

The *Catalpa* powdery mildew *Erysiphe elevata* in Slovakia

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Abstract – The first record of *Erysiphe elevata* (Burrill) U. Braun & S. Takamatsu (syn. *Microsphaera elevata* Burrill), North American powdery mildew in Slovakia is presented. It was found on living leaves and fruits of southern catalpa (*Catalpa bignonioides* Walt.). The fungus is described and photographically documented.

Powdery mildew / *Erysiphe elevata* / *Catalpa bignonioides* / Slovakia

INTRODUCTION

Erysiphe elevata (Burrill) U. Braun & S. Takamatsu (syn. *Microsphaera elevata* Burrill) (Ascomycota, Erysiphales) is a common powdery mildew species infecting *Catalpa* trees in North America (Braun, 1987). Vajna *et al.* (2004) recorded heavily infected *Catalpa bignonioides* Walt. trees with *Erysiphe elevata* in Hungary for the first time in September 2002. It was the first report of *Erysiphe elevata* in Europe. Next collections of *Erysiphe elevata* were found in the United Kingdom (Cook *et al.*, 2004). This pathogen attacks living leaves of *Catalpa bignonioides* Walt., *Catalpa speciosa* Engelm. and *Catalpa × hybrida* Späth. (*Catalpa bignonioides* × *ovata*) in the USA and Canada (Anonymous, 1960; Amano, 1986; Braun, 1987). *Erysiphe elevata* is not included in the monograph of the European powdery mildews (Braun, 1995) because it has not been found in Europe to this time. The species *Erysiphe elevata* is neither listed in the checklist of fungi of Slovakia (Lizoň & Bacigálová, 1998) nor in the monograph of powdery mildews of Slovakia (Paulech, 1995). *Erysiphe elevata* was found in Slovakia in 2003, in anamorph and teleomorph stages on *Catalpa bignonioides*. The fungus attacks living leaves and fruits. This is the first report of *Erysiphe elevata* from Slovakia.

MATERIAL AND METHODS

Fresh leaves and fruits of *Catalpa bignonioides* with powdery mildew infections were used for identification purposes and for morphological examinations of the anamorph and teleomorph stages of the fungus by means of standard

light microscopy (JENAMED2, Carl Zeiss Jena). The specimens were collected from September to November 2003. The fungus was photographically documented by digital camera Olympus CAMEDIA C-4000 ZOOM.

Voucher specimens of the collections has been deposited at the Mycological Herbarium (BRA) in Bratislava, at the IFE's herbarium in Nitra and at the private author's collections. The specimen examined by Uwe Braun is deposited at HAL (Martin-Luther-University, Institute of Geobotany, Herbarium, Halle/Saale, Germany).

RESULTS AND DISCUSSION

Vajna *et al.* (2004) and Cook *et al.* (2004) described and illustrated the teleomorph and the anamorph of *Erysiphe elevata* introduced in Europe. Our collections agree very well with their descriptions. The following description of the species is based on the both found stages.

***Erysiphe elevata* (Burrill) U. Braun & S. Takamatsu**

Erysiphe elevata (Burrill) U. Braun & S. Takamatsu, Schlechtendalia 4: 8, 2000

Syn.: *Microsphaera elevata* Burrill, Bull. Ill. State Lab. Nat. Hist. 1: 58, 1876

The fungus attacked leaves and fruits, covered them with white, arachnoid coating composed of conidiophores and conidia. Anamorph was sparsely developed; foot-cells of the conidiophores were usually curved to flexuous-sinuous. Conidia doliiiform to oblong-ellipsoid, were long $20-40 \times 8-15 \mu\text{m}$. Anamorph belonging to *Oidium* subgen. *Pseudoidium*. Hyphae were colourless, branched, septate, smooth. Appressoria were simple or lobed to multilobed. Cleistothecia were produced in abundance mostly on the upper leaf surfaces. We also found the mature cleistothecia on the fruits. Cleistothecia measured $90-125 \mu\text{m}$ in diameter (Fig. 1). Appendages were flaccid and $100-450 \mu\text{m}$ long ($297.5 \mu\text{m}$ average),

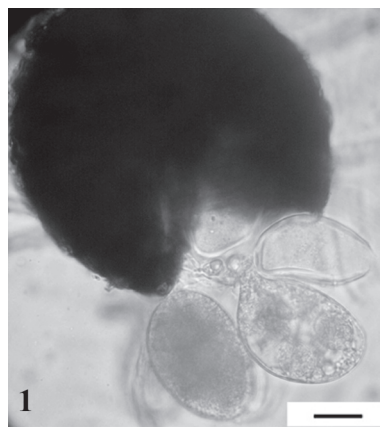


Fig. 1. *Erysiphe elevata*, cleistothecium with asci (scale bar $12 \mu\text{m}$), by M. Pastirčák.

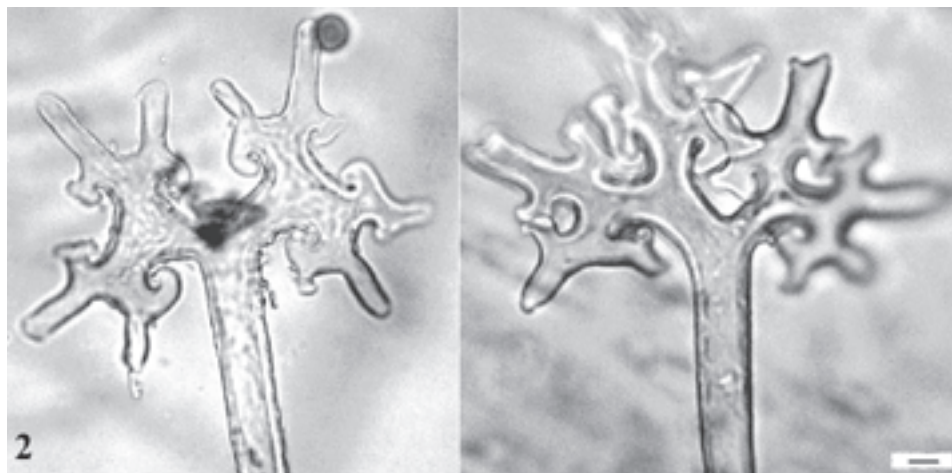
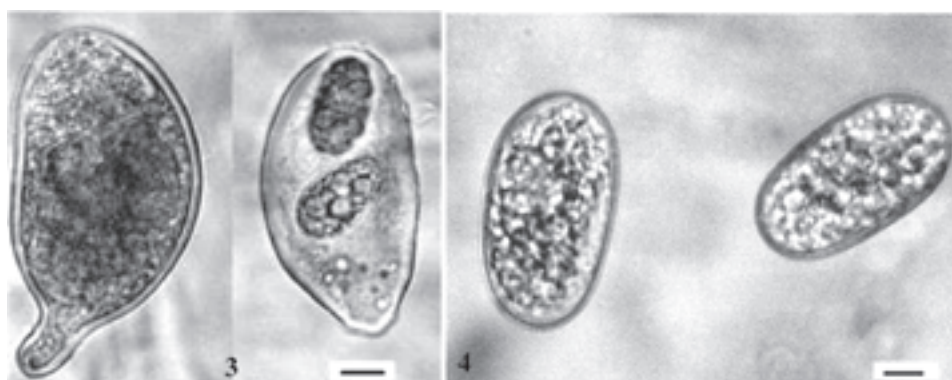


Fig. 2. *Erysiphe elevata*, apex of the appendages (scale bar 4 μm), by M. Pastirčák.



Figs. 3-4 : 3. *Erysiphe elevata*, asci with ascospores (scale bar 7 μm), by M. Pastirčák. 4 : *Erysiphe elevata*, ascospores (scale bar 4 μm), by M. Pastirčák.

aseptate or with a single basal septum, apex 2-5 times densely dichotomously branched, tips know-like to slightly curved (Fig. 2). The cleistothecium contained 4-7 asci, short-stalked or sessile, measuring $40-60 \times 30-40 \mu\text{m}$ (Fig. 3). The ascus contained 3-6 ellipsoid to ovoid ascospores, $18-30 \times 11-15 \mu\text{m}$ (Fig. 4).

Occurrence in Slovakia: on *Catalpa bignonioides* Walt.: Nitra, Výstavná street, 23 Sept. 2003 (leg. G. Juhásová); Hlohovec, Hlohová street, 15 Oct. 2003 (leg. M. Pastirčák); Piešťany, Bratislavská street, precinct of the Research Institute of Plant Production, 7 Nov. 2003 (leg. M. Pastirčák [The specimens were identified by K. Pastirčáková]).

The species of *Catalpa* are also attacked by *Erysiphe catalpae* S. Simonian in Europe (Braun, 1995). The species *Erysiphe catalpae* is easily distinguishable from *Erysiphe elevata*. Conidia of *Erysiphe catalpae* are wider and appendages are shorter in compare with *Erysiphe elevata*, ascomata are rarely formed and apexes are unbranched. Vajna *et al.* (2004) suggested that this North American powdery mildew species has increased its area of distribution only

recently. The collections from Hungary, the United Kingdom and our records from Slovakia indicate an epidemic spread of this pathogen.

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REFERENCES

- AMANO K.H., 1986 – *Host range and geographical distribution of the powdery mildew fungi*. Japan Science Societies Press, Tokyo, 741 p.
- ANONYMOUS, 1960 – *Index of Plant Diseases in the United States*. USDA Agric. Handbook. No. 165. Washington, D.C., 531 p.
- BRAUN U., 1987 – A monograph of the Erysiphales (powdery mildews). *Beiheft zur Nova Hedwigia* 89: 1-700.
- BRAUN U., 1995 – *The powdery mildews (Erysiphales) of Europe*. Fischer Verlag, Jena, 337 p.
- COOK R.T.A., HENRICOT B. & KISS L., 2004 – First record of *Erysiphe elevata* on *Catalpa bignonioides* in the UK. New Disease Reports [<http://www.bspp.org.uk/ndr/>], Volume 9. *Plant Pathology*, in press.
- LIZOŇ P. & BACIGÁLOVÁ K., 1998 – *Fungi*. In: MARHOLD K. & HINDÁK F. (ed.), Checklist of non-vascular and vascular plants of Slovakia, Veda, Bratislava, pp. 101-227.
- PAULECH C., 1995 – *Huby múčnatkotvaré (Erysiphales)*. Flóra Slovenska X/1, Veda, Bratislava, 294 p.
- VAJNA L., FISCHL G. & KISS L., 2004 – *Erysiphe elevata* (syn. *Microsphaera elevata*), a new North American powdery mildew fungus in Europe infecting *Catalpa bignonioides* trees. New Disease Reports [<http://www.bspp.org.uk/ndr/>], Volume 8. *Plant Pathology* 53: 244.