

DIALYTRICHIA MUCRONATA (BRID.) BROTH. (POTTIACEAE), A NEW RECORD FOR THE MOSS FLORA OF IRAN

R. Asadboland, A. R. Iranbakhsh, S. Shirzadian & M. R. Eslahi

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Pottiaceae are a world-widely distributed in characteristic harsh habitats. Based on the survey of mosses in Khuzestan province (SW of Iran), a new species, namely, *Dialytrichia mucronata* (Brid.) Broth. is found from Sheyvand waterfall of Izeh. Illustrations, characteristics, locality and habitat of the species are explained as a new record for Iranian bryoflora herewith.

Roghaieh Asadboland & Ali Reza Iranbakhsh, (correspondence <iranbakhsh@iau.ac.ir>). Department of Biology, Science and Research Branch, Islamic Azad University, Tehran, Iran.- Saeed Shirzadian, Department of Botany, Iranian Research Institute of Plant Protection, Agricultural Research, Education and Extension Organization (AREEO), Tehran, Iran.- Mohammad Reza Eslahi, Plant Protection Department, Khuzestan Agriculture and Natural Resource Research and Education Center, AREEO, Ahvaz, Iran.

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Dialytrichia mucronata (Brid.) Broth. گزارشی جدید از تیره Pottiaceae برای فلور خزهای ایران

رقیه اسدبلند: دانشجوی دکتری سیستماتیک گیاهی، دانشگاه آزاد اسلامی، واحد علوم و تحقیقات، گروه زیست شناسی، تهران، ایران
علیرضا ایرانبخش: استاد، دانشگاه آزاد اسلامی، واحد علوم و تحقیقات، گروه زیست شناسی، تهران، ایران
سعید شیرزادیان: دانشیار پژوهش، بخش تحقیقات رستنی‌ها، مؤسسه تحقیقات گیاهپزشکی کشور، سازمان تحقیقات، آموزش و ترویج کشاورزی، تهران، ایران
محمدرضا اصلاحی: استادیار پژوهش، بخش تحقیقات گیاهپزشکی، مرکز تحقیقات و آموزش کشاورزی و منابع طبیعی خوزستان، سازمان تحقیقات، آموزش و ترویج کشاورزی، اهواز، ایران
تیره Pottiaceae با گسترش جهانی، صفت مشخصه زیستگاه‌های سخت محسوب می‌شود. براساس بررسی‌های صورت گرفته در استان خوزستان، گونه‌ای به نام *Dialytrichia mucronata* (Brid.) Broth. متعلق به تیره مذکور از آبشار شیوند ایذه یافت شد. تصاویر، شرح ریخت شناختی، محل جمع‌آوری و رویشگاه گونه مذکور به عنوان گزارشی جدید برای فلور خزهای ایران توضیح داده می‌شود.

INTRODUCTION

Pottiaceae is a large and diverse family in mosses with almost worldwide distribution that embraces ca. 77 genera and 1450 species nearly 1.4 of the total number of species mentioned in the bryophyte flora of the Near and Middle East. These mosses mainly grow on soil or rocks, covered by thin soil layers in places

subject to severe desiccation (Zander 1993). Kürschner (2007) constructed a key for the identification of Pottiaceae family of the Near and Middle East and reported 77 species for bryoflora of Iran. Kürschner and Frey (2011) published a comprehensive report on the bryophyte flora of Southwest Asia and raised this number to 91 species. Fereidounfar & al. (2011)

reported *Syntrichia norvegica* F. Web. and *Tortula solmsii* (Schimp.) Limpr. from Alvand Mountain in Hamadan Province (West of Iran). Later, Shirzadian & al. (2014) recorded a new species of this family, namely, *Diymodon sinuosus* (Mitt.) Delogne from West Azerbaijan Province (NW of Iran). Salimpour & al. (2014) also reported *T. vahliana* (Schultz) Mont. from Sarab-e-Kiyan region in Hamedan Province.

In the present study, a new record of Pottiaceae, namely, *Dialytrichia mucronata* (Brid.) Broth. is reported for the first time from Khuzestan Province (SW of Iran).

MATERIALS AND METHODS

Khuzestan Province is situated in South-west of Iran. It covers an area of 63633 km², which lies between the latitudes of 29° 57' N and 33° 00' N and the longitudes of 47° 40' E and 50° 33' E. The elevation varies from sea level in Persian Gulf beaches to 3500 m in Sefidkoh Mountain. About 30% of Khuzestan territory is surrounded by Zagros Mountains in the north, east, and south-east. The area possesses some large rivers of which only one is navigable i.e. the Karun River. Climate widely differs in this area but

most parts of the region are arid and the predominant plants in these areas are species of *Tamarix* and cultivated *Eucalyptus*. The average precipitations is 266 mm per year, but mean annual rainfall reaches to 950 mm in the north eastern parts. The main season of the rainfall is during winter. Temperature in most parts of the region reaches above 50 °C during summer (Masoudi & Elhaesahar 2016).

For this study, the moss samples were collected from Sheyvand waterfall of Izeh (Khuzestan Province, Iran) during summer 2018 (fig. 1). Samples were collected in paper bags and field data were recorded. The samples were air-dried in room temperature and stored in the standard paper packet. For morphological observations, the samples were soaked in hot water for a few minutes for their revival. The whole leaf and peristome were observed under the microscope (Olympus-BH2) and photographed. Identification of the specimen was made with the help of Smith (2004) Frey & al. (2006), Kürschner (2007) and Kürschner and Frey (2011). The voucher specimen is preserved in the herbarium of the Ministry of Jihad-e Agriculture ("IRAN") at the Iranian Research Institute of Plant Protection (Tehran, Iran).

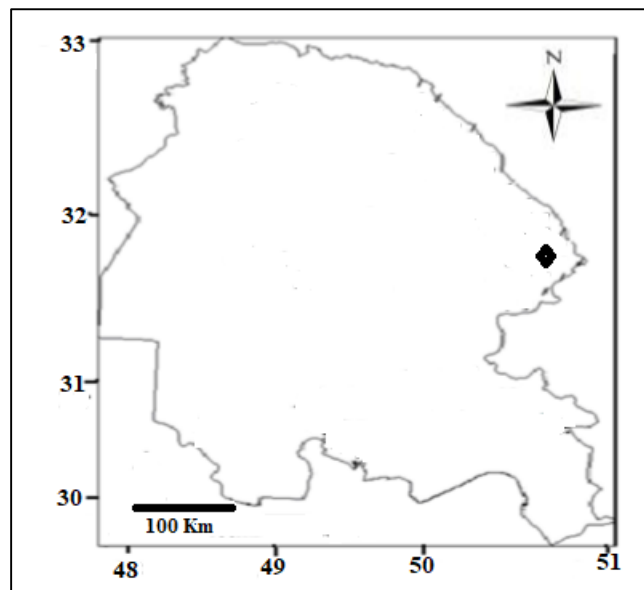


Fig. 1. Map showing distribution of *Dialytrichia mucronata* in Khuzestan province (Iran).

RESULT

Dialytrichia mucronata (Brid.) Broth., Nat. Pflanzenfam. 1: 412. 1902. (fig. 2)

Plants relatively small in dark green tufts, stems erect, 1-3 cm long, with irregular short lateral branches; central strand present; sclerodermal cells in (2) 3-4 (5) layers, 5-10 μm wide, cortical cells larger, up to 30-35 μm; leaves without hair, crispate, flexuose when dry,

erecto-patent when moist, 2-3 mm long, lingulate to oblong-lanceolate; leaf apex shortly mucronate; leaf margin recurved throughout, 1 (2) stratoze, inner border cells of similar size as cells of outermost layer; costa relatively stout, (50) 70-80 (130) μm wide, lacking epidermal cell layer; ventral stereids few; guide cells 3-4 (5); laminal cells irregularly hexagonal to quadrate, (6) 8-10 (12) μm wide, opaque, densely pluripapillose;

basal cells rectangular to longly hexagonal, smooth, (20) 25-30 (45) μm .

Seta erect, up to 12 mm long; capsule exserted, erect, cylindrical, up to 5 mm long; operculum conical-rostrate; peristome well-developed, consisting of 32 filiform segments, free at base, spirally coiled, papillose, up to 850 μm long, spores smooth, crenulate or weakly papillose, 15-20 μm in diameter.

Specimens examined: Iran: Khouzestan Province, Sheyvand waterfall, Izeh, on rock near river, 31°36'47"N 50°11'35"E, 600 m, 08.08.2018, R. Asadboland (IRAN 615 B).

Dialytrichia mucronata grows on rocks periodically submerged in fast-flowing streams and rivers that so far reported from Lebanon, Sinai Peninsula (Egypt), Israel, and Turkey (Erdağ & Kürschner 2011).

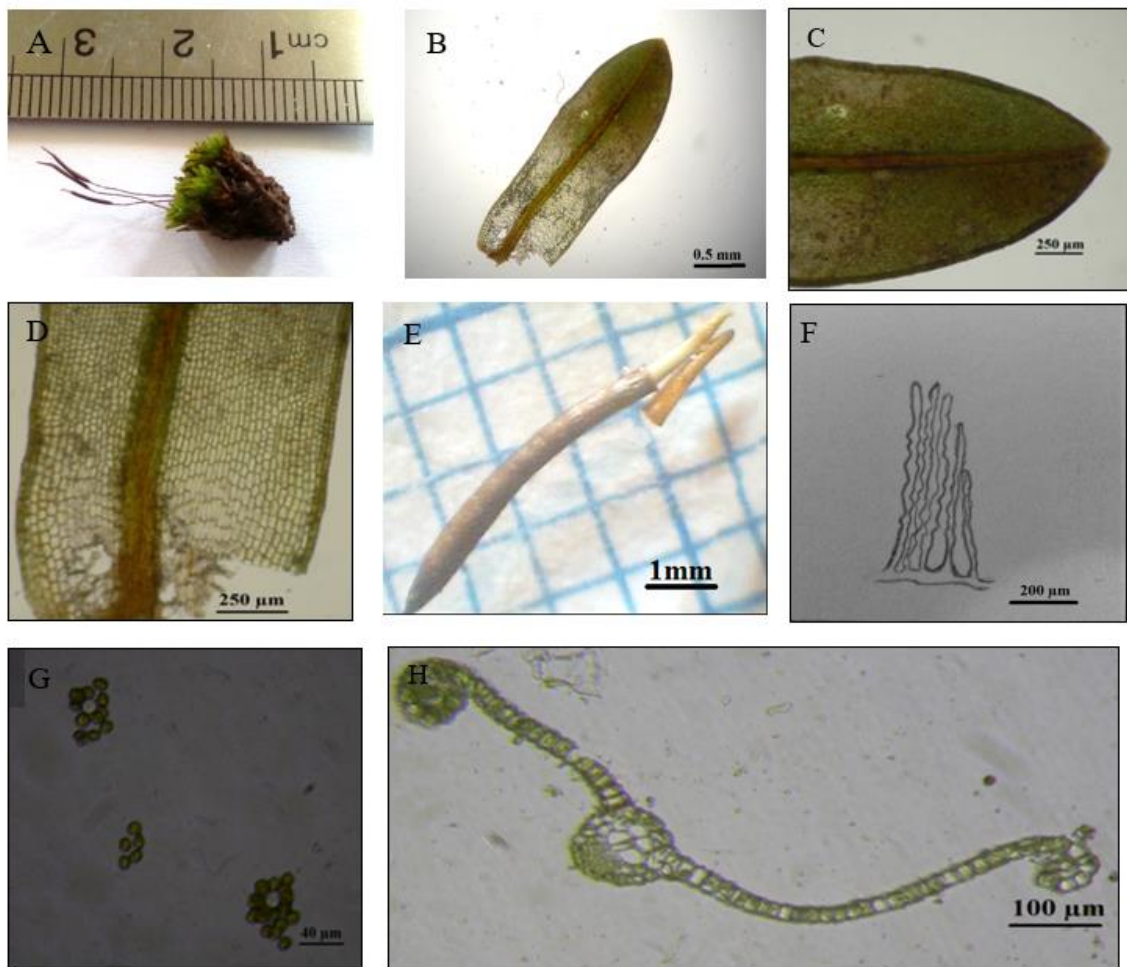


Fig. 2. *Dialytrichia mucronata*. A, habit; B, leaf; C, upper laminal cells; D, basal laminal cells; E, capsule with operculum and peristome; F, peristome showing free base; G, spores; H, leaf cross section.

DISCUSSION

Dialytrichia mucronata is an epilithic species found growing in association with *Cinclidotus fontinaloides* (Hedw.) P. Beauv. and *C. riparius* (Host. ex Brid.) Arn. At the first glance, the species gets confused with *Cinclidotus* species but after thorough microscopical examination, it shows the different characters. *Dialytrichia mucronata* differs from *C. riparius* by

recurved margins of leaves that become spirally when dry. Unlike *D. mucronata*, *C. fontinaloides* has capsules hidden among the leaves, and usually form irregular tufts rather than neat cushions or low tufts (Smith 2004).

The specimens studied in the present research, show leaf margins with single stratoise which is consistent with Kürschner and Lübenau-Nestle (2000) who

believe this as an adaptation to temporarily xeric sites, strongly papillose laminal cells, as well as short setae with immersed capsules.

The genera *Cinclidotus* and *Dialytrichia* were classified by Smith (2004) into two separate families, viz. Cinclidotaceae and Pottiaceae. But, Frey & al. (2006) placed both genera under Cinclidotaceae, because of their similarity in leaf shape and thickened margin. Finally, Kürschner and Frey (2011), considered the position of these two genera in Pottiaceae considering some common features such as thickened leaf margins, two or more layers of leaf cells, olive green to dark green color, and aquatic to floating habitat of the plant.

It is worthy to state that, Smith (2004), considered the genus *Dialytrichia* as a monotypic genus (*D. mucrunata*) under Pottiaceae family but later, Cano (2007) added *D. saxicola* (Lamy.) M. J. Cano. as a second member of the of the genus.

For more information, reference could be made to the work of Ros & al. (2013) who made a checklist on the Mediterranean mosses.

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