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ON THE SPECIES OF *BUELLIA* AND *DIPLOTOMMA* FROM MANIPUR, INDIA

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ABSTRACT

The paper reports the occurrence of 15 species of *Buellia* and 5 species of *Diplotomma* from Manipur, India. Out of these, 2 species *viz.*—*Buellia conspirans* and *Diplotomma chlorophaea* are new records for India and therefore, are described in detail. *Diplotomma chlorophaea* is made a new combination. A key to the all species is also provided to facilitate their identification in the area.

The lichen genera *Buellia* De Not. s. str. and *Diplotomma* Mass. are represented in India by 40 species and 9 species respectively (S. Singh 1979, K. Singh 1980, S. Singh and Awasthi 1981, K. Singh and S. Singh 1982). Only 4 species of *Buellia* and 2 of *Diplotomma* had so far been recorded from Manipur. During the course of detailed taxonomic investigations on the specimens from Manipur additional 11 species of *Buellia* and 3 of *Diplotomma* have been found. Out of these 10 species of *Buellia* and 2 of *Diplotomma* are already known from other regions of India. Two taxa *viz. Buellia conspirans* (Nyl.) Vain. and *Diplotomma chlorophaea* (Hepp. ex. Leight.) Singh et Singh *comb. nov.* are new reports from India. In order to facilitate the identification a key for all the species of *Buellia* and *Diplotomma* recorded from Manipur is given in this paper. Full descriptions of the two taxa which are new records for India are also provided along with a new combination. The descriptions of other taxa are omitted since they are already available in above mentioned publications.

Key to the species of *Buellia* and *Diplotomma* recorded from Manipur

1a. Spores 2-celled — *Buellia*
  2a. Thallus corticolous :
    3a. Spore wall ± uniformly thickened :
      4a. Thallus K+red, P+yellow :
        5a. Disc of apothecium greyish pruinose, spores 16.5-23×6.9-9 µm, atranorin and norstictic acid present — *B. glaucotheca* (Fée) Malme.
        5b. Disc of apothecium epruinose :
          6a. Thallus thin, ± uniform, spores 24-32×9-12 µm, atranorin, norstictic acid present — *B. curtisii* (Tuck.) Imsh.
          6b. Thallus thick, verruculose, spores 18-32×6-9 µm, atranorin, norstictic, salacinic acid unidentified terpines present — *B. morehensis* Singh et Singh
      4b. Thallus K—, P— :

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7a. Internal stipe pallid, exciple less than 20 μm thick, spores 18-24×7-12 μm, no lichen substances present — *B. diorista* (Nyl.) Zahlbr.
7b. Internal stipe dark reddish brown, exciple more than 30 μm thick :
8a. Thallus scanty, cracked, exciple 35-60 μm thick, spores 10-15 (18)×6-8 μm no lichen substances present — *B. punctata* (Hoffm.) Mass.
8b. Thallus conspicuous, smooth, exciple 50-90 μm thick, spores 18-25×9-13 μm, atranorin present — *B. montana* (Stirt.) Zahlbr.

3b. Spore wall unevenly thickened :
9a. Thallus K+ reddish brown, spores±mischoblastiomorphic, 15-18×6-9 μm, atranorin, norstictic acid and terpines present — *B. inornata* (Stirt.) Zahlbr.
9b. Thallus K−, P−, spores placodiomorphic, 20-26×6-8, μm, atranorin, terpines present — *B. placodiomorpha* Vain.

2b. Thallus saxicolous :
10a. Spores mischoblastiomorphic, 18-28×3-11 μm, thallus K−, P−, no lichen substances present: — *B. posthabita* (Nyl.) Zahlbr.
10b. Spores not mischoblastiomorphic, wall±uniformly thickened :
11a. Medulla I+ blue :
12a. Thallus K+ yellow, P+ yellow, thick, areolate, spores 15-24×6-9 μm, atranorin, norstictic acid, baeomycesic acid and unidentified substance present — *B. meghalayensis* Singh et Awas.
12b. Thallus K+ red, P+ yellow, atranorin and norstictic acid present :
13a. Spores surface ornamented, apothecia partially erumpent, spores 15-18×6-7 μm — *B. ceylanensis* Zahlbr.
13b. Spores smooth, apothecia immersed, spores 12-16×6-8 μm — *B. aethalea* (Ach.) Th. Fr.

11b. Medulla I− :
14a. Thallus K+ red, P−, spores ornamented, 15-21×9-12 μm, no lichen substance present : — *B. palniensis* Singh et Awas.
14b. Thallus K+ red, P+ yellow, atranorin and norstictic acid present, spore surface ornamented :
15a. Thallus±granular to verruculose or cracked areolate, apothecia adnate to subsessile, spores (9) 12-17×6-8 μm — *B. conspirans* (Nyl.) Vain.
15b. Thallus±uniform, areolate, apothecia sunken in the thallus, spores 12-15×5.5-7 μm — *B. subdisciformis* (Leight.) Vain.

1b. Spores transversely 4-6 celled or muriform — *Diplotomma*
16a. Thallus corticolous :
17a. Spores transversely septate surface ornamented :
18a. Thallus K+ red, P+ yellow, spores 4-celled, 18-30×9-12 μm, atranorin and norstictic acid present — *D. lauricassiae* (Fée) Müll.-Arg.
18b. Thallus K+ yellow, spores 4-6 celled 18-24×6-9 (12) μm atranorin, terpenes present — *D. proximata* Magn.
17b. Spores muriform, surface smooth, 15-25×6-12 μm thallus K−, P− — *D. alboatra* (Hoffm.) Branth.
16b. Thallus saxicolous :
19a. Spores transversely 4-celled surface ornamented, thallus K+ red, P+ yellow, spores 18-27 (36)×7-11 μm, atranorin, norstictic acid present — *D. manipurensis* Singh et Singh
19b. Spores muriform, surface smooth :
20a. Thallus K+ red, P+ yellow, apothecia sunken, spores 15-24×9-12 μm, atranorin, norstictic acid present — *D. chlorophaea* (Hepp. ex Leight.) Lett.
20b. Thallus K−, P−, apothecia prominent, spores 15-25×6-12 μm, no chemical substance present — *D. alboatra* (Hoffm.) Branth.

Buellia conspirans (Nyl.) Vain., Ann. Acad. Sci. Fenn. Ser. A 6(7) : 88. 1915. *Lecidea conspirans* Nyl. Flora 51 : 345. 1868.

Thallus saxicolous, crustaceous, effuse, whitish to ashy grey, cracked areolate to verruculose, surrounded by black hypothalline line. Apothecia black, prominent, adnate to sessile, constricted below, rounded, 0.2-0.7 mm diam. ; margin black, thick, persistent ; disc flat to concave, epruinose ; hymenium 60-75 (100) μm high, not inspersed with oil globules, I+blue ; internal stipe pale brown, K−; exciple reddish brown, K+ red crystals ; asci 8-spored ; spores brown, transversely 2-celled, ellipsoid, uniformly thickened, (9) 12-17 × 6-8 μm surface ornamented ; paraphyses simple to furcated.

Chemistry : Thallus K+ red, C−, KC−, P + yellow, I−, UV− ; atranorin, norstictic acid present (TLC).

Specimens examined : Tegnoupal, Moreh, Singh 550830, 550833, 550834, 550836, 550837 (all CAL.).

Extra Indian specimen examined : Nova granata, Lindig 1863, Herb. Nyl. 10547 (Holotype : H).

The species known from tropical regions of America is characterized by the thallus reactions, black constricted apothecia and spore size.

Diplotomma chlorophaea (Hepp. ex Leight.) Singh et Singh *comb. nov. Lecidea chlorophaea* Hepp. ex Leight., Lich. Flora Great Brit. et I : 2-328. 1871.

Thallus saxicolous, crustaceous, whitish grey to dark grey, effuse, cracked-areolate ; hypothallus not seen but blackish at the junction of other thalli. Apothecia sunken, black, rounded, 0.3-0.6 mm diam. ; margin white and present in younger apothecia but becomes indistinct in mature apothecia ; disc flat to concave, epruinose ; hymenium 120-130μm high, not inspersed with oil globules, I+ blue, internal stipe and excple brown, K+ red crystals ; asci 8 ⁻ spored ; spores brown, ellipsoid, muriform, 15-24 × 9-12 μm, surface smooth ; paraphyses simple.

Chemistry : Thallus K+ yellow- orange, C−, KC−, P+ yellow, I−, UV−, atranorin, norstictic acid present (TLC).

Specimen examined : Korong, Mao, Singh 550271 (CAL).

This species known from Europe is characterized by muriform spores and thallus reactions. *B. alboatra* (Hoffm.) Branth., has also muriform spores but differs from *B. chlorophaea* by negative thallus reactions.

Diplotomma manipurensis (Singh et Singh) Singh et Singh *comb. nov.* Basionym—*Buellia manipurensis* Singh et Singh *Geophytology* 12(1) : 128-129, 1982.

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