
XXIV. *Musci Nepalenses; or Descriptions of several new Mosses from Nepal.* By William Jackson Hooker, Esq. F.L.S.

Read June 7, 1808.

IT is through the kindness of Dr. Smith, who has favoured me with specimens for the purpose, that I have now the honour of laying before the Linnean Society figures and descriptions of such of the mosses gathered by Dr. Francis Buchanan, during his journey to Nepal, as appear to have escaped the attention of former writers on this subject. His collection contained also a few others already published, the names of which I have thought it best to insert, as nothing whatever is at present known respecting the *Muscologia* of that very extensive country

1. SPHAGNUM *iridans*.

S. iridans. Bridel. *Suppl. I.* p. 20.

S. javense. Bridel. *Hist. Musc. II.* p. 27. t. 6. f. 3.

S. clandestinum. Palisot de Beauvois. *Prod. Æth.* p. 88.

The only specimen that Dr. Smith has received of this is barren. It is most probably a *Dicranum*, as Bridel suspects, and there is a plant with fructification in Mr. Turner's collection,

gathered by Mr. Menzies in New Zealand, so like it, as to be perhaps not distinct.

2. *OCTOBLEPHARUM albidum*. Hedw.

3. *SPLACHNUM squarrosum*.

Splachnum foliis linear-i-lanceolatis acuminatis serratis: apice horizontaliter patulis, capsula cylindracea, apophysi obconicâ. *Caules* cæspitosi, pollicares, vel sesquipollicares, erecti, nunc simplices, nunc basin versus bifurci; infernè, sicut in *Muscis* aliis loca turfosa colentibus, tomento nigro-ferrugineo densè obtecti, supernè foliosi. *Folia* lutescenti-viridia, undique laxè disposita, basi imbricata, apice horizontalia, vel etiam recurva, linear-i-lanceolata, acuminata, reticulata, margine supra medium argutè et manifestè serrata, nervo crasso, obscuro, in acumen longum, extra paginæ apicem producto, instructa; madore plana, siccitate crispatula. *Pedicellus* terminalis, ferè unguicularis, erectus, strictus, croceus, glaber. *Capsula* luteo-fusca, cylindracea, perbrevis, orâ incrassatâ, in exsiccatis ampliatâ, apophysi insidens obconicæ, capsulâ paullùm longiori, vix tamen latiori, eique concolori, adeò ut una ægrè ab alterâ dignoscatur. *Peristomium* dentibus sedecim, magnis, luteis, incurvis, transversè striatis, per paria approximatis. *Columella* capsulâ brevior. —Neque calyptram nec operculum hactenùs vidi.

Every other species of *Splachnum* at present described having its leaves either pressed close to the stem, or at least between erect and patent, there can be no difficulty in distinguishing the present, in which they are, both when moist and dry, disposed in a horizontal direction. In addition to this most obvious

obvious distinction, they are more deeply serrated than those of all the other species, without excepting even *S. serratum*, and the reticulations are less apparent than is common in most of the individuals of this beautiful genus. The apophysis is so obsolete as scarcely to be distinguishable from the capsule, which in its form bears a great resemblance to that of *S. tenue*. Dr. Buchanan found this plant at Naram Hetty.

TAB. XXVI. Fig. 2.

- a. *Splachnum squarrosum*, natural size.
- b. *leaf*, magnified.
- c. *capsule*, magnified.

4. PTEROGONIUM *declinatum*.

Pterogonium caule repente, foliis imbricatis ovatis integerrimis mediotenuis uninervibus, capsula declinata, operculo incurvato.

Caules procumbentes, reptantes, ramosissimi, ramis vagis, numerosis, unguicularibus, adscendentibus, divisis, curvatis, teretibus, apicem versus leviter incrassatis, basi denudatis, indè foliosis. *Folia* pallidè viridia, laxiusculè imbricata, erecto-patula, ovata, brevitè acuminata, plana, margine integerrima, nervo obscuro concolore ultra medium evanescente instructa; *perichætia* reliquorum similia, sed aliquantum angustiora, magis acuminata et lutescentia, basi rufescente. *Pedicellus* lateralis, ramorum prope medium ortus, unguicularis, erectus, rufo-fuscus, infernè laevis, superne punctis elevatis scabrosus. *Capsula* oblonga, infra oram aliquantum angustata, declinata, rufo-ferruginea, punctata, orâ incrassata. *Operculum* capsulae concolor, ejusque

instar punctatum, conicum, curvulum. *Calyptra* tenuis, dilutè fusca, subulata, curvata, dimidiata, lævis. *Peristomium* dentibus sedecim, suberectis, e capsulæ membranâ interiore reticulatâ ortis, linearis-subulatis, luteis, transversè striatis, a basi ad medium longitudinaliter fissis.

I have named this plant from its most obvious character, the drooping capsule, in which it differs from all the other species of this genus described by Hedwig or Bridel, and has, in consequence of it, so completely the appearance of a *Hypnum*, that no one would suspect its real family, without first examining it. There will also be found under the microscope a strong peculiarity in the circumstance of the teeth of the peristomium being cleft in a very curious manner.

TAB. XXVI. Fig. 3.

- a. *Pterogonium declinatum*, natural size.
- b. part of a branch, magnified.
- c. leaf.
- d. perichaetial leaf.
- e. capsule.
- f. operculum.
- g. calyptra, with the operculum.
- h. teeth of the peristomium.

5. PTEROGONIUM *ambiguum*.

Pterogonium caule pendulo pinnato, foliis obovatis concavis uniovibus, capsulâ terminali globosâ sessili, operculo planiusculo.

Caules semipedales et ultrà, denudati, tenues, subflexuosi, debiles,

biles, penduli, pinnatim ramosi; rami ut plurimum alterni, vel rarius secundi, hic illie intervallis bi- tri-linearibus se- tuncti, horizontales, circiter pollicares, aliis minoribus simili modo pinnati, foliosi. *Folia* laxè imbricata, erecto-paten- ia, obovata, brevitè apiculata, valde concava, margine propè apicem involuto, cætera plano, ubique integerrimo, nervo obscuro ante apicem evanescente instructa; *perichæ- tialia* erecta, ovato-lanceolata, acutiuscula, paullum modò concava, margine supernè revoluta, nervo ad apicem usque attingente pereursa; omnia siccitate longitudinaliter striata. *Capsulæ* propemodùm sessiles, foliis perichaetialibus im- mersæ, ramorum brevissimorum reliquis immixtorum ad ex- tremitates terminales, globosæ, rufo-fuscae, venis anastomos- antibus eleganter pictæ, orâ valdè contractæ, margine an- gusto, elevato. *Operculum* planum, aut obsoletissimè et obtusissimè umbonatum. *Peristomium* dentibus sedecim obtusecuneiformibus, luteis, transversim striatis, semper, quan- tum vidi, clausis, et nunquam vel erectis vel reflexis.

The capsules of this very singular moss have a remarkably contracted mouth, furnished with a narrow elevated margin, below which the operculum is situated; this is nearly flat, hav- ing an elevation in the centre so slight that it does not reach to the edge of the margin. The peristomium, which, on account of its minuteness, is very difficult to examine, has 16 obtusecuneiform, yellowish teeth placed close together in a horizontal direc- tion, never, as far as I could discern, becoming erect, but re- sembling, in situation as well as in appearance, those of the *Fu- nariae*. I have given this plant the name of *P. ambiguum*, as I cannot help still regarding it as uncertain to what genus it pro- perly belongs, its terminal sessile capsules, its operculum, and

its whole habit appearing to require that it should ultimately be removed from the *Pterogonia*, with which, on account of its peristomium, it did not appear possible to avoid associating it at present.

TAB. XXVI. Fig. 4.

- a. *Pterogonium ambiguum*, natural size.
- b. *capsuliferous branch*, magnified.
- c. *leaf*.
- d. *perichaetial leaf*.
- e. *capsule*.
- f. *operculum*.
- g. *peristomium, with the capsule*.

6. *DICRANUM scoparium*. Hedw.7. *POLYTRICHUM aloides*. Hedw.8. *NECKERA sphærocarpa*.

Neckera caule pinnato, ramis abbreviatis, foliis ovatis acuminatis mediotenuis uninervibus, capsulis subglobosis subsessilibus secundis.

HABITAT in truncis arborum apud Kargoo. D. Buchanan.

Caules bi- tri-pollicares, penduli, ramosi; rami alterni, sparsi, remoti, horizontales, plerumque simplices et breves, longitudo tamen incertæ, paullum flexuosi, apices versus attenuati. *Folia* undique laxè imbricata; superiora cauli appressa, apicibus tamen saepius subsecundis, ovato-lanceolata, longè acuminata, ad apicem minutissimè serrulata, lutescenti-

tescenti-viridia, basi purpurascentia, inferiora patula, vel sœpè recurvato-patula, ex ovato brevitèr modò acuminata, integerrima, atro-viridia; omnia concava, sed ~~margine~~ juxta basin plano, nervo circiter medium evanescere instructa; perichaetalia erecto-patula, pallidè luteo-virescentia; interiora majora, oblongo-lanceolata, acuminata, apicem versus sub-serrata, valdè concava, et aliquantum crispata, nervo obscurò ante medium evanido; exteriora longè minora, lanceolata, plana, integerrima, et basi tantum nervo brevissimo instructa. Capsulæ ramorum ad latera sitæ, semper secundæ, solitariæ, et plerumque intervallis majusculis se-junctæ, subglobosæ, læves, fusco-lutescentes, orâ incrassatâ, rubrâ, brevissimè pedunculatæ, ut prorsùs sessiles videantur, foliis perichaetalibus multò breviores, iisque obtectæ, unde, seorsùm observatæ, *Phasco cuspidato* non sunt absimiles. Operculum conicum, acutum, parùm rugosum, internè striatum, basi annulo composito cinctum. Peristomium duplex, utrumque albicans, et nigro-fasciatum; interius, dentes sedecim filiformes, cum exterioribus, latioribus, brevioribus alternantes. Semina magna, sphærica, fusco-viridia, rugosa, quasi pulvere obtecta, quod, si sub lente in aquâ conspicuntur, evidentissimum est. Calyptra nondum a me visa.

The affinity of this moss with the British *Neckera heteromalla* is too remarkable to escape notice; and it is most pleasant to the scientific observer of nature to find the artificial system of Genera so confirmed by individuals collected on the trunks of trees in England and in the distant regions of Nepal. The spherical capsule appears, however, a sufficient criterion to distinguish the present species from every other at present known.

TAB. XXVII. Fig. 1.

- a. *Neckera sphærocarpa*, natural size.
- b. part of a branch, magnified.
- c. upper leaf, magnified.
- d. apex of the same, more highly magnified.
- e. lower leaf, magnified.
- f. perichætial leaf.
- g. apex, more highly magnified.
- h. capsule and interior perichætial leaf.
- i. operculum.
- k. operculum seen internally with the annulus.
- l. part of the peristomium.
- m. seeds.

9. NECKERA flavesens.

Neckera caule erecto pinnato, ramis simpliciusculis, foliis ovatis enervibus, capsulâ cylindraceâ erectâ, operculo subulato.

Caules tri- quinque- pollicares, erecti, pinnatini ramosi; rami vagi, plerumque alterni, elongati, paullùm flexuosi, sub-compressi, acuti, horizontales, nunc simplices, nunc aliis minoribus similitèr instructi, undique foliosi, Folia laxiusculè imbricata, erecta, et cauli appressa, planiuscula, ova-ta, brevitèr acuminata, prorsùs enervia, lutescentia; summa aureo-fulva; omnia siccitate nitentia, basi reticulata, margine integerrima; perichætialia reliquorum similia, sed minora, angustiora, et longissimè acuminata, recurvato-patula. Pedicelli in ramis siti, unciales, laterales, læves, erecti, tenuissimi, rufi. Capsula oblongo-cylindracea, tenuis, erecta, ru-fescens,

fescens, pulcherrimè reticulata. *Operculum* capsulæ concolor, cāque dimidio brevius, similiter reticulatum, e basi conicā subulatum, obtusiusculum. *Calyptra* cylindraceo-conica, dilutissimè fusca, glabra, nuda, integra secedens.

Among the Neckeræ Bridel enumerates no more than two species which have leaves imbricated on all sides, and upright pendunculated capsules, (*N. curtipendula*, and *N. dendroides*,) both of which are of too common occurrence, and are too easily distinguished, for there to be any necessity of pointing out the differences that separate them from *N. flavescens*, here figured, the name of which I have derived from the colour.

TAB. XXVII. Fig. 2.

- a. *Neckera flavescens*, natural size.
- b. part of a branch, magnified.
- c. leaf.
- d. perichaetial leaf.
- e. capsule.
- f. operculum.
- g. capsule covered with a calyptra.

10. NECKERA tenuis.

Neckera caule bipinnato, foliis imbricatis serratis: caulinis cordato-subrotundis basi bistriatis, capsulâ erectâ, operculo incurvo.

Caulis procumbentes, repentes, palmates et ultrà, variè flexuosi, cæspitosi, implexi, ramosissimi. *Rami* horizontales, erecti-usculi, distichi, vagè pinnati, sub-pollicares, longitudine tamen incertæ, minoribus eâdem ratione dispositis obsiti,

undique foliosi, siccitate incurvi et crispatuli. *Folia* lutescentia, nitida, laxiusculè imbricata, marginibus ab apice ad medium usque serrata; *caulina majora*, horizontalia, plana vel paullùm undulata, cordato-subrotunda, breviter apiculata, basi obsoletè bistriata; *ramea minora*, concava, erecto-patula, siccitate magis appressa, ovata, mutica, prorsùs enervia; *perichætialia* albicantia, lanceolata, longè acuminata, reflexa, apice modò serrata. *Pedicelli* in caulis laterales, sesquipollicares, erecti, tenues, laeves, rubri. *Capsula* pedicello concolor, reticulata, erecta, oblonga, orâ contractâ. *Operculum* ejusdem quoque coloris, e basi convexâ rostratum, rostro curvato, capsulâ triplò brevius. *Peristomium* breve, flavum, striatum.

Though I have named this plant from its very thin stem and branches, it has a peculiarity still more remarkable in the twisting of the branches when dry, in which I believe that no other species of *Neckera* participates with it. It belongs to the same division as that last mentioned, and is consequently immediately distinguishable from every other.

TAB. XXVII. Fig. 3.

- a. *Neckera tenuis*, natural size.
- b. part of a stem and branch, magnified.
- c. stem leaf.
- d. leaf of the branch.
- e. perichætial leaf.
- f. capsule.
- g. operculum.

11. BARTRAMIA *fontana*. Hedw.

12. BARTRAMIA *falcata*.

Bartramia caule subdiviso apice falcato, taliis quadrifariis ovato-lanceolatis serratis secundis, pedicellis caulem subæquantibus.

Caules densè cæspitosi, tripollicares et ultrà, nunc simplices, nunc infernè bis ter vagè dichotomi, tomento denso ferrugineo-fusco ad medium longitudinis obsiti, indè foliosi. *Rami* fastigiati, erecti, apicibus insigniter falcatis. *Folia* lætè viridia, quadrifariam posita, laxiusculè imbricata, erecto-patula, apicibus tamen, præsertim siccitate, secundis, ovato-lanceolata, acuminata, concavo-carinata, margine ubique serrata, pulcherrimè reticulata, nervo valido, fusco, excurrente instructa; *perichætialia* vix discrepant, nisi quod sint e basi ovatâ in acumen multò longius producta, apice solummodò serrata, et pallidè lutescentia. *Pedicelli* læves, e ramorum axillis caulis infra medium orti, pollicares et ultrà, sed longitudine vix ramos excedentes, fusi, erecti, vel basi flexuosi. *Capsula* globosa, subcernua, fusca, matura sulcata. *Operculum* deest. *Calyptra* integra, cylindraceo-conica, albicans, glabra. *Peristomium* fusco-rubescens.

This very distinct and beautiful species of a beautiful genus is most nearly allied to *B. fontana*, and particularly to the var. β . of the plant figured in Mr. Turner's *Muscologia Hibernica* (t. 10. f. 1.), but it differs in having the leaves more loosely imbricated, always disposed in four rows, with summits slightly incurved, and pointing the same way, as is particularly observable in dried specimens.

specimens. They are also serrated throughout their whole length. Besides this, the ends of the branches are remarkably incurved; which furnishes so strong and obvious a character of the plant that I have derived the specific name from that circumstance.

TAB. XXVII. Fig. 4.

- a. *Bartramia fulcata*, natural size.
- b. parts of the branch, magnified.
- c. leaf.
- d. perichaetial leaf.
- e. capsule.
- f. calyptra.

13. *BRYUM heterophyllum*.

Bryum caule subdiviso, foliis serratis: infimis subrotundis; summis linear-acuminatis, capsula cernua, operculo convexo.

Caules cæspitosi, simplices, vel prope basin vagè divisi, unciales et ultra, per dimidiam ferè longitudinem terrâ immersi et aphylli; inde foliosi. *Folia* majuscula, atro-purpurea, margine incrassata, purpurea, serrata, nervo valido purpureo instrueta, elegantissimè réticulata, madore erecto-patula, siccitate crispata. *Foliorum* forma, et nervi longitudo, mirè variant; *inferiora* ovata seu ovato-subrotunda, apice modò minutè serrata, nervo circa medium evanescente instructa; *intermedia* ovato-elliptica, magis evidentè serrata, nervo infra apicem evanescente; *superiora* longe-lanceolata, argutè serrata, nervo valido excurrente; omnia acuta. *Pedicellus* terminalis, erectus, uncialis, lævis, infernè croceus, supernè rutilans. *Capsula* ovato-oblonga, subcernua, fusca.

Operculum

Operculum capsulâ pallidius, conicum, umbone minuto, obliquo terminatum. *Peristomium* exterius dentibus fusco-flavescensibus, transversim striatis; interius dentibus membranaceis, flavis, similiter striatis.

The singularly variable form of the leaves offers so strong a character of this moss that I have derived from it the specific name. In size and in general appearance, when dry, it considerably resembles *Mnium stellare* of Hedwig, near which it must be arranged in the system.

TAB. XXVIII. Fig. 1.

- a. *Bryum heterophyllum*, natural size
- b. *upper leaf*, magnified.
- c. *intermediate leaf*.
- d. *lower leaf*.
- e. *portion of the leaf*, highly magnified.
- f. *capsule*.
- g. *operculum*.

14. LESKEA *flexilis*.

L. flexilis. Hedw. Sp. Musc. p. 234. t. 58

I am induced to offer a figure of the leaves of this very curious moss, the specimens gathered by Dr. Buchanan differing from those figured by Hedwig, in having their leaves furnished at the base with a very evident, though short nerve, and tipped in many instances with a piliform mucro. Dr. Buchanan found it upon trees mixed with *Pterogonium ambiguum*, and, like Dr. Swartz, found it only barren. I have compared the individual

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here figured with original specimens in Mr. Turner's valuable Herbarium, and find them agree so precisely in every particular, excepting those just mentioned, as to leave no doubt of their identity.

TAB. XXVIII. Fig. 2.

- a. small branch, magnified.
- b. leaves.

15. *HYPNUM proliferum.*16. *HYPNUM Buchanani.*

Hypnum caule procumbente, ramis erecto-patulis, foliis ovatis acuminatis subserratis uninervibus, capsulâ cernuâ, operculo conico obtuso.

Caules bi- tri- pollicares, adscendentes, pinnatim ramosi. Rami erecti, circiter unguiculares, subdistichi, sparsi, plerumque simplices, sed interdum repetito-divisi, filiformes, teretes, acuminati, undique foliosi. Folia lutescenti-viridia, nitida, undique laxè imbricata, erecta, plana, ovata, longè acuminata, nervo tenui, viridi, ad medium usque percurrente instructa, apices versus subserrata, et apicibus, præcipue in ramis superioribus, flexuosis; caulinæ majora, latiora, ad basin striata; rameæ angustiora; omnia elegantè reticulata; perichætialia linear-lanceolata; longè acuminata, apice torta et reflexa. Pedicelli in ramis orti, frequentes, subunguiculares, rufi, erecti, laeves. Capsulæ rufo-fuscæ, cernuæ, oblongæ, reticulatæ. Operculum conicum, obtusum, capsulæ concolor, et similiter reticulatum. Calyptra dimidiata, subulata, fuscella, laeyis.—Exemplarium ætas haud satis provecta peristomium investigare vetuit.

I am

I am at a loss to say which *Hypnum* approaches most nearly to that here figured, as it belongs to the division "ramis teretibus," the most numerous and intricate of this immense genus. I flatter myself, however, with the hopes that the figure and character here given will serve to distinguish it from all others. I have named it after Dr. Francis Buchanan, who found all the mosses that form the subject of this paper.

TAB. XXVIII. Fig. 3.

- a. *Hypnum Buchanani*, natural size.
- b. part of the branch, magnified.
- c. stem leaf.
- d. perichaetial leaf.
- e. capsule, with the operculum.
- f. calyptra.

17. *HYPNUM crispatulum*.

Hypnum caule adscendente, ramis erectis aduncis, foliis falcatis secundis lanceolatis serratis uninervibus siccitate crispis.

Caules adscendentes, simplices, vel bis ter dichotomi. Rami erecti, apicibus incurvatis, undique foliosi. Folia dilutè fusco-flavescentia, nitidiuscula, undique imbricata, laxè disposita, falcata, secunda, oblongo-lanceolata, acuminata, nervo concolore infra apicem evanescente instructa, et striis aliquot longitudinalibus notata; per totum marginem argutè serrata, plana, vel sæpè concavo-carinata, paullùm undulata, siccitate insigniter crispata. Fructificationem non vidi.

This Hypnum, of which I possess but very imperfect specimens, belongs evidently to the division "foliis reflexis," and appears so different from all the individuals composing that section, that I have ventured upon describing it as a new species. It is nearly allied, both in form and general habit, to *H. rugosum* of *Fl. Brit.* (not *Hedw.*), but may be easily distinguished from it by the form of the leaves, which are considerably more narrow, and by the serratures which extend the whole length of the margin, whereas the leaves of *Hypnum rugosum* are entire

TAB. XXVIII. Fig. 4.

- a. *Hypnum crispatum*, natural size.
- b. part of a branch, magnified.
- c. c. leaves.



XXV. EXTRACTS





