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Revised Checklist of Powdery Mildews (Fungi: Erysiphales) from Nepal

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Abstract

The mycotaxa belonging to Erysiphales reported from Nepal since 1966, are revised based on 20 published papers. The recent moleculer and phyllogenetic analysis have done several changes in the nomenclature of several powdery mildew species reported earlier from Nepal. Some were erroneously reported, while some species have undergone synonyms. Near about eighteen species of *Oidium* (anamorphic: imperfect stage) reported earlier still need collections, examination and study are not incorporated here. The present checklist provides corrections to misidentified species with their current (authentic) or valid names and some additions have been made based on publications. The list also records three endemic species. So, the revision includes 13 genera and 53 species parasitic on 76 flowering plants gathered from different areas of Nepalese Himalayan belt.

Keywords: Endemic, Fungi, *Oidium*, Nepal

Introduction

Fries (1829) included powdery mildews in '*Perisporieae*' followed by Léveillé (1851) who treated it as a taxon. The family Erysiphaceae was proposed by Tulasne & Tulasne (in *Select.Fung. Carpol.*1: 191, 1931). The order Erysiphales was considered by Gwynne-Vaugan & Barnes [Gwynne-Vaughan & Barnes (1927) *emend*. Martin, in Ainsworth & Bisby (1945)]. The taxonomic treatment of Erysiphales, Erysiphaceae Lev. is as follows.

- Alexopoulos (1961) - 6 genera based on Bessey's (1950) and Martin's system (1961) classified Erysiphales in Ascomycetes, Euascomycetidae and Pyrenomycetes Ascomycetes, Euascomycetidae, Pyrenomycetes, Erysiphales, Erysiphaceae.
- Webster (1970) - 6 genera included Erysiphales in Eumycota, Ascomycotina and Plectomycetes.
- Kirk et al. (2001) included Erysiphales in Ascomycota, Ascomycetes, Erysiphomycetidae. They again included this group in Ascomycota, Ascomycetes, Erysiphomycetidae, Erysiphales, Erysiphaceae. Again *Erysiphales* was placed within the Leotiomycetidae ("*Dictionry of fungi*", Kirk et al., 2008 -13 genera).
- Moore et al. (2011) placed Erysiphales in Leotiomycetes.
- Braun (1987) *A monograph of the Erysiphales (Powdery Mildews). Nova Hedwigia.* 89 and U. Braun & R. T. A. Cook (2012 - 44 genera) *Taxonomic manual of the Erysiphales (Powdery Mildews). CBS Biodiversity Series 11* have done tremendous work on the order Erysiphales resulting vast changes in nomenclature and taxonomy of the species concerned. Erysiphales has been treated in a new horizon based on molecular phylogeny and morphological characters.

The family Erysiphaceae consists of large number of species, some of which are distributed worldwide. The diseases caused by these pathogenic fungi are commonly known as powdery mildews as the infected plant surface appears powdery due to the mycelium, conidiophores and conidia produced on the plant surface. They are obligate pathogens on flowering plants. The mycelium produces haustoria sunken typically into the epidermal cells of the host. The Erysiphaceae also produces ascomata which is globose solitary or aggregated cleistothecia. The chasmothecia (previously often referred to as 'cleistothecia' or 'perithecia') reproduce sexually. The asexual morph (anamorphic stage or asexual cycle) produces oidia (conidia / conidiospores).

The identification of *Oidium* species (anamorphic stage: asexual cycle or incomplete stage) on the

basis of conidiophores and conidiospores only is experienced very difficult without their cleistothecial stage (telomorphic stage: sexual cycle or complete stage). Some are host specific, while most of them are found attacking wide range of hosts. Some are confined to certain region only.

The Nepalese references are hard to find. The present paper provides checklist and review of the powdery mildew flora (Erysiphales: Erysiphaceae) reported from Nepalese Himalayan belt. This work will serve as a baseline for future researchers. However, the present compilation is based on the literature of Nepalese fungi as mentioned below. Some species can be found in *Fungi of Nepal, Part 2: Mastigomycotina, Zygomycotina* and *Ascomycotina.* (Adhikari & Manandhar, 1997) and *Fungi of Nepal, Part 3: Deuteromycotina* (Adhikari & Manandhar, 2001). In time to time many species were added. Very few authors have contributed their findings on the powdery mildews from various places of Nepal (Adhikari, 1997, 2009, 2012a, 2012b, 2014, 2017, 2020a, 2020b, 2020c, 2021, 2022). In addition, notably they are Adhikari et al. (1997, 2001, 2006, 2018, 2021a, 2021b), Bhatta (1966), Khadka & Shah (1967), Khadka, et al. (1968), Lama (1976, 1977), Manandhar & Shah, (1975), Pandey & Adhikari (2005), Parajuli et al. (1999, 2000), Pawsey (1989), Shin et al. (2018), Singh (1968), Singh & Nisha (1976), Braun & Cook (2012) and Verma, et al. (1990). The check reference list to the previous reports and additions can be found in '*Researches on the Nepalese mycoflora-3: Erysiphales from Nepal'* (Adhikari, 2017) and '*Researches on the Nepalese mycoflora- 4* (Adhikari, 2020a). The species reported previously were listed only without any taxonomic details except Pandey & Adhikari (2005). The nomenclature of the species concern have been based on Braun (1987) and Braun & Cook (2012) publication and comments. As stated above, 18 species of *Oidium* parasitic on 23 hosts reported by earlier authors need recollection and reassement as there is drastic change in the nomenclature and taxonomy of this group in the recnt system (Adhikari, 2017). Brief notes on the concerned species are added.

The previous studies include 47 taxa (23 species in 7 genera), whereas Adhikari added 30 taxa with one species new to science (Adhikari et al., 2018). The present paper incorporates 13 genera and 53 species of powdery mildews with their current names parasitic on 76 flowering plants. This will serve as the first part to the revised checklist of Erysiphales reported from Nepal.

Materials and Methods

The Nepalese powdery mildews (Erysiphales) were gathered in time to time by present author; photographs were taken and identified in the laboratory. Some of the papers along with specimens were also sent to U. Braun, Germany for correct identification, authenticity and review. During review, several mistakes were indicated on previously published species by the authors. The valid names to erroneously published species by consequent authors have been changed in the light of corrections made by U. Braun and his publications (Braun, 1987; Braun & Cook, 2012).

Checklist with Comments

Here, the checklist is organized in pathogen – host manner followed by citation of literature. It comprises of 53 species of pathogens parasitizing 76 hosts. The correct name to the previously reported species is also provided after the host and author's reference.

Enumeration of Species

Arthrocladiella mougeotii (Lév.) Vassilkov, *Bot. Mat. Otd. Spor. Rast*. 16:112 (1963); U. Braun & R. T. A. Cook (2012: 393).

Parasitic on leaves of *Lycium chinense* Mill. from Bhanimandal and Nagdaha, Dhapakhel, Lalitpur, Adhikari (2017).

Distribution – Europe, Asia, North & South America, Africa, New Zealand, Japan, China, Nepal.

Blumeria graminis (DC.) Speer, *Sydowia.* 27 (1-6):2 (1975); Braun (1987: 268) and U. Braun & R. T. A. Cook (2012:90–91).

Erysiphe graminis DC reported on wheat from Matatirtha (Bhatt, 1966); on *Hordeum vulgare* from Ulleri; and on *Triticum vulgare* from Matatirtha (Khadka & Shah, 1967; Singh, 1968) belong to *Blumeria graminis* (See – Adhikari, 2017).

Distribution – Worldwide.

Erysiphe alphitoides (Griff. & Maubl.) U. Braun & S. Takam., *Schlechtendalia* 4: 5 (2000); U. Braun & R.T. A. Cook (2012, 432).

Parasitic on *Spondias pinnata* (L.) Kurz. (= *Spondias mangifera* L.) (Anacardiaceae), 2068/3/1, (June 15, 2011), NHM, Adhikari, no 2011.06.05, NHM & KATH.

The host is new for Nepal.

Distribution – Worldwide.

Erysiphe australiana (McAlpine) Braun & Takam. *Schlechtendalia* 4: 17 (2000); U. Braun & R. T. A. Cook (2012: 542).

Parasitic on *Lagerostroemia indica* L, Kathemandu valley, Nepal (Adhikari, 2017). Previously this species was reported by Chhetri *et al.* (2010) on *Lagerstroemia indica* L. from Kathmandu valley (collection area unknown).

Distribution – Wide spread in Kathmandu valley. Australia, New Zealand, Europe, Asia, USSR, Japan, China, Korea, Tiwan, North Africa, North America, South America, Nepal.

Erysiphe aquilegiae var. ***ranunculi*** (Grev.) R.Y. Zheng & G.Q. Chen, *Sydowia* 34: 302(1981); U. Braun & R. T. A. Cook (2012, 362 – 363).

Previously recorded as *Oidium* sp. parasitic on *Ranunculus lactus,* Godawari (Singh, 1968).

Distribution - North and South Africa, North and South America, Asia, Europe, Australia, New Zealand, Nepal,

Erysiphe aspera (Doidge) U. Braun & S. Takam., *Schlechtendalia* 4: 16, (2000) var. ***aspera*** [(Syn. *Uncinula aspera* Doidge, *Trans. Roy Soc. South Africa* 5: 240, (1915)] in U. Braun & R. T. A. Cook, (2012: 541).

Parasitic on leaves of *Ficus lacor* Buch.-Ham. (Kabhro), Bhanimadal, Lalitpur, (Adhikari, 2020a).

Distribution - Africa and Nepal

Erysiphe betae (Va¸ha) Weltzien, *Phytopathol.* 47:127 (1963); Braun (1987: 217); U. Braun & R. T. A. Cook (2012: 366–367). [*Microsphaera betae* Vaňha, Z. Zuckerind. *Böhmen* 27: 180, (1903); *Erysiphe betae* var. *betae* Paul & Thakur (2006) *Indian Erysiphaceae*: 32, Jodhpur [Anamorph. *Oidium cylindricum* Sawada, *Special Publ. Coll. Agric. Natl.Taiwan Univ*. 8: 180, (1959]

Accoding to U. Braun (1987: 217); U. Braun & R. T. A. Cook (2012: 366–367). *Erysiphe cichoracearum* DC. is *Erysiphe betae* parasitic on *Dysphania ambrosioides* (= *Chenopodium ambrosioides*), reported from TC College (Singh, 1968) and on *Chenopodium,* (Manadhar & Shah, 1975) (See – Adhikari, 2017).

Distribution – North Africa, North and South America, Europe, Asia including Nepal.

Erysiphe cruciferarum Opiz ex L. Junell, *Sv. Bot. Tidskr.* 61(1): 217 (1967); U. Braun (1987: 96) and U. Braun & R. T. A. Cook (2012:375–376).

Erysiphe polygoni DC reported parasitic on *Brassica nigra*, Shree Mahal, Kathmandu (Khadka & Shah, 1967) and *Erysiphe communis* (Wallr.) Schltdl. on *Brassica juncea* (L.) Vassili- from Putalisadak, Kathmandu (Singh, 1968) belongs to *Erysiphe cruciferarum* Opiz ex L.The fungus is parasitic on leaves, stems, and seed crop pods of crucifers (See – Adhikari, 2017).

Distribution – Worldwide.

Erysiphe diffusa (Cooke & Peck) U. Braun & Takam., *Schlechtendalia* 4: 7(2000); U. Braun & R. T. A. Cook (2012: 453–454).

Parasitic on *Glycine max* (Soya bean), Lainchour, Kathmandu valley, Adhikari (2017).

Distribution – North and South America, Asia including Nepal.

Erysiphe embeliae (R.K. Verma, R. Chand & Kamal) U. Braun & S. Takam., *Schlechtendalia* 4: 19 (2000); U. Braun & R. T. A. Cook (2012: 556), (Syn. *Uncinula embeliae* R.K. Verma, R. Chand & Kamal, *Mycol. Res.* 94 (1):128, (1990).

Uncinula embeliae Verma et al., 1999 reported parasitic on *Embelia ribes* from Nepal. Holotype:

on *Embelia ribes*, Nepal, Kathmandu valley, Jan.1986, R.K. Verma (GPU, KK244). Isotype: HCIO 303493. (in U. Braun & R. T. A. Cook. 2012).
Distribution – Endemic to Nepal

Erysiphe ficicola U. Braun & Y. S. Paul, *Nova Hedwigia* 89 (3–4): 391, (2009) in U. Braun & R. T. A. Cook, (2012: 556) [Syn. *Uncinuliella ficicola* Y.S. Paul & V.K. Thakur, Indian *Erysiphaceae*: 68, *Pl. Disease Res.* 20 (2): 203-207(2005), *nom. inval*. (ICBN, Art. 37.6)]
Parasitic on leaves of *Ficus religiosa* L. Bhanimandal, Lalitpur and Lainchour, Kathmandu, (Adhikari, 2020a).
Distribution – Himachal Pradesh, India, Nepal.

Erysiphe heraclei DC., *Fl. Franç.*6: 107 (1815) and U. Braun & R. T. A. Cook (2012:384–386**).** [Syn. *Alphitomorpha heraclei* (DC.)Wallr, *Ann. Wetterauischen Ges. Gesammten Naturk., N. F.*, 4**:** 240, (1819); *Erysibe communis* var. *umbelliferarum* (Wallr.) Link, *Sp. pl.* 4, 6 (1): 106 (1896)**]**
Nepal host not specified (in U. Braun & R. T. A. Cook, 2012).
Distribution – Worldwide

Erysiphe howeana U. Braun in *Mycotaxon* 14 (1):373 (1982); Braun (1987: 204); U. Braun & R. T. A. Cook (2012: 386).
Parasitic on *Oenothera* sp. 2068/2/24, Bramha tole, Kathmandu (Adhikari, 2014; Adhikari & Bhattarai, 2014; Adhikari, 2020a).
Distribution - North and South America, South Africa, Europe, Nepal.

Erysiphe kydiae-calycinae (R.K. Verma, R. Chand & Kamal) U. Braun & S. Takam., *Schlechtendalia* 4: 21 (2000); U. Braun & R. T. A. Cook (2012: 565).
Uncinula kydiae-calycinae R.K. Verma, R. Chand & Kamal reported parasitic on *Kydia calycina* from Nepal (1999) Holotype: on *Kydia calycina*, Malvaceae; Bhaisalotan, Nepal, Jan. 1982, R. Chand (GPU 10). Isotype: IMI 265839.
Distribution – Endemic to Nepal.

Erysiphe malvae V.P. Heluta, In *Ukr. Bot. Zh.* 47 (4): 75. (1990). U. Braun & R. T. A. Cook (2012: 394).
On cultivated ornamental *Malva sylvestris* L. leaves, Bhanimandal, Lalitpur, Nepal. (Adhikari, 2021a)
Distribution – Iran, Israel, Europe, Nepal

Erysiphe necator Schwein**.**, *Trans. Amer. Philos. Soc*. II, 4: 270 (1834) var. ***necator***; ; (2012: 572). [Syn. *Uncinula necator* (Schwein.) Burrill, in Ellis & Everh., *North Amer. Pyrenomyc*.: 15 (1892); *Erysiphe tuckeri* Berk. *Jour. Hort. Soc. London* 9: 66 (1855); *Sphaerotheca castagnei* var. *vitis* Fuckel, *Jahrb. Nassauischen Vereins Naturk*. 23–24: 79 (1870); *Uncinula americana* Howe, *Jour. Bot., N.S.,* 1: 170 (1872)][Anamorph - *Oidium tuckeri* Berk., *Gard. Chron*. 7: 779 (1847)]
Reported as *Oidium* sp. parasitic on *Vitis vinifera*, Kathmandu (Khadka, Shah & Lawat, 1968; Manandhar & Shah, 1975).
Distribution – Worldwide

Erysiphe oleosa (Zheng & Chen) Braun & Takam. var. ***zhengii*** (U. Braun) U. Braun & Takam., *Schlechtendalia* 4: 22 (2000). U. Braun & R. T. A. Cook (2012:574).
Reported as *Erysiphe* sp. parasitic on *Tilia* sp., TC.College, Kathmandu, (Singh, 1968) (See Adhikari, 2017).
Distribution – Japan, Nepal.

Erysiphe pedaliacearum (H.D. Shin) H.D. Shin, comb. nov. in Shin, Meeboon, Takamatsu, Adhikari & Braun, *Mycological Progress*, (2018), https://doi.org/10.1007/s11557-018-1429-y [Basionym: *Oidium pedaliacearum* H.D. Shin, *Schlechtendalia* 17: 45 (2008); *Pseudoidium pedaliacearum* (H.D. Shin) H.D. Shin, in U. Braun & R. T. A. Cook, *Taxonomic Manual of the Erysiphales* (Powdery Mildews): 615 (2012); *Oidium sesami* H.D. Shin, *Korean J. Pl. Pathol.* 6(1): 9 (1990).
On leaves of *Sesamum indicum* L. Nepal, Kathmandu, Lainchour, Alkabasti, Adhikari (HAL 3242 F).
Distribution – Asia (Japan, Korea, Nepal).

Erysiphe pisi DC. *Fl. Franç.* 2: 274 (1805) var. ***pisi*** U. Braun & R. T. A.Cook (2012: 400) [Anamorph: *Oidium arachidis* Chorin, *Bull. Res. Counc. Israel,* Sect. *D, Bot.*, 10D: 148 (1961)]. (Syn. *Oidium vicae-*

fabae Sandu, *Probleme agricole* 6: 68–75 (1954), *nom. inval.*)

Erysiphe pisi DC.reported parasitic on *Pisum sativum,* Kathmandu (Pawsey, 1989); *Erysiphe polygoni* DC. on Sweet pea (*Lathyrus odoratus*), Kathmandu (Bhatt, 1966), TC. College (Singh, 1968); *Erysiphe polygoni* DC. parasitic on *Pisum sativum,* Dhunibesi (Khadka & Shah, 1967); *Erysiphe pisi* DC., on *Pisum sativum* (Pawsey, 1989). Putalisadak (Singh, 1968), on *Pisum sativum*, Dhunbesi (Khadka & Shah, 1967) and Simara are *Erysiphe pisi* var.*pisi* (See Adhikari, 2017).

Distribution – Worldwde.

Erysiphe polygoni DC. *Fl. Franc*. 2: 273 (1805); U. Braun & R. T. A.Cook (2012: 400) [Syn. *Microsphaera polygoni* (DC.) Sawada, *Special Rep. Formosa Agric. Exp. Sta*. 9: 52 (1914); *Alphitomorpha communis f. polygonacearum* Wallr., *Verh. Ges. Naturf. Freunde Berlin* 1(1): 31, (1819); *Erysibe communis* var. *polygonearum Link, Sp. pl.* 4, 6 (1): 107 (1824); *Erysiphe communis* x. *polygonearum* Fr., *Syst. Mycol*. 3: 242 (1829); *E. cichoracearum* f. *muehlenbeckiae* Nelen, *Novisti Niszh. Rast.* 3: 133 (1966) (type host – *Muehlenbeckia* sp).[Anamorph: *Oidium muehlenbeckiae* N. Ahmad, A.K. Sarbhoy, Kamal & D.K. Agarwal, *Indian Phytopathol*. 57(4): 478 (2004).

Recorded parasitic on leaves of *Muehlenbeckia platyclada* (Syn. *Homalocladium platycladum*) (Singh, 1968). Previously recorded as *Oidium* sp. on *Persicaria hydropiper* (Syn. *Polygonum hydropiper*) from Kirtipur (Singh & Nisha, 1976), *Persicaria perfoliata* (Syn. *Polygonum perfoliatum*) from Gyneswar (Singh & Nisha, 1976), on *Fagopyrum esculentum*, Malepatan, Pokhara (Lama, 1976) and *Fagopyrum esculentum,* (Manadhar & Shah, 1975). Parasitic on *Rumex nepalensis*, growing along the canal, swimming pool, Satdobato, Lalitpur (Adhikari, 2014; Adhikari & Bhattarai, 2014).) (See Adhikari, 2017). Also recorded in U. Braun & R. T. A. Cook (2012: 404) from Nepal, but host not specified.

Distribution – Worldwide.

Erysiphe quercicola S. Takam. & U. Braun, *Mycol. Res.*111: 819 (2007); U. Braun & R. T. A. Cook (2012: 497) [Syn. *Microsphaera alphitoides* auct. p.p.; *Erysiphe alphitoides* auct. p.p.; *O. mangiferae Berthet, Bol. Agric. (São Paulo)* 15: 818, 1914; *Acrosporium mangiferae* (Berthet) Subram., *Hyphomycetes* (New Delhi): 834, 1971; *Oidium citri* (J.M. Yen) U. Braun, *Zentralbl. Mikrobiol.* 137: 323, 1982; *Oidium mangiferae* Berthet.; [Anamorph: *Pseudoidium anacardii* (Noack) U. Braun & R.T.A. Cook (2012); Bas.: *Oidium anacardii* Noack, *Bol. Inst. Estado São Paulo* 9(2): 77, 1898].

Previous reports include *Oidium mangiferae* Berthet, on *Mangifera indica*, Shree Mahal (Khadka & Shah, 1967); as *Microsphaera alphitoides* Griff. & Maubl. on *Mangifera* and *Quercus* from Dhulikhel (Singh, 1968) and Adhikari (2022) from Bhanimandal. *Oidium citri* (J.M. Yen) U. Braun parasitic on leaves of *Citrus reticulata*, Jhruwarashi, Lalitpur and Pokhara valley (Pandey & Adhikari, 2005) (See Adhikari, 2017).

According to Braun (1987), the previous reports from Nepal, regarding the two species *Oidium tingitanium* Carter parasitic on *Citrus reticulata* (Lama, 1977) and *Oidium* sp. on *Citrus* sp. (Khadka & Shah, 1967), are different species. In *Oidium tingitanium* the conidia is 20–28 × 10 × 14 µm in size,which are significantly longer and formed singly. Hence the previous reports from Nepal related to *Oidium citri* has been erroneously referred to as *Oidium tangitanium* Carter (Pandey & Adhikari, 2005). U. Braun & R. T. A. Cook (2012) mentioned in a note that due to the confusion with the anamorph of *Erysiphe quercicola* **(**= *Oidium citri***)** all the recorded powdery mildew species on *Citrus* and *Aegle* belong to *Oidium citri*.

Distribution – In tropical and subtropical Africa, Asia and South America.

Erysiphe russellii (Clinton) U. Braun & S. Takam., *Schlechtendalia* 4: 13 (2000) [= *Microsphaera russellii* Clinton, in *Peck, Rep. (Annual) New York Stat. Mus. Nat. Hist.* 26: 80, (1874); *Trichocladia russellii* (Clinton) Jacz., *Karmanny opredelitel' gribov. Vyp.2. Muchnisto-rosyanye griby*: 299

(1927); *Acrosporium oxalidis* (McAlpine) Subram, *Hyphomycetes* (New Delhi), 838 (1971)]. [Anamorph: *Pseudoidium oxalidis* (McAlpine) U. Braun & R. T. A. Cook comb. nov. (2012: 502), Bas: *Oidium oxalidis* McAlpine, *Proc. Roy. Soc. Victoria, N.S.*, 6: 219 (1894)]

Oidium oxalidis McCalp. parasitic on *Oxalis corniculata,* Godawari (Singh, 1968) and Malepatan, Pokhara (Lama, 1976) is *Erysiphe russellii.* This species is also recorded by U. Braun & R. T. A. Cook (2012) from Nepal. Host not specified.

Distribution –Worldwide.

Erysiphe trifoliorum (Wallr.) Braun in *Mycotaxon*. 112:175 (2010); U. Braun & R. T. A. Cook, *CBS Biodiversity Ser.* 11*:* 515: (2012). **[**Syn. *Alphitomorpha trifoliorum* Wallr. (1819)*; Erysiphe trifolii* Grev. (1824)*; Erysiphe trifolii* var. *trifolii Grev. ; Microsphaera trifolli* (Grev.) Braun var. *trifolii* (Grev.) Braun in *Nova Hedwigia*. 34 (3-4):685 (1981)**]**

Parasitic on leaves of *Trifolium repens* L., CDB, TU, Kathmandu, Adhikari (2017),

Distribution – Europe, Nepal.

Euoidium chrysanthemi (Rabenh.) U. Braun & R.T.A.Cook comb. nov, in U. Braun & R. T. A. Cook, *CBS Biodiversity Ser*. 11:333(2012) [Bas. *Oidium chrysanthemi* Rabenh., *Hedwigia*. 1:19 (1853); U. Braun (1989: 604)].

Parasitic on leaves of *Chrysanthemum* sp., (Exotic, cultivated), Bhanimandal, Lalitpur (Adhikari, 2012b). Adhikari (2012b) reported this species as *Oidium chrysanthemi* Rabenh.

Distribution – Worldwide.

Euoidium longipes (Noordel. & Loer.) U. Braun & R.T.A. Cook, comb. nov, *Taxonomic Manual of the Erysiphales (Powdery Mildews),* CBS Biodiversity Series No. 11. (2012: 335) [Bas.: *Oidium longipes* Noordel. & Loer., *Persoonia* 14: 53, (1989)]

Oidium on *Solanum melongena*, leaves, Lainchour, Kathmandu, Nepal. Adhikari,

New to Nepal.

Comments - *Oidium melongena* Zaprom. [*Uzbekist. Stat. Pflanzenschutz, Taschkent,* 11: 17 (1928)] is an excluded species (U. Braun & R. T.A. Cook, 2012).

Distribution – North America, Europe, Nepal

Golovinomyces adenophorae (R.Y. Zheng & G.Q. Chen) Heluta, *Ukrayins'k. Bot. Zhurn*. 45(5): 62 (1988); U. Braun & R. T. A. Cook, (2012: 298) [Syn. *Erysiphe adenophorae* R.Y. Zheng & G.Q. Chen, *Sydowia* 34: 235 (1981); *E. cichoracearum* auct. p.p.]

Reported as *Oidium* sp. parasitic on *Ageratina adenophora* (Syn. *Eupatorium adenophora*), Palpa; (Lama, 1977) and parasitic on *Chromolaena odorata* [Syn.*Eupatorium odoratum*, *Osmia odorata*] Compositae, Bhanimandal, Lalitpur, (Adhikari, 2017).

Distribution – Asia, Europe.

Golovinomyces artemisiae (Grev.) Heluta, *Ukrayins'k. Bot. Zhurn*. 45 (5): 62 (1988): U. Braun & R. T. A. Cook, (2012: 301- 302) [Syn. *Erysiphe artemisiae Grev., Fl. edin*.: 459 (1824); *Alphitomorpha artemisiae* Wallr., *Ann. Wetterauischen Ges. Gesammte Naturk., N.F*.,4: 240 (1819); *Erysiphe depressa* var. *artemisiae* (Wallr.) Link, *Sp. pl*. 4, 6(1): 110 (1824); *E. cichoracearum* f. *artemisiae* (Fuckel) Jacz. (Jaczewski 1927: 186)].

Parasitic on leaves of *Artemissia vulgaris,* Karyabinoyak, Lalitpur. *(*Adhikari, 2017)

Distribution – North America, Asia, Europe.

Golovinomyces biocellatus (Ehrenb.) Heluta, *Ukrayins'k. Bot. Zhurn.* 45(5): 62 (1988); U. Braun & R. T. A. Cook (2012) *Taxonomic Manual of the Erysiphales (Powdery Mildews)*. 304 - 305; [Syn. *Erysiphe biocellata* Ehrenb., *Nova Acta Phys.- Med. Acad. Caes. Leop.- Carol. Nat. Cur.* 10: 211 (1821); *Erysiphe communis* f. *biocellata* (Ehrenb.) Fr., *Syst. Mycol*. 3: 239 (1829); *Erysiphe biocellata* var. *monardae* (Nagy) U. Braun, *Zentralbl. Mikrobiol.* 137:316 (1982); *Golovinomyces simplex* (Heluta) Heluta, *Ukrayins'k. Bot. Zhurn.* 45(5): 63 (1988)] [Anamorph: *Oidium erysiphoides* Fr., *Syst.Mycol.* 3: 432 (1832); *Oidium ocimi* S. Naray. & K. Ramakr., *Madras. Univ. Jour.* 37-38: 87 (1967)]

Parasitic on leaves of *Ocimum tenuiflorum* L. (Syn. *Ocimum sanctum* L.). Bhanimandal, Lalitpur, Adhikari (2014, 2018) (Adhikari &

Bhattarai, 2014). Previously reported as *Oidium ocimi-sancti* Puzari, Sarbhoy, Ahmad & Argawal, *Indian Phytopathol*. 59(1): 75 (2006); U. Braun & R. T. A. Cook (2012) *Taxonomic Manual of the Erysiphales (Powdery Mildews)*, (629 p) recorded under anamorphic powdery mildews (*Oidium*) of unclear generic affinity

Distribution – North and South Africa, North and South America, Asia, Europe.

Golovinomyces chrysanthemi (Rabenh.) M. Bradshaw, U. Braun, Meeboon & S. Takam. in *Mycologia* 109 (3):512.(2017). [Syn. *Acrosporium chrysanthemi* (Rabenh.) Põldmaa, *Fitopatogennye Mikromitsety Severnoj Estonii*: (1967: 83); *A. chrysanthemi* (Rabenh.) Subram. *Hyphomycetes* (New Delhi) (1971:836); *Euoidium chrysanthemi* (Rabenh.) U. Braun & R. T. A. Cook comb. nov U. Braun & R. T. A. Cook, (2012: 333); [Bas.: *Oidium chrysanthemi* Rabenh., *Hedwigia* 1: 19, 1853].

Reported as *Oidium chrysanthemi* Rabenh. on *Chrysanthemum* sp., PN.College (Lama, 1976) and on *Chloris gayana*. (Manandhar & Shah, 1975).

Distribution – Worldwide.

Golovinomyces cichoracearum (DC.) Heluta, *Ukrayins'k. Bot. Zhurn.* 45(5): 62 (1988); U. Braun & R. T. A. Cook, (2012: 308 - 309) **(**Syn. *Erysiphe cichoracearum* DC., *Fl. franç*. 2: 274 (1805.) [Anamorph: *Oidium lactucae-debilis* Sawada, *Bull. Dept. Gov. Res. Inst. Formosa* 24: 34 (1927)].

Parasitic on leaves of *Youngia japonica* (Syn. *Crepis japonica*), Jawalakhel, east of Nepal Telecommunication, Adhikari (2012a) reported as *Erysiphe cichoracearum* (Adhikari, 2017).

Distribution – Africa, North and South America, Asia, Europe, New Zealand.

Golovinomyces cucurbitacearum (R.Y. Zheng & G. Q. Chen) Vakal. & Kliron,.*Mycotaxon* 80: 490 (2001); U. Braun & R. T. A. Cook (2012) *Taxonomic Manual of the Erysiphales (Powdery Mildews)*. 310p. [Syn. *Erysiphe cucurbitacearum* R.Y. Zheng & G.Q. Chen, *Sydowia* 34: 258 (1981); *E. cichoracearum* f. *cucurbitacearum* Poteb., *Gribnye parazity vysshikh rastenij Kharkovskoj i smezhnykh gubernij* (1915:233)].

Previously recorded as *Oidium* sp. parasitic on *Cucumis sativus*, Balaju (Khadka & Shah, 1967; Khadkaet al., 1968; Manandhar & Shah, 1975). *Erysiphe cichoracearum* DC. reported parasitic on *Cucumis sativus*, Balaju (Singh, 1968), on Squash (*Cucurbita maxima*), Dilli Bazzar (Bhatt, 1966), Putalisadak, Kathmandu, (Singh, 1968), and Nayabazar (Lama, 1976).

Distribution – Worldwide.

Golovinomyces cynoglossi (Wallr.) Heluta, *Ukrayins'k. Bot. Zhurn.* 45(5): 62 (1988); U. Braun & R. T. A. Cook (2012) *Taxonomic Manual of the Erysiphales (Powdery Mildews)*. 310-311p. [Syn. *Alphitomorpha cynoglossi* Wallr. (1819); *Erysiphe cynoglossi* (Wallr.) U. Braun, *Mycotaxon* 15: 136 (1982); *E. artemisiae var. cynoglossi* (Wallr.) Ialongo, *Mycotaxon* 44(1): 255 (1992) nom. inval]

Parasitic on *Cynoglossum zeylanicum* (Vehl.) Thumb. ex Lehm., (Syn. *Cynoglossum furcatum* Wall.), Swaymbhu, Kathmandu, (Adhikari, 2014; Adhikari & Bhattarai, 2014). Previously recorded as *Oidium sp.* parasitic on *Cynoglossum zeylanicum (Syn. Cynoglossum furcatum),* Godawari (Singh, 1968) (U. Braun & R. T. A. Cook (2012: 310, in Adhikari, 2017).

Distribution – Europe, USSR, North Africa, North America, Asia including Nepal.

Golovinomyces orontii (Castagne) Heluta, *Ukrayins'k. Bot. Zhurn*. 45(5): 63 (1988); U. Braun & R. T. A. Cook (2012:322–323). [Syn. *Erysiphe orontii* Castagne, in *Suppl. Cat. Pl. Mars*.:52 (1851) emend Braun*, Nova Hedwigia* 89:252 (1989); *Erysiphe cichoracearum* auct. p.p.; Anamorph: *Euoidium violae* (Pass.) U. Braun & R.T.A. Cook, comb. nov. Braun (1980: 78-79, as *E. cichoracearum*; 1987a: 252; 1995: 137).

Previous record include parasitic as *Erysiphe orontii* and *Erysiphe cichoracearum* DC. on *Helianthus annus* (Singh, 1968) from TC College; *Erysiphe* sp. parasitic on *Physalis divaricata* (Syn. *Physalis minima*), Jawalakhel (Bhatt, 1966) and as *Oidium* sp. parasitic on *Helianthus annus,* area unknown (Manadhar & Shah, 1975). On *Nicotiana plumbaginifolia* growing on wall, Swayambhu nath, Kathmandu,

(Adhikari, 2014) and on *Helianthes annus* L., Patan Hospital, Lalitpur, Adhikari (2020a)

Distribution – Worldwide attacking various hosts

Golovinomyces sonchicola U. Braun & R.T.A. Cook, in Cook & Braun, *Mycol. Res*. 113(5): 629 (2009); U. Braun & R. T. A. Cook (2012: 328) [Syn. *Erysiphe cichoracearum* f. *sonchi* Jacz. (Jaczewski 1927: 210).[Anamorph: *Oidium sonchi-arvensis* Sawada, *Bull. Dept. Agric. Gov. Res. Inst. Formosa* 24: 34, (1927).

Previously recorded as *Erysiphe* sp parasitic on *Sonchus asper*, TC.College (Bhatt, 1966) and as *Oidium* sp.on *Sonchus* sp. T. C. College (Singh, 1968). [Syn. *Erysiphe cichoracearum* f. *sonchi* Jacz. (Jaczewski, 1927: 210)] (see Adhikari, 2017). U. Braun & R. T. A. Cook (2012: 328) has also recorded from Nepal (host not specified).

Distribution – Africa, Asia, North and South America, Europe.

Golovinomyces spadiceus (Berk. & Curtis) U. Braun, comb. nov. in U. Braun & R. T. A. Cook (2012, 329–330) **[**Bas.: *Erysiphe spadicea* Berk. & M.A. Curtis, *Grevillea* 4: 159, (1876);Syn. *Erysiphe cichoracearum* f. *xanthii* Jacz. (1927: 212); *Golovinomyces cichoracearum* var. *transvaalensis* (G.J.M. Gorter & Eicker) U. Braun, *Schlechtendalia* 3: 51 (1999)] [Anamorph: *Oidium acanthospermi* Chidd., *Lloydia* 18: 46 (1955); *Oidium lagasceae* Chidd., *Lloydia* 18: 47, (1955)].

Speciemen examined - *Oidium* on *Zinnia elgans, c*ollected from Lalitpur, Bhanimandal, 2077.6.10, Adhikari, no 2078.Z2a KATH and Lainchour, Nepal, 2078.7.16, Adhikari, no 2078.Z2b, KATH.

Previously recorded as *Erysiphe cichoracearum* DC., parasitic on *Zinnia elegans,* TC College (Singh, 1968); on *Zinnia* sp., (Manandhar & Shah, 1975); parasitic on *Xanthium strumarium* L., Compositae, Matatirtha and Mantar, KATH, Adhikari. U. Braun & R. T. A. Cook, (2012, 329 p.) has also recorded this species from Nepal (host not speciefied). U. Braun & R. T. A. Cook (2012, 329 p.) recorded this species on *Zinnia elegans*, *Asteraceae* [*Heliantheae*] from Nepal.

Distribution – Widespread (Africa, North and South America, Bermuda, Australia, Russia, Europe, New Zealand, Oceania, Asia including Nepal)

Comment – U. Braun & R.T.A. Cook (2012) treates *Oidium xanthii* ("*xanthami*") M.K. Bhatn. & K.L.Kothar*i, Sci & Cult.* 32(8): 422 (1966) as anamorphic powdery mildew (*Oidium*) under unclear generic affinity reported from India on *Xanthium strumarium*. This species differs from *Golovinomyces ambrosiae*, by narrower conidia (width < 20 ĕm), shorter chasmothecial appendages, and conidial germination of *Euoidium* type. According to U. Braun & R. T. A. Cook, (2012, 639 p.) *Oidium erysiphoides* f. *zinniae* Cif., *Ann. Mycol.* 29: 292, 1931; status unclear, possibly belongs to *Golovinomyces*. (Syn.= *O. zinniae* (Cif.) *Bunkina, Komarovskie Chteniya* (Vladivostok) 21: 74, 1974, *nom. inval.* Above all *Zinnia elegans* agree, however, with *G. spadiceus*. (300 p.)

Leveillula buddlejae Adhikari, Meeboon, Takamatsu & Braun. in *Mycoscience journal homepage*: www.elsevier.com/locate/myc *Mycoscience* (2018) 1e4; *Mycoscience* (2018), https://doi.org/10.1016/j.myc.2017.08.012

On *Buddleja asiatica*, Kathmandu, Basundhara, Godhuli party place, Nepal. M.K. Adhikari, no. 2073.4. (TSU-MUMH 7069 d holotype), KATH (isotype). Previously recorded as *Oidium* sp. parasitic on *Buddleja asiatica*, Kheokeba (Singh, 1968).

Distribution – Endemic to Nepal.

Leveillula taurica (Lev.) Arnaud, *Ann. Épiphyt.*7: 94 (1921); U. Braun & R. T. A. Cook (2012: 206–208). [Syn. *Erysiphe taurica* Lév., in *Démidoff, Voy. Russ. merid.* (bot.): 119 (1842); *Oidiopsis taurica* (Lév.) E.S. Salmon, *Ann. Bo*t. 20: 187 (1906)] [Anamorph: *Oidiopsis sicula* Scal., *Atti Congr. Bot. Palermo*. (1902: 396); *Oidiopsis solani* N. Ahmad, A.K. Sarbhoy, Kamal & D.K. Agarwal, *Indian Phytopathol*. 59(2): 221 (2006)].

Previously recorded as *Leveillula* sp. parasitic on *Lycopersicum esculentum* (Pawsey, 1989) and parasitic on *Capsicum annum,* Sallaghari, Bhaktapur (Khadka, Shah & Lawat, 1968; Manadhar & Shah, 1975), Malepatan, (Lama,

1976); on *Capsicum frutescens*, Malepatan (Lama, 1976); *Oidiopsis taurica* (Lev.) Salma parasitic on *Capsicum frutescens,* Putalisadak and *Capsicum annum* (Syn. *Capsicum grassum*), Kirtipur (Singh, 1968)].(See Adhikari, 2017).
Distribution – Worldwide.

Leveillula papilionacearum (Kom.) U. Braun comb. nov. in U. Braun & R. T. A. Cook (2012: 202)[Bas.: *Erysiphe papilionacearum* Kom., *Bot. Zap*. 4: 271 (1895)] [Syn. *Leveillula taurica f. ammodendri* Jacz. (Jaczewski 1927: 413); *L. taurica* f. *ononidis* T.M. Akhundov (l.c.: 51)
Recorded as *Leveillula taurica* (Lev.) Arnaud reported parasitic on *Phaseolus aureus,* Malepatan, Pokhara (Lama, 1977) (See Adhikari, 2017).
Distribution – Africa, Europe, Asia including Nepal.

Phyllactinia dalbergiae Piroz., *Mycologia* 57:827 (1965); U**.** Braun & R. T. A. Cook (2012: 241).[Syn. *Phyllactinia corylea* var. *subspiralis* E.S. Salmon, *Ann. Mycol.* 3: 501 (1905); *P. yarwoodii* Patw., *Sydowia* 29: 136 (1965)]
Previously recorded as *Phyllactinia corylea* (Pers.) Karst. host not specified (Pawsey, 1989), parasitic on leaves of *Dalbergia sissoo* (Ivory, 1985); Tarai belt, Khojapur, Banauli, Gamaria-Maheshpur (Shiraha) and Jibaha Community Forestry plantations. Wide spread in Bhairahawa and Butawal community Forestry (Adhikari, 1996; Parajuli et al*.,* 1999, 2000).Wide spread from East to West Nepal.
Distribution – India, China, Nepal.

Phyllactinia mali (Duby) U. Braun, *Feddes Repert.* 88(9–10): 657, 1978.
Recorded from Nepal. Host not speciefied (U. Braun & R. T. A. Cook (2012:261).
Distribution – Nepal, Pakistan, Russia, Siberia, Turkey, Turkmenistan, Uzbekistan), Caucasus (Armenia, Azerbaijan, Georgia), all Europe.

Pleochaeta indica N. Ahmad, A.K. Sarbhoy & Kamal, *Mycol. Res.* 99: 375 (1995); U. Braun & R. T. A. Cook (2012) *Taxonomic Manual of the Erysiphales (Powdery Mildews)*. 282pg,
Parasitic on *Celtis australis* L., Harihar bhawan, Pulchowk, Lalitpur, (KATH), Adhikari, HAL Germany and Bhanimandal, Lalitpur.(Adhikari, 2018). Previously Singh (1968) reported *Oidium* sp. on *Celtis australis,* collected from TC. College (Adhikari, 2017, 2018).
Distribution – India, Nepal.

Podosphaera erigerontis-canadensis (Lév.) U. Braun & T.Z. Liu, in Liu, *The Erysiphaceae of Inner Mongolia*. (2010:198)**;** U. Braun & R. T. A. Cook (2012: 196). [Syn. *Erysiphe erigerontis-canadensis* Lév., in *Mérat, Rev. Fl. Paris*. (1843: 459)].
Parasitic on leaves of *Erigenron acer*, growing near wall, Khumaltar, behind NAST, Lalitpur, Adhikari. Previously reported as *Erysiphe cichoracearum* DC. (Adhikari & Bhattarai, 2014)
Distribution – North and South America, Europe, Iceland, Asia including Nepal.

Podosphaera hibiscicola (Z.Y. Zhao) U. Braun & Takam., *Schlechtendalia* 4: 30 (2000); U. Braun & R. T. A. Cook (2012: 144).[Syn. *Sphaerotheca hibiscicola* Z.Y. Zhao, *Acta Microbiol. Sin.* 21(3): 294 (1981)].
Parasitic on leaves of *Hibiscus mutabilis* (exotic, cultivated) (Adhikari, 2014, 2017).
Distribution – China, Taiwan, Japan, India, Nepal.

Podosphaera leucotricha (Ellis & Everh.) E.S. Salmon, *Mem. Torrey Bot. Club.* 9: 40 (1900); U. Braun & R. T. A. Cook (2012: 105–106).[Syn. *Sphaerotheca leucotricha* Ellis & Everh., *Jour. Mycol.* 4: 58 (1888)][Anamorph: *Oidium farinosum* Cooke, *Grevillea*, 16: 10 (1887)]
Parasitic on leaves *Malus sylvestris*. Syn. *Pyrus malus*), Kakani (Khadka, Shah & Lawat, 1968; Manandhar & Shah, 1975; Pawsey, 1989).
Distribution – Worldwide.

Podosphaera pannosa (Wallr.: Fr.) de Bary, *Abh. Senkenb. Naturf. Ges.*7: 408, (1870) and *Hedwigia* 10: 68 (1870)**;** U. Braun & R. T. A. Cook (2012: 150–151).[Syn. *Alphitomorpha pannosa* Wallr., *Verh. Ges. Naturf. Freunde Berlin* 1: 43 (1819); *Erysibe pannosa* (Wallr.) Link, *Sp. Pl*. 4, 6(1): 104 (1824)*; Erysiphe pannosa* (Wallr.) Fr., *Syst. Mycol.* 3: 236 (1829): *Sphaerotheca pannosa* (Wallr. : Fr.)

Lév., *Ann. Sci. Nat., Bot., 3 Sér*., 15:138 (1851)] [Anamorph: *Oidium leucoconium* Desm., *Ann. Sci. Nat., Sér.* 1, 13: 102 (1829); *Oidium rosacearum* Hosag. & Manian, *Indian Jour. Forest*. 13: 224 **(**1990).

Previously recorded as *Sphaerotheca* sp. parasitic on Rose, Kathmandu (Bhatt, 1966). Parasitic on leaves *Rosa indica* and *Rosa* sp., Putalisadak, Kathmandu (Singh, 1968) and parasitic on *Rosa banksiae* (exotic, cultivated), NHM, Kathmandu, previously reported as *Sphaerotheca pannosa* (Wallr.) Lév. (Adhikari, 2014; Adhikari & Bhattarai, 2014).

Distribution – Worldwide.

Podosphaera xanthii (Castagne) U. Braun & Shishkoff, *Schlechtendalia* 4: 31, 2000; U. Braun & R. T. A. Cook (2012: 165-167) [Syn. *Erysiphe xanthii* Castagne, *Cat. Pl. Marseille*: (1845:188); *Sphaerotheca xanthii* (Castagne) L. *Junell, Svensk Bot. Tidskr*. 60(3):382 (1966); *Erysiphe fuscata* Berk. & M.A. Curtis, *Grevillea* 4: 159 (1876); *Sphaerotheca phaseoli* (Z.Y. Zhao) U. Braun, *Zentralbl. Mikrobiol*. 140: 166 (1985); *Podosphaera phaseoli* (Z.Y. Zhao) U. Braun & S. Takam., *Schlechtendalia* 4: 30 (2000)] [Anamorph: *Oidium balsaminae* Rajd., *Mycopathol. Mycol. Appl*. 28 (1-2): *Podosphaera euphorbiae-hirtae* (U. Braun & Somani) U. Braun & S. Takam., *Schlechtendalia* 4: 28 (2000); U. Braun & R. T. A. Cook (2012) *Taxonomic Manual of the Erysiphales (Powdery Mildews)*.138p. [Syn.*Sphaerotheca euphorbiae-hirtae* U. Braun & Somani, Mycotaxon 25: 263 (1986)] [Anamorph: *Oidium euphorbiae-hirtae* J.M. Yen, *Rev. Mycol. (Paris)* 31(4):296 (1966) [Syn. *O. pedilanthi* J.M. Yen, Cah. Pacifique 11: 104 (1967); *O. pedilanthi* R.L. Mathur, B.L. Mathur & Bhargavan, Indian Phytopathol. 24(1): 63 (1971)].

Podospaera xanthii [Syn. *Podosphaera phaseoli* (Z.Y. Zhao) U. Braun & S. Takam.,] was reported parasitic on *Macrotyloma uniflorum* (Lam.) Verdc. from Bhanimandal, Lalitpur [erroneously called as *Dolichos biflorus; Dolichos uniflorus,* and written as *Phaseolus acontifolius* (by Rajbhandari, 1976, See in Adhikari, 2017)]. This species was reported as *Sphaerotheca fuliginea* (Schltdl.:Fr.) Poll. on *Macrotyloma uniflorum* and *Erysiphe cichoracearum* DC. parasitic on leaves of *Coreopsis* sp., *Calendula officinalis* L*., Bidens pilosa* L. *Siegesbeckia orientalis* L. and *Vigna ungulata* (L). Walp. from Kathmandu valley (Adhikari, 2014,, 2020a,2020b). *Oidium* sp. parasitic *o*n leaves of *Euphorbia hirta* L*.,* Nepal Academy of Science and Technology (NAST), Khumaltar, Lalitpur, Nepal (Adhikari, 2021b).

Reported as *Oidium* sp. *Oidium* sp. parasitic on *Vigna radiata* (*Phaseolus radiatus*), Yagyapuri (Khadka, Shah & Lawat, 1968) and parasitic on *Vigna unguiculata* (Syn. *Vigna sinensis*) (Manadhar & Shah, 1975). The previous studies on Nepalese species also include *Oidium cyparissiae* Syd. parasitic on *Euphorbia heterophylla* (Syn. *Euphorbia geniculata*), *Oidium* sp. on *Impatiens balsamina,*TC.College; on *Euphorbia hirta*, Balaju, Kathmandu (Singh, 1968) and Malepatan, Pokhara (Lama, 1976).

Comment – According to Meeboon et al., 2016, *Podosphaera xanthii* on *Euphorbia hirta* based on molecular phylogeny with the conidia formed in chains and fibrosin-bodies "*Podosphaera euphorbiae-hirtae*", the species in U. Braun and R. T. A. Cook's monograph (2012), is very common in Asia on *Euphorbia hirta* and *E. tithymaloides*. The phylogenetic tree and molecular examinations *Oidium euphorbiae-hirtae* and *Oidium pedilanthi* are conspecific and *Podosphaera euphorbiae-hirtae* has to be reduced to synonymy with *Podosphaera xanthii.*

Distribution –Worldwide.

Pseudoidium braunii (Hosag.) U. Braun & R.T.A. Cook, *CBS Biodiversity Series*. 11:599 (2012) [Syn. *Oidium braunii* Hosag., *Sydowia* 31: 50 (1984); Braun, *Nova Hedwigia* 89:601 (1989)].

Parasitic on *Nyctanthes arbor-tristis,* Bhanimandal, Lalitpur (Adhikari, 2012a).

Distribution – Asia (India, Nepal).

Pseudoidium kalanchoës (Lüstner ex U. Braun) U. Braun & R.T.A. Cook, in U. Braun & R. T. A. Cook (2012: 608–609)

Previous report include *Oidium calanchoea* Lüstner ex U. Braun parasitic on *Bryophyllum* sp., T. C.College (Singh, 1968) (see Adhikari, 2017).

Distribution - North America, Australia, Europe, Nepal.

Pseudoidium neolycopersici (L. Kiss) L. Kiss, comb. nov. in U. Braun & R. T. A. Cook, *CBS Biodiversity Ser*. 11: 612 (2012) [Bas.: *Oidium neolycopersici* L. Kiss, *Mycol. Res.* 105(6): 695, (2001); Pseudonym: *Oidium lycopersici* ("*lycopersicum*")].

Previously recorded as *Erysiphe polygoni* DC. parasitic on tomato [*Solanum lycopersicum* (=*Lycopersicon esculentum*)], Dillibazzar (Bhatt, 1966); as *Oidium* sp. parasitic on *Lycopersicum esculentum,* Kakani (Khadka & Shah, 1967); TC college (Singh, 1968). Parasitic on leaves of *Solanum esculentum* (Syn. *Lycopersicon esculentum*), growing near wall, Swayambhunath, Kathmandu (Adhikari, 2014, Adhikari & Bhattarai, 2014). U. Braun & R. T. A. Cook (2012: 618) has also recorded this species from Nepal (See Adhikari, 2017).

Distribution – Worldwide.

Pseudoidium nyctaginacearum (Hosag.) U. Braun & R.T.A. Cook, comb. nov. CBS *Biodiversity Series* No. 11; 613 (2012). [Bas.: *Oidium nyctaginacearum* Hosag., *Indian Phytopathol.* 43: 217 1990)].

Parasitic on *Mirabilis jalapa*, (Adhikari & Bhattarai (2014) reported this species as *Erysiphe communis* (Wallr.) Schltdl (Adhikari, 2017).

Distribution – Africa, North America, China, India, Indonesia, Japan, Sri Lanka and Nepal.

Pseudoidium trichiliae (Hosag., Siddappa, Vijay. & Udaiyan) U. Braun & R.T. A. Cook, CBS Biodiversity Series No. 11: 620 (2012) [Bas.:*Oidium trichiliae* Hosag., Siddappa, Vijay. & Udaiyan, *Indian J.Forest.*15: 162 (1992).

Parasitic on leaves of *Trichilia connaroides*, NHM, Swayambhu, Kathmandu (Adhikari, 2014; Adhikari & Bhattarai, 2014). This species was reported by Adhikari (2014) and Adhikari & Bhattarai (2014) as *Uncinula cedrelae* F.L. Tai**.** According to Braun & Cook (2012), *Uncinula cedrelae* is parasitic on *Toona sinensis*.

Distribution – India, Nepal.

Pseudoidium urenae (J.M. Yen) U. Braun & R.T.A. Cook, comb. nov. *CBS Biodiversity Series*.11**:**621 (2012) [Bas. *Oidium urenae* J.M. Yen, *Cahiers du Pacifique* 11: 110 (1967).

Parasitic on leaves of *Urena lobata*, Swayambhu*,* (Adhikari 2012b). Adhikari (2012b) reported it as *Oidium urenae* J.M. Yen.

Distribution – Taiwan, India, Nepal.

Setoidium murrayae (Hosag., U. Braun & Rabindran) U. Braun & R.T.A. Cook, comb. nov. *CBS Biodiversity Series*. 11:96–97 (2012) [Syn. *Oidium murrayae* Hosag., U. Braun & Raindran, *Int. Jour.. Mycol. Lichenol.*5 (3):213 (1992)].

Parasitic on leaves of *Murraya paniculata* Tribhuvan University, VC gate, Kathmandu and on *Murraya koenigii,* NHM, Swayambhu, Kathmandu (Adhikari, 2012a: Adhikari & Bhattarai, 2014). It was reported as *Oidium murrayae* Hosag, U. Braun & Raindran.

Distribution – India, Nepal.

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