

A M Al-Shehri

Pteridophytes of Tanumah Mountains, Aseer Region, South-West Saudi Arabia

Abstract: Nine species of pteridophyta are listed and described in this survey of the Tanumah Mountains in Aseer region, southwestern Saudi Arabia. Three species of *Asplenium* (*A. adiantum nigrum*, *A. ceterach*, and *A. viride*) are new records for Saudi Arabia, while six species (*Adiantum capillus veneris*, *Cetrach officinarum*, *Asplenium aethiopicum*, *A. filare*, *A. trichomanes* and *Cheilanthes pteridioides*) are reported as a new record for the Tanumah Mountains.

The frequency of some species collected from different areas of the Aseer region in previous studies and the present study are given in Table (1).

Keywords: Tanumah mountains, Aseer region, Saudi Arabia, Flora survey, New records.

Introduction

The investigations of vegetation, in particular of the lower plants, of Saudi Arabia have made very good progress in the last three decades (Vesey-Fitzgerald, 1955, Migahid, 1978, Frey and Kürschner, 1982, Kürschner, 1984a and 1984b and Collenette, 1985). A large number of plant species have been brought to light, which make these additions a contribution to botanical research.

Recent findings of bryophytes and pteridophytes made by Kürschner (1989) and Basahy (1996) showed a good record of pteridophytes flora from southwestern Saudi Arabia (Aseer Mountains). The elevation of the mountains in this area gives rise to a climatic differentiation, which induce a phytodiversity in these highlands. Kürschner (1984) suggested a floristic link between the African highland and southwestern Saudi Arabia. The lack of study of pteridophyte communities in the Tanumah Mountains led to a detailed study on the pteridophyte flora in this area. Species collected have

النباتات التريديية لجبال تنومة، منطقة عسير. جنوب المملكة العربية السعودية
عبدالرحمن محي الشهري

المستخلص: لقد تم حصر و دراسة تسعة أنواع من النباتات التريديية لجبال تنومة (منطقة عسير) في المملكة العربية السعودية. وقد سجل ثلاثة أنواع من جنس أسبليينيم (أسبليينيم نجم، أسبليينيم سترش ، أسبليينيم فريدي) ، ووجد أنها أنواع جديدة بالنسبة لفلورا المملكة، بينما سجل ستة أنواع (أديانتم كابلس فينيرس ، سترش أفوسنريم ، أسبليينيم أتويكيم ، أسبليينيم فلاري ، أسبليينيم ترياكومونس، كلنش بتريديوس) ووجد أن هذه الأنواع جديدة في جبال تنومة. وهذا يتفق مع تسجيل تواجدها هذه الأنواع نفسها في دراسات سابقة كما هو موضح في هذا البحث.

كلمات مدخلية: جبال تنومة، عسير، السعودية، مسح فلورا، تسجيل أنواع جديدة

been identified and classified to species level based on Migahid (1978), Phillips (1980), Collenette (1985) and Basahy (1996). Habitat, growth form and morphology are described for all species.

It is worth mentioning that Migahid (1978), Collenette (1985) and Basahy (1996) had previously recorded some of the species, reported in the present study, from the Aseer and Fayfa Mountains, but no records of pteridophytes from the Tanumah Mountains were included in their studies.

Study area

The Tanumah Mountains, (18°58' N, 42°06' E), 1920m above sea level, are part of Aseer Mountains, in southwestern Saudi Arabia (Fig. 1). These mountains run parallel to the Red Sea, with downward slopes to the sea. The location is about 110 km north of Abha. The mean maximum and minimum temperatures are 28.6°C and 6.5°C, respectively, while the mean temperature is about 18.8°C (Tanumah Agricultural Branch, Ministry of Agriculture, 1998). The mountains come under the influence of monsoonal summer rains in addition to the main precipitation (rain, fog and dew) period in the winter and spring. Geologically, the mountains are made up of crystalline basement rocks of granites (granite-gneiss, diorite) and slates, which were broken up during orogenesis (Kürschner, 1994).

Abdulrahman M Al-Shehri
Biological Sciences Department, College of Science
King Khalid University
P.O. Box 9019, Abha, Saudi Arabia

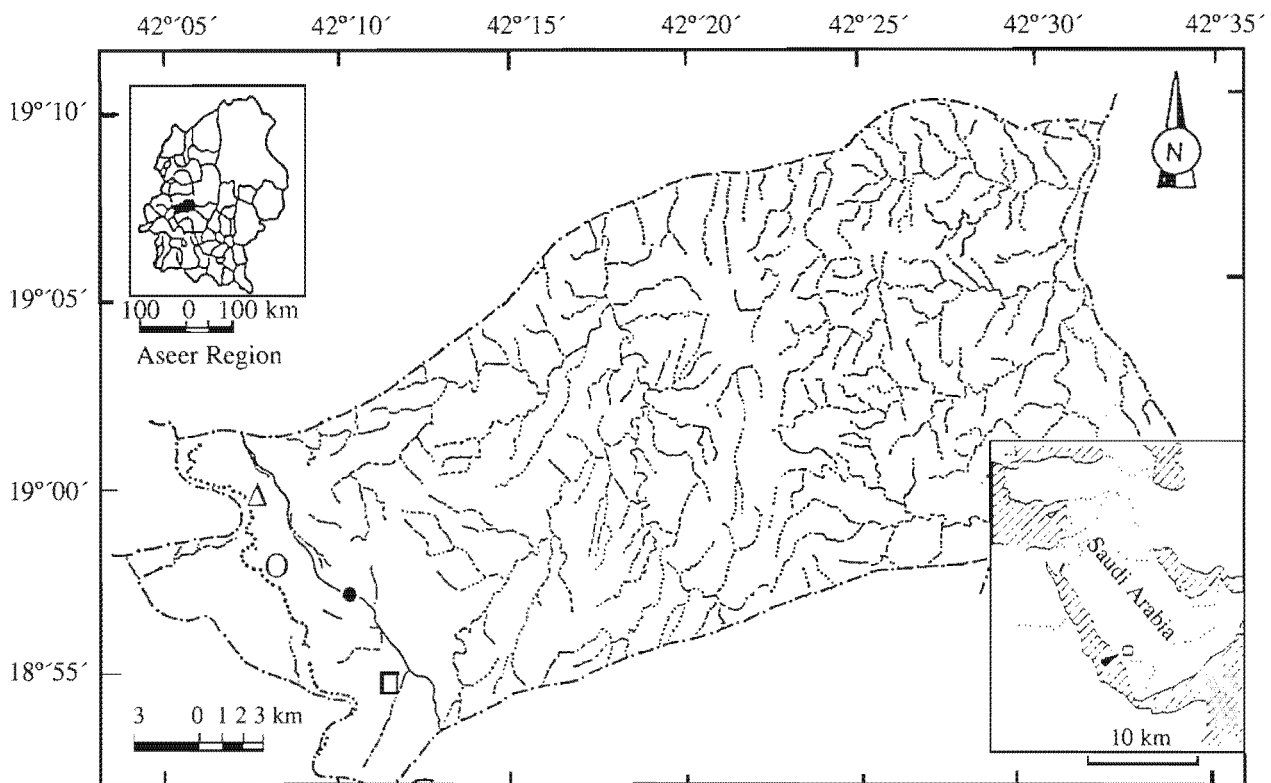


Fig. 1. Map of Tanumah area showing the three locations of plant collection (Δ : Al-Mehfar, \square : Al-Dahna and O : Al-Sharaf).

• main city; -.-.-.-.; province boarder; _____ main road; escarpment; valleys

Material and Methods

Specimens were collected during May 1998 from three locations (Al-Mehfar, Al-Dahna and Al-Sharaf) in the study area (see Fig. 1). These were studied as fresh and preserved materials in the laboratory. Identifications were based on Migahid (1978), Phillips (1980), Collenette (1985) and Basahy (1996). The specimens have been deposited in the herbarium of the College of Science, King Khalid University, Abha, Saudi Arabia.

Species description

Family: Adiantaceae

1- *Ceterach officinarum* Lam. et DC.

A small fern with fairly thick fronds, 6-8 cm long. The underside of the fronds is covered with silvery scales, which become rust-coloured with age. Sori are produced among these scales. Spores are spherical, 80-90 μm in diameter, aperture with no value (may be monoporate or monosulcate), surface regular reticulate with delicate muri and smooth lumen. (Plate 1, a, b and c).

Rarely found on the tip of the escarpment in very shady rock crevices of Al-Mehfar location in the Tanumah Mountains.

2- *Adiantum capillus veneris* L.

A terrestrial fern with creeping rhizome, with wiry black stems about 30 cm long. Leaflets delicate. Sori are produced on the underside of tiny indusium, which curl to cover them (See Plate 1, d).

Widely distributed in the damp and shady places and rarely found in rock crevices at the three locations in the study area.

Family: Aspleniaceae

3- *Asplenium adiantum nigrum* L.

Fronds are 15-35 cm long, narrowly triangular in shape. Stalks are dark and brittle. Leaves are hard, almost leathery and sori are long and narrow, grouped near the centre of the leaf divisions (see Plate 1, e).

Very rare on rock crevices and shady places at Al-Dahna location in the Tanumah Mountains.

4- *Asplenium aethiopicum* (Burm. P.) Bech.

A tufted fern with dentate fronds up to 35 cm high, pinnules toothed and with reddish hairs on the young fronds. Indusium one side attached to the inner side of the fertile vein. Spores prolate with dimensions 70 x 50 μm , aperture with no value (may be monoporate or monosulcate), surface nearly rugulate (See Plate 1, f, g, and h).

Fairly spread in Aseer region. Found in shady places and in small water falls at the three locations in the study area.

5- *Asplenium ceterach* L.

A small fern with fairly thick fronds up to 6 cm. long. Fronds oblong, spreading pinnae alternate, ovate to oblong, entire obtuse, confluent at the base, glabrous above scurfy beneath. Sori are produced underside of the fronds among rust-coloured scales (See Plate 2, a).

Very rare in cracks in limestone at Al-Sharaf location in the Tanumah Mountains.

6- *Asplenium filare* (Forssk.) Alston

An herbaceous fern up to 30 cm high, fronds are bipinnate turning brown when dry. Ramenta on rachis and very dense on young fronds (See Plate 2, b).

Rarely found in shady places at Al-Dahna and Al-Sharaf locations in the Tanumah Mountains.

7- *Asplenium viride* Huds.

A delicate and small flat-pinnuled fern with wiry green stalks 5-20 cm long, and tufted fronds. Pinnae sessile, roundish oblong, unequal-sided. Sori are long and narrow (See Plate 2, c).

Very rare in shady rock crevices at Al-Mehfar location in the Tanumah Mountains.

8- *Asplenium trichomanes* L.

Densely tufted fern and hard dark green leaflets with wiry black stems up to 35 cm high. Fronds

linear-lanceolate with short stipe and rachis, dark polished brown. Pinnae nearly sessile, roundish oblong or elliptical, unequal-sided. Sori are long and narrow. Spores kidney-shaped with dimensions 50 x 35 μm , aperture monosulcate, surface irregular reticulate with thick muri and granulated lumen (See Plate 2, d, e and f).

Found on western tip of the escarpment, in shady crevices, wide spread at the three locations in the study area.

Family: Sinopteridaceae

9- *Cheilanthes pteridioides* (Reichard) C. Chr.

A small fern with black wiry stalks 7 cm long, fronds compound with reddish hair-like scales on the young stem. Spores spherical, 60 μm in diameter, aperture trilet, surface granulated (See Plate 2, g, h and i).

Found in shady rock crevices near the tip of the escarpment at Al-Sharaf and Al-Mehfar locations in the study area. Wide spread in different parts of Saudi Arabia.

Conclusion

In this study, as shown in Table 1, three species of *Asplenium* (*A. adiantum nigrum*, *A. ceterach* and *A. viride*) are new records not only to the area of study but also for Saudi Arabia. The species *Adiantum capillus veneris* and *Asplenium aethiopicum* were found to be widely distributed in Saudi Arabia, as compared to the other fern species.

Table 1. Occurrence of fern species in Saudi Arabia as recorded in previous studies and the present study.

No	Species	Previous collection			Present study
		Migahid	Collenette	Basahy	
1	<i>Cetrach officinarum</i>	+	+	-	+
2	<i>Adiantum capillus veneris</i>	+	+	+	+
3	<i>Asplenium adiantum nigrum</i> *	-	-	-	+
4	<i>A. aethiopicum</i>	+	+	+	+
5	<i>A. ceterach</i> *	-	-	-	+
6	<i>A. filare</i>	+	-	-	+
7	<i>A. viride</i> *	-	-	-	+
8	<i>A. trichomanes</i>	+	+	-	+
9	<i>Cheilanthes pteridioides</i>	-	+	-	+

(+) = present, (-) = absent and (*) = new record

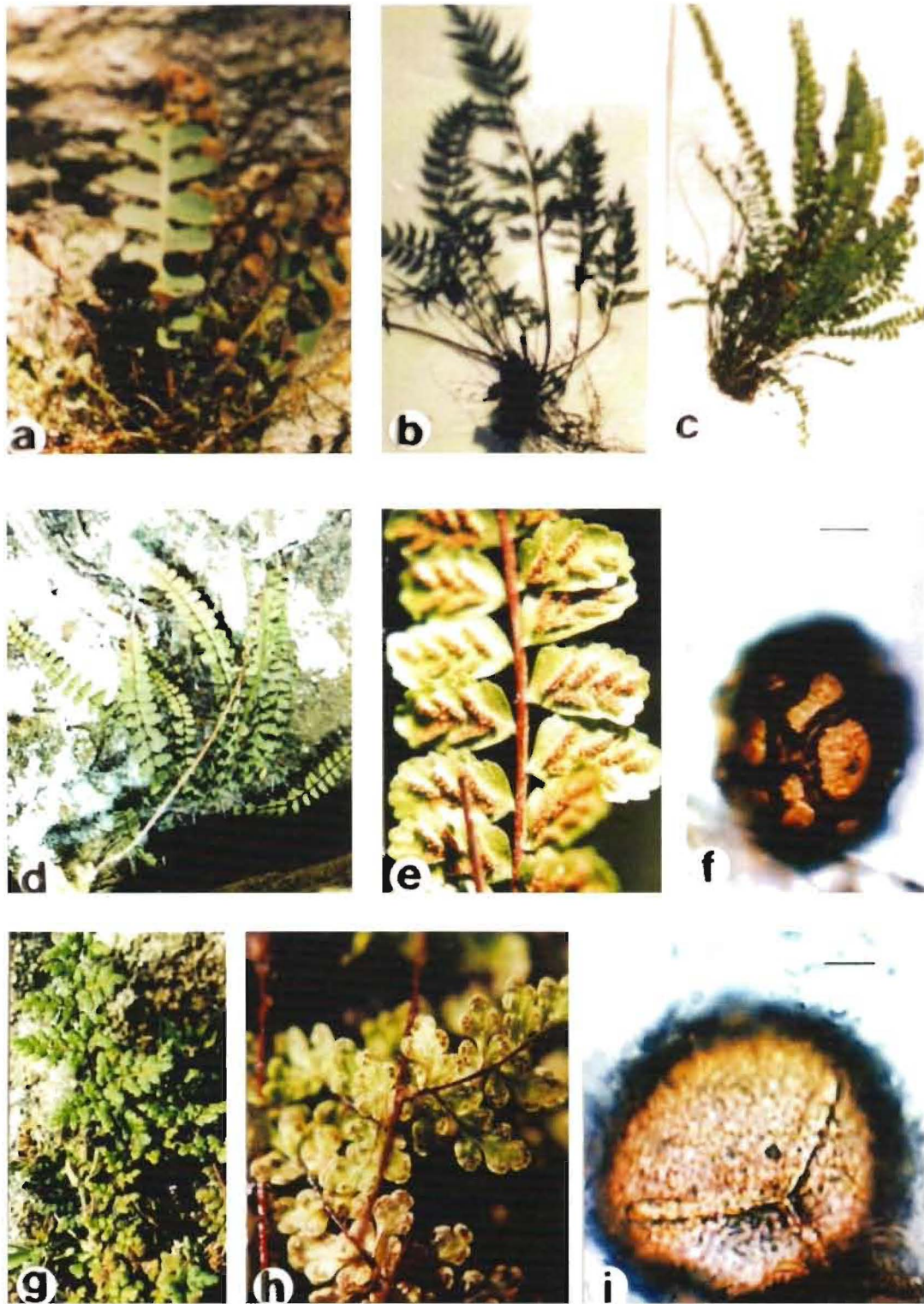


Plate 1: *Ceterach officinarum*

(a: complete plant), (b: fruiting branch and c: spore); *Adiantum capillus veneris* (d: complete plant); *Asplenium adiantum nigrum* (e: complete plant); *A. aethiopicum*, (f: complete plant), (g: fruiting branch and h: spore). Scale measures to 10 mm.

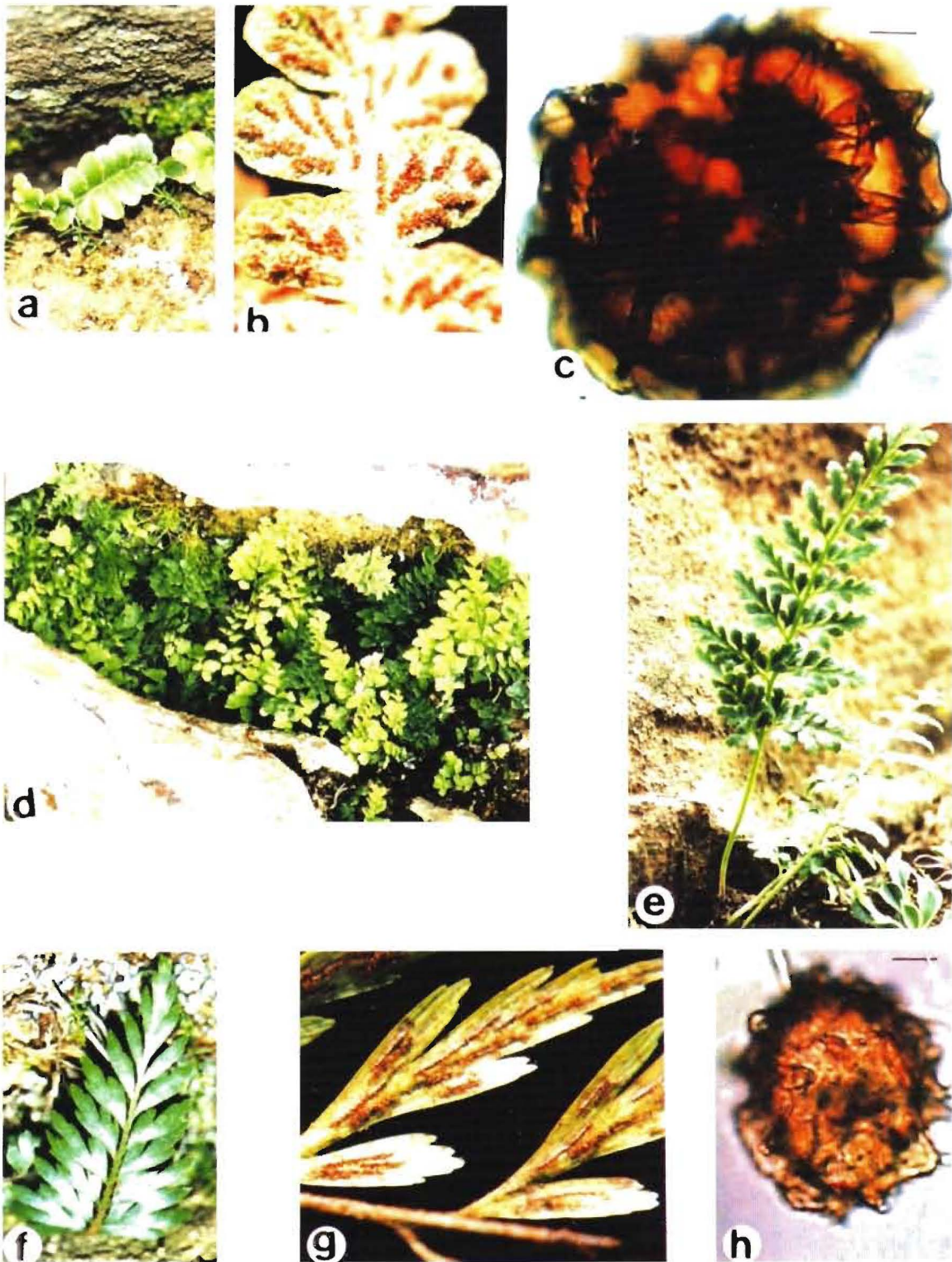


Plate 2: *Asplenium ceterach*

(a: complete plant); *A. filare* (b: complete plant); *A. viride* (c: complete plant); *A. trichomanes* (d: complete plant), (e: fruiting branch and f: spore); *Cheilanthes pteridioides* (g: complete plant), (h: fruiting branch and i: spore). Scale measures to 10 mm.

References

- Basahy, A.Y.** (1996) Bryophytes and pteridophytes of the Fayfa mountains (Gizan area), Saudi Arabia. *Biol. Sci.* **4**: 17-29.
- Collenette, S.** (1985) *An Illustrated Guide to the Flowers of Saudi Arabia*. Scorpion Publishing Ltd., London.
- Frey, W. and Kürschner, H.** (1982) The First Records of Bryophytes from Saudi Arabia. Studies in Arabian Bryophytes 1. *Lindbergia*, **8**: 157-160.
- Kapp, R.O.** (1969) *Pollen and Spores*, Brown, Wm. C (ed) Co., Iowa, USA.
- Kürschner, H.** (1984a) Epiphytic Communities of the Aseer Mountains, (Southwestern Saudi Arabia). Studies in Arabian Bryophytes 2. *Nova Hedwigia*, Braunschweig, J. Cramer.
- Kürschner, H.** (1984b) An Epilithic Bryophyte Community in the Aseer Mountains (SW Saudi Arabia). Studies in Arabian Bryophytes 2. *Nova Hedwigia*. **39**: 177-199.
- Kürschner, H.** (1989) Bryophytes from Saudi Arabia, collected by I.S. Collenette. Studies in Arabian Bryophytes 15. *Nova Hedwigia* **48**:73-83.
- Migahid, A. M.** (1978) *Flora of Saudi Arabia*, 2nd ed, Vol. 1. . Riyadh University Publications, Riyadh.
- Ministry of Agriculture** (1998) Tanumah Agriculture Branch, Saudi Arabia.
- Phillips R.** (1980) *Grasses, Ferns, Mosses and Lichens of Great Britai and Ireland*. Pan Books Ltd., London.
- Vesey-Fitzgerald, D.F.** (1955) The vegetation of Red Sea coast south of Jedda, Saudi Arabia. *J. of Ecol.*, **43**(2): 477-489.

Received 16/05/2001; in revised form 18/03/2002.