Cololejeunea furcilobulata (Berrie et Jones) Schuster and Heteroscyphus argutus (Reinw. et al.) Schiffn. from Mahendragiri Hills of Kanyakumari District of South India

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Bryophytes of Kanyakumari district are being investigated for the first time. This paper reports two liverwort species viz., Cololejeunea furcilobulata and Heteroscyphus argutus described for the first time from this district. Cololejeunea furcilobulata has been found to occur as corticolous and along with Heteroscyphus argutus as rupicolous. C. furcilobulata is characterized by ovate leaves with uniformly thick walled leaf cells devoid of trigones. The lobule is biciliate with undivided basal portion in the corticolous form and inflated in the rupicolous form. The sexuality is paroecious in both forms. Heteroscyphus argutus occurs as rupicolous forms with leaves possessing 5 to 6 terminal papillae and uniformly thick walled leaf cells devoid of trigones. Rhizoids are hyaline and grouped at the base of bifid under leaves. Sexuality could not be confirmed as the plants examined had no sex organs.

Introduction

Bryological studies have made significant progress in recent years. Detailed systematic studies of Hepatic flora of different localities have frequently been carried out in various parts of the world. However, barring the major works of Kashyap (1929, 1932), Chopra (1938, 1943), Bharadwaj (1950, 1958, 1960), Kachroo (1969, 1970, 1970a, 1973), Kachroo et al. (1977), Udar (1976), Udar and Srivastava (1975, 1977) and Joshi and Biradar (1984), there are still some Indian regions in which Bryology has not received much attention. One such area is the Kanyakumari district.

Kanyakumari district is situated at the southernmost tip of the Indian subcontinent. Its position has the advantage of receiving both the southwest and northeast monsoon rains. Therefore showers are not concentrated to one season but more or less uniformly distributed throughout the year. The hills of this district, a part of the Western Ghats, support rich wet evergreen and moist deciduous forests at higher altitudes and scrub at lower levels. Due to the introduction of plantation crops like teak, rubber, clove and albizzia
by both private and government sectors, the forests have become patchy. However, these patches are still dense and humid and therefore support a luxuriant growth of bryophytes.

The forests of Kanyakumari have not been surveyed for bryophytes so far. Therefore, it was felt that a systematic survey should be undertaken of this region. Specimens of bryophytes were collected from the Mahendragiri hills in the district in evergreen forests at an altitude of ca 1500 ft. The highest elevation in this hill range is ca 6000 ft. The present paper reports the occurrence of two species viz. Cololejeunea furcilobulata and Heteroscyphus argutus for the first time with brief notes on their ecology. The collected samples have been coded and deposited locally at the herbarium of Scott Christian College, Nagercoil.

Description

Cololejeunea furcilobulata (Fig. 1)

Plants corticolous, green, appressed to the substratum, branching irregularly pinnate, rhizoids hyaline and grouped. Leaves imbricate, ovate, margins entire. Marginal cells rectangular whereas median cells pentagonal to hexagonal, cell walls uniformly thickened and devoid of trigones. Basal cells elongated, hexagonal, oil-bodies 3-15 per cell, rounded, smooth but fewer in rupicolous form than in corticolous. Leaf-lobule biciliate with undivided basal portion in corticolous form and inflated in rupicolous form. The cilia are of equal length. Paroecious sexuality; capsule spherical enclosed within five plicate, obovate perianth.

Specimens examined

AEDD-L 105/2, AEDD-L 105/3; Locality: Mahendragiri hills, Kanyakumari district; Altitude ca 1500 ft.; Corticolous and rupicolous adjacent to a small stream; Daniels and team, 5.8. 1995.

Distribution and Ecology

Type locality: Nigeria.

Range: Nigeria, India (Karnataka, Kerala, Tamil Nadu).

Habitat: Corticolous and Rupicolous.

**Discussion**

The taxon *C. furcilobulata* was first described by Udar *et al.* (1985) for Asia. They have collected the taxon from localities in Kerala and Karnataka.
in different habitats such as corticolous, rupicolous and foliiicolous populations. In Mahendragiri hills it was seen growing on the bark (corticolous) of *Stereospermum xylocarpum*, as an epiphyte on *Polyporus* spp. and also on rocks (rupicolous) at ca. 1500 ft.

Earlier, this taxon was described by Jones (1954) from Nigeria under the generic name *Leptocolea*. Schuster (1963) brought it under *Cololejeunea*. However, Udar et al. (1985) have treated this as a subgenus *Pedinolejeunea* due to the thin-walled leaf cells and the variable lobule. But the present observation reveals that the walls of the leaf cells are uniformly thickened (Fig 1.4).

The distinctive feature of this plant is the "furcate lobule" with cilia of equal or unequal size (Udar et al., 1985) from which the specific epithet has arisen. However, saccate lobules are seen in rupicolous form.

The present observation reveals paroecious sexuality. As cautioned by Udar et al. (1985), locating the presence of antheridia in male bracts was difficult in plants with mature perianth. However, the paroecious condition was confirmed by the presence of the characteristic strongly inflated leaf-lobule just below the perianth which clearly suggests their identity with male bracts (Fig 1.1).

The plants examined had no archegonia and therefore whether the plants from this locality show autoecious sexuality or not needs further seasonal observation which will be carried out in the long term. Capsule is spherical and protected by five plicate perianth.

*Heteroscyphus argutus* (Fig 2)

Plants yellowish green, prostrate; rhizoids hyaline and grouped at the base of small bifid underleaves. Leaves succubous with 5-6 terminal dentitions (Fig 2.1), cell wall uniformly thickened, chloroplasts many per cell, oil bodies 3-6 per cell, oval, faintly grained; marginal cells elongated and pentagonal, median and basal cells hexagonal. Sex organs absent.

**Distribution and Ecology**

Range: Burma, Java, Borneo, Philippines, New Guinea, Australia, New Zealand, Brazil, Taiwan, Japan and India (Uttar Pradesh, Tamil Nadu)

Habitat: Rupicolous
Figure 2: *Heteroscyphus argutus* 1. Part of plant showing leaf arrangement, dentitions, underleaves and rhizoids. 2. Leaf cells (marginal and median). 3. Underleaf. 4. Oil bodies.

Specimens examined

AEDD-L 105/2; Locality: Mahendragiri hills, Kanyakumari district, Tamil Nadu; Altitude: ca 1500 ft.; Rupicolous adjacent to a small stream, in association with *Cololejeunea furcilobulata*; Daniels and team, 5.8. 1995.

Discussion

The taxon *H. argutus* was reported by Kachroo in 1969 from Mussoorie in north India. According to him, the taxon has wide range of distribution such as in Burma, Java, Borneo, Philippines, New Guinea, down to Australia and elsewhere in Taiwan, Japan and Brazil. In Mahendragiri hills it was seen growing as rupicolous at about 1500 ft.
Earlier *Heteroscyphus* was treated as a synonym of *Chiloscyphus*. However, it was later separated from *Chiloscyphus* by Schiffner on the basis of the small, amentiform androecia; the latter are larger in *Chiloscyphus*. Schuster (1963) stated that this genus needs reexamination and that a major difference in sporophyte anatomy might warrant segregation of *Heteroscyphus* from the species at present assigned to this genus. (Kachroo, 1969). As sex organs were absent in the specimens presently examined, the nature of androecia could not be studied.

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*Not seen in original*