NOTES ON DUTCH LICHENS

by

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In Madroño (1936) Herre has lamented the disappearance of lichen species through the disastrous interference of man. Unavoidably, the advance of civilised modern life is linked with destruction of the vegetation. This applies all the more as the endangered area is more densely populated and it certainly applies most alarmingly to the lichen flora of the Netherlands. Here, every way-side tree felled is an irreparable loss to the epiphytic lichen communities, every acre of heath burnt or turned into arable land is a blow to our stock of terrestrial lichen species, whereas the use of dry fertilisers and the spraying of orchards are very effective in killing any lichen in the neighbourhood that otherwise might have survived. A comparison of the material preserved in the older collections with what can be found nowadays, clearly shows what has gone lost. It is sad to think that an ever increasing number of species are on their way to total extermination.

However, from a thorough investigation of the epiphytic communities of cryptogams latterly started by Mr J. J. Barkman, it becomes apparent that at least to some extent the losses may be compensated by the discovery of species hitherto overlooked or not recognised. It is on such and other finds that I intend to report from time to time.

It may seem an inconsistency that in the present paper the species have not been treated alike, some being quoted with more or less complete descriptions, others without any. The reason is that my lack of proficiency in crustaceous groups makes it desirable as yet to add the most distinctive characters, so as to render my identifications controllable by the reader. Obviously, for the information required, some species need a more detailed description than others.

With regard to the abbreviation of the herbaria, I may refer to my paper on *Parmeliaceae* (Maas Geesteranus, 1947).

I am very much indebted to the directors of the herbaria at Groningen and Utrecht for the loan of their material.

My best thanks are due to Dr O. Almborn, Lund, and to Dr A. H. Magnusson, Göteborg, for their kind help in critical cases.

ACAROSPORA Mass.

A. fuscata (Nyl.) Arn. — New to the flora.

Drente: Loon, 10 V 1941, *Maas G. 1121a*, on granite boulder of cairn, exposed (det. Magnusson) (L).

ARTHONIA Ach.

A. punctiformis Ach. — Thallus endophloeodal. Disc black, epruinose, up to 0.6 mm across. Hypothecium pallid. Spores colourless, vestigiiform (footprint-shaped), 4-celled, 13.8—17.7 × 4.9—7 μ.

Not previously recorded.

Friesland: Piaam, 18 VIII 1951, *Barkman 3107*, smooth bark of *Fraxinus excels.* (L).

Utrecht: Linschoten, Linschoterbos, 24 IV 1953, *Maas G. 9307*, smooth bark of *Juglans regia* (L).

Noord-Holland: Bergen, 't Hof, 23 IX 1943, *Barkman 642*, on *Fagus silv.* in wood (L); Texel, Oudeschild, 30 VIII 1951, *Barkman 3364*, smooth bark of *Fraxinus excels.* (L).

ARTHOPYRENIA Mass.

A. biformis (Borr.) Mass. — Thallus corticolous, greyish white. Perithecia black, up to 0.3 mm across. Excipulum black, carbonaceous, somewhat incompletely developed at the base. Asci cylindrical-clavate, 8-spored, (73)79—97(114) × 10—12 μ. Spores obliquely 1-seriate, frequently 2-seriate towards the top of the ascus, colourless, ellipsoidal, straight or somewhat fabiform, 2-celled, not or little constricted at the septum, cells not equally large, (10.8)12.8—16(16.8) × 4.9—6.5 μ. Paraphyses branched, anastomosing.

Von Keissler (1937. 172) in enumerating the differences of the present species from closely allied *A. sphaeroides*, points out that among others it should be possible to distinguish *A. biformis* from that species by the "an den Enden verschmälerten, spitzlich auslaufenden Sporen" and by "die Grünfärbung des Lagers wie des Hypotheciums durch Kalilauge". It should be noted, however, that spores with rounded ends are equally common, as could be checked in some of the exsiccata quoted by Von Keissler. As to the colour reaction with K, this may be so faint as to be hardly perceptible.

Abeleven (1898. 95) recorded the species as *Acrocordia polycarpa* Flk. from Amerongen only, whereas a good many finds appear to have been erroneously listed as *Microthelia micula* (l. c. 57), although most of them had been correctly identified as *Verrucaria biformis* by Van den Bosch (1853. 164). Other finds remained unobserved in a mixtum of various species, or were mistaken for other species. Altogether, *Arthopyrenia biformis* seems to have been of fairly common occurrence in former days, favourably contrasting with the single find of recent times.

Friesland: Veenwouden—Zwaag-Westeinde. 12 XII 1869. *Sprée*, on *Salix* (NBV).

Groningen: Groningen, no date, *Acker Stratingh*, on *Fraxinus* (Gro); no date, *Van Hall* (NBV); Haren, no date, *Acker Stratingh*, on *Salix* (Gro).

Overijsel: Dalfsen, 16 X 1951, *Barkman 4135*, on *Juglans* in orchard (det. Almborn) (L); Kampen, no date, *Bondam*, on *Fraxinus* (NBV); IJselmuiden, no date, *Bondam*, on *Salix* (L).

Utrecht: Amerongen, 8 VI 1862, *Sprée*, on *Castanea* (L, NBV); near Utrecht, no date, *Van der Sande Lacoste*, on *Salix* (NBV); Utrecht, 1841, 1842, *Van der Sande Lacoste*, on *Salix* (NBV); Zuilen, 1841, *Van der Sande Lacoste*, on *Fraxinus* (L).

Noord-Holland: Amsterdam, XI 1848, 1849, *Van der Sande Lacoste*, on *Ulmus* (NBV); Amsterdam, Verwerspad, IV 1849, *Van der Sande Lacoste*, on *Tilia* (NBV).

Zuid-Holland: Leiden, no date, *Van den Bosch*, on *Quercus* (L); Rijnsburg, no date, *De Haan* (NBV); Wassenaar, 31 VII 1922, *Ten Kate* (L).

Zeeland: Zuid Beveland: locality not specified, no date, *Van den Bosch*, on *Ulmus* (NBV); Goes, no date, *Van den Bosch*, on *Salix* (Gro), on *Ulmus* (NBV); Kloetinge, 1843, *Van den Bosch*, on *Salix* (NBV); Zwake, 1841, *Van den Bosch*, on *Pirus malus* (NBV); VIII 1841, *Van den Bosch*, on *Populus* (NBV).

Noord-Brabant: Breda, 1841, *Van der Sande Lacoste*, on *Salix* (NBV); Cromvoirt, 3 XII 1904, *Wakker*, on *Fraxinus* (L); Engelen, Engelense Veer, 5 XII 1906, *Wakker*, on *Salix* (L).

ARTHOTHELIUM Mass.

A. dispersum (DC.) Mudd — Thallus greyish white. Apothecia up to 1 mm across, with irregular radiations, disc black. Hymenium J + bluish. Spores colourless, muriform, ovoid-ellipsoidal, 20—24.6 × 9.9—10.8 μ.

New to the flora.

Noord-Brabant: Cuik, Coebax, 2 VI 1907, *Wakker*, on *Quercus* (L).

A. ruanideum (Nyl.) Arn. — Thallus olivaceous. Apothecia 0.2—1 mm, with black, irregularly lobate disc. Hymenium J + vinaceous. Spores colourless, muriform, ovoid-ellipsoidal, 17.7—19.7 × 6.9—8.8 μ.

New to the flora.

Overijsel: Delden, Twickel, 18 X 1951, *Barkman 3368*, on *Fraxinus* in wood (L).

BACIDIA (De Not.) A. Zahlbr.

B. acerina (Nyl.) Arn. — Apothecia black-brown, somewhat constricted at the base. Epithecium fuscous, K + vinaceous. Hymenium colourless, 70—90 μ, J + blue. Hypothecium pallid. Spores colourless, acicular, 14—16-celled, 55—67 × 1.5—3.9 μ.

Vainio (1922. 147) in his monographic treatment of the Finnish lichens differentiates *B. acerina* (= *subacerina*) from *B. arceutina* by the way the apothecium is attached to the thallus. It is "bene constricta" at the base in the former, broadly adnate in the latter. As for this character, our specimen might be referred to *B. arceutina*, but the broader and more-celled spores make it probable that the present collection rather belongs to *B. acerina*.

New to the flora.

Friesland: Veenklooster, 14 VIII 1951, *Barkman 3359*, on *Fagus* (L).

B. arceutina (Ach.) Arn. — Apothecia fuscous, broadly adnate. Epithecium olive-brown in one collection, fuscous in the other, K —. Hymenium colourless, 60—70(—75?) μ, J + blue. Hypothecium pallid to dingy yellowish. Spores colourless, acicular, immature and obscurely septate in one collection, 7—8-celled in the other, straight to somewhat flexuous, 41.4—59.1 × 1.5—2 μ.

B. acerina (= *subacerina*), "*subacerina* subsp. *laurocerasi*" and *arceutina* as described in Vainio's Lichenographia (1922) form a group of closely related species whose delimitation does not seem established at all.

In both our collections, the specimens have the negative reaction of the epithecium upon K in common which, in connection with the broadly adnate apothecia, would point to subsp. *laurocerasi*. On the other hand, it is significant that the spores are narrower than in that subspecies, the width of the spores in *laurocerasi* being given as 2.5—4.5 μ. It depends, of course, on which character one is inclined to give preponderance whether the present specimens are to be regarded as *laurocerasi* or *arceutina*. Dr Magnusson, whom I sent our material for revision, is in favour of *B. arceutina*, but admits the choice to be difficult.

Another discrepancy lies in the paraphyses which Vainio in both species and subspecies mentioned describes as simple, whereas I found them sparingly but distinctly furcate towards the apex.

New to the flora.

Zuid-Holland: Rozenburg: De Beer, 12 IV 1952, *Barkman 2923*, on *Sambucus nigra* in the dunes (L); Voorne: Oostvoorne, Mildenburg, 2 V 1953, *Barkman 4151b*, on *Ulmus* in wood (L).

The following collection seems even more intermediate between *arceutina* and *laurocerasi* on account of its spores being slightly broader (up to 2.5 μ) than usual for the former.

Zuid-Holland: Voorne: Rockanje, Brede Water, 3 V 1953, *Maas G. 9338*, on *Salix repens* in the dunes (L).

B. laurocerasi (Del.) A. Zahlbr. — Apothecia fuscous, broadly adnate. Epithecium yellowish brown-to fuscous, K —. Hymenium colourless, ± 75 μ, J + blue. Hypothecium pallid. Spores colourless, fusiform-acicular, with one end more attenuate than the other, immature, hardly septate (once seen to be 6-celled), 47.3—53.2 × 2.9—3.9 μ.

The specimens seem to belong to the present species on account of their broad spores, although I failed to observe that, as Vainio (1922. 176) has it, "paraphysibus apice crassioribus et hypothecio magis colorato a *B. subacerina* differt".

For the time being *laurocerasi* is used as a specific epithet, although Vainio is probably right in writing "non est autonoma species". It is no use, however, to venture a new combination as long as the whole group is so much in need of a revision.

New to the flora.

Zuid-Holland: Voorne: Rockanje, Windgat, 3 V 1953, *Maas G. 9331*, on *Salix* sp. in coppice (L).

B. muscorum (Sw.) Mudd — Apothecia black-brown to black. Epithecium dark blue-green to blackish green. Hymenium colourless below, gradually taking on the epithecial colour further upward, 55—60 μ, J + blue, turning vinaceous. Hypothecium rufous-fuscous. Parathecium dingy vinous red-brown. Spores colourless, acicular, 4—9-celled, straight or somewhat curved or flexuous, 31.5—45.3 × 1.5—3 μ.

Under the synonym of *Raphiospora viridescens* Mass. Abeleven (1898. 44) recorded the species from 2 localities in the dunal region, viz. near Bloemendaal and near Overveen. It appears that from the former locality there are 2 collections, one of which actually is this species, whereas the other is *Bacidia lignaria* (Ach.) Lettau. *Bacidia muscorum* seems to be rare in this country, although it may have been overlooked.

Noord-Holland: Bloemendaal, no date, *Buse & Gildemeester-Buse*, on mosses and sand (NBV); Overveen, no date, *Van Hall*, overgrowing mosses on sand (NBV).

Zuid-Holland: Voorne: Oostvoorne, 2 V 1953, *Maas G. 9344*, overgrowing mosses and vegetable debris on sand in the dunes (L).

Noord-Brabant: 's Hertogenbosch-Meerwijk, 21 V 1905, *Wakker*, no date, on fragment of brick among tiny mosses (L).

Limburg: St. Pietersberg, south of Maastricht, 24 V 1950, *Westhoff*, overgrowing mosses (L).

B. naegelii (Hepp) A. Zahlbr. — Thallus greyish, verruculose, esorediate. Apothecia fuscous or partly also ochraceous yellow-brown variegated, broadly adnate. Hypothecium pallid. Spores colourless, fusiform-ellipsoidal, 2—4-celled, occasionally also 6-celled, somewhat curved, 17.7—23.5 × 5.5—6 μ. Paraphyses closely coherent, not gelatinised.

New to the flora.

Zuid-Holland: Wassenaar, 11 V 1952, *Barkman 2963*, on *Populus* sp. in the dunes (L).

Noord-Brabant: Esch, 5 I 1906, *Wakker*, on deciduous tree (L); 's Hertogenbosch, fort Isabel, 10 XII 1904, *Wakker*, on *Ulmus* (L).

B. subincompta (Nyl.) Arn. — Apothecia black. Epithecium blue-green to blackish green. Hymenium colourless in the lower part, ± 50 μ, J + blue, turning vinaceous. Hypothecium dingy red-brown. Spores cylindrical to acicular, 4—6-celled, straight or somewhat curved, 19.7—27.6 × ± 2 μ.

New to the flora.

Gelderland: Elspeet, Vierhouter bos, 25 IV 1951, *Barkman 3406*, on *Fagus* in wood (L).

B. trisepta (Naeg.) A. Zahlbr. — Thallus grey-green, verrucose to granular. Apothecia dark fuscous to black, hemispherical, broadly adnate. Epithecium blue-green to blackish green or dark fuscous or discoloured in places, K—. Hymenium colourless or aeruginose, 73—83 μ, J + blue or at first pale vinaceous, then blue. Hypothecium pallid to pale fuscous. Asci clavate or somewhat saccate, 8-spored, 50—80 × 12—20 μ. Spores colourless, ellipsoidal—fusiform, 4-celled, with the apices obtuse or acute, 15.8—25 (31) × 5—7 μ. Paraphyses conglutinate, simple or furcate, septate, with somewhat incrassate apices.

Abeleven (1898. 41) reported the find of *Bilimbia miliaria β saxicola* Kbr., collected by Van Hall near Rheden. This name stands as a synonym for *Bacidia trisepta* f. *saxicola*, but examination shows the specimen to be poorly developed. No spores could be found and for the time being I regard the determination as dubious.

New to the flora.

Noord-Holland: Schoorl, 1 V 1954, *Barkman 4449*, on the ground and overgrowing mosses in heath of *Calluna* and *Empetrum* (L).

Limburg: south of Maastricht, immediate proximity of the Belgian village Canne, 21 V 1950, *Maas G. 7092*, overgrowing mosses on calcareous rock (det. Magnusson) (L).

BUELLIA De Not.

B. griseovirens (Turn. & Borr.) Almb. — Thallus grey or bluish grey, often bordered with a black prothalline fringe. Soralia maculiform, greenish, frequently confluent. All specimens examined are sterile.

New to the flora.

Groningen: Groningen, along road to Leeuwarden, 20 IX 1950, *Barkman 3457*, on *Ulmus* (det. Almborn) (L).

Friesland: Hardegarijp, 14 VIII 1951, *Barkman 3187* on *Quercus* (det. Almborn) (L); Wolvega, 6 VIII 1951, *Barkman 3198b* on *Quercus* (confirmed Almborn) (L).

Zuid-Holland: Voorne: Oostvoorne, 2 V 1953, *Maas G. 9347*, on *Populus* in the dunes (L).

Zeeland: Walcheren: Oostkapelle, "Westhove", 21 IV 1951, *Walrecht* on *Populus* in the dunes (L).

B. pharcidia (Ach.) Malme — Thallus grey, cortex K —, medulla J —. Apothecia up to 0.7 mm across, with black disc. Epithecium and hypothecium dark brown. Hymenium colourless, J + persistently blue. Spores at first colourless, turning blackish green or brown with maturity, fabiform (distinctly curved) or in inequilaterally ellipsoidal (not actually curved, but with one side plane and the other convex), permanently parallel 4-celled, or becoming somewhat muriform as a longitudinal wall develops in one or both of the central cells, 14.7—19.5 × 7.9—9.9 μ. Only once a spore was found with 4 transverse and 2 longitudinal septa. Paraphyses hardly conglutinate, septate, furcate upwards, with inflated apical cells.

Dr Magnusson whom I had sent our material under the name of *B. alboatra* drew my attention to a note by Malme (1927) on 2 *Buellia* species at that time little known in Sweden, one of them being *B. pharcidia*. This species used to be confused with *B. alboatra*, from which Malme showed it to differ in the generally somewhat larger apothecia, the stronger development of the parathecium, and more especially in the entirely different spores. Malme omitted to describe the spores of *B. alboatra*, but, fortunately, indicated Massalongo, Lich. Ital. exs. 289 as a good example of that species. Examination of our specimens of this exsiccatum reveals the spores to be of about the same size as in *B. pharcidia*, but ellipsoidal and straight instead. At first they are parallel 4-celled, but towards maturity the development of a longitudinal wall (sometimes even 2 septa) in 3 or all cells almost completely obscures the regularity of the original cells.

The size of the apothecia seems a character of minor importance, probably being somewhat dependent on individual development. The largest apothecia of *B. pharcidia* as measured first in a specimen collected by Malme (Gottland, Ljugarn, 1918) and given to me by Dr Magnusson for comparison, secondly in Magnusson, Lich. sel. scand. exs. 364, and subsequently in our material, range from 0.9 mm and 0.8 mm to 0.7 mm respectively, which comes close to 0.5 mm in *B. alboatra* of Massalongo no. 289.

As to the parathecium, I failed to find it any better developed in *pharcidia* than in *alboatra*.

New to the flora.

Noord-Holland: Texel: Den Burg, 2 IX 1951, *Barkman 3318*, on *Ulmus* (det. Magnusson) (L).

CANDELARIELLA Müll. Arg.

C. xanthostigma (Pers.) Lettau — This species, as understood by Swedish lichenologists, would differ from *C. vitellina* in the thallus consisting of "extremely small, usually 0.06—0.08(0.1) mm, globular granules

which as a rule are somewhat scattered, but may unite more or less into a crust" (translated from Magnusson, 1935. 123), whereas *vitellina* has "the granules c. 0.2 mm diam., forming a continuous crust" (Almborn, 1952. 244).

However, I think this too simplified an image of how matters appear to me, as our material shows intermediate stages which seem to obscure the differences between both species.

Barkman 3117b, identified by Almborn as *C. xanthostigma*, has a thallus made up of scattered granules which for the greater part are minute and globular, but a few are somewhat flattened and slightly lobate, measuring up to 384 × 266 μ.

In a collection from Walcheren all granules are globular and minute but so closely packed as to form a crust, only divided into areolae by numerous cracks. The thallus is even thicker than that of a specimen from Sweden (Skåne, Båstad, 1932, leg. Magnusson 13764a) of which the collector stated "thallus unusually thick!" Yet, the granules are decidedly unlike those of *C. vitellina*, not being flattish and incised-lobate.

Maas G. 3149b is different again in that towards the centre the originally minute, smooth, clear-cut and scattered granules turn into a dense mass of coalescent, verrucose knobs. The specimen looks equally different from both *xanthostigma* and *vitellina*, although Dr Magnusson, whom I had sent it, thought it might be the latter species.

The above may serve to show that it is probably better again to consider *xanthostigma* a variety of *vitellina*, but of course that will not lessen our trouble in distinguishing both taxa.

Not previously recorded.

Friesland: Vlieland: Oost Vlieland, 1 IV 1948, *Maas G. 9396*, on tree in village (L).

Noord-Holland: Oostwoud—Hauwert, 8 IV 1945, *Maas G. 3149b*, on *Ulmus* along road (L).

Zeeland: Walcheren, Middelburg—Nieuw en St. Joosland, 13 III 1942, *C. Brakman*, on *Populus* along road (L).

Noord-Brabant: Hintham, 3 VII 1904, *Wakker*, on *Populus*, c. apoth. (L); Lage Zwaluwe, 3 VII 1951, *Barkman 3117b*, on *Ulmus* (det. Almborn) (L).

CATILLARIA (Ach.) Th. Fr.

C. graniformis (Hag.) Vain. — It is no easy matter to distinguish the present species from the next in the pycnidial stage. In such cases Vainio's key (1934) is of no use, being based on apothecial characters, whereas Almborn in his key to the sterile, corticolous, crustaceous lichens (1952) leaves out *C. griffithii*. As may be gathered from Vainio's descriptions, the sterigmata (= fulcra sensu Steiner) should be simple in *graniformis*, sparingly branched in *griffithii*, whereas the pycnoconidia are said to be 2—3 × 1 μ in the former, 3—3.5 (or 4—5) × 1.5 μ in the latter. Examining our material of *graniformis*, identified by Almborn, I find the fulcra furcate at the base, and the pycnoconidia measuring 4.5—5 × 1.8 μ. Examination of what we possess of the exsiccata of *graniformis* quoted by Vainio (Arnold, Lich. Mon. exs. 179; Hepp, Flecht. Europ. 228, 497; Kryptog. exs. Vindob. 1231; Rabenhorst, Lich. Europ. exs. 94; Stenhammar, Lich. Suec. exs. 134) equally shows the fulcra to be furcate near the

base, whereas the conidia are 3.6—4.5 × 1.3—1.8 μ. The length of the pycnoconidia in our exsiccata of *C. griffithii* (Arnold, Lich. exs. 216; Elenkin, Lich. Fl. Ross. 140; Hepp, Flecht. Europ. 738; Körber, Lich. sel. Germ. 278; Stenhammar, Lich. Suec. exs. 169) partly overlaps that of *graniformis*, measuring 4—6 μ.

Vainio describes the pycnidia (= conidangia) of *graniformis* as "conglomerata, in glomerulo partim partibus superioribus sejunctis ... partim laceratis" which in fact they seem to be in several of the exsiccata examined. In my opinion, however, these are no conglomerations, but single pycnidia which during their development have bulged in various directions, the process ending up by some of the bulges opening with a separate ostiolum. Young and simple pycnidia can also be found.

No description is given of the pycnidia of *griffithii*, as they were presumably unknown to Vainio. It appears that our exsiccata of *C. griffithii* usually have small, immersed, hard to find pycnidia, but larger ones (as in Arnold, Lich. exs. 216) with protruding upper parts and bulging lower parts do occur.

The above may have made it clear that I do not feel completely satisfied as to the correctness of the determination of both *C. graniformis* and *griffithii* when sterile.

New to the flora.

Noord-Holland: Naarden, Naardermeer, Kooi, 27 IV 1954, *Barkman 4404*, on *Salix*, c. apoth. (L).

Zuid-Holland: Krimpen aan de Lek, 16 VII 1951, *Barkman 3110*, on *Salix* (det. Almborn) (L).

Zeeland: Schouwen, Westenschouwen, 19 IX 1951, *Barkman 2841*, on *Fraxinus*, c. apoth., identity uncertain (det. Magnusson) (L).

C. griffithii (Sm.) Malme — See discussion under the preceding species. New to the flora.

Friesland: Cornjum, 12 VIII 1951, *Barkman 3189*, c. apoth., on *Acer pseudoplatanus* (L); Tietjerk, 14 VIII 1951, *Barkman 3113b*, on *Fraxinus* (L); Vlieland: Oude Kooi, 31 III 1948, *Maas G. 3992*, on *Alnus* (L).

Overijsel: Dalfsen, 16 X 1951, *Barkman 4136*, on *Juglans* (det. Almborn) (L).

Utrecht: Leersum, 26 X 1940, *Maas G. 73a*, on *Salix* (L).

Noord-Holland: Bergen, Egmonderweg, 12 V 1954, *Maas G. 9668, 9670*, c. apoth., on *Quercus, Ulmus* (L); Bergen, Franschman, 12 V 1954, *Maas G. 9660*, c. apoth., on *Ulmus* (L); Bergen, Verbrande Pan, 12 V 1954, *Maas G. 9695*, c. apoth., on *Betula* (L); Hoorn, 8 IX 1951, *Barkman 3334b*, on *Ulmus* (L); Texel: De Kooy, 1 IX 1951, *Barkman 3342, 3415*, c. apoth. on *Salix* (L); Oude Schild, 30 VIII 1951, *Barkman 3344*, c. apoth., on *Fraxinus*; *3460*, on *Fraxinus* (det. Almborn) (L).

Zuid-Holland: De Zilk, 26 V 1947, *Maas G. 3707*, c. apoth., on *Ulmus* (L); Hazerswoude, 9 IV 1948, *Maas G. 4080*, on *Salix* (L); Voorne: Oostvoorne, 2 V 1953, *Maas G. 9350*, c. apoth., on *Populus* (L).

C. prasina (Fr.) Th. Fr. — Thallus fairly thick, greyish green to olive-green, granular-verrucose. Apothecia at first whitish or pallid flesh-colour, becoming darker with age, sometimes (sickly state?) blackish-livid. Epithecium greenish-brownish, K + pale reddish violet or pale purplish brown, this colour soon diffusing into the hymenium underneath. Hymenium colourless, 40—60 μ, J (very dilute solution) + blue, turning dingy red-brown. Hypothecium colourless or pallid, no gonidia underneath. Asci cylindrical-clavate, 8-spored, 35—50 × 10 μ. Spores colourless, 1—2-celled,

9—10.7 × 3.6—4.5 μ. Paraphyses flexuous, sparingly branched, reticulately anastomosing.

With regard to the positive reaction of the epithecium upon K, I may refer to the remark under *C. sordidescens*.

It seems worthwile to draw the attention to the striking resemblance of the sterile thalli of *C. prasina* and *Lecidea uliginosa*. Both may consist of minute, granular, sometimes isidia-like excrescences which may be simple, torulose or budding into various directions. I have to admit that I failed to find any clear-cut morphological differences. *L. uliginosa* has not been treated in Almborn's key (1952), but in this country it does occur on the weathered, much cracked bark at the base of old birches.

New to the flora.

Drente: Dwingelo, Lhee, Lheederzand, 18 VIII 1954, *Maas G. 10042*, c. apoth., among bryophytes and *Microphiale diluta* on *Quercus* in dense wood (L); *Maas G. 10098*, c. apoth., among bryophytes on fallen stick of *Picea* in wood (L).

Gelderland: Druten, Horssen, 19 VI 1951, *Barkman 3116*, sterile, on old *Populus* in wood (det. Almborn) (L).

Noord-Holland: Naarden, Naardermeer, Kooi, 27 IV 1954, *Barkman 4414*, c. apoth., on *Ulmus* in moist wood (L).

C. prasina (Fr.) Th. Fr. f. **laeta** Th. Fr. — Differing from f. *prasina* described above in that the apothecia remain pale, being pale livid grey or greenish pallid or darkish leaden blue-grey with or without pallid margin. Epithecium olivaceous, K— or in places + faintly reddish violet. Hymenium colourless, 55—60 μ, J (very dilute solution) + blue, turning (sometimes dingy) red-brown. Hypothecium colourless. Spores colourless, ellipsoidal, 1—2-celled, (9)12—13(15) × 3.5—4.5 μ.

Dr Magnusson wrote as follows about the material: "... after Th. Fr., Lich. Scand., it is C. prasina f. laeta, but there is a too rich development of algae ... Determined after Vainio where the group is divided into several, badly delimited species it does not agree with his prasina that ought to be KOH —, but it agrees still less with his sordidescens. I know this bluish pale form in a normal state from the excursions here about, but do not remember that I have found such a form with a surplus of algae." However, see remarks under *C. sordidescens*.

New to the flora.

Gelderland: Dieren, Hagenau, 20 IV 1951, *Maas G. 7689*, among mosses, *Trentepohlia aurea* and *Microphiale diluta* f. *leucostigma* on *Fagus* in wood (det. Magnusson) (L).

C. sordidescens (Nyl.) Vain. — Thallus fairly thick, grey-green to glaucous green, granular-verruculose. Apothecia livid brown-black, convex. Epithecium greenish brown, K + purplish brown to fuscous-violaceous. Hymenium colourless, 55—65 μ, J (very dilute solution) + dark violet-blue. Hypothecium pallid, yellowish, with no gonidia underneath. Asci cylindrical-clavate, 8-spored, 43—61 × 14 μ. Spores colourless, ellipsoidal-ovoid, 2-celled, 10—11.8 × 3.9 μ. Paraphyses sparse, extremely thin, flexuous, sparingly branched, anastomosing.

The present collection is in perfect agreement with Arnold, Lich exs. 280c and Hepp, Flecht. Europ. 278, both of which are cited by Vainio (1934. 464).

Macroscopically the thallus resembles that of our specimens of *C. pra-*

sina f. *laeta*, but the apothecia are differently coloured. Microscopically the apothecia differ from that form in that the epithecium reacts more strongly to K, whereas the hymenium instead of turning red-brown after a while remains dark ink-blue.

In connection with the hesitance expressed by Magnusson concerning *C. prasina* f. *laeta*, it is interesting to read Vainio's Observatio 1 (1934. 467) in which it is stated that once in a while *C. prasina* may have somewhat darker apothecia of which the epithecium does stain violaceous with K.

Possibly, the iodine reaction of the hymenium provides a more reliable method by which to distinguish *sordidescens* from dark forms of *prasina*. The material we possess of *C. prasina* f. *laeta* (Lich. Suec., Västerg., Floby, Hasslebergen, Sept. 1915, leg. Vrang) certainly strengthens this assumption.

New to the flora.

Noord-Brabant: 's Hertogenbosch, Helvoirtse weg, 17 III 1906, *Wakker*, on *Quercus* (L).

CHAENOTHECA Th. Fr.

Ch. chrysocephala (Ach.) Th. Fr. f. **melanocephala** (Nyl.) A. L. Sm. — Thallus yellowish green, granular, partly sorediose. Apothecia with entirely black stipe and capitulum.

Abeleven (1898. 51) recorded the species as *Cyphelium chrysocephalum* Turn. from a single locality, near Groningen, where it had been collected both by Van Hall and Miquel. The lack of the yellow-green pruina in the upper part of the fruit stalk and on the excipulum shows the specimens to belong to f. *melanocephala*.

Groningen: Groningen, no date, *Van Hall, Miquel* (NBV).

Zuid-Holland: Warmond, Huis te Warmond, 27 V 1953, *Barkman 4147*, on old *Aesculus* near pond in wood (L).

Ch. melanophaea (Ach.) Zw. — Thallus grey or greenish grey, often suffused with yellow, verrucose-granular. Fruit stalk black. Disc originally fuscous. Macaedium often lighter brown.

Not previously recorded.

Friesland: Gaasterland, Rijs, Rijster bos, 19 VIII 1951, *Barkman 3443*, on *Quercus* (L); St. Nicolaasga, Huis ter Heide, 10 VIII 1951, *Barkman 3444*, on *Pinus* (L).

Drente: Diever, Berkenheuvel, 25 XII 1953, *Beyerinck*, on *Pinus* (Beyerinck); Oosterhesselen, De Klenke, 14 X 1951, *Barkman 3448*, on *Quercus* (L); Westerbork, 14 X 1951, *Barkman 3451*, on *Pinus*, edge of wood (L).

Overijsel: Denekamp, De Borge, 17 X 1951, *Barkman 3447*, on *Quercus*, edge of wood (L); Zwolle-Wijhe, Windesheim, 11 X 1951, *Barkman 3452* on *Quercus*, edge of wood (L).

Gelderland: Beekhuizen, 19 IV 1951, *Maas G. 7668*, on old *Fagus*, edge of wood (L); Ede, Edese bos, 10 VIII 1953, *Maas G. 9444*, on *Quercus* in wood (L); Hoog Keppel, 24 VII 1951, *Barkman 3455*, on *Quercus* (L); Leuvenum, Leuvenumse bos, 27 IV 1951, *Barkman 3456*, on *Quercus* in wood (L); Wolfheze, Wodanseiken, 18 IV 1951, *Maas G. 7655*, on very old *Quercus* in wood, *7656*, on *Pinus* in wood (L).

Utrecht: Leersum, 27 X 1940, *Maas G. 91a, 97* on *Pinus*, edge of wood (L); Rhenen, Achterberg, 3 VIII 1862, *Sprée*, on *Quercus* (NBV).

Noord-Holland: Naarden, Naardermeer, Kooi, 27 IV 1954, *Barkman 4416*, on *Quercus* (L).

Zuid-Holland: 's Gravenhage, Haagse bos, IV 1850, *Van der Sande Lacoste* (NBV).

Noord-Brabant: Nederhemert, 5 VII 1951, *Barkman 3453*, on *Juglans* at edge of marsh (L).

CLADONIA (Hill.) Vain.

Cl. caespiticia (Pers.) Flk. — New to the flora.
Noord-Brabant: Helvoirt, 15 III 1903, *Wakker* (L).

Cl. cornuta (L.) Schaer. — Abeleven (1891.5) reported the species from Marum (Groningen), collected in 1829 on a thatched roof by Van Hall, but on re-examination the specimens appear to belong to *Cladonia coniocraea*.

In the herbarium there are a few old collections under the name of *Cl. cornuta*, but these are referable to various other species.

New to the flora.

Drente: Diever, Berkenheuvel, 11 XII 1953, *Beijerinck* (Beijerinck, L); Dwingelo, 31 VII 1941, *Maas G. 1404a*, among low *Calluna* (L); Zuidwolde, 11 VIII 1920, *Ten Kate* (L).

Cl. cornuta (L.) Schaer. f. **phyllotoca** (Flk.) Vain. — New to the flora.
Groningen: Haren, Witte Veen, no date, *Acker Stratingh* (Gro).
Zeeland: Zuid-Beveland: vicinity of Kloetinge, 5 VI 1951, *Walrecht*, border of ditch (L).

Cl. nemoxyna (Ach.) Coem. — Podetia Pd + yellowish.

Contrary to Sandstede (1938. 78—79) who assumed a slight content of fumarprotocetraric acid which would account for the positive Pd-reaction, Dahl (1950. 110) maintains that *nemoxyna* is devoid of this acid, but has 2 others instead.

New to the flora.

Gelderland: Putten-Garderen, 2 III 1950, *Maas G. 6838*, in heath, among poor *Calluna* and *Cl. cornutoradiata* (L).

Cl. pyxidata (L.) Fr. var. **grayi** Merrill — Podetia scyphiferous, sparingly granular-sorediose, decorticate on the outside of the cups, coarsely granular on the inside. Cups with many marginal proliferations which are tipped with crowded apothecia. Pd —.

On account of the strong podetial squamules, the specimens are referable to what Sandstede called f. *squamulosa*.

I have not seen the original description, but as may be inferred from Dahl (1950. 105), *grayi* was described as a variety and subsequently raised to specific rank by Sandstede.

As pointed out by Asahina (1940. 717) and Evans (1944. 597; 1952. 300) *grayi* may or may not have fumarprotocetraric acid which accounts for a positive or negative Pd-reaction. In view of the former possibility it is probable, therefore, that more specimens of *grayi* will eventually be found in our collections of *Cl. pyxidata* var. *chlorophaea*, since the only difference between *chlorophaea* and *grayi* thusfar seems to lie in the content of grayani(ni)c acid of the latter. Our *chlorophaea* has not been tested microchemically.

Although various authors assert *grayi* to differ from *chlorophaea* in chemical respect only, I found the way the soredia are borne on the podetia somewhat unusual for *chlorophaea*, but that may have been an exceptional case.

New to the flora.

Drente: Terhorst, 11 VIII 1953, *Damman* (Damman, L).

Cl. rangiferina (L.) Web. — Various records under this name have been published in the past which are supported by well over one hundred collections in the Rijksherbarium and in the herbarium of the Botanical Society. None of these, however, is the true *rangiferina*. As yet, I know the species from one locality only, and I have reason to regard *Cl. rangiferina* as extremely rare.

New to the flora.

Gelderland: Hierden, Hulshorst, 26 XI 1947, *Maas G. 3883*; 25 II 1951, *Maas G. 7626*, among other *Cladinae* and bryophytes in cultivated wood of *Pinus sylvestris* (L).

Cl. scabriuscula (Del.) Sandst. — Not previously recorded.

Friesland: Terschelling: Koegelwieck, VIII 1940, *Westhoff*, in Corynephoretum (U); Vlieland: Kroonpolders, 31 III 1948, *Maas G. 3997, 3998*, among bryophytes on sand (L).

Drente: Lheebroek, Lheebroekerzand, 4 X 1944, *Wasscher*, among *Erica* in heath (L).

Zuid-Holland: Berkenwoude, Wellepoort-polder, 18 VI 1947, *Maas G. 3724*, among *Molinia caerulea* in peatmoor (L).

Zeeland: Walcheren: Oostkapelle, Westhove, 30 VI 1951, *Walrecht*, among *Polytrichum* (L); Oostkapelle-Vrouwenpolder, 25 V 1946, *C. Brakman*, edge of ditch (L); Vrouwenpolder, Overduin, 21 XII 1943, 21 I 1944, *C. Brakman*, among mosses (L); Zuid-Beveland: vicinity of Kloetinge, 5 VI 1951, *Walrecht*, edge of ditch (L).

Cl. strepsilis (Ach.) Vain. — Primary thallus, especially the white underside, Pd + tardily and permanently chrome-yellow. Apothecia uncommon.

Not previously recorded.

Drente: Dwingelo, Davidsplas, 26 VI 1941, *Meeuse*, among *Erica tetralix* (L); Zuidwolde, XII 1920, *Ten Kate* (det. Sandstede, Ten Kate) (L); Zuidwolde, Oosterveld, 23 IV 1919, *Ten Kate* (det. Ten Kate) (L).

Overijsel: Lattrop, Lattropse Veld, 10 VI 1948, *Maas G. 4166*, among low *Calluna vulgaris* (L); Weerselo, Everlo, 7 VIII 1951, *Van Ooststroom 15511*, among *Drosera* and *Sphagnum*, c. apoth. (L).

Gelderland: Kootwijk, IV 1948, *Schimmel & Van Leeuwen* (L); Putten-Garderen, Sprielder bos, 2 II 1950, *Maas G. 6844*, among scattered pines, *Calluna*, *Aira flexuosa*, *Cl. papillaria*, c. apoth. (L); Stroe, Stroese Zand, 12 III 1948, *Schimmel & Van Leeuwen*, in Corynephoretum cladonietosum (L).

Utrecht: Bilthoven, 2 IV 1919, *Ten Kate* (det. Sandstede) (L).

Noord-Brabant: Oisterwijk, Kampina, 24 VII 1943, *Maas G. 2633a*, among *Erica*, *Drosera*, *Narthecium*, few *Calluna* (L).

Cl. zopfii Vain. — This species has not previously been recorded, although it was collected also in earlier days, but it has almost invariably been mistaken for *Cl. uncialis*.

Drente: vicinity of Langelo, 6 II 1944, *Hoogland* (L); Zuidwolde, 15 VIII 1922, *Ten Kate* (L); Zuidwolde, Oosterveld, 24 VII 1919, *Ten Kate* (L).

Overijsel: Lattrop, Lattropse Veld, 10 VI 1948, *Maas G. 4154* in peat-moor, among *Erica*, *Myrica*, *Leucobryum* (L); Lemele, Lemeler berg, 27 VII 1941, *Maas G. 1320* among low *Calluna* (L); Vaasse-Ootmarsum, Paardenslenk, 28 IV 1946, *Stafleu* (U).

Gelderland: Hatert, 19th century, *Abeleven* (NBV); Hierden, Hulshorst, 23 VII 1934, *Kruyt* (L); Kootwijk, 7 IV 1948, *Schimmel & Van Leeuwen*, among *Corynephorus* (L); Nijkerk, 19th century, *Bondam* (NBV); Nijmegen, Berg en Dal, XI 1873, *Van Hall* (NBV).

Utrecht: Den Dolder, 2 IX 1931, *Van Ooststroom 4630, 4631* (L); Maarn, Henschoter meer, 6 X 1948, *Westhoff*, on bare sand (L).

Noord-Brabant: Oisterwijk, Heikant, 24 VII 1943, *Maas G. 2655*, dry *Calluna* heath (L); Oisterwijk, Kampina, 24 VII 1943, *Maas G. 2629a*, low moist *Erica* heath (L).

EVERNIA Ach.

E. prunastri (L.) Ach. var. **herinii** (Duv.) Maas G. **comb. nov.** — *Evernia herinii* Duv. Bull. Soc. Roy. Bot. Belg. ser. 2, **22**: 153. 1940 — In morphological respect Duvigneaud's "species" is essentially identical with *E. prunastri*. The difference is purely chemical, as *herinii* lacks usninic acid and is stated to possess an unknown substance which would account for the grey colour of the upper side of the thallus (Duvigneaud, l. c.).

As to the taxonomic rank to be assigned to *herinii*, the following should be remembered. A lichen consists of an algal and a fungal component, and the latter should play the dominant role where taxonomical classification is concerned. As long as there is no proof of the fungus in *herinii* being specifically different from that in *prunastri*, it seems best to treat the former as a variety whose physiology is different from that of the latter.

New to the flora.

Zuid-Holland: Beijerland; Numansdorp-Strijen, near Schuring, 21 VII 1951, *Barkman 3081*, among *Ramalinae* and *Evernia prunastri* on *Ulmus* along road (L).

Zeeland: Schouwen: Haamstede, 7 VI 1952, *Walrecht*, on *Acer* sp. (L); Zeeuws Vlaanderen: St. Jansteen, 25 VIII 1951, 30 X 1951, *Walrecht*, on *Quercus* (L); Zuid-Beveland: Wolphaartsdijk-Wilhelminadorp, 15 III 1952, *Walrecht*, on *Ulmus* (L).

Noord-Brabant: Ulvenhout, Valkenberg, 11 IV 1952, *Walrecht*, on *Quercus* (L).

GYALECTA (Ach.) A. Zahlbr.

G. truncigena (Ach.) Hepp — Thallus hardly perceptible. Apothecia numerous, immersed to sessile, with thick, pallid margin and pale incarnate disc. Asci cylindrical, 6—8-spored, with thin, hardly visible (± 1.5 μ, gelatinising?) wall, J + blue, turning pale violet or vinaceous, 73—100 × 12—16 μ. Spores (transversely to) obliquely 1—2-seriate, colourless, ellipsoidal to sublimoniform or subfusiform, sometimes one end tapering into a short or fairly long tail, straight or somewhat curved, tardily becoming muriform through the formation of 4—7 transverse walls and 1—4 longitudinal walls, the latter frequently oblique, 16.7—25.6 × 7.9—9.9 μ. Paraphyses free, imbedded in copious "gelatina hymenialis", thick, straight, septate, usually simple, sometimes furcate above, colourless, but towards the base inspersed with orange-yellow droplets, with hardly incrassate or capitate-clavate tip.

The species varies a great deal, also in the sporal characters. In the specimen collected near Utrecht, 1837, the spores are predominantly parallel-celled with (4—)5—7 transverse septa, those with a longitudinal wall in one of the cells being very scarce. This makes the specimen resemble *G. croatica*, but it differs from that species in the somewhat longer paraphyses (85—100 μ, whereas they are 65—90 μ in *croatica*), the tail-like appendage in a number of the spores, and the occasional occurrence of a longitudinal septum. In connection with these characters I may refer to Lettau (1937. 195).

Abeleven (1898. 36) listed *Secoliga abstrusa*, which is a synonym of *Gyalecta truncigena*, from Schierstins near Veenwouden in the province of Friesland, collected on apple-trees by Sprée, 1 XII 1869. This appears to be an error, the specimens being referable to *Bacidia luteola*.

Utrecht: vicinity of Utrecht, IX 1837, *Wttewaal*, together with *Bacidia luteola* and *Arthopyrenia gemmata*, (inserted under the latter, remaining unobserved) in fissures of bark of *Ulmus* (NBV).

Zeeland: Schouwen: vicinity of Schuddebeurs, 21 IX 1951, *Barkman 4198*, in fissures of bark of *Ulmus* (L); Voorne: Oostvoorne, Middelburg, 2 V 1953, *Barkman 4148*, in fissures of bark of *Ulmus* (L).

HAEMATOMMA Mass.

H. coccineum (Dicks.) Körb. — New to the flora.

Zeeland: Zuid-Beveland: Kloetinge, 12 XI 1943, *Maas G. 2941*, on *Fraxinus*, edge of orchard (det. Almborn) (L).

H. coccineum (Dicks.) Körb. var. **porphyrium** (Pers.) Th. Fr. — New to the flora.

Groningen: Warffum, Breedenburg, 24 IX 1950, *Barkman 3459*, on *Ulmus*, sheltered (det. Almborn) (L).

LECANIA Mass.

L. cyrtella (Ach.) Th. Fr. — Thallus greyish green, verruculose to granular. Apothecia numerous to crowded, plane, then convex, with the disc incarnate to fuscous, thalline margin finally disappearing. Epithecium almost colourless to brown. Hymenium colourless, J + persistently blue, or turning vinaceous to dark violet (40)60—70 μ. Hypothecium colourless to yellowish, J + persistently blue, with gonidia underneath. Asci cylindrical-clavate, with thickened apical wall, 8-spored, 40—50 × 10—14 μ. Spores colourless, 2-celled, ellipsoidal to subfusiform, straight, (8.9)10—13.8(15.8) × 3—5(5.7) μ. Paraphyses colourless, conglutinate, septate, brown and densely branched upwards, with the cells constricted at the septa.

I failed to observe any 16-spored asci. On account of the straight spores I regard the collections mentioned below as referable to the present species.

The only record thusfar of the species, as *Biatorina cyrtella*, dates as far back as 1855 (Abeleven, 1898).

Noord-Holland: Texel: De Cocksdorp, 2 IX 1951, *Barkman 3436*, on *Ulmus* (L); De Muy, 10 V 1942, *Stafleu*, on *Sambucus nigra* (U).

Zuid-Holland: Voorne: Oostvoorne, vicinity Groene Strand. 2 V 1953. *Maas G. 9366*, on *Populus* (L).

Zeeland: Zuid-Beveland: near Goes, 1855, *Van den Bosch*, on *Ulmus* (NBV).

Noord-Brabant: Lage Zwaluwe, 3 VII 1951, *Barkman 3379a*, on *Salix* in willow coppice (L).

L. dimera (Nyl.) Th. Fr. — Differs from the previous species in having fabiform spores.

New to the flora.

Zuid-Holland: Overflakkee: Melissant, 16 IV 1952, *Barkman 2888*, base of *Ulmus* (L).

Noord-Brabant: 's Hertogenbosch, fort, 28 I 1905, *Wakker*, on *Alnus* (L); 's-Hertogenbosch-Vlijmen, 5 XI 1904, *Wakker*, on *Salix*, identity uncertain (L); Rosmalen, Steenenkamer, 12 XI 1904, *Wakker*, on *Populus* (L).

LECIDEA (Ach.) A. Zahlbr.

L. olivacea (Hoffm.) Mass. var. **soralifera** Erichs. — Not previously recorded.

Zuid-Holland: Oud Ade, 21 VIII 1943, *Maas G. 2749b*, on *Ulmus* along road (det. Magnusson) (L).

MICROPHIALE (Stizenb.) A. Zahlbr.

M. diluta (Pers.) A. Zahlbr. — Thallus greenish grey, somewhat verruculose. Apothecia 0.1—0.2 mm across, entirely pale incarnate to pallid, with thick entire margin. Disc concolorous, turning brownish grey with age. Asci cylindrical, 8-spored, 60—70 × 6 μ, J + (pale blue, quickly turning) pale vinaceous, finally pinkish orange to orange-brown. Spores obliquely 1-seriate, colourless, fusiform, 2-celled, straight, 8.9—14.8 × 3.9—4.5 μ. Paraphyses colourless, free or somewhat coherent at the apex, filiform, simple, septate, with spathulate or somewhat clavate, sometimes torulose apex, 98—108 × 1.5—4 μ.

I usually failed to observe that, as stated by Lettau, the asci should first stain blue with iodine.

New to the flora.

Friesland: Tietjerk, 14 VIII 1951, *Barkman 3424*, on *Fraxinus* in decoy (L).
Drente: Dwingelo, Lhee, Lheederzand, 18 VIII 1954, *Maas G. 10043*, among bryophytes and *Catillaria prasina* on *Quercus* (L).
Noord-Holland: Bergen-Egmond, 12 V 1954, *Maas G. 9666*, on *Quercus* (L).

M. diluta (Pers.) A. Zahlbr. f. **leucostigma** (Leight.) A. Zahlbr. — Differing from f. *diluta* described above in having whitish apothecia.

Magnusson in a letter suggested that this form would represent a sickly state, adding that he had never seen it before. Lettau (1937. 212) in his treatise of the *Gyalectaceae* is rather evasive as to the nature of this form.

New to the flora.

Gelderland: Dieren, Hagenau, 20 IV 1951, *Maas G. 7690*, among bryophytes, *Trentepohlia aurea*, *Catillaria prasina* f. *laeta* on *Fagus* in wood (det. Magnusson) (L).
Noord-Holland: Bergen, Verbrande Pan, 12 V 1954, *Maas G. 9696*, on *Betula* in the dunes (L); Naarden, Naardermeer, Diemonts bos, 27 IV 1954, *Barkman 4406*, on *Alnus* in moist wood (L).

OCHROLECHIA Mass.

O. subviridis (Höeg) Erichs. — Thallus greyish, nearly smooth to verruculose, not rimose, either isidiate, isidia turning into soredia, or sorediate, margin white, not zonate. Cortex and medulla KC + orange-red.

Not previously recorded.

Gelderland: Elspeet, 24 IV 1951, *Barkman 3205*, on *Fagus* (confirmed Almborn) (L); Hoog Keppel, 24 VII 1951, *Barkman 3175* (det. Almborn) (L).

OPEGRAPHA Humb.

Although in this country the number of species of the present genus is limited, *Opegrapha* is an important component in epiphytic associations. When working up the material, it was found desirable also to revise the older collections which with few exceptions proved incorrectly identified. *O. atra* appeared correctly named in a number of cases, and is not being treated here for that reason. All species mentioned are corticolous and belong to the section *Euopegrapha* Müll. Arg. with the excipulum closed at the base.

O. betulina Sm. — Disc narrow at first, becoming dilated in the centre with age. Asci cylindrical-clavate, (45)51—55(70) × (12)14—18

(20) μ. Spores vestigiiform (footprint-shaped), 4-celled, (15.8)17.7—23.6 × (3.9)4.9—7.9 μ.

Not previously recorded.

Friesland: Jelsum, 12 VIII 1951, *Barkman 3425*, on *Ulmus* (L); Veenklooster, 14 VIII 1951, *Barkman 3427a*, on *Fagus* (L); Veenwouden—Zwaag-Westeinde, 12 II 1869, *Sprée*, on *Salix* (NBV).

Groningen: Groningen, IV 1853, *Van Hall* (?) (Gro); Haren, IV 1831, *Van Hall*, on *Salix* (NBV); Zuidhorn, Arnichem, 19 III 1908, *Van Giffen*, on *Acer pseudoplat.* (Gro.).

Overijsel: Kampen, no date, Bondam (L, NBV); no date, Bondam, on *Quercus* ((NBV); no date, *Top* (L); Kampen, Zandberg, no date, *Top* (L); IJsselmuiden, no date, *Bondam*, on *Salix* (L).

Utrecht: Nigtevecht, 6 V 1934, *Nannenga 533*, on *Salix* (U); Polanen, Wulverhorst, 2 V 1952, *Barkman 2951*, on *Ulmus* (L); Utrecht, no date, *Van der Sande Lacoste* (NBV); no date, *Van der Sande Lacoste*, on *Salix* (NBV); 1841, *Van der Sande Lacoste*, on *Quercus* (L); 1841, *Van der Sande Lacoste*, on *Tilia* (NBV); Vreeland, IV 1873, *Oudemans*, on *Salix* (Gro); Zuilen, 1841, *Van der Sande Lacoste*, on *Fraxinus* (NBV); Zuilen-Maarssen, IV 1870, *Beinz*, on *Populus* (L).

Noord-Holland: Amsterdam, Kalfjeslaan, XII 1848, *Van der Sande Lacoste*, on *Salix* (NBV); Bergen-Egmond, 't Woud, 22 IX 1943, *Barkman 643*, on *Ulmus* (L); Hoorn, 8 IX 1951, *Barkman 3381b*, on *Ulmus* (L); Naardermeer, Eendekooi, 16 III 1952, *Reijnders*, on *Salix* (L).

Zuid-Holland: Krimpen a. d. Lek, 16 VII 1951, *Barkman 3397*, on *Salix* (L); Lisse, Keukenhof, 30 V 1924, *Ten Kate*, on *Ulmus* (L); Vianen-Lexmond, 20 IV 1952, *Barkman 2917*, on *Salix* (L); Voorne: Oostvoorne, Mildenburg, 2 V 1953, *Barkman 4152*, on *Ulmus* (L); Rockanje, Windgat, 3 V 1953, *Maas G. 9384*, on *Salix* (L).

Zeeland: Schouwen: Schuddebeurs, 21 IX 1951, *Barkman 3429a*, on *Ulmus* (L); Zuid-Beveland: locality not specified, no date, *Van den Bosch*, on *Populus* (NBV); 1844, *Van den Bosch*, on *Salix* (L); Zwake, 1841, *Van den Bosch* (L).

O. cinerea Chev. — Disc usually slit-like, but not infrequently also widening, sometimes broad and plane. Asci cylindrical-clavate, (40)50—60(70) × 10—14 μ. Spores elongate-fusiform, 5—7-celled, straight or somewhat curved, (19.6)23.6—27.6(32) × 3—4 μ. Pycnoconidia falcate, tapering towards the ends (9.8)11.8—15.8(18.7) × 1—1.5 μ.

Redinger (1938. 360) describes the thallus as "dünnhäutig ... geglättet bis glatt" which is rarely the case in our material. Thin, smooth thalli do occur, but they become thicker and areolate as they grow, and to me it seems that the more exposed the habitat, the sooner it applies. In Redinger's description the disc is said to be permanently narrow and slit-like, but as stated above, widened or even broad and plane discs are by no means exceptional in this country.

A most unusual collection which with some hesitation is referred to the present species is *Barkman 3411*, from Nes, island of Ameland. The main features are as follows. Thallus grey, thick, areolate. Lirellae elongate, with acute ends, usually curved, often furcate. Disc black, broad, plane. Excipulum incompletely closed at the base, although by no means lacking as in subgen. *Pleurothecium*. Asci up to 78 μ long. Spores 6—7-celled, but in the same ascus also 8—9-celled, (23.6)25.6—29.6(35.5) × 3.9 μ. Pycnoconidia falcate, 11.8—16.7(19.7) × ± 1 μ, little or not tapering towards the ends. Some of the characters seem to agree with those of *Opegrapha danica* as described by Erichsen (1942. 140), but our specimens differ from that species in the mainly epiphloeodal thallus, the apothecia being frequently furcate, the hymenium colouring red-brown with J, and the somewhat

broader, sometimes more-celled spores which have the ends not acuminate.

For the rest, a closer investigation of the *cinerea-danica*-group may very well reveal that the latter lies within the limits of variability of the former. A collection like *Barkman 3376,* from Speulde, which has the thallus mainly hypophloeodal and the spores longer than in typical *cinerea,* but the pycnoconidia tapering towards the ends as in that species, suggests such an infra-specific relationship.

The present species was enumerated by Abeleven (1898. 47) under the synonym of *Opegrapha atra β vulgata* Kbr., but some collections are mixtures of various other species.

Friesland: Ameland: Nes, 7 IX 1951, *Barkman 3411,* on *Ulmus,* deviating collection (L); Paesens, 15 VIII 1951, *Barkman 3428,* on *Ulmus* (L); Sneek, 17 VIII 1951, *Barkman 3410,* on *Ulmus* (L); Tietjerk, 14 VIII 1951, *Barkman 3423,* on *Tilia* (L); Veenwouden—Zwaag-Westeinde, 12 XII 1869, *Sprée,* on *Salix* (NBV).

Groningen: Groningen, no date, *Van Hall,* on *Crataegus* (NBV); Uitwierda near Delfzijl, 25 IX 1950, *Barkman 3421,* on *Tilia* (L); Warffum, 23 IX 1950, *Barkman 3418,* on *Pirus malus* (L).

Overijsel: near Kampen, V 1889, *Top* (L); IJselmuiden, no date, *Bondam,* on *Salix,* identity uncertain, pycnides only (L).

Gelderland: Beekhuizen, no date, *Van den Bosch,* identity uncertain, pycnides only (NBV); Beesd, 7 VII 1951, *Barkman 3387,* on *Ulmus* (L); Drie, 29 IV 1951, *Barkman 3377,* on *Fagus* (L); Garderen, 29 IV 1951, *Barkman 3419,* on *Fagus* (L); Randwijk, 19 IV 1951, *Maas G. 7660,* on *Salix* (L); Speulde, Speulder bos, 30 IV 1951, *Barkman 3376,* on *Fagus,* approaching *O. danica* Erichs. (L).

Utrecht: Vreeland, II 1873, *Oudemans,* on *Salix* (Gro).

Noord-Holland: Amsterdam, Zaagpad, I 1849, *Van der Sande Lacoste,* on *Tilia* (L); Amsterdam-Amstelveen, III 1849, *Van der Sande Lacoste,* on *Ulmus* and *Salix* (L); Bergen, 20 IX 1943, *Barkman 622,* on *Ulmus* (L); Bergen, Breelaan, 30 IV 1954, *Reijnders,* on *Ulmus* (Reijnders); Bergen-Egmond, Wimmenum, 12 V 1954, *Maas G. 9688,* on *Ulmus* (L).

Zuid-Holland: De Zilk, 26 V 1947, *Maas G. 3712, 8492,* on *Ulmus* (L); Goeree, dunal area, 15 IV 1952, *Barkman 2897a,* on *Ulmus* (L); Vianen-Lexmond, 20 IV 1952, *Barkman 2917,* on *Salix* (L); Voorne: Oostvoorne, 20 VII 1951, *Barkman 3432b,* on *Quercus* (L); Oostvoorne, Mildenburg, 2 V 1953, *Barkman 4152, Maas G. 9374,* on *Ulmus* (L).

Zeeland: Zuid-Beveland: Goes, no date, *Van den Bosch,* on *Pirus malus* (NBV); Goes, 12 XI 1943, *Maas G. 2949,* on *Ulmus* (L); Kloetinge, 1843, *Van den Bosch* (NBV).

Noord-Brabant: Best-Liempde, 11 X 1908, *Wakker,* on *Carpinus* (L); Engelen, Engelse Veer, 14 IV 1908, *Wakker,* on *Salix* (L); Helvoirt, 16 XI 1904, *Wakker,* on *Salix* (L); 's-Hertogenbosch, 13 V 1903, *Wakker,* on *Quercus* (L); St. Michielsgestel, Horzikse dijk, 11 VIII 1903, *Wakker,* on *Juglans* (L); Nuland, Wolfsdijk, 25 II 1906, *Wakker,* on *Fagus* (L); Vucht, 31 III, 7 XI 1904, *Wakker,* on *Salix* (L).

O. devulgata Nyl. — Disc slit-like. Asci cylindrical-clavate, 50—75 × 12 μ. Spores elongate-fusiform, 6—7-celled, straight or somewhat curved, 22.7—27.6 × 3—4 μ. Pycnoconidia falcate, 9.8—12.8 × 0.9—1(1.5) μ.

Not previously recorded.

Overijsel: Zwolle, V 1889, *Top* (L).
Zuid-Holland: Wassenaar, 6 III 1923, *Ten Kate,* on *Populus* (L).
Zeeland: Walcheren: Oostkapelle, 24 IX 1951, *Barkman 3402,* on *Ulmus* (L).

O. diaphora (Ach.) Ach. — Disc slit-like to somewhat widened. Asci cylindrical-clavate, 45—55 × 14—16 μ. Spores turning brownish with age, vestigiiform, 6-celled, (17.7)18—25.6 × (4.9)6—8.9 μ. Pycnoconidia ellipsoidal, straight or somewhat curved, 4—5 × 1.5—2(2.5) μ.

Under the synonym of *Opegrapha varia* var. *diaphora* Abeleven (1898.

46) recorded some localities, but none of the specimens proved correctly determined.

Gelderland: Beekhuizen, 19 IV 1951, *Maas G. 7669, 7674,* on *Fagus* (L); Elspeet, Elspeter bos, 23 IV 1951, *Barkman 3433,* on *Fagus* (L); Speulde, Speulder bos, 30 IV 1951, *Barkman 3391,* on *Fagus* (L).

Utrecht: De Bilt, 1841, *Van der Sande Lacoste,* on *Fagus* (NBV); Zeist, 1841, *Van der Sande Lacoste,* on *Fagus* (NBV).

O. dubia Leight. — Thallus yellowish grey or grey with ochraceous patches. Disc slit-like, later on widening. Asci cylindrical-clavate, 50—70 (80) × 12—14 μ. Spores elongate-fusiform to acicular, 6—9(—12)-celled, straight or somewhat curved, (21.7)22.4—31.5(35.5) × 3—4 μ. Pycnoconidia cylindrical, somewhat curved to falcate, (3.6)4.5—5.8(6.9) × 0.9—1 μ.

Since our two recent collections differ from Redinger's description (1938. 387) regarding some important points, I asked for and was granted the loan of Leighton's material from Kew Herbarium. Of the specimens glued on the sheets I examined the type collection (July 4th 1866 on a Scotch fir by the side of the Bala turnpike road about three quarters of a mile from Dolgelley, North Wales) and Leighton, Lich. Brit. Exs. 312 which is on the bark of a deciduous tree, probably *Populus.* It appears that Redinger's description needs the following corrections and emendations: Thallus not always made up of "kleine ... Fleckchen", frequently covering larger patches of several square centimeters, thin and smooth or somewhat thicker and minutely cracked, especially in the centre. Apothecia usually simple, sometimes furcate. Excipulum decidedly not "am Grunde ... keilförmig verschmälert", but with broad and plane base. Epithecium not only "hellbräunlich", also reddish brown to fuscous, either smooth or crumbly. Spores frequently "(7—)8-zellig", but 9-celled ones do occur, whereas Leighton described them as 6—9-septate.

It is true that our material (*Barkman 598, 3412*) is not fully identical with Leighton's specimens, the main discrepancy being in the spores which may be up to 12-celled, but in view of the wide range of cells found to occur in the spores of other species (e. g. *O. viridis*), it seems reasonable to allow the present species some variability in this respect. As to the length of the spores, which in our specimens considerably exceeds that of the type material (Leichton: 0.29 mm; I found: 24.6—29.6 μ), I may refer to Redinger's measurements.

Not previously recorded.

Friesland: Boekhorst (there is more than one locality of this name; unknown which is meant), 2 XII 1860, *Sprée,* on bark of deciduous tree (NBV); Terschelling: Midsland, 4 IX 1951, *Barkman 3412,* on *Ulmus* (L).

Noord-Holland: Callantsoog, De Stolpen, 29 IX 1943, *Barkman 598,* on *Ulmus* (L).

O. fuscella (Fr.) Almb. (*O. hapaleoides* Nyl.) — Lirellae unknown in recent collections. Disc slit-like, very narrow. Asci cylindrical-clavate, 47—53 × 10—12 μ. Spores elongate-fusiform, 6—7-celled, 22.7—29.6 × 3—3.9 μ. Pycnidia numerous, globose, projecting above the level of the thallus, dark brown under a white mealy covering. Pycnoconidia straight, 4.5—5.4(6.3) × 0.9—1.3 μ.

The old herbarium contains a fair number of what was then known

as *Lecanactis abietina* (Abeleven, 1898. 45). On examining these collections it appears that some of them are actually referable to that species, others to *Opegrapha fuscella.*

Not previously recorded.

Friesland: Jelsum, 12 VIII 1951, *Barkman 3190,* on *Ulmus* (det. Almborn) (L); *Barkman 3425,* on *Ulmus* (L); Oenkerk, 13 VIII 1951, *Barkman 3186,* on *Ulmus* (det. Almborn) (L); *Barkman 3417,* on *Ulmus* (L); Veenklooster, 14 VIII 1951, *Barkman 3191,* on *Fagus* (det. Almborn) (L).

Groningen: Groningen, no date, *Van Hall,* on *Tilia,* c. apoth. (L); III 1855, *Acker Stratingh,* on *Quercus,* c. apoth. (Gro); Groningen, Heerepoort, IV 1853, *Van Hall* (?) (Gro); Groningen, Sterrebosch, no date, *Acker Stratingh,* on *Quercus,* c. apoth. (Gro); Haren, 18 III 1854, *Van Hall* (?), c. apoth. (Gro).

Overijsel: near Kampen, V 1889, *Top* (L).

Gelderland: Apeldoorn, Soerense bos, 19 VIII 1849, *Van der Sande Lacoste,* on *Quercus* (NBV); Uddel, Uddelermeer, 1849, bot. excurs., on *Quercus,* c. apoth. (NBV).

Utrecht: Vreeland, IV 1873, *Oudemans,* on *Salix* (Gro).

Noord-Holland: Osdorp, IX 1849, *Van der Sande Lacoste,* on *Salix,* c. apoth. (L, NBV); Texel: Den Burg-Oude Schild, 31 VIII 1951, *Barkman 3118,* on *Ulmus* (det. Almborn) (L).

Zuid-Holland: 's-Gravenhage, Haagse bos, IV 1850, *Van der Sande Lacoste,* c. apoth. (L).

Noord-Bragant: Breda, 1841, *Van der Sande Lacoste,* on *Salix* (NBV); Den Dungen, 19 XI 1922, *Wakker,* on *Salix* (L); Helvoirt, 25 V 1903, *Wakker,* on *Quercus,* c. apoth. (L); Vucht, 25 XI 1901, *Wakker,* on *Quercus,* c. apoth. (L); 1 II 1904, *Wakker,* on *Salix,* c. apoth. (L).

O. pulicaris (Hoffm.) Schrad. — Disc broadly dilated in the centre. Asci cylindrical-clavate, (45)55—70(75) × (12)14—18(20) μ. Spores vestigiiform to somewhat fusiform, 5—6-celled, (15.8)19.7—25.6(30.5) × (4.9)5.9—7.9(9.9) μ. Pycnoconidia straight to somewhat curved, (3)4—5(6) × ± 1 μ.

As to the shape of the lirellae, *O. pulicaris* may in some cases resemble *O. lichenoides,* a species I have not had yet the occasion to study in this country. If, as forwarded by Redinger (1938. 370—371, 375), the presence or absence of the excipular margin should be the only character by which to tell one species from the other, the difference is very slight indeed, since this character lacks constancy. The height of the epithecium might prove of better value. It is interesting to note that recently Faurel, Ozenda and Schotter (1953. 29) again stress the desirability of lumping both species.

Abeleven (1898. 46) recorded a single find by Van Hall from Groningen. This specimen turned out to be *Hysterium pulicare* Pers. ex Fr., whereas several collections of true *O. pulicaris* appeared preserved under various other names.

Friesland: Boekhorst (there is more than one locality of this name; unknown which is meant), 2 XII 1860, *Sprée,* on *Salix* (NBV); Paesens, 15 VIII 1951, *Barkman 3341,* on *Ulmus* (L); Veenklooster, 14 VIII 1951, *Barkman 3363, 3427* on *Fagus* (L); Veenwouden—Zwaag-Westeinde, 12 XII 1869, *Sprée,* on *Salix* (NBV); Vlieland: Westvlieland, 3 IX 1951, *Barkman 3382,* on *Populus* (L).

Groningen: Groningen, no date, *Van Hall* (L); Haren, Helpman, no date, *Acker Stratingh,* on *Ulmus* (Gro, NBV); 18 III 1854, *Acker Stratingh,* on *Quercus* (Gro, L); Ter Apel, klooster, 29 IX 1950, *Barkman 3422,* on *Fraxinus* (L).

Drente: Smilde, no date, *Van den Bosch* (NBV).

Gelderland: Beesd, 7 VII 1951, *Barkman 3387, 3388,* on *Ulmus* (L); Nijmegen, Uilenput, II 1872, *Van Hall,* on *Juglans* (L); Twello, no date, *Bondam* (NBV); Zutfen-Doesburg, 5 VIII 1951, *Barkman 3430,* on *Populus* (L).

Utrecht: Utrecht, IX 1837, *Wttewaal,* on *Salix* (NBV); 1841, *Van der Sande Lacoste* (NBV); 1841, *Van der Sande Lacoste,* on *Salix* (NBV); 1842, *Van der Sande*

Lacoste, on *Salix* (NBV); Vreeland, IV 1873, *Oudemans 954*, on *Salix* (Gro, L); Zuilen, 1841, *Van der Sande Lacoste* (NBV).

Noord-Holland: Amsterdam, 1849, *Van der Sande Lacoste* (NBV); Amsterdam-Amstelveen, 1849, *Van der Sande Lacoste*, on *Ulmus*, approaching *O. lichenoides* (NBV); Amsterdam, Weesperzijde, XI 1848, *Van der Sande Lacoste*, on *Ulmus* (NBV); Bergen, 20 IX 1943, *Barkman 601*, on *Ulmus* (L); Bergen, Breelaan, 30 IV 1954, *Reijnders*, on *Ulmus* (Reijnders); Bergen-Egmond, De Voert, 12 V 1954, *Maas G. 9673*, on *Ulmus* (L); Haarlem, Haarlemmerhout, no date, *Van Hall* (NBV); Vogelenzang, 1855, *Van den Bosch*, on *Quercus* (NBV).

Zuid-Holland: Lisse, Keukenhof, 23 III 1921, *Ten Kate*, on *Ulmus* (L).

Zeeland: Schouwen: Schuddebeurs, Heesterlust, 21 IX 1951, *Barkman 3394*, on *Ulmus* (L); Walcheren: Oostkapelle, 25 IX 1951, *Barkman 3401*, on *Ulmus* (L); Zuid-Beveland: locality not specified, III 1841, *Van den Bosch*, on *Salix* (NBV); IX 1842, *Van den Bosch*, on *Salix*, approaching *O. lichenoides* (NBV); Goes, 1843, *Van den Bosch*, on *Salix* (NBV); Kapelle, V 1839, *Van den Bosch*, on *Tilia* (NBV).

Noord-Brabant: Berlicum, 2 III 1902, *Wakker*, on *Salix* (L); Esch, 21 II 1912, *Wakker*, on *Salix* (L); Gestel, 15 XII 1901, *Wakker*, on *Quercus* (L); Hintham, IV 1901, *Wakker* (L).

O. rubescens Sandst. — Thallus greyish white, K + vinaceous around the lirellae. Disc black, slit-like. Hymenium colourless for $^2/_3$ of the total height, J + vinaceous red-brown, the upper part brown, J + blue-green, Asci cylindrical-clavate, 8-spored, 49.5—53 × 10—12 μ. Spores vestigiiform to fusiform, 4-celled, 14.8—15.8 × 3.9—5.5 μ. Pycnoconidia bacilliform, somewhat tapering towards one or both ends, straight or slightly curved, 15.8—18.7 × 1.5 μ.

The species seems variable as to the number of spores per ascus. Redinger (1938. 328) describes the asci as 4—6-spored.

New to the flora.

Gelderland: Beekhuizen, 19 IV 1951, *Maas G. 7675*, on *Fagus* at edge of wood near rivulet (L).

O. rufescens Pers. (*O. herpetica* (Ach.) Ach.) — Thallus yellowish brown to olive-brown. Disc slit-like. Asci cylindrical-clavate, 50—55 × 12—14 μ. Spores fusiform, 4-celled, straight or somewhat curved, 17.7—19.7 × 3.9—5.5 μ.

Although no recent finds are known, it may be not out of place to make the following comment upon the present species.

Abeleven (1898. 47) recorded some localities of what was then called *O. herpetica*, whereas many more are substantiated by material in the herbarium. It appears, however, that with the exception of the material from Utrecht no collection was correctly identified.

Utrecht: Utrecht, 1841, *Van der Sande Lacoste*, on *Fraxinus* (NBV).

Noord-Brabant: Cromvoirt, 3 XII 1904, *Wakker*, on *Fraxinus*, *Salix* (L).

O. subsiderella (Nyl.) Arn. — Disc slit-like. Asci cylindrical-clavate, 50—65(70) × (10)12—14 μ. Spores elongate-vestigiiform, 5—7-celled, (17.7) 22.5—28(39.4) × 3—4 μ. Pycnoconidia curved to falcate (rarely straight), (3.9)5—7(7.9) × 1—1.5 μ.

New to the flora.

Groningen: Warffum, Groot Zeewijk, 23 IX 1950, *Barkman 3360*, on *Ulmus* (L).

Overijsel: Dalfsen, 16 X 1951, *Barkman 3434*, on *Juglans* (L).

Gelderland: Elspeet, Vierhouter bos, 25 IV 1951, *Barkman 3407*, on *Fagus* (L).

Noord-Holland: Texel: De Koog, 1 IX 1951, *Barkman 3415*, on *Salix* (L); Prins Hendrikpolder, Capnie's burg, 31 VIII 1951, *Barkman 3409*, on *Ulmus* (L).

Zuid-Holland: Voorne: Rockanje, Windgat, 3 V 1953, *Maas G. 9383*, on *Salix* (L).

Noord-Brabant: Helvoirt (?), Molenstraat, 12 XI 1904, *Wakker*, on *Salix* (L); Vucht, Sionsburg, 9 XII 1922, *Wakker*, on *Salix* (L).

PARMELIA Ach.

P. aspera Mass. — After having written that the species was not known to have been collected in recent times (Maas Geesteranus, 1947), the following specimen came to my hands.

Zeeland: Walcheren: Nieuw en St. Joosland, 23 VII 1946, *C. Brakman*, on *Populus* (L).

PELTIGERA Pers.

P. scabrosa Th. Fr. — New to the flora.

Zuid-Holland: Voorne: Rockanje, north of Brede Water, 3 V 1953, *Maas G. 9326*, on calcareous sand in moist, low dunes in very sparse vegetation of *Ammophila arenaria* (L).

PHLYCTIS (Wallr.) Flot.

Phl. argena (Ach.) Flot. — Thallus usually strongly verrucose, often so badly developed as to be almost unrecognisable. Smooth thalli are rare and seem to be restricted to very sheltered habitats only.

Not previously recorded.

Friesland: Beetsterzwaag, 9 VIII 1951, *Barkman 3192*, on *Acer pseudoplatanus* (det. Almborn) (L); Veenklooster, 14 VIII 1951, *Barkman 3166c*, base of *Fagus* (confirmed Almborn) (L).

Drente: Ansen-Uffelte, 18 VIII 1954, *Maas G. 10031*, on *Quercus* (L); Dwingelo, 18 VIII 1954, *Maas G. 10030*, on *Quercus* (L); Dwingelo-Beilen, Lheebroekerzand, 14 VIII 1954, *Maas G. 10017*, on *Quercus* (L).

Overijsel: Deventer, 10 X 1951, *Barkman 3216*, on *Acer* (confirmed Almborn) (L).

Gelderland: Beesd, 7 VII 1951, *Barkman 3183*, on *Ulmus* (det. Almborn) (L); south of Deventer, 4 VIII 1951, *Barkman 3174*, on *Ulmus* (confirmed Almborn) (L); Hoog Keppel, 24 VII 1951, *Barkman 3176*, on *Quercus* (det. Almborn) (L); Winterswijk, Bekkendelle, 26 VII 1951, *Barkman 3167*, on *Ulmus* (confirmed Almborn) (L).

Utrecht: Haarzuilens, De Haar, 7 IX 1943, *Maas G. 2789*, on *Acer negundo* (confirmed Almborn) (L); Harmelen, 7 IX 1943, *Maas G. 2796*, on *Salix* (confirmed Almborn) (L); Vleuten, 7 IX 1943, *Maas G.*, on *Salix* (confirmed Almborn) (L).

Noord-Holland: Alkmaar-Heiloo, 16 IX 1943, *Barkman 620*, on *Ulmus* (confirmed Almborn) (L); Bergen, Eeuwige laan, 30 IV 1954, *Reijnders*, on *Quercus* (L); Bergen, Franschman, 12 V 1954, *Maas G. 9661*, on *Ulmus* (L); Enkhuizen-Hoorn, 8 IX 1951, *Barkman 3194*, on *Ulmus* (confirmed Almborn) (L); St. Maartensbrug, Wildrijk, 29 IX 1943, *Barkman 595*, on *Ulmus* (confirmed Almborn) (L).

Zuid-Holland: Den Deyl-Leiden, Zuidwijk, 22 VIII 1943, *Barkman*, on *Salix* (confirmed Almborn) (L); De Zilk, 26 V 1947, *Barkman 4188*, on *Ulmus* (L); Dordrecht, Kop van het Land, 22 VII 1951, *Barkman 3181*, on *Ulmus* (det. Almborn) (L); Oegstgeest, Oud-Poelgeest, 2 V 1922, *Ten Kate*, on *Populus* (L); Voorne: Oostvoorne, Mildenburg, 2 V 1953, *Barkman 4153*, on *Ulmus*; *Maas G. 9370*, on *Populus* (L); Wassenaar, Meiendel, 6 VI 1951, *Maas G. 7725*, on *Ulmus* (L).

Zeeland: Schouwen: Haamstede, 19 VII 1952, *Walrecht*, on *Acer* (L); Walcheren: Oostkapelle, Randduin, 30 IV 1952, *Walrecht*, on *Quercus* (L); Zuid-Beveland: Goes, no date, *Van den Bosch*, on *Salix* (Gro); 12 XI 1943, *Maas G. 2952b*, on *Ulmus* (det. Almborn); *Maas G. 2953*, on *Ulmus* (L); Kapelle, Postweg, 9 V 1952, *Walrecht*, on *Ulmus* (L); Kloetinge, 3 IV 1952, *Walrecht*, on *Ulmus* (L); Wolphaartsdijk, 23 IX 1951, *Barkman 2850*, on *Ulmus* (confirmed Almborn) (L).

Noord-Brabant: Bergen op Zoom, 11 XI 1943, *Maas G. 2900*, on *Quercus* (confirmed Almborn) (L); Lage Zwaluwe, 3 VII 1951, *Barkman 3177*, on *Ulmus* (confirmed Almborn) (L); Nuland, Wolfsdijk, 26 XI 1904, *Wakker*, on *Fagus* (L); Udenhout-Helvoirt, 31 V 1908, *Wakker*, on *Populus* (L).

PHYSCIA (Ach.) Vain.

Ph. nigricans (Flk.) Stizenb. — After the paper on indigenous *Physciaceae* had appeared (Maas Geesteranus, 1952) Dr Stafleu sent me his recent collections which, unpardonably, had escaped my attention. They contain among others fine material of the present species from a station which is the second in recent times.

Utrecht: Utrecht, 't Hemeltje, IV 1952, *Stafleu,* on concrete of pill-box, c. apoth. (U); 26 IV 1954, *Maas G. 9631, 9645,* c. apoth. (L).

PORINA Müll. Arg.

P. affinis (Mass.) A. Zahlbr. — Thallus whitish. Perithecia hemispherical with flattened top and base, ± 150 μ high, ± 190 μ diam. Excipulum carbonaceous, dimidiate, 30—40 μ thick, N —. Hymenium J —. Asci cylindrical, 8-spored, 51—65 × 8—10 μ. Spores obliquely 2—2.5-seriate, colourless, fusiform-ellipsoidal, 4-celled, 13.8—15.8 × 4—4.9 μ. Paraphyses filiform, simple, septate.

New to the flora.

Noord-Brabant: Cuik, Coebax, 2 VI 1907, *Wakker,* on *Quercus* (L).

P. chlorotica (Ach.) Müll. Arg. var. **carpinea** (Pers.) Keissl. — Thallus olivaceous, K —. Excipulum dark brown, involucrellum carbonaceous, 20—35 μ, both N + red-brown. Asci cylindrical, 8-spored, J —, (35)58—75(90) × (6)8—10(12) μ. Spores obliquely 1-seriate to 2-seriate, colourless, fusiform, 4-celled, cells cylindrical, (15.8)17.7—19.7(21.7) × (3.5)4—5(5.9) μ. Paraphyses free, filiform, septate, simple but occasionally also furcate, not anastomosing, straight or flexuous.

New to the flora.

Friesland: Bakkeveen, 8 VIII 1951, *Barkman,* on *Fagus* (L).

Gelderland: Beekhuizen, 20 IV 1951, *Barkman 3120,* on *Fagus* (L); Elspeet, Elspeter bos, 23 IV 1951, *Barkman 3383,* on *Fagus* (confirmed Magnusson) (L); Rheden, Middachten, 21 IV 1951, *Barkman 3471,* on *Quercus borealis* (L); Winterswijk, Bekkendelle, 10 VI 1949, *Barkman 4190,* on *Salix* (L).

Noord-Holland: Bergen-Binnen, 23 IX 1943, *Barkman 4185,* on *Fagus* (L); Bergen-Egmont, De Voert, 12 V 1954, *Maas G. 9671,* on *Acer* (L).

Zuid-Holland: De Zilk, 26 V 1947, *Maas G. 8494,* on *Ulmus* (L); Goeree: dunal region, 15 IV 1952, *Barkman 2897,* on *Ulmus* (L).

Zeeland: Schouwen: Haamstede, 20 IX 1951, *Barkman 3414b,* on *Populus* (L); Schuddebeurs, 21 IX 1951, *Barkman 3108, 3429b,* on *Ulmus* (L).

Noord-Brabant: Breda, 1841, *Van der Sande Lacoste,* on *Salix* (NBV); Ophemert, 5 VII 1951, *Barkman 3435c,* on *Juglans* (L); Vucht, 24 XII 1904, *Wakker,* on *Fagus* (L).

P. olivacea (Borr.) A. L. Sm. — Thallus olivaceous. Asci fusiform, 8-spored, J —, 80—100 × 10 μ. Spores colourless, acicular-fusiform, 7—8-celled, 25.6—31.5 × 3.9—4.9 μ. Paraphyses simple. Material scanty.

New to the flora.

Friesland: Veenklooster, 14 VIII 1951, *Barkman 3165,* on *Fagus* (L).

STAUROTHELE Norm. em. Th. Fr.

St. catalepta (Ach.) Blombg. & Forss. — Thallus fulvous, thick, areolate, fertile areoles hardly larger than the sterile ones. Perithecia immersed, subspherical, flattened at the top, 300—350 μ in diam., circum-

ostiolar part dark brown. Excipulum consisting of a colourless, 14—20 μ thick inner lining, and a brownish, 10—25 μ thick outer wall which around the ostiolum turns dark brown and broadens considerably into an involucrellum-like structure. Hypothecium obscurely delimited, yellowish. Asci clavate-saccate, up to 20 μ broad, 2-spored. Spores at first colourless, later on dark-brown, cylindrical-ellipsoidal, muriform, 33.5—39.4 × 13.8—17.7 μ. Paraphyses absent. Periphyses colourless, 23—30 μ long, straight, free. Hymenial gelatina J + blue. Hymenial gonidia globose to ellipsoidal, frequently angular, sometimes 2-celled, 4—5 μ.

New to the flora.

Zuid-Holland: Ammerstol-Schoonhoven, 19 VIII 1942, *Maas G. 2148*, on basalt of the dike along the river Lek (L).

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