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Unrecorded moss species from Korean flora II

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ABSTRACT: Five unrecorded species (*Oedipodium griffithianum*, *Myurella tenerrima*, *Trachypus bicolor*, *Coscinodon humilis*, *Meteorium miquelianum* subsp. *atrovariegatum)* with one unrecorded family and two unrecorded genera, were reported as new to the Korean moss flora. The monotypic family Oedipodiaceae consisting of a single genus and single species was distinguished from Splachnaceae by small plants that were 10 mm in length simple or sometimes branched, obovate-spathulate to ± orbicular, costa ending below the apex and entire margins except for the lower long-ciliate portion The species was first found at the top of the Mt. Seorak at an altitude of 1708 m. The two genera, *Myurella* and *Coscinodon* were found in the Korean Peninsula. *Myurella tenerrima* (Theliaceae) was found around the top of Jung-bong on Mt. Jiri. It was mixed with other mosses in the crevices of rocks in the alpine regions. The species is similar to *M. sibirica*, yet it can be distinguished by the position of papilla in the median laminal cells. *Coscinodon humilis* (Grimmiaceae) were found on the ridge of Mt. Gaya. *C. humilis* has a variety of hyaline apex according to leaf position and forms a capsule so it can be distinguished by family. *Trachypus bicolor* and *Meteorium miquelianum* subsp. *atrovariegatum* are unrecorded species. *T. bicolor* (Trachypodaceae) were found on the ridge of Mt. Gaya. *T. bicolor* is similar to *T. humilis* but distinguished by the costal lengths of the leaves. *M. miquelianum* subsp. *atrovariegatum* (Meteoriaceae) was found in Gageo-do. This species was distinguished by the plant form and morphology of stem leaves in the same genus.

Keywords: *Oedipodium griffithianum*, *Myurella tenerrima*, *Trachypus bicolor*, *Grimmia subsulcata*, *Meteorium miquelianum* subsp. *atrovariegatum*

Descriptions

1. OEDIPODIACEAE Schimp. Syn. Musc. Eur. (ed. 2) 354. 1876.

Korean name: Ok-gu-seur-i-kki-gua (옥구슬이끼과)

This is a monotypic family. The description of this family is the same as that of the species. Some bryologists considered it to be a genus of the Splachnaceae, while others treat it as a distinct family (Cao, 2003).

Oedipodium Schwaegr. Sp. Musc. Frond., Suppl. 2. 1(1): 15. 1823.

Korean name: Ok-gu-seur-i-kki-sok (옥구슬이끼속)

The description of this genus is the same as that of the species.

Oedipodium griffithianum (Dicks.) Schwaegr. Sp. Musc. Suppl. 2. 1: 15. 1823.

Korean name: Ok-gu-seur-i-kki (옥구슬이끼)

Plants small, soft, green or bright green, scattered or gregarious. Stem erect, to 5–10 mm long, simple or sometimes branched. Central strand absent. Leaves soft, crowded in a rosette, shrivelled when dry, erect-patent to spreading when moist, imbricate, smaller on lower stem, larger toward stem tips; obovate-spathulate to ± orbicular, to 1.5–3.5 × 1.0–2.0 mm long, margins entire except for the lower long-ciliate portion; costa single, weak, broader at base, ending below apex. Median laminal cells rounded-hexagonal, to 60–85 × 35–50 μm long, marginal and upper cells smaller, covered by small granulose papillae. Alar regions indistinct. Discoid multicellular gemmae, to 250–300 μm long, often present in leaf axils. Seta to 10 mm long, stout, flexuose, twisted to the right when dry, light bright. Capsules erect to inclined, peristome lacking. Operculum to 0.5 mm long, conic. Spores 25–35 μm, papillose.

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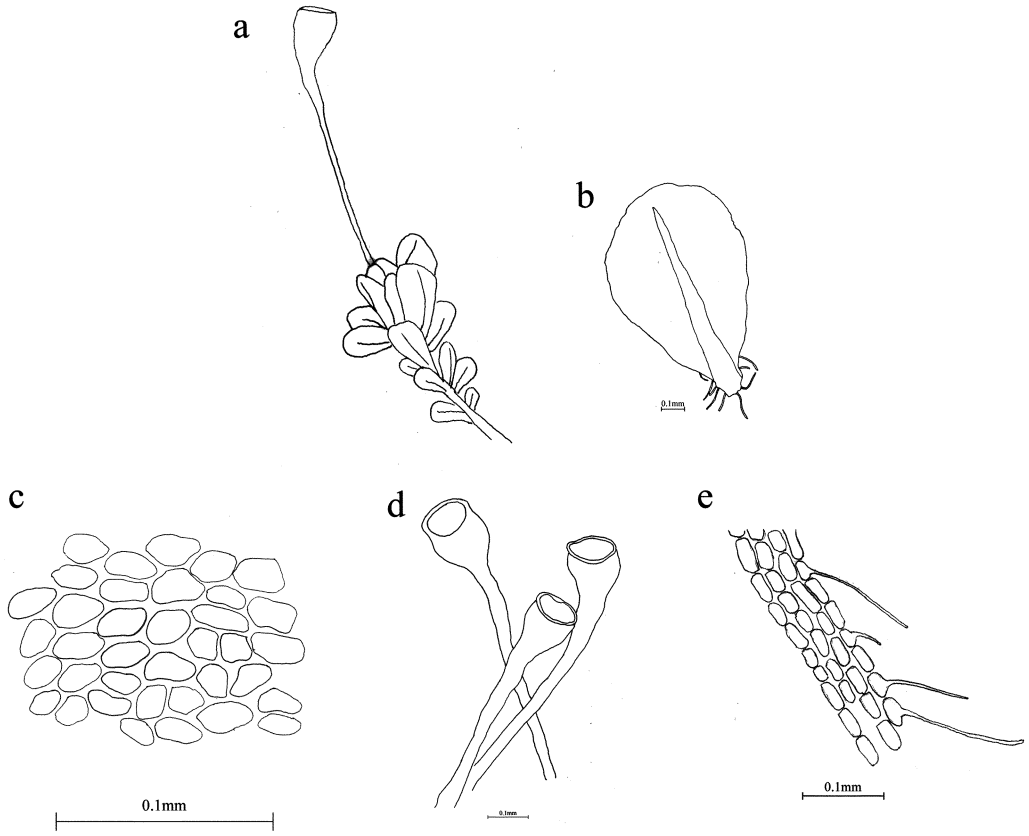

Fig. 1. *Oedipodium griffithianum* a. Plant; b. Stem leaf; c. Median laminal cells; d. Dry capsules; e. Cells at leaf base.

Habitats: Thin soil over rocks of northern slope or moist soil at top of the mountain.

Distribution: Korea, China (Inner Mongol, Khingan Mountains and Sichuan), Japan (Hokkaido, Honshu, Shikoku), Soviet Far East, Europe (Great Britain, Ireland, Norway, Sweden, Finland), N. and S. America, Pacific North America (Southern Alaska, Britain Columbia and Washington), Argentina and Falkland Islands (Noguchi, 1988; Ignatov et al., 2006).

Specimens examined: Mt. Seorak, Kangwon-do, Korea. 22 September 2009, *Yoon, Y. J. 4504* (JNU)

Sometimes *Oedipodium* has been placed in the Splachnaceae because of the remarkably differentiated neck of the capsule, which is somewhat similar to the expanded hypophysis of that family (Crum, 2007).

Recently, molecular phylogenetic studies overturned the traditional view of the relationship of this species. It was found in the phylogenetic tree between *Sphagnum* and *Polytrichum*; thus, the absence of peristome is not considered secondary, but rather primary. Some bryologists segregated *Oedipodium* into its own class (Ignatov et al., 2006).

2. *Myurella* Bruch & Schimp. Bryol. Eur. 6: 39 (fasc. 52-56. Monogr. 1). 1853.

Korean name: Jak-eun-su-yeom-i-kki-sok (작은수염이끼속)

Plants very small, slender, pale green. Stems prostrate or creeping, irregularly branched, sparsely leaved; sometime with bundles of rhizoids. Paraphyllia absent. leaves rounded ovate, imbricately arranged, long-acuminate or rounded at apex; margins entire or irregularly serrulate; costa indistinct or absent. Laminal cells thin-walled, hexagonal or rhomboidal, papillose. [Capsules erect or inclined; exostome teeth lanceolate-subulate, striate below, papillose above, ciliata present; calyptrae minute. (Smith, 2004).]

Myurella tenerrima (Brid.) Lindb., Musci Scand. 37. 1879.

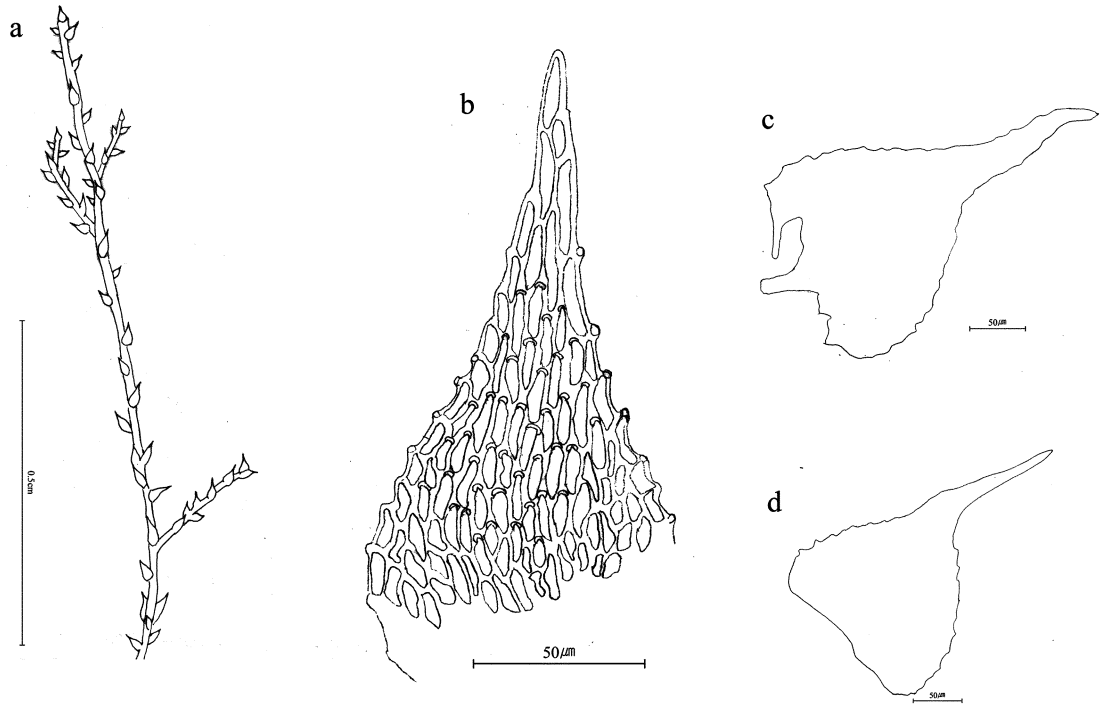

Fig. 2. *Myurella tenerrima* a. Plant; b. Cells at leaf apex; c, d. Leaves.

Korean name: Jag-eun-su-yeom-i-kki (작은수염이끼)

Plants pale green to yellowish-green. Stems prostrate, slender, irregularly branched, to 8–10 mm long. Leaves imbricate when dry, concave, broadly ovate, long or shortly lanceolate, often curved at apex; margins serrulate; costa short, short forked or single, very indistinct. Median laminal cells hexagonal, 12–20 × 5–8 μm, thin-walled, prorate; alar cells quadrate or rectangular. [Seta 10–15 mm long, reddish brown; capsules erect, obovoid or shortly cylindrical; annuli consisting of 2 rings cells, deciduous. spore 12–16 μm in diameter, finely papillose (We et al., 2002).]

Habitats: It was distributed on the humus rocks around the peak of Mt. Jiri (alt. 1833 m) in Namwon-si, Jeollabuk-do, Korea.

Distribution: Korea, Japan (Honshu), Siberia, Europe, N. America (Noguchi, 1991).

Specimens examined: Mt. Jiri, Namwon-si, Jeollabuk-do, Korea. 29 Sept. 2010, *Yoon Y. J. 6006* (JNU)

In the Theliaceae, only one genus, *Fauriella* Besch. has been reported in Korea until now (Choe, 1980). However, one more genus, *Myurella* was reported here as an unrecorded genus in the moss flora of Korea. *M. tenerrima* is very rare. This species grows with other mosses in the crevices of rocks in the alpine regions (Noguchi, 1991), and is considered endangered in the Red List of British Mosses (Smith, 2004).

3. *Coscinodon* Spreng. Anleit. Kenntn. Gew. 3: 281. 1804.

Korean name: Ba-wi-i-kki-sok (바위이끼속)

Plants small, dark green or brownish green, appearing grayish due to hyaline hair point. Stems shortly irregularly branched. Leaves lanceolate, with bistratose plicae on both sides of costa, long hair-pointed leaf apex; Median laminal cells irregularly quadrate, thick-walled; margins plane; costa strong, single, percurrent; basal part of leaves shortly rectangular. Dioicous. Setae straight; capsules erect, emergent; peristome teeth cribrose; columella free from the operculum; peristome teeth irregularly divided. Calyptrae large, campanulate. Spore small.

Coscinodon humilis Milde, Bot. Zeitung (Berlin) 22 (Beil.): 13. 1864.

Korean name: ba-wi-i-kki (바위이끼)

Plants dark green to blackish above, in compact tufts. Stems erect, to 20 mm long, with irregularly branched. Leaves appressed

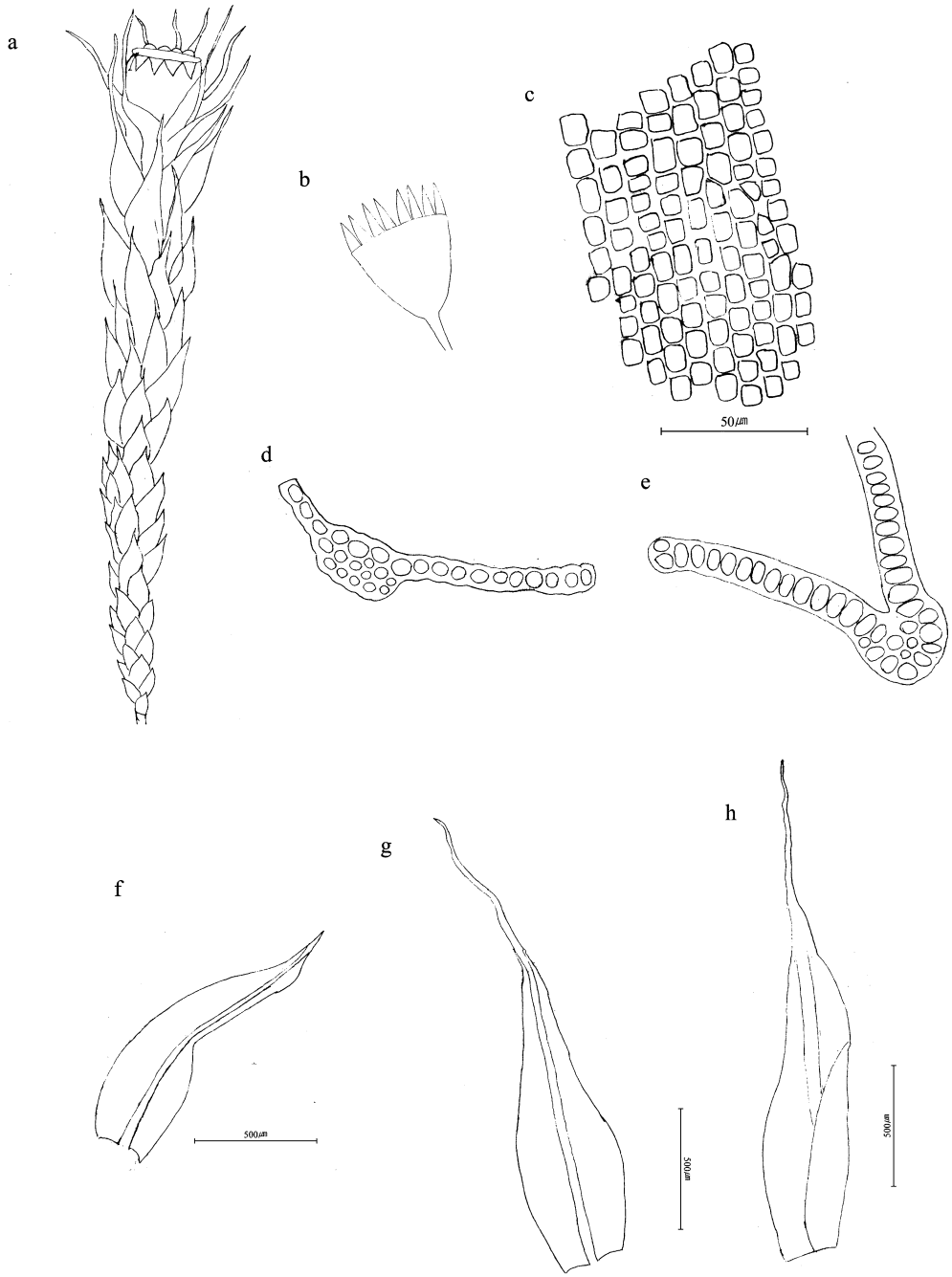

Fig. 3. *Coscinodon humilis* a. Plant; b. Dry capsule; c. Median laminal cells; d, e. Cross-section of leaves; f. Lower leaf; g, h. Upper leaves.

when dry, erect-spreading when moist, upper part leaves much large than lower part leaves, lower leaves with short hair point, upper leaves lanceolate, with a long hair point, not plicate. Median laminal cells quadrate to rectangular, 6–11 μm long, thick-walled; costa stout, single, long excurrent; cells at leaf base elongate-rectangular, 25–35 × 10–14 μm, thin-walled, towards the alar cells parts shorter; cells in 2–3 row at the basal angles rectangular, hyaline, thin-walled, the area extending up for a short distance along the margins. Dioicous. Perichaetial leaves similar to the upper stem leaves. Seta straight 0.3–0.5 mm long. Capsule erect, obovoid. Annulus present. Peristome teeth spreading or reflexed when dry, brown.

Habitats: It was distributed on the humus rocks around the peak of Mt. Gaya (alt. 1418 m) in Hapcheon-gun, Gyeongsangnam-do, Korea.

Distribution: Korea, Japan (Hokkaido, Honshu), Altai, Caucasus, Europe (Noguchi, 1988).

Specimens examined: Mt. Gaya, Hapcheon-gun, Gyeongsangnam-do, Korea. 22 Jun. 2010, *Yoon Y. J. 5225* (JNU)

Coscinodon may be distinguished from *Grimmia* by its cribrose peristome teeth and long campanulate and plicate calyptras, which cover the whole capsule. The length of hair points was highly variable, especially in the upper leaves where they may be very short or more often, especially for plants in extremely dry conditions, longer than the lamina (Noguchi, 1988).

4. *Trachypus bicolor* Reinw. & Hornsch., Nova Acta Phys.-Med. Acad. Caes. Leop.-Carol. Nat. Cur. 14(2): 708. f. 39. 1829.

Korean name: Ga-ya-o-so-ri-i-kki (가야오소리이끼)

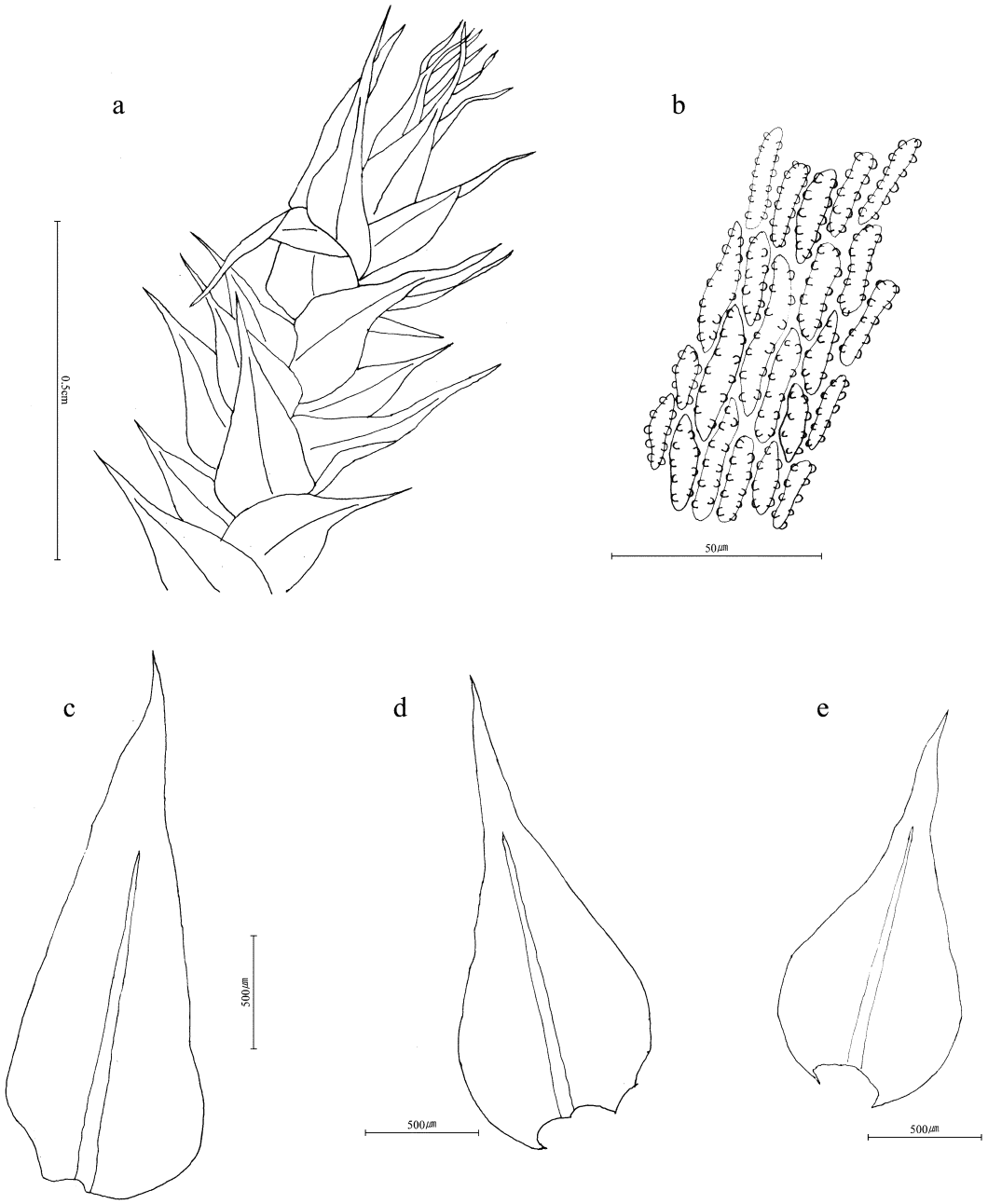

Fig. 4. *Trachypus bicolor* a. Plants; b. Median laminal cells; c, d, e. Stem leaves.

Plants green, yellowish-green or brownish-green, tinged with black with age. Stems spreading, to 70 mm long or more. Secondary stems ascending, subpinnately branched; branched simple or few branchlets. Secondary stems leaves slightly appressed when dry, broadly acuminate from oblong-ovate base, 1.6–2.4 × 0.5–0.7 mm; margins serrulate; costa stout, single, extending to 2/3 the leaf length or longer. Median laminal cells linear, 37–30 μm long, the walls thick, papillose on both lumina and walls; alar cells subrectangular, pellucid. [Inner perichaetial leaves oblong with a piliferous, flexuose point, to 2.5 mm long, the costa thin but extending to 2/3 the leaf length; paraphyses numerous. Seta stout, 7–10 mm long, ca. 0.18 mm thick with abundant large papillae, brown. Capsules oblong-ovoid to subglobose, with an apophysis, to 2 × 1 mm, deep brown (Noguchi, 1989).]

Habitats: It was distributed on the humus rocks around the peak of Mt. Gaya (alt. 1418 m) in Hapcheon-gun, Gyeongsangnam-do, Korea.

Distribution: Korea, Japan (Honshu, Shikoku, Kyushu), China,

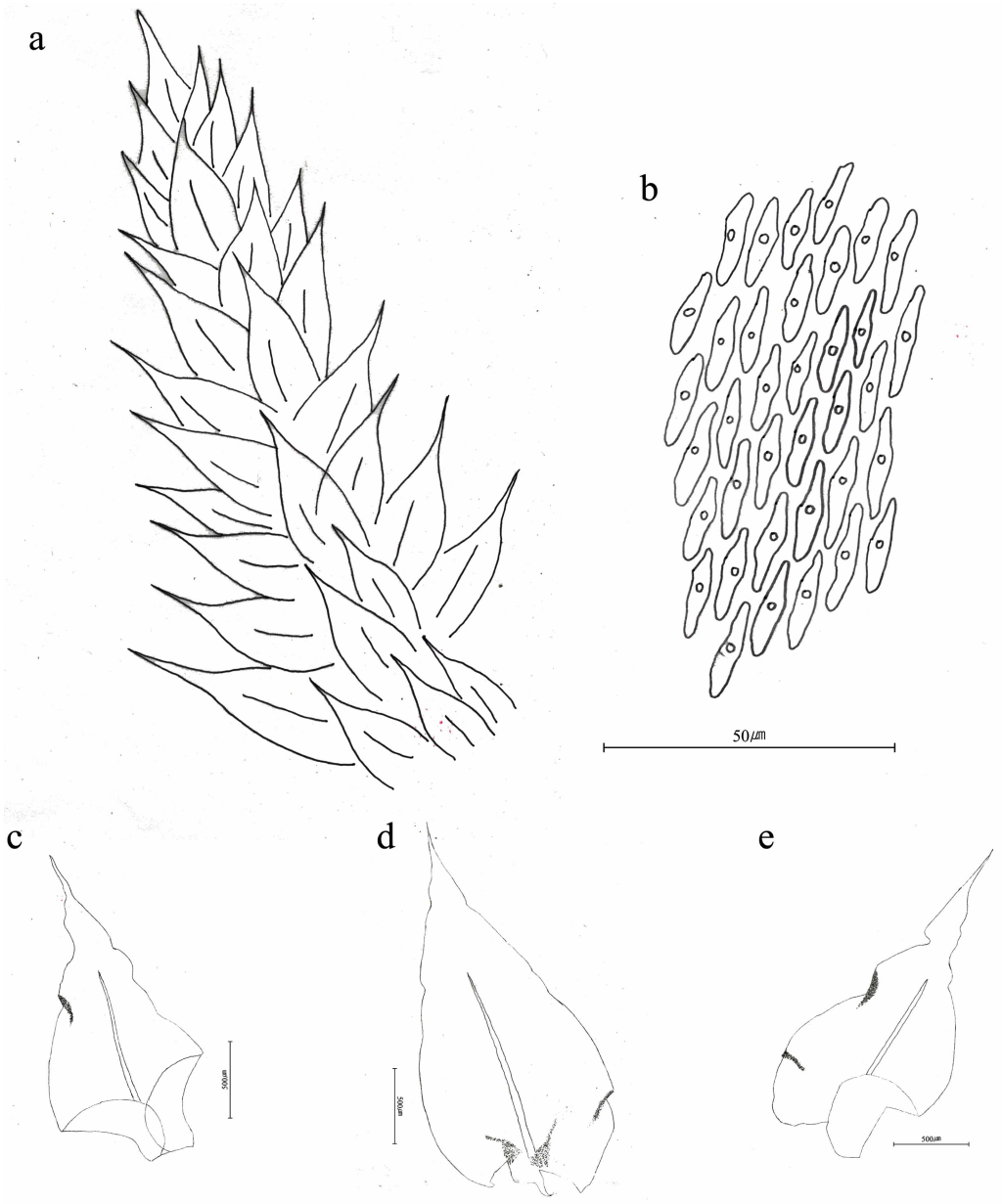

Fig. 5. *Meteorium miquelianum* subsp. *atrovariegatum* a. Plant; b. Median laminal cells; c, d, e. Stem leaves.

Taiwan, Philippines, Borneo, Java, Himalaya, southern Idia, Sri Lanka (Noguchi, 1989).

Specimens examined: Mt. Gaya, Hapcheon-gun, Gyeongsangnam-do, Korea. 22 Jun. 2010, *Yoon Y. J. 5204, 5205* (JNU)

T. bicolor is distinguished from allied species by its large size, and the costal lengths of the leaves (Noguchi, 1989).

5. *Meteorium miquelianum* subsp. ***atrovariegatum*** (Cardot & Thr.) Nog., J. Hattori Bot. Lab. 41: 260. 1976.

Korean name: Ga-geo-nu-un-kkeun-i-kki (가거누운끈이끼)

Plants green, yellowish-green or brownish-green, black with age. Stems to 180 mm long; Branches terete, simple, often curved. Stems leaves somewhat appressed, imbricate and curved when dry, ovate to oblong-ovate, 2.5–2.9 × 0.4–0.5 mm, with a long acuminate, auriculate at base, deeply plicate; margins serrulate or slightly serrulate, incurved, slightly undulate at base; costa single, extending to 2/3 the leaf length. Branch leaves similar to the stem leaves. Median laminal cells rhomboidal to elongate-rhomboidal, 23–30 × 4–6 μm; cells at the basal angle similar to the median cell. [Perichaetia on branches; Paraphyses long. Seta ca. 7 mm long, scabrous except for the basal portion. Capsules oblong, ca. 1.5 × 1.0 mm. Exostome teeth to 0.5 mm long; endostome segments as long as the exostome teeth (Noguchi, 1989).]

Habitats: It was distributed on the rocks alzong the trail of Mt. Doksil (alt. 145 m) in Gageo-do, Heuksan-myeon, Jeollanam-do, Korea.

Distribution: Korea, Japan (Honshu, Shikoku, Kyushu), China, Taiwan (Noguchi, 1989).

Specimens examined: Mt. Doksil, Gageo-do, Heuksan-myeon, Jeollanam-do, Korea. 03 Mar. 2010, *Yoon Y. J. 5036-1* (JNU)

This species grows on dry limestone in Japan. However, it was found on dry granite near the coast in Gageo-do Jeolnan provence. The most distinct characters of this species are the gradually tapering leaf acumen and the distinct plicate leaf lamina (Noguchi, 1989).

Acknowledgements

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