

Fig. 377. *Asterella khasyana* (Griff.) Pandé, K.P.Srivast. & Sultan Khan. Thalli small to medium-sized, in dense mats, green to light green, often reddish along the margins, simple or furcate, branches 3-6 x 2-4 mm. Ventral surfaces green, with large purple scales in two rows. Autoecious. Antheridia in sessile cushions. Gynoecial receptacles on 3-17 mm long stalk, carpocephala suborbicular, 3.5-5 mm diameter, the whole receptacle strongly warted above with large protruding air-chambers, pseudoperianth with 7-9 segments. **Habitat:** Open soil and road cuts with *Cyathodium africanum* and *Marchantia* spp., 1900-2000 m. **Distribution in Rwanda:** Nyungwe NP: Cyamudongo. **Distribution in Africa:** Burundi, Uganda. Also East Asia.

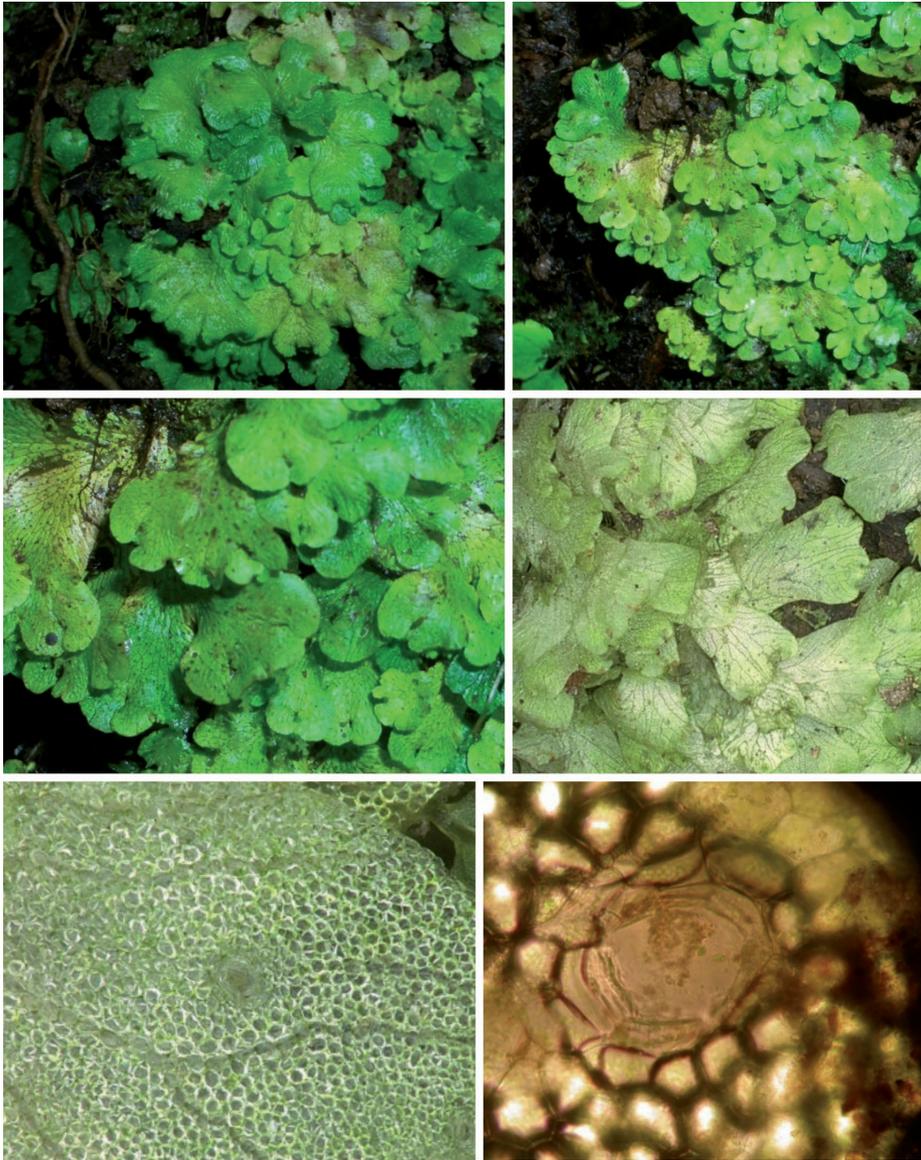


Fig. 378. *Cyathodium africanum* Mitt.

Thalli very thin, delicate, translucent, brilliant luminous green to yellowish green, not tinged with purple, often irregularly lobed, lobes 1-2(-4) mm wide, lacking midrib. Monoicous.

Involucres 2-valved, globose, c. 0.7-0.8 x 0.5 mm. **Habitat:** On moist soil and roadcuts, 1900 m. **Distribution in Rwanda: Nyungwe NP:** Cyamudongo, along road to Nyakabuye.

Distribution in Africa: Guinea, Sierra Leone, Ivory Coast, Ghana, Togo, Nigeria, Annobón, São Tomé, Bioko, Cameroon, Central African Republic, Congo-Brazzaville, DR Congo, Uganda, Tanzania, Malawi, Zimbabwe, Namibia. Also Cape Verde, Comoros, Madagascar.



Figs 379 and 380 (next page). *Dumortiera hirsuta* (Swartz) Nees in Reinw., Blume & Nees

Thalli dark green, very large, hygrophilous, translucent, 1- to several times furcate, 50-95(-200) x 8-13(-22) mm. Ventral surfaces green, with small colourless scales in 2 rows, and rhizoids forming a midrib. Monoicous. Male receptacles nearly sessile, circular and unlobed, c. 2.8 mm diameter, margins with stiff, bristle-like hairs. Female receptacles disciform, c. 3.8 mm diameter, on long stalks, becoming shallowly 6-8-10-lobed. **Habitat:**

On soil and roadcuts in montane forest, mainly near rivers and streams in valleys under humid air conditions, 1700-2400 m. **Distribution in Rwanda:** Nyungwe NP: Cyamudongo, Gisakura, Kamiranzovu, Uwinka, Pindura-Bweyeye. **Distribution in Africa:** Sierra Leone, São Tomé, Bioko, Cameroon, DR Congo, Burundi, Ethiopia, Uganda, Kenya, Tanzania, Angola, Malawi, Zimbabwe, Mozambique, Swaziland, South Africa. Also Comoros, Madagascar, Mauritius, Réunion. **Note:** A widespread species known from Europe, North, Central and South America, Tropical Africa and Tropical Asia.



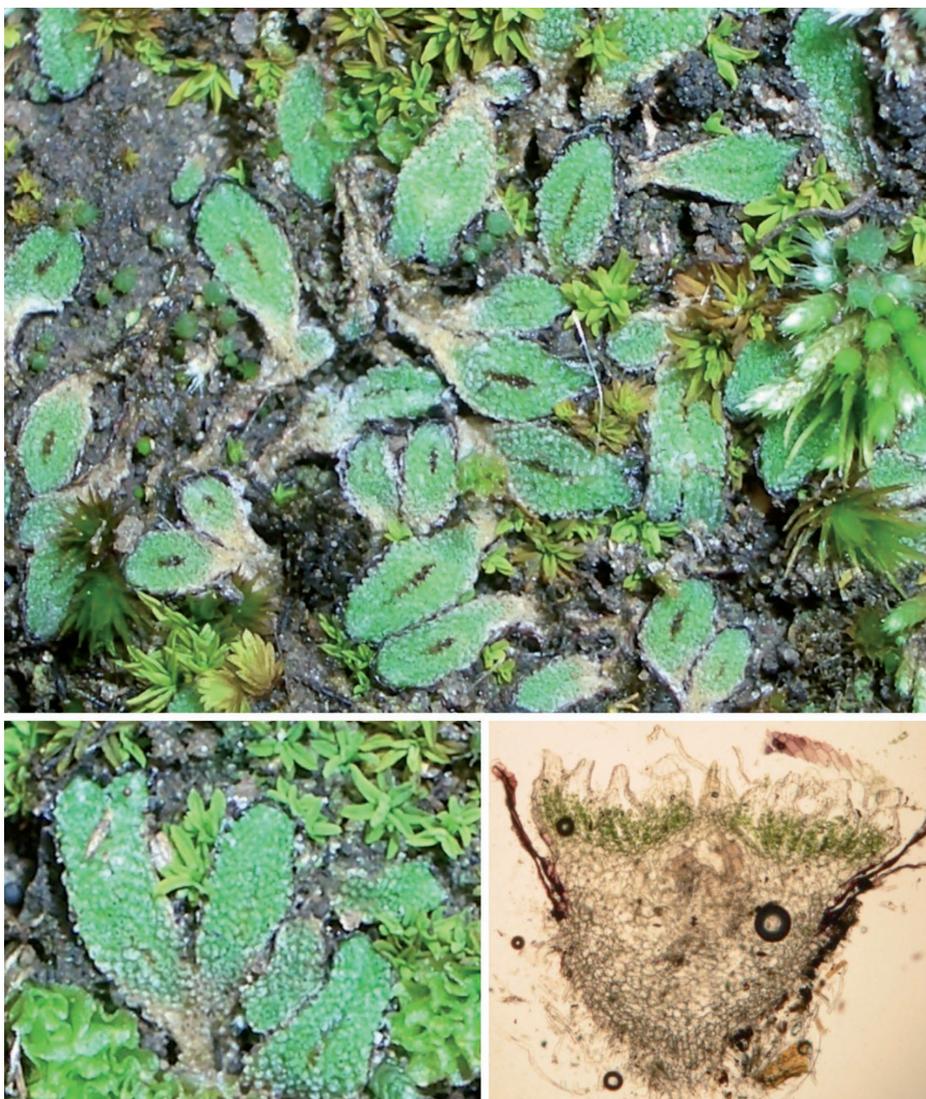
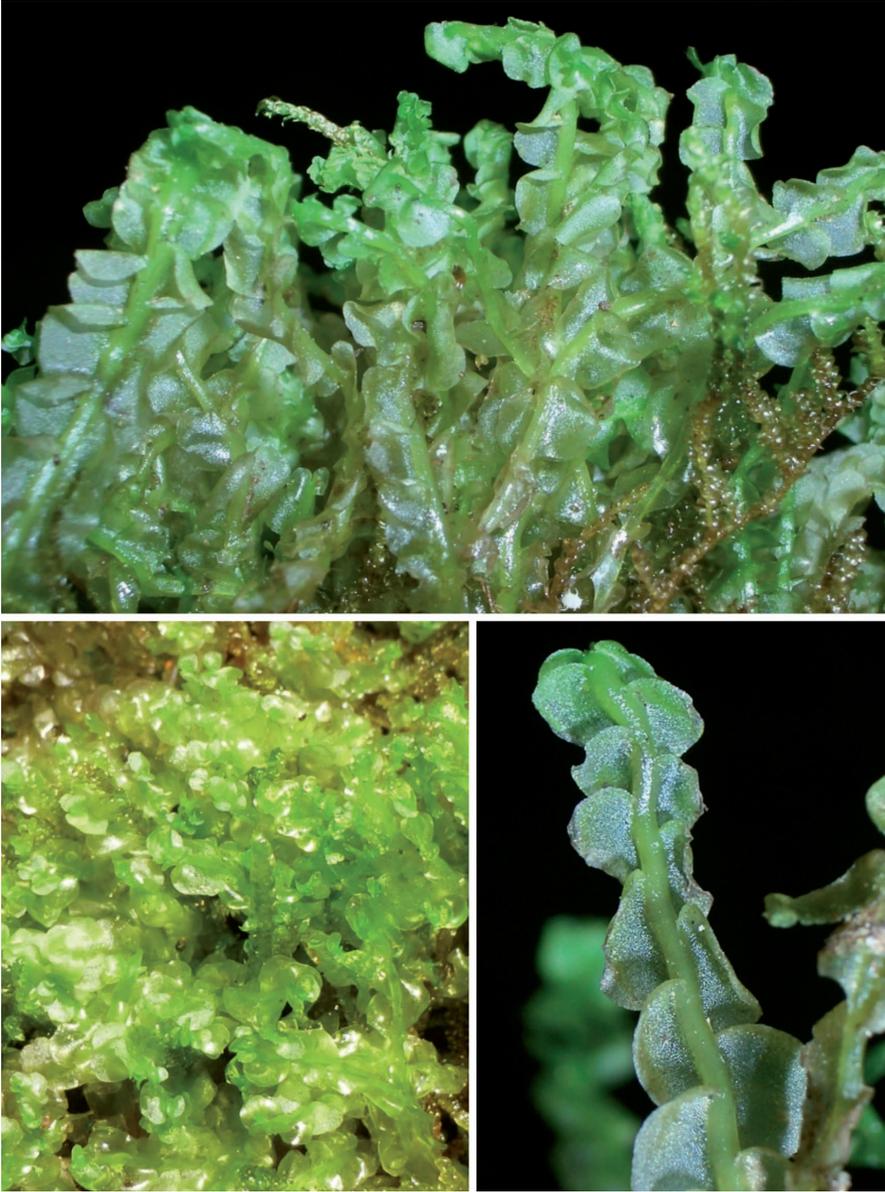


Fig. 381. *Exormotheca pustulosa* Mitt.

Thalli small, in crowded patches, silvery glaucous-green, branches simple or furcate, up to 8-9 x 2-3 mm. Dorsal surfaces slightly concave, completely covered with numerous conical evaginations. Ventral surfaces green, ventral scales purple or partly hyaline. Monoicous. Androecia in 1-3 rows along middle of thallus. Female receptacles sessile when young, later raised on a stalk at maturity up to 10 mm. **Habitat:** Quartzitic rocks, fissures with *Streptocarpus bindseilii* and *Stemodiopsis ruandensis*, 1712 m. **Distribution in Rwanda: Akagera:** Kibungo, near Rugarama. **Distribution in Africa:** Chad, Ethiopia, Kenya, Tanzania, Zimbabwe, Angola, Botswana, Namibia, Lesotho, South Africa. Also South Western Europe, North Africa, Atlantic Islands (Azores, Madeira, Canaries, Cape Verde, St. Helena), Arabia, Indian Ocean Islands.



Figs 382 and 383 (next page). *Fossombronina pulvinata* Steph.

Plants large, up to 4-6 cm long, forming dense cushions. Rhizoids purple. Leaves imbricate, entire, oblong, 4 × 7 mm, apex broadly truncate-rounded. Leaf cells 54 × 63 μm. Pseudoperianth and sporophyte unknown. **Habitat:** *Lobelia-Cyperus denudatus*-bogs, humid rocks in waterfalls, 2000-2450 m. **Distribution in Rwanda:** Nyungwe NP: Gisakura waterfalls, Rwasekoko. **Note:** Very large and distinct species but only known in sterile condition. The type specimen was annotated by Perold as *Fossombronina* sp. (sterile).

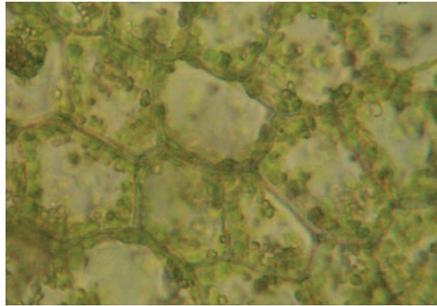
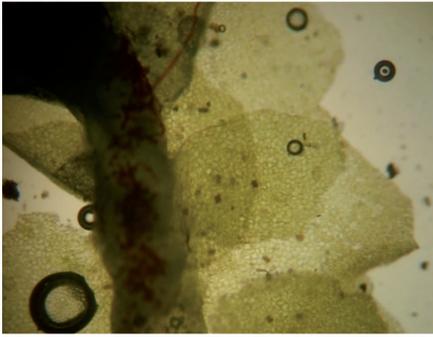




Fig. 384. *Fossombronina pusilla* (L.) Nees

Plants solitary or gregarious. Rhizoids violet-purple. Leaves \pm entire or lobed, crisped towards stem apex. Paroecious. Pseudoperianth campanulate. Spores brown to dark brown, 40-68 μ m, lamellae straight to sinuose, sometimes anastomosing on distal face. **Habitat:** On open soil and roadcuts, 2300-2450 m. **Distribution in Rwanda:** Gishwati Forest: Gikungu. Nyungwe NP: Uwinka. **Distribution in Africa:** D.R. Congo, Malawi, Lesotho. Also Europe, Cape Verde, Réunion.



Figs 385 and 386 (next page). *Fossombronina rwndaensis* Perold

Synonym: *Fossombronina capensis* auct. non S.W.Arnell. Plants in dense mats, shoots large, simple or once furcate, up to 20 x 3.2-4 mm. Stems prostrate, rhizoids purple. Leaves overlapping, widely spreading, irregularly rectangular, upper margin rounded. Cells thin-walled, 50-75 x 40-50 µm in middle of lamina. Dioicous. Plants predominantly male, female plants very rare. Capsule globose, 1 mm in diameter. Spores with ridges, loops, blobs or rarely reticulations, distal face with black ridges, irregularly branching and curving or unbranched, with up to 13 small areolae, proximal face with triradial mark indistinct to distinct. **Habitat:** Open soil and roadcuts in montane forest, 2000-2300 m. **Distribution in Rwanda:** **Gishwati Forest:** Gikungu, stream Bikeneko. **Nyungwe NP:** Gisakura, Karamba, Kamiranzovu. **Distribution in Africa:** Burundi.





Figs 387 and 388 (next page). *Jensenia spinosa* (Lindenb. & Gottsche) Grolle
 Synonym: *Pallavicinia stephanii* Jack. Thalli pale green to reddish, dendroid, consisting of erect thalli arising from a prostrate rhizome, the erect part narrow and stalked below, 2-4 times furcate, midrib very broad and thick, to 1/2 of thallus width, thallus margin dentate-spinose. Branches of aerial frond 1-2 mm wide, usually \pm lingulate to slightly tapering, unistratose for 0.5-6.5 of width. Margin dentate to coarsely spinose. Inframarginals cells of unistratose area of frond branches 21-27 x 24-35(-42) μm . Female involucre a deeply lacinate cup. Sporophyte surrounded by a pseudoperianth. **Habitat:** Montane forest, *Hagenia-Hypericum* forest to subalpine paramo, on rocks, 2500-3600 m. **Distribution in Rwanda:** Volcano NP: Karisimbi, Bisoke. **Nyungwe NP:** Rwasenkoko. **Distribution in Africa:** Bioko, DR Congo, Uganda, Kenya, Tanzania, Malawi, South Africa. Also St. Helena, Mauritius, Réunion.





Fig. 389. *Lunularia cruciata* (L.) Dumort.

Thalli clear green, in crowded patches, glossy, 40-55 x 5(-10) mm. Scales hyaline. Asexual reproduction by discoid gemmae on thallus surface on the inner side of lunate gemm cups with entire margins. Dioicous, mostly sterile and with gemmae. **Habitat:** Secondary habitats, on soil in disturbed places roadsides, paths, also on damp soil and rocks, 1700-2800 m. **Distribution in Rwanda:** **Volcano NP:** Gahinga, Muhavura. **Gishwati Forest:** Gikungu. **Central Rwanda:** Huye (Butare). **Distribution in Africa:** Cameroon, DR Congo, Eritrea, Ethiopia, Uganda, Kenya, Tanzania, Malawi, Zimbabwe, Namibia, South Africa. Also Europe, North America, Asia, Australia, New Zealand.



Figs 390 and 391 (next page). *Mannia capensis* (Steph.) S.W.Arnell
 Thalli small to medium-sized, in crowded patches, light green, laterally reddish, simple or furcate, up to 12 x 2-4 mm. Ventral surface black, scales in 2 ventral rows, black to reddish-black. Dioecious. Androecia with 2-4 rows of antheridia along center of branch. Gynoecial receptacles sessile, surrounded by dark purple lanceolate paleae. Carpocephala 2 mm diameter, papillose and not or scarcely lobed, stalk 5-25 mm long.
Habitat: Rock fissures on quartzite, also on manioc fields, 1700 m. **Distribution in Rwanda:** Akagera: Kibungo, near Rugarama. **Distribution in Africa:** Kenya, Tanzania, Zambia, Zimbabwe, Namibia, South Africa.





Figs 392 and 393 (next page). *Marchantia debilis* Goebel

Synonyms: *Marchantia chevalieri* Steph. ex Bonner; *M. wilmsii* Steph. Thalli light green, furcate, with dark, narrow-longitudinal median band, 5-12 x 4.5-7.3 mm. Ventral surfaces with large violet to purple-brown scales in 4 rows. Dioicous. Male receptacles 7.5-9 mm in diameter, on stalks 7-16 mm long, palmate, dissected into (4-)5-7 rays, 1.5-3 mm long and c. 1.2 mm wide at base. Female receptacle (3-)4.5-7(-9) mm in diameter, deeply dissected into 8-10 lobes, 0.8-1.2 mm long, narrowed at base, widened towards apex. **Habitat:** On soil and roadcuts in montane forest, mainly near rivers and streams in valleys under humid air conditions, 1800-2200 m. **Distribution in Rwanda: Kivu-Lake:** Rwaza. **Nyungwe NP:** Cyamudongo, Gisakura, Pindura-Bweyeye. **Distribution in Africa:** Guinea, Sierra Leone, Ivory Coast, Ghana, Togo, Nigeria, Chad, Cameroon, Gabon, Congo-Brazzaville, DR Congo, Burundi, Uganda, Tanzania, Angola, Malawi, Zambia, Zimbabwe, Lesotho, Swaziland, South Africa. Also Morocco, Madagascar, Réunion.





Figs 394 and 395 (next page). *Marchantia pappeana* Lehm.

Synonyms: *Marchantia parviloba* Steph.; *M. planiloba* Steph. Thalli light to yellowish green, furcate, without dark median band, 10-15 x 7-8.5 mm. Ventral surfaces with large violet to purple-brown scales in 4 rows. Dioicous. Male receptacles 9-14 mm in diameter, on stalks 9-18(-32) mm long, palmate, dissected into 6-8 rays, 1.7-3.4 mm long and c. 3.5 mm wide. Female receptacle 8-11 mm in diameter, symmetrically divided into 9-11 lobes, 1.4-1.7 mm long. **Habitat:** On soil and roadcuts in montane forest, mainly near rivers and streams in valleys under humid air conditions, also in roadside ditches, 1900-2500 m.

Distribution in Rwanda: Volcano NP: Kinigi. **Gishwati Forest:** Lac Bulera, Lac Karago, Gikungu. **Nyungwe NP:** Rwasekoko, Kamiranzovu, Gisakura, Pindura. **Distribution in Africa:** Guinea, Sierra Leone, Ivory Coast, Ghana, Togo, São Tomé, Bioko, Cameroon, Congo-Brazzaville, DR Congo, Burundi, Ethiopia, Uganda, Kenya, Tanzania, Angola, Malawi, Zambia, Zimbabwe, Lesotho, Swaziland, South Africa. Also Cape Verde, Madagascar, Mauritius.

