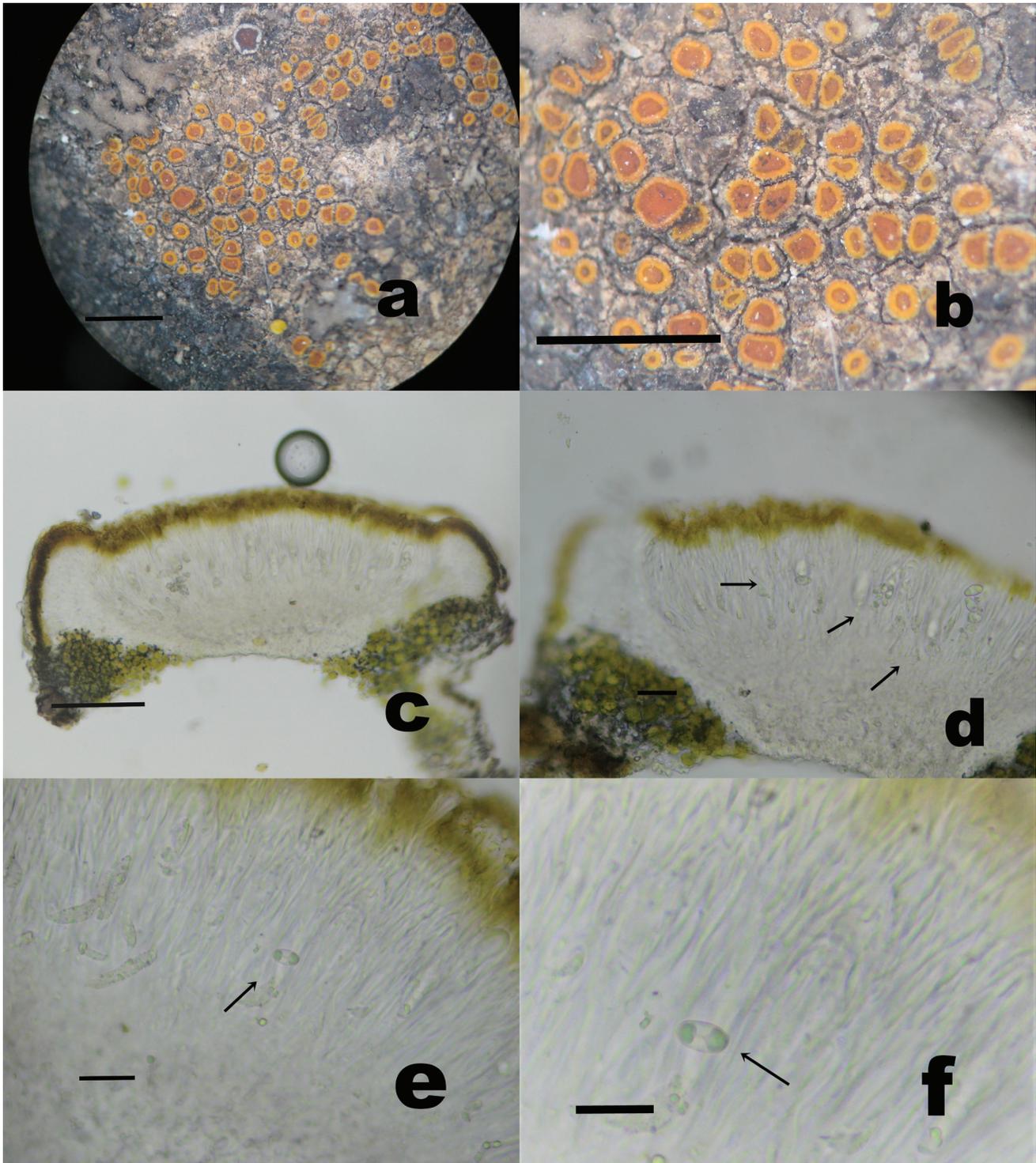


Fig. 1a-f. *Athallia brachyspora*: **a, b.** Thallus with areoles and apothecia. Scale: **a, b:** 2 mm, **c.** Section through an apothecium with epihymenium, hymenium and hypothecium. Scale: **c:** 100 µm (in water), **d, e.** Section of an apothecium with epihymenium, hymenium and asci with ascospores. Scale: **d, e:** 20 µm (in water), **f.** Section of apothecia with ascospores. Scale: **f:** 15 µm (in water).

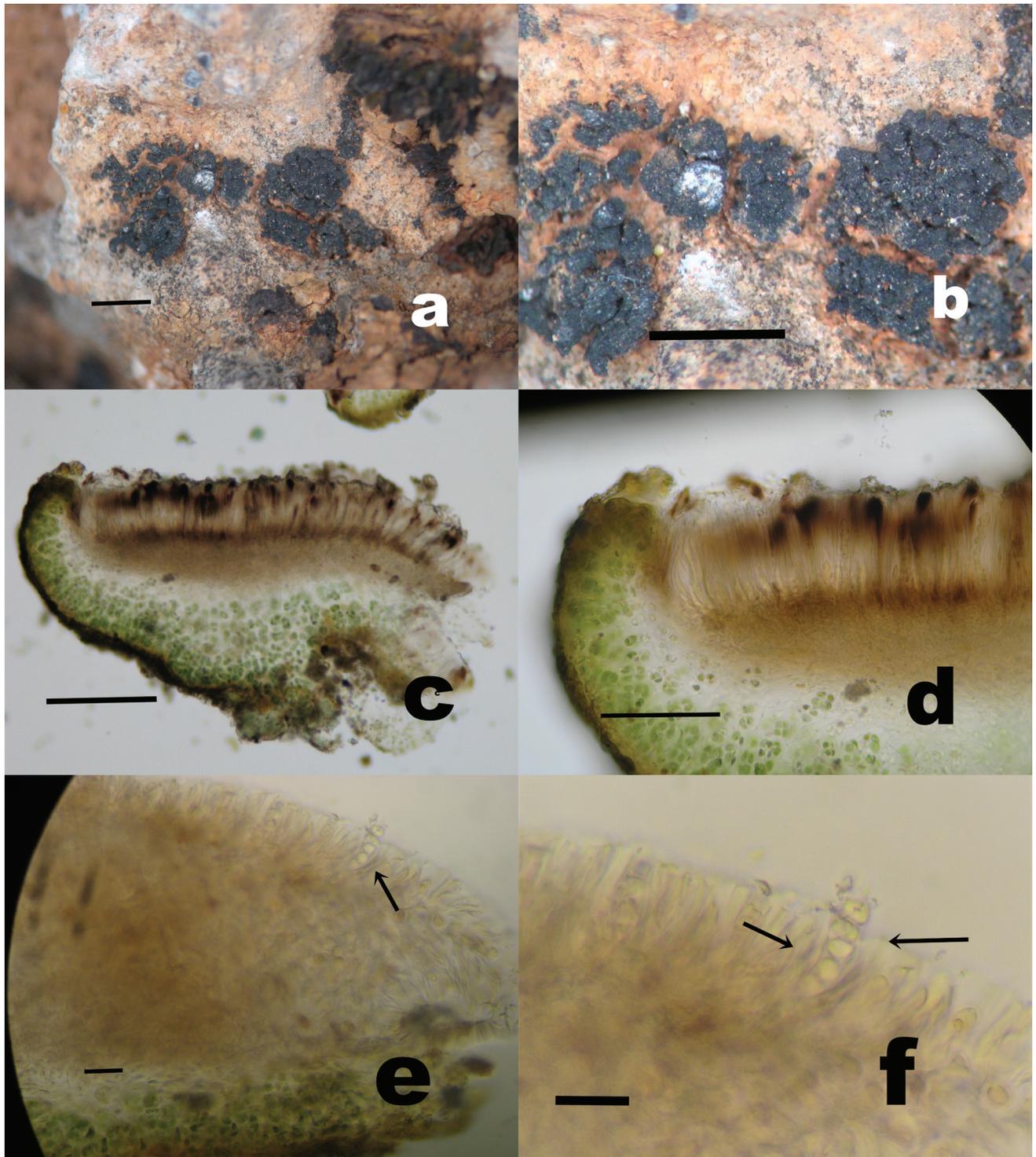


Fig. 2a-f. *Peccania tiruncula*: **a, b.** Squamulose thallus with cylindrical lobes and apothecia, Scale: **a, b:** 2 mm, **c, d.** Section of an apothecium with indistinct epihymenium, hymenium and hypothecium. Scale **c:** 20 μm , **d:** 100 μm , **e.** Hymenium with ascus and ascospores. Scale **e:** 35 μm , **f.** Ascus with small and broad ellipsoid ascospores. Scale: **f:** 30 μm .

an Carpathians, Asia (Dagestan) (Kondratyuk & al. 1996; Sedelnikova 2013; Malíček & al. 2014, 2021; Vondrák & al. 2010, 2016, 2017). That is a new record for Turkey.

Peccania tiruncula (Nyl.) Henssen, in Henssen & Jørgensen, Lichenologist 22 (2): 143(1990)

Thallus heteromerous (in longitudinal section), squamulose or \pm peltate, or irregularly dwarf-fruticose, black and dull, 2–5 mm in diameter; squamules with cylindrical or flattened lobules, 1–2 mm wide, initially erect, subsequently \pm radially arranged or occasionally branched, \pm cylindrical or \pm flattened; lobes up to 1.5 mm long, 0.2 mm thick; isidia not present (Fig. 2a, b); lower surface black, attached by central rhizohyphae; apothecia sessile, marginal or subterminal, 0.5–0.8(–1) mm wide; disc black, plane plain and wide open; thalline margin persisting, prominent and flat (Fig. 2a, b); epihymenium indistinct, brown or \pm reddish brown (Fig. 2c, d); hymenium 100–110 μ m high, light brown, with brown base, subhymenium hyaline, 75–80 μ m high; hypothecium light brown, 75–90 μ m high, thalline margin green-brown, occasionally light brown or brown (Fig. 2c, d); asci \pm subcylindrical, thin-walled, 50–62.5 μ m long, with gelatinous cap, 8-spored; ascospores hyaline, simple, small, broad ellipsoid to subglobose, 9-12 \times 8-10(-11) μ m. (Fig. 2e, f).

Specimen examined: Turkey, Siirt: Pervari, 2-3 km to Doğançay village, N 37°49'44.02", E 42°19'04.62", alt. 1635 m, on calcareous rock, 28.08.2021, leg. K.Yazıcı, det. K. Yazıcı and A. Aslan (KTUB-2480).

Notes: *Peccania tiruncula* superficially resembles *Peccania cerebriformis*, although the lobes in *P. tiruncula* are never irregularly folded and are smaller than those of *P. cerebriformis*.

Based on the catalogues by John & Türk (2017) and John & al. (2020), that species is new for Turkey. Detailed descriptions are provided by Nash & al. (2007).

Peccania tiruncula grows mainly in shaded or sheltered microhabitats on boulders and in seepage tracks on calcareous rocks.

The species associated with our collection are *Synalissa symphorea* and *Psorotichia schaeferi*. *Peccania*

tiruncula has been known earlier from Africa (Algeria, Morocco, Namibia, Sahara), Arabian Peninsula (Umman), Europe (France, Spain) and North America (Canada), (Moreno & Egea 1992; Nash & al. 2007; Brown & al. 2002). The species is new for Turkey.

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