

خلاصه ... رستنیها، جلد ۵، ۱۳۸۳

۸۶۶ ... ۶۶۶۶ ...

### چهار گونه جدید برای فلور خزهای ایران\*

New records for the moss flora of Iran

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چهار گونه خز به اسامی *Physcomitrium pyriforme* (Funariaceae), *Bryum alpinum*, *Pohlia elongata* (Bryaceae) و *Fabronia pusilla* (Fabroniaceae) متعلق به چهار جنس و سه تیره برای اولین بار از ایران گزارش می‌گردند. نمونه‌ها از مخمل کوه (واقع در شمال خرم‌آباد لرستان بین ۱۳:۴۸ تا ۳۷:۴۸ عرض جغرافیایی و ۳۷:۳۳ تا ۲۳:۳۳ درجه طول جغرافیایی) در طی ماه‌های بهمن و اسفند ۸۰ و فروردین ۸۱ از نقاط مختلف منطقه جمع‌آوری گردید. جهت شناسایی دقیق گونه‌ها از اندام‌های مختلف هر نمونه پس از برش‌گیری و قرار دادن در محلول گام کلرال اسلایدهای میکروسکوپی تهیه و سپس با استفاده از کلیدهای شناسایی معتبر (Lawton 1971, Smith 1978 and Crum & Anderson 1981) نمونه‌ها تعیین نام گردیدند.

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از مجموع ۲۸ نمونه جمع آوری شده، تعداد چهار گونه به چهار جنس و سه تیره تعلق داشتند که براساس سیستم رده‌بندی، مشخصات کامل هر یک با تصاویر مربوط برای نخستین بار از ایران گزارش می‌گردند (متن کامل مقاله در قسمت انگلیسی آورده شده است).

**واژه های کلیدی:** خزه، مخمل کوه، لرستان، تنوع زیستی، برفیوفیت

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## NEW RECORDS FOR THE MOSS FLORA OF IRAN

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### Abstract

The following four species *Physcomitrium pyriforme* (Funariaceae), *Bryum alpinum*, *Pohlia elongata* (Bryaceae) and *Fabronia pusilla* (Fabroniaceae), are reported for the first time from Iran.

The specimens were collected from Makhmal-kuh mountain (situated in north of Khorram-abad, Lorestan province). The voucher specimens are preserved in the Az-Zahra University herbarium, Tehran, Iran.

**Key words:** Mosses, Makhmal-kuh, Lorestan, Plant diversity, Bryophytes

### Introduction

The first attempt to study the Iranian mosses was made by BOISSIER & BUHSE in 1860. They recorded 43 species from northern provinces of Iran and some parts of former Russia. STÖRMER (1963) studied mosses collected by WENDELBO (1959)

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from Iran. He compiled a comprehensive list of mosses which was recorded by other researchers before. FREY & KÜRSCHNER (1977, 1979, 1981 & 1983) added new species to the Iranian moss flora where most of these species were collected from northern parts of Iran.

An indigenous bryologist, SHIRZADIAN (1989, 1996), took up the studies on the mosses of Iran as the first person from the country. SHIRZADIAN & KUMAR (1994) recorded some species from various localities of Alburz mountains and its adjacent regions. Later, KÜRSCHNER (1996) studied the moss flora of Near & Middle East and recorded 30 new species to the moss flora of Iran. SHIRZADIAN *et al.* (2000) recorded four new species from North of Khorrasan province. KÜRSCHNER *et al.* (2000) also recorded seven species from Golestan National Park. Recently, SHIRZADIAN (2002) recorded two species of *Bryum* from Boushehr and Khuzestan provinces (Negin and Minoo islands respectively). Most recently, GHAHREMAN *et al.* (2003) prepared a check list for the moss flora of Iran.

#### Material and Methods

The plant materials were collected during February–April, 2002 from various localities in the Makhmal-kuh mountains, situated in north of Khorram-abad, Lorestan province Iran, ranging between 48° 13' to 48° 37' latitude and 33° 37' to 33° 23' longitude with mean rainfall about 520 mm/year with a rocky texture. This region has usually, a long drought season from June to November. Generally, in winter, this mountain remains covered with snow while in summer, goes under a dry steppe climate.

Samples were brought to the laboratory in polythene bags and washed with water. Different plant organs were carefully dissected and mounted in Gum Chloral and then observed under the microscope. To determine the taxa, LAWTON (1971), SMITH (1978) and CRUM & ANDERSON (1981) methodology were followed.

The voucher specimens are preserved in the Az-Zahra University herbarium (Tehran, Iran).

**Result and Discussion:**

*Physcomitrium pyriforme* (Hedw.) Brid., Bryol. Univ. 2: 815. 1827 (Fig. 1).

Plants small, about 3-5 mm long. Lvs. patent when dry and twisted, erect to patent when moist; 3-5 mm long and about 1 mm wide; apex acute; margin plane, entire, unbordered; costa ending below apex; lamina unistratose; cells rectangular, uniformed,  $21-60 \times 11-5.0 \mu\text{m}$ .

Seta terminal, straight, 5.0-6.0 mm. long. Capsule pyriforme, erect, 1.0-2.0 mm long and about 1.0 mm. wide; annulus uni- to bi-stratose; gymnostomous. Spores spherical, papillose,  $7.0 \mu\text{m}$  in diameter.

Lorestan, Khorram-abad (Makhmal-kuh), near Sarmargh, 1500-1600m, on soil, January and March 2002, Sh. Ahmadi.

Distribution: C. Europe, Caucasus, Algeria, Morocco, Macaronesia, Australia, and Iran.

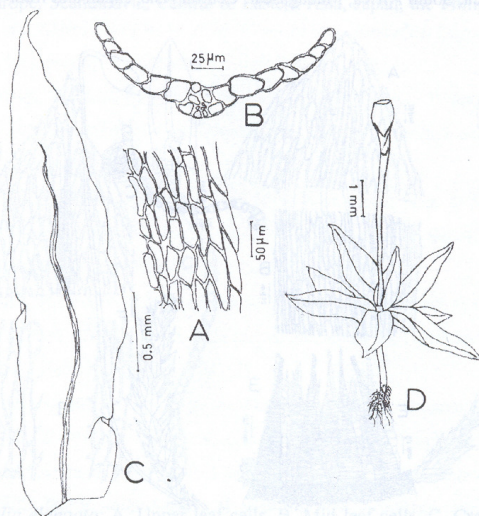


Fig. 1. *Physcomitrium pyriforme*: A. Mid leaf cells, B. Cross-section of leaf, C. Leaf, D. Plant with sporophyte.



*Bryum alpinum* Huds. ex With., Syst. Arr. Brit. Pl. ed. 4, 3: 824. 1801 (Fig. 2).

Plants about 2.5 cm long. Lvs. straight, imbricate when dry, erecto-patent when moist; about 1.5-2.5 mm long and 0.5-1.0 mm wide; lanceolate to ovate-lanceolate, apex acute; margin recurved, entire, unbordered; costa percurrent; lamina plicate, unistratose; cells at apex and middle long, narrowly rhomboid, 23-31 x 0.4-0.6  $\mu$ m, at base rectangular, 12-26 x 0.6-10  $\mu$ m, smooth.

Seta lateral, single, about 2.5 cm long, red-yellow. Capsule pyriforme, cylindrical, inclined, about 3.0 mm long and 1.0 mm wide; peristome teeth 16, entire, smooth; operculum apiculate; calyptra not seen. Spores smooth, 6.0  $\mu$ m in diameter.

Lorestan, Khorram-abad (Makhmal-kuh), near Sarmargh, 1400 m, on rock, March 2002, Sh. Ahmadi.

Distribution: Idaho, Alaska, California, Colorado, New England, Newfoundland, Lawrence Island, British Columbia, Europe, Asia Minor, Canary Islands, North & Central Africa, South Africa, Madagascar, Central Asia, Japan and Iran.

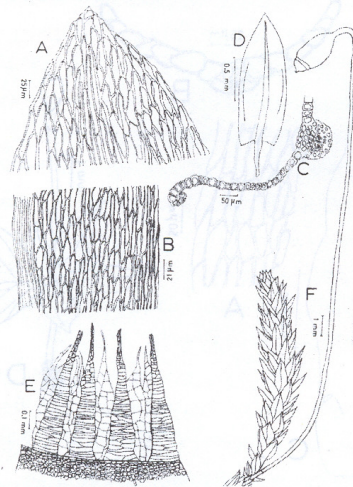


Fig. 2. *Bryum alpinum*: A. Upper leaf cells, B. Mid leaf cells, C. Cross-section of leaf, D. Leaf, E. Peristome, F. Plant with sporophyte.

*Pohlia elongata* Hedw., Spec. Musc., 171. 1801 (Fig.: 3).

Plants in dense tufts, green-yellow, about 3.5 cm long, slender. Lvs. erect when dry, erecto-patent when moist, about 2.0-2.5 mm long and 1.0 mm wide; lanceolate, acute; margin recurved, entire, unbordered; costa excurrent; lamina with 2-3 plicate, unistratose, cells long and narrow rhomboidal, smooth, 16-30 x 3.0-5.0  $\mu\text{m}$ .

Seta lateral, red, about 2.0-3.0 cm long. Capsule pyriform, about 2.0 mm long and 1.0 mm wide, annulus present; peristome in two rows, outer row with 16 teeth; operculum rostellate. Spores bluntly papillose, spherical, about 5.0  $\mu\text{m}$  in diameter.

Lorestan, Khorram-abad (Makhmal-kuh), Tangeh-Shabikhoon, 1200 m, on rock, February 2002, Sh. Ahmadi.

Distribution: British Columbia, Colorado, Minnesota, New England, North Carolina, New Brunswick to Ontario, Wisconsin, Georgia, Tennessee, Arizona, Central & Western Europe, Scandinavia, Central & Eastern Asia, Japan, the Philippine Islands and Iran.

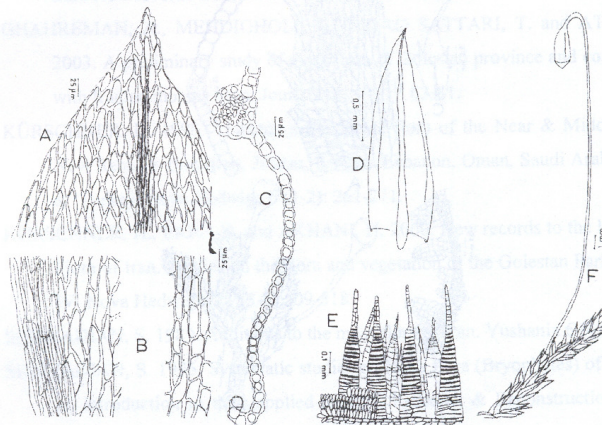


Fig. 3. *Pohlia elongata*: A. Upper leaf cells, B. Mid leaf cells, C. Cross-section of leaf, D. Leaf, E. Peristome, F. Plant with sporophyte.



*Fabronia pusilla* Raddi, Atti Accad. Sci. Siena 9: 231. 1808 (Fig. 4).

Plants small, bright green and shiny. Main stem creeping, branched alternately. Lvs. patent when moist, similar on main stem and branches, ovoid, about 0.5 mm long and 0.3 mm wide; margin with long and narrow segments, plane, unbordered; costa up to half of the leaves; lamina unistratose; cells long narrow hexagonal to rhomboidal, rectangular at base with wavy walls, smooth,  $16-25 \times 3.0-5.0 \mu\text{m}$ .

Seta lateral, many, yellow-green, twisted when dry, 1.0-3.0 mm long. Capsule rectangular-globose, about 0.5 mm long and 0.5 mm wide; annulus absent; operculum apiculate; peristome teeth in one row, teeth bearing cilia, very prominent. Spores spherical-elliptic, dense papillose, about  $5.0 \mu\text{m}$  in diameter.

Lorestan, Khorram-abad (Makhmal-kuh), near Iman-abad, 1500m, on soil, January 2002, Sh. Ahmadi.

Distribution: British Columbia, Washington, Oregon, Idaho, California, Arizona, Colorado and Iran.

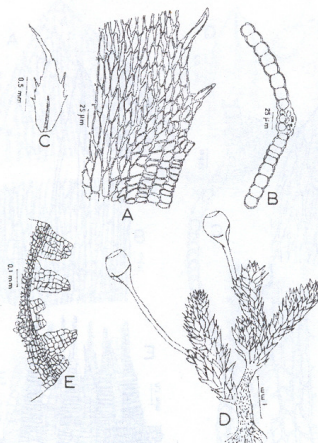


Fig. 4. *Fabronia pusilla*: A. Mid leaf cells, B. Cross-section of leaf, C. Leaf, D. Plant with sporophyte, E. Peristome.



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