



## A new checklist of the liverworts and hornworts of Georgia (Caucasus)

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### ABSTRACT

The newly updated and revised checklist of Georgian liverworts and hornworts is provided. It records 172 species (including 171 native and one introduced, once recorded and currently probably extinct), with each species annotated by synonyms previously used in Georgia, data on distribution within administrative subunits of Georgia, literature reference and presence of specimens examined in herbaria TBI and VBGI.

**Key words:** Hepaticae, liverworts, Anthocerotae, hornworts, Georgia, Caucasus, checklist

### РЕЗЮМЕ

**Бакалин В., Тигишвили К., Арутинов Г. Новый чеклист печеночников и антоцеротовых Грузии (Кавказ).** Составлен чеклист печеночников и антоцеротовых Грузии, включающий 172 вида (включая 171 аборигенный вид и 1 случайно интродуцированный и в настоящее время, вероятно, «выпавший» из состава флоры). Каждый вид аннотирован сведениями о распространении в пределах административных единиц Грузии, ссылками на работы в которых этот вид приводился для страны и наличием образцов с территории Грузии в гербариях ТБИ и ВБГИ.

**Ключевые слова:** Нерпачеа, печеночники, Anthocerotae, антоцеротовые, Грузия, Кавказ, чеклист

Georgia is the Caucasian country situated on the border between Asia and Europe and washed by the Black Sea in the west. It is characterized by great differences in climatic conditions, varying from mild and wet warm temperate in the Colchis forests of Adjara to sub-continental cool temperate in the inner part. Whereas Georgia covers a relatively small area (69 000 km<sup>2</sup>, including self-proclaimed South Ossetia and Abkhazia), the flora of 'higher' plants (mosses, liverworts, hornworts and angiosperms) of the land is rather diverse and comprises over 5000 species, 172 of which are hepatics (including both liverworts and hornworts). Unfortunately, Georgia has not had a checklist compiled in accordance with new nomenclature. Available checklists (although with the last published only one decade ago, Chikovani & Svanidze 2004) are out of date and sometimes bear nomenclatural mistakes.

To fill this gap and to promote further studies of Georgian hepatics we provide a checklist based on all available sources and in accordance with modern taxonomy. To harmonize the distributional data from previous checklists (Chikovani 1986, Chikovani & Svanidze 2004) and other sources was one of the most difficult tasks of the present work, since those authors used a so-called historical-geographic subdivision of Georgia that is not official and has unstable and not evident borders. In contrast, the

present checklist follows the official current subdivision of Georgia for the first time ([http://gov.ge/index.php?lang\\_id=ENG&sec\\_id=227&info\\_id=31239](http://gov.ge/index.php?lang_id=ENG&sec_id=227&info_id=31239) last access March 2016).

Although the flora of the Caucasus in general, and Georgia in particular, have long attracted attention, the first records of hepatics for this land were published by Kuntze and Regel (1887) based on L. Kaernbach's collections. The authors (l.c.) provided a list of six species based on F. Stephani's identifications, five of which were from Georgian Adjara: *Anthoceros dichotomus* Raddi (= *Phaeoceros bulbiculosus*), *Chiloscyphus polyanthos* Nees, *Jungermannia sphaerocarpa* Hook. (= *Solenostoma sphaerocarpum*), *Radula commutata* Gottsche (= *R. complanata*) and *Reboulia hemisphaerica* Raddi. Thereafter the greatest input to the knowledge of Georgian liverworts was made by E. Levier in collaboration with S. Sommier in the course of exploration for Caucasian plants. The hepatic material gathered by E. Levier was identified by F. Stephani along with several specimens collected by V. F. Brotherus and published in the widely known and still valuable "Enumeratio Muscorum Caucasi" (Brotherus 1882). Here he cited 94 species of hepatics, 93 of which were recorded from Georgia.

In the next half century, rich in political crises, further studies of Georgian hepatics were impeded. Only two

works that bore information on hepatic diversity were published in that time (Voronov 1914, Bush & Bush 1936). They contributed a little in understanding the Georgian hepatic flora. Fortunately, the first three decades of the second half of 20th century were very productive due to miscellaneous works, including local checklists, flora analyses and revision of some groups (Abramova & Abramov 1953a, 1953b, 1979, Abramov et al. 1964, 1986, Chikovani 1972, 1973, Duda 1982, etc.). The great achievements in this field resulted in the publication of a checklist of Georgian liverworts and hornworts (Chikovani 1986). The latter provides data on distribution of 161 species including records of unclear origin, i. e., we were unable to find either herbarium specimens or original literature records for more than 10 taxa (*Riccardia chamedryfolia*, *Isopaches bicrenatus*, etc.). Similarly, the same taxa were mentioned under multiple names (*Jungermannia tristis* and then *J. atrovirens*) in the list. Only a few local papers appeared after the latter conspectus (Váňa & Ignatov 1990, Tigischvili 2006, Kürschner et al. 2013, Bakalin & Tigischvili 2013, Bakalin et al., 2013).

The last attempt to summarize data on the hepatics of Georgia was undertaken in 2004 with the publication “Checklist of Bryophyte Species of Georgia” by Chikovani & Svanidze (2004). The latter represents a shortened version of conspectus published 18 years before (Chikovani 1986) with some inexplicable omissions. Nomenclature usage in the both mentioned checklists sometimes was unclear, as was mentioned by Bakalin & Tigischvili (2013). Also Chikovani & Svanidze (2004) stated in the abstract that they recorded 174 taxa of hepatics, but really listed in the checklist only 156 taxa (152 species) and overlooked even some previous indications of taxa in Chikovani (1986), but sometimes provided the same species under different names.

## RESULTS AND DISCUSSION

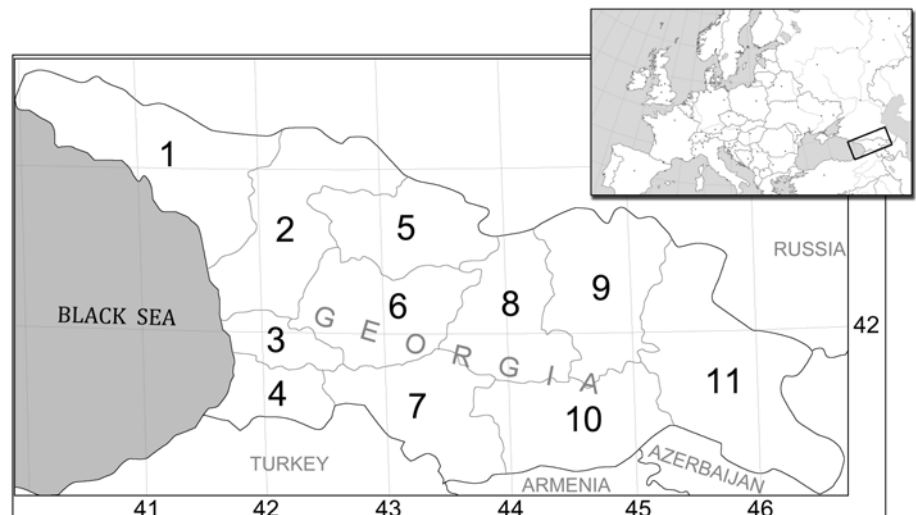
The present checklist adds 20 species to the Chikovani & Svanidze (2004) checklist and totals 172 species (including recently introduced and now probably extinct *Nardia assamica*). In our checklist, we mostly followed to the last checklist of Russian liverworts (Konstantinova et al. 2009) in both nomenclature and systematics. The synonyms are provided only if they were used in literature on Georgian hepatics. Each species is annotated by the names of administrative subunits where the species is recorded, literature references in which the record is based and presence of specimens of the species in TBI and/or VBGI. As it is evident from Table 1, the state of knowledge on the Georgian hepatic flora varies from region to region. The highest number

of taxa is recorded in Adjara (107 species), followed by Mtskheta-Mtianeti (89) and Shida Kartli (87). Other regions total from 53 to 77 taxa that, at least in some cases, should be far from reality.

The intricate question is how many taxa may be recorded as new for Georgia in further studies. As Chikovani (1978: 56) wrote (groundlessly ascribing this to Brotherus) “Caucasus being very rich by endemics of vascular plants did not support the same expectation [in hepatic flora]”. This point of view may be fully applied particularly to Georgia as well. A recent comparison of hepatic floras of Manchuria and Caucasus (Bakalin 2014a) also showed a comparative poor-ness of Caucasian hepatic flora that may be explained by the complex of natural historical factors. Nevertheless, we believe that future research will add at least 20–25 species to the list of Georgian hepatics and therefore the known hepatic flora will reach approximately 200 species. In addition to the wetter areas of Abkhazia, Samegrelo, Guria and Adjara, where hepatic flora should be richer than it is now known, attention should also be paid to Kvemo Kartli and Kakheti.

**Table 1.** The administrative subdivisions of Georgia (excluding the city of Tbilisi) and the number of hepatic species recorded for each.

No.	Region	No. of species recorded
1	Abkhazia	76
2	Samegrelo-Zemo Svaneti	53
3	Guria	53
4	Adjara	107
5	Racha-Lechkhumi and Kvemo Svaneti	77
6	Imereti	60
7	Samtskhe-Javakheti	66
8	Shida Kartli	87
9	Mtskheta-Mtianeti	89
10	Kvemo Kartli	62
11	Kakheti	64



**Figure 1** Administrative subdivision of Georgia (numbers indicate regions as they appear in Table 1)

## LIST OF SPECIES

## ANTHOCEROTOPHYTA

## Anthocerotaceae Dumort.

*Anthoceros* L.

*A. caucasicus* Steph. – Adjara [Abramov et al. 1966, Duda 1982, Chikovani & Svanidze 2004, Bakalin et al. 2013; VBGJ].

*A. punctatus* L. – Adjara [Abramov et al. 1966, Chikovani & Svanidze 2004, Bakalin et al. 2013; VBGJ].

*Phaeoceros* Prosk.

*P. laevis* (L.) Prosk. subsp. *laevis* ( $\equiv$  *Anthoceros laevis* L.) – Adjara [Abramov et al. 1966, Chikovani & Svanidze 2004, Bakalin et al. 2013; VBGJ].

*P. carolinianus* (Michx.) Prosk. – Adjara [Duda 1982].

*Phymatoceros* Stotler, W.T. Doyle et Crand.-Stotl.

*P. bulbiculosus* (Brot.) Stotler, W.T. Doyle et Crand.-Stotl. ( $\equiv$  *Anthoceros dichotomus* Raddi) – Adjara [Brotherus 1892].

## MARCHANTIOPHYTA

## Blasiaceae H. Klinggr.

*Blasia* L.

*B. pusilla* L. – Adjara, Racha-Lechkhumi [Brotherus 1892, Abramov et al. 1966, Chikovani 1986, Chikovani & Svanidze 2004, Bakalin et al. 2013; VBGJ].

## Lunulariaceae H. Klinggr.

*Lunularia* Adans.

*L. cruciata* (L.) Dumort. ex Lindb. – Adjara [Abramov et al. 1966, Chikovani 1986, Chikovani & Svanidze 2004, Bakalin et al. 2013; VBGJ].

## Marchantiaceae Lindl.

*Marchantia* L.

*M. paleacea* Bertol. – Abkhazia, Adjara, Guria, Imereti, Samegrelo [Brotherus 1892, Ladyzhenskaya 1951, Abramova & Abramov 1953b, Abramov et al. 1966, Chikovani 1986, Chikovani & Svanidze 2004].

*M. polymorpha* L. s.l. – all regions [Brotherus 1892, Abramova & Abramov 1953a, Abramov et al. 1963, 1964, 1966, Duda 1982, Chikovani & Svanidze 2004, Bakalin et al. 2013; VBGJ].

*Preissia* Corda

*P. quadrata* (Scop.) Nees ( $\equiv$  *Chomiocarpon quadratum* (Scop.) Lindb.) – Abkhazia, Adjara, Mtskheta-Mtianeti, Shida Kartli [Brotherus 1892, Abramov & Abramova 1953a, Abramov et al. 1986, Chikovani 1986, Chikovani & Svanidze 2004; TBI, VBGJ].

## Aytoniaceae Cavers

*Mannia* Corda

*M. androgyna* (L.) A. Evans ( $\equiv$  *M. dichotoma* (Raddi) S.W. Arnell, *Grimaldia dichotoma* Raddi) – Imereti, Mtskheta-Mtianeti, Shida Kartli [Brotherus 1892, Chikovani 1986, Chikovani & Svanidze 2004].

*M. fragrans* (Balb.) Frye & L. Clark ( $\equiv$  *Grimaldia fragrans* (Balb.) Corda ex Nees) – Mtskheta-Mtianeti, Shida Kartli [Brotherus 1892, Chikovani 1986, Chikovani & Svanidze 2004].

*Plagiochasma* Lehm.

*P. rupestre* (J.R. Forst. & G. Forst.) Steph. – Shida Kartli [Brotherus 1892, Chikovani 1986].

*Reboulia* Raddi

*R. hemisphaerica* (L.) Raddi s.l. – all regions [Brotherus 1892, Abramova & Abramov 1953b, Abramov et al. 1963, 1966, Chikovani 1986, Chikovani & Svanidze 2004, Bakalin et al. 2013; VBGJ].

## Cleveaceae Cavers

*Clevea* Lindb.

*C. hyalina* (Sommerf.) Lindb. ( $\equiv$  *Athalamia hyalina* (Sommerf.) S. Hatt., *Clevea suecica* (Lindb. ex Gottsche & Rabenh.) Lindb.) – Mtskheta-Mtianeti [Brotherus 1892, Chikovani 1986, Chikovani & Svanidze 2004].

*Peltolepis* Lindb.

*P. quadrata* (Saut.) Müll. Frib. – Mtskheta-Mtianeti [Chikovani 1986, Chikovani & Svanidze 2004].

## Conocephalaceae Müll. Frib. ex Grolle

*Conocephalum* Hill

*C. conicum* (L.) Dumort. s. str. ( $\equiv$  *Fegatella conica* (L.) Corda) – all regions [Brotherus 1892, Abramova & Abramov 1953a, Abramov et al. 1963, 1964, 1966, Duda 1982, Chikovani 1986, Vána & Ignatov 1990, Chikovani & Svanidze 2004, Bakalin et al. 2013; VBGJ].

## Ricciaceae Rchb.

*Riccia* L.

*R. bifurca* Hoffm. – Mtskheta-Mtianeti, Shida Kartli [Brotherus 1892, Chikovani 1986, Chikovani & Svanidze 2004].

*R. ciliata* Hoffm. var. *intumescens* Bisch. – Mtskheta-Mtianeti [Chikovani 1986, Chikovani & Svanidze 2004].

*R. ciliifera* Link ex Lindenb. – Mtskheta-Mtianeti [Chikovani 1986, Chikovani & Svanidze 2004].

*R. fluitans* L. – Samtskhe-Javakheti, Shida Kartli [Chikovani 1986, Chikovani & Svanidze 2004].

*R. frostii* Austin – Adjara [Chikovani 1986, Chikovani & Svanidze 2004].

*R. sorocarpa* Bisch. – Mtskheta-Mtianeti, Samtskhe-Javakheti, Shida Kartli [Brotherus 1892, Abramova & Abramov 1953a, Chikovani 1986, Chikovani & Svanidze 2004; TBI, VBGJ].

## Pelliaceae H. Klinggr.

*Pellia* Raddi

*P. endiviifolia* (Dicks.) Dumort. ( $\equiv$  *P. calycina* (Taylor) Nees, *P. fabroniana* s. auct.) – all regions [Brotherus 1892, Abramova & Abramov 1953a, Abramov et al. 1963, 1964, 1966, 1986, Chikovani 1986, Vána & Ignatov 1990, Chikovani & Svanidze 2004].

*P. epiphylla* (L.) Corda – all regions [Brotherus 1892, Abramov et al. 1964, 1966, Duda 1982, Chikovani 1986, Chikovani & Svanidze 2004].

*P. neesiana* (Gottsche) Limpr. – Adjara, Mtskheta-Mtianeti, Samtskhe-Javakheti [Abramov et al. 1964, 1966, Duda 1982, Chikovani 1986, Chikovani & Svanidze 2004, Bakalin et al. 2013; VBGJ].

## Fossombroniaceae Hazsl.

*Fossombronia* Raddi

*F. foveolata* Lindb. ( $\equiv$  *F. dumortieri* (Huebener & Genth) Lindb., *F. dumortieri* var. *robusta* Lindb. ex Ladyz.) – Guria, Samegrelo, Shida Kartli [Chikovani 1972, 1973, 1986, Chikovani & Svanidze 2004].

*F. pusilla* (L.) Nees – Abkhazia [Chikovani 1986, Chikovani & Svanidze 2004].

**Pallaviciniaceae** Mig.**Pallavicinia** Gray

*P. lyellii* (Hook.) Gray – Adjara [Abramov et al. 1966] – This record in Abramov et al. (1966) was overlooked by Chikovani & Svanidze (2004).

**Moerckiaceae** K.I. Goebel ex Stotler & Crand.-Stotl.**Moerckia** Gottsche

*M. flotoviana* (Nees) Schiffn. – Shida Kartli [Abramova & Abramov 1953a, Chikovani 1986, Chikovani & Svanidze 2004] – Chikovani & Svanidze (2004) included this taxon twice for the same region, the first time as aforementioned and the second time as “*Moerckia flotoviana* (Nees) Schiffn. f. *flotoviana*– Shida Kartli”.

**Metzgeriaceae** H. Klinggr.**Metzgeria** Raddi

*M. conjugata* Lindb. (= *M. conjugata* Lindb. var. *epilosa* Steph. ex Broth.) – all regions [Brotherus 1892, Abramova & Abramov 1953a, Abramov et al. 1963, 1966, Váňa & Ignatov 1990, Chikovani & Svanidze 2004, Bakalin et al. 2013; VBGJ].

*M. furcata* (L.) Corda (= *M. furcata* var. *uhula* Nees) – all regions [Brotherus 1892, Abramov et al. 1963, 1964, Chikovani 1986, Váňa & Ignatov 1990, Chikovani & Svanidze 2004, Bakalin et al. 2013; VBGJ].

*M. pubescens* (Schrank) Raddi (= *Apometzgeria pubescens* (Schrank) Kuwah.) – all regions [Brotherus 1892, Abramova & Abramov 1953a, Chikovani 1986, Chikovani & Svanidze 2004; TBI, VBGJ].

*M. temperata* Kuwah. – Adjara [Bakalin et al. 2013; VBGJ].

**Aneuraceae** H. Klinggr.**Aneura** Dumort.

*A. pinguis* (L.) Dumort. (= *Riccardia pinguis* (L.) Gray) – Abkhazia, Adjara, Kvemo Kartli, Samtskhe-Javakheti, Shida Kartli, [Brotherus 1892, Abramov et al. 1966, Chikovani 1986, Váňa & Ignatov 1990, Chikovani & Svanidze 2004].

**Riccardia** Gray

*R. chamedryfolia* (With.) Grolle (= *Riccardia sinnata* (Hook.) Trevis., *R. pinnatifida* (F. Weber) Carruth., *Aneura pinnatifida* (F. Weber) – Samegrelo-Zemo Svaneti, Kvemo Svaneti [Chikovani 1986, Chikovani & Svanidze 2004].

*R. latifrons* (Lindb.) Lindb. – all regions [Abramova & Abramov 1953a, Abramov et al. 1964, Chikovani 1986, Chikovani & Svanidze 2004].

*R. multifida* (L.) Gray – Adjara [Brotherus 1892, Abramov et al. 1966, Chikovani 1986, Chikovani & Svanidze 2004, Bakalin et al. 2013; VBGJ].

*R. palmata* (Hedw.) Carruth. (= *Aneura palmata* (Hedw.) Dumort.) – Dusheti, Kakheti, Racha-Lechkhumi, Samtskhe-Javakheti, Kvemo Svaneti [Abramov et al. 1963, 1964, Chikovani 1986, Chikovani & Svanidze 2004].

**Porellaceae** Cavers**Porella** L.

*P. arboris-vitae* (With.) Grolle (= *P. laevigata* (Schrad.) Pfeiff., *P. laevigata* var. *thuja* (Hook.) Arnell, *P. caucasica* Steph. ?) – all regions [Brotherus 1892, Abramov et al. 1963, Chikovani 1986, Chikovani & Svanidze 2004]. *Porella caucasica* was regarded as synonym of *P. laevigata* in Chikovani & Svanidze (2004), but they did not provide nomenclatural citation (therefore synonymy is invalid) and we do not know whether this synonymization was based on study of types or only description.

*P. cordaeana* (Huebener) Moore (= *Madotheca rivularis* Nees) – Abkhazia, Kakheti, Racha-Lechkhumi, Kvemo Kartli, Samtskhe-Javakheti, Shida Kartli [Brotherus 1892, Abramov et al. 1963, Chikovani 1986, Chikovani & Svanidze 2004; TBI, VBGJ].

*P. platyphylla* (L.) Pfeiff. (≡ *Madotheca platyphylla* (L.) Dumort.) – all regions [Brotherus 1892, Abramova & Abramov 1953a, Abramov et al. 1963, 1964, Chikovani 1986, Váňa & Ignatov 1990, Chikovani & Svanidze 2004, Bakalin et al. 2013; VBGJ].

*P. platyphylloidea* (Schwein.) Lindb. (≡ *Madotheca platyphylloidea* (Schwein.) Nees) – Racha-Lechkhumi [Brotherus 1892, Chikovani 1986, Chikovani & Svanidze 2004]. Chikovani & Svanidze (2004) regarded this name as synonymous with *P. baueri* (Schiffn.) C. Jens.; the reasons for this are unclear to us.

**Radulaceae** Müll. Frib.**Radula** Dumort.

*R. complanata* (L.) Dumort. (= *R. complanata* (L.) Dumort. var. *alpestris* (Lindb. ex Berggr.) Lindb., *R. complanata* (L.) Dumort. var. *cucullifolia* Steph. ex Broth.) – all regions [Brotherus 1892, Abramova & Abramov 1953a, Abramov et al. 1963, 1966, Duda 1982, Chikovani 1986, Chikovani & Svanidze 2004, Bakalin et al. 2013; VBGJ].

*R. lindenberghiana* Gottsche ex C. Hartm. (= *Radula commutata* Gottsche ex Limpr.) – all regions [Brotherus 1892, Abramova & Abramov 1953a, Abramov et al. 1963, 1966, Duda 1982, Chikovani 1986, Váňa & Ignatov 1990, Chikovani & Svanidze 2004, Bakalin et al. 2013; VBGJ].

**Jubulaceae** H. Klinggr.**Jubula** Dumort.

*J. butchinsiae* subsp. *caucasica* Konstant. & Vilnet – Adjara, Imereti, Shida Kartli – *Jubula butchinsiae* s.l. was overlooked by compilers of the checklist of Georgian liverworts (Chikovani & Svanidze 2004), although it was previously recorded for Georgia at least three times. We suggest that records under the names *Jubula butchinsiae* subsp. *javanica* (Steph.) Verd. (Abramova & Abramov 1953a, Abramov et al. 1966) and *Frullania butchinsiae* (Hook.) Nees var. *integrifolia* (Nees) Lindb. (Brotherus 1892) should belong to this taxon. Recently the subsp. *caucasica* was also recorded for Georgia by Kürschner et al. (2013) [VBGJ].

**Frullaniaceae** Lorch**Frullania** Raddi

*F. dilatata* (L.) Dumort. (= *F. dilatata* (L.) Dumort. var. *anomala* Corb.) – Imereti, Kakheti, Kvemo Kartli, Racha-Lechkhumi, Samtskhe-Javakheti, Shida Kartli [Abramova & Abramov 1953a, Abramov et al. 1963, 1964, 1966, Duda 1982, Chikovani 1986, Váňa & Ignatov 1990, Chikovani & Svanidze 2004, Bakalin et al. 2013; VBGJ].

*F. fragilifolia* (Taylor) Gottsche, Lindenb. & Nees – Mtskheta-Mtianeti [Chikovani 1986, Chikovani & Svanidze 2004].

*F. jackii* Gottsche – Adjara [Bakalin et al. 2013; VBGJ].

*F. tamarisci* (L.) Dumort. – all regions [Brotherus 1892, Abramova & Abramov 1953a, Abramov et al. 1964, Duda 1982, Chikovani 1986, Chikovani & Svanidze 2004, Bakalin et al. 2013; VBGJ].

*F. parvistipula* Steph. (= *F. tenera* Lindb. ex Steph., nom. illeg., non Spruce) – Kvemo Kartli, Samtskhe-Javakheti, Shida Kartli [Brotherus 1892].

**Lejeuneaceae** Cavers**Cololejeunea** (Spruce) Steph.

*C. calcarea* (Lib.) Steph. (= *Lejeunea calcarea* Lib.) – Abkha-

zia, Adjara, Imereti [Brotherus 1892, Duda 1982, Chikovani 1986, Váňa & Ignatov 1990, Chikovani & Svanidze 2004, Bakalin et al. 2013; VBG I].

*C. rosettiana* (C. Massal.) Schiffn. – Abkhazia, Shida Kartli [Chikovani 1986, Chikovani & Svanidze 2004].

#### **Lejeunea** Lib.

*L. canifolia* (Ehrh.) Lindb. – all regions [Brotherus 1892, Abramova & Abramov 1953a, Abramov et al. 1963, 1966, Duda 1982, Chikovani 1986, Váňa & Ignatov 1990, Chikovani & Svanidze 2004, Bakalin et al. 2013; VBG I].

*L. patens* Lindb. – Abkhazia, Adjara, Guria, Shida Kartli [Brotherus 1892, Chikovani 1986, Chikovani & Svanidze 2004].

#### **Ptilidiaceae** H. Klinggr.

##### **Ptilidium** Nees

*P. ciliare* (L.) Hampe – all regions [Brotherus 1892, Chikovani 1986, Chikovani & Svanidze 2004].

*P. pulcherrimum* (Weber) Vain. – Guria, Kvemo Kartli, Samtskhe-Javakheti, Shida Kartli, Kvemo Svaneti [Brotherus 1892, Abramova & Abramov 1953a, Abramov et al. 1964, Duda 1982, Chikovani 1986, Chikovani & Svanidze 2004].

#### **Pseudolepicoleaceae** Fulford & J. Taylor

##### **Blepharostoma** (Dumort.) Dumort.

*B. trichophyllum* (L.) Dumort. (≡ *Jungermannia trichophylla* L.) – all regions [Brotherus 1892, Abramova & Abramov 1953a, Abramov et al. 1964, 1986, Duda 1982, Chikovani 1986, Chikovani & Svanidze 2004, Bakalin et al. 2013; VBG I].

#### **Trichocoleaceae** Nakai

##### **Trichocolea** Dumort.

*T. tomentella* (Ehrh.) Dumort. – Abkhazia, Adjara [Chikovani 1986, Chikovani & Svanidze 2004].

#### **Lepidoziaceae** Limpr.

##### **Bazzania** Gray

*B. flaccida* (Dumort.) Grolle (= *B. denudata* auct.) – Adjara [Abramov et al. 1966, Chikovani 1986, Chikovani & Svanidze 2004].

*B. tricrenata* (Wahlenb.) Lindb. (= *Mastigobryum deflexum* (Mart.) Nees) – Adjara, Samtskhe-Javakheti, Shida Kartli, Kvemo Svaneti [Brotherus 1892, Abramov et al. 1964, 1966, Chikovani 1986, Chikovani & Svanidze 2004; TBI, VBG I].

*B. trilobata* (L.) Gray – Abkhazia, Adjara, Samtskhe-Javakheti [Abramov et al. 1964, Chikovani 1986, Chikovani & Svanidze 2004, Bakalin et al. 2013; VBG I].

##### **Lepidozia** (Dumort.) Dumort.

*L. reptans* (L.) Dumort. – all regions [Brotherus 1892, Abramova & Abramov 1953a, Abramov et al. 1963, 1964, 1966, Chikovani 1986, Chikovani & Svanidze 2004; TBI, VBG I].

#### **Lophocoleaceae** Vanden Berghen

##### **Chiloscyphus** Corda

*C. fragilis* (A. Roth) Schiffn. – Adjara [Bakalin et al. 2013; VBG I].

*C. pallescens* (Ehrh. ex Hoffm.) Dumort. – all regions [Brotherus 1892, Abramova & Abramov 1953a, Abramov et al. 1963, 1964, 1966, Chikovani 1986, Chikovani & Svanidze 2004].

*C. polyanthos* (L.) Corda – all regions [Brotherus 1892, Abramov et al. 1963, 1964, 1966, Chikovani 1986, Chikovani & Svanidze 2004].

##### **Lophocolea** (Dumort.) Dumort.

*L. bidentata* (L.) Dumort. – Abkhazia, Adjara, Kvemo Svaneti [Abramov et al. 1966, Chikovani 1986, Chikovani & Svanidze 2004, Bakalin et al. 2013; VBG I].

*L. cuspidata* (Nees) Limpr. – all regions [Abramov et al. 1966, Chikovani 1986, Chikovani & Svanidze 2004]. *L. cuspidata* is usually regarded as a synonym of *L. bidentata*, but the name has frequently been misapplied and it may be that what here is referred to as *L. cuspidata* really is *L. coadunata* (Sw.) Mont.

*L. heterophylla* (Schrad.) Dumort. – Abkhazia, Adjara, Kakheti, Kvemo Svaneti, Samtskhe-Javakheti [Brotherus 1892, Abramova & Abramov 1953a, Abramov et al. 1963, 1964, 1966, Abramov et al. 1986, Duda 1982, Chikovani 1986, Váňa & Ignatov 1990, Chikovani & Svanidze 2004, Bakalin et al. 2013; VBG I].

*L. minor* Nees – all regions [Brotherus 1892, Abramova & Abramov 1953a, Abramov et al. 1964, 1966, 1986, Chikovani 1986, Chikovani & Svanidze 2004; VBG I].

#### **Plagiochilaceae** Müll. Frib.

##### **Plagiochila** (Dumort.) Dumort.

*P. asplenioides* (L.) Dumort. (= *P. major* (Nees) S.W. Arnell) – all regions [Brotherus 1892, Abramova & Abramov 1953a, Abramov et al. 1963, 1966, 1986, Chikovani 1986, Chikovani & Svanidze 2004]. Most probably the majority of records of this taxon for Georgia belong to *P. porelloides*, although *Plagiochila asplenioides* s. str. should also be more or less common there.

*P. porelloides* (Torr. ex Nees) Lindenb. – Abkhazia, Adjara [Abramov et al. 1986, Váňa & Ignatov 1990, Bakalin et al. 2013; VBG I].

##### **Pedinophyllum** Lindb.

*P. interruptum* (Nees) Kaal. (≡ *Leptoscyphus interruptus* (Nees) Lindb.) – Abkhazia, Imereti, Racha-Lechkumi [Brotherus 1892, Chikovani 1986, Váňa & Ignatov 1990, Chikovani & Svanidze 2004].

#### **Adelanthaceae** Grolle

##### **Syzygiella** Spruce

*S. autumnalis* (DC.) K. Feldberg, Váňa, Hentschel & Heinrichs (≡ *Jamesoniella autumnalis* (DC.) Steph., *Jungermannia autumnalis* DC., *J. schraderi* Mart.) – all regions [Brotherus 1892, Abramova & Abramov 1953a, Abramov et al. 1963, 1966, Chikovani 1986, Chikovani & Svanidze 2004, Bakalin et al. 2013; VBG I].

#### **Cephaloziaceae** Mig.

##### **Cephalozia** (Dumort.) Dumort.

*C. bicuspidata* (L.) Dumort. – all regions [Brotherus 1892, Abramov et al. 1966, Chikovani 1986, Chikovani & Svanidze 2004; VBG I]. Chikovani & Svanidze (2004) also recorded as a separate species *C. lammersiana* (Huebener) Carrington for Adjara, but we follow Konstantinova et al. (2009), and most of the other recent literature referring the latter name to the synonymy of *C. bicuspidata*.

*C. lacunculata* (J.B. Jack ex Gottsche & Rabenh.) Spruce – Adjara, Kvemo Svaneti [Chikovani & Svanidze 2004, Bakalin et al. 2013; VBG I].

##### **Fuscocephaloziopsis** Fulford

*F. catenulata* (Huebener) Váňa & L. Söderstr. – Adjara, Mtskheta-Mtianeti, Shida Kartli [Abramov et al. 1966, Chikovani 1986, Chikovani & Svanidze 2004, Bakalin et al. 2013; VBG I].

*F. connivens* (Dicks.) Váňa & L. Söderstr. (≡ *Jungermannia con-*

- nivens* Dicks.) – all regions [Brotherus 1892, Abramova & Abramov 1953a, Chikovani 1986, Chikovani & Svanidze 2004].
- F. leucantha* (Spruce) Váňa & L. Söderstr. – Kvemo Svaneti [Chikovani 1986, Chikovani & Svanidze 2004].
- F. lunulifolia* (Dumort.) Váňa & L. Söderstr. (= *C. media* Lindb.) – Adjara, Samtskhe-Javakheti, Kvemo Kartli [Abramov et al. 1966, Chikovani & Svanidze 2004].
- F. pleniceps* (Austin) Váňa & L. Söderstr. – Shida Kartli [Chikovani 1986, Chikovani & Svanidze 2004].

#### **Nowellia** Mitt.

- N. curvifolia* (Dicks.) Mitt. (= *Cephalozia curvifolia* (Dicks.) Dumort.) – Abkhazia, Adjara, Kakheti, Kvemo Kartli, Racha-Lechkhumi [Brotherus 1892, Abramov et al. 1963, Duda 1982, Chikovani 1986, Váňa & Ignatov 1990, Chikovani & Svanidze 2004, Bakalin et al. 2013; VBG].

#### **Odontoschismataceae** Schljakov (= Cephalozaceae subfam. Odontoschismatoideae H. Buch ex Grolle)

##### **Odontoschisma** (Dumort.) Dumort.

- O. denudatum* (Mart.) Dumort. – Kakheti [Abramov et al. 1963, Duda 1982, Chikovani 1986, Chikovani & Svanidze 2004].
- O. fluitans* (Nees) L. Söderstr. & Váňa – Mtskheta-Mtianeti [Chikovani 1972, 1986, Chikovani & Svanidze 2004].

#### **Cephaloziellaceae** Douin

##### **Cephaloziella** (Spruce) Schiffn.

- C. divaricata* (Sm.) Schiffn. (= *C. divaricata* (Sm.) Schiffn. var. *scabra* (M. Howe) Haynes, *C. starkei* auct.) – all regions [Brotherus 1892, Abramov et al. 1963, 1966, Chikovani 1986, Chikovani & Svanidze 2004, Bakalin et al. 2013; VBG, TBI].
- C. hampeana* (Nees) Schiffn. ex Loeske – Adjara [Chikovani 1986, Chikovani & Svanidze 2004].
- C. rubella* (Nees) Warnst. – Adjara, Mtskheta-Mtianeti [Chikovani 1972, 1986, Chikovani & Svanidze 2004].
- C. turneri* (Hook.) Müll. Frib. – Abkhazia, Adjara [Chikovani 1973, 1986, Chikovani & Svanidze 2004].

#### **Anastrophyllaceae** L. Söderstr., De Roo & Hedde.

##### **Anastrophyllum** (Spruce) Steph.

- A. michauxii* (F. Weber) H. Buch – Racha-Lechkhumi [Chikovani 1986, Chikovani & Svanidze 2004].

##### **Barbilophozia** Loeske

- B. barbata* (Schmidel ex Schreb.) Loeske – all regions [Brotherus 1892, Abramov et al. 1963, 1986, Chikovani 1986, Chikovani & Svanidze 2004; TBI, VBG].
- B. hatcheri* (A. Evans) Loeske – all regions [Abramova & Abramov 1953a, Abramov et al. 1963, 1964, Chikovani 1986, Chikovani & Svanidze 2004, Bakalin et al. 2013; VBG].
- B. lycopodioides* (Wallr.) Loeske – all regions [Brotherus 1892, Abramova & Abramov 1953a, Abramov et al. 1963, 1986, Chikovani 1986, Chikovani & Svanidze 2004].

##### **Gymnocolea** (Dumort.) Dumort.

- G. inflata* (Huds.) Dumort. (= *Jungermannia inflata* Huds.) – Imereti [Brotherus 1892, Chikovani 1986, Chikovani & Svanidze 2004].

##### **Isopaches** H. Buch

- I. bicrenatus* (Schmidel ex Hoffm.) H. Buch (= *Lophozia bicrenata* (Schmidel ex Hoffm.) Dumort. – Mtskheta-Mtianeti, Kvemo Svaneti, Kvemo Kartli [Chikovani 1986, Chikovani & Svanidze 2004].

##### **Neoorthocaulis** L. Söderstr., De Roo & Hedde.

- N. attenuatus* (Mart.) L. Söderstr., De Roo & Hedde. (= *Barbilophozia gracilis* (Schleich. ex DC.) Müll. Frib.) – Abkhazia, Kvemo Svaneti [Chikovani 1986, Chikovani & Svanidze 2004].
- N. floerkei* (F. Weber & D. Mohr) L. Söderstr., De Roo & Hedde. (= *Barbilophozia floerkei* (F. Weber & D. Mohr) Loeske, *Lophozia floerkei* (F. Weber & D. Mohr) Schiffn., *Jungermannia lycopodioides* Wallr. var. *floerkei* (F. Weber & D. Mohr) Lindb.) – Mtskheta-Mtianeti, Shida Kartli, Samtskhe-Javakheti [Brotherus 1892, Abramova & Abramov 1953a, Chikovani 1986, Chikovani & Svanidze 2004].

##### **Pseudolophozia** Konstant. & Vilnet

- Pseudolophozia sudetica* (Nees ex Huebener) Konstant. & Vilnet (= *Lophozia sudetica* (Nees ex Huebener) Grolle, *L. alpestris* auct.) – all regions [Chikovani 1972, 1986, Chikovani & Svanidze 2004; TBI, VBG]. This species was confirmed for Kakheti only; see discussion on this taxon in Bakalin & Tigishvili (2013).

##### **Schljakovianthus** Konstant. & Vilnet

- S. quadrilobus* (Lindb.) Konstant. & Vilnet (= *Lophozia quadri-loba* (Lindb.) A. Evans) – Shida Kartli [Abramova & Abramov 1953a, Chikovani 1986, Chikovani & Svanidze 2004].

##### **Sphenolobus** (Lindb.) Berggr.

- Sphenolobus minutus* (Schreb. ex D. Crantz) Berggr. (= *Jungermannia minuta* Schreb. ex D. Crantz) – all regions [Abramova & Abramov 1953a, Abramov et al. 1966, Chikovani 1986, Chikovani & Svanidze 2004, Bakalin et al. 2013; VBG].

#### **Scapaniaceae** Mig.

##### **Diplophyllum** (Dumort.) Dumort.

- D. albicans* (L.) Dumort. – Abkhazia, Adjara, Imereti, Kakheti, Kvemo Svaneti [Brotherus 1892, Abramov et al. 1963, 1966, Duda 1982, Chikovani 1986, Chikovani & Svanidze 2004, Bakalin et al. 2013; VBG].
- D. obtusifolium* (Hook.) Dumort. – Mtskheta-Mtianeti, Kvemo Svaneti [Chikovani 1986, Chikovani & Svanidze 2004].
- D. taxifolium* (Wahlenb.) Dumort. – Abkhazia, Guria, Kvemo Svaneti, Mtskheta-Mtianeti, Shida Kartli [Brotherus 1892, Abramova & Abramov 1953a, Abramov et al. 1966, 1986, Chikovani 1986, Chikovani & Svanidze 2004].

##### **Lophozia** (Dumort.) Dumort.

- L. ascendens* (Warnst.) R.M. Schust. – Adjara, Kvemo Kartli, Samtskhe-Javakheti [Abramov et al. 1964, 1966, Chikovani 1986, Chikovani & Svanidze 2004].
- L. lantratoviae* Bakalin – Mtskheta-Myianeti [Bakalin & Tigishvili 2013; TBI, VBG].
- L. guttulata* (Lindb. & Arnell) A. Evans – Adjara, Guria, Kvemo Kartli, Sakachavo [Duda 1982, Bakalin & Tigishvili 2013; TBI, VBG].
- L. sibiricola* H. Buch (= *L. porphyroleuca* (Nees) Schiffn.) – all regions [Abramov et al. 1966, Chikovani & Svanidze 2004]. *Lophozia porphyroleuca* is sometimes regarded as a synonym of *L. longiflora* or *L. guttulata*, although Schljakov (1981), based on a study of type specimens, showed this name is a synonym of *L. ventricosa* sensu Schljakov (i.e. *L. sibiricola* in the current view).
- L. ventricosa* (Dicks.) Dumort. (= *Jungermannia porphyroleuca* auct., *J. ventricosa* Dicks., ?). *porphyroleuca* Nees var. *flavidula* Lindb.) – all regions [Brotherus 1892, Abramova & Abramov 1953a, Abramov et al. 1964, 1966, Duda 1982, Chikovani 1986, Chikovani & Svanidze 2004, Bakalin & Tigishvili, 2013].
- L. wenzelii* (Nees) Steph. – all regions [Chikovani 1986, Chi-

- kovani & Svanidze 2004]. Most probably these records belong to var. *massularioides* Bakalin of the species.
- L. wenzellii* (Nees) Steph. var. *massularioides* Bakalin – Adjara [Bakalin & Tigishvili 2013; TBI, VBG].
- Lophoziopsis** Konstant. & Vilnet
- L. excisa* (Dicks.) Konstant. & Vilnet (≡ *Lophozia excisa* (Dicks.) Dumort.) – all regions [Abramov et al. 1964, Chikovani 1986, Chikovani & Svanidze 2004, Bakalin & Tigishvili 2013; VBG].
- L. longidens* (Lindb.) Konstant. & Vilnet – Kakheti [Bakalin & Tigishvili 2013; TBI, VBG].
- Obtusifolium** S.W. Arnell
- O. obtusum* (Lindb.) S.W. Arnell (≡ *Barbilophozia obtusa* (Lindb.) H. Buch – Kakheti [Abramov et al. 1963, Chikovani 1986, Chikovani & Svanidze 2004].
- Oleolophozia** L. Söderstr., De Roo & Hedd.
- O. perssonii* (H. Buch & S.W. Arnell) L. Söderstr., De Roo & Hedd. – Kvemo Svaneti [Bakalin & Tigishvili 2013; TBI, VBG].
- Scapania** (Dumort.) Dumort.
- S. aequiloba* (Schwägr.) Dumort. – Adjara, Imereti, Kvemo Svaneti, Mtskheta-Mtianeti, Racha-Lechkhumi, Shida Kartli [Brotherus 1892, Abramov et al. 1966, Chikovani 1986, Chikovani & Svanidze 2004].
- S. apiculata* Spruce – Mtskheta-Mtianeti [Chikovani 1986, Chikovani & Svanidze 2004].
- S. aspera* M. Bernet & Bernet (≡ *Martinellius asperus* (M. Bernet & Bernet) Broth.) – Abkhazia, Kvemo Svaneti, Mtskheta-Mtianeti, Shida Kartli [Brotherus 1892, Chikovani 1986, Chikovani & Svanidze 2004].
- S. calcicola* (Arnell & J. Perss.) Ingham – Abkhazia, Kvemo Svaneti [Chikovani 1986, Chikovani & Svanidze 2004].
- S. cuspiduligera* (Nees) Müll. Frib. – Mtskheta-Mtianeti [Chikovani 1986, Chikovani & Svanidze 2004].
- S. helvetica* Gottsche – Kakheti [Abramov et al. 1963, Chikovani 1986, Chikovani & Svanidze 2004].
- S. irrigua* (Nees) Nees (≡ *Martinellius irriguus* (Nees) Lindb.) – all regions [Brotherus 1892, Abramov et al. 1963, Chikovani 1986, Chikovani & Svanidze 2004].
- S. nemorea* (L.) Grolle – all regions [Brotherus 1892, Abramov et al. 1963, 1966, Duda 1982, Chikovani 1986, Chikovani & Svanidze 2004, Bakalin et al. 2013; VBG].
- S. mucronata* H. Buch – Shida Kartli [Abramov et al. 1964, Chikovani 1986, Chikovani & Svanidze 2004].
- S. subalpina* (Nees ex Lindenb.) Dumort. (≡ *Martinellius subalpinus* (Nees ex Lindenb.) Trevis.) – Mtskheta-Mtianeti, Shida Kartli [Brotherus 1892, Chikovani 1986, Chikovani & Svanidze 2004].
- S. uliginosa* (Sw. ex Lindenb.) Dumort. – Adjara, Samtskhe-Javakheti [Chikovani 1973, 1986, Chikovani & Svanidze 2004].
- S. undulata* (L.) Dumort. (= *S. undulata* (L.) Dumort. f. *denticulata* (Dumort.) Jørg., *Martinellius resupinatus* (L.) Gray) – all regions [Brotherus 1892, Abramov et al. 1963, 1966, Duda 1982, Chikovani 1986, Chikovani & Svanidze 2004, Bakalin et al. 2013; VBG].
- S. verrucosa* Heeg – Adjara, Kakheti, Mtskheta-Mtianeti [Abramov et al. 1963, 1966, Chikovani 1986, Chikovani & Svanidze 2004, Bakalin et al. 2013; VBG].
- Schistochilopsis** (N. Kitag.) Konstant.
- S. incisa* (Schrad.) Konstant. (≡ *Lophozia incisa* (Schrad.) Dumort., *Jungermannia incisa* Schrad.) – all regions [Brotherus 1892, Abramov & Abramov 1953a, Abramov et al. 1966, Duda 1982, Chikovani 1986, Chikovani & Svanidze 2004].
- Trilophozia** (R.M. Schust.) Bakalin
- T. quinqueidentata* (Huds.) Bakalin – all regions [Brotherus 1892, Abramov & Abramov 1953a, Abramov et al. 1963, Chikovani 1986, Chikovani & Svanidze 2004; TBI, VBG].
- Tritomaria** Schiffn. ex Loeske
- T. exsecta* (Schmidel ex Schrad.) Schiffn. ex Loeske (≡ *Sphenolobus exsectus* (Schmidel ex Schrad.) Steph., *Jungermannia exsecta* Schmidel ex Schrad.) – all regions [Brotherus 1892, Abramov & Abramov 1953a, Abramov et al. 1963, 1966, Chikovani 1986, Chikovani & Svanidze 2004; TBI, VBG].
- T. exsectiformis* (Breidl.) Schiffn. ex Loeske – Kvemo Kartli, Samtskhe-Javakheti, Shida Kartli [Chikovani 1986, Chikovani & Svanidze 2004].
- Myliaceae** Schljakov
- Mylia** Gray
- M. taylorii* (Hook.) Gray – Adjara [Chikovani & Svanidze 2004].
- Arnelliaceae** Nakai
- Southbya** Spruce
- S. topbasea* (Spruce) Spruce (= *S. stillicidiorum* (Raddi) Lindb.) – Abkhazia, Kvemo Kartli, Samtskhe-Javakheti, Shida Kartli [Chikovani 1986, Váňa & Ignatov 1990, Chikovani & Svanidze 2004].
- Calypogeiaceae** Arnell
- Calypogeia** Raddi
- C. arguta* Nees & Mont. – Adjara, Samegrelo [Abramov et al. 1966, Chikovani 1973, Duda 1982, Chikovani 1986, Chikovani & Svanidze 2004, Bakalin et al. 2013; VBG].
- C. azurea* Stotler & Crotz (= *C. trichomanis* (L.) Corda) – all regions [Brotherus 1892, Abramov & Abramov 1953a, Abramov et al. 1966, 1986, Chikovani 1986, Chikovani & Svanidze 2004]. This name in Chikovani & Svanidze (2004) probably reflects many old records that regard most *Calypogeia* species as *C. trichomanis*. The real distribution of *C. azurea* in Georgia remains ambiguous.
- C. fissa* (L.) Raddi – Abkhazia, Adjara, Samegrelo [Chikovani 1973, 1986, Duda 1982, Chikovani & Svanidze 2004, Bakalin et al. 2013; VBG].
- C. muelleriana* (Schiffn.) Müll. Frib. – Abkhazia, Adjara, Samegrelo [Abramov et al. 1966, Chikovani 1986, Chikovani & Svanidze 2004; TBI, VBG].
- C. neesiana* (C. Massal. & Carestia) Müll. Frib. – Kakheti, Mtskheta-Mtianeti, Shida Kartli, Kvemo Kartli [Abramov & Abramov 1953a, Chikovani 1973, 1986, Chikovani & Svanidze 2004, Abramov et al. 1986].
- C. sphagnicola* (Arnell & J. Perss.) Warnst. & Loeske – Mtskheta-Mtianeti, Kvemo Svaneti [Chikovani 1973, 1986, Chikovani & Svanidze 2004].
- C. suecica* (Arnell & J. Perss.) Müll. Frib. – Abkhazia, Kvemo Kartli [Chikovani 1973, 1986, Chikovani & Svanidze 2004; TBI, VBG].
- Delavayellaceae** R.M. Schust.
- Liocblaena** Nees
- L. lanceolata* Nees (≡ *Jungermannia lanceolata* sensu Schrad.) – all regions [Brotherus 1892, Abramov & Abramov 1953b, Abramov et al. 1963, 1966, Chikovani 1986, Chikovani & Svanidze 2004].
- L. subulata* (A. Evans) Schljakov – Adjara [Bakalin et al. 2013; VBG].

**Jungermanniaceae** Rchb.**Jungermannia** L.

- J. atrovirens* Dumort. (≡ *Haplozia atrovirens* (Dumort.) Dumort., = *Jungermannia tristis* Nees, *Haplozia tristis* (Nees) Dumort., *Jungermannia riparia* Taylor) – Abkhazia, Mtskheta-Mtianeti, Racha-Lechkumi, Shida Kartli [Brotherus 1892, Duda 1982, Chikovani 1986, Chikovani & Svanidze 2004, Bakalin et al. 2013; VBG]. Chikovani & Svanidze (2004) listed this species twice, firstly as *Haplozia atrovirens* and secondly as *H. tristis*.
- J. exsertifolia* Steph. subsp. *cordifolia* (Dumort.) Váňa (≡ *J. cordifolia* Hook., nom. illeg., non Brot., *Haplozia cordifolia* Dumort., *Aplozia cordifolia* Dumort.) – Adjara, Kvemo Svaneti, Mtskheta-Mtianeti, Racha-Lechkumi [Brotherus 1892, Abramova & Abramov 1953b, Chikovani 1986, Chikovani & Svanidze 2004].

**Mesoptychia** (Lindb.) A. Evans

- M. badensis* (Gottsche ex Rabenh.) L. Söderstr. & Váňa (≡ *Lophozia badensis* (Gottsche ex Rabenh.) Schiffn.) – Mtskheta-Mtianeti, Shida Kartli [Abramova & Abramov 1953a, Chikovani 1986, Chikovani & Svanidze 2004].
- M. bantriensis* (Hook.) L. Söderstr. & Váňa (= *Lophozia bornschuchiana* (Nees) Macoun) – Adjara, Kakheti, Shida Kartli, Kvemo Svaneti [Abramova & Abramov 1953a, Abramov et al. 1963, Chikovani 1986, Chikovani & Svanidze 2004].
- M. collaris* (Nees) L. Söderstr. & Váňa (= *Lophozia muelleri* (Nees ex Lindenb.) Dumort., *Jungermannia muelleri* Nees ex Lindenb.) – all regions [Brotherus 1892, Abramova & Abramov 1953a, Abramov et al. 1963, Chikovani 1986, Chikovani & Svanidze 2004].
- M. heterocolpos* (Thed. ex Hartm.) L. Söderstr. & Váňa (≡ *Lophozia heterocolpos* (Thed. ex Hartm.) M. Howe) – Kakheti, Shida Kartli [Abramova & Abramov 1953a, Abramov et al. 1963, Chikovani 1986, Chikovani & Svanidze 2004].
- M. turbinata* (Raddi) L. Söderstr. & Váňa (≡ *Jungermannia turbinata* Raddi, *Lophozia turbinata* (Raddi) Steph.) – Adjara, Imereti, Racha-Lechkumi [Brotherus 1892, Chikovani 1986, Chikovani & Svanidze 2004].

**Endogemmataceae** Konstant., Vilnet & A.V. Troitsky**Endogemma** Konstant., Vilnet & A. V. Troitsky

- E. caespiticia* (Lindenb.) Konstant., Vilnet & A.V. Troitsky (= *Solenostoma caespiticium* (Lindenb.) Steph.) – Adjara [Chikovani 1986, Chikovani & Svanidze 2004].

**Solenostomataceae** Stotler & Crand.-Stotl.**Solenostoma** Mitt.

- S. caucasicum* (Váňa) Konstant. (≡ *Jungermannia caucasicum* Váňa) – Adjara [Váňa 1970, Duda 1982, Chikovani 1986, Chikovani & Svanidze 2004, Bakalin et al. 2013; VBG].
- S. gracillimum* (Sm.) R.M. Schust. f. *crenulatum* (Mitt.) Bakalin (≡ *Solenostoma crenulatum* Mitt., *Nardia crenulata* (Mitt.) Lindb., = *Jungermannia crenulata* Sm., nom. illeg., non Schmidel, *J. genibiana* Huebener) – all regions [Brotherus 1892, Duda 1982, Chikovani 1986, Chikovani & Svanidze 2004].
- S. gracillimum* (Sm.) R.M. Schust. f. *gracillimum* (≡ *Solenostoma crenulatum* Mitt. f. *gracillimum* (Sm.) Vanden Berghen, *Aplozia crenulata* (Mitt.) Dumort. f. *gracillima* (Sm.) Casaes-Gil) – Adjara, Kvemo Kartli, Shida Kartli [Abramova & Abramov 1953a, Chikovani & Svanidze 2004; TBI, VBG].
- S. handelii* (Schiffn.) Müll. Frib. – Adjara [Chikovani 1986, Chikovani & Svanidze 2004].
- S. levieri* (Steph.) Steph. (= *S. sphaerocarpum* auct., ≡ *Nardia levieri* Steph.) – Adjara, Mtskheta-Mtianeti [Brotherus 1892, Chikovani 1986, Chikovani & Svanidze 2004, Bakalin

2014b]. See explanation on this species in Bakalin (2014b).

- S. sphaerocarpum* (Hook.) Steph. (≡ *Jungermannia sphaerocarpum* Hook.) – Adjara, Shida Kartli [Brotherus 1892, Abramova & Abramov 1953a, Abramov et al. 1966, Chikovani 1986, Chikovani & Svanidze 2004; TBI, VBG].

**Plectocolea** (Mitt.) Mitt.

- P. obovata* (Nees) Lindb. – Adjara, Abkhazia, Kakheti, Kvemo Svaneti, Mtskheta-Mtianeti [Abramov et al. 1963, Chikovani 1986, Chikovani & Svanidze 2004].
- P. hyalina* (Lyell ex Hook.) Mitt. (≡ *Jungermannia hyalina* Lyell ex Hook.) – all regions [Abramov et al. 1966, Duda 1982, Chikovani 1986, Chikovani & Svanidze 2004, Bakalin et al. 2013; VBG].
- P. infusca* Mitt. var. *memiadzei* Bakalin – Adjara [Bakalin et al. 2013; VBG].

**Geocalycaceae** H. Klinggr.**Geocalyx** Nees

- G. graveolens* (Schrad.) Nees – Kvemo Kartli, Samtskhe-Javakheti [Chikovani 1986, Chikovani & Svanidze 2004].

**Harpanthus** Nees

- H. flotovianus* (Nees) Nees – Mtskheta-Mtianeti [Chikovani 1972, 1986, Chikovani & Svanidze 2004].
- H. scutatus* (F. Weber & D. Mohr) Spruce – Abkhazia, Mtskheta-Mtianeti [Brotherus 1892, Chikovani 1986, Chikovani & Svanidze 2004].

**Antheliaceae** R.M. Schust.**Anthelia** (Dumort.) Dumort.

- A. julacea* (L.) Dumort. – Abkhazia, Mtskheta-Mtianeti, Shida Kartli [Brotherus 1892, Chikovani 1972, 1986, Chikovani & Svanidze 2004].
- A. juratzkana* (Limpr.) Trevis. – Shida Kartli [Abramova & Abramov 1953a, Chikovani 1986, Chikovani & Svanidze 2004].

**Gymnomitriaceae** H. Klinggr.**Gymnomitrium** Corda

- G. concinnatum* (Lightf.) Corda (≡ *Cesius concinnatus* (Lightf.) Gray) – Adjara, Mtskheta-Mtianeti, Samegrelo, Shida Kartli [Brotherus 1892, Abramova & Abramov 1953a, Abramov et al. 1966, Chikovani 1986, Chikovani & Svanidze 2004].
- G. coralloides* Nees (≡ *Cesius coralloides* (Nees) Carruth.) – Adjara, Mtskheta-Mtianeti, Shida Kartli [Brotherus 1892, Abramova & Abramov 1953a, Chikovani 1986, Chikovani & Svanidze 2004].
- G. obtusum* Lindb. (= *Cesius obtusus* (Lindb.) Lindb.) – Mtskheta-Mtianeti [Brotherus 1892, Chikovani 1986, Chikovani & Svanidze 2004].

**Marsupella** Dumort.

- M. emarginata* (Ehrh.) Dumort. (= *Sarcocyphos ebrhardtii* Corda) – Imereti, Mtskheta-Mtianeti [Brotherus 1892, Chikovani 1986, Chikovani & Svanidze 2004, Bakalin et al. 2013; VBG].
- M. funckii* (F. Weber & D. Mohr) Dumort. (≡ *Sarcocyphos funckii* (F. Weber & D. Mohr) Nees, *Marsupella badensis* Schiffn.) – Adjara, Imereti, Kakheti, Mtskheta-Mtianeti, Racha-Lechkumi [Brotherus 1892, Abramov et al. 1963, 1966, Chikovani 1972, 1986, Chikovani & Svanidze 2004, Bakalin et al. 2013; VBG].
- M. sphaelata* (Giesecke ex Lindenb.) Dumort. (≡ *Sarcocyphos sphaelatus* (Giesecke ex Lindenb.) Nees) – Abkhazia, Imereti, Mtskheta-Mtianeti [Brotherus 1892, Chikovani 1986, Chikovani & Svanidze 2004].



*M. apiculata* Schiffn. (≡ *Gymnomitrium apiculatum* (Schiffn.) Müll. Frib.) – Adjara [Chikovani 1986, Chikovani & Svanidze 2004].

### *Nardia* Gray

*N. compressa* (Hook.) Gray – Kvemo Svaneti [Brotherus 1892, Chikovani 1986, Chikovani & Svanidze 2004].

*N. geoscyphus* (De Not.) Lindb. – Mtskheta-Mtianeti, Shida Kartli [Chikovani 1986, Chikovani & Svanidze 2004].

*N. scalaris* Gray – Adjara, Mtskheta-Mtianeti [Abramova & Abramov 1953b; Chikovani 1986; Chikovani & Svanidze 2004].

## INTRODUCED AND PROBABLY CURRENTLY DISAPPEARED TAXON

*Nardia assamica* (Mitt.) Amakawa – Adjara [Vaňa 1976].

This species was collected in Batumi Botanical Garden in the East-Asian sector of the garden and most probably was introduced from East Asia with transplanted vascular plants. Despite a special search, it was not found by Bakalin in 2013 and is probably now disappeared in the hepatic flora of the Caucasus.

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