

New records and new host plants of powdery mildews (*Erysiphales*) from Idaho and Oregon (USA)

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Abstract: Braun, U. & Mohan, S. K. 2013: New records and new host plants of powdery mildews (*Erysiphales*) from Idaho and Oregon (USA). *Schlechtendalia* 27: 7–10.

In the course of routine examinations of powdery mildews collected in Idaho and Oregon, USA, some of the identified species proved to be new to North America, in some cases on new host plants. *Leveillula papilionacearum* and *L. picridis* are first records from the USA. *Astragalus filipes*, *Dalea ornata* and *D. searlsiae* are new hosts for *Leveillula papilionacearum*. *Enceliopsis*, *Heliomeris* and *Machaeranthera* are new host genera for *L. picridis*. Additional records refer to powdery mildew species which have been rarely reported from North America or first records on certain hosts.

Zusammenfassung: Braun, U. & Mohan, S. K. 2013: Neufunde und neue Wirtsarten von Mehltaupilzen (*Erysiphales*) aus Idaho und Oregon (USA). *Schlechtendalia* 27: 7–10.

Im Verlauf von Routineuntersuchungen an in Idaho und Oregon, USA, gesammelten Mehltaupilzen erwiesen sich einige der identifizierten Arten als Neunachweise für Nordamerika, in einigen Fällen auf neuen Wirtsarten. Erstnachweise für die USA umfassen *Leveillula papilionacearum* und *L. picridis*; *Astragalus filipes*, *Dalea ornata* und *D. searlsiae* sind neue Wirtsarten für *Leveillula papilionacearum*, und *Enceliopsis*, *Heliomeris* und *Machaeranthera* sind neu nachgewiesene Wirtsgattungen für *L. picridis*. Weitere Funde beziehen sich auf Arten, die selten aus Nordamerika angegeben worden sind, bzw. auf Neuangaben auf bestimmten Wirten.

Key words: *Erysiphaceae*, North America, novelties, new hosts.

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Powdery mildews (*Erysiphales*) are an important group of plant pathogenic fungi, worldwide in distribution, and occur on a wide range of hosts including numerous economically important cultivated plants. A taxonomic monograph of this relatively well-known fungal group has recently been published by Braun & Cook (2012). However, host range and distribution of powdery mildews has not been extensively examined in various parts of North America. During the course of routine examinations of powdery mildews collected mainly on ornamental plants in southwest Idaho and eastern Oregon, several of the identified species turned out to represent first records for the USA. Some of the host species involved are also new, either for North America or to the literature. The following collections have been examined by light microscopy, and identified based on Braun & Cook (2012):

Erysiphe paeoniae R.Y. Zheng & G.Q. Chen

On *Paeonia* sp. (*Paeoniaceae*), USA, Idaho, Boise, Riva Ridge Way, 12 Sep. 2013, S.K. Mohan (HAL 2635 F) and Oct. 2013 (HAL 2636 F).

Note: This species is known from the USA (Texas, Farr et al. 1989, Braun & Cook 2013), but these are new records for Idaho.

Golovinomyces biocellatus (Ehrenb.) Heluta

On *Salvia* sp. (*Lamiaceae*), USA, Idaho, Parma, Research & Extension Center, University of Idaho, Sep. 2011, S.K. Mohan (HAL 2639 F).

Notes: This species is known from the USA, but records of *Salvia* spp. as hosts are rare. Farr et al. (1989) listed *Erysiphe cichoracearum* DC. on *Salvia spathacea* and *Salvia* sp. from California. Furthermore, there is a collection on *Salvia verticillata* from Idaho (31 Jul. 1931, C.V. Piper) deposited under *Erysiphe lamprocarpa* as BPI 563533.

Golovinomyces depressus (Wallr.) Heluta

On *Centaurea montana* (*Asteraceae*), USA, Idaho, Boise, Riva Ridge Way, Oct. 2013, S.K. Mohan (HAL 2637 F).

Note: *G. depressus* is known from the USA (Braun & Cook 2012), but new on *Centaurea montana*.

***Leveillula papilionacearum* (Kom.) U. Braun**

On *Astragalus filipes* (*Fabaceae*), USA, Oregon, Ontario, Malheur Experiment Station of Oregon State University, 11 Sep. 2013, S.K. Mohan (HAL 2628 F). On *Dalea ornata* (*Fabaceae*), USA, Oregon, Ontario, Malheur Experiment Station of Oregon State University, 11 Sep. 2013, S.K. Mohan (HAL 2623 F). On *Dalea searlsiae* (*Fabaceae*), USA, Oregon, Ontario, Malheur Experiment Station of Oregon State University, 11 Sep. 2013, S.K. Mohan (HAL 2622 F).

Notes: This is the first unambiguous record of this species from the USA, and *Astragalus filipes*, *Dalea ornata* and *D. searlsiae* are new, hitherto unrecorded host species. The identification of these specimens is based on the new, revised concept of *Leveillula* species recently published by Braun & Cook (2012). Conidiophores, conidia and chasmothecia (only found on *Astragalus filipes*) match well with European and Asian collections of this species.

***Leveillula picridis* (Castagne) Durrieu & Rostam**

On *Enceliopsis nudicaulis* (*Asteraceae*), USA, Oregon, Ontario, Malheur Experiment Station of Oregon State University, 11 Sep. 2013, S.K. Mohan (HAL 2626 F). On *Gaillardia* sp. (*Asteraceae*), USA, Idaho, Parma, Research & Extension Center, University of Idaho, Sep. 2012, S.K. Mohan (HAL 2630 F). On *Heliomeris multiflora* var. *multiflora* (*Asteraceae*), USA, Oregon, Ontario, Malheur Experiment Station of Oregon State University, 11 Sep. 2013, S.K. Mohan (HAL 2629 F). On *Heliomeris multiflora* var. *nevadensis* (*Asteraceae*), USA, Oregon, Ontario, Malheur Experiment Station of Oregon State University, 11 Sep. 2013, S.K. Mohan (HAL 2627 F). On *Machaeranthera canescens* (*Asteraceae*), USA, Oregon, Ontario, Malheur Experiment Station of Oregon State University, 11 Sep. 2013, S.K. Mohan (HAL 2631 F). On *Sphaeralcea grossulariifolia* (*Malvaceae*), USA, Oregon, Ontario, Malheur Experiment Station of Oregon State University, 11 Sep. 2013, S.K. Mohan (HAL 2632 F). On *Sphaeralcea* sp. (*Malvaceae*), USA, Oregon, Ontario, Malheur Experiment Station of Oregon State University, Sep. 2011, S.K. Mohan (HAL 2633 F).

Notes: This is the first record of this species from the USA, and *Enceliopsis*, *Heliomeris* and *Machaeranthera* are new, hitherto unrecorded host genera (Braun & Cook 2012). The identification of these specimens was based on the revised treatment of *Leveillula* species recently published by Braun & Cook (2012). All collections examined just contain mycelium, conidiophores and conidia which perfectly agree with the current concept of *L. picridis*. Ascomata (chasmothecia) are lacking. *L. picridis* in its current circumscription is still a complex compound species. Data from inoculation experiments and molecular examinations are not yet sufficient for a further splitting. Anamorphs on *Sphaeralcea grossulariifolia* and *Sphaeralcea* sp., found adjacent to several infected composites, agree morphologically well with *L. picridis* and are at least tentatively assigned to this species. In Braun & Cook (2012) *Leveillula* on malvaceous hosts are referred to as *L. contractirostris* Heluta & Simonyan and *L. taurica*, two morphologically distinct species that can be ruled out easily. Infections of *Sphaeralcea* in the vicinity of composites attacked by *L. picridis* suggest the possibility of a cross infection which is, however, not yet proven either by inoculation experiments or by molecular examinations.

***Leveillula* sp.**

On *Peritoma lutea* [= *Cleome lutea*] (*Cleomaceae*), USA, Oregon, Ontario, Malheur Experiment Station of Oregon State University, 11 Sep. 2013, S.K. Mohan (HAL 2625 F). On *Peritoma serrulata* [= *Cleome serrulata*] (*Cleomaceae*), USA, Oregon, Ontario, 1059 S.W. 2nd Avenue, S.K. Mohan (HAL 2624 F).

Notes: *Leveillula cleomes* Simonyan & Heluta on *Cleoma glaucescens* and *Tarenaya hassleriana* in Asia and Europe is characterised by having subcylindrical primary conidia, often slightly narrowed in the middle, 50–80 × 14–21 µm, and subcylindrical to slightly clavate secondary conidia, 50–70 × 13–21 µm (Braun & Cook 2012). Collections of *Leveillula* on *Peritoma* spp. from Oregon are distinguished by having subcylindrical to broadly ellipsoid-

obovoid, shorter primary conidia, $45\text{--}60 \times (11\text{--})14\text{--}16\ \mu\text{m}$, and shorter secondary conidia, $35\text{--}55 \times 12\text{--}18\ \mu\text{m}$. Chasmothecia found on *Peritoma serrulata* are $140\text{--}180\ \mu\text{m}$ diam., with mostly simple, short, sometimes rudimentary appendages. These characters are rather reminiscent of conidia and ascomata of *L. picridis*. As infected plants of *Peritoma lutea* and *P. serrulata* have been found in the vicinity of composites with *L. picridis*, the possibility of cross infections has to be taken into consideration.

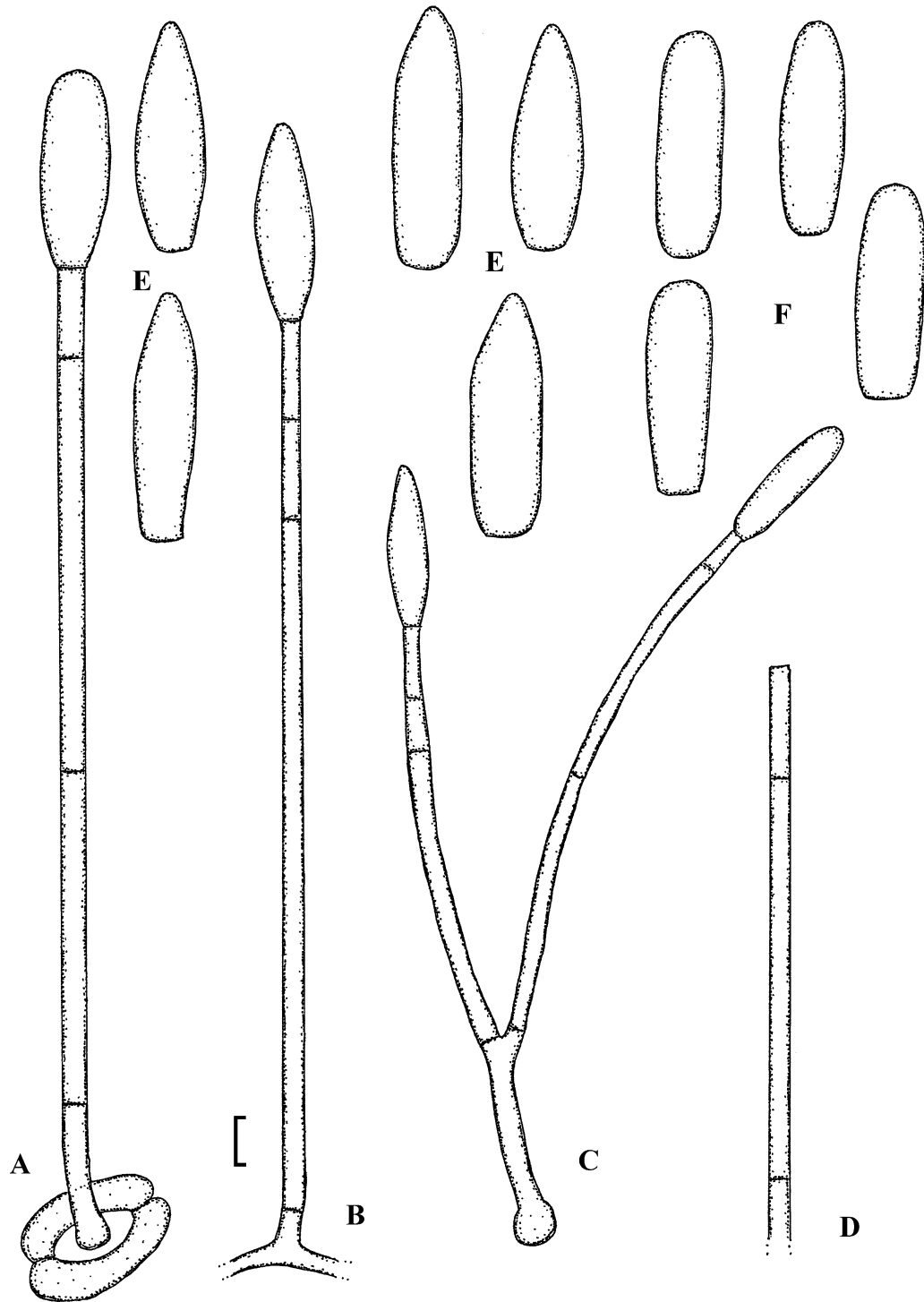


Fig. 1: *Leveillula* sp. on *Peritoma serrulata*, A – Conidiophore emerging through stoma, B – Conidiophore arising from superficial hypha, C – Branched conidiophore, D – Upper part of a conidiophores, E – Primary conidia, F – Secondary conidia. Bar – $10\ \mu\text{m}$. U. Braun del.

***Leveillula taurica* (Lév.) Arnaud**

On *Cucurbita maxima* (*Cucurbitaceae*), USA, Oregon, Ontario, Malheur Experiment Station of Oregon State University, 11 Sep. 2013, S.K. Mohan (HAL 2644 F).

Notes: This is the first record of this species on *Cucurbita maxima* from the USA.

***Sawadaea tulasnei* (Fuckel) Homma**

On *Acer platanoides* (*Sapindaceae*), USA, Idaho, Coeur d'Alene, Sep. 2011, S.K. Mohan (HAL 2634 F).

Notes: Braun & Cook (2012) did not list *S. tulasnei* from North America, but this species is known from the USA. Hirose et al. (2005) cited a collection from Ohio. Weiland & Stanosz (2006) discussed the distribution of this species in the USA, and Hudelson et al. (2008) recorded *S. tulasnei* on *Acer platanoides* from Wisconsin. Collections from Idaho, Latah Co. (842088), New York, Erie Co. (871210) and Wisconsin (878273) are deposited at BPI.

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