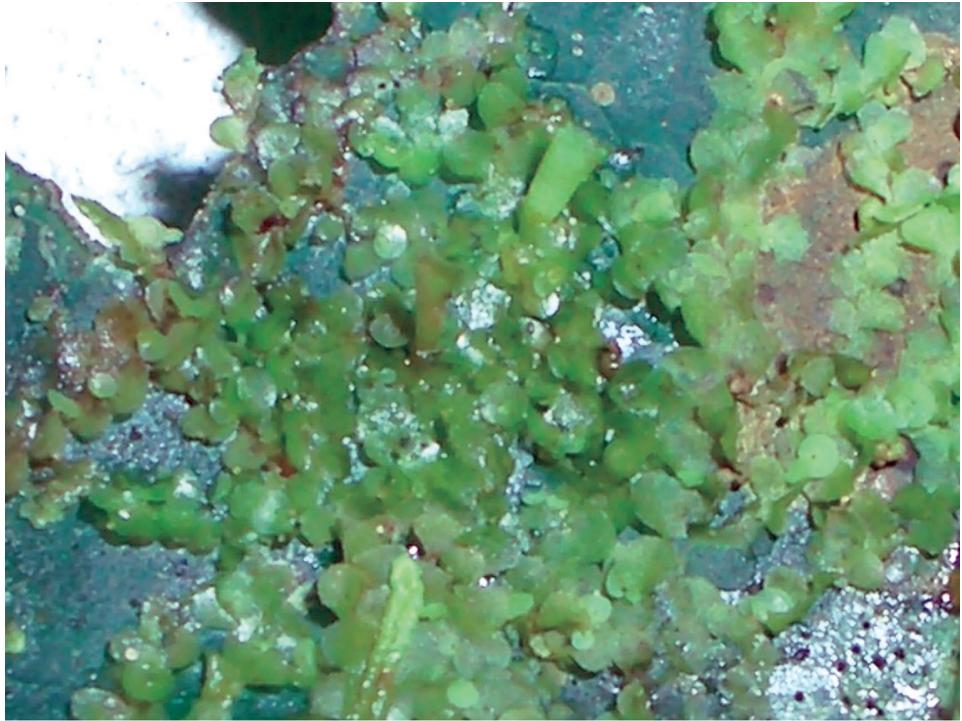
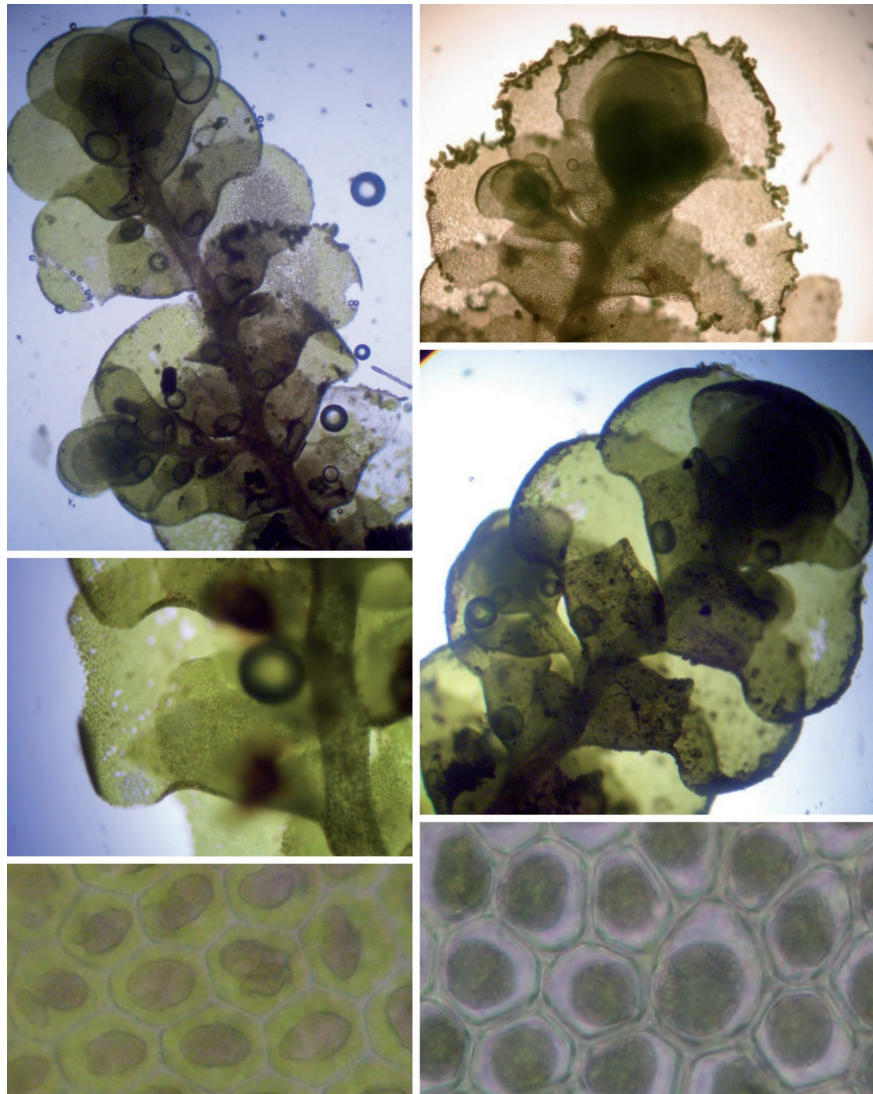


**Figs 337 and 338 (next page).** *Radula flaccida* Lindenb. & Gottsche

Plants green, regularly pinnate or bipinnate, closely appressed to the substrate, shoots 1.5-1.9 mm wide. Leaves flat, approximate or moderately imbricate, bearing reniform stipitate gemmae on the antical margin, the base crossing the stem. Lobule occupying 1/3 the width of the shoot, apex prolonged into a blunt liguliform beak, directed forwards parallel to the stem, keel nearly straight or concave, decurrent, forming an angle of 40-45° with the stem and a wide sinus with the lobe. Cells without trigones. Dioicous. Perianth erect, narrowly conical, up to 2.8 mm long. **Habitat:** Follicolous in montane forest, 2000-2500 m. **Distribution in Rwanda:** Nyungwe NP: Rwasenkoko, Karamba, Kamiranzovu, Uwinka. **Distribution in Africa:** Guinea, Sierra Leone, Ivory Coast, Ghana, Nigeria, São Tomé, Príncipe, Bioko, Cameroon, Rio Muni, DR Congo, Uganda, Kenya, Tanzania, Angola. Also Comoros.

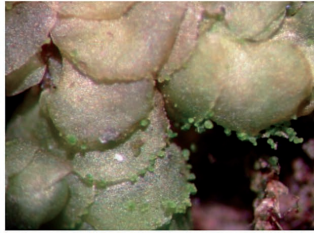
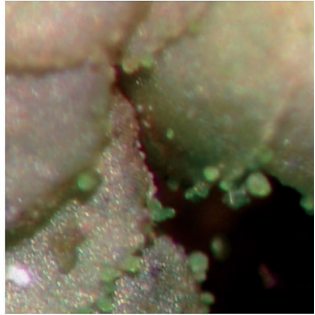




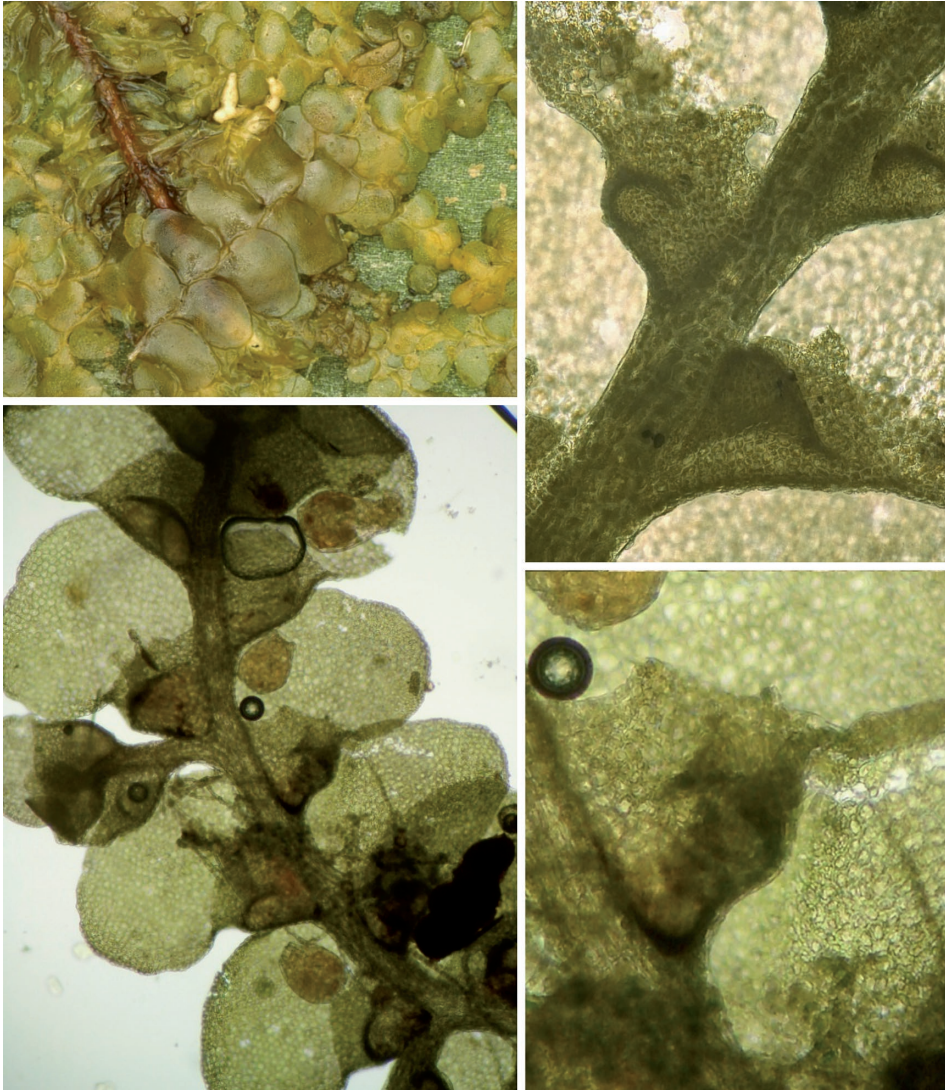


**Figs 339 and 340 (next page). *Radula quadrata* Gottsche**

Synonym: *Radula recurvifolia* Steph. Plants green, irregularly pinnately branched, shoots 1.8-2.5 mm wide. Leaves convex, imbricate, 1-1.5 x 0.68-1.2 mm, always with gemmae on margin. Lobule a little longer than wide, with a long insertion, the base occupying more than 1/2 of the width of the shoot, the keel usually nearly straight, making an angle of 50-80° with the stem, the base extending far across the stem but not auriculate. Cells with small trigones, 18-20 µm in diameter. Dioicous. Perianth compressed, 1-2.7 x 1.5-3.5 mm, the mouth truncate. **Habitat:** Epiphyte in ericaceous heath with *Andropogon shirensis*, 2500 m. **Distribution in Rwanda:** Nyungwe NP: Rwasenkoko. **Distribution in Africa:** Bioko, Cameroon, DR Congo, Socotra, Eritrea, Ethiopia, Uganda, Kenya, Tanzania, Malawi, South Africa. Also Comoros, Madagascar, Mauritius, South America.



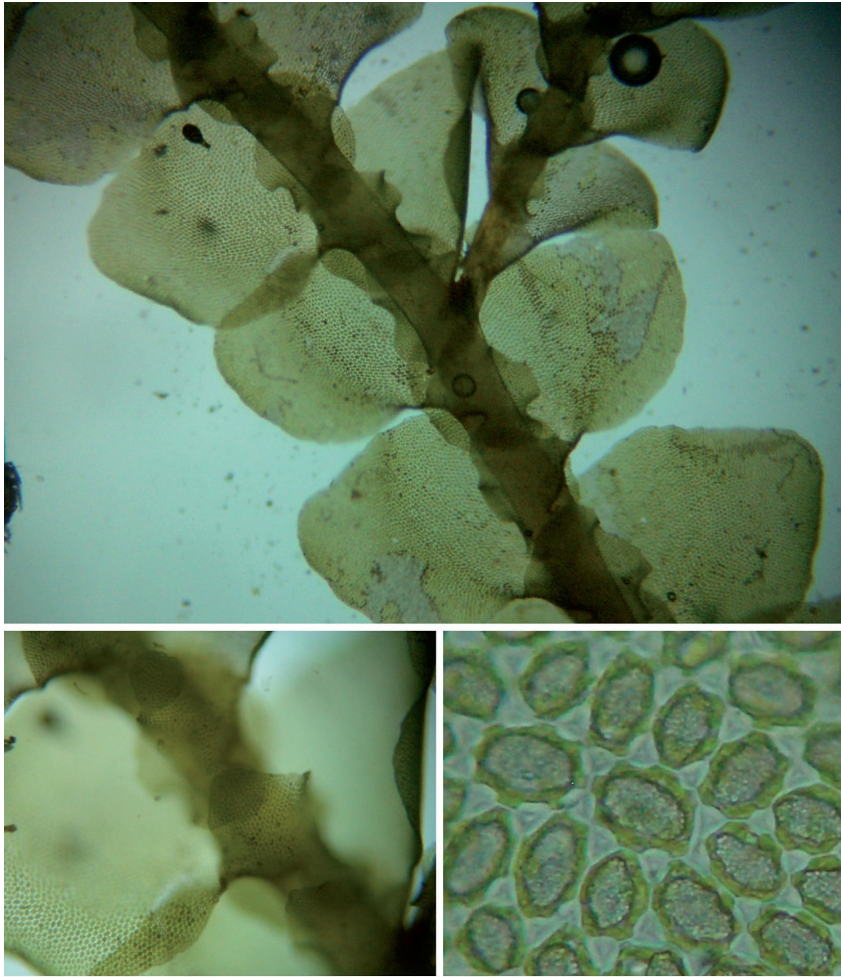




**Fig. 341. *Radula stenocalyx* Mont.**

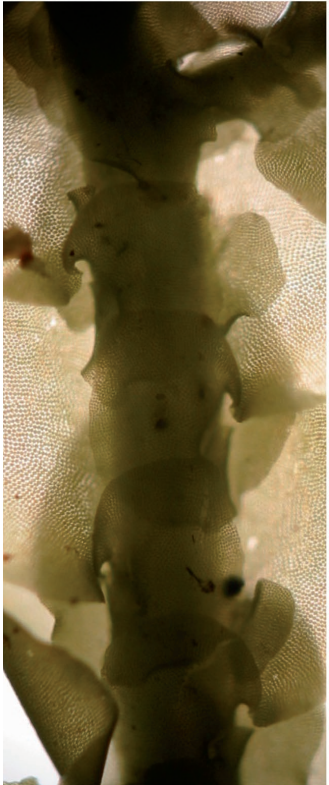
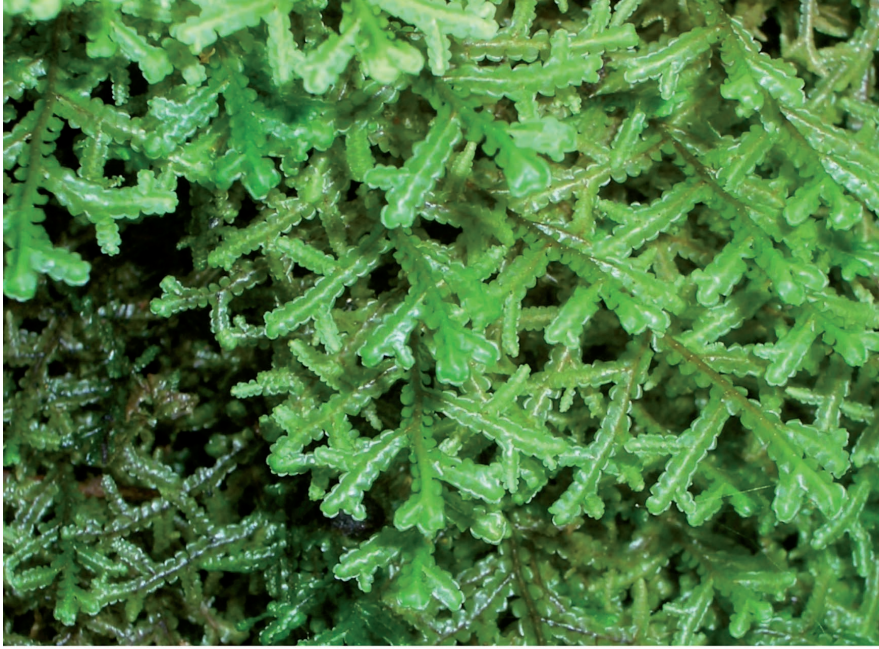
Plants green, pinnately branched, shoots 1-1.8 mm wide. Leaves ovate, approximate, 1-1.5 x 0.68 -0.8 mm, bearing discoid gemmae. Lobule a little longer than wide, with a long insertion, the keel extending rather less than 1/2 the distance from insertion to leaf apex, very strongly convex, making an angle of 90° with the postical margin of the lobe, the base narrow. Cells without or with minute trigones, 15-25 µm in diameter. Dioicous. Perianth compressed, 0.5 x 2.5 mm, the mouth compressed, slightly and irregularly lobed.

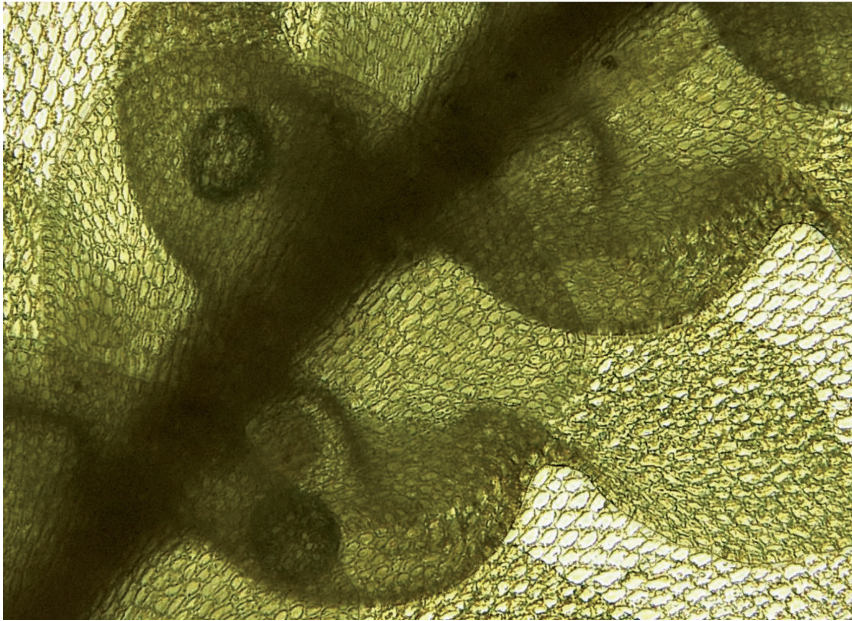
**Habitat:** Epiphyllous in montane forest, 1950-1970 m. **Distribution in Rwanda:** Nyungwe NP: Gisakura. **Distribution in Africa:** Guinea, Sierra Leone, Ghana, São Tomé, Bioko, Cameroon, Rio Muni, Gabon, DR Congo, Burundi, Uganda, Kenya, Tanzania, Malawi, South Africa. Also Comoros, Madagascar, Mauritius, Réunion, Seychelles.



**Figs 342 and 343 (next page).** *Radula voluta* Tayl. ex Gottsche, Lindenb. & Nees  
 Synonyms: *Radula stipatiflora* Steph.; *R. allamanoi* Gola. Plants pale yellow brown or green, pinnately branched, up to 4-10 cm long. Leaves flat or slightly convex, sometimes caducuous, approximate or imbricate, 1-4.5 x 1.1-3.6 mm, the base crossing the stem, sometimes auriculate. Lobule a little wider than long, with a long insertion, the base occupying rather more than 1/2 of the width of a strong shoot, convex, strongly ampliate, apex rectangular, often exceeding the stem, keel nearly straight or slightly concave, forming an angle of 40-60°. Cells with thin trigones. Dioicous. Perianth conical or with oblong apex, up to 2.5-6 mm long. **Habitat:** Montane forest, *Hagenia-Hypericum* forest and *Dendrosenecio-Lobelia stuhlmannii* paramo, 2000 - 3900 m. **Distribution in Rwanda:** **Volcano NP:** Karisimbi, in the saddle between Mt. Bisoke and Mt. Karisimbi, Karisimbi, on E-slopes along trail to summit, Bisoke, crater crest, Sabinyo, Muhavura. **Gishwati Forest:** Gikungu, vallée de Sebeya. **Nyungwe NP:** Rwasenkoko, Mt. Muzimu. **Distribution in Africa:** Bioko, DR Congo, Socotra, Ethiopia, Uganda, Kenya, Tanzania, Malawi, South Africa. Also Madagascar, Mauritius, Réunion.

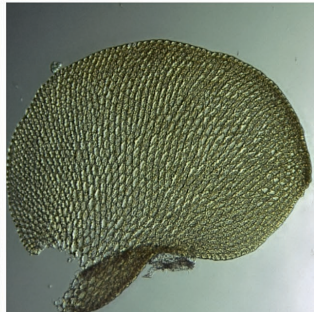
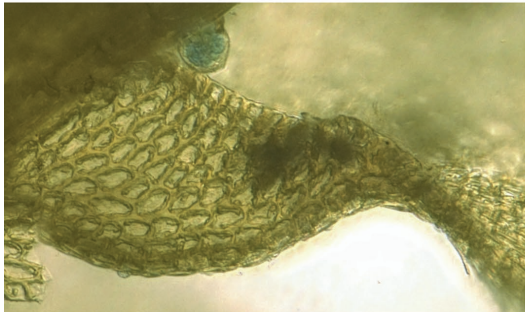
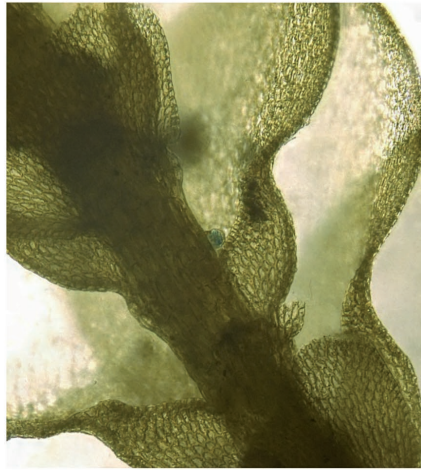
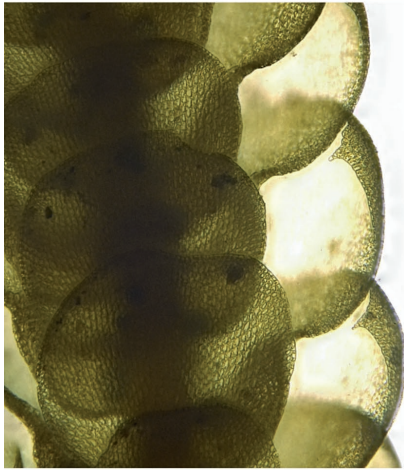
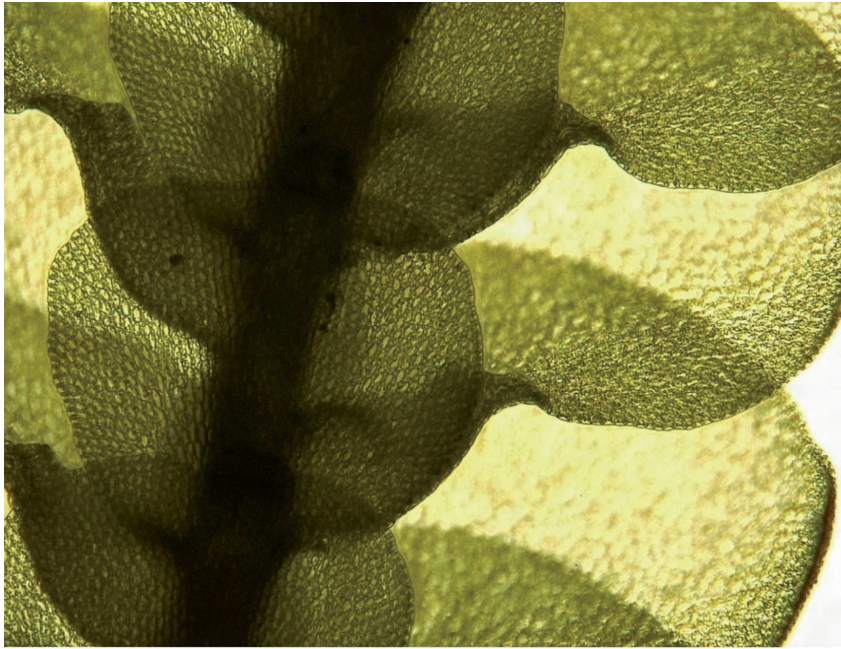


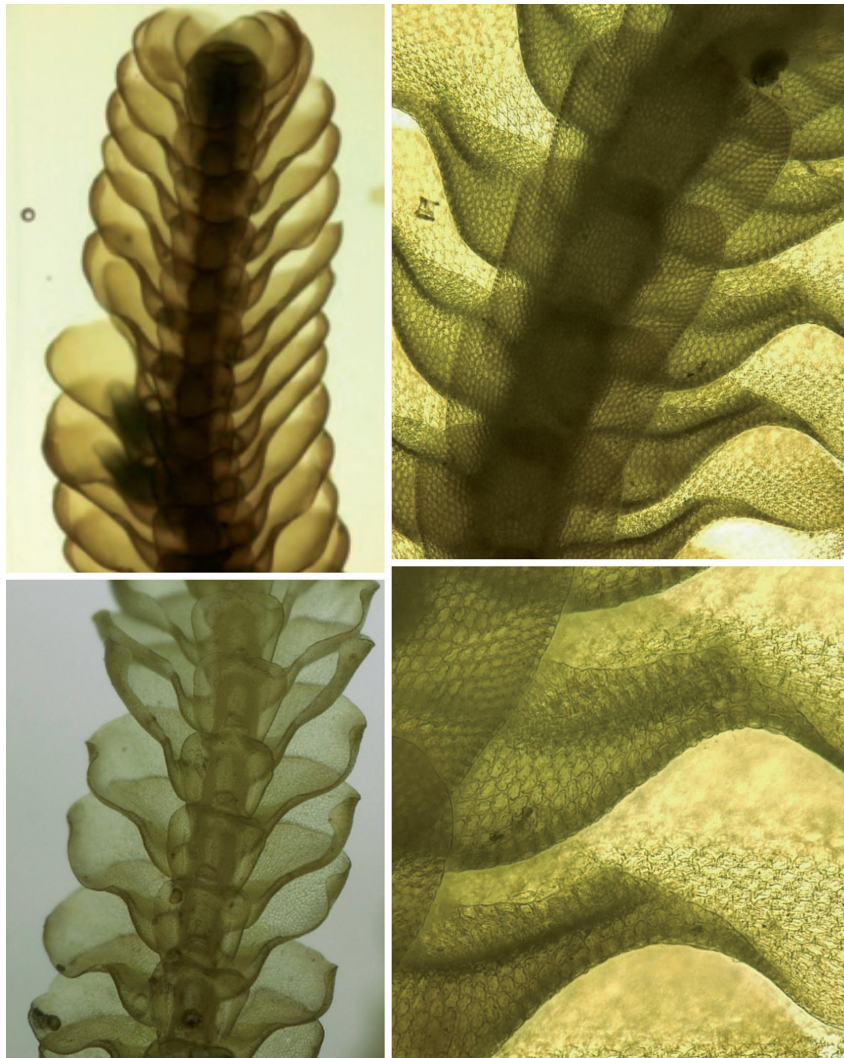




**Figs 344 and 345 (next page).** *Schiffneriolejeunea altimontana* Vanden Berghen  
 Plants epiphytic, glossy brown. Stems prostrate to ascending, 2-3 cm long. Leaves alternate, densely imbricate, convolute and wrapped around the stem when dry. Lobes with apex apiculate, 0.6-0.8 x 0.9-1.2 mm. Lobules inflated, free margin sinuate, 0.22-0.27 x 0.37-0.46 mm, with 1 apical tooth of 2-3 cells. Cells with trigones cordate, 15-20 x 21-28  $\mu$ m. Underleaves undivided, 0.6-0.75 x 0.6-0.82 mm, base not auriculate. Dioicous. Perianths smooth, with 3 distinct keels in the upper third, slightly exserted, 0.7-0.88 x 1.4-1.5 mm, rostrum indistinct or lacking. **Habitat:** Epiphytic in montane forest, 2200-2500 m. **Distribution in Rwanda:** Nyungwe NP: Uwinka, Mt. Muzimu, Pindura-Bweyeye. **Distribution in Africa:** DR Congo (Kahuzi-Biéga), Uganda, Tanzania.

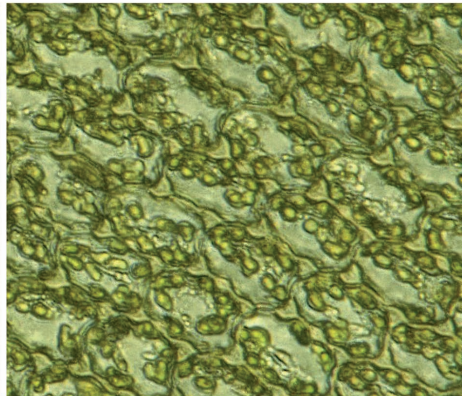
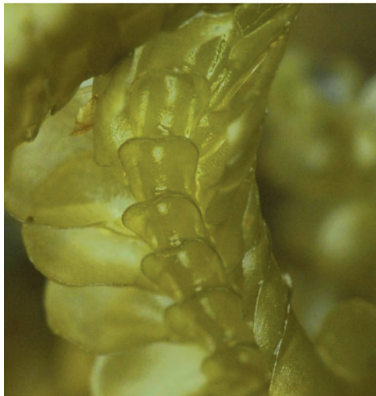
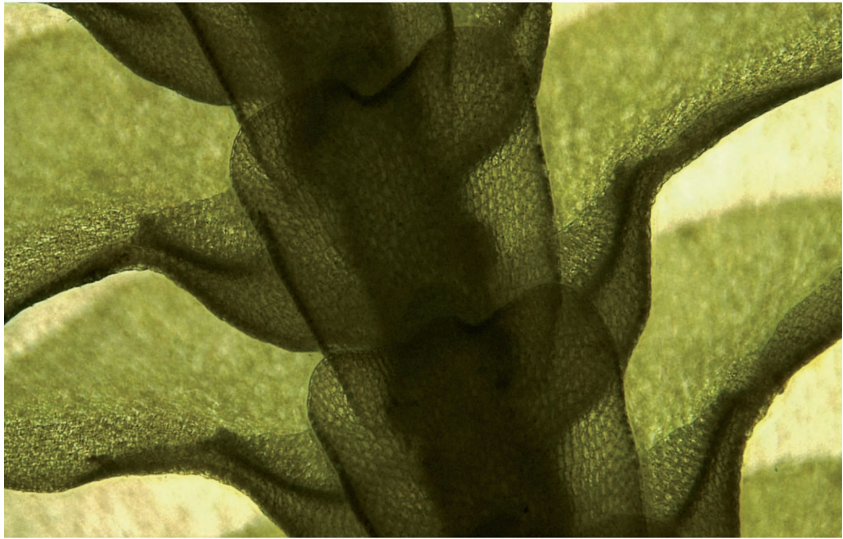


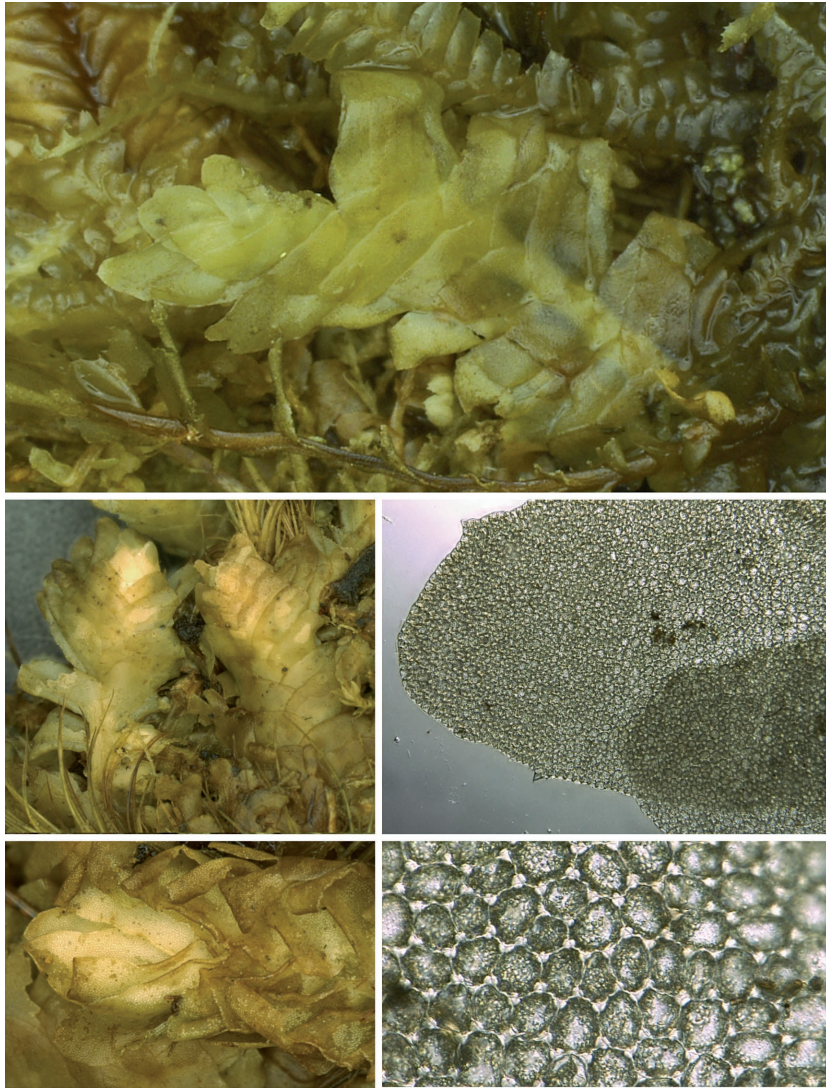




**Figs 346 and 347 (next page).** *Schiffneriolejeunea pappeana* (Nees) Gradst. Plants epiphytic, brown to olive or blackish. Stems prostrate to ascending, 1.5-3.5(-6) cm long. Leaves alternate, densely imbricate, convolute and wrapped around the stem when dry. Lobes with apex obtuse, ovate-elliptical, 0.7-0.85 x 0.9-1.3(-1.8) mm. Lobules inflated, rectangular, 0.4-0.5 the length of the lobe, with 1 apical tooth. Cells with trigones cordate, 15-20 x 18-28  $\mu$ m. Underleaves undivided, 0.6-0.75 x 0.6-0.82 mm, base auriculate. Dioicous. Perianths smooth, without keels or only slightly keeled in upper part, deeply immersed, rostrum well developed. **Habitat:** Epiphyte in montane forest, 2000-2380 m. **Distribution in Rwanda:** Gishwati Forest: Gikungu. **Nyungwe NP:** 1 km E of Pindura, near small waterfall. **Distribution in Africa:** Guinea, Annobón, São Tomé, Bioko, Cameroon, Central African Republic, DR Congo, Ethiopia, Uganda, Kenya, Tanzania, Angola, Malawi, Zimbabwe, South Africa. Also Madagascar, Mauritius, Réunion.







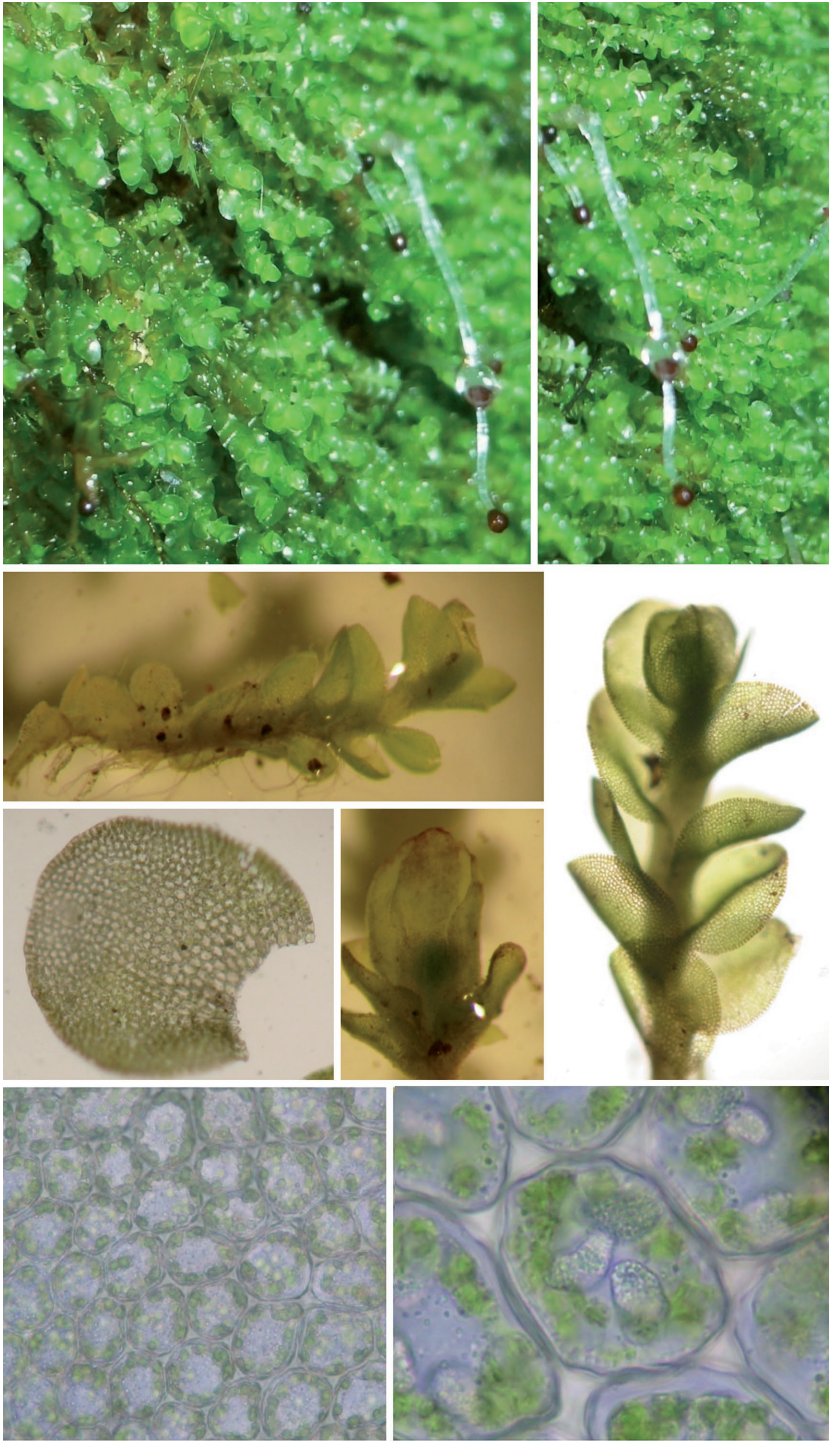
**Fig. 348. *Schistochila engleriana* Steph.**

Synonyms: *Gottschea engleriana* (Steph.) Grolle & Zijlstra; *Paraschistochila engleriana* (Steph.) Schust. Shoots 5-8 mm wide. Lower lobes of leaves 3.5 x 0.9-1.3 mm, (2.5-)3-4(-4.5) x as long as wide, ligulate with broadly rounded nearly entire apex to narrowly lanceolate with tapering acute coarsely serrate apex, dentition variable. Upper lobe with a straight suture extending for 1/2 the length of the lower lobe, convex, oblong to ovate-oblong, base not crossing stem, apex truncate with short apiculus to rounded without apiculus. Underleaves often absent, if present bifid, 0.3 x 0.2 mm. Cells 25-35  $\mu$ m wide, with nodular trigones. **Habitat:** Epiphytic or on dead wood in montane forest, 2000 m. **Distribution in Rwanda:** Nyungwe NP: Gisakura. **Distribution in Africa:** Tanzania, Malawi. Also Comoros.

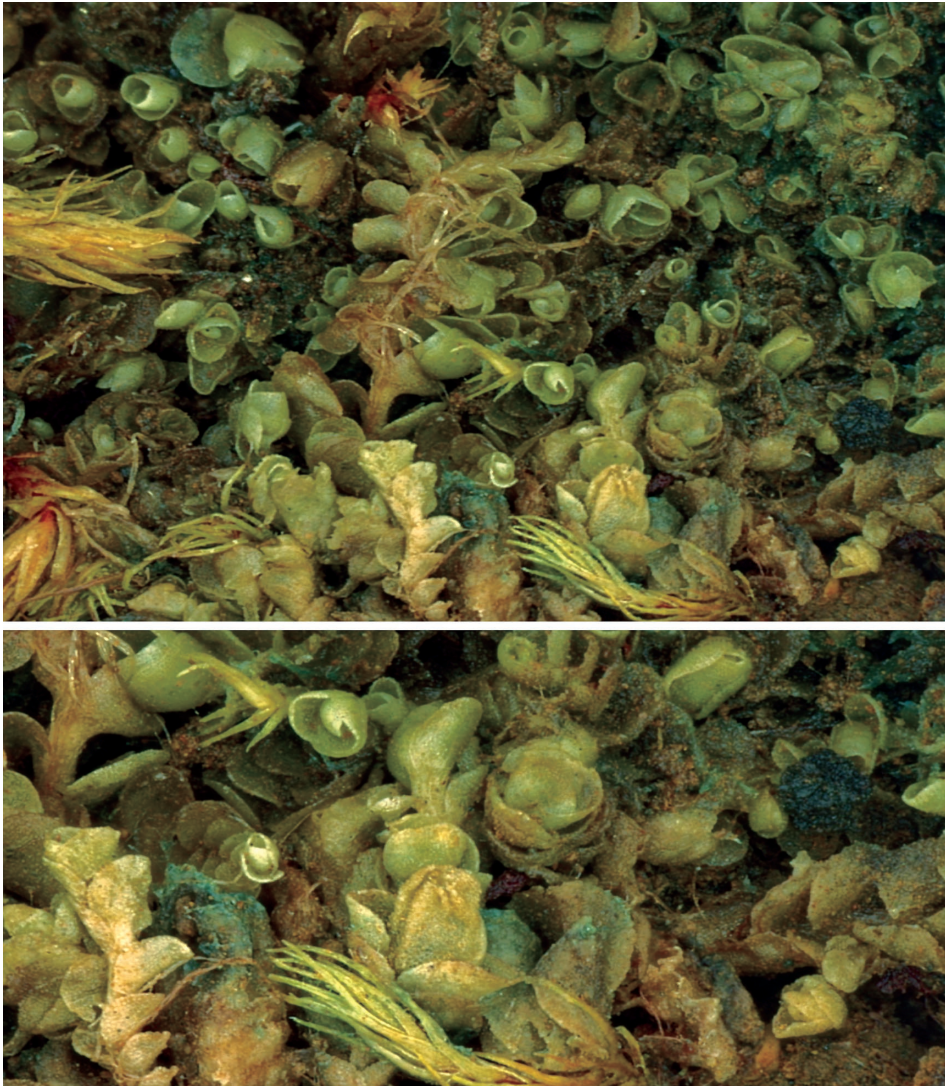




**Figs 349 and 350 (next page). *Solenostoma borgenii*** (Gottsche ex Pears.) Steph. Synonym: *Jungermannia borgenii* Gottsche ex Pears. Plants green to brown. Rhizoids abundant on stem, brown or purple. Leaves nearly orbicular, 0.4-1 x 0.4-1 mm. Cells thin-walled, c. 23-35 x 20-27  $\mu\text{m}$ , trigones distinct. Dioicous. Perianths emergent, pyriform, abruptly narrowed to the mouth. **Habitat:** On damp peaty soil in ericaceous heath with *Andropogon shirensis*, *Hypericum-Dendrosenecio* subparamo, open *Dendrosenecio-Lobelia wollastoni* paramo, 2400-3900 m. **Distribution in Rwanda: Volcano NP:** Karisimbi, at E-slopes along trail to summit. **Nyungwe NP:** Rwasenkoko, waterfall c. 3 km E of Pindura. **Distribution in Africa:** São Tomé, Bioko, Cameroon, Congo-Brazzaville, DR Congo, Uganda, Kenya, Tanzania, Angola, Malawi, Zambia, Zimbabwe, Botswana, South Africa. Also Madagascar, Mauritius, Réunion.







**Fig. 351. *Solenostoma mildbraedii*** (Steph.) R.M.Schust.

Synonym: *Jungermannia mildbraedii* Steph. Plants green, yellow green, olive-brown or brownish-green. Shoots 0.5-3 cm long and 0.3-1.4 mm wide, prostrate to ascendant, rhizoids numerous, brownish to yellow-brown. Leaves ovate, rarely cordate to orbiculate, concave, decurrent only at dorsal margin. Cells isodiametric, (18-) 20-30  $\mu\text{m}$  in leaf center, trigones small or lacking. Paroicous. Perianths at maturity exceeding the bracts, ovate to clavate. **Habitat:** On damp peaty soil in ericaceous heath with *Andropogon shirensis*, *Hypericum-Dendrosenecio* subparamo, open *Dendrosenecio* paramo, 2400-3400 m.

**Distribution in Rwanda: Volcano NP:** Karisimbi, at E-slopes along trail to summit.

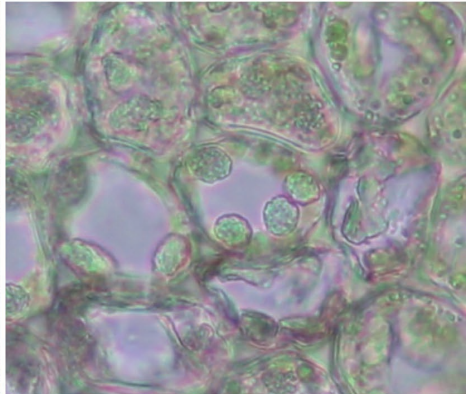
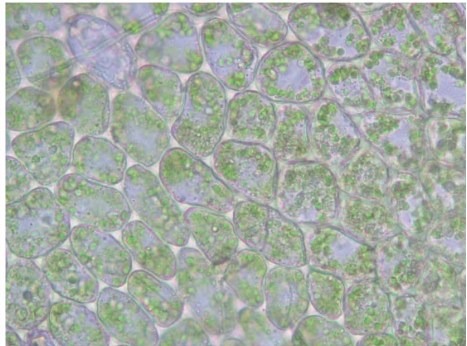
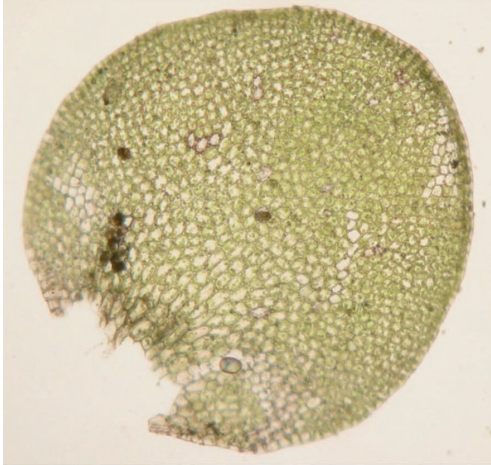
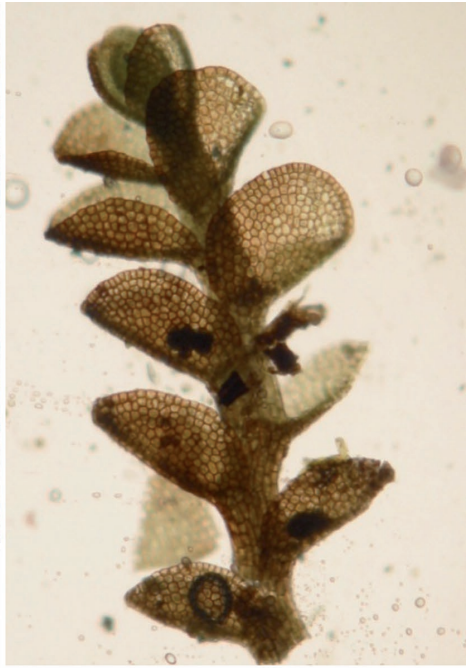
**Nyungwe NP:** Rwasekoko. **Distribution in Africa:** Uganda, Tanzania, South Africa.

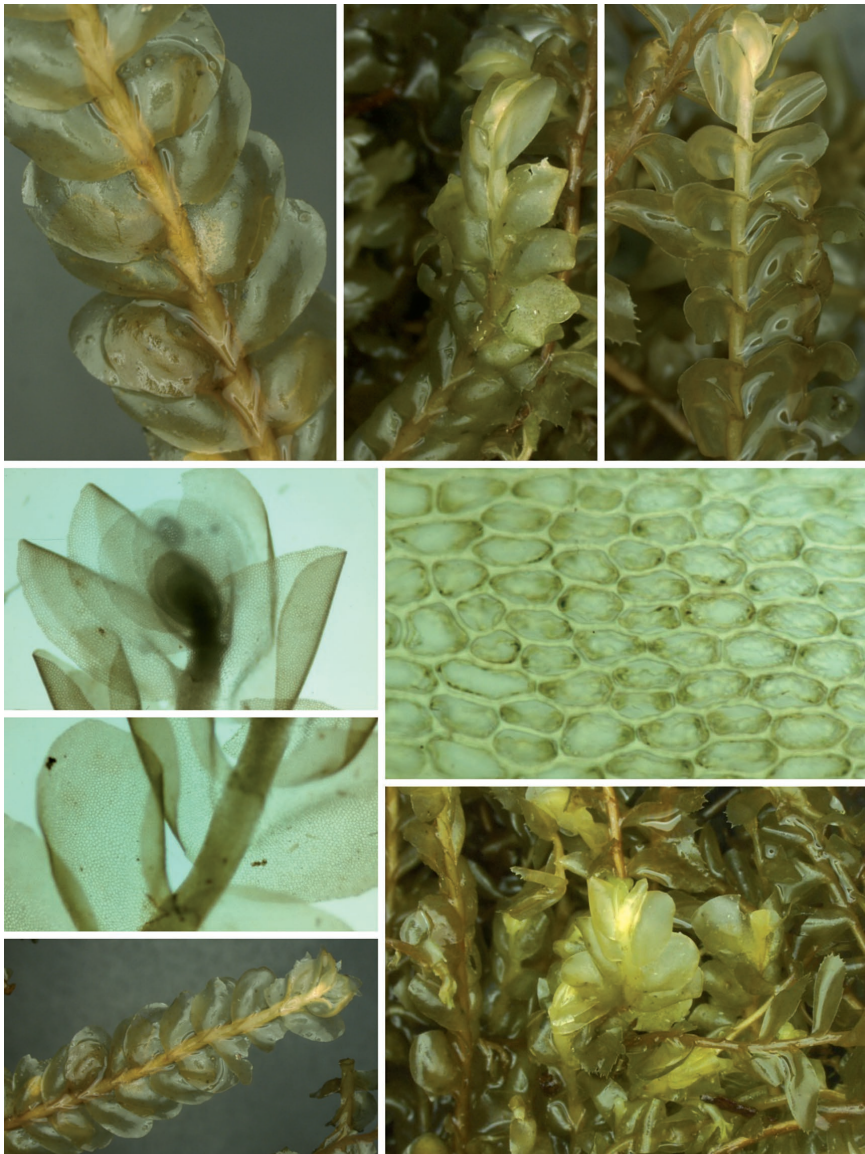
**Note:** Difficult to distinguish from *S. borgenii* when sterile.



**Figs 352 and 353 (next page). *Solenostoma sphaerocarpum* (Hook.) Steph.**  
 Synonym: *Jungermannia sphaerocarpa* Hook. Plants yellowish-green to brown. Rhizoids abundant on stem, colourless. Leaves orbicular, 0.5-1.3 X 0.5-1.3 mm. Cells thin-walled, c. 25-35  $\mu$ m long, trigones distinct. Paroicous. Perianths emergent, broadly obovate, abruptly narrowed to the mouth. **Habitat:** Terrestrial in ericaceous heath with *Andropogon shirensis*, *Dendrosenecio-Lobelia stuhlmannii* paramo, open *Dendrosenecio-Lobelia wollastoni* paramo, *Alchemilla* mats interrupted by boulders in the alpine belt, 2400-4200 m. **Distribution in Rwanda:** **Volcano NP:** Bisoke, Sabinyo, Karisimbi, on E-slopes along trail to summit. **Nyungwe NP:** Rwasenkoko, waterfall c. 3 km E of Pindura. **Distribution in Africa:** Cameroon, DR Congo, Uganda, Tanzania, Malawi, Zimbabwe, Lesotho, South Africa. Also Madagascar, Réunion. Widespread in the Northern Hemisphere.







**Fig. 354. *Syzygiella concreta* (Gottsche) Spruce**

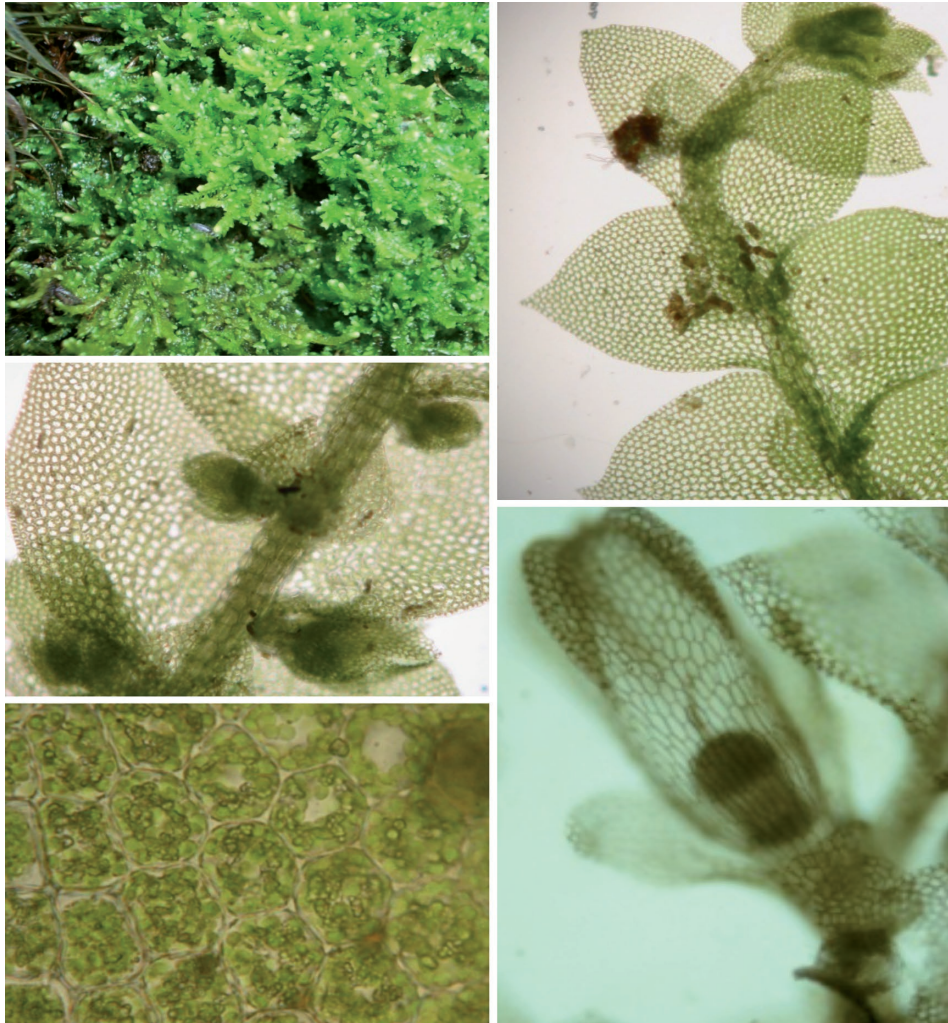
Plants rupicolous, small to large, 1-5 cm long, reddish-brown to purplish. Stems prostrate or erect. Leaves distant to moderately contiguous, obliquely to nearly lanceolately spreading, oblong-ligulate or oblong. 1 x 0.7 mm. Cells 26-33 x 32-40  $\mu\text{m}$ , with large trigones. **Habitat:** Rocky slopes in montane forest, 2000 m. **Distribution in Rwanda:** Nyungwe NP: Rugege. **Distribution in Africa:** DR Congo (Kahuzi-Biéga, 3200 m), Kenya (Mt. Kenya), Tanzania (Uluguru Mts.). Also Madagascar, Mexico, Cuba, Venezuela, Brazil, Tristan da Cunha. **Note:** The only collection from Rwanda made by J.-J. De Sloover is without precise locality.





**Fig. 355. *Syzygiella geminifolia* (Mitt.) Steph.**

Synonyms: *Plagiochila* (?) *ruwenzorensis* Steph.; *Syzygiella ruwenzorensis* Steph. Plants rupicolous, small to large, 1-5 cm long, reddish-brown to purplish. Stems prostrate or erect. Leaves contiguous to imbricate, opposite to subopposite, obliquely spreading, triangular-ovate, 1-1.1 x 0.7-0.8 mm. Cells 26-33 x 32-40  $\mu\text{m}$ , with large trigones. **Habitat:** Rocky slopes in heath forest, 2000 m. **Distribution in Rwanda:** Nyungwe NP: Karamba, along abandoned road to Burundi. **Distribution in Africa:** São Tomé, Bioko, DR Congo, Ethiopia, Tanzania. Also Madagascar, Réunion.



**Figs 356 and 357 (next page). *Taxilejeunea conformis* (Nees & Mont.) Steph.**  
 Plants flaccid, green, 0.5-1.8 mm wide. Leaves ovate, acuminate, 0.8 x 0.6 mm, apex acuminate, margin more or less crenulate with protuberant cells. Lobules very variable, 1/3-1/2 the length of the lobe, apical tooth one-celled, with hyaline papilla on proximal side. Cells pellucid, 18-25(-30) x 25-40  $\mu$ m in leaf centre, walls thin, trigones and intermediate thickenings small but distinct, cuticle often finely punctate. Underleaves broadly orbiculate, bifid to middle, sinus V-shaped, base rounded, 2-2.5 x the width of stem. Monoicous. Perianths clavate, exerted for 1/2 or more of its length, with 5 equal keels in the upper third to half, beak short, c. 40  $\mu$ m long. **Habitat:** Epiphytic or epiphyllous in montane forest, 2000-2300 m. **Distribution in Rwanda: Gishwati Forest:** Gikunku. **Nyungwe NP:** Kamiranzovu, Gisakura. **Distribution in Africa:** Sierra Leone, Ghana, Togo, Cameroon, Central African Republic, DR Congo, Burundi, Ethiopia, Uganda, Kenya, Tanzania, Angola, Malawi, South Africa. Also Comoros, Madagascar, Mauritius, Réunion.