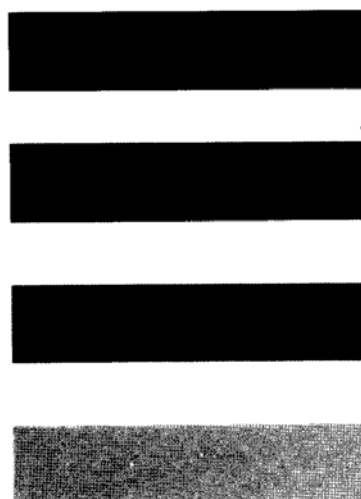


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New record of *Septocytia ruborum* (Lib.) Petrak a pathogen of blackberry in Eastern Hungary

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Summary

In the spring of 1996 a severe damage of *Septocytia ruborum* (Lib.) Petrak was observed on stems and lateral shoots in some thornless blackberry plantations in Debrecen-Józsa, and *Rubus nessensis* W. Hall wild blackberry in Debrecen-Pallag (Eastern Hungary). The fungus caused a significant number of purple blotches, axillary buds, flower buds and leaves, initially at the ends of lateral shoots, stop normal development and die. This record of pathogen is the first in the Eastern-Hungarian region. This paper surveys the symptoms of the disease, the morphological features of pathogen, and opportunities for *in vitro* growing of fungus.

Introduction

The importance of the production of thornless blackberries has been increasing since the middle of the 1970's in Hungary. The most popular varieties are the "Thornless Evergreen" and "Thornfree". Lately, "Dirksen" and "Hull Thornless" have been officially admitted in Hungary. As a result of usage of the virus-free rootstock materials (since 1982), the large scale farm plantations increased about 205 ha by 1985. The small scale farms and private allotments have approx. 50 ha blackberries (Várady 1991). Because of newly recorded diseases and technological problems the dinamic increase of the blackberry plantation has stopped.

The following blackberry diseases were recorded in Hungary: purple blotch (stem spot disease, dieback), *Septocytia ruborum* (Lib.) Petrak (Tőkés and Vörös 1982, Kövics 1996); stem blight (canker, cane blight), *Diaplella coniothyrium* (Fuckel) Barr (as *Leptosphaeria coniothyrium* (Fuckel) Sacc.), anamorph:

Coniothyrium fuckelii Sacc. (Lőrinczné-Izsányi 1986, Várady 1991, Várady et al. 1993); cane and leaf rust, *Kuehneola uredinis* (Link) Arth. /as *K. albida* (Kühn) Magnus/ (Pálfi and Tőkés 1987); orange rust, *Arthuriomyces peckianus* (E. Howe) Cummins & Y. Hiratsuka /the long-cycled form/ and *Gymnoconia nitens* (Schwein.) F. Kern & H.W. Thurston /the short-cycled form, as *G. peckiana* (E. Howe) Trott./ (Tőkés 1989); cane canker, *Botryosphaeria obtusa* (Schwein.) Shoem. anamorph: *Sphaeropsis* sp. (Várady 1991, Várady et al. 1993); Septoria leaf spot, *Septoria rubi* Westend. /the teleomorph of this fungus *Mycosphaerella rubi* Roark is uncertain, and not identical with pathogen causing raspberry leaf spot, *Sphaerulina rubi* Demaree & M.S. Wilcox, anamorph: *Septoria darrowii* Zeller/ (Kövics 1996). *Diachea leucopodia* (Buillard) Rostafinski slime mould sporangia were also observed on blackberry cane, strawberry petioles, fruits, and different weeds (Kövics et al. 1994).

Septocyta ruborum (Lib.) Petrak was earlier described in Hungary on the stem of *Rubus idaeus* (as "*Rhabdospora ramealis* var. *macrospora*" Hollós 1910, 1913), and on *Rubus procerus* (as "*Rhabdospora ramealis*" Vass and Tóth 1960).

Materials and Methods

Field studies

Observations were made in a small scale farm plantation of thornless blackberry in the spring of 1996 in Debrecen-Józsa, additional records of disease were made on *Rubus nessensis* W. Hall, wild blackberry in Debrecen-Pallag (both Eastern Hungary). The plantation was established in the autumn of 1994, size of plot approx. 100 m², number of rows 3, variety "Thornfree". Rootstocks were apparently healthy at plantation.

After the recognition of early symptoms the canes were visually examined to determine the level of damage. Samples on canes with typical purple blotch symptoms were collected both from planted and wild blackberries for checking the causal agent and examining microscopically in the lab. At the same time, spotted leaves from the previous year were also collected.

Laboratory studies

Methods for morphological studies

During the morphological studies microscopic studies were carried out. Shape, measurements and septation of spores were determined by light microscope. Conidiomata and conidiogenous cells were examined in sections made by freezing microtome. Comparisons of structures from canes and leaves of blackberries were made.

Methods for growing fungus

Three solid media were tested for *in vitro* growing of *Septocytia ruborum* (Lib.) Petrak. Isolation of fungus was made on potato dextrose agar (PDA) in Petri discs. For *in vitro* mycelial growing and producing pycnidia and conidia PDA, oatmeal and malt agar solid media were used and tested in continuous dark incubators with 10, 15, 20, 25, and 30 °C temperature for 14 days.

Results

As a result of the study it was verified that the damage on blackberry canes were caused by *Septocytia ruborum* (Lib.) Petrak. *Septoria rubi* Westend. was collected from blackberry spotted leaves and confirmed delimitation from similar fungus *Septocytia ruborum* (Lib.) Petrak not only symptomatically but morphologically as well.

Field studies

Symptoms of disease

In late summer, minute, dark green lesions first appear on the vegetative canes near ground level. As the disease progresses, new lesions appear higher on the canes throughout the winter. They eventually become reddish and then brown, with a conspicuous red margin (Fig. 1).

In spring their centers become a paler brown and less conspicuous, the margin remaining red. From late February until April the lesions rapidly expand up to 2 cm in length. In time, they merge and may completely cover stem internodes up to 2.5—3.0 m from the root stock.

Fig. 1.

Lesions of *Septocyta ruborum* (Lib.) Petrak on "Thornfree" blackberry cane



In spring, the effects of this disease can be confused with late frost damage which often occurs on "Thornless Evergreen" in Hungary. Axillary buds in infected portions of canes often begin to grow normally in spring, but later the flower buds and leaves, initially at the ends of lateral shoots, stop their normal development and die (Fig. 2). Under severe conditions for disease development the entire shoot appears barren and desiccated (Fig. 3).

Fig. 2.

Death of shoots on infected cane of *Rubus nessensis* W. Hall



Fig. 3.

The entire shoots of *Rubus nessensis* W. Hall desiccated after severe infection of *Septocyta ruborum* (Lib.) Petrak



In early spring, rows of tiny black pycnidia break through the epidermis. Under high humidity, strands of conidia in white mucilage (cirrhi) up to 1 mm long are extruded from the pycnidia and are visible to the naked eye.

Laboratory studies

Morphology of *Septocyta ruborum* (Lib.) Petrak

Conidiomata (*pycnidia*) immersed in the bark, become exposed by the splitting of the epidermis in early March. Shape of pycnidia elongated, convex, 300 µm diam. x 140 µm deep (Sutton 1980), up to 500 µm wide (Punithalingam 1980) with the floor of the pycnidial cavity convoluted and ostiolate. Pycnidial wall stromatic composed of several layers of pseudoparenchymatic cells, the outermost layer thick-walled and heavily pigmented, the innermost layer hyaline.

Conidiophores absent. *Conidiogenous cells* 5-8 x 2-3.5 µm, hyaline, sympodial with 1-3 apical, scarcely protruding, unthickened denticles, indeterminate, discrete, obpyriform to ampulliform, holoblastic, arising from the innermost layer of cells lining the pycnidial cavity.

Conidia hyaline, straight or rarely curved, aciculate, apex obtuse, base truncate, multiguttulate, faintly 1—3 euseptate, chiefly 20—30 x 1—1.5 µm, extruding as whitish cirrhi (Fig. 4).

Growing on solid media

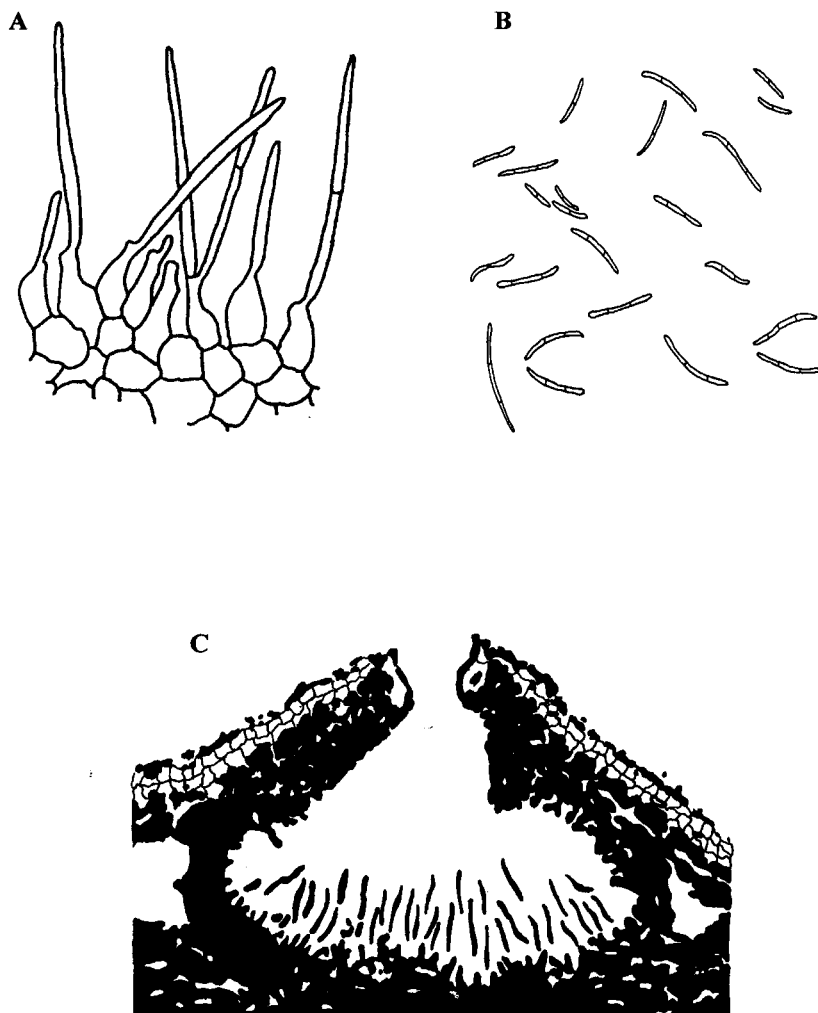
The fungus isolates can grow well on different media e.g. potato dextrose agar and malt agar. The optimum temperature for mycelial growing and pycnidia/conidia production is 20—25 °C. Developed mycelium immersed, branched, septate, hyaline to pale brown.

Discussion

Occurrence of *Septocyta ruborum* (Lib.) Petrak a newly recorded pathogen in Eastern Hungary can cause serious damage both in planted and wild blackberries. Varieties, especially wide-range grown "Thornfree" and the recently introduced "Hull Thornless" are susceptible to the purple blotch disease. The symptoms, the morphological features of pathogen, and *in vitro* growing opportunities were discussed.

Fig. 4.

Septocyta ruborum (Lib.) Petrak, A: conidiogenous cells and developing conidia; B: conidia; C: vertical section of conidioma



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