

Available online at www.sciencedirect.com**MYCOSCIENCE**

ISSN 1340-3540 (print), 1618-2545 (online)

journal homepage: www.elsevier.com/locate/myc**Short communication*****Erysiphe aucubae* sp. nov., a new powdery mildew species on *Aucuba japonica* from Japan**

Siska A.S. Siahaan, Susumu Takamatsu*

Graduate School of Bioresources, Mie University, 1577 Kurima-machiya, Tsu, 514-8507, Japan

ARTICLE INFO

Article history:

Received 3 February 2016

Received in revised form

4 March 2016

Accepted 6 March 2016

Available online 4 April 2016

Keywords:

Erysiphaceae

Garryaceae

Molecular phylogeny

Morphology

Pseudoidium

ABSTRACT

Aucuba japonica (Japanese aucuba), native to Japan, is an evergreen shrub distributed in the Japanese Archipelago and cultivated worldwide as an ornamental plant. A powdery mildew with *Pseudoidium*-type asexual morph commonly occurs on this species. Because of the absence of sexual morph (chasmothecia), the taxonomic identity of this fungus has been unclear for a long time. The new species *Erysiphe aucubae* is proposed for this fungus based on molecular phylogenetic analyses and a detailed morphological description of the asexual morph.

© 2016 The Mycological Society of Japan. Published by Elsevier B.V. All rights reserved.

The genus *Aucuba* (Garryaceae) consists of species that are evergreen shrubs distributed in the Himalayas, southern China and Japan. *Aucuba japonica* Thunb. (Japanese aucuba), native to Japan, is distributed at Miyagi prefecture and westward in the main island, Shikoku, Kyushu, and Ryukyu islands of the Japanese Archipelago. This species was introduced into England in 1783 and cultivated worldwide as an ornamental plant ever since. A powdery mildew with *Pseudoidium*-type asexual morph commonly occurs on *A. japonica* var. *japonica* and var. *borealis* in Japan, but because of the absence of sexual morph (chasmothecia) the taxonomic identity of this fungus has been unclear for a long time (Nomura et al. 1976; Amano 1986; Sato and Eto 2014). Although Amano (1986) recorded *Microsphaera* sp. (present name, *Erysiphe* sect. *Microsphaera*) on *A. japonica* var. *japonica* and var. *borealis*, this affiliation was based on

asexual morph and host plant, and thus should be re-examined. Molecular phylogenetic analysis and morphological observations revealed that this fungus is an undescribed species belonging to the genus *Erysiphe*. *Erysiphe aucubae* S. Takam. & Siahaan is proposed for this fungus with a detailed morphological description of the asexual morph in this study.

Morphological examinations and DNA sequencing were conducted according to the procedure described by Meeboon and Takamatsu (2015). The nucleotide sequences of the 5'-end of the 28S rRNA gene (including domains D1 and D2) and internal transcribed spacer (ITS) regions including the 5.8S rRNA gene were determined in this study. New sequences determined were deposited in DNA Data Base of Japan (DDBJ) under the accession numbers LC121919–LC121922. These sequences were aligned with closely related sequences of

* Corresponding author. Tel.: +81 59 231 9497; fax: +81 59 231 9540.

E-mail address: takamatu@bio.mie-u.ac.jp (S. Takamatsu).<http://dx.doi.org/10.1016/j.myc.2016.03.001>

1340-3540/© 2016 The Mycological Society of Japan. Published by Elsevier B.V. All rights reserved.

Erysiphe spp. retrieved from DNA databases using MUSCLE (Edgar 2004) implemented in the MEGA 6 program (Tamura et al. 2013). Alignments were further manually refined and deposited in TreeBASE (<http://www.treebase.org/>) under the accession number S18825. Phylogenetic trees were obtained from the data using maximum parsimony (MP) and maximum likelihood (ML) methods as described in Meeboon and Takamatsu (2014). Gaps were treated as the 5th character in the MP analysis.

Erysiphe aucubae S. Takam. & Siahaan, sp. nov. Fig. 1. MycoBank no.: MB 815276.

Similar to the asexual morph of *Erysiphe alphitoides* (Griff. & Maubl.) U. Braun & S. Takam., but genetically different and distinguished in having longer conidia with a l/w ratio higher than 2.0 and *A. japonica* as host, belonging to the Garryaceae.

Type: On *Aucuba japonica* var. *japonica* (Garryaceae), JAPAN, Shiga Prefecture, Maibara-shi, Ikesita, Green Park Santo, 35°22'28.93"N 136°21'37.47"E, 14 Oct 2015, S. Takamatsu and S.A.S. Siahaan, TNS-F-65454 (holotype), MUMH 6474, HAL 2984 F (isotypes).

Etymology: Epithet derived from the genus name of the host plant, *Aucuba*.

Gene sequences (holotype): LC121921 (ITS+28S).

Mycelium hypophyllous, effuse, persistent, forming irregular white patches; hyphae almost straight to somewhat wavy, 4–7 µm wide; hyphal appressoria solitary or in opposite pairs, lobed; conidiophores on top of mother cells, erect, 61–94 µm long; foot-cells cylindrical, straight or somewhat curved at the base, 21–40 × 7–10 µm, followed by 1–2 mostly shorter cells, forming conidia singly; conidia ellipsoid-ovoid,

subcylindrical, 39–53 × 15–20 µm (l/w = 2.1–3.1), producing germ tubes on shoulders, germ tubes terminating in multi-lobed appressoria; chasmothecia not found.

Additional specimens examined: On *A. japonica* var. *japonica* (Garryaceae), JAPAN, Nara Pref., Uda-shi, Mt. Kuroso, 30 Oct 1994, S. Takamatsu, MUMH 57, GenBank accession number: LC009911 (ITS+28S); Shiga Pref., Hikone-shi, Mt. Sawayama, 1 Oct 1997, S. Takamatsu, MUMH 392; Mie Pref., Tsu-shi, Mt. Kyogamine, 20 Jun 1999, S. Takamatsu, MUMH 832; Mie Pref., Inabe-shi, Mt. Fujiwara, 15 Oct 2002, S. Takamatsu, MUMH 2121; Shiga Pref., Maibara-shi, Mt. Ibuki, 2 Nov 2003, S. Takamatsu, MUMH 2726; 6 Nov 2004, S. Takamatsu, MUMH 3660; Nara Pref., Sakurai-shi, Mt. Torimi, 11 Nov 2007, S. Takamatsu, MUMH 4814; Nara Pref., Gose-shi, Takamahiko Jinja, 25 Nov 2007, S. Takamatsu, MUMH 4846; Shiga Pref., Maibara-shi, Ikesita, Green Park Santo, 35°22'27.20"N 136°21'32.46"E, 14 Oct 2015, S. Takamatsu and S.A.S. Siahaan, MUMH 6468, HAL 2978 F; 35°22'29.00"N 136°21'34.74"E, MUMH 6469, HAL 2979 F, GenBank accession number: LC121919 (ITS+28S); MUMH 6470, HAL 2980 F; MUMH 6471, HAL 2981 F; MUMH 6472, HAL 2982 F, GenBank accession number: LC121920 (ITS+28S); MUMH 6473, HAL 2983 F; 35°22'28.93"N 136°21'37.47"E, MUMH 6475, HAL 2985 F, GenBank accession number: LC121922 (ITS+28S); On *A. japonica* var. *borealis* Miyabe & Kudô (Garryaceae), JAPAN, Fukui Pref., Nanjo-cho, Mt. Somayama, Sep 1996, S. Takamatsu, MUMH 132.

Host range and distribution: On *A. japonica* var. *japonica*, *A. japonica* var. *borealis* (Japan, endemic).

Note: The ITS and 28S rRNA gene nucleotide sequences obtained from four specimens of *E. aucubae* were determined in this study to clarify the phylogenetic placement of this

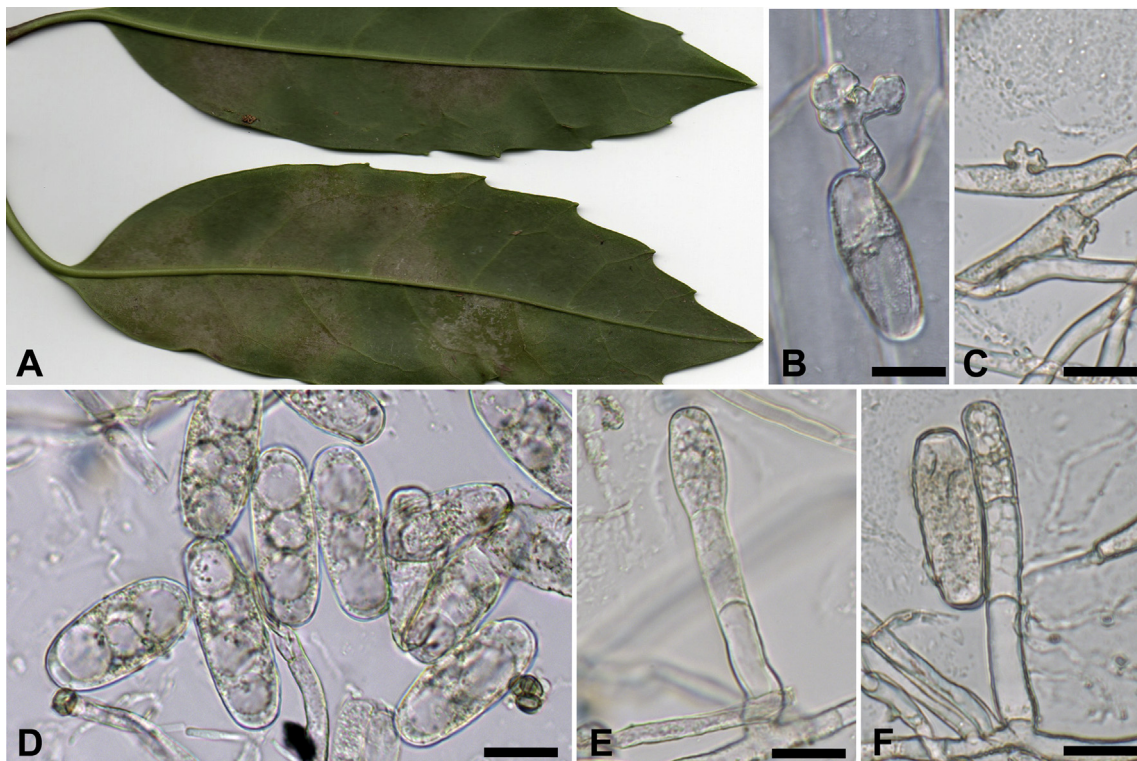


Fig. 1 – *Erysiphe aucubae* ex *Aucuba japonica*. A: Leaves of the host plant affected by the fungus. B: Germ tube. C: Hyphal appressoria. D: Conidia. E, F: Conidiophores. Bars: 20 µm.

Download English Version:

<https://daneshyari.com/en/article/2060067>

Download Persian Version:

<https://daneshyari.com/article/2060067>

[Daneshyari.com](https://daneshyari.com)