

A PRELIMINARY STUDY OF MOSS FLORA OF GOLESTAN PROVINCE AND COMPARISON WITH IRANIAN MOSSES

A. Ghahreman, K. Mehdigholi, T. Nejad Sattari and F. Attar

Ghahreman, A., Mehdigholi, K., Nejad-Sattari, T. & Attar, F. 2003 12 30: A preliminary study of moss flora of Golestan province and comparison with Iranian mosses. - Iran. Journ. Bot. 10(1): 63-81. Tehran.

In this study, moss flora in Golestan province has been compared with Iranian moss flora. Thirty nine locations in the province were used for the research and collection of the plants. Hundred and seventeen species were gathered constituting a high percentage (nearly one third) of the total number of moss species found throughout the country. The list of moss flora of Iran is presented in this paper. The species occurring in Golestan province are signed by an asterisk. Localities of the new collections are given.

مطالعه مقدماتی فلور خزّه ای استان گلستان و مقایسه آن با فلور خزّه ای ایران

احمد قهرمان، کاظم مهدیقلی، طاهر نژاد ستاری و فریده عطار

در تحقیق فلورستیک خزّه های استان گلستان که جمع آوری نمونه های آن در ۳۹ ایستگاه در این استان صورت گرفت، ۱۱۷ گونه از مجموع نمونه های جمع آوری شده شناسائی گردید که در مقایسه با کل گونه های فلور خزّه در ایران که دیگران جمع آوری کرده و یا در منابع موجود است یک سوم آن را تشکیل می دهد.

لیست حاضر، علاوه بر خزّه های جمع آوری شده در این تحقیق شامل لیست کل خزّه های ایران نیز می باشد.

Introduction

Iran is a vast country with a climate which has given rise to high diversity of plant species. There are nearly 8000 plant species identified in Iran. In addition to these lower plants are also widely distributed. Bearing in mind the growth of mosses in regions not characterised as humid, Iran with its wide dry areas can be of interest from the moss flora point of view.

Golestan province is situated in East of the Caspian sea and has an area of about 20,891 sq km. The province is surrounded from northwest by the Caspian sea, in east by Khorasan, in West by Mazandaran, in North by Turkamanistan, and in South by Semnan province respectively. Alborz mountain range's high elevations South of the Caspian sea catches the sea's moisture, thus creating a humid climate and dense forest in zone between the sea and the mountains. Golestan province is one of the most humid provinces of Iran. It has a Caspian-like temperate and humid climate caused by: Alborz mountain range, the geographic orientation of the mountain range, the elevation and the mountain proximity with the sea. Based on the mentioned conditions, three types of climates can be identified as follows:

1. Temperate plain land climate at the East of the province with annual rainfall 1200-1300 mm which decreases eastwards.
2. Mountainous climate at the high elevations and northern slopes of the Alborz mountains.
3. Semi-arid climate including parts of Gonbad and Gorgan steep slopes which extends from North of the Gorgan river to the borders of Turkamanistan.

In this investigation, nearly 400 specimens from various locations (39 localities) and different elevations, mostly from Golestan National Park, were gathered and deposited in Tehran University's Central Herbarium. All the specimens were collected by Farideh Attar & Kazem Mehdigholi.

Floristic analysis

The total number of Iranian moss species is 353 which are placed in 117 genera and 29 families. These numbers are based mainly on the following papers: Frey & Kürschner 1977; Frey & Kürschner 1983; Shirzadian, 1989; Shirzadian & Kumar, 1994; Kürschner, 1996; Shirzadian 1996; Kianmehr, Shirzadian & Sotoodehnia, 2000; Shirzadian, 2000 and Shirzadian & al., 2000; Kürschner & al. The largest moss families in Iran are *Pottiaceae* with 80, *Brachytheciaceae* with 39 and *Bryaceae* with 37 species respectively. Mosses can be divided into two basic categories: acrocarpous (mostly belonging to arid regions) and pleurocarpous (mostly belonging to the humid regions). There are 250 acrocarpous and 103 pleurocarpous species in Iran.

In this study, nearly 400 specimens were gathered in Golestan province which belong to 117 species, 57 genera and 23 families (Table 1). The largest families are *Pottiaceae* (79 species), *Brachytheciaceae* and *Bryaceae* (39 species), *Amblystegiaceae* (23 species) and *Grimmiaceae* (22 species) respectively. (Fig. 1).

Identification of the species are mainly based on: Bilewsky, 1965; Agnew & Vondracek, 1975; Smith, 1978; Watson, 1981; Noguchi, 1988, 1991; Zhu & So, 1996.

List of localities

- 10 km after Aliabad to Azad Shahr, Shirabad village, 139m (1)
 Aliabad, Gorogh forest, mountains, 800m (2)
 Aliabad, Kabudval, 500-1100m (3)
 Bandar Gas, Banafsh Tappeh village, 200m (4)
 Galikesh to Mazar, 526m (5)
 Golestan National Park, Almehr road from Mirzabaylu, 1450-1650m (6)
 Golestan National Park, Soleyman Koshteh, 1250m (7)
 Golestan National Park, Adnasad valley, 600-700m(8)

Table 1. Moss genera and species in Iran and Golestan province (*G= species occurring in Golestan prov.; I.= species occurring in Iran; P= Pleurocarpus; A= Acrocarpus).

Taxa (L)	G.	Habit	Locality and herbarium number, substratum.
Amblystegiaceae			
<i>Amblystegiella subtilis</i> (Hedw.) Loeske		P	
<i>Amblystegium juratzkanum</i> Schimp.		P	
<i>Amblystegium riparium</i> (Hedw.) Bruch & Schimp. in B.S.G.	*	P	
<i>Amblystegium serpens</i> (Hedw.) B.S.G.	*	P	(23)1362-TUH, on soil; (32)1360-TUH, on soil; (28) 1046-TUH, on soil; (30) 1361-TUH, on soil; (35) 1200-TUH, on soil; (4) 1082-TUH, on soil; (32) 1236-TUH, on soil
<i>Amblystegium tenax</i> (Hedw.) C. Jens.		P	
<i>Amblystegium varium</i> (Hedw.) Lindb.	*	P	(28) 1198-TUH, on soil
<i>Calliergon sarmmentosum</i> (Wahlenb.) Kindb.		P	
<i>Calliergonella cuspidata</i> (Hedw.) Loeske		P	
<i>Campyllum calcaratum</i> Crundw. & Nyh.		P	
<i>Campyllum sommerfeltii</i> (Myr.) J. Lange		P	
<i>Cratoneuron commutatum</i> (Hedw.) G. Roth. var. <i>commutatum</i>	*	P	(30) 1095-TUH, on rock; (17)1111-TUH, on rock
“ var. <i>falcatum</i> (Brid.) Monk.	*	P	(17) 1114- TUH, on rock; (16) 1206- TUH, on rock
“ var. <i>fluctans</i> (B.S.G.) Wijk & Marg.	*	P	
<i>Cratoneuron decipiens</i> (De Not.) Loeske		P	
<i>Cratoneuron decipiens</i> (De Not.) Loeske var. <i>nagaeiforme</i> (Schiffn.) Schiffn.		P	
<i>Cratoneuron filicinum</i> (Hedw.) Spruce	*	P	(10)1261-TUH, on rock
<i>Cratoneuron filicinum</i> (Hedw.) Spruce var. <i>fallax</i> (Brid.) Roth		P	
<i>Drepanocladus aduncus</i> (Hedw.) Warnst.	*	P	
<i>Drepanocladus exannulatus</i> (B.S.G.) Warnst.		P	
<i>Hygroamblystegium flavivittae</i> (Hedw.) Loesk		P	
<i>Hygroamblystegium tenax</i> (Hedw.) Jenn.		P	
<i>Hygrohypnum luridum</i> (Hedw.) Jenn.	*	P	(26)1115-TUH, on rock, with thin layer of soil; (4)1091-TUH, on rock
<i>Leptodictyum kochii</i> (B.S.G.) Warnst.		P	
Bartramiaaceae			
<i>Bartramia halteriana</i> Hedw.		A	

<i>Philonotis caespitosa</i> Jur		A	
<i>Philonotis calcarea</i> (B.S.G.) Schimp.		A	
<i>Philonotis calcarea</i> (B.S.G.) Schimp. var. <i>seriatifolia</i> Schiffn.		A	
<i>Philonotis capillaris</i> Lindb. in Hartm.		A	
<i>Philonotis fontana</i> (Hedw.) Brid.		A	
<i>Philonotis fontana</i> (Hedw.) Brid. var. <i>minor</i> Par.		A	
<i>Philonotis hastata</i> (Düb.) Wijk & Marg.		A	
<i>Philonotis laxitexta</i> Froehl.		A	
<i>Philonotis marchica</i> (Hedw.) Brid.		A	
<i>Philonotis rigida</i> Brid.		A	
<i>Philonotis uncinata</i> (Schwaegr.) Brid.		A	
<i>Philonotis seriatata</i> Mitt.		A	
<i>Philonotis seriatata</i> Mitt. var. <i>persica</i> Schiffn.		A	
<i>Philonotis tomentella</i> Mol. in Lor.		A	
<i>Plagiopus oederi</i> (Brid.) Limpinr.	*	A	(9)1288-TUH, on rock
Brachytheciaceae			
<i>Brachythecium acuminatum</i> (Hedw.) Aust.		P	
<i>Brachythecium albicans</i> (Hedw.) B.S.G.	*	P	(15)1069-TUH, floor of forest
<i>Brachythecium fendleri</i> (Sull.) Jaeger.		P	
<i>Brachythecium gehzebii</i> Milde.	*	P	(18)1070-TUH, on tree trunk; (26)1177-TUH, on tree trunk
<i>Brachythecium olympicum</i> Jur. in Ung. & Kotschy		P	
<i>Brachythecium populeum</i> (Hedw.) B.S.G.	*	P	(23)1059-TUH, on rock; (32)1050-TUH, on soil; (34)1206-TUH, on soil
<i>Brachythecium rivulare</i> B.S.G.		P	(10)1285-TUH, on tree trunk
<i>Brachythecium rutabulum</i> (Hedw.) B.S.G.	*	P	(32)1001-TUH, on soil; (37)1204-TUH, on soil
<i>Brachythecium rutabulum</i> (Hedw.) B.S.G. var. <i>meridional</i> Schiffn.		P	
<i>Brachythecium salebrosum</i> (Web. & Mohr) B.S.G.		P	(37)1048-TUH, on soil
<i>Brachythecium umbilicatum</i> Jur. & Milde		P	
<i>Brachythecium velutinum</i> (Hedw.) B.S.G.	*	P	(38)1083-TUH, on soil; (32)1220-TUH, on soil; (4)1077-TUH, on soil
<i>Bryhnia novae-angliae</i> (Sull. & Lesq.)		P	
<i>Cirriophyllum crassinervium</i> (Tayl.) Loeske & Fleisch.	*	P	(10)1259-TUH, on soil
<i>Cirriophyllum piliferum</i> (Hedw.) Grout		P	
<i>Cirriophyllum reichenbachianum</i> (Hub.) Wijk & Marg.	*	P	(11)1260-TUH, on soil

<i>Eurhynchium hians</i> (Hedw.) Sande Lac.	*	P	(11)1269-TUH, on soil; (26)1167-TUH, on soil; (27)1161-TUH, on soil; (28)1195-TUH, on rock; (3)1197-TUH, on soil; (32)1356-TUH, on humus; (39)1194-TUH, on soil
<i>Eurhynchium hians</i> (Hedw.) Sande Lac. var. <i>rigidum</i> (Boul.) Cortes		P	
<i>Eurhynchium praelongum</i> (Hedw.) B.S.G.	*	P	(11)1270-TUH, on soil
<i>Eurhynchium praelongum</i> (Hedw.) B.S.G. var. <i>stokesii</i> (Turn.) Dix.		P	
<i>Eurhynchium pulchellum</i> (Hedw.) Jenn.	*	P	(1)1045-TUH, on rock; (18)1140-TUH, on soil; (23)1181-TUH, on soil; (3)1160-TUH, on soil; (30)1159-TUH, on soil; (32)1233-TUH, on rock; (34)1207-TUH, on soil and rock; (39)1169-TUH, on soil; (4)1080-TUH, on rock; (8)1112-TUH, on soil; (9)1171-TUH, on soil
<i>Eurhynchium pulchellum</i> (Hedw.) Jenn. var. <i>praecox</i> (Hedw.) Dix.		P	
<i>Eurhynchium schleicheri</i> (Hedw. f.) Jur. in Rom.	*	P	(27)1178-TUH, on soil; (32)1221-TUH, on rock; (37)1013-TUH, on soil;
<i>Eurhynchium speciosum</i> (Brid.) Jur.	*	P	(19)1180-TUH, on soil; (26)1163-TUH, on soil; (4)1076-TUH, on soil
<i>Errhynchium speciosum</i> (Brid.) Jur. var. <i>angustifolium</i> Sotner		P	
<i>Eurhynchium striatum</i> (Hedw.) Schimp.	*	P	(15)1141-TUH, on soil; (17)1154-TUH, on soil
<i>Homalothecium lutescens</i> (Hedw.) Robins.	*	P	(13)1150-TUH, on rock
<i>Homalothecium megacarpum</i> (sull.) Robins.		P	
<i>Homalothecium nilgheriese</i> (mont.) Robins.		P	
<i>Homalothecium nitens</i> (Hedw.) Robins.	*	P	(31)1298-TUH, on rock; (32)1224-TUH, on rock
<i>Homalothecium philippaeum</i> (Spruce) B.S.G.	*	P	(17)1162-TUH, on rock; (9)1151-TUH, on rock
<i>Homalothecium sericeum</i> (Hedw.) B.S.G.		P	(16)1134-TUH, on rock
<i>Isoetecium alopecuroides</i> (Duh.) Isov.		P	
<i>Ptilanocladium euchloron</i> (C. Muell.) Wijk & Marg.	*	P	(1)1031-TUH, on rock; (1)1031-TUH, on rock; (4)1092-TUH, on rock; (17)1176-TUH, on rock; (17)1114-TUH, on tree trunk; (26)1196-TUH, on rock; (30)1179-TUH, on rock; (32)1234-TUH, on rock; (34)1237-TUH, on rock
<i>Rhyncostegiella jacquinii</i> (Garov.) Limpr.		P	
<i>Rhyncostegiella menadensis</i> (Lac.) Bartr.		P	
<i>Rhyncostegiella tenella</i> (Dicks.) Limpr.		P	
<i>Rhyncostegium megapolitanum</i> (Web. & Mohr) B.S.G.	*	P	(3)1124-TUH, on soil; (1)1124-TUH, on tree trunk; (17)1119-TUH, on soil; (32)1223-TUH, on rock; (39)1118-TUH, on rock

<i>Rhynchostegium riparoides</i> (Hedw.) Card.		P	(15)1137-TUH, on soil; (16)1126-TUH, on soil; (32)1213-TUH, on soil
<i>Scleropodium purum</i> (Hedw.) Limpr.		P	
<i>Scorpiurium circinatum</i> (Brid.) Fleisch. & Loeske var. <i>tenu</i> (Britz.) Latz.	*	P	(1) 1030-TUH, on rock
Braceae			
<i>Anomobryum auratum</i> (Mitt.) Jaeg.	*	A	
<i>Brachymenium exile</i> (Doz. & Molk.) Bosch. & Lac.		A	
<i>Brachymenium nepalense</i> Hook. ex Schwaegr.		A	
<i>Bryum argenteum</i> Hedw.	*	A	(11) 1352-TUH, on stony wall; (1) 1035-TUH, on soil; (26) 1358-TUH, on rock; (28) 1088-TUH, on soil; (30)1190-TUH, on soil; (34) 1028-TUH, on soil.
<i>Bryum argenteum</i> Hedw. var. <i>lanatum</i> (B. Beauv.) Hampe		A	
<i>Bryum atroviridens</i> Vill. ex Brid.		A	
<i>Bryum bedium</i> (Brid.) Shimp.		A	
<i>Bryum bicolor</i> Dicks		A	
<i>Bryum caespitium</i> Hedw.	*	A	(6) 1353-TUH, on rock; (18) 1355-TUH, on soil
<i>Bryum capillar</i> Hedw. var. <i>meridional</i> Schimp.	*	A	(9) 1201-TUH, on tree trunk; (13)1351-TUH, on rock; (28)1034-TUH, on soil; (3)1102-TUH, on soil; (33)1074-TUH, on soil; (37)1216-TUH, on soil; (4)1085-TUH, on soil
<i>Bryum comense</i> Schimp.		A	
<i>Bryum elwendicum</i> Fehn.		A	
<i>Bryum flaccidum</i> Brid.	*	A	(16)1189-TUH, on rock; (23)1188-TUH, on soil
<i>Bryum funckii</i> Schwaegr.		A	
<i>Bryum inclinatum</i> (Brid.) Bland.		A	
<i>Bryum muehlenbeckii</i> B.S.G.		A	
<i>Bryum neodanense</i> Iztigs. ex C. Muell.		A	
<i>Bryum pallens</i> Sw.		A	
<i>Bryum pallescens</i> Schleich. ex Schwaegr.	*	A	(6)1258-TUH, on soil
<i>Bryum pallescens</i> Schleich. ex Schwaegr. var. <i>contextum</i> (Hoppe & Hornsch.) Furrn.		A	
<i>Bryum pseudotriquetrum</i> (Hedw.) Gaertn. Meyer et Scherb.		A	
<i>Bryum pseudotriquetrum</i> (Hedw.) Gaertn., Meyer et Scherb. var. <i>bornmulleri</i> Schiffn.		A	
<i>Bryum schleicheri</i> Lam. & DC.		A	

<i>Bryum schleicheri</i> Lam. & DC. var. <i>latifolium</i> (Schwaegr.) Schimp.		A	
<i>Bryum sylvicum</i> Lor.		A	
<i>Bryum torquescens</i> Bruch ex De Not.		A	
<i>Bryum turbinatum</i> (Hedw.) Turm.		A	
<i>Bryum uliginosum</i> (Brid.) Bruch & Schimp. in B.S.G.	*	A	(28)1187-TUH, on soil
<i>Bryum weigelii</i> Spreng.		A	
<i>Leptobryum pyriforme</i> (Hedw.) Wils.	*	A	(30)1113-TUH, on very wet rock
<i>Mielichhoferia compacta</i> (Lindb.) Kindb. var. <i>papillosa</i> Froehl.		A	
<i>Pohlia annotina</i> (Hedw.) Lindb.		A	
<i>Pohlia cruda</i> (Hedw.) Lindb.		A	
<i>Pohlia flexuosa</i> Hook.		A	
<i>Pohlia havigii</i> (Spreng. ex Schwaegr.) Bruch.		A	
<i>Pohlia nutans</i> (Hedw.) Lindb.		A	
<i>Pohlia pentasticha</i> Schiffn.		A	
<i>Pohlia wahlenbergii</i> (Web. & Mohr) Andr. var. <i>calcareo</i> (Warnst.) Werb.	*	A	(3)1053-TUH, on wet soil
<i>Rhodobryum roseum</i> (Hedw.) Limpr.		A	
Dicranaceae			
<i>Dicranella howei</i> Ren. & Card.		A	
<i>Dicranella varia</i> (Hedw.) Schimp.	*	A	(37)1051-TUH, on soil; (3)1200-TUH, on soil
<i>Dicranum muehlenbeckii</i> B.S.G.		A	
<i>Dicranum scoparium</i> Hedw.		A	
<i>Oreas maritima</i> (Hopp. & Homsch.) Brid.		A	
<i>Paraleucobryum enerve</i> (Thed.) Loeske		A	
Ditrichaceae			
<i>Ceratodon purpureus</i> (Hedw.) Brid.		A	
<i>Chetiothela chloropus</i> (Brid.) Broth.		A	
<i>Distichum capillaceum</i> (Hedw.) B. S.G.		A	
<i>Distichum inclinatum</i> (Hedw.) B. S.G.	*	A	(9)1263-TUH, on soil
<i>Ditrichum flexiculate</i> (Schwaegr.) Hampe	*	A	(9)1264-TUH, on soil
<i>Ditrichum pallidum</i> (Hedw.) Hampe		A	
<i>Garckea comosa</i> (Doz. & Molk.) Wijk & Marg.		A	
Encalyptaceae			
<i>Encalypta ciliata</i> Hedw.		A	
<i>Encalypta intermedia</i> Jur.		A	
<i>Encalypta rhytidocarpa</i> Schwaegr.		A	

<i>Encalypta streptocarpa</i> Hedw.	*	A	(22)1147-TUH, on rock
<i>Encalypta vulgaris</i> Hedw.	*	A	(22)1192-TUH, on soil; (7)1193-TUH, on rock
Entodontaceae			
<i>Entodon concinns</i> (De Not.) Par.		A	
<i>Entodon schleicheri</i> (Schimp.) Demet.	*	A	(9)1267-TUH, on soil
Fabroniaceae			
<i>Fabronia ciliaris</i> (Brid.) Brid.	*	A	(14)1271-TUH, on rock
Fissidentaceae			
<i>Fissidens algarvicus</i> Solms		A	
<i>Fissidens bambergeri</i> Schimp. in Milde		A	
<i>Fissidens bryoides</i> Hedw. subsp. <i>Bryoides</i> Bertsch	*	A	(34)1011-TUH, on soil; (8)1272-TUH, on soil
<i>Fissidens bryoides</i> Hedw. subsp. <i>Incurvus</i> (Starke) Bertsch		A	
<i>Fissidens crassipes</i> Wils. ex B.S.G.		A	
<i>Fissidens cristatus</i> Wils. ex Mittl.		A	
<i>Fissidens exiguus</i> Sull.		A	
<i>Fissidens exilis</i> Hedw.		A	
<i>Fissidens mildannus</i> Schimp.	*	A	(10)1273-TUH, on soil
<i>Fissidens osmundoides</i> Hedw.	*	A	(1)1005-TUH, on soil; (28)1029-TUH, on soil
<i>Fissidens persicus</i> Ruthe in Jur. & Milde		A	
<i>Fissidens pusillus</i> (Wils.) Milde		A	
<i>Fissidens rivularis</i> (Spruce) B.S.G.	*	A	(32)1212-TUH, on soil
<i>Fissidens taxifolius</i> Hedw.	*	A	(3)1168-TUH, on soil; (32)1214-TUH, on soil
<i>Fissidens taxifolius</i> Hedw. Subsp. <i>Pallidicaulis</i> (Mitt.) P. Varde		A	
<i>Fissidens viridulus</i> (Sw.) Wahlentb.	*	A	(19)1149-TUH, on soil; (34)1241-TUH, on soil; (4)1090-TUH, on soil
Fontinalaceae			
<i>Fontinalis antipyretica</i> Hedw.		A	
<i>Fontinalis hypnoides</i> Hartm var. <i>duriaei</i> (Schimp.) Husn.		A	
Funariaceae			
<i>Entosthodon alpinus</i> (Dicks.) Bryhn		A	
<i>Entosthodon pallescens</i> Jur. in Ung. & Kotschy		A	
<i>Funaria anomala</i> Jur. in Ung. & Kotschy		A	
<i>Funaria handelii</i> Schiffn.		A	
<i>Funaria hygrometrica</i> Hedw.	*	A	(3)1199-TUH, on soil; (33)1075-TUH, on soil; (1)1002-TUH, on soil

<i>Funaria muhlenbergii</i> Hedw. f. ex Lam. & Cand.		A	
<i>Physcomitrium sphaericum</i> (Ludw.) Brid.		A	
Grimmiaceae			
<i>Coscinodon crispus</i> (Hedw.) Spruce		A	
<i>Grimmia alpestris</i> (Web. & Mohr) Schleich		A	
<i>Grimmia anodon</i> B.S.G.	*	A	(34)1350-TUH, on rock with thin layer of soil; (9)1143-TUH, on rock
<i>Grimmia caespitica</i> (Brid.) Jur. Var. <i>bornmuellerorum</i> Schiffn.		A	
<i>Grimmia crassifolia</i> Lind. ex Broth var. <i>cucullata</i> Baumg.		A	
<i>Grimmia crinita</i> Brid.	*	A	(22)1145-TUH, on rock; (7)1144-TUH, on rock; (9)1148-TUH, on rock
<i>Grimmia laevigata</i> (Brid.) Brid.	*	A	(34)1024-TUH, on rock
<i>Grimmia olneyi</i> Sull.		A	
<i>Grimmia orbicularis</i> Bruch ex Wils.		A	
<i>Grimmia orbicularis</i> Bruch ex Wils. var. <i>persica</i> Schiffn.	*	A	(7)1274-TUH, on rock
<i>Grimmia ovalis</i> (Hedw.) Lindb.	*	A	(34) 1016-TUH, on rock
<i>Grimmia pulvinata</i> (Hedw.) Sm.	*	A	(7)1142-TUH, on rock
<i>Grimmia tricophylla</i> Grev.	*	A	(28)1040-TUH, on soil; (5)1036-TUH, on rock
<i>Racomitrium elongatum</i> Ehn. ex Frisvoll		A	
<i>Schistidium alpicola</i> (Hedw.) Limpr.	*	A	(13)1131-TUH, on rock with thin layer of soil; (22)1146-TUH, or rock; (34)1007-TUH, on rock; (31)1300-TUH, on rock with thin layer of soil
<i>Schistidium apocarpum</i> (Hedw.) B.S.G.	*	A	(35)1017-TUH, on rock; (16)1127-TUH, on rock; (23)1123-TUH, on soil
<i>Schistidium apocarpum</i> (Hedw.) B.S.G. subsp. <i>gracile</i> (Rohl.) Meyl.		A	
<i>Schistidium brunescens</i> Limpr.		A	
<i>Schistidium conertum</i> (Funck) B.S.G.		A	
<i>Schistidium crassipilum</i> Blom.		A	
<i>Schistidium flaccidum</i> (De Not.) Ochhya		A	
<i>Schistidium rivulare</i> (Brid.) Podp.		A	
Hedwigiaceae			
<i>Hedwigia ciliata</i> (Hedw.) P. Beauv.	*	A	(35)1012-TUH, on rock

Hypnaceae				
<i>Ctenidium molluscum</i> (Hedw.) Mitt.	*	P	(9)1262-TUH, on soil	
<i>Ectopothecium cypreoides</i> (Hook.) Jaeg.		P		
<i>Herzogella seligeri</i> (Brid.) Iwatsuki	*	P	(28)1026-TUH, on soil	
<i>Homomallium incurvatum</i> (Brid.) Loecke	*	P	(17)1132-TUH, on trunk; (21)1133-TUH, on trunk	
<i>Hypnum cupressiforme</i> Hedw.	*	P	(5)1003-TUH, on rock; (1)1039-TUH, on rock; (22)119-TUH, on soil	
<i>Hypnum cupressiforme</i> subsp. <i>imponens</i> (Hedw.) Boul.		P		
<i>Hypnum cupressiforme</i> Hedw. var. <i>uncinulatum</i> B.S.G.		P		
<i>Hypnum julandicum</i> Holm. & Warncke		P		
<i>Hypnum pallescens</i> (Hedw.) P. Beauv. var. <i>reptile</i> (Michx.) Husn.		P		
<i>Hypnum macrogynum</i> Besch.		P		
<i>Hypnum revolutum</i> (Mitt.) Lindb.		P		
<i>Hypnum vaucherii</i> Lessq.		P		
<i>Platygyrium repens</i> (Brid.) B.S.G.		P		
<i>Pylaisia polyantha</i> (Hedw.) B.S.G.		P	(17)1175-TUH, on tree trunk	
Leskeaceae				
<i>Leskea patens</i> (Lindb.) H. Arn. & C. Jen.	*	P	(30)1151-TUH, on tree trunk	
<i>Leskea persiricta</i> Dix.		P		
<i>Leskea polycarpa</i> Hedw.	*	P	(16)1278-TUH, on tree trunk	
<i>Leskeella nervosa</i> (Brid.) Loecke	*	P	(26)1279-TUH, on tree trunk; (13)1174-TUH, on tree trunk; (26)1173-TUH, on trunk	
<i>Pseudoleskea incurvata</i> (Hedw.) Loecke	*	P	(9)1277-TUH, on tree trunk	
<i>Pseudoleskeella catenulata</i> (Schrad.) Kindb.		P		
<i>Pseudoleskeella laxiramea</i> (Schiffn.) Broth.		P	(1)1004-TUH, on tree trunk; (30)1184-TUH, on rock; (32)1229-TUH, on soil; (34)1008-TUH, on rock	
<i>Pseudoleskeella tectorum</i> (Brid.) Kindb.		P		
<i>Ptychodium plicatum</i> (Web. & Mohr) Schimp.		P		
Leucodontaceae				
<i>Antirichia</i> sp.		A		
<i>Leucodon immersus</i> Lindb.	*	A	(19)1156-TUH, on rock; (3)1158-TUH, on rock; (32)1227-TUH, on tree trunk	
<i>Leucodon sciuroides</i> (Hedw.) Schwaegr.		A		
<i>Leucodon sinensis</i> Ther.		A		
Meesiaceae				
<i>Amblyodon dealbanus</i> (Hedw.) B.S.G.		A		

Mniaceae				
<i>Mnium marginatum</i> (Wih.) Brid. ex P. Beauv.	*	A		
<i>Mnium spinosum</i> (Voit) Schwaegr.	*	A	(4)1089-TUH, on soil; (32)1231-TUH, on soil	
<i>Mnium stellare</i> Hedw.	*	A	(32)1218-TUH, on soil	
<i>Mnium thomsonii</i> Schimp.	*	A	(8)1281-TUH, on soil	
<i>Plagiomnium affine</i> (Funck) T. Kop.		A		
<i>Plagiomnium cuspidatum</i> (Hedw.) T. Kop.	*	A	(21)1170-TUH, on soil; (26)1186-TUH, on soil; (28)1047-TUH, on soil; (34)1239-TUH, on soil; (8)1157-TUH, on rock	
<i>Plagiomnium elatum</i> (B.S.G.) T. Kop.	*	A	(10)1287-TUH, on soil	
<i>Plagiomnium ellipticum</i> (Brid.) T. Kop.	*	A	(26)1185-TUH, on soil; (34)1217-TUH, on soil	
<i>Plagiomnium rostratum</i> (Schrad.) T. Kop.	*	A	(9)1288-TUH, on soil	
<i>Plagiomnium undulatum</i> (Hedw.) T. Kop.	*	A	(26)1122-TUH, on soil; (27)1183-TUH, on soil; (28)1101-TUH, on soil; (29)1021-TUH, on soil; (32)1222-TUH, on rock with thin layer of soil; (34)1238-TUH, on rock; (37)1042-TUH, on soil	
<i>Rhizomnium punctatum</i> (Hedw.) T. Kop.	*	A	(32)1211-TUH, on soil	
<i>Trachypogon ussuriensis</i> (Maack & Regel) T. Kop.		A		
Neckeraceae				
<i>Homalia besseri</i> Lob. in Haidinger	*	P	(16)1276-TUH, on tree trunk	
<i>Neckera complanata</i> (Hedw.) Hub.	*	P	(17)1138-TUH, on rock; (26)1152-TUH, on rock; (28)1032-TUH, on rock; (4)1079-TUH, on soil	
<i>Neckera crispa</i> Hedw.	*	P	(9)1282-TUH, on rock	
<i>Neckera pennata</i> Hedw.		P		
Orthotricaceae				
<i>Orthotrichum alpestre</i> Hornsch. in B.S.G.		A		
<i>Orthotrichum anomalum</i> Hedw.	*	A	(10)1283-TUH, on rock	
<i>Orthotrichum anomalum</i> Hedw. subsp. <i>Saxatile</i> (Mild.) Boul.		A		
<i>Orthotrichum cupulatum</i> Brid.	*	A	(20)1093-TUH, on rock; (7)1104-TUH, on rock; (20)1093-TUH, on rock	
<i>Orthotrichum microcarpum</i> De Not.		A		
<i>Orthotrichum obtusifolium</i> Brid.		A		
<i>Orthotrichum pallens</i> Bruch ex Brid.		A		
<i>Orthotrichum pumilum</i> Sw.	*	A	(25)1286-TUH, on rock with thin layer of soil	
<i>Orthotrichum pumilum</i> Sw. subsp. <i>fallax</i> (Bruch) Bertsch		A		
<i>Orthotrichum rupestre</i> Schleich. ex Schwaegr.		A		

<i>Orthotrichum shimperi</i> Hammar		A	
Plagiothecaceae			
<i>Plagiothecium denticulatum</i> (Hedw.) B.S.G.	*	P	(37)1357-TUH, on rock
<i>Plagiothecium denticulatum</i> (Hedw.) B.S.G. var. <i>obtusifolium</i> (Turn.) Moore		P	
<i>Plagiothecium laetum</i> B.S.G.		P	
<i>Plagiothecium latebricola</i> B.S.G.		P	
<i>Plagiothecium nemorale</i> (Mitt.) Jaeg.		P	
<i>Plagiothecium sculentum</i> (Wils.) Lindb.		P	
<i>Plagiothecium platyphyllum</i> Monk	*	P	(9)1289-TUH, on soil
<i>Plagiothecium undulatum</i> (Hedw.) B.S.G.		P	
<i>Stereophyllum wightii</i> (Mitt.) Jaeg.		P	
Polytrichaceae			
<i>Atrichum angustatum</i> (Brid.) B.S.G.		A	
<i>Atrichum undulatum</i> (Hedw.) P. Beauv.		A	
<i>Pogonatum aloides</i> (Hedw.) P. Beauv.		A	
<i>Pogonatum urtigerrum</i> (Hedw.) P. Beauv.		A	
<i>Polytrichum commune</i> Hedw.		A	
Pottiaceae			
<i>Alonia ambigua</i> (B.S.G.) Limplr.	*	A	(2)1049-TUH, on soil; (39)1364-TUH, on soil
<i>Anoetangium handelii</i> Schiffn.		A	
<i>Barbula convoluta</i> Hedw.		A	
<i>Barbula icomadophyla</i> Schimp. ex C. Muell.		A	
<i>Barbula spadiacea</i> (Mitt.) Braithw.		A	
<i>Barbula topfacea</i> (Brid.) Mitt.	*	A	(24)1064-TUH, on wet rock; (28)1015-TUH, on very wet rock; (30)1063-TUH, on wet rock
<i>Barbula topfacea</i> (Brid.) Mitt. var. <i>excurrens</i> (Broth.) Podp.		A	
<i>Barbula trijaria</i> (Hedw.) Mitt.		A	
<i>Barbula unguiculata</i> Hedw.	*	A	(19)1066-TUH, on soil; (28)1020-TUH, on soil; (30)1065-TUH, on rock; (31)1299-TUH, on rock with thin layer on soil; (32)1210-TUH, on soil; (37)1235-TUH, on soil
<i>Barbula vinealis</i> Brid.	*	A	(15)1067-TUH, on soil; (19)1068-TUH, on soil; (37)1359-TUH, on soil
<i>Bryocerythophyllum recurvirostrum</i> (Hedw.) Chen	*	A	(37)1052-TUH, on soil
<i>Cinclidius fontinaloides</i> (Hedw.) P. Beauv.		A	
<i>Crossidium crassinerve</i> (De Not.) Jur. var. <i>crassinerve</i>		A	

<i>Crossidium squamiferum</i> (Viv.) Jur. var. <i>potitoidium</i> (De Not.) Monk.		A	
<i>Crossidium squamiferum</i> (Viv.) Jur. var. <i>squamiferum</i>	*	A	(22)1208-TUH, on soil; (31)1302-TUH, on rock with thin layer of soil
<i>Dematodon latifolius</i> (Hedw.) Brid.		A	
<i>Dematodon sisyphus</i> Schimp.		A	
<i>Didymodon planatophaceus</i> Froehl. Fid. Froehl.		A	
<i>Eucladium verticillatum</i> (Brid.) B.S.G.	*	A	(9)1268-TUH, on soil
<i>Gymnostomum aerriginosum</i> Sm.	*	A	(28)1027-TUH, on soil
<i>Gymnostomum calcareum</i> Nees & Horsch.	*	A	(9)1275-TUH, on rock
<i>Gymnostomum calcareum</i> Nees & Horsch. var. <i>muticum</i> Boul.		A	
<i>Gymnostomum mosis</i> (Lor.) Jur. & Milde		A	
<i>Hydrogoum ehrenbergii</i> (Lor.) Jaeg.		A	
<i>Hymenostyllum recurvirostrum</i> (Hedw.) Dix.	*	A	(32)1073-TUH, on rock
<i>Hymenostyllum recurvirostrum</i> (Hedw.) Dix. var. <i>latifolium</i> (Zell.) Wijk & Marg.		A	
<i>Oxystegus cylindricus</i> (Brid.) Hilp.		A	
<i>Oxystegus tenuirostris</i> (Hook & Tayl.) A.J.E. Smith		A	
<i>Phascum cuspidatum</i> Hedw.		A	
<i>Pleurochaete squarrosa</i> (Brid.) Lindb.	*	A	(34)1243-TUH, on soil
<i>Poitia commutata</i> Limpr.		A	
<i>Poitia cirtica</i> Wils. ex B.S.G.		A	
<i>Poitia davalliana</i> (Sm.) C. Jens.		A	
<i>Poitia lanceolata</i> (Hedw.) C. Muel.		A	
<i>Pseudocrossidium revolutum</i> (Brid.) Zander		A	
<i>Pterygoneurum medium</i> (Salm.) Broth.		A	
<i>Pterygoneurum ovatum</i> (Hedw.) Dix.		A	
<i>Stegonia latifolia</i> (Schwaegr.) Ven. ex Broth.		A	
<i>Synthlipsis caninervis</i> Mitt.	*	A	(7)1290-TUH, on rock
<i>Synthlipsis inermis</i> (Brid.) Bruch	*	A	(20)1291-TUH, on rock
<i>Synthlipsis pseudohandelii</i> (Froehl.) Agnew & Vondr.	*	A	(22)1293-TUH, on rock; (35)1014-TUH, on rock
<i>Synthlipsis ruraliformis</i> (Besch.) Card.		A	
<i>Synthlipsis ruralis</i> (Hedw.) Web. & Mohr	*	A	(20)1094-TUH, on soil; (25)1096-TUH, on soil; (6)1109-TUH, on rock; (9)1097-TUH, on soil
<i>Synthlipsis ruralis</i> (Hedw.) Web. & Mohr subsp. <i>hirsuta</i> (Vent.) Podp.		A	

<i>Synthyria virescens</i> (De Not) De Not Ochlya	*	A	(16)1098-TUH, on rock; (7)1136-TUH, on rock; (9)1099-TUH, on rock
<i>Timmeria anomala</i> (B.S.G.) Limpin.		A	
<i>Timmeria barbuloides</i> (Brid.) Monk.		A	
<i>Timmeria grosseserrata</i> Schiffn.		A	
<i>Torrella fragilis</i> (Drumm.) Limpin.	*	A	(28)1019-TUH, on soil; (9)1128-TUH, on soil
<i>Torrella humilis</i> (Hedw.) Jenn.		A	
<i>Torrella inclinata</i> (Hedw.f.) Limpin.		A	
<i>Torrella inflexa</i> (Bruch) Broth.		A	(11)1294-TUH, on soil
<i>Torrella nitida</i> (Lindb.) Broth.	*	A	(3)1121-TUH, on soil
<i>Torrella tortuosa</i> (Hedw.) Limpin.	*	A	(16)1120-TUH, on soil; (19)1165-TUH, on soil; (31)1301-TUH, on rock with thin layer of soil; (34)1242-TUH, on soil
<i>Tortula astoma</i> Schiffn.		A	
<i>Tortula atrovirens</i> (Sm.) Lindb.		A	
<i>Tortula calcicolens</i> W. Kramer.		A	
<i>Tortula demawendica</i> Schiffn.		A	
<i>Tortula fragilis</i> Tayl.		A	
<i>Tortula handelii</i> Schiffn. var. <i>handelii</i>		A	
<i>Tortula intermedia</i> (Brid.) De Not. var. <i>intermedia</i>		A	
<i>Tortula mucronifolia</i> Schwaegr.	*	A	(7)1295-TUH, on rock
<i>Tortula muralis</i> Hedw.	*	A	(11)1105-TUH, on stony wall; (31)1303-TUH, on rock with thin layer of soil; (32)1215-TUH, on soil; (36)1245-TUH, on soil; (4)1087-TUH, on soil; (5)1037-TUH, on soil; (7)1103-TUH, on rock
<i>Tortula muralis</i> Hedw. var. <i>aestiva</i> Brid. ex Hedw.	*	A	(22)1106-TUH, on soil; (34)1240-TUH, on soil; (9)1107-TUH, on soil
<i>Tortula obtusifolia</i> (Schwaegr.) Math.		A	
<i>Tortula princeps</i> De Not. subsp. <i>parnassica</i> (Schiffn.) W. Kramer		A	
<i>Tortula princeps</i> De Not. subsp. <i>princeps</i>		A	
<i>Tortula revolvens</i> (Schimp.) G. Roth var. <i>obtusata</i> Reim.		A	
<i>Tortula ruraliformis</i> (Besch) Ingh. var. <i>ruraliformis</i>		A	
<i>Tortula subulata</i> Hedw.	*	A	(35)1010-TUH, on soil
<i>Tortula virescens</i> (De Not.) De Not. subsp. <i>bizotii</i> (Laz.) W. Kramer		A	

<i>Tortula virescens</i> (De Not.) De Not subsp. <i>virescens</i> var. <i>iranica</i> W. Kramer.		A	
<i>Tortula virescens</i> (De Not.) De Not. subsp. <i>virescens</i> var. <i>virescens</i>		A	
<i>Trichostomopsis haussknechtii</i> (Jur. & Milde) Agnew & Townsend	A		
<i>Trichostomum brachydontium</i> Bruch	A		
<i>Trichostomum crispulum</i> Bruch	A		
<i>Trichostomum mildaanum</i> Jur.	A		
<i>Trichostomum persicum</i> Jur. & Milde	A		
<i>Weissia condensata</i> (Voit) Lindb.	A		
<i>Weissia controversa</i> Hedw.	A		
<i>Weissia triumphans</i> (De Not.) Hill	A		
Rhytidiaceae			
<i>Pleurozium schreberi</i> (Brid.) Mitt.	A		
<i>Rhytidiadelphus triquetrus</i> (Hedw.) Warnst.	A		
<i>Rhytidium rugosum</i> (Hedw.) Kindb.	A		
Sematophyllaceae			
<i>Brotherella harveyana</i> (Mitt.) Dix	P		
<i>Clastobryum capillaceum</i> (Griff.) Broth.	P		
Thamniaceae			
<i>Thamnum alopecurum</i> (Hedw.) B.S.G. subsp. <i>caucasicum</i> Kindb.	P		
<i>Thamnobryum alopecurum</i> (Hedw.) Nieuwl.	*	P	(23)1117-TUH, on rock; (30)1116-TUH, on rock; (32)1125-TUH, on rock; (3)1130-TUH, on soil
Thuidiaceae			
<i>Abietinella abietina</i> (Hedw.) Fleisch.	*	P	(28)1025-TUH, on soil; (1)1018-TUH, on soil; (34)1365-TUH, on soil
<i>Anomodon acutifolius</i> Mitt.		P	
<i>Anomodon attenuatus</i> (Hedw.) Hub.	*	P	(1)1023-TUH, on rock with thin layer of soil; (21)1054-TUH, on rock; (28)1006-TUH, on soil; (32)1232-TUH, on tree trunk; (4)1081-TUH, on soil
<i>Anomodon longifolius</i> (Brid.) Hartm.		P	
<i>Anomodon rostratus</i> (Hedw.) Schimp.	*	P	
<i>Anomodon rougeletii</i> (C. Muell.) Keissl.		P	(28)1084-TUH, on soil

<i>Anomodon viticulosus</i> (Hedw.) Hook. & Tayl.	*	P	(5)1043-TUH, on rock; (12)1056-TUH, on tree trunk; (13)1055-TUH, on tree trunk; (15)1060-TUH; on tree trunk; (17)1062-TUH, on tree trunk; (19)1061-TUH, on tree trunk; (26)1057-TUH, on tree trunk; (30)1058-TUH, on rock wit thin layer of soil; (32)1226-TUH, on tree trunk; (34)1246-TUH, on rock
<i>Thuidium delicatulum</i> (Hedw.) Mitt.		P	
<i>Thuidium philiberti</i> Limpr.		P	
<i>Thuidium recognitum</i> (Hedw.) Lindb.		P	
Timmiaceae			
<i>Timmia bavarica</i> Hessel.		A	
<i>Timmia norvegica</i> Zett.		A	

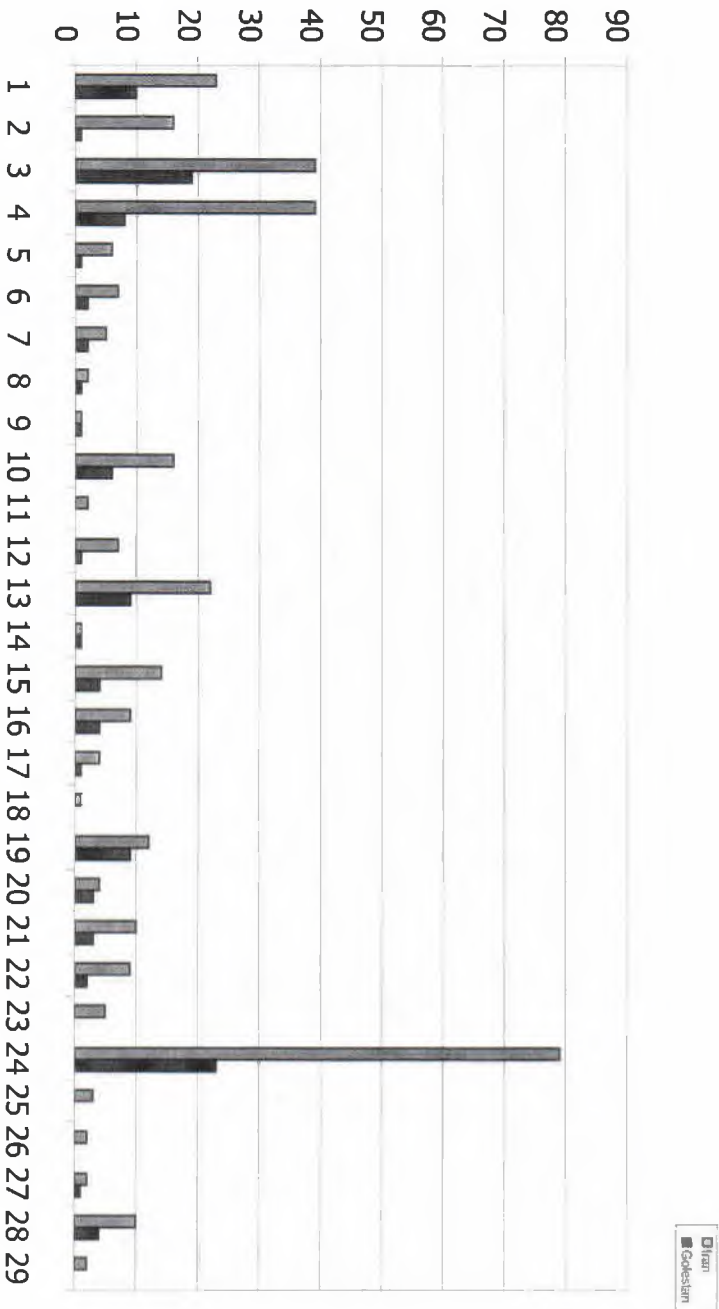


Fig. 1. Comparison between mosses of Iran and Golestan Province. 1. *Amblystegiaceae*, 2. *Bartramiaceae*, 3. *Brachytheciaceae*, 4. *Bryaceae*, 5. *Dicranaceae*, 6. *Ditrichaceae*, 7. *Encalyptaceae*, 8. *Entodontaceae*, 9. *Fabroniaceae*, 10. *Fissidentaceae*, 11. *Fontinalaceae*, 12. *Funariaceae*, 13. *Grimmiaceae*, 14. *Hedwigiaceae*, 15. *Hypnaceae*, 16. *Leskeaceae*, 17. *Leucodontaceae*, 18. *Meesiaceae*, 19. *Mniaceae*, 20. *Neckereaceae*, 21. *Orthotrichaceae*, 22. *Plagiobryaceae*, 23. *Polytrichaceae*, 24. *Pottiaceae*, 25. *Rhytidiaceae*, 26. *Sematiophyllaceae*, 27. *Thamniaceae*, 28. *Timmiaceae*, 29. *Timmidaeae*

Golestan National Park, Alubagh, 1600-1950 (9)
 Golestan National Park, around Tang-e Rah, 600m (10)
 Golestan National Park, between Tang-e Gol and Tang-e Rah, 550-1200m (11)
 Golestan National Park, Cheshmeh Mazarli, 430m (12)
 Golestan National Park, Gharankeh Jangal, 1320-1550m (13)
 Golestan National Park, Golestan park, between Golzar and Soleyman Koshteh, 1250m (14)
 Golestan National Park, Golshan, 450m (15)
 Golestan National Park, Golzar valley, 700-1800m(16)
 Golestan National Park, Incheh-su, 1200m (17)
 Golestan National Park, Karkoli slope, Khers valley, 1600m (18)
 Golestan National Park, Khandushan, 500m (19)
 Golestan National Park, Maassumzadeh valley, 1350m (20)
 Golestan National Park, Mazarli, 550-650m (21)
 Golestan National Park, Mirzabayllu, 1250m (22)
 Golestan National Park, Nazar-Dashbasan, 814-1050m (23)
 Golestan National Park, Tafarogjagh-e Abshar (24)
 Golestan National Park, Tang-e Gol (25)
 Golestan National Park, Zav valley, 950-1300m (26)
 Gorgan, foothill of Ghorogh forest, 500-900m (27)
 Gorgan, Nahar Khoran, 550-1500m (28)
 Gorgan, Shast-Kola (29)
 Gorgan, Ziarat, 500-1454m (30)
 Khosh Yeylagh pass, 270-526m (31)
 Kordkuy to Abshar-Doab, 534-1840m (32)
 Kordkuy to Balaghuz, 187m (33)
 Kordkuy to Radkan, 2229 m (34)
 Kordkuy to Radkan, 1200m (35)

Kordkuy to Radkan, 219m (36)
 Kordkuy to Radkan, 620m (37)
 Kordkuy, Balaghuz village, 187m (38)
 Minudasht, Saidabad mountains, 500-1048m (39)

Acknowledgment

We are very grateful to Dr. S. Shirzadian from IRAN Herbarium for the scientific editing of this paper.

References

- Agnew, S. & Vondracek, M. 1975: A moss flora of Iraq. - Feddes Rep. 86: 341-489.
 Bilewsky, F. 1965: Moss flora of Israel. - Nova Hedwigia 9: 335-434.
 Frey, W. & Kürschner, H. 1977: Studies on the bryophyte flora and vegetation of Golestan national park, N. Iran. - Iran. Journ. Bot. 1(2):137-153.
 Frey, W. & Kürschner, H. 1983: Contribution towards a bryophyte flora of Iran, New records from Iran. - Iran. Journ. Bot. 2(1): 13-19.
 Kianmehr, H., Shirzadian, S. & Sotoodehnia, Sh. 2000: A report on some new moss species of the Hezar Masjed (Khorasan). -Pajouhesh & Sazandegi 46(1): 5-56.
 Kürschner, H. 1996: Towards a bryophyte flora of the Near & Middle East. New records from Iran, Jordan, Kuwait, Lebanon, Oman, Saudi Arabia, Syria and Turkey. -Nova Hedwigia 63(1-2): 261-271.
 Kürschner, H.; Beata, P. & Akhiani, H. 2000: New records to the bryophyte of Iran Studies on the flora and vegetation of the Golestan National Park, NE Iran IV. -Nova Hedwigia 71 (3-4): 509-518.
 Noguchi, A. 1988: Illustrated moss flora of Japan part1. -Hattori Botanical Laboratory.
 Noguchi, A. 1991: Illustrated moss flora of Japan part4. -Hattori Botanical Laboratory.

- Shirzadian, S. & Kumar, S. S. 1994: A report on the moss flora of northern Iran. -Iran. Journ. Bot. 6(2):179-184.
- Shirzadian, S. & Sotoodehnia, Sh. & Kianmehr, H. 2000: Four new records for the moss of Iran. -Rostaniha 1: 7-9.
- Shirzadian, S. 1989: Additions to the moss flora of Iran. -Yushania 6(4):17-20.
- Shirzadian, S. 1996: Systematic studies on moss flora (Bryophytes) of Iran with an introduction to their applied aspects. - Pajouhesh & Sazandegi 30 (1): 50-54.
- Shirzadian, S. 2000: Two new records of bryum (musci) from Negin and Minoo islands in Iran. -The 1st Iranian conference on plant science and biodiversity p. 85.
- Smith, A. J. E. 1978: The moss flora of Britain and Ireland. -Cambridge Univ. Press. London, New York & Melbourne.
- Watson, E. V. 1981: British mosses and liverworts. - Cambridge University Press.
- Zhu R. L. & So. M. L. 1996: Mosses & Liverworts of Hong Kong. -Heavenly people depot.