THE

JOURNAL OF BOTANY

BRITISH AND FOREIGN.

EDITED BY

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VOL. LI.

ILLUSTRATED WITH PLATES AND BLOCKS

LONDON
WEST, NEWMAN & CO., 54, HATTON GARDEN.
1913.

LICHENS OF ARRAN (v.-c. 100).

By J. A. Wheldon, F.L.S., and W. G. Travis.

There appears to be very little in print to indicate to what extent the lichens of Arran have hitherto been investigated. Beyond the mention in Leighton's *Lichen Flora of Great Britain* and Crombie's *Monograph of British Lichens*, of Arran localities for a few lichens, mostly gathered by Prof. J. H. Balfour, of Edinburgh, we know of no published record of earlier work.

Our paper includes these records, and also the results of field-work done by one of us in July, 1910, and by Mr. Wm. West, F.L.S., in August of the same year. On hearing that we were working at the lichens of the island, Mr. West kindly placed at our disposal a mass of material collected by him. His gatherings, which were particularly rich in corticolous species, have, on examination, yielded many interesting lichens; and we are much indebted to him for allowing us to supplement our list so materially by the inclusion of particulars of his finds. It may be added that some of the material collected has been distributed through the Lichen Exchange Club, and was referred to in the Report of the Club for the year 1911.

It should be explained that practically the whole of the field-work was done on the coast, little or nothing being done on the mountains, owing, to some extent, to inclement weather. The eastern side of the island, from Corrie to Lamlash, received most attention; but some collecting was also done on the western coast between Drumadoon Point and Tormore, and on the south coast in the neighbourhood of Bennan Head and Kildonan. The corticolous species were mainly gathered in the woods about Brodick and Corrie, and in the lower wooded portions of Glen Rosa, Monamore Glen, and other glens opening to the east coast.

In Arran lichens are abundant and in fine condition on the shore-rocks; and most of the saxicolous species in our list were collected on the coast, more especially at Corriegills, just south of Brodick. The outcropping rocks on the shore there are mainly of sandstone and conglomerate, but are intersected by numerous dykes of igneous rocks.

A note was taken, so far as practicable, of the kind of rock on which the saxicolous species were met with, with a view of ascertaining to what extent they exhibit a preference for a particular type of rock substratum. The data obtained are hardly sufficient to warrant more than a brief reference to the subject.

Many of the silicicolous lichens were found to occur indifferently, as might be expected, on siliceous sedimentary rocks (sandstones and conglomerates) as well as on some of the acid igneous rocks. Thus, on sandstone rocks on the shore at Corriegills the following lichens were noted as common:—*Physcia aquila*, *Xanthoria parietina*, *Lecanora parella*, *L. atra*, *Verrucaria maura*, *Callopisma ferrugineum* var. *festivum*, *Lecanora campestris*, *Ramalina cuspidata*, *Physcia stellaris*, *P. tenella*, and *Placodium tegularis*. These

lichens constitute the principal components of a well-marked lichen-association on the barer sandstone rocks just above high-water mark. Most of the foregoing species were also noted on quartz-porphyry, an acid igneous rock which is very prominent at Drumadoon Point and other localities on the Arran coast. A few species were found to occur not only on sandstone and acid igneous rocks, but also on igneous rocks of basic type, *e.g.*, basalt, but unfortunately the lichen-flora of the basic rocks was not sufficiently examined to yield data for comparative purposes. It may be mentioned that certain lichens (e. g., *Verrucaria nigrescens*, *V. maculiformis*, *Placodium tegularis*, and *P. lobulatum*), which in many parts of the country are restricted to calcareous rocks, were observed on siliceous rocks on the Arran coast. From this it would appear that these exposed, spray-washed maritime rocks afford the requisite xerophytic conditions which in other districts are only furnished by limestone, and the chemical composition of the substratum does not come into question in these cases. As bearing on the question of the part played by the texture or grain of a rock-surface so far as some lichens are concerned, it may be mentioned that on the Arran coast the sandstone, when adjacent to intrusive igneous rocks, is usually close-grained and indurated, and that several species, e. g., *Lecanora squamulosa*, *L. picea*, *Lecidea rivulosa*, and *Rhizocarpon petræum*, were found on this type of rock, and were not seen on the unaltered sandstone. The coarse conglomerates, such as are met with near Corrie, are poorer for lichens than the sandstones, this being probably due to the fact that when the sandstone matrix weathers, a very uneven surface, mainly consisting of quartzose pebbles, results. The granitic rocks were not much examined, but at the lower elevations, at all events, the granite is characterized by a paucity of species; on the exposed crags of the high peaks, however, some of the boreal lichens found on other Scotch granite mountains may be expected to occur.

In the following list, one hundred and nineteen species of lichens are enumerated. It must be understood, however, that our list does not at all pretend to represent the lichen-flora of the island: it is simply a catalogue of the lichens collected and observed during a holiday visit, supplemented by a few previously published records which have come under our notice.

Lichina confinis Ag. On sandstone rocks at tide-level, Corriegills. A form also occurs in the same locality, on boulders well above high-water mark, in which the spores are monostichous, but slightly different in shape and measurement from the normal (16·5–19·5 × 13·2 μ).

Collema furvum (Ach.) var. *tunæforme* Nyl. On sandstone, Corriegills shore.—*C. pulposum* (Ach.) *c. frt.* Among mosses, on earth, Corrie, *West.*

Synechoblastus nigrescens (Ach.). On an ash, Monamore Glen, *West.* A more divided form than usual, and, perhaps, may be a distinct variety.

Leptogium lacerum Gray. Among mosses, on shady rocks, Corrie, *West.*—*L. pulvinatum* Nyl. On mossy boulders, Corriegills.—*L. scotinum* Fr., *c. frt.* On the ground among mosses, Corrie, *West*; on mossy boulders, Corriegills.

Stictina fuliginosa Nyl. Corrie, *West.*

Lobaria pulmonaria Hoffm. "Arran," Prof. Balfour, Leighton's *Lichen-Flora.*

Peltigera canina and *P. polydactyla* Hoffm. "Arran," Prof. Balfour, Leighton's *Lichen-Flora*, p. 102–3.—*P. rufescens* Hoffm. On the sandy shore by the mouth of the Rosa burn.—*P. horizontalis* Hoffm. "Arran," Prof. Balfour; Corrie, and among mosses on rocks, Monamore Glen, *West*; on sand-dunes at Blackwater Foot.

Sphærophorus coralloides Pers. "Arran," Prof. Balfour; on peaty soil, near Brodick; Monamore Glen, *West.*

Ramalina farinacea Ach., *c. frt.* On bark, common.—*R. scopulorum* Ach. "Arran," Prof Balfour; on quartz-porphyry, at sea-level, Bennan Head.—*R. cuspidata* Nyl., *c. frt.* On sandstone, Corriegills shore; very fine on quartz-porphyry at Drumadoon Point.

Usnea florida var. *hirta* Hoffm. Common on bark. — *U. ceratina* Ach. On alder, near Lamlash, *West*; on the bark of trees, Brodick.

Cetraria aculeata Fr. On the sandy shore, Invercloy; probably common.

Platysma glaucum Nyl. Common on bark and on rocks.

Evernia prunastri Ach. On bark, common.

Parmelia perlata Ach. On the bark of sycamores, Lamlash, and also near Corrie, *West*; on bark, Brodick.—*P. ciliata* Nyl. Among mosses, Corrie, *West.*—*P. cetrarioides* Nyl. On sycamore bark, Lamlash, *West.*—*P. saxatilis* Ach. Common on bark and on rocks.—*P. sulcata* Tayl. Lamlash, *West.*—*P. omphalodes* Ach. Common, on granite and pitchstone.—*P. Borreri* Turn. On bark, near Brodick and Lamlash, *West.*—*P. caperata* Ach. On maritime rocks, King's Caves.—*P. sinuosa* Ach. Brodick Castle, Sir W. J. Hooker, Leighton's *Lichen-Flora.* — *P. olivacea* Ach. Corrie, sparingly in fruit, and also at Lamlash, *West.*—*P. exasperata* Nyl. On alder, Corrie, *West.*—*P. fuliginosa* Nyl. Common both on bark and rocks (noted on granite and pitchstone).—*P. physodes* Ach. Common on bark, especially on birches.

Xanthoria parietina Th. Fr., *c. frt.* Common on the shore-rocks; noted on sandstone and quartz-porphyry.

Physcia pulverulenta Nyl. var. *subvenusta* Nyl., *c. frt.* On the bark of ash, Lamlash, *West.*—*P. pityrea* Nyl. f. *flavescens.* On ash, Benlister Glen, *West.*—*P. aquila* Nyl., *c. frt.* Abundantly, on sandstone rocks, Corriegills shore; also on quartz-porphyry, Bennan Head.—*P. stellaris* Nyl. var. *leptalea* Nyl. Common on sandstone rocks, Corriegills. — *P. tenella* Nyl., *c. frt.* Common, along with the next preceding, on sandstone rocks, just above high-water mark.—*P. cæsia* Nyl. On bark, Lamlash, *West.*

Placodium tegularis Nyl., *c. frt.* Frequent on the coastal

rocks, occurring on sandstone, Corriegills, and on basaltic dykes on the shore at Kildonan. — *P. lobulatum* Hepp., *c. frt.* On quartz-porphyry, Bennan Head.

Callopisma vitellinum Sydow. On bark, near Corrie, *West.*— *C. citrinum* Koerb., *c. frt.* On sandstone rocks, King's Caves.— *C. ferrugineum* Mudd, var. *festivum* Nyl. On sandstone rocks on the shore, Tormore, and at Corriegills; on quartz-porphyry, Bennan Head.

Lecanora irrubata Nyl., *c. frt.* On limestone, Corrie. — *L. subfusca* Nyl., var. *campestris* Nyl., *c. frt.* Common on sandstone, Corriegills shore. — *L. allophana* Nyl., *c. frt.* On ash, Lamlash; also at Corrie, and near Brodick, *West*; on birch bark, North Sannox Glen. — *L. Parisiensis* Nyl., *c. frt.* On alder, Lamlash, *West.*—*L. rugosa* Nyl., *c. frt.* On hawthorn, Lamlash, and on hazel, Corrie, *West*; on stumps by the shore, Brodick.— *L. chlarona* Nyl. Common on the bark of trees. The f. *minor* Oliv., on mountain ash, Corrie, *West.*—*L. Hageni* Ach., *c. frt.* On the bark of a young sycamore, Lamlash, *West.*—*L. sulphurea* Ach., *c. frt.* On a gritstone boulder, Corriegills shore; probably common. — *L. expallens* Ach., *c. frt.* On larch, Lamlash, *West.* The var. *lutescens* Nyl., near Brodick, and var. *smaragdocarpa* Nyl., Lamlash, *West.* — *L. atra* Ach., *c. frt.* Very common on sandstone rocks, Corriegills; occurs also on quartz-porphyry, Bennan Head, and on basaltic dykes, Kildonan.—*L. badia* Ach. On granite, Goat Fell, *West*; on quartz-porphyry, Drumadoon.— *L. picea* Nyl. On indurated sandstone, Corrie, *West.*—*L. tartarea* Ach. On bark, Corrie, *West.* — *L. parella* Ach., *c. frt.* Very common on maritime rocks, and almost always there associated with *L. atra*; on the bark of an alder, Monamore Glen, *West.* A specimen collected by Mr. West, on bark, at Corrie, may be the f. *porinoides* Crombie (spores 4–9 μ).—*L. pallescens* Nyl., *c. frt.* On ash, Lamlash, *West.*

Rinodina exigua Gray, *c. frt.* On a basaltic dyke on the shore at Kildonan.

Acarospora squamulosa Th. Fr. On indurated sandstone, Tormore.

Pertusaria globulifera Nyl. On mossy bark, Corrie, *West.*— *P. amara* Nyl. Common on bark. — *P. communis* DC., *c. frt.* Very common on bark, and noted on oak, hazel, and mountain ash. — *P. leioplaca* Schaer., *c. frt.* On ash, Monamore Glen; on sycamore, Lamlash; on hazel, Corrie, *West.* The var. *octospora* Nyl. On ash, Corrie, *West.* We have not previously seen this form recorded for Britain.

Gyrophora torrefacta Cromb. Near Brodick, *West.* Recorded for Arran in Crombie's Monograph.—*G. polyphylla* Turn. & Borr. On granite rocks, Goat Fell, alt. 1300 ft., *West.*

Bæomyces rufus DC., *c. frt.* Near Brodick, *West.*

Cladonia pyxidata Fr. Very common.—*C. fimbriata* Fr., var. *tubæformis* Fr., *c. frt.* On decaying wood, near Brodick, *West.* — *C. cervicornis* Schaer. "Arran," Prof. Balfour; on peaty earth, Goat Fell, *West.*—*C. furcata* Hoffm. "Arran," Prof.

Balfour; among mosses on the sandy shore near Brodick Castle. —Vars. *corymbosa* Nyl. and *spinosa* Hook, Corrie, *West.*—*C. Lamarkii* Nyl. (*C. pityrea* var. *Lamarkii* DC.). On ash, near Lamlash, *West.*—*C. squamosa* Hoffm. On peaty earth, Corrie, and near Brodick.—*C. cæspititia* Floerke. On bark, near Lamlash, *West.* — *C. coccifera* Schaer. *c. frt.* Common, on peaty soil, Goat Fell; Corrie; Glen Rosa, &c. — *C. digitata* Hoffm., *c. frt.* "Arran," Prof. Balfour; on peaty ground, Corrie, and between Glen Sannox and Loch Ranza.—*C. macilenta* Hoffm. On mossy tree-trunks and peaty banks, common; the f. *clavata* Fr., on a wall near Brodick, *West.*—*C. bellidiflora* Floerke. "Arran," Prof. Balfour.

Cladina uncialis Nyl. "Arran," Prof. Balfour.

Cœnogonium ebeneum A. L. Sm. On shady, vertical rock-faces of Old Red Sandstone, Corrie, *West.*

Lecidea coarctata Nyl. var. *elacista* Cromb. On sandstone, Brodick.—*L. granulosa* Schaer., *c. frt.* On peaty earth, Goat Fell, and also near Brodick, *West.*—*L. parasema* Ach., *c. frt.* Very common on bark; f. *tabescens* Stitz. and var. *elæochroma* Ach. On ash, Lamlash; var. *limitata* Ach. On sycamore, Corrie and Lamlash, *West.* — *L. latypea* Ach., *c. frt.* On sandstone, near King's Caves. — *L. contigua* Fr., *c. frt.* Common on sandstone rocks, and occurs also on granite.—*L. lactea* Floerke *ex* Schaer. On rock, Brodick, *West.*—*L. rivulosa* Ach., *c. frt.* On indurated sandstone, Corriegills, and also on quartz-porphyry, Drumadoon Point. — *L. nigroclavata* Nyl., *c. frt.* On indurated shale, near Drumadoon Point, associated with *Verrucaria nigrescens* and *V. maculiformis.*

Biatorina lenticularis Koerb., *c. frt.* Sandstone rocks, Corriegills shore. "Must be, I think, *B. lenticularis* Koerb., judging from the very capitate paraphyses. Spores imperfectly developed, but one seen seemed septate, and measured 8 × 2 μ." Miss A. L. Smith, in Rept. Lichen Exchange Club. 1911.—*B. erysiboides* Th. Fr., *c. frt.* On bark, Corrie, *West.*

Bacidia Bechausii Koerb., *c. frt.* On bark, Lamlash, *West.* —*B. incompta* Anzi, *c. frt.* On ash, Monamore Glen and Lamlash, *West.*

Buellia myriocarpa Mudd, *c. fr.* On bark, Corrie, *West.*

Rhizocarpon geographicum DC. Common on granite, and also noted on quartz-porphyry, at Drumadoon Point.—*R. petræum* Mass., *c. frt.* Along with the var. *excentricum* A. L. Sm. On indurated sandstone, near Drumadoon Point. The variety was also gathered on quartz-diorite, on the String Road.

Arthonia gregaria Koerb. var. *astroidea*, Mudd, *c. frt.* On the bark of hazels, Corrie; also along with *Graphis scripta* and *Lecanora subfusca*, in Monamore Glen, *West.* In the latter gathering the f. *cuspidans* A. L. Sm. also occurred.—*A. radiata* Ach., *c. frt.* On sycamore bark, Lamlash, *West.* var. *Swartziana* Sydow. On ash and oak, Lamlash and Monamore Glen, *West.*— *A. punctiformis* Ach., *c. frt.* On alder bark, Monamore Glen; on hawthorn, associated with *Opegrapha herpetica*, *Arthopyrenia epidermidis* and *Lecanora rugosa*, Lamlash, *West.*

Opegrapha herpetica Ach., *c. frt.* On hazel, near Corrie; on sycamore, Lamlash, and on ash, Monamore Glen, *West.*—*O. atra* Pers., *c. frt.* On sycamore, Lamlash, and on hazel, near Corrie, *West* (in the latter gathering the f. *parallela* Leight. and also the var. *arthonoidea* Leight. passing into the ordinary form); var. *denigrata* Schaer., on sycamore, Lamlash.—*O. betulina* Sm., *c. frt.* On sycamores, Lamlash, *West.*—*O. varia* Pers., *c. frt.* On hazels, Corrie, *West.*—*O. vulgata* Ach., *c. frt.* On the bark of sycamores, Lamlash, *West.*

Graphis scripta Ach., *c. frt.* Monamore Glen, and on hazel, Corrie, *West*; var. *serpentina* Nyl., on ash, Monamore Glen, *West.*

Verrucaria maura Wahl., *c. frt.* Common on sandstone rocks at tide-level, Corriegills, and near Drumadoon Point.—*V. nigrescens* Pers., *c. frt.* On a basaltic dyke on the shore, Kildonan, associated with *Lecanora atra*, *L. parella*, *Placodium tegularis*, and *Rinodina exigua*; on quartz-porphyry, Drumadoon Point, and also on indurated shale near the same locality.—*V. maculiformis* Krempelh., *c. frt.* Near Drumadoon Point, associated with the next preceding species.—*V. rupestris* Schrad., *c. frt.* On limestone rocks, in an old quarry at Corrie.

Acrocordia gemmata Koerb., *c. frt.* On hazel, Corrie, and along with *Opegrapha betulina*, on sycamore, Lamlash, *West.*—*A. biformis* Oliv., *c. frt.* On hazel, Corrie, *West.*

Arthopyrenia epidermidis Mudd, *c. frt.* Corrie, and on hawthorn, Lamlash, *West.*—*A. fallax* Arn., *c. frt.* On hazel, Corrie, *West.*

Leptoraphis epidermidis Th Fr., *c. frt.* On hazel, Corrie, *West.*

Pyrenula nitida Ach., *c. frt.* On ash, near Corrie, *West.*

Mycoporellum obscurum A. L. Sm. On hazel, Corrie, *West.*

NEPETA GLECHOMA VAR. PARVIFLORA BENTH.

By Eleonora Armitage.

I came across a fine patch of this plant on the downs above Merrow, in Surrey, at an elevation of about 350 ft., during the latter part of May this year. Ground Ivy in its typical form is exceedingly abundant on all the extensive down-land hereabouts; many thousands of plants were then in full flower, but only in one spot did I encounter this exceedingly peculiar and conspicuous variety.

Paradoxical as it may seem, this pallid micranthous form, which one might imagine was so unnoticeable as to be passed over altogether, seemed to stand out from the herbage and arrest one's attention. A circle with a diameter of about three yards presented an appearance of soft greyish green mixed with pale lavender on a background of short green herbage. It was this peculiar *facies* which marked it out at once from the dark-leafed, purple-blue type plant which was growing in its close neighbourhood, and of which some specimens were taken at the same time for purposes of comparison, as it was in size and growth the usual down-land form of this somewhat variable plant.