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Daniel Alexander Boyd 1855-1928: a formidable amateur Scottish mycologist

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ABSTRACT

Daniel Alexander Boyd, an amateur naturalist who came from West Kilbride, Ayrshire, Scotland, made considerable contributions to Scottish mycology but has been largely forgotten. In this paper, his life, and in particular his natural history activities, are outlined. To illustrate his achievements, an account of his contribution to knowledge of leaf and stem microfungi of the genus *Phyllosticta* in Scotland is provided.

INTRODUCTION

The aim of this paper is to draw attention to a largely forgotten amateur mycologist – D.A. Boyd – who made an outstanding contribution to Scottish natural history, mainly in the field of microfungi. A short biography is provided and, to give an indication of his scientific achievements, this is followed by an annotated list of all the Scottish microfungi found by him that have been assigned to the widespread and very speciose genus *Phyllosticta*.

Most of the biographical information provided below was obtained from Johnstone (1931) and Ramsbottom (1929, 1963). He is the subject of a short entry in the reference work of Ainsworth (1996), which regrettably misreports his year of birth.

DAVID ALEXANDER BOYD – THE MAN

David Alexander Boyd was a son of the manse, born in 1855 in West Kilbride, Ayrshire, Scotland, this village being the locality of many of his collections. In 1912 he moved to Saltcoats, Ayrshire, another locality of his collections, and died there in 1928. He qualified as a Writer to the Signet (a variety of solicitor) but never practised his profession and he was best known in his time for his natural history activities, especially his almost fanatical field collecting, which saw him venturing into every nook and cranny: "Dirty hands with grubbing – and he could grub like a terrier – among leaves, wet feet with wading through boggy places, torn clothes with scrambling through thorny bushes, and bruises from falls in climbing steep or slippery places, what did it matter so long as he got what he was seeking?" (Johnstone, 1931). At first he took a great interest in both archaeology and general natural history, especially ferns, mosses and flowering plants. He then turned his attention first to larger fungi and later to microfungi, because he noticed how meagre the records of these were (Johnstone, 1931). He served as President of the Cryptogamic Society of Scotland before it was disbanded in 1923 and published many records of fungi (eg. Boyd, 1913) especially in the society's Annual Reports (e.g. Boyd, 1913). He also published papers on various aspects of natural history in the *Transactions of the Natural History Society of Glasgow* and its successor *The Glasgow Naturalist*. The subjects of these papers included his findings for West Kilbride on plants and animals, as well as microfungi. He was editor of *The Glasgow Naturalist* (with John Paterson) from 1909 to 1914.

Boyd led many excursions for the Cryptogamic Society and for many of the natural history groups of which he became a member. It was reported that, although at first shy, he was eager to help anyone (Johnstone, 1931). He was president of the Natural History Society of Glasgow and during 1900-1901 he was a member of the organising committee for the proposed British Association for the Advancement of Science meeting for which he prepared lists of microfungi and certain arthropod groups in *The Fauna, Flora and Geology of the Clyde Area* (Boyd, 1901a,b,c). He later prepared a paper on physical features influencing the occurrence of fungi for the British Association Handbook for the 1928 Glasgow meeting (Boyd, 1928).

Boyd collected microfungi extensively and intensely, particularly in the Ayrshire area of Scotland, and continued to collect almost until his death. He did not generally collect any further afield, except apparently on forays organised by the Cryptogamic Society of Scotland and local organisations where his keen eye was helpful in spotting little known species, such as the leaf fungus *Phyllosticta erysimi* Westend. found by him in Perthshire on garlic mustard (*Alliaria petiolata*) (Grove, 1935). His finds resulted in many published articles and added many new species to the British list, some not found since. West Kilbride and the surrounding settlements offered a wide range of different habitats and therefore host plants. West Kilbride was a weaving village with many associated activities, whereas nearby Stevenston had an industrial history of coal-mining and chemical industries, which left waste areas and brown sites where fungi could be sought.

It is suspected that Boyd identified his collections only from the external appearance of their fruiting structures and of the host, and rarely used a microscope to investigate further, e.g. to measure the conidia (asexual spores) or development of the conidiomata (structures

that contain conidia), which is admittedly an exceedingly difficult task even with the best of material and of microscopes. His forte as a naturalist was his ability to identify vascular plants and recognise the fungi growing on them. He must have had a very retentive memory. With respect to his ability to to find microfungi, Ramsbottom (1929) described Boyd as "our best field-man in this line". Over many years, especially latterly after retirement, the present author has tried to follow Boyd in his ability to spot microfungi but has been miserably unsuccessful, though that might be partly because in more recent times air pollution has adversely affected these foliicolous fungi.

Boyd sent his collections for identification or confirmation to Annie Lorrain Smith, a mycologist (best known for her contribution to British lichenology: Ainsworth, 1996) in the British Museum who also hailed originally from south-west Scotland, and to J.B. Grove at Birmingham Municipal Technical School. Both of these sets of specimens are now in the Herbarium at the Royal Botanic Gardens, Kew. Unfortunately only two of Boyd's specimens have been found in the fungarium in the Royal Botanic Garden, Edinburgh, which he himself created, *viz*. *Venturia johnsonii* (Berk. & Br.) Sacc. (now *Venturia maculiformis* (Desm.) Winter; Venturiaceae: Venturiales) and *Sporomega degenerans* (Kunze) Corda (Rhytismataceae: Rhytismatales) growing on bog whortelberry (*Vaccinium uliginosum*). He apparently never collected at the Edinburgh Botanic Garden.

Several taxa have been named after, or recognise, Boyd, including: *Coccomyces boydii* A.L. Sm. (Ostropocaceae: Rhytismatales), collected by Boyd from bog-myrtle (*Myrica gale*), Killin, Perthsire (Smith & Rea, 1907); discussed by Dennis (1968) and Sherwood (1980); *Helotium marchantiae* (Berk.) Fr. var. *conocephali* Boyd, found by Boyd on the liverwort *Conocephalum conicum*, Dalry, Ayrshire (Smith, 1907) and now placed in the recently recognised genus *Bryoscyphus* (Kirk & Spooner, 1984) as a distinct species *B. conocephali* (Boyd) Spooner (Helotiaceae: Helotiales); *Orbilia boydii* A.L. Sm. & Ramsb. 1913, found by Boyd on stems of blaeberry (*Vaccinium myrtillis* L.), Beith, Ayrshire (Smith & Ramsbottom, 1913), and now called *Pezicula myrtillina* P. Karst. (Dermateaceae: Helotiales); *Ascochyta boydii* Grove (Didymellaceae: Pleosporales) (Grove, 1918), found by Boyd on water plantain (*Alisma plantago-aquatica*), Stevenston, Ayrshire; its taxonomy has remained unchanged.

Smith (1917) named a genus after Boyd - *Boydia* - for the species *B. remuliformis* found by Boyd on holly (*Ilex aquifolium*) in West Kilbride. This is unfortunately a junior synonym of *Vialaea insculpta* (Fr.) Sacc. (Vialaeaceae: Xylariales) and is discussed by Dennis (1968). It has also been found on Mull (Henderson & Watling, 1978).

Boyd personally described only two species – *Bryoscyphus conocephali*, as noted above, and *Orbilia marina* (Phill.) Boyd, occurring on decaying fronds of seaweed (Boyd's description was reported in Smith, 1907), which was subsequently renamed *Laetinaevia marina* (Boyd) Spooner (Kirk & Spooner, 1984), and then *Calycina marina* (Boyd) Rämä & Baral (Pezizellaceae: Helotiales) (Baral & Rämä, 2015).

BOYD'S CONTRIBUTION TO SCOTTISH MYCOLOGY AS EXEMPLIFIED BY *PHYLLOSTICTA*

To give an indication of the importance of Boyd as a mycologist, his contribution to knowledge of the genus *Phyllosticta* in Scotland is now outlined.

Phyllosticta is a genus of coelomycetes - an artificial taxonomic group of fungi imperfecti (which lack a known sexual state) that produce conidia inside a cavity - the conidioma (pl. conidiomata). *Phyllosticta* species are distinguished by their thin-walled conidiomata and imperceptible or shortened conidiophores (fungal hyphae that carry conidia) called pycnidia. They are mostly plant pathogens and are responsible for numerous diseases, including leaf and fruit spot (Fig. 1), some of which are of significant economic importance (Wikee *et al.*, 2013). Kirk *et al.* (2008) estimated that there are around 90 well-documented and confirmed *Phyllosticta* species. As with other fungi imperfecti, some *Phyllosticta* species have been found to be asexual stages in the life-cycle of species that have a known reproductive stage (teleomorph), in which case their name is changed to that of the teleomorph.

The following is an annotated list of all Scottish microfungi collected by Boyd during his excursions that have been identified as *Phyllosticta* species. All the records can be found in Grove (1935). References are also given to the descriptions by Grove or A.L. Smith (with or without J. Ramsbottom) of new taxa based on Boyd's specimens; these taxa are indicated below by an asterisk. West Kilbride is abbreviated to WK.

****Phyllosticta acetosellae*** A.L. Smith & Ramsb. On sheep's sorrel (*Rumex acetosella*), Ayrshire and Lanarkshire (Smith & Ramsbottom, 1912); this is now *Didymella acetosellae* (Smith & Ramsb.) Qian Chen & L. Cai.

P. aegopodii Allesch. On ground elder (*Aegopodium podagraria*), Renfrewshire, Ayrshire and Lanarkshire; now known to the asexual stage of *Mycosphaerella aegopodii* Pot. (Mycosphaerellaceae: Mycosphaerellales).

P. ajugae Sacc. On living leaves of bugle (*Ajuga reptans*); recorded by Grove (1935) only as collected in Ayrshire.

P. angelicae Sacc. On fading and living leaves of wild angelica (*Angelica sylvestris*), Ayrshire; now considered to be the anamorph (asexual reproductive stage) of *Asteromella huubii* Ruszk.- Mich. (family *incertae sedis*).

****P. asperulae*** Grove. On fading and dead leaves of woodruff (*Galium odoratum*), Dalry, Ayrshire (Grove, 1922).

P. briardi Sacc. On living leaves of crab apple (*Malus sylvestris*), Stevenston, Ayrshire.

Fig. 1. *Phyllosticta hederae*. (A) Spots (arrows) on living leaves of ivy (*Hedera helix* 'Pedata') on garden wall, Edinburgh, Scotland, January 2022. (B) Dry spots of P. hederae on leaf of ivy shown in (A); these have circular except where broken by the leaf edge; the spots are dark at the margain and pale in the centre. (Photos: R. Watling)

P. carpathica Allesch. & Syd. On living leaves of the naturalised bell flower (*Campanula persicifolia*), Ayrshire; now *Ascochyta carpathica* (Allesch.) Keissl. (Didymellaceae; Pleosporales)

P. cornicola Rabenh. On leaves of dogwood (*Cornus alba*); noted by Grove (1935) only as collected in Ayrshire.

P. coryli Westd. On living leaves of hazel (*Corylus avellanea*); recorded by Grove (1935) only as collected in Ayrshire..

P. dahliicola Brun. On dead stems and petioles of *Dahlia* at Saltcoats, Ayrshire; now *Ascochyta dahliicola* (Brun.) Petr. (Didymellaceae; Pleosporales).

P. destructiva* var. *menyanthis Rabenh. On bogbean (*Menyanthes trifoliata*), Ayrshire; Grove (1935) thought this is really an *Ascochyta* sp.

P. ericae Allesch. On dead leaves of cross-leaved heath (*Erica tetralix*), WK.

P. erysimi Westend. On leaves of garlic mustard, Perthshire.

P. euonymi Sacc. On leaves of spindle (*Euonymus japonicus*), Ayrshire.

P. eupatorii All. On fading leaves of hemp agrimony (*Eupatorium cannabinum*), Ayrshire.

P. eximia Bubak. On fading leaves of marsh hawk's-beard (*Crepis paludosa*), Ayrshire and Renfrewshire; now *Asteromella eximia*.

P. forsythiae Sacc. On leaves of golden bells (*Forsythia suspensa*), Ayrshire; this is the very variable *Phoma exigua* (Bubak) Boerema (Didymellaceae).

P. fraxinicola Sacc. On leaflets of ash (*Fraxinus excelsior*), Argyllshire; this is really *Melomastia mastoidea* (Fr.) Schroeter (Pleurotremataceae; order *incertae sedis*), differing from *Phyllosticta* in the structure of the conidiophores, as Grove (1935) noted.

P. fuchsiicola Speg. On dead bark and stems of *Fuchsia* sp., WK; this could be one of the numerous *Fuchsia* cultivars, many based on hybridisation of the South American lady's ear-drop (*F. magellanica*), which is grown extensively in the west as it is hardy and withstands salty winds; as indicated by Grove (1935), the host substrate is unusual as *P. fuchsiicola* more commonly colonises the leaves; it is also recorded for the British Isles on *F. coccinea*.

P. funkiae Ferrarris. On leaves of plantain lily (*Hosta* sp.; referred to as *Funkia ovata*), Dalry. *Hosta* is a large genus with many cultivars grown in gardens. It is most likely that the species which acted as host to the *Phyllosticta* collected by Boyd was a cultivar of *H. undulata*.

P. gei Bres. On leaves of water avens (*Geum riviale*) and wood avens (*G. urbanum*), Ayrshire.

P. grossulariae Sacc. On living leaves of gooseberry (*Ribes uva-crispa*), Bute and Ayrshire; this is the asexual stage of *Mycosphaerella ribis* (Fuckel) Lindau (Mycosphaerellaceae: Mycosphaerellales).

P. hederae Sacc. & Roum. On dead spots on living ivy leaves (*Hedera helix*), Ayrshire (see Fig. 1).

P. helianthemicola Allesch. On dead leaves, sepals and petals of "*Helianthemum*", Perceton, Ayrshire; the host was presumably the common rock-rose (*Helianthemum chamaecistus*), other native species having a very restricted distribution and rarely planted outside their range.

P. hepaticae Brun. On *Anemone hepatica* (*Hepatica triloba*), WK; the host was undoubtedly an introduced plant, the species being of Eurasian distribution.

****P. heucherae* forma *sanguineae*** Grove. On fading leaves of alum root (*Heuchera sanguinea*), WK; the form differs from the type (which was found in France) in the colour and size of the spots and in the spores being longer, narrower and curved (Grove, 1922).

P. hortorum Speg. On fading leaves of bittersweet (*Solanum dulcamara*), WK.

P. holosteae Allesch. On bleached leaves of bog stitchwort (*Stellaria alsine*), Kilwinning, Ayrshire.

****P. hydrocotyles*** A.L. Sm. On leaves of marsh pennywort (*Hydrocotyle vulgaris*), WK (Smith, 1917).

P. impatientis Fautr. On living and fading leaves of wild balsam (*Impatiens noli-tangere*), Ayrshire.

P. lamii Sacc. On fading leaves of white dead-nettle (*Lamium album*), Stevenston, Ayrshire.

****P. lychnidina*** Grove. On living leaves of red campion (*Lychnis dioica*), WK (Grove, 1918).

P. mahoniana Allesch. On fading leaves of Oregon grape (*Mahonia aquifolia*) Ayrshire; the host is a widely planted ornamental from Western North America.
P. marchantiae Sacc. On dead archegoniophores (components of female reproductive structures) of the liverwort *Marchantia polymorpha*, Kilwinning; *M. polymorpha* has recently been shown to be a complex of taxa.
P. oxalidis Sacc. On leaves of wood sorrel (*Oxalis acetosella*), Beith, Dalry (Ayrshire) and WK; Grove (1935) pointed out that the spots strongly resemble those of the coelomycete *Stagonospora hygrophila* Sacc. and there is a suggestion that it may have a *Mycosphaerella* teleomorph.
P. platanoidis Sacc. On fading leaves of cotyledons of sycamore (*Acer pseudoplatanoides*), WK; now *Asteromella platanoidis*.
****P. polemonii*** A.L. Sm. & Ramsb. On fading leaves of "*Polemonii*", Ayrshire; though the specific host taxon is not given, *Polemonium caeruleum* (Jacob's ladder) is the native species (Smith & Ramsbottom, 1916).
P. potamogetonis Rostr. Recorded by Grove (1935) as *P. potamia* Cooke, on leaves of pondweed (*Potamageton* sp.), Ayrshire; the host species is not specified; the original fungus described by M.C. Cooke as *P. potamia* is the asexual stage of a smut fungus (*Doassansiopsis hydrophila* (Diedrich) Lavrov (Urocystidiales: Basidomycota). Grove reported that the spores of Boyd's collection were slightly constricted and gave signs of being 1-septate, which points towards an *Ascochyta* sp.
P. punctiformis Allesch. On fading leaves of red campion (*Silene dioica*), Largs, Ayrshire.
P. ranunculorum Sacc. & Speg. On fading leaves of fair maids of France (*Ranunculus aconitifolius*), Ayrshire; the host, being native to Central Europe, was presumably an introduced plant.
P. rhodorae (Cooke) Tassi. On living leaves of *Rhododendron* sp., Renfrewshire; no specific name is offered for the host species, the habit of indicating the genus alone being unfortunately widespread amongst mycologists; *P. rhodorae* was originally placed in *Phoma* but Grove (1935) commented that it was better placed in *Phyllosticta*.
P. ribicola Sacc. On red currant (*Ribes rubrum*), Seamill, Ayrshire; this (like ***P. grossulariae***: see above) is the asexual stage of *Mycosphaerella ribis*.
P. sambuci Desm. On living and fading leaves of elder (*Sambucus nigra*), Ayrshire; widespread in U.K.
P. scrophulariae Sacc. On fading and living leaves of figwort (*Scrophularia nodosa*), Ayrshire.
P. scrophularinea Sacc. On living leaves of water figwort (*Scrophularia aquatile*) and *S. nodosa*, Ayrshire.
P. teucrii Sacc. & Speg. On living on leaves of wood sage (*Teucrium scorodonia*), Ayrshire.
P. typhina Sacc. & Malcr. On tips of leaves of reed mace (*Typha latifolia*), Kilwinning.
P. ulmi Westd. On dead and fading leaves of elm (*Ulmus*: species not specified), Ayrshire.
P. umbilici Brun. On fading and dead leaves and stalks of pennywort (*Umbilicus rupestris*), Ayrshire.
P. valerandi Brun. On fading and living stems of brookweed (*Samolus valerandi*), Isle of Cumbrae.
****P. valerianae*** Sm. & Ramsb. On leaves of valerian (*Valeriana officinalis*), Whiting Bay, Isle of Arran (Smith & Ramsbottom, 1915).

CONCLUSION

The above account of *Phyllostica* demonstrates how important Boyd's contributions were to Scottish, and British, mycology. Boyd collected specimens of 51 *Phyllosticta* species in Scotland, which included one form and six species new to science. The field data show that Boyd collected in a variety of habitats and it is therefore unsurprising that both himself and his clothing were damaged in this quest (as celebrated by Johnstone, 1931).

His influence extended not just to *Phyllosticta* and other coelomycetous "stem and leaf fungi", but also to those fungi that can be classified as "moulds", such as the plant pathogen genera *Ovularia* and *Ramularia*: for example, although Massee (1895) had described 30 British species in these two genera, Boyd increased the total to 53 for the Clyde area alone (Ramsbottom, 1929).

Although Boyd has been almost forgotten, the present author hopes that, by drawing attention to his contributions over a wide range of microfungi, he will eventually attain his rightful place in the hierarchy of Scottish mycology.

REFERENCES

Ainsworth, G.C. (1996). *Brief Biographies of British Mycologists*. British Mycological Society, Stourbridge.

Baral, H.O. & Rämä, T. (2015). Morphological update on *Calycina marina* (Pezizellaceae, Helotiales, Leotiomycetes), a new combination for *Laetinaevia marina*. *Botanica Marina* 58, 523-534. https://doi.org/10.1515/bot-2015-0049

Boyd, D.A. (1901a). Fungi (microscopic). In: Elliot, G.F.S., Laurie, M. & Murdoch, J.B. (Editors). *Fauna, Flora and Geology of the Clyde Area*, pp. 61-77. British Association for the Advancement of Science, Glasgow.

Boyd, D.A. (1901b). Orders Collembola and Thysanura. In: Elliot, G.F.S., Laurie, M. & Murdoch, J.B. (Editors). *Fauna, Flora and Geology of the Clyde Area*, pp. 316-317. British Association for the Advancement of Science, Glasgow.

Boyd, D.A. (1901c). Myriapoda. In: Elliot, G.F.S., Laurie, M. & Murdoch, J.B. (Editors). *Fauna, Flora and Geology of the Clyde Area*, p. 318. British Association for the Advancement of Science, Glasgow.

Boyd, D.A. (1913). Notes on the fungal flora of the Moray district. *Transactions of the British Mycological Society* 4, 66-73. https://doi.org/10.1016/S0007-1536(12)80010-6

Boyd, D.A. (1928). Physical features of the Clyde district relating to the occurrence of fungi. In: Patton, D. (Editor). *Handbook: British Association for the*

Advancement of Science, pp. 313-317. Burlington House, London.
Dennis R.W.G. (1968). *British Ascomycetes*. J. Cramer, Stuttgart, Germany.
Grove, W.B. (1918). New or noteworthy fungi. II. *Journal of Botany, British and Foreign* 56, 314-321.
Grove, W.B. (1922). New or noteworthy fungi VII. *Journal of Botany, British and Foreign* 60, 14-17.
Grove, W.B. (1935). *Stem and Leaf Fungi (Coelomycetes). Vol. 1*. Cambridge University Press, Cambridge.
Henderson, D.M. and Watling, R. (1978). Fungi. In: Jermy, A.C. & Crabbe, J.A. (Editors). *The Island of Mull; a Survey of its Flora and Environment*, pp. 151-174. British Museum (Natural History), London.
Johnstone, R.B. (1931). In memoriam D.A. Boyd. *The Glasgow Naturalist* 9, 60-62.
Kirk, P.M., Cannon, P.F., Minter, D.W. & Stalpers, J. (2008). *Dictionary of the Fungi*. (10th edition). CAB International, Wallingford.
Kirk, P.M. & Spooner, B.M. (1984). An account of the fungi of Arran, Gigha and Kintyre. *Kew Bulletin* 38, 503-597. https://doi.org/10.2307/4108573
Massee, G. (1895). *British Fungus Flora*. Bell, London.
Ramsbottom, J. (1929). Obituaries. Daniel Alexander Boyd (1855-1928). *Journal of Botany, British and Foreign* 67, 52-53.
Ramsbottom, J. (1963). History of Scottish mycology. *Transactions of the British Mycological Society* 46, 161-178. https://doi.org/10.1016/S0007-1536(63)80072-8
Sherwood, M.A. (1980). Taxonomic studies in the Phacidiales: the genus *Coccomyces* (Rhytismataceae). *Occasional Papers of the Farlow Herbarium* 15, 1-120. https://doi.org/10.5962/p.305850
Smith, A.L. (1907). New or rare microfungi. *Transactions of the British Mycological Society* 3, 111-123. https://doi.org/10.1016/S0007-1536(07)80027-1
Smith, A.L. (1917). New or rare microfungi. *Transactions of the British Mycological Society* 6, 149-157. https://doi.org/10.1016/S0007-1536(17)80025-5
Smith, A.L. & Ramsbottom, J. (1912). New or rare micro-fungi. *Transactions of the British Mycological Society* 4, 165-185. https://doi.org/10.1016/S0007-1536(12)80018-0
Smith, A.L. & Ramsbottom, J. (1913). New or rare micro-fungi. *Transactions of the British Mycological Society* 4, 168-170. https://doi.org/10.1016/S0007-1536(14)80016-8
Smith, A.L. & Ramsbottom, J. (1915). New or rare micro-fungi. *Transactions of the British Mycological Society* 5, 156-168. https://doi.org/10.1016/S0007-1536(14)80016-8
Smith, A.L. & Ramsbottom, J. (1916). New or rare micro-fungi. *Transactions of the British Mycological Society* 5, 231-248. https://doi.org/10.1016/S0007-1536(14)80027-2
Smith, A.L. & Rea, C. (1907). Fungi new to Britain. *Transactions of the British Mycological Society* 3, 34-46. https://doi.org/10.1016/S0007-1536(14)80027-2
Wikee, S., Lombard, L., Nakashima, C., Motohashi, K., Chukeatirote, E., Cheewangkoon, R. *et al.* (2013). A phylogenetic re-evaluation of *Phyllostaticta* (Botryosphaeriales). *Studies in Mycology* 76, 1-29. https://doi.org/10.3114/sim0019