

## SHORT COMMUNICATION

# Occurrence of *Drynaria sparsisora* (Desv.) T. Moore, in the lower Hantana area, Sri Lanka

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**Abstract:** *Drynaria sparsisora* (Desv.) T. Moore was observed in the lower Hantana area after 56 years. A cytological study and continuation of morphological observation of sori is suggested to confirm the occurrence of *D. sparsisora* in the lower Hantana area.

**Keywords:** *Drynaria sparsisora*, *Drynaria quercifolia*, ferns, Hantana, pteridophytes.

## INTRODUCTION

Out of about 11,300 pteridophyte species recorded worldwide<sup>1</sup>, 362 species have been reported from Sri Lanka<sup>2</sup>. Due to various threats, 90 local species are considered to be threatened. It has been reported that 13 species of ferns from Sri Lanka are already extinct and more than 30 species of pteridophytes have not been collected during the last century<sup>3</sup>. The specimens in the National Herbarium in the Royal Botanical Gardens, Peradeniya and the literature revealed that the Hantana range provides a natural refugium for Pteridophyte species that are extremely rare and possibly extinct in other localities in the island<sup>4-7</sup>. For example, two fern species namely, *Pronephrum gardneri* Holttum (Thelypteridaceae) and *Pteridrys zeylanica* Ching. (Dryopteridaceae) have been recorded from the Hantana range during 1883-1890. These two species have not been recorded during the last century<sup>6-7</sup>. Although such evidences suggest that the Hantana range is one of the sensitive areas of the Central Highland in the country, only limited studies (i.e. Perera *et al.*<sup>8</sup>; Subasinghe *et al.*<sup>9</sup>) have been carried out on the biodiversity of pteridophytes of the Hantana range. The objective of this study was to provide information on the observation of the presence of a rare and supposedly extinct fern species from lower Hantana area.

## METHOD AND MATERIALS

During a field visit to the Hantana range, specimens resembling *Drynaria sparsisora* (Desv.) T. Moore were observed along the banks of a stream. Morphological characters of both nest and foliage fronds and rhizome of the observed specimen and known specimens of *D. quercifolia* (L.) J. Smith were measured and recorded. Scales of the observed specimen and known samples of *D. quercifolia* were also observed using a light microscope (×100) and line diagrams were drawn. Literature on the genus *Drynaria* was reviewed to obtain the historical records. Scientists studying the family Polypodiaceae were consulted for the identification of *Drynaria* species.

## RESULTS AND DISCUSSION

The genus *Drynaria* is represented in Sri Lanka by two species namely, *D. quercifolia* and *D. sparsisora*<sup>10</sup>. *Drynaria quercifolia* is the most common species found in Sri Lanka which is commonly known as *Benduru*. It had originally been collected by Paul Herman from Sri Lanka and described by Linnaeus<sup>11</sup>. It usually grows on trees as an epiphyte or on rocks as a lithophyte in the Central, Western and Southern Provinces up to an elevation of 900 m<sup>11</sup>. In addition to Sri Lanka, *D. quercifolia* has been observed in India and Southern China, throughout Southeast Asia to tropical Australia and Polynesia<sup>12</sup>. The species is used to prepare oil which is used as an indigenous medicine, and also as an ornamental plant<sup>13</sup>.

In contrast, *D. sparsisora* is considered a rare species in Sri Lanka<sup>10,14</sup>. In addition to Sri Lanka, it has

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also been found throughout Southeast Asia, Southern China, tropical Australia and Polynesia<sup>11</sup>. The original report of the occurrence of this species in Sri Lanka was based on a single herbarium sheet at the Kew Herbarium, UK which was labeled "Ceylon" with no other details. Even though the specimen was not adequately labeled it was identified as *D. sparsisora*. According to Sledge<sup>10</sup>, there are no other Sri Lankan or Indian specimens in the National Herbarium in Peradeniya or in the British Museum, UK and therefore he had suggested that the evidence for the occurrence of *D. sparsisora* in Sri Lanka was inadequate. However, Hovenkamp<sup>15</sup>, while revising the family Polypodiaceae in Sri Lanka had found three other specimens of *D. sparsisora* from the Kew Herbarium that were collected from Sri Lanka in 1950-1951 by Ballard, but no spores were observed in all three specimens. Hovenkamp<sup>15</sup> later identified these specimens as *D. sparsisora* based on scale characters of the rhizome. Details of information of the four specimens identified as *D. sparsisora* in the Kew Herbarium are given in Table 1.

It is clear from the literature that both *D. quercifolia* (Plate 1) and *D. sparsisora* (Plate 2) closely resemble each other. However, scales on the rhizome and sori arrangement are unique to each species<sup>11,16</sup>. A comparison of scale characters of rhizome and sori of *D. quercifolia*

and *D. sparsisora* is illustrated in Figures 1 and 2. According to the available literature and the specimens kept at the National Herbarium, it is suggested that *D. sparsisora* has not been recorded from Sri Lanka during the last 56 years.

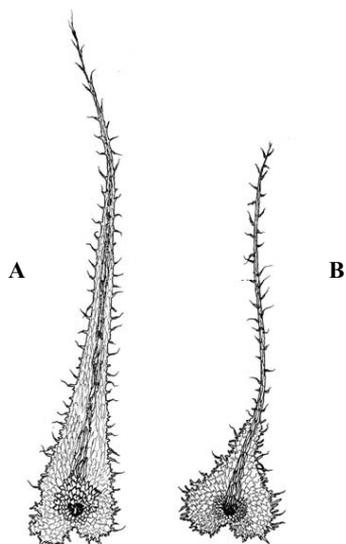
#### Observation of *D. sparsisora* after 56 years

A group of about 10 plants of *D. sparsisora* (Plate 2) were observed on a rock crevice close to a stream bank of the lower Hantane area in Kandy District. The voucher specimen (850R) was deposited in the Pteridological collection of the Faculty of Agriculture, University of Peradeniya. The morphological characters of the observed plants are given below.

**Rhizome characters:** The observed specimens had a short, thick and creeping rhizome which was covered with dark brown, peltate shaped scales. A dark brown prominent midrib was observed on the scales as illustrated in Figure 1B. In contrast, *D. quercifolia* scales usually has no prominent midrib (Figure 1A).

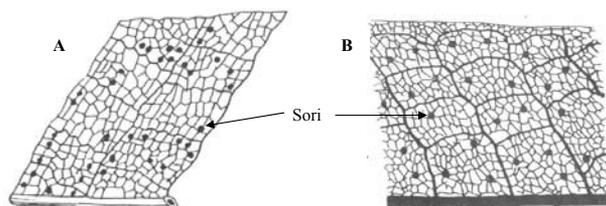
**Fronde characters:** The observed specimens had two types of fronds the foliage fronds and the base fronds. Foliage frond had leathery lamina with long winged-petioles (lengths ranged from 27.5 to 39 cm). The frond lamina was deeply pinnate consisting of 7- 11 pairs of lobes. Length and width of frond lamina ranged from 64 to 105 cm and from 40 to 58 cm, respectively. Nest leaves (base fronds) were sessile and entire, and with shallowly or deeply lobed margins. The width of base fronds varied from 12 to 19 cm and length varied from 13 to 23 cm. Veins of base fronds were reticulate between two main lateral veins. Free veinlets were simple or absent. According to Beddome<sup>16</sup>, Sledge<sup>13</sup>, Winter and Amoroso<sup>11</sup> there are no significant differences between the nest and foliage frond characters of *D. quercifolia* and *D. sparsisora*.

**Figure 1:** Scales observed from rhizome of *Drynaria* species (mag. x100).



Note: A = Scales of *D. quercifolia* where the mid rib is light, not prominent and discontinuous; B = Scales of *D. sparsisora* where dark brown midrib is prominent and continuous

**Figure 2:** Sori arrangement of two *Drynaria* species (mag. x2).



Note: A = *D. sparsisora* with scattered or irregular row arrangement<sup>16</sup>; B = *D. quercifolia* with sori arrangement in two regular rows<sup>17</sup>

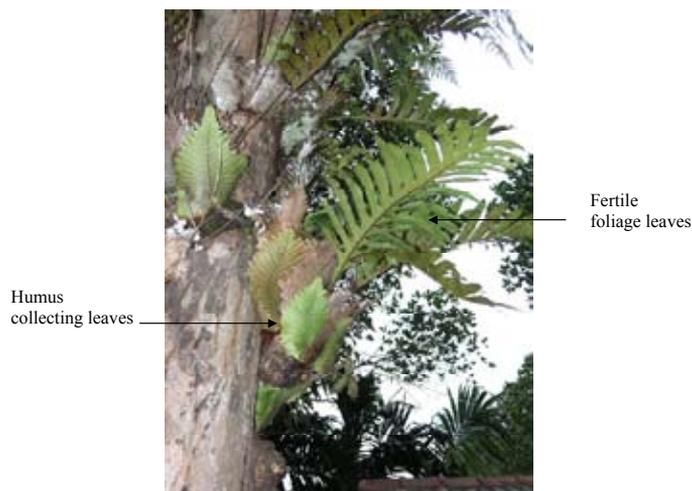
**Sori arrangement:** All specimens consisted of juvenile foliage fronds and thus, sori were not observed in any plant. However, according to Hovenkamp<sup>15</sup> and Winter

and Amoroso<sup>11</sup>, the sori of *D. sparsisora* are rounded slightly sunken and 1-2 mm in diameter. In general, 2-7 sori are arranged in each areole irregularly scattered or in

**Table 1:** Descriptions of specimens of *Drynaria sparsisora*, collected from Sri Lanka and deposited at the Kew Herbarium.

Specimen No.	Locality	Date	Collector
--	Stated as Ceylon	Not stated	Not stated
1095	Kandy District, Kadugannawa, 62 mile post, on Colombo-Kandy road.	12 Dec. 1950	Ballard
1370	Ratnapura District, Belihul oya, in crevice in granite in stream by rest house	03 Jan. 1951	Ballard
1371	Ratnapura District, Belihul oya, on dead tree trunk, near rest house	03 Jan. 1951	Ballard

Source: Hovenkamp<sup>15</sup>



**Plate 1:** *Drynaria quercifolia*, on tree trunk of boundary of the Sinharaja forest



**Plate 2:** *Drynaria sparsisora*, on rock around river rine vegetation of the lower Hantana area

two irregular rows between the connecting veins (Figure 2B). In comparison, the sori of *D. quercifolia* are arranged in two regular rows parallel and close to the veins (Figure 2A). The pattern of sori arrangement is considered as one of the unique and strong characters which can be used to differentiate the two species.

Scale characters and information of the previously described specimens suggest that the observed specimens from the lower Hantana area were those of *D. sparsisora*. Morphological observations of the occurrence and characters of sori as well as molecular and cytological studies of the observed specimens are being conducted to confirm that the observed specimens are that of *D. sparsisora*.

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