

VII. Discovery of Harpanthus Flotovianus in Scotland

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To cite this article: W. H. Pearson (1879) VII. Discovery of Harpanthus Flotovianus in Scotland, Transactions of the Botanical Society of Edinburgh, 13:1-4, 443-447, DOI: [10.1080/03746607909468788](https://doi.org/10.1080/03746607909468788)

To link to this article: <http://dx.doi.org/10.1080/03746607909468788>



Published online: 01 Dec 2010.



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Fig. 9.—A plant of maize, to show to what length the sheath will sometimes extend; it reaches from near *a* to *c*. The embryotic node remains in the kernel, throwing out the embryotic radicles. From *a* to *b* is the first internode covered by the sheath. At *b* is the second node, throwing out nodal roots through the sides of the sheath.

Fig. 10.—Transverse and longitudinal sections of oat sheath and plumule, near the apex; *g*, the rolled leaf of the plumule; its point can generally be seen green through the translucent sides of the sheath, at a short distance behind the beak of the latter. The two vascular rays *h*, where they issue from the embryo, are each 90 degrees from the cord *l* (fig. 13), but converge into the cord *l*, where it leaves the scutellum and spreads out into the substance of the embryo.

Fig. 11.—Transverse section through maize sheath (fig. 9), and node at *b* on the level of an issuing root.

Fig. 12.—Transverse section of oat scutellum where the point tapers near the upper end. Wheat, barley, rye, and maize want this slender extension; *l*, the cord running down the centre.

Fig. 13.—A lateral vertical section of wheat embryo through the centre; *c*, the point of the sheath; *g*, the plumule; *k*, the scutellum; *l*, cord joining the embryo. The light parts are the primary node and embryotic roots springing out of it in the same way as roots spring out of the secondary nodes higher up the stalk.

VII. *Discovery of Harpanthus Flotovianus in Scotland.*

By W. H. PEARSON. Communicated by Dr CARRINGTON.
(Plate XV.)

(Read July 10th, 1879.)

HARPANTHUS FLOTOVIANUS, Nees.—Shoots ascending, leaves approximate, ovate-orbiculate, obtusely emarginate, horizontally arranged; stipules ovate-lanceolate, toothed on one side or entire; colesule sub-sessile, postical, cylindrical.

Jungermannia Flotoviana, Nees ab Esen. in *Diar. Bot. Ratib.* 1833, ii. No. 26, p. 408.

Jungermannia convoluta, Hüb. in *Hepat. Germ.*, p. 60, No. 7 (*Hep. Eur.* iii. p. 570).

Jungermannia Hartmanni, Thed. *Musc. Succ. exsicc.*, vi. No. 138, a. *ferrugineus*.

Pleuranthe olivacea, Taylor, in *London Journal of Botany*, v. p. 282 (1846) (S. O. Lindberg, *Hepaticæ in Hibern.* col. p. 516).

Harpanthus Flotovianus, Nees, Hep. Eur. ii. 353, 492 (1836); iii. 570 (1838); G. L. & N. Syn., Hep. p. 170 (1844); Dumortier, Hep. Eur., p. 67 (1874).

Delin.—Gottsche et Rabenh. Hep. Eur. exs. No. 417. Sullivant, Musci and Hepaticæ of United States, t. vii., as *Pleuranthe olivacea*, Taylor.

Exsicc.—Herb. Gunth et Beilschm, as *Jungermannia viticulosa* (Nees); Thed. Musc. Suec. exs. vi., No. 138, as *Jungermannia Hartmanni*; Gottsche et Rabenh., Hep. Eur., No. 379, and No. 417; Lindberg et Lackstrom, Hepaticæ Scandinavicæ, No. 8, et 8b.

Hab.—On wet micaceous rocks, Burra Firth, Uist, Shetland Islands, June 1878, Mr John Sim.

Shoots $\frac{1}{2}$ inch to 2 inches in length. Some stems in Lindberg's "Hepaticæ of Scandinavia," are quite 2 inches long; others in same collection smaller, 9 and 12 mm. The specimens in Gott. and Rab., Hep. Eur. No. 417, collected by Herr Jack, in Upper Baden (4000 ft.), are small; and those I have had the opportunity of examining collected by Mr Sim are still smaller, the largest stems average from 7 to 8 mm., the majority only measuring from 4 to 5. These were male plants, which, as Nees mentions (Hep. Eur. ii. 358), are somewhat smaller.

Diameter of stem, $\cdot 4$, $\cdot 5$, $\cdot 6$ mm.

Stems (figs. 1, 2)—flexuose, procumbent, creeping amongst mosses and hepaticæ; mostly unbranched, but sometimes several stems issue from what appears to be the shoot of the previous year's growth. Specimens from wet stations are of a delicate green colour, more uniform in diameter, and laxly reticulate; whereas, those from drier stations are broader and of a firmer texture, and generally tinged with brown.

Rootlets (fig. 26) white, rather short, 1, $\cdot 7$, $\cdot 6$, $\cdot 5$ mm.; some very short, $\cdot 1$ to $\cdot 2$ long; many have their ends swollen. One I noticed had four branches; they proceed sparingly from back of stem, generally from base of stipules.

Leaves (figs. 3-9 and 16-18), $2 \times 1\cdot 4$, 2×1 , $1\cdot 5 \times 1\cdot 5$, $1\cdot 5 \times 1\cdot 3$, $1\cdot 5 \times 1$, $1\cdot 2 \times 1\cdot 2$, 1×1 , $1 \times \cdot 8$, $\cdot 9 \times \cdot 6$ mm.; ovate-orbiculate, horizontally disposed; the insertion of the upper part of leaf is in a line with the side of stem,

whilst the base is decurrent, and brought forward by a gradual symmetrical curve. Apex contracted and emarginate; sinus small and shallow, equal to about $\frac{1}{7}$ to $\frac{1}{8}$ part of length; segments usually rounded, upper tooth sometimes larger and acute, and then overhanging the other like a claw.

Texture laxly reticulated, cells with thin walls; in young shoots, or in specimens from wet stations, we find the texture more delicate, whilst in older plants it is much firmer and thicker.

Colour.—Young shoots light green or light olive; older plants, except the extremity which is green, often with a reddish tinge. Also, as Nees mentions, some leaves are of a dark green colour. These I have noticed at the apex of some stems, where they are more or less crowded.

Stipules (figs. 10–15) large, and very distinct; ovate, ovate-lanceolate or lanceolate, acute, varying much in shape, inserted obliquely, so as to turn from the leaf opposite which they arise; some are entire, but generally they have a tooth more or less deep on the outer side about the middle; occasionally we find them toothed on both sides.

Texture and colour as leaves, size $\cdot 65 \times \cdot 225$, $\cdot 65 \times \cdot 2$, $\cdot 6 \times \cdot 2$, $\cdot 55 \times \cdot 225$, $\cdot 5 \times \cdot 2$, $\cdot 475 \times \cdot 15$ mm.; foreign specimens, $\cdot 75 \times \cdot 3$, $\cdot 7 \times \cdot 3$, $\cdot 725 \times \cdot 25$, $\cdot 675 \times \cdot 275$ mm.

Leaf cells (figs. 22, 23), 4, 5, and 6 sided, mostly hexagonal and longer than broad; in upper portion of leaf sub-quadrate; basal cells oblong, more regularly rhomboidal; trigones none; cell-walls thin but clearly defined; some contain a few dark green granular bodies, which usually cling to the margin of the cell. Size $\cdot 0775 \times \cdot 025$, $\cdot 075 \times \cdot 025$, $\cdot 06 \times \cdot 03$, $\cdot 05 \times \cdot 027$, $\cdot 05 \times \cdot 03$ mm.—stipular cells not differing from others.

Inflorescence dioecious.

The male plants are smaller; antheridia (fig. 21) placed singly at the base of each swollen leaf. These are elliptic or round when young, greenish with hyaline border, becoming brown when older; “very shortly stipulate” (Nees). Size $\cdot 15 \times \cdot 5$, $1 \times \cdot 1$.

Colesule (fig. 24) seldom met with; it rises from the axil of a stipule, usually about half-way up the shoot, and is inserted on a very short receptacle bearing

one or more whorls of involucreal leaves; it is sub-cylindrical, slightly sickle-shaped, pale greenish, composed of small oval cells; mouth at first pointed, notched on one side, and finely crenulate; walls much thickened in the lower half from their junction with the calyptra. The fructification is produced in spring and summer, but on account of their firm texture, the colesules remain long after the fall of the capsule, and therefore on fructifying plants are generally found of different ages; size about 2 m. (actual measurement, $2\cdot4 + \cdot7$ mm). Calyptra (fig. 21), when matured campanulate, thickened below, and connate with the walls of the colesule, so that in section the capsule seems to lie in a hollow covered in part by the calyptra, and partly by the dilated apex of the receptacle.

Capsule scarcely $\frac{1}{6}$ of line long, oval, brown, "split to bottom" into four valves. Herr Jack says 80 to 90 per cent. deep ("Botanische Zeitung," Nos. 4-7, 1877).

Spores, according to a list of the relative sizes of spores compiled by Herr Jack ("Botanische Zeitung," Nos. 4-7, 1877), smaller than the majority of other species; they are same size as those of *Lophocolon heterophylla*, roundish, smooth, brown.

Elaters bi-spiral, broad, long.

Harpanthus Flotovianus was first found by Funck in the Silesian mountains, and distributed by him as *Jung. heterophylla*, from which it is however abundantly distinct, (in addition to the lateral sub-sessile fructification) in the cellular structure of the leaves, *Jung. heterophylla* having squarer, smaller areolation, with thicker walls.

It is generally distributed over northern Europe. North America (Drummond).

First collected in Britain by Mr Jolin Sim, of Strachan, on wet rocks, Burra Firth, Uist, Shetland Islands, June 1878. It was from the examination of specimens he was kind enough to forward to me the species was identified.

To the figures by Dr Gottsche, G. & R. Hep. Eur. No. 417, I am indebted for my figures of colesule and cross-section of it; to Dr Carrington, for gift of foreign specimens, and for the following observations:—

Note.—*Harpanthus scutatus* is smaller in all its parts;

leaves rounder, more rigid, with smaller thicker walled cells; colour darker olive-brown; acutely emarginate, more concave and sub-connivent.

In a barren state it is difficult to distinguish our plant from some of the forms of *Jung. Bantriensis*, and probably on looking over herbaria *H. Flotovianus* may be found under that name. When fertile the position of the colesule, which in *Jungermannia Bantriensis* is terminal, will at once lead to identification. In a barren state the thicker-walled hexagonal cells of a duller green colour should serve to distinguish them.

Description of Drawing.—1, plant natural size; 2, $\times 16$; 3 to 9, leaves $\times 16$; 10 and 11, stipules $\times 30$; 12 to 15, stipules $\times 46$; 16, 17, and 18, leaves from foreign specimens $\times 16$; 19 and 20, stipules from foreign specimens $\times 30$, 21, antheridia $\times 85$; 22 and 23, portions of leaf $\times 290$; 24, colesule (after Gottsche); 25, section of colesule (after Gottsche); 26, portion of rootlets $\times 290$.

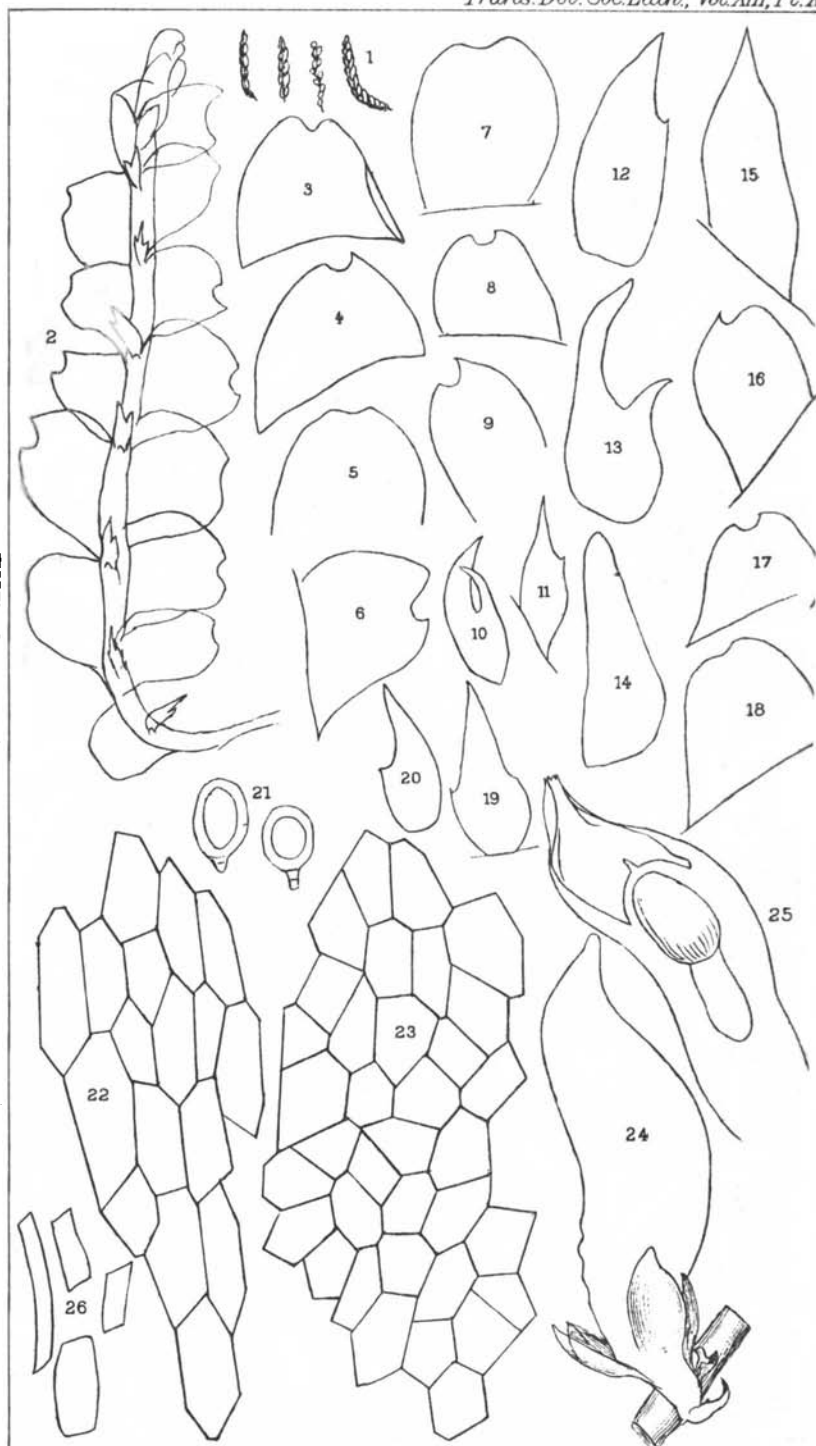
VIII. *On Functional Specialisation of Individuals in Animals and Plants, with Particular Reference to Analogies between the Sertularian Zoöphyte and the Flowering Plant.* By ALEXANDER DICKSON, M.D., Edinburgh and Dublin; LL.D., F.R.S.E., F.L.S., Professor of Botany in the University of Edinburgh.* (Plate XX.)

In accordance with the custom in this, as in other universities, a newly inducted Professor is expected to deliver an Inaugural Discourse, which may have reference to everything in general or to nothing in particular—which may or may not have specially to do with the subject on which in the course of the session he will have to descant.

Sometimes the glories of the university or of the special chair are referred to at greater or less length. In almost all cases, however, it is difficult to dwell upon such themes without laying oneself open to the charge of implied self-glorification, as having been deemed worthy of association with such an institution, or of succeeding such and such

* The following formed Dr Dickson's Inaugural Address to the Botanical Class, 5th May 1879, and is printed by request of the Council.

THE OMBU. (*Phytolacca dioica*)



W. H. P. Pendleton.

M. C. Farlane & Erskine.

HARPANTHUS FLOTOVIANUS NEES.