ON ALECTORIA ACANTHODES HUE, ALECTORIA CONFUSA SP. NOV. AND SYSTEMATIC POSITION OF THE GENUS ALECTORIA

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ABSTRACT

The paper reduces Alectoria acanthodes Hue to the synonymy of A. divergescens Nyl., describes a new species Alectoria confusa Awas., reports the occurrence of A. implexa (Hoffm.) Nyl. from Nepal and makes a plea for the revision of the systematic position of the genus Alectoria into an independent family Alectoriaceae.

The taxon Alectoria acanthodes Hue was described by A. M. Hue (1899, pp. 89-90) on a collection from Yunnan by R. P. Delavay in 1888. It was characterized "thallus passim nigricans, passium obscure vel pallide castaneus, 5-6 cent. altus, erectus, ··· varie ramosi, ramulis validis, parumdivaricatis, ··· interdum ramosis aut ramulis fibrilliformibus asperati, ··· raro sulcatis, sulco brevi corticem non-rumpente, K immutati. ··· Apothecia 1-5 mm. lata, in fere omnibus, ramis aspectu terminalia, sporae 8-nae, hyalinae simplices, 11-13 μ longae et 4-5 μ latae ··· Satura fere ut in A. sulcata Nyl.". Du Rietz (1926, p. 17) placed the species in the subsection Subfibrillosae Du R. of Alectoria and reported that since he had not been able to examine an authentic specimen, his conclusions about its affinity were based on the observations "sed affinis A. bicolori Nyl. a qua ramis multo validioribus, minus elongatis, implexisque, magis spinosis, apotheciis alio modo enatis atque sporibus majoribus jam differt" by Hue (op. cit.). Gyelnik (1935, p. 238) placed A. acanthodes Hue as conspecific to A. divergescens Nyl. and synonymized both of them under Bryopogon divergescens (Nyl.) Gyl. In recent years, Asahina (1955, p. 63, and 1966, p. 604), Motyka (1964, p. 6), and Bystrek (1969, p. 18) have recognised Alectoria acanthodes Hue as a valid species, and certain collections of lichens from E. Himalaya and Nepal have been referred to this species by Asahina and Bystrek.
During the course of the examination of specimens of *Alectoria* from the Himalayan region, it became obvious that the specimens that have apparently been referred to *A. acanthodes* Hue by the authors cited above seem to have been placed incorrectly within the said taxon. The descriptive phrases and the characters in the keys to the species given by them do not at all correspond to the type description given above. An authentic specimen of *Alectoria acanthodes* Hue (Plate VII, Fig. 1) borrowed from Paris (PC) entirely conforms to the type description, but whether it could be regarded as the holotype is questionable. The specimen sheet bears the details about locality, date of collection corresponding to those given by Hue (1899), but there is slight variation in the spellings of the specific epithet and the collector is referred R. P. Faurie in contrast to R. P. Delavay in the original type description of the species by Hue. Whether Faurie is equivalent to Delavay or there has been some error elsewhere is difficult to ascertain. In any case, this specimen, even if not a holotype, can undoubtedly be regarded as an authentic specimen for *Alectoria acanthodes* Hue as it conforms to the type description in its entirety. In the absence of any other type specimen (*leg. R. P. Delavay*), it could unhesitatingly be substituted for one as a Neotype.

I then compared the above specimen with the holotype of *Alectoria divergescens* Nyl. borrowed from Helsinki (H—Herb. Nylander No. 35972) and found that except for the size of the thalli, there is basically no difference in the two. While the thallus in *A. divergescens* Nyl. is ca. 2.5 cm. tall, that of *A. acanthodes* Hue is ca. 5 cm.; the apothecia in the former are up to 3.5 mm. in diameter, and in the latter up to 5 mm. in diameter. Both of them have thick caespitose, divaricately branched thallus with short lateral spinules, the sulcate condition (medulla not exposed) is identical, the subterminal to terminal apothecia and spore size are also identical, and lastly the chemical colour reactions in the cortex and medulla [K—, Cl—, K (Cl)—, Pd—] are also identical. Thus a minor variation of the size has no taxonomic significance, especially when the type (in *A. divergescens* Nyl.) comprises a couple of plants and there has been no duplication of the collection. In fact, a smaller individual thallus of *A. acanthodes* Hue could easily be substituted as equivalent to *A. divergescens* Nyl. The figure of the holotype (which all that it consists of) of *A. divergescens* Nyl. in Du Rietz (1926, Plate VII, Fig. 2) is distinctive enough to make a comparison with the figure given here. Consequently, the views of Gyelnik are reaffirmed and according to the *International Code of Botanical Nomenclature*, *Alectoria divergescens* Nyl. receives nomenclatural priority.
Now since the plants referred to *A. acanthodes* Hue by Asahina, Motyka and Bystrek are decidedly different (the characterization is given later), it may seem desirable to trace the source of the error, as any error of judgement by these authorities is ruled out. It seems possible that their views on the identity of *A. acanthodes* Hue are based on the assumption that the Exsiccate 'A. Zahlbruckner et Redinger, Lich. Rar. Exs. No. 321: det. *Alectoria acanthodes* Hue' is an authentic specimen for the species, and that subsequent determinations may have been made on comparison to it. In this connection it may be remarked that Gyelnik (1935, p. 235) established a new taxon—*Bryopogon orientalis* Gyel.—on the specimen of the above exsiccate that was then preserved in Herb. Mus., Budapest. The species is diagnosed to be sorediate, and from the comparison of the descriptions, it seems to be subsimilar to *Alectoria variabilis* Bystrek (1969, p. 9). However, a comparison of the two is no longer possible as the holotype of *Bryopogon orientalis* Gyel. was destroyed during the last world war (I am thankful to Dr. Veresghy for this information in private communication). The same exsiccates at other herbaria could be considered the isotypes if they possess sorediate specimens, but I have had no occasion to examine any other except a small piece of the exsiccate (kindly sent to me a few years back by late Dr. Magnusson), which is non-sorediate, and is not identical to *A. acanthodes* Hue. Further, because Zahlbruckner (1940, pp. 552–53) reported *Bryopogon orientalis* Gyel. as conspecific to *Alectoria acanthodes* Hue, the error never got discovered and the exsiccate No. 321 referred to above continued to be regarded, erroneously, as an authentic specimen for the latter species. Even from the descriptions, the two are distinctly different. Thus *Alectoria orientalis* (Gyel.) Comb. Nov. (syn. *Bryopogon orientalis* Gyel., Fedde Repert. 38: 235, 1935) is a distinct species based on the sorediate forms in the exsiccate No. 321 referred to above and that probably this exsiccate may have a mixture of the sorediate and non-sorediate types.

It is thus clear that the *Alectoria* specimens characterized "thallus 6 cm. long, 0.5 mm. thick, frequently branched, fibrillose, medulla Pd—" and compared to *A. acanthodes* Hue by Asahina (1955) do not pertain to that species. Similarly, the taxon *A. acanthodes* Hue that has been keyed out by Motyka (1964) with the characters "plants ± tufted, erect, dark brownish-black, spreading, distinctly spinulose, esorediate, apothecia small, semi-globose, not terminal" and by Bystrek (1969) "aste ± zylindrische, nicht rinning, aufbrechend, Lager strauchformig abstehend bis aufsteigend, oft dichtrosig, ohne sorale, mit zahlreichen kleinen Apothecia, medulla P—" shows no similarity to the type description of the species. Plants conform-
ing to the above descriptions and concept are frequent epiphytes in the upper temperate parts of E. Himalaya and E. Nepal, and most likely extend to S. China. They are quite distinct from any of the species of *Alectoria* known so far and consequently are described below as a new species.

*Alectoria confusa* Awasthi Sp. Nov.

**Diagnosis.**—Thallus erectus vel subpendulus, pallido-castaneus vel fuscus subnitidus vel nitidus, usque 5–8 (10) cm. longus, cylindricus, laeves vel pro parte sulcatus, sulci corticem non rumpente, rami primari ca. 1 mm. crassi, divaricati vel varie ramosi, teres, ramosis aut ramulis fibrilliformibus (spinulis) asperati, non-sorediatus, non-isidiatus, et non-pseudocyphellatus. Apothecia lateralia, sessilia, globosa vel semi-globosa, eciliata, usque 1 mm. diam., discus rufescens, epruinuosus, sporae 8-nae, hyalinae, simplices, oblongae vel oblongo-ellipsoideae, 9–12 (14) × 4–6 μ. Thallus cortice et medulla K—, Cl—, K (Cl)—, Pd—. Corticola.

**Habitat:** Usually on branches of trees (particularly of *Rhododendron*), and rosaceous shrubs.


**Description.**—Thallus ± erect to scandent or partially pendulous, divergent, 5–8 (10) cm. tall, basal attachment indistinct, basal part of the thallus in well-developed thalli usually 1 mm. (rarely 1·2 mm.) thick, divaricately branched, branches tapering, pale grey, brown, brown-black to black, often mottled darker below and comparatively lighter coloured towards the apices, or the greater part of the thallus lighter grey pale except the basal part; primary, secondary and thicker branches beset with sparse to dense, light-coloured to dark-coloured fibrils or spinules (or branchlets) disposed at right angles to the main branches. Thallus rounded, and occasionally to

frequently longitudinally sulcate by narrow infolded depressions, medulla not exposed. Soredia, isidia and pseudocyphellae absent.

Cortex of the thallus somewhat proportional to the thickness of the thallus; in thick branches cortex (80) 100–130 μ thick, composed of longitudinally disposed, conglutinate, thick, gelatinous walled confluent hyphae with 1–1.5 μ wide lumina. Exterior 3–4 μ wide region gelatinous hyaline, with a 6–18 μ thick light pale to brown or dark brown or black zone inside it, and the remaining part of the cortex generally hyaline. Algal cells *Trebouxia*, average 10–14 μ in size. Medulla of loose to lax or almost of arachnoid hyphae, hyphae ca. 3 μ thick, smooth. Cortex and medulla K—, Cl—, K (Cl)—, Pd—.

Apothecia lateral, sessile, globose to semiglobose, up to 1 mm in diam.; disc brown to olivaceous, epruinose, smooth, shining, plane to generally convex; margin smooth, without fibrils. Hymenium 70–90 μ thick, I + blue to pale smudgy blue; epithecium I--; hypothecium colourless, 120–140 μ thick; exciple composed of compact erect thick hyphae, 120–150 μ thick; margin proper, without algal cells; algal cells present near the base of the apothecium below the exciple. Asci clavate, ca. 60 × 15 μ in size, 8-spored; spores colourless, single celled, oval oblong to oblong ellipsoid, 9–12 (14) × 4–6 μ in size. Pseudoparaphyses thin, branched septate, anastomosing, occasionally slightly thickened at the apical end.

No chemical ingredients extracted in acetone, the slide remains just as clean when thallus is treated with acetone.

The new species *Alectoria confusa* Awas. is subsimilar to *Alectoria orientalis* (Gyel.) Awas. and *A. variabilis* Bystrek, in the nature of the thallus, the apothecia and the chemical reactions, but differs in the absence of soredia and pseudocyphellae. The size of the spores in *A. orientalis* is not known, but the spores of *A. variabilis* are smaller (ca. 9 × 6 μ).

Bystrek (1969) has reported 21 species of *Alectoria* to occur in the Himalayan region. To this can now be added the following as well:


Systematic position of the genus *Alectoria*.—In almost all the systems of the classification of lichens, the genus *Alectoria* has been placed in
the family Usneaceae on account of the fruticose, radially symmetrical, generally filamentous thallus. Within the family the genus has been distinguished from the other members by a cortex composed of longitudinally disposed confluent hyphae—a character which is also shared by the closely related, monotypic genus *Oropogon* (distinguished by solitary, large muri-form spores). The genus *Alectoria* further exhibits important distinctions of the presence of a proper margin, a well-defined thick exciple underneath the hypothecium, and branched and anastomosing pseudoparaphyses probably not true paraphyses, as they have often been referred to earlier), none of which are present in the other genera of the family.

Since the recent trend for the classification of the lichens demands greater emphasis on the presence of uni-/bi-tunicate asci and true paraphyses/pseudoparaphyses, a need for the revision of the systematic position of *Alectoria* has also been felt. Though the asci in the genus are thickened at the top, but in the few species (*Alectoria sulcata*, *A. implexa*, *A. diver-gescens*, *A. confusa*) investigated by me only unitunicate type of asci have been found. The presence of the pseudoparaphyses is discernible from the early stages of the development of the apothecia. Consequently, due to absence of bitunicate asci the genus cannot be placed within the Asco-loculares. But, in the presence of the anastomosing pseudoparaphyses, a well-developed exciple and the external appearance of the lateral sessile apothecia the genus shows similarity to the members of the family Roccellaceae. It is thus felt that the present retention of the genus *Alectoria* in the family Usneaceae is artificial based as it is on the similar fruticose habit. The above-mentioned distinctions of the genus warrant its separation into an independent family Alectoriaceae (type genus *Alectoria* Ach.) of which *Oropogon* Th. Fr. is another member. The genus *Ramalina* a member of Usneaceae exhibits the intermediate characters as regards its cortex of partially longitudinally disposed hyphae and a distinct gap between the hypothecium and the algal cells of the apothecium, which in *Alectoria* is occupied by the exciple of vertically disposed compact hyphae.

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Figs. 1–2. Fig. 1. Holotype (?) of *Alectorion acanthodes* Hue, × 5/4. Fig. 2. Holotype of *Alectorion confusa* Awasthi, × 6/5.
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