Gyalecta titovii, a new corticolous lichen species from Abkhazia and Russia

Liudmila V. Gagarina

Laboratory of Lichenology & Bryology, Komarov Botanical Institute, Professor Popov St. 2, RU-197376, St. Petersburg, Russia (e-mail: kvercus@yandex.ru)

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Gyalecta titovii sp. nova is described from Abkhazia and Russia from the Black Sea coast in the Caucasus region. It is morphologically and anatomically similar to G. flotowii and G. truncigena. It mainly differs from G. flotowii in having ellipsoid and more muriform ascospores (6–12 cells visible in optical view). Gyalecta truncigena has similar ascospores, but the apothecia of G. truncigena are larger (0.3–0.7 mm diam.) and their margins are dark.

The lichen genus Gyalecta (Ascomycota, Ostropales, Gyalectaceae) comprises more than 30 species distributed mainly in the temperate zones of both hemispheres. The genus is characterized by a crustose thallus; photobiont Trentepohlia; concave or urceolate apothecia without thalline exciple and with true exciple; thin-walled asci lacking an apical apparatus or tholus, with eight spores; transversally septate to muriform, colourless ascospores; absence of lichen products detectable by TLC (Blum et al. 1975, Foucard 2001, Egea et al. 2004, Smith et al. 2009). Gyalecta species grow on bark (e.g. G. derivata, G. truncigena), on soil (e.g. G. foveolaris, G. geoica), or on rock (G. jenensis, G. kukriensis). During field work in the Caucasian coast of the Black Sea in June and July 2008, a new species was found, which is described here.

The Black Sea coast of the Caucasus extends over 600 km from Anapa in Russia to the Georgian–Turkish border. It runs from the spurs of the Greater Caucasus in the north through the Colchidskaya lowland to the spurs of the Little Caucasus in the south. It is located where the mountains of Mediterranean Europe, and western and central Asia meet. The Caucasus is situated partly in the temperate vegetation zone and partly in the subtropical vegetation zone, and it is characterized by an intermixture of plains and high mountains. The vegetation of the Greater and Little Caucasus ranges from humid subtropical forests in Colchis to dry subtropical semideserts in the Kura-Araksinskaya lowland, and to alpine habitats at high altitudes (Fedina 1990).

The collections reported here are deposited in the herbarium of the Komarov Botanical Institute (LE). I have studied herbarium material of G. flotowii and G. truncigena in the herbaria of LECB, LE, H and UPS. The morphology and anatomy was studied using a light microscope and a dissecting microscope. The measurements were made from water-soaked material. TLC was performed according to the standard procedure (Culberson & Ammann 1979, Kranner et al. 2002), using solvent system A.
Gyalecta titovii Gagarina, sp. nova (Fig. 1)


**ETYMOLOGY**: The species is named after the eminent Russian lichenologist Prof. Dr. Aleksander Titov, who was my colleague and friend. It was found during a field trip arranged by him.

Thallus crustose, < 1 mm thick to almost inconspicuous, smooth to minutely granular, greenish to grey, hypothallus absent; hyphae 1.5–2.3 µm in diameter. Photobiont Trentepohlia, cells rounded, 20 × 20(−22.5) µm. Apothecia usually numerous, scattered, rarely confluent, rounded, 0.1–0.25 mm diam., sessile, often ± immersed in substrate. Disc concave, pale to dark yellowish-brown. Margin prominent, smooth, pale brown. Exciple 42–50 µm wide, consisting of two layers; an external hyaline layer (31–35 µm wide) and an internal layer with a dirty blue tinge (24–27 µm wide). Hymenium hyaline, 80–93 µm tall, without oil drops. Paraphyses simple, with a few septa, in upper part 2–2.5 µm diam.; apices slightly swollen to 3 µm diam., colourless. Epithecium hyaline to pale yellowish, 12–14 µm tall. Hypothecium dirty yellowish brown, 67–84 µm tall. Asci 8-spored, clavate, 80–88 × 8–12 µm (Fig. 1) with uniseriate spores. Ascospores hyaline, ellipsoid, muriform when mature, with 6–12 cells visible in optical view and with numerous oil drops, 12–20 × 8–12 µm. Thallus C–, K–, KC–, P–. Hymenium J+ blue. No secondary substance detected by TLC. Pycnidia not seen.

**HABITAT ECOLOGY**: Gyalecta titovii grows on the bark of Cupressus sempervirens, Taxus sp. and Taxodium mucronatum in humid, open and sun-exposed places at altitudes between 1100 and 3010 m a.s.l., often near roads.

**DISTRIBUTION**: Four samples of G. titovii were collected in the territory of Krasnodar in Russia, and six samples in the nearby territory of Abkhazia (Fig. 2). It has been collected on conifers (Cupressus sempervirens, Taxus sp., Taxodium mucronatum). Gyalecta truncigena and G. flotowii grow mainly on broad-leaved trees. The
former is common in the British Isles, Europe, Iceland, North and Central America, and Asia. *Gyalecta flotowii* has a similar distribution, but is rarer and lacking in Iceland (Smith et al. 2009).

*Gyalecta titovii* is morphologically similar to *Gyalecta flotowii* and *G. truncigena*, but differs by several characters (Table 1).

**Additional examined specimens of *Gyalecta titovii* (paratypes).** Abkhazia. Picundo-Myussers Nature reserve, valley of the river Mzyrka, on bark of *Cupressus sempervirens*, 2008 L.V. Gagarina 3044, 3072 (LE-7960, LE). **Fig. 2.** Distribution map of *Gyalecta titovii.*

Abkhazia. Sukhumi region, on the bark of *Quercus* sp., 2008 L.V. Gagarina 3044, 3072 (LE L-7960, LE). **Fig. 2.** Distribution map of *Gyalecta titovii.*

**Specimens examined for comparison.** — *Gyalecta truncigena* (*Gyalecta wahlenbergiana var. truncigena* (holotype, H-ACH)). **Fig. 2.** Distribution map of *Gyalecta titovii.*

Abkhazia. Sukhumi region, on the bark of *Quercus* sp., 2008 L.V. Gagarina 3044, 3072 (LE-7960, LE). Finland. South Häme (EH), on *Tilia*, 1991 T. Ahti (H 9100141); Uusimaa, on ornamental *Acer platanoides*, 1994 T. Ahti & M. Kuusinen (H 9100140). Greece. Crete, Rethimno, on trunk of *Quercus macrolepis*, 1993 A. Nordin (UPS L-027760). **Fig. 2.** Distribution map of *Gyalecta titovii.*

Russia. Chukotka peninsula, on the bark of *Salix* sp., 1877 I.I. Makarova (LE L-653); Karelia, on old growth *Populus*, 1998 J. Hermansson (UPS L-111351); Leningrad region, on the bark of *Populus tremula*, 2009 L.V. Gagarina 3171, 3172, 3173 (LE); Lodeinopol’sky district, on the bark of *Populus tremula*, 2001 E.S. Kuznetsova & D.E. Himelbrant 3200 (LECB); Luga district, on the bark of *Populus tremula*, 2008 D. Erastova & E.S. Kuznetsova 4007 (LE); Podporozhsky district, on the bark of *Populus tremula*, 2009 I. Stepanchikova 3186 (LE), 2009 I. Stepanchikova & E.S.

**Table 1.** Main differences between *Gyalecta truncigena*, *G. titovii* and *G. flotowii.*

<table>
<thead>
<tr>
<th>Characters</th>
<th><em>G. truncigena</em></th>
<th><em>G. titovii</em></th>
<th><em>G. flotowii</em></th>
</tr>
</thead>
<tbody>
<tr>
<td>Apothecia</td>
<td>0.3–0.7 mm diam., gradually become dark at edge</td>
<td>0.1–0.25 mm diam.</td>
<td>0.2–0.4 mm diam.</td>
</tr>
<tr>
<td>Margin</td>
<td>somewhat prominent, rarely uneven-wavy, gradually darkened</td>
<td>prominent, even, pale brownish</td>
<td>prominent, smooth to occasionally crenate</td>
</tr>
<tr>
<td>Exciple</td>
<td>30–60 µm wide, smooth, cream to brownish or yellowish pink</td>
<td>42–50 µm wide, of 2 layers: external hyaline, 31–35 µm wide, internal with a dirty blue tinge, 24–27 µm wide</td>
<td>10–20 µm wide in basal part, 50–80 µm in lateral part, hyaline or cream to orange</td>
</tr>
<tr>
<td>Hymenium</td>
<td>90–115 (–125) µm tall</td>
<td>80–93 µm tall</td>
<td>90–115 µm tall</td>
</tr>
<tr>
<td>Hypothecium</td>
<td>22–26 µm tall, pale yellow or hyaline</td>
<td>67–84 µm tall, dirty yellowish brown</td>
<td>20–40 µm tall, hyaline</td>
</tr>
<tr>
<td>Asci</td>
<td>70–95 × 10–16 µm</td>
<td>80–88 × 8–12 µm</td>
<td>70–100 × 8–12 µm</td>
</tr>
<tr>
<td>Ascospores</td>
<td>12–31 × 5–9 µm, ellipsoid, ovoid or oblong-fusiform, muralform, 6 or more cells visible in optical view</td>
<td>12–20 × 8–12 µm, ellipsoid, strongly muralform, 6–12 cells visible in optical view</td>
<td>9–18 × 6–11 µm, almost spherical, divided by oblique or diagonal septa, 6 or less cells visible in optical view</td>
</tr>
<tr>
<td>Substrate</td>
<td>broad-leaved trees</td>
<td>conifers</td>
<td>broad-leaved trees</td>
</tr>
</tbody>
</table>
Acknowledgements

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