

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

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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 semi-deserts 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.

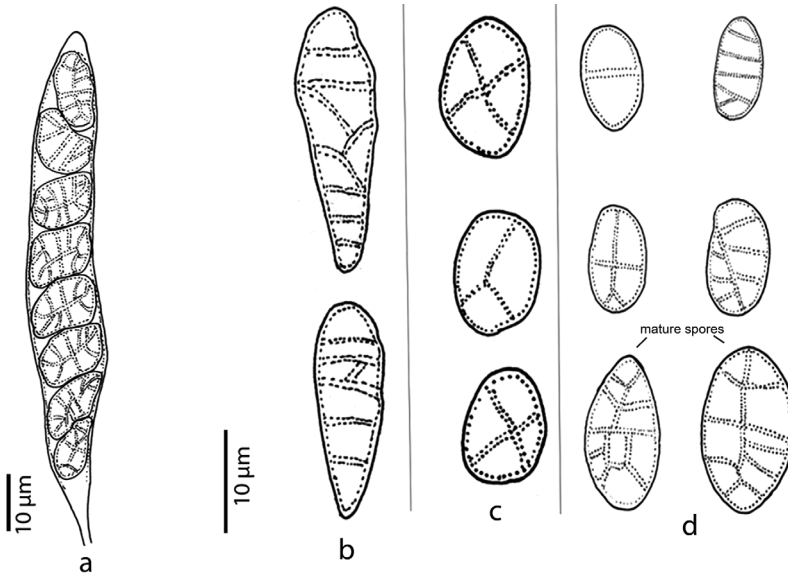


Fig. 1. Ascus and ascospores in *Gyalecta*. — **a:** Ascus of *G. titovii* (from the holotype). — **b:** Ascospores of *G. truncigena* (from LE L-7960). — **c:** Ascospores of *G. flotowii* (from LE L-7841). — **d:** Ascospores of *G. titovii* (from the holotype).

***Gyalecta titovii* Gagarina, sp. nova (Fig. 1)**

Thallus crustaceus, tenuis, laevis vel minute granulatus. Apothecia orbicularia, 0.1–0.25 mm diametro, disco dilute ad obscure luteo-fuscido. Exipulum 42–50 µm latum, bistratosum, stratum externum 31–35 µm latum, decoloratum, stratum internum 24–27 µm latum, dilute et sordide caeruleum. Hymenium 80–93 µm altum, hyalinum. Epithecium hyalinum vel dilute luteolum. Hypothecium 67–84 µm altum, obscure luteo-brunneum. Sporae ellipsoideae, murales, sectio longitudinalis media 6–12-loculares.

TYPE: Abkhazia. Picundo-Myussers Nature reserve, valley of the river Mzyrka, on bark of *Cupressus sempervirens*, 43°01.291'N, 40°27.197'E, 22.VI.2008, L.V. Gagarina 3033 (holotype LE).

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 3002, 3045, 3073, 3074 (LE); Novoafon gorge, valley of the river Psyrtskha, on the bark of *Taxus*, 2008 L.V. Gagarina 3075 (LE). **Russia**. Krasnodar region, Botanical garden of Kuban, on the bark of *Taxodium mucronatum*, 2008 L.V. Gagarina 3030, 3058, 3202 (LE), vicinity of the village Kashtany, on the bark of *Cupressum sempervirens*, 2008 L.V. Gagarina 3020 (LE).

SPECIMENS EXAMINED FOR COMPARISON. — *Gyalecta truncigena* (*Gyalecta wahlenbergiana* var. *truncigena* (holotype, H-ACH!). **Abkhazia**. Sukhumi region, on the bark of *Quercus* sp., 2008 L.V. Gagarina 3044, 3072 (LE L-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). **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



Fig. 2. Distribution map of *Gyalecta titovii*.

region, on the bark of *Populus tremula*, 2009 L.V. Gagarina 3171, 3172, 3173 (LE); Lodejnopolsky 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*.

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

Kuznetsova 3187, 3190 (LE L-7966, LE), 2009 *I. Stepanchikova 3191* (LE), 2009 *I. Stepanchikova & D.E. Himelbrant 3188, 3189* (LE); Novgorod region, on the bark of *Picea abies*, 2009 *L.V. Gagarina 3167* (LE L-7962); Republic of Mari EL, on the bark of *Populus tremula*, 2001 *G. Bogdanov 3063* (LE L-7961); Vologda region, 2008 *L.A. Konoreva 3035* (LE L-7959); Yaroslavl region, on the bark of *Populus tremula*, 2008 *L.A. Konoreva 3034* (LE L-7958). **Slovenia**. Dolenjska, on trunk of *Juglans*, 1991 *A. Nordin* (UPS L-076305). **Sweden**. Värmland, Kila, on the bark of *Ulmus* sp., 1936 *A.H. Magnusson* (UPS L-002454); Uppland, on the bark of *Ulmus glabra*, 1992 *A. Nordin* (UPS L-023596); Gräsö, on trunk of recently pollarded *Fraxinus excelsior*, 1997 *A. Nordin* (UPS L-084820); Forsmark, on trunk of *Acer platanoides* in wooded pasture, 2004 *A. Nordin* (UPS L-140855). — *Gyalecta flotowii*. **Croatia**. Zagrabacka, on roots of *Acer*, 1991 *A. Nordin* (UPS L-076300). **Germany**. Westfalen, 1861 *G. Lahm* (H). **Russia**. Kalinin region, 1908 *A.A. Elenkin* (LE L-7841). **Sweden**. Närke, on the bark of *Quercus*, 1869 *P.J. Hellbom* (UPS L-002447, H 9100507). **USA**. Tennessee, on trunk of *Juglans*, 1995 *A. Nordin* (UPS L-071505).

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