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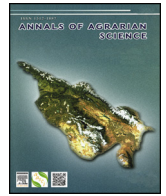
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Main oak species and fungi associated with oak trees described in Georgian mycological herbarium

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ABSTRACT

The Georgian mycological herbarium of the Agricultural University of Georgia contains 147 specimens collected in Georgia.

Among the herbarium samples there are described six different oak tree species: *Quercus petraea* subsp. *iberica* (Steven ex M. Bieb.) Krassiln., *Quercus ilex* L., *Quercus macranthera* Fisch. & C.A.Mey. ex Hohen., *Quercus mongolica* Fisch. ex Ledeb., *Quercus suber* L., *Quercus glauca* Thunb.

In Eastern Georgia there were collected samples of the following species: *Quercus petraea* subsp. *iberica* (Steven ex M. Bieb.) Krassiln., *Quercus ilex* L., *Quercus macranthera* Fisch. & C.A.Mey. ex Hohen., *Quercus mongolica* Fisch. ex Ledeb. From Western Georgia were collected: *Quercus suber* L., *Quercus glauca* Thunb., *Quercus petraea* subsp. *iberica* (Steven ex M. Bieb.) Krassiln. 71 specimens were not identified to species level yet.

It was described 59 species of 34 fungal genera associated with oak trees. 21 fungal genera were associated with trunk and branches of oak trees: *Anthostoma*, *Daedalea*, *Dendrophoma*, *Diaporthe*, *Diatrype*, *Diatrypella*, *Diplodia*, *Endothia*, *Fomes*, *Fusicoccum*, *Gloeosporium*, *Kneiffia*, *Leptosphaeria*, *Melogramma*, *Metasphaeria*, *Microdiplodia*, *Myrmaecium*, *Peniophora*, *Phomopsis*, *Polystictus*, *Valsa* and 14 genera were found on oak tree leaves: *Articulariella*, *Ascochyta*, *Hormiscium*, *Exoascus*, *Microsphaera*, *Microspora*, *Oidium*, *Phloeospora*, *Phyllosticta*, *Physalospora*, *Septoria*, *Stemphylium*, *Stigmella*, *Taphrina*.

Introduction

Georgia is famous with its biodiversity. Approximately 40% of the country's territory is covered by forests where more than 4100 species of plants are distributed. 300 species among them are endemic to Georgia and the Caucasus [1].

Oaks provide some of the most beautiful and valuable tree specimens to our forests and landscapes. Wood from oak species is used in a variety of ways including construction, interior finishing, furniture, cooperage and firewood. Their acorns are an important food source to numerous birds and mammals.

There are known 600 oak species in the world. 18 species of them are distributed in the Caucasus and 7 subspecies of 5 native species to Georgia: 1. *Quercus petraea* subsp. *iberica* (Steven ex M. Bieb.) Krassiln. (syn: *Quercus iberica*), 2. *Quercus petraea* subsp. *iberica* (Steven ex M. Bieb.) Krassiln. (syn: *Quercus dshorochensis* K. Koch.), 3. *Quercus hartwissiana* Steven., 4. *Quercus pontica* C. Koch., 5. *Quercus macranthera*

Fisch. & C.A.Mey. ex Hohen. 6. *Quercus robur* subsp. *imeretina* (Steven ex Woronow) Menitsky. (syn: *Quercus imeretina* Steven ex Woronow), 7. *Quercus robur* subsp. *pedunculiflora* (K. Koch) Menitsky. (syn: *Quercus pedunculiflora*) [2–12].

There are different kind of fungi associated with oak trees [13–15]. Some of them are saprophytic, some of them are beneficial to plants such as mycorrhizal fungi that ensure the tree's good health, and ultimately, survival and some of them are causing diseases of the trees.

Oak trees are affected by numerous fungal diseases, causing its weakening and death. Data about described oak diseases in Georgia are not studied well and require appropriate attention and study [13,14,16]. The creation of the herbarium database made possible and available to access information that was not known before.

Georgian and foreign scientists started to study oak diseases at the beginning of the 19th century. Studied and identified specimens to species level are kept at mycological herbarium of Agricultural University of Georgia.

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The aim of the work was to collect information about oak tree species collected in herbarium and mycobiota described on specimens on a base of mycological herbarium of Georgia.

The Georgian mycological herbarium was created in 1852. The collection at different times belonged to different institutions such as Tbilisi Botanical Garden (1911–1930) and L. Kanchaveli Institute of Plant Protection (1930–2011). Since 2011 collection was moved to Agricultural University of Georgia. The renovation of the collection has been granted by Shota Rustaveli National Science Foundation in 2014–2018. The herbarium contains specimens collected since 1857. There are more than 19000 specimens in the herbarium.

Materials and methods

The database of Mycological Herbarium of Agricultural University was created by recording label information from all specimens kept in mycological herbarium of the Agricultural University. Specimens that were associated with oak trees has been filtered and list of the fungi associated with oaks has been created. Fungal and plant species names has been corrected by Index Fungorum (2018) [17], Mycobank (2018) [18], and The Plant List (2018) database [19]. Fungal names are presented in alphabetic order.

Results and analyses

Study of the herbarium specimens revealed 147 specimens of oak tree leaves and branches associated with fungi in Georgia.

Six different oak tree species has been described among herbarium samples: *Quercus petraea* subsp. *iberica* (Steven ex M. Bieb.) Krassiln., *Quercus ilex* L., *Quercus macranthera* Fisch. & C.A.Mey. ex Hohen., *Quercus mongolica* Fisch. ex Ledeb., *Quercus suber* L., *Quercus glauca* Thunb.

Following oak species: *Quercus petraea* subsp. *iberica* (Steven ex M. Bieb.) Krassiln., *Quercus ilex* L., *Quercus macranthera* Fisch. & C.A.Mey. ex Hohen., *Quercus mongolica* Fisch. ex Ledeb. has been collected in Eastern Georgia. From Western Georgia there were collected: *Quercus suber* L., *Quercus glauca* Thunb., *Quercus petraea* subsp. *iberica* (Steven ex M. Bieb.) Krassiln. 71 specimens were not identified to the species level yet.

Totally 59 species of 34 fungal genera has been described on oak trees.

35 species of 21 genera of the fungi were associated with oak tree trunks and branches: *Anthostoma atro-punctatum* (Schwein.) Sacc, *Daedalea quercina* (L.) Pers. (4 specimen), *Daedalea unicolor f. irpicoides* Bres., *Dendrophoma pleurospora* Sacc., *Diaporthe leiphaemia* (Fr) Sacc., *Diaporthe* sp. (2 specimens), *Diatrype stigma* (Hoffm.) Fr. (2 specimens), *Diatrypella favacea* (Fr.) Ces. & De Not., *Diatrypella laevigata* Fuckel, *Diatrypella quercina* (Pers.) Cooke (6 specimen), *Diatrypella verruciformis* (Ehrh.) Fr., *Diplodia amphisphaerioides* Pass., *Diplodia quercus* Fuckel (3 specimen), *Diplodia* sp., *Endothia* sp., *Fomes* sp., *Fusicoccum brunaudii* Pass. (2 specimens), *Fusicoccum quercinum* Sacc. (2 specimen), *Gloeosporium quercinum* Westend. (2 specimens), *Kneiffia corticalis* (Bull.) Bres. (2 specimen), *Leptosphaeria* sp., *Leptosphaeria vagutunda* Sacc., *Melogramma bulliardii* for. *capini* Tul., *Melogramma caucasicum* Jav., *Metasphaeria sepincola* (Fr.), *Microdiplodia iliceti* Sacc., *Myrmaecium rubricosum* (Fr.) Fuckel, *Peniophora corticalis* (Bull.) Bres. (4 specimen), *Peniophora nuda* (Fr.) Bres., *Phomopsis quercina* (Sacc.) Höhn. ex Died (2 specimens), *Phomopsis* sp. (2 specimens), *Polystictus pergamenus* (Fr.) Cooke., *Valsa ceratophora* Tul. & C. Tul., *Valsa intermedia* Nitschke., *Valsa* sp. (2 specimen):

Anthostoma atro-punctatum (Schwein.) Sacc, *Quercus macranthera* Fisch. & C.A.Mey. ex Hohen branch, Georgia, Kakheti, Lagodekhi conservancy area, 27.06.1973, Dekanoidze N.

Daedalea quercina (L.) Pers., *Quercus* sp., Georgia, Nedzviskhevi, 29.07.1920., Baratashvili, Woronichin.

D. quercina (L.) Pers., *Quercus* sp., Georgia, Nedzviskhevi,

29.07.1920., Baratashvili, Woronichin.

D. quercina (L.) Pers., *Quercus* sp., Georgia, Tbilisi Botanical Garden, 06.01.1915.

D. quercina (L.) Pers., *Quercus* sp., Georgia, Tbilisi Botanical Garden, 05.01.1905.

D. unicolor f. irpicoides Bres., *Quercus* sp., Georgia, 22.07.1933, Esaulowa, Schischkina.

Dendrophoma pleurospora Sacc., *Quercus glauca* Thunb., Georgia, Abkhazia, 27.10.1963 Gvritishvili M.

Diaporthe leiphaemia (Fr) Sacc., *Quercus petraea* subsp. *iberica* (Steven ex M. Bieb.) Krassiln., Georgia, Abkhazia, Tzebelda, 23.03.1912, Woronow G.

D. sp., *Quercus petraea* subsp. *iberica* (Steven ex M. Bieb.) Krassiln., Georgia, Babanauri, 17.09.1964, Gvritishvili M.

D. sp., *Quercus petraea* subsp. *iberica* (Steven ex M. Bieb.) Krassiln., Georgia, Qvishkheti, Mtatsminda, 27.07.1966, Gvritishvili M.

Diatrype stigma (Hoffm.) Fr., *Quercus iberica* Steven ex M. Bieb., Georgia, Tbilisi, Turtle lake, 18.02.1973, Gvritishvili M., Dekanoidze N.

D. stigma (Hoffm.) Fr., *Quercus petraea* subsp. *iberica* (Steven ex M. Bieb.) Krassiln. Georgia, Tbilisi, Turtle lake, 18.02.1973, Gvritishvili, Dekanoidze.

Diatrypella favacea (Fr.) Ces. & De Not., *Quercus petraea* subsp. *iberica* (Steven ex M. Bieb.) Krassiln., Georgia, Abkhazia, Tsebelda, 23.03.1912, Woronow G.

D. iatrypella laevigata (Fuckel) Cooke, *Quercus petraea* subsp. *iberica* (Steven ex M. Bieb.), Krassiln., Georgia, Abkhazia, Tsebelda, 23.03.1912, Woronow G.

D. laevigata Fuckel., *Quercus petraea* subsp. *iberica* (Steven ex M. Bieb.) Krassiln., Georgia, Abkhazia, Tsebelda, 23.03.1912, Woronow G.

D. quercina (Pers.) Fr., *Quercus petraea* subsp. *iberica* (Steven ex M. Bieb.) Krassiln., Georgia, Tbilisi, Funicular, 21.09.1975, Gvritishvili M., Dekanoidze N.

D. quercina (Pers.) Fr., *Quercus petraea* subsp. *iberica* (Steven ex M. Bieb.) Krassiln., Georgia, Abkhazia, 08.12.1912, Woronow G., Rehm H.

D. quercina (Pers.) Fr., *Quercus petraea* subsp. *iberica* (Steven ex M. Bieb.) Krassiln., Georgia, Tbilisi, Funicular, 21.09.1975, Gvritishvili M., Dekanoidze N.

D. quercina (Pers.) Fr., *Quercus petraea* subsp. *iberica* (Steven ex M. Bieb.) Krassiln., Georgia, Abkhazia, 08.12.1912, Woronow G., Rehm H.

D. quercina (Pers.) Fr., *Quercus petraea* subsp. *iberica* (Steven ex M. Bieb.) Krassiln., 18.02.1978, Gvritishvili M., Dekanoidze N.

D. quercina (Pers.) Fr., *Quercus petraea* subsp. *iberica* (Steven ex M. Bieb.) Krassiln., Georgia, Tbilisi, Turtle lake, 18.02.1978, Gvritishvili M., Dekanoidze N.

D. verruciformis (Ehrh.) Fr., *Quercus petraea* subsp. *iberica* (Steven ex M. Bieb.) Krassiln., Georgia, Tbilisi, Turtle lake, 06.05.1979.

Diplodia amphisphaerioides Pass., *Quercus petraea* subsp. *iberica* (Steven ex M. Bieb.) Krassiln., Georgia, Tbilisi, Turtle lake, 06.05.1979.

D. quercus Fuckel, *Quercus ilex* L., Georgia, Tbilisi, Botanical garden, 28.11.1980, Gvritishvili M., Dekanoidze N.

D. quercus Fuckel, *Quercus petraea* subsp. *iberica* (Steven ex M. Bieb.) Krassiln., Georgia, Babaneuri, 17.09.1964.

D. quercus Fuckel, *Quercus* sp., Georgia, Tbilisi, Delisi, Nutsubidze plato, 20.07.1977, Gvritishvili M.

D. sp., *Quercus* sp., Georgia, 11.07.1963.

Endothia sp., *Quercus petraea* subsp. *iberica* (Steven ex M. Bieb.) Krassiln., Georgia, Tbilisi, Funikular, 21.09.1975, Gvritishvili M., Dekanoidze N.

Fomes sp., *Quercus* sp., Georgia, Kakheti, v. Chiauri, 1916, Vispilevski V., Kuschke, *Fusicoccum brunaudii* Pass., *Quercus* sp., Georgia, Melia M.

Fusicoccum brunaudii Pass., *Quercus* sp., Georgia, Tbilisi, Turtle lake.

F. perniciosum Briosi & Farneti, *Quercus petraea* subsp. *iberica* (Steven ex M. Bieb.) Krassiln. Georgia, Mukhrani, Dampalo, 30.05.1957, Gvritishvili M.

- F. quercinum** Sacc., *Quercus* sp., Georgia, 23.05.1962, Dadalauri T.
- F. quercinum** Sacc., *Quercus petraea* subsp. *iberica* (Steven ex M. Bieb.) Krassiln., Georgia, Abkhazia, Jurevskoe, Tsebelda, 27.03.1912, G. Woronow.
- Gloeosporium quercinum** Westend., *Quercus petraea* subsp. *iberica* (Steven ex M. Bieb.) Krassiln., Georgia, Betania, 16.05.1969.
- G. quercinum** Westend., *Quercus* sp., Georgia, Tsotsoreti, 23.05.1962, Dadalauri T., *Kneiffia corticalis* (Bull.) Bres., *Quercus* sp., Georgia, Abkhazia, 27.03.1912, Woronow G.
- Kneiffia corticalis** Bresad., *Quercus* sp., Georgia, Abkhazia, Fauces Petzskir, 27.03.1912, Woronow G.
- Leptosphaeria* sp., *Quercus macranthera* Fisch. & C.A.Mey. ex Hohen., Georgia, Kakheti, Lagodekhi conservancy area, 27.06.1973, Jibgashvili N.
- Leptosphaeria vagutunda** Sacc., *Quercus petraea* subsp. *iberica* (Steven ex M. Bieb.) Krassiln., Georgia, Turtle lake, 18.02.1978, Gvritishvili M., Dekanoidze N.
- Melogramma bulliardi** for. *capini* Tul., *Quercus petraea* subsp. *iberica* (Steven ex M. Bieb.) Krassiln., Georgia, Abkhazia, Tsebelda, 24.03.1912, Woronow G.
- M. caucasicum** Jav., *Quercus petraea* subsp. *iberica* (Steven ex M. Bieb.) Krassiln., Georgia, Abkhazia, Fauces Petzskir, 27.09.1909, Woronow G.
- Metasphaeria sepincola** (Fr.), *Quercus glauca* Thunb., Georgia, Abkhazia, Sokhumi botanical garden, 27.10.1963, Gvritishvili M.
- Microdiplodia iliceti** Sacc., *Quercus petraea* subsp. *iberica* (Steven ex M. Bieb.) Krassiln., Georgia, Tbilisi, Turtle lake, 18.02.1978, Gvritishvili M., Dekanoidze N.
- Myrmaecium rubricosum** (Fr.) Fuckel, *Quercus* sp., Georgia, Tbilisi, Kodjori 12.06.1912, Newodowski, Kancaveli L.
- Peniophora corticalis** (Bull.) Bres., *Quercus petraea* subsp. *iberica* (Steven ex M. Bieb.) Krassiln., Georgia, Prov. Tiflis, Mechetha, 25.09.1913, Kuschke, Kancaveli L.
- P. corticalis** (Bull.) Bres., *Quercus* sp., Georgia, Abkhazia, 07.12.1912, Woronow G., Bresadola G.
- P. corticalis** (Bull.) Bres., *Quercus* sp., Georgia, Abkhazia, 14.12.1912, Woronow G., Bresadola G.
- P. corticalis** (Bull.) Bres., *Quercus* sp., Georgia, 08.10.1908, Haglund E.
- P. nuda** (Fr.) Bres., *Quercus* sp., Georgia, Tbilisi, Botanical garden, 27.12.1912, Woronow G., Bresadola G.
- Phomopsis quercella** (Sacc. & Roum.) Died., *Quercus* sp., Georgia, Tbilisi, Vake park, 26.09.1964, Tsanova N., Ratiani G.
- Ph. quercina** (Sacc. & Roum.) Died., *Quercus petraea* subsp. *iberica* (Steven ex M. Bieb.) Krassiln., Georgia, v. Ikoti, 07.07.1963, Gvritishvili M.
- Ph. sp.**, *Quercus petraea* subsp. *iberica* (Steven ex M. Bieb.) Krassiln., Georgia, Babanauri, 17.10.1964, Gvritishvili M.
- Ph. sp.**, *Quercus petraea* subsp. *iberica* (Steven ex M. Bieb.) Krassiln., Georgia, Babanauri, Gvritishvili M.
- Polystictus pergamenus** (Fr.) Cooke., *Quercus* sp., Georgia, Akhmeta, 29.07.1933, Ivanova, Schischkina.
- Valsa ceratophora** Tul. & C. Tul., *quercus* sp., Georgia, Abkhazia, Akhali atoni, 27.09.1963.
- V. intermedia** Nitschke, *Quercus* sp., Georgia, 11.08.1963, Gvritishvili M.
- V. sp.**, *Quercus macranthera* F. et M.H., Georgia, Bakuriani, Botanical garden, 20.07.1964, Gvritishvili M.
- V. sp.**, *Quercus* sp., Georgia, Mestia, Ikliani, Zermeli, 01.07.1964, Gvritishvili M.
- 24 species of 14 genera were found on oak leaves:
- Articulariella aurantiaca* Höhn. Sacc. & Speg (4 specimen), *Ascochyta quercus* Sacc. & Speg., *Hormiscium* sp. (2 specimen), *Exoascus caeruleus* (Desm. & Mont.) Sadeb. (3 specimen), *Microsphaera abeliae* Homma, *Microsphaera abbreviata* Peck., *Microsphaera alphitoides* Griffon & Maubl. (6 specimen), *Microsphaera hypophylla* Nevod. (2 specimen), *Microsphaera* sp., *Microspora* sp., *Oidium alphitoides* Griffon & Maubl. (2 specimen), *Oidium dubium* Jacz. (20 specimen), *Oidium quercinum* Thüm., *Phloeospora quercicola* (Desm.) Sacc. & D. Sacc., *Phyllosticta associata* Bubák, *Phyllosticta maculiformis* Sacc., *Phyllosticta tumoricola* Peck, *Physalospora citricola* Penz, *Septoria asclepiadea* Sacc., *Septoria dubia* Sacc. & P. Syd. (5 specimen), *Septoria ocellata* (Lév.) Sacc., *Stemphylium botryosum* Wallr., *Stigmella dryophila* (Corda) Lindau, *Taphrina caerulescens* (Desm. & Mont.) Tul.
- Articulariella aurantiaca** Höhn. Sacc. & Speg, *Quercus* sp., Georgia, Kakheti, Lagodekhi, 12.01.1960, Schischkinab A.
- A. aurantiaca** Höhn. Sacc. & Speg., *Quercus* sp., Georgia, Zemo Avchala, 16.07.1917, Uvarow B. P., Nagorny, P. I.
- A. aurantiaca** Höhn. Sacc. & Speg, *Quercus petraea* subsp. *iberica* (Steven ex M. Bieb.) Krassiln., Georgia, v. Ikoti, 13.10.1955, Schischkina A.
- A. aurantiaca** Höhn. Sacc. & Speg., *Quercus* sp., Georgia, Orbeti dist., v. Amlivi, 1960.10, Melia M.
- Ascochyta quercus** Sacc. & Speg., *Quercus macranthera* F. et M.H., Georgia, Lortsoma, 29.09.1954, Gvritishvili M.
- Hormiscium** sp., *Quercus suber* L., Georgia, Adjara, Batumi, Buknari 14.10.1912, Vinogradov-Nikitin N., Woronichin N.
- H. sp.**, *Quercus suber* L., Georgia, Adjara, Batumi, Buknari 14.10.1912, Newodowski G.
- Exoascus caeruleus** (Desm. & Mont.) Sadeb., *Quercus cerris* L., Transcaucasia, Jaczewski A.
- E. caeruleus** (Desm. & Mont.) Sadeb., *Quercus macranthera* F. et M.H., Georgia.
- E. caeruleus** (Desm. & Mont.) Sadeb., *Quercus petraea* subsp. *iberica* (Steven ex M. Bieb.) Krassiln., Georgia, v. Pavliani, m. Ukuna, 29.08.1957, Gvritishvili M.
- Hormiscium** sp., *Quercus suber* L. leaf, Georgia, Adjara, Batumi, Buknari, 14.10.1912, Vinogradov-Nikitin N., Woronichin N.
- H. sp.**, *Quercus suber* L., Georgia, Adjara, Batumi, Buknari, 14.10.1912, Newodowski G.
- Microsphaera abeliae** Homma, *Quercus petraea* subsp. *iberica* (Steven ex M. Bieb.) Krassiln., Georgia, Tbilisi, 22.09.1959, Melia M.
- M. abbreviata** Peck., *Quercus* sp., Georgia, Qartli, Tbilisi Botanical Garden, 21.10.1966, Melia M.
- M. alphitoides** Griffon & Maubl., *Quercus* sp., Georgia, Melia M.
- M. alphitoides** Griffon & Maubl., *Quercus petraea* subsp. *iberica* (Steven ex M. Bieb.) Krassiln., Georgia, Kakheti, Ivris chala, 14.09.1953, Gvritishvili M.
- M. alphitoides** Griffon et Meublane, *Quercus petraea* subsp. *iberica* (Steven ex M. Bieb.) Krassiln., Georgia, Ivris chala, 03.10.1954, Gvritishvili M.
- M. alphitoides** Griffon et Moullac., *Quercus petraea* subsp. *iberica* (Steven ex M. Bieb.), Georgia, Kazreti, Maretsi, 20.05.1957, Dzagnidze.
- M. alphitoides** Griffon & Maubl., *Quercus* sp., Georgia, Tskhinvali park, 27.07.1959, Gvritishvili M. Tsanova N.
- M. alphitoides** Griffon et Moullac., *Quercus petraea* subsp. *iberica* (Steven ex M. Bieb.) Krassiln., Georgia, Bolnisi, Kazreti, 17.09.1959, Dzagnidze.
- M. hypophylla** Nevodovski, *Quercus petraea* subsp. *iberica* (Steven ex M. Bieb.) Krassiln., Georgia, Tbilisi, Vake park, 29.09.1959, Melia M.
- M. hypophylla** Nevodovski, *Quercus petraea* subsp. *iberica* (Steven ex M. Bieb.) Krassiln., Georgia, Tbilisi, Vake park., 10.11.1952 Aleksimkshvili N.
- M. sp.**, Georgia.
- M. sp.**, *Quercus* sp., Georgia, Tbilisi Vake park, Melia M.
- Microspora** sp., *Quercus* sp., Georgia, **Oidium alphitoides** Griffon & Maubl., *Quercus* sp., Georgia, Tskhinvali, park, 27.07.1959, Gvritishvili M., Tsanova N.
- O. alphitoides** Griffon & Maubl., *Quercus* sp., Georgia, Qvishkheti, 05.07.1914, Kuschke I., Woronichin N.
- O. dubium** Jacz., *Quercus* sp., Alazani valley, 25.07.1950, Melia M., Chorkeli M.

O. dubium Jacz., *Quercus* sp., Georgia, Arguni gorge, 25.08.1950, Melia M.

O. dubium Jacz. *Quercus macranthera* F. et M.H., Georgia, Bakuriani, 16.07.1916, Woronichin N.

O. dubium Jacz., *Quercus* L., Georgia, Tbilisi, 23.07.1933, Loris-Melikowa.

O. dubium Jacz., *Quercus macranthera* F. et M.H., Georgia, Maturi valley, 04.08.1932, Janjalashvili.

O. dubium Jacz., *Quercus petraea* subsp. *iberica* (Steven ex M. Bieb.) Krassiln., Georgia, Saguramo, 04.06.1926, Sosnowsky D.

O. dubium Jacz., *Quercus* sp., Georgia, Batumi, 15. 08, Bugadze T.

O. dubium Jacz., *Quercus* sp., Georgia, Kakheti, near riv. Alazani, 25.07.1950, Melia M., Chokheli M.

O. dubium Jacz., *Quercus* sp., Georgia, Lagodekhi, 21.07.1916.

O. dubium Jacz., *Quercus* sp., Georgia, Likani, 22.07.1920, Woronichin N.

O. dubium Jacz., *Quercus* sp., Georgia, Lower Swaneti, v. Lentekhi, 25.08.1950, Melia M.

O. dubium Jacz., *Quercus* sp., Georgia, near riv. Kvirila, 20.06.1920, Sviridenko.

O. dubium Jacz., *Quercus* sp., Georgia, 03.09.1918.

O. dubium Jacz., *Quercus* sp., Georgia, Imereti, Qutaisi, 24.10.1912, Loladze S.

O. dubium Jacz., *Quercus* sp., Georgia, Khiliani, 22.08.1932, Kancaveli L.

O. dubium Jacz., *Quercus* sp., Georgia, Qartli, Kojori, 12.08.1912, Newodowsky G.

O. dubium Jacz., *Quercus* sp., Georgia, Tbilisi, 12.08.1912, Newodowsky G.

O. dubium Jacz., *Quercus* sp., Georgia, Tbilisi, Uriatubani, 04.08.1925, Nagorny, P. I., Eristavi.

O. dubium Jacz., *Quercus* sp., Georgia, Tskhinvali, 07.01.1919, Rulik A.

O. dubium Jacz., *Quercus* sp., Georgia, Tskhinvali, 1922, Siazova, Nagorny, P. I.

O. dubium Jacz., *Quercus mongolica* Fisch. ex Ledeb., Georgia, Tbilisi, Botanical garden, 14.08.1926, Koenig E.

O. quercinum Thüm, *Quercus* sp., Georgia, Melia M.

Phloeospora quercicola (Desm.) Sacc. & D. Sacc., *Quercus petraea* subsp. *iberica* (Steven ex M. Bieb.) Krassiln., Georgia, Bolnisi, Kazreti, 17.09.1957, Dzagnidze.

Phyllosticta associata Bubák, *Quercus* sp., Georgia, Kakheti, Lagodekhi, 18.04.1917, Nagorny P., Kancaveli L.

Ph. maculiformis Sacc., *Quercus petraea* subsp. *iberica* (Steven ex M. Bieb.) Krassiln., Georgia, 18.09.1956, Gvritishvili M.

Ph. tumoricola Peck., *Quercus macranthera* F. et M.H., Georgia, Tianeti, 2000 mt, 28.08.1943, Melia M.

Physalospora citricola Penz., *Quercus* sp., stem, Georgia.

Septoria asclepiadea Sacc., *Cynanchum laxum* Bartl., Georgia, Qartli, Mckheta-mtianeti aneti, Gormagala, 12.08.1945, Melia M.

S. dubia Sacc. & P. Syd., *Quercus* sp. Georgia, Qartli, Qvishkheti, 25–03.08.1914, Kuschke I., Woronichin N.

S. dubia Sacc. & P. Syd., *Quercus* sp., Georgia, Kakheti, Lagodekhi, 04.08.1916, Nagorny P., Kancaveli L.

S. dubia Sacc. & P. Syd., *Quercus* sp., Georgia, Likani, 25.07.1926, Woronichin N.

S. dubia Sacc. & P. Syd., *Quercus* sp., Georgia, near Likani, 25.07.1920 Woronichin N.

S. dubia Sacc. & P. Syd., *Quercus* sp., Georgia, Samtskhe - Javakheti, Likani, near Borjomi, 25.07.1920, Woronichin N.

S. ocellata (Lev) Sacc., *Quercus* sp., Georgia, Upper Swaneti, v. Ushkhvanari, 1600 mt, 14.08.1946, Melia M.

Stemphylium botryosum Wallr., *Quercus* sp., Georgia, Teberda, forest 1300 mt, 27.08.1945, Melia M.

Stigmella dryophila (Corda) Lindau, *Quercus petraea* subsp. *iberica*

(Steven ex M. Bieb.) Krassiln., Georgia, Apkhazia, Sokhumi, 26.09.1913, Woronow.

Taphrina caeruleascens (Desm. & Mont.) Tul., *Quercus petraea* subsp. *iberica* (Steven ex M. Bieb.) Krassiln., Georgia, Java, v. Chokhantura, 27.07.1959, Gvritishvili M., Tsanova N.

Information source kept in herbarium is not only of value to botanical taxonomists but to all applied disciplines concerned with plants (agriculture, horticulture, forestry etc.) and thus to the community as a whole. There is a direct link between herbarium - pathological perspective based information and ability to solve many problems of economic importance [20]. Aspects, such as plant disease identification and control, are freedom from crop diseases, weed problems, biological control of pests, diseases and weeds, plant quarantine, international trade in primary produce where plant disease and weed distributions are of major significance, marine biology etc.

Conclusion

Such databases are of great importance and useful for scientists all over the world. Because of that collection and systematization of the information about local mycological herbariums and collections as well as providing their online accessibility is one of the most important actual research branches in mycological research.

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