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An Inventory of Lichens in Uttar Pradesh through Bibliographic Compilation

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Introduction

Lichens are basically fungi that construct self sustainable composite thalli symbiotically in association with alga and or cyanobacteria. They are included in the fungal Kingdom, but have members of other two kingdoms; Bacteria and Chromista (Cavalier-Smith 2004). Lichens are ubiquitous, sensitive indicators of air pollution, microclimate of region, anthropogenic disturbances, forest health and continuity, and constitute an important component of terrestrial biodiversity. It is estimated that in the world, there are about 20,000 species (Sipman & Aptroot, 2001) and in India 2300 species (Singh & Sinha 2010).

In India, most of the lichenological explorations were under taken in lichen rich regions such as Himalayas and Western Ghats, and less attention was paid to Gangatic plains, Central India, Deccan Plateau or arid zones of the country. Hence, before the creation of state Uttar Pradesh in the year 2000, Uttar Pradesh was represented by a large number of lichen species (471 spp., Srivastava 2004) due to extensive exploration in the Himalayan region of the state since 18th century. Similarly, in case of present state of Uttar Pradesh, no authentic chronological lichen exploration records are available. As per the literature *Heppia lutosa* (Ach.) Nyl., collected by Dudgeon from Allahabad during 1926 is the oldest record available. Thereafter, though there is collection of lichens from few localities in the state, they are either undescribed or included in the

monographic studies (Awasthi 1980, Akhtar & Awasthi 1980, Awasthi & Srivastava 1989, Joshi & Upreti 2007, 2008, Pant & Upreti 1993, Singh & Upreti 1984, Upreti 1988, 1997, Upreti & Büdel 1990). In the mean time, lichens growing over monuments attracted the attention of lichenologists and they are studied from some major monuments of Uttar Pradesh (Ayub 2005, Chatterjee *et al.* 1996, Saxena *et al.* 2004, Singh & Upreti 1991). More recently, air pollution studies with the help of lichens are being conducted in Faizabad (Dubey *et al.* 1999), Kanpur (Satya & Upreti 2009, 2011), Lucknow (Bajpai *et al.* 2004, Mishra *et al.* 2003, Saxena 2004, Saxena *et al.* 2007, Upreti & Bajpai 2003), Rae Bareli (Bajpai *et al.* 2010a, b) districts of Uttar Pradesh and regarding this some lichens have been collected. Srivastava (2004) prepared the first list of lichens for Uttar Pradesh with 26 species, while Singh & Sinha (2010) in their checklist recorded only 43 species. In both the cases, it is evident that they missed several important publications and the list is still incomplete. The aim of present study is to compile all the available literature for lichens in Uttar Pradesh and to prepare an inventory. The study would provide a base line data for future lichenological studies in the state and would expose the lacuna in the current knowledge of diversity and distribution.

Materials and method

The current communication is chiefly based on

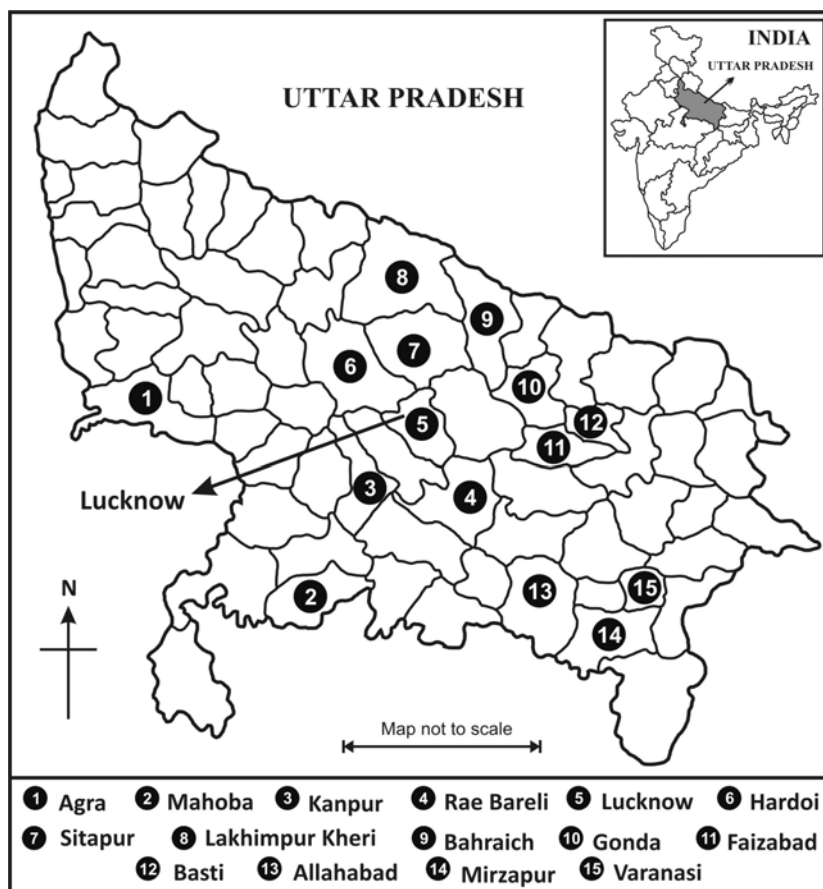


Fig. 1: Map of Uttar Pradesh showing districts with lichen collection

compilation of published research papers. However, few unpublished Ph.D. thesis available at National Botanical Research Institute were also consulted for validly identified lichen specimens from Uttar Pradesh. The recent nomenclature of the lichen taxa are updated using Index Fungorum (www.indexfungorum.org) and Lumbsch & Huhndorf (2007) was followed for classification. The representations of lichens in different districts are counted and their micro and macro habitat preferences are analyzed.

Result

The compilation of literature revealed the

occurrence of 90 species belonging to 24 families and 33 genera of lichens in Uttar Pradesh (Appendix 1). Out of 71 districts in Uttar Pradesh the representation of lichens were available only for 15 districts (Fig. 1), of which Bahraich had maximum diversity with 45 species followed by Lucknow with 34 (Fig. 2). All the remaining 13 districts had number of species ranging from 1 - 8.

The state has the dominance of crustose lichens with 60 species. A total of 15 foliose lichens belonging to genus *Collema*, *Dirinaria*, *Hyperphyscia*, *Parmotrema*, *Phaeophyscia*, *Physcia* and *Pyxine* are encountered. The state has equally large number of squamulose lichen with 14 species under genera

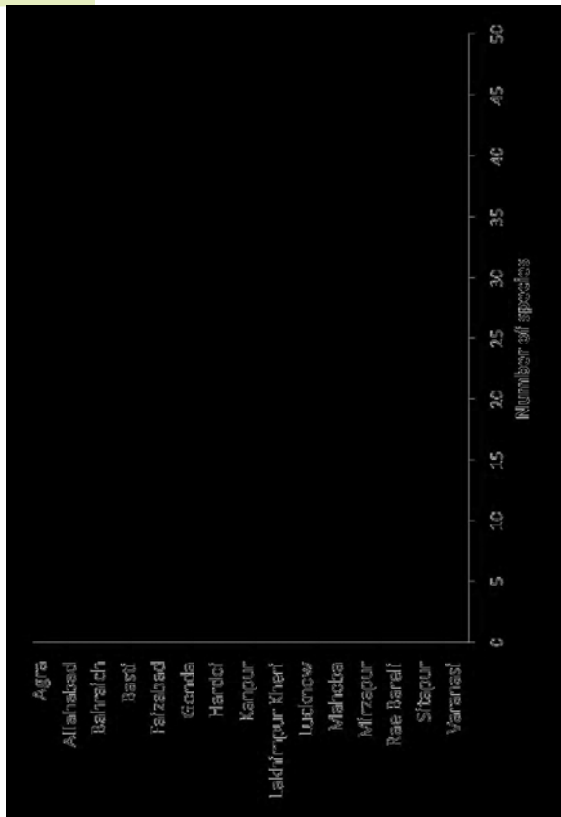


Fig. 2: Number of lichen species represented in 15 districts in U.P.

Endocarpon, *Phyllicum*, *Heppia* and *Peltula*. The lichen *Chrysothrix chlorina* is the only leprose lichen recorded so far from the state, while fruticose lichens are completely absent. The lichen family *Physciaceae* is the most diverse and dominant in state with eight genera and 14 species (Table 1). It is followed by *Lecanoraceae* with 13 species under one genus. Except for *Physciaceae* all the remaining 23 families had only one genus with maximum number of species seven.

The lichens in Uttar Pradesh are being collected from macro-habitats such as forest areas, mango orchards, monuments and old buildings, rocky outcrops and sometimes from trees along the road sides. The *Mangifera indica* trees are the dominant substratum (micro-habitat) for lichens in mango orchard along with some trees of *Syzygium cumini*,

Acacia nilotica and occasional rocks. Whereas in forest areas several trees host lichens with frequent rocks and boulders. Some localities such as Wyndom and Sirsi falls in Mirzapur district have purely rocky outcrops for the growth of lichens. The walls of the monuments in Uttar Pradesh were plastered with lime for which the lichen belonging to genera *Endocarpon*, *Phyllicum* and *Peltula* have special attraction. The analysis of the lichen flora of Uttar Pradesh so far reported indicates that a large number (39 spp.) of lichens are restricted to forest areas followed by mango orchards (22 spp.) (Fig.3). However, as many as five lichen species are common between forest and mango orchards. Many of the lichens (*Endocarpon*, *Peltula*) growing on the monuments also do grow on rocks and lime stones. In general, the epiphytic lichens are more dominant in the state (68 spp.) as compared to lichen those prefer lime plaster (7 spp.) or rock (7 spp.) (Fig. 4). While most of the lichens show substrate specificity *Dirinaria papillulifera* (Nyl.) D.D. Awasthi, an epiphytic lichen also found growing also on lime plaster. *Heppia lutosa* is the only terricolous (soil inhabiting) lichens found in the Uttar Pradesh state.

Discussion

Upreti & Büdel (1990) described *Heppia lutosa* from Allahabad based on the specimen collected by Dudgeon during 1926. The specimen is originally housed in Naturhistorisches Museum, Wien (NMW) and a part of it (duplicate) in NBRI herbarium (LWG). However, the specimen does not contain much detail about the locality and habitat. Further, this species has not been recollected elsewhere from Uttar Pradesh or India and can be considered as a rare species.

Upreti *et al.* (2002) reported *Arthopyrenia ceuthocarpoides* Müll. Arg. and *Phyllicum macrosporum* A. Henssen from Lucknow and as new record for India. However, it appears to be an erroneous identification and hence deleted from list of Uttar Pradesh lichens. It can be noted that *P. macrosporum* was repeatedly cited by several authors till recently, (Singh &



Table 1: Lichen families present in Uttar Pradesh, their number of genera and species

Family	No. of genera	No. of species	Family	No. of genera	No. of species
1. Arthoniaceae	1	1	13. Peltulaceae	1	5
2. Arthopyreniaceae	1	2	14. Pertusariaceae	1	3
3. Chrysotrichaceae	1	1	15. Physciaceae	8	14
4. Collemataceae	1	1	16. Pilocarpaceae	1	1
5. Fuscideaceae	1	1	17. Pyrenulaceae	1	5
6. Graphidaceae	2	7	18. Ramalinaceae	1	6
7. Heppiaceae	1	1	19. Roccellaceae	1	4
8. Lecanoraceae	1	13	20. Sphinctrinaceae	1	2
9. Letrouitiaceae	1	3	21. Strigulaceae	1	1
10. Lichinaceae	1	1	22. Teloschistaceae	1	6
11. Monoblastiaceae	1	1	23. Thelotremataceae	1	2
12. Parmeliaceae	1	3	24. Verrucariaceae	1	6

Upreti 1991, Chatterjee *et al.* 1996, Saxena 2004, Saxena *et al.* 2004, Ayub 2005) but excluded by Singh and Sinha (2010) for the same reason.

Srivastava (2004) mentioned the occurrence of 42 lichen species belonging to 17 genera and 15 species in Uttar Pradesh. However, the list provided by him included only 26 species and the references are also incomplete. *Rinodina exigua* (Ach.) Gray mentioned in the list is a temperate species reported from Manipur and its occurrence in Uttar Pradesh is doubtful, while in case of *Pertusaria pertusa* (L.) Tuck., and *Dirinaria applanata* (Fée) D.D. Awasthi there is no literature to support their occurrence in Uttar Pradesh and hence they are excluded.

Singh & Sinha (2010) in their annotated checklist of Indian lichens enumerated 43 species from Uttar Pradesh for which they cited 17 references. Of them, Awasthi (1976) and Pant & Upreti (1993) did not include any lichens from Uttar Pradesh while several references are left out including a important one Saxena *et al.* (2007). Hence, the exact distribution of 15 lichen species in their list is almost

untraceable, but later on they were recorded from other literature. Even then, the distribution of *Bulbothrix isidiza* (Nyl.) Hale, *Dirinaria applanata*, *D. picta* (Sw.) Clem. & Shaer, *Pyrenula immissa* (Stirt.) Zahlbr., *P. introducta* (Stirt.) Zahlbr., and *P. pinguis* Fée in Uttar Pradesh was not traceable and hence for the time being they are excluded in the updated list provided here (Appendix 1).

At National Botanical Research Institute, few Ph.D. and monographic studies have been carried out revising dominant lichen groups such as *Parmelioid lichens* (Divakar & Upreti 2005), *Lecanora* (Nayaka 2004), *Pyrenocarpous lichens* (Gauniya 2005), *Teloschistaceae* (Joshi 2008) and these works also included specimens from Uttar Pradesh. Joshi (2008) described in his thesis a total 83 Teloschistacean taxa from India and included seven species from Uttar Pradesh. Of the species *Caloplaca pseudopoliotera* Joshi & Upreti described from Mahoba and Mirzapur was not published validly due to its taxonomic complication and it may be a variant of *C. poliotera* (Nyl.) Stein.

Most of the lichenological studies in Uttar

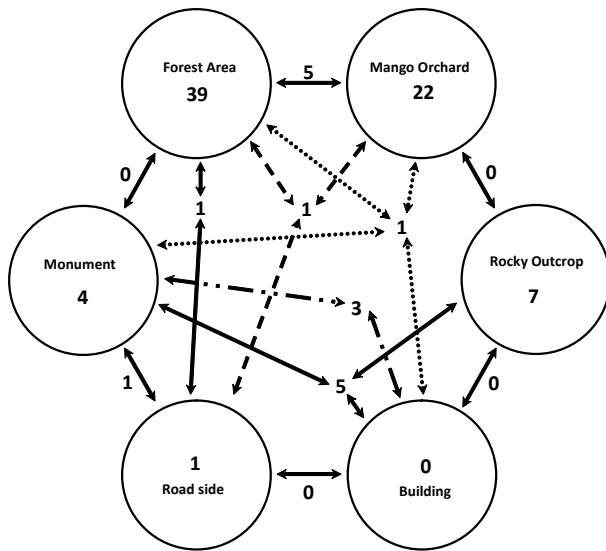


Figure 3: Macro habitat sharing by the lichens of Uttar Pradesh

Pradesh were carried out in Lucknow districts. That is mainly due to situation of a Lichen Research Centre at National Botanical Research Institute in Lucknow. The district has less - forest area but has many mango orchards providing habitat for some epiphytic lichens. The district also has rich cultural heritage and hence several historical monuments. The lime plaster of these monuments and some old buildings provide suitable habitats for luxuriant growth of calcicolous lichens. Lucknow is also one of the fast growing cities of north India with increasing urbanization and vehicular traffic. The lichens being sensitive to air pollution, their utilization in biomonitoring studies was another interest of the Lichenologists. Hence, Singh & Upreti (1991) studied the lichen flora of Lucknow with reference to historical monuments, while Saxena (2004) studied in relation to air pollution. Saxena (2004) intensively surveyed a large number of localities (51 nos.) within the district and recorded 33 species under 15 genera. Upreti *et al.* (2002), Saxena *et al.* (2003), and Upreti (2005) made a few notes on changed environment of Lucknow with respect to lichen flora. Ayub (2005)

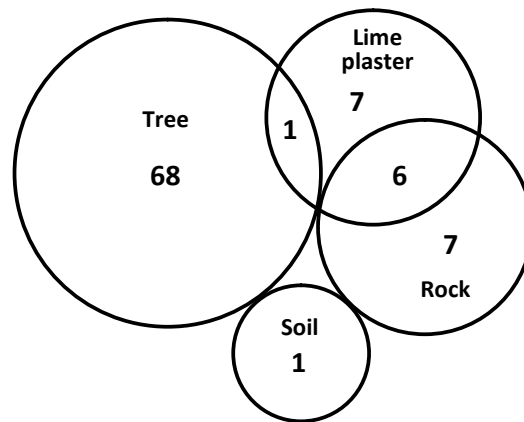


Figure 4: Substratum (micro habitat) sharing by the lichens of Uttar Pradesh

studied the lichens growing on some major monuments of Uttar Pradesh, especially of Lucknow and listed 14 lichen species. Asafi Imambara, Asafi Mosque, Residency complex, Sadat Ali Khan Maqbara, Sikander Bagh Building and Dilkusha Palace are some of the monuments studied for lichens in Lucknow. After compilation of all these studies now it is clear that Lucknow has a total of 34 lichen species.

Uttar Pradesh has protected areas (PA's) in the form of 24 Sanctuaries and one National Park. Among them only Dudwa National Park (Lakhimpur Kheri district) and Katarniaghat Wildlife Sanctuary (Bahraich district) have representative collections of lichens. From Dudwa, *Lecanora flavidomarginata* de Lesd. and *Parmotrema praesorediosum* (Nyl.) Hal are the only two species reported while many more specimens seem to be left unidentified in herbarium LWG. Katarniaghat is better explored for lichens and has 45 species, which is highest for any district in the state. However, there were only three collections from this area including two cursory collections by Tewari in year 1965 and Sharmat *et al.* in 1967. Nayaka *et al.* (2011) reported a total of 42 species from



Katarniaghat that included three partially described species of *Diorygma*, *Lecanora* and *Phaeographis*. This clearly indicates that the forest and protected areas have richer diversity.

Conclusion

Uttar Pradesh state has a geographic area of 2,40,928 km² that is 7.3% of the country's geographic area. The state has about 14,341 km² recorded forest cover which is 5.95 % of the state geographic area and about 2.0 % of country's forest area. Of the total forest area in the state, about 65.8% comes under reserved forest categories, 14.4% protected forest and 19.7% unleashed forest. Sonbhadra (37.43%), Pilibhit (19.95%), Mirzapur (19.16%), Lakhimpur Kheri (17.19%) and Chandauli (22.17%) are the few districts with maximum forest cover in the state. The flowering plants of the state are fairly well studied and so far 2,711 species are reported. However, lower plants did not receive much attention from the researchers. The state has a total of 698 species of algae, about 500 species of fungi, 19 species of liverworts (bryophytes) and 22 species

References

- Akhtar, P. & Awasthi, D.D. 1980. The lichen genus *Collema* in India. *Biol. Mem.* 5(1): 13-29.
- Awasthi, D.D. 1976. Lichen genus *Parmelia* in India. Subgenera *Parmelia* and *Amphigymnia*. *Biol. Mem.* 1: 155-229.
- Awasthi, D.D. 1980. *Pyxine* in India. *Phytomorphology* 30: 359-379.
- Awasthi, D.D. & Srivastava, P. 1989. Lichen genera *Brigantiaea* and *Letrouitita* from India. *Proc. Indian Acad. Sci., Pl. Sci.* 99(3): 165-177.
- Ayub, A. 2005. Lichen Flora of Some Major Historical Monuments and Buildings of Uttar Pradesh. Dept. of Botany, Dr. R.M.L. Avadh Univeristy, Faizabad, (Ph.D. Thesis).
- Bajpai, R., Upreti, D.K. & Nayaka, S. 2010a. Accumulation of arsenic and fluoride in lichen *Pyxine* *cocoes* (Sw.) Nyl., growing in the vicinity of coal based thermal power plant at Raebareli, India. *J. Expt. Scie.* 1(4): 37-40.
- Bajpai, R., Upreti, D.K., Nayaka, S. & Kumari, B. 2010b. Biodiversity, bioaccumulation and physiological changes in lichens growing in the vicinity of coal-based thermal power plant of Raebareli district, north India. *J. Hazardous Material*

of pteridophytes (Srivastava 2004). It has been observed in the case of Bahraich district which has about 13.22% of forest cover contains maximum diversity of lichens. Hence, present study clearly indicates that lichen exploration in the state is inadequate and several dense forested areas with possibly rich lichen diversity are untouched. The current total of 90 species from such a state is a poor estimate. This number would certainly increase once all the lichen rich areas in foot hills of Himalayas, Tarai region and eastern part of the state are thoroughly surveyed for lichens.

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174: 429-436.

- Bajpai, R., Upreti, D.K., Pandey, V. & Mishra, S.K. 2004. Pollution monitoring with the help of lichen transplant technique in some residential sites of Lucknow City. *J. Environ. Biol.* 22(2): 191-195.
- Cavalier-Smith, T. 2004. Only six kingdoms of life. *Proc. R. Soc. Lond. B* 271: 1251-62.
- Chatterjee, S., Sinha, G.P., Upreti, D.K. & Singh, A. 1996. Preliminary observation on lichens growing over some Indian Monuments. *Flora & Fauna* 2(1): 1-4.
- Divakar, P.K. & Upreti, D.K. 2005. *Parmelioid* Lichens in India (A Revisionary Study). Bishen Singh Mahendra Pal Singh, Dehradun.
- Dubey, A.N., Pandey, V., Upreti, D.K. & Singh J. 1999. Accumulation of lead by lichens growing in and around Faizabad, U.P., India. *J. Environ. Biol.* 20(3): 223-225.
- Gauniyal, A.K. 2005. Morpho-Taxonomic Studies on *Pyrenocarpous* Lichens of India. Dept. of Botany, Dr. R.M.L. Avadh Univeristy, Faizabad, (Ph.D. Thesis).
- Joshi, Y. 2008. Morphotaxonomic Studies on Lichen Family *Teloschistaceae* from India. Dept. of Botany, University of Kumaun, Nainital (Ph.D. Thesis).



- Joshi, Y. & Upreti, D.K. 2007. New species and new records of the lichen genus *Caloplaca* from India. *Lichenologist* 39(6): 505-508.
- Joshi, Y. & Upreti, D.K. 2008. Sorediate and isidiate species of the lichen genus *Caloplaca* (Ascomycetes, Teloschistaceae) from India. *Nova Hedwigia* 86(1-2): 259-272.
- Lumbsch, H.T. & Huhndorf, S.M. (ed.) 2007. Outline of Ascomycota - 2007. *Myconet* 13: 1 - 58.
- Mishra, S.K., Upreti, D.K., Pandey, V. & Bajpai, R. 2003. Pollution monitoring with the help of lichen transplant technique in some commercial and industrial areas of Lucknow city. *Pollut. Res.* 22(2): 221-225.
- Nayaka, S. 2004. Revisionary Studies on Lichen Genus *Lecanora* Sensu Lato in India. Dept. of Botany, Dr. R.M.L Avadh Univeristy, Faizabad, (Ph.D. Thesis).
- Nayaka, S., Upreti, D.K. and Khare, R. 2011. Diversity and distribution of lichens in Katarniaghat Wildlife Sanctuary, Uttar Pradesh. *J. Indian Bot. Soc.* (in press).
- Pant, G. & Upreti, D.K. 1993. The lichen genus *Diploschistes* in India and Nepal. *Lichenologist* 25(1): 33-50.
- Satya & Upreti, D.K. 2009. Correlation among carbon, nitrogen, sulphur and physiological parameters of *Rinodina sophodes* found at Kanpur city, India. *J. Hazardous Material* 169(1-3): 1088-1092.
- Satya, Upreti, D.K. & Patel, D.K. 2011. *Rinodina sophodes* (Ach.) Massal.: a bioaccumulator of polycyclic aromatic hydrocarbons (PAHs) in Kanpur City, India. *Environ. Monit. Assess* (DOI 10.1007/s10661-011-1962-5)
- Saxena, S. 2004. Lichen Flora of Lucknow District with Reference to Air Pollution Studies in the Area. Dept. of Botany, Lucknow Univeristy, Lucknow (Ph.D. Thesis).
- Saxena, S., Upreti, D.K. & Sharma, N. 2003. Distribution of lichens in surroundings of Lucknow City, Uttar Pradesh, India. In Proc. 90th Indian Science Congress Part III. Bangalore (Abstract).
- Saxena, S., Upreti, D.K. & Sharma, N. 2007. Heavy metal accumulation in lichens growing in north side of Lucknow City, India. *J. Environ. Biol.* 28(1): 49-51.
- Saxena, S., Upreti, D.K., Singh, A. & Singh, K.P. 2004. Observation on lichens growing on artifacts in the Indian Subcontinent: In L.L. St. Clair and M.R.D. Seaward (eds.), *Biodeterioration of Stone Surface*, pp. 181-193. Kluwer Academic Publishers, London.
- Singh, A. & Upreti, D. K. 1984. The lichen genus *Endocarpon* from India. *Candollea* 39: 539-548.
- Singh, A. & Upreti, D. K. 1991. Lichen flora of Lucknow with special reference to its historical monuments: In O. P. Agarwal and S. Dhawan (eds.), *Biodeterioration of Cultural Property*, pp. 219-231. MacMillan India Ltd., New Delhi.
- Singh, K.P. & Sinha, G.P. 2010. Indian Lichens An Annotated Checklist. Botanical Survey of India. Kolkata.
- Sipman, H.J.M. & Aptroot, A. 2001. Where are the missing lichens? *Mycol. Res.* 105: 1433-1439.
- Srivastava, S.K. 2004. Floristic diversity in Uttar Pradesh - an overview. *J. Econ. Taxon. Bot.* 28(2): 292-334.
- Upreti, D.K. 1988. A new species of lichen genus *Phylliscum* from India. *Curr. Sci.* 57(16): 906-907.
- Upreti, D.K. 1997. Notes on corticolous K⁺ yellow species of *Lecanora* in India. *Feddes Repert.* 108(3-4): 185-203.
- Upreti D.K. 2005. Lichens in the changed environment of Lucknow. *Environews* 11(1): 9.
- Upreti, D.K. & Bajpai, A. 2001. Pollution monitoring with the help of lichen transplant technique in Lucknow city. In 2nd International Conference on Plants and Environmental Pollution (ICPEP-2), NBRI, Lucknow (Abstract).
- Upreti, D.K. & Büdel, B. 1990. The lichen genera *Heppia* and *Peltula* in India. *J. Hattori Bot. Lab.* 68: 274-284.
- Upreti, D.K. & Nayaka, S. 2006. *Anisomeridium calcicolum* sp. nov. and further new records of pyrenocarpous lichens from India. *Lichenologist* 38: 231-233.
- Upreti, D.K. & Pant, G. 1993. Notes on *Arthopyrenia* species from India. *Bryologist* 96(2): 226-232.
- Upreti, D.K., Yadav, V. & Nayaka, S. 2002. A note on lichens from environs of Lucknow district, U.P. India. In Proc. 89th Indian Science Congress. Lucknow University, Lucknow (Abstract).



Appendix 1

List of lichens reported form Uttar Pradesh in various literatures (District names are in italics)

1. *Anisomeridium calcicolum* Upreti & Nayaka (Monoblastiaceae)
Distribution: *Faizabad* - Gulab Bari monument (Upreti & Nayaka 2006, Ayub 2005), Gauniyal (2005), Singh & Sinha (2010)
Habitat (substratum): Monument (lime plaster)
2. *Arthopyrenia nidulans* Müll. Arg. (Arthopyreniaceae)
Distribution: *Lucknow* - Khursi Road (Upreti and Pant 1993, Upreti *et al* 2002), Behta (Saxena *et al* 2007), *Rae Bareli* Road, Sikrori Village, Bani, Alinagar, Kurda Village, Palka Village, Rahimabad (Saxena 2004), Gauniyal (2005), Srivastava (2004), Singh & Sinha (2010)
Habitat (substratum): Mango orchard (tree)
3. *Arthopyrenia terminata* (Nyl.) Müll. Arg. (Arthopyreniaceae)
Distribution: *Lucknow* - Chandiamau, Bani, Rahimabad (Saxena 2004), Gauniyal (2005)
Habitat (substratum): Mango orchard (tree)
4. *Bacidia alutaceae* (Krempelh) Zahlbr. (Ramalinaceae)
Distribution: *Bahraich* - *Katarniaghat* (Nayaka *et al* 2011)
Habitat (substratum): Forest area (Tree)
5. *Bacidia inundata* (Fr.) Körber (Ramalinaceae)
Distribution: *Sitapur* - Mehmudabad (Ayub 2005)
Habitat (substratum): Monument (lime plaster)
6. *Bacidia laurocerasi* (Del. ex Duby) Vainio (Ramalinaceae)
Distribution: *Lucknow* - Palka village (Saxena 2004)
Habitat (substratum): Mango orchard (tree)
7. *Bacidia medialis* (Tuck.) Zahlbr. (Ramalinaceae)
Distribution: *Lucknow* - *Sitapur* road, Chandiamau Village, Bani, *Rae Bareli* Road, Madarpur Village (Saxena 2004), Srivastava (2004)
Habitat (substratum): Mango orchard (tree)
8. *Bacidia millegrana* (Taylor) Müll. Arg. (Ramalinaceae)
Distribution: *Bahraich* - *Katarniaghat* (Nayaka *et al* 2011), Srivastava (2004)
Habitat (substratum): Forest area (tree)
9. *Bacidia submedialis* (Nyl.) Zahlbr. (Ramalinaceae)
Distribution: *Lucknow* - Seiva Village (Saxena *et al* 2007), Kursi Road, Bani, Amausi, Sesandy Village, Pursaini village, Gudamba Road, Kakori Station, Sherpur Village, Kamlabad Badauli village, Raitha Village, Badaura Village, Malihabad, Rahimabad, Chenunta Village (Saxena 2004), Srivastava (2004), Singh & Sinha (2010)
Habitat (substratum): Mango orchard, Forest area (tree)
10. *Buellia almorensis* S. Singh & Awasthi (Physciaceae)
Distribution: *Bahraich* - *Katarniaghat* (Nayaka *et al* 2011).
Habitat (substratum): Forest area (tree)
11. *Caloplaca bassiae* (Willd. ex Ach.) Zahlbr. (Teloschistaceae)
Distribution: *Bahraich* - *Katarniaghat* (Nayaka *et al* 2011, Joshi 2008); *Lucknow* - Mehmood Nagar (Joshi & Upreti 2008), Malihabad (Joshi 2008), Singh & Sinha (2010)
Habitat (substratum): Forest area, Mango orchard (tree)
12. *Caloplaca conciliascens* (Nyl.) Zahlbr. (Teloschistaceae)
Distribution: *Mirzapur* - Wyndhom Falls (Joshi 2008)
Habitat (substratum): Rocky outcrop (rock)
13. *Caloplaca cupulifera* (Vain.) Zahlbr. (Teloschistaceae)
Distribution: *Mahoba* - Bukhra Pahar (Joshi 2008); *Mirzapur* - Sirsi Fall (Joshi & Upreti 2008), Singh & Sinha (2010)
Habitat (substratum): Rocky outcrop (rock)
14. *Caloplaca pyracea* (Ach.) Th. Fr. (Teloschistaceae)
Distribution: *Bahraich* - *Katarniaghat* (Nayaka *et al* 2011)
Habitat (substratum): Forest area (rock)
15. *Caloplaca subpoliotera* Y. Joshi & Upreti (Teloschistaceae)
Distribution: *Mahoba* - Bukhra Pahar (Joshi & Upreti 2008, Joshi 2008), Singh & Sinha (2010)
Habitat (substratum): Rocky outcrop (rock)
16. *Caloplaca tropica* Y. Joshi & Upreti (Teloschistaceae)
Distribution: *Mirzapur* - Shivpur Hills (Joshi & Upreti 2007, Joshi 2008), Singh & Sinha (2010)
Habitat (substratum): Rocky outcrop (rock)
17. *Chrysothrix candelaris* (L.) Laundon (Chrysotrichaceae)
Distribution: *Bahraich* - *Katarniaghat* (Nayaka *et al* 2011)
Habitat (substratum): Forest area (tree)
18. *Collema pulcellum* var. *subnigrescens* (Müll. Arg.) Degel. (Collemataceae)
Distribution: *Bahraich* - *Katarniaghat* (Akhtar & Awasthi 1980), Singh & Sinha (2010)
Habitat (substratum): Forest area (tree)
19. *Cryptothecia subnidulans* Stirton (Arthoniaceae)
Distribution: *Bahraich* - *Katarniaghat* (Nayaka *et al* 2011)
Habitat (substratum): Forest area (tree)
20. *Diorygma junghuhnii* (Montn. & Bosch) Kalb, Staiger & Elix (Graphidaceae)
Distribution: *Bahraich* - *Katarniaghat* (Nayaka *et al* 2011)
Habitat (substratum): Forest area (tree)



21. *Dirinaria aegilata* (Afz. in Ach.) Moore (Physciaceae)
Distribution: *Bahraich - Katarniaghat* (Nayaka *et al.* 2011), Srivastava (2004)
Habitat (substratum): Forest area (tree)
22. *Dirinaria confluens* (Fr.) D.D. Awasthi (Physciaceae)
Distribution: *Faizabad - Lucknow Road, Allahabad Road, Azamgarh Road, Angoori Bagh, Bazaza, Railway Station* (Dubey *et al.* 1999), Singh & Sinha (2010)
Habitat (substratum): Road side (tree)
23. *Dirinaria consimilis* (Stirton) Awasthi (Physciaceae)
Distribution: *Bahraich - Katarniaghat* (Nayaka *et al.* 2011); *Rae Bareli - Bachhrawa* (Bajpai *et al.* 2004), Gonda (Mishra *et al.* 2003), Srivastava (2004), Singh & Sinha (2010)
Habitat (substratum): Forest area, Mango orchard (tree)
24. *Drinaria papillulifera* (Nyl.) D.D. Awasthi (Physciaceae)
Distribution: *Faizabad - Rae Bareli Road, Maqbara* (Dubey *et al.* 1999), Srivastava (2004), Singh & Sinha (2010)
Habitat (substratum): Road side, Monument (tree, lime plaster)
25. *Endocarpon nanum* Ajay Singh & Upreti (Verrucariaceae)
Distribution: *Bahraich - Katarniaghat* (Nayaka *et al.* 2011); *Lucknow - Carlton Hotel Boundary Wall* (Singh & Upreti 1984, 1991, Chatterjee *et al.* 1996, Saxena *et al.* 2004), Malihabad (Singh & Upreti 1984), Residency Area, Moosabagh (Saxena 2004), Udaiganj (Ayub 2005), Gauniyal (2005), Srivastava (2004), Singh & Sinha (2010)
Habitat (substratum): Forest area, Monument, Mango orchard, Building wall (rock, lime plaster)
26. *Endocarpon nigro-zonatum* Ajay Singh & Upreti (Verrucariaceae)
Distribution: *Lucknow - Wall of Imambara, Carlton Hotel Boundary Wall* (Singh & Upreti 1984, Chatterjee *et al.* 1996, Ayub 2005), Gauniyal (2005), Srivastava (2004), Singh & Sinha (2010)
Habitat (substratum): Monument, Building wall (lime plaster)
27. *Endocarpon pallidum* Ach. (Verrucariaceae)
Distribution: *Lucknow - Rae Bareli Road, Residency Area, Moosabagh* (Saxena 2004); *Rae Bareli - Pithan Village* (Singh & Upreti 1984, Ayub 2005, Gauniyal 2005), Srivastava (2004), Singh & Sinha (2010)
Habitat (substratum): Monument, Rocky area, Building wall (rock, lime plaster)
28. *Endocarpon pusillum* Hedw. (Verrucariaceae)
Distribution: *Lucknow - Carlton Hotel Boundary Wall, On the wall of Imambara, NBRI Garden Boundary Wall* (Singh & Upreti 1984, 1991, Chatterjee *et al.* 1996, Saxena *et al.* 2004), Malihabad, Residency Area, Moosabagh, *Rae Bareli Road* (Saxena 2004, Ayub 2005); *Rae Bareli - Pithan Village* (Singh & Upreti 1984), Gauniyal (2005), Srivastava (2004), Singh & Sinha (2010)
Habitat (substratum): Monument, Building wall, rocky area (rock, lime plaster)
29. *Endocarpon rosettum* Ajay Singh & Upreti (Verrucariaceae)
Distribution: *Agra - Buland Darwaja; Allahabad - Khusro Bagh, Akbar's Fort; Faizabad - Gulab Bari, Maqbara; Kanpur - Bithoor* (Ayub 2005); *Lucknow - Wall of Imambara, Carlton Hotel Boundary Wall* (Singh & Upreti 1984, Saxena *et al.* 2004), Malihabad (Chatterjee *et al.* 1996), Tikhatganj (Saxena 2004), Residency; *Varanasi - Ram Nagar Fort, BHU Hostel Building* (Ayub 2005), Gauniyal (2005), Srivastava (2004), Singh & Sinha (2010)
Habitat (substratum): Monument, Building wall, Rocky area (rock, lime plaster)
30. *Endocarpon subrosettum* Ajay Singh & Upreti (Verrucariaceae)
Distribution: *Agra - Buland Darwaja; Faizabad - Maqbara* (Ayub 2005); *Lucknow - Tikhatganj, Raja Sahib's Fort, Malihabad Road* (Saxena 2004), Cantt Area (Ayub 2005); *Sitapur - Mahmudabad* (Singh & Upreti 1984, Ayub 2005), Gauniyal (2005), Singh & Sinha (2010)
Habitat (substratum): Monument (lime plaster)
31. *Fissurina incrustans* Fée (Graphidaceae)
Distribution: *Bahraich - Katarniaghat* (Nayaka *et al.* 2011)
Habitat (substratum): Forest area (tree)
32. *Graphis* cfr. *striatula* (Ach.) Spreng. (Graphidaceae)
Distribution: *Bahraich - Katarniaghat* (Nayaka *et al.* 2011)
Habitat (substratum): Forest area (tree)
33. *Graphis guimarana* Vaino (Graphidaceae)
Distribution: *Bahraich - Katarniaghat* (Nayaka *et al.* 2011)
Habitat (substratum): Forest area (tree)
34. *Graphis nigroglauca* Leighton (Graphidaceae)
Distribution: *Bahraich - Katarniaghat* (Nayaka *et al.* 2011)
Habitat (substratum): Forest area (tree)
35. *Graphis subasahinae* Nagarkar & Patw. (Graphidaceae)
Distribution: *Bahraich - Katarniaghat* (Nayaka *et al.* 2011)
Habitat (substratum): Forest area (tree)
36. *Graphis subserpentina* Nyl. (Graphidaceae)
Distribution: *Bahraich - Katarniaghat* (Nayaka *et al.* 2011)
Habitat (substratum): Forest area (tree)
37. *Hafellia disciformis* (Fr.) Marbach & H. Mayrhofer (Physciaceae)
Distribution: *Bahraich - Katarniaghat* (Nayaka *et al.* 2011)
Habitat (substratum): Forest area (tree)
38. *Heppia lutosa* (Ach.) Nyl. (Heppiaceae)
Distribution: *Allahabad* (Upreti & Büdel 1990), Srivastava (2004), Singh & Sinha (2010)
Habitat (substratum): Rocky outcrop (soil)
39. *Hyperphyscia syncolla* (Nyl.) K. Kalb. (Physciaceae)
Distribution: *Lucknow - Chenunta Village* (Saxena 2004)



- Habitat (substratum): Mango orchard (tree)
40. *Hyperphyscia minor* (Fée) Nyl. (Physciaceae)
Distribution: *Bahraich - Katarniaghat* (Nayaka *et al.* 2011)
Habitat (substratum): Forest area (tree)
41. *Lecanora achroa* Nyl. in Cromb. (Lecanoraceae)
Distribution: *Lucknow - Fatehganj, Mohanlalganj, Sesandy Village, Badaura Village, Lalnagar Hardoiya, Madarpur Village* (Saxena 2004), *Kakori, Katabhidh Village* (Nayaka 2004), Singh & Sinha (2010)
Habitat (substratum): Mango orchard (tree)
42. *Lecanora argentata* (Ach.) Degel. (Lecanoraceae)
Distribution: *Hardoi - Garhi* (Nayaka 2004)
Habitat (substratum): Mango orchard (tree)
43. *Lecanora austrointumescens* Lumbsch & Elix (Lecanoraceae)
Distribution: *Lucknow - Malihabad* (Saxena 2004), *Dewan* (Nayaka 2004), Singh & Sinha (2010)
Habitat (substratum): Mango orchard (tree)
44. *Lecanora cinereofusca* H. Magn. (Lecanoraceae)
Distribution: *Bahraich - Katarniaghat* (Upreti 1997); *Faizabad - Maqbara, Gulab Bari* (Dubey *et al.* 1999); *Gonda - Sarju; Lucknow - NBRI Garden* (Nayaka 2004), Singh & Sinha (2010)
Habitat (substratum): Forest area, Road side (tree)
45. *Lecanora concilians* Nyl. (Lecanoraceae)
Distribution: *Bahraich - Katarniaghat* (Nayaka *et al.* 2011)
Habitat (substratum): Forest area (tree)
46. *Lecanora coriensis* (Hue) J. R. Laundon (Lecanoraceae)
Distribution: *Faizabad - Bahu Begum Maqbara* (Ayub 2005)
Habitat (substratum): Monument (Lime plaster)
47. *Lecanora flavidomarginata* B. de Lesd. (Lecanoraceae)
Distribution: *Lakhimpur Kheri - Dudwa National Park* (Nayaka 2004)
Habitat (substratum): Forest area (tree)
48. *Lecanora helva* Stizenb. (Lecanoraceae)
Distribution: *Lucknow - Madarpur Village* (Saxena 2004), *Mohanlalganj* (Nayaka 2004)
Habitat (substratum): Mango orchard (tree)
49. *Lecanora interjecta* Müll. Arg. (Lecanoraceae)
Distribution: *Bahraich - Katarniaghat* (Nayaka *et al.* 2011)
Habitat (substratum): Forest area (tree)
50. *Lecanora leprosa* Fée (Lecanoraceae)
Distribution: *Bahraich - Katarniaghat* (Upreti 1997); *Basti - Saltaura* (Nayaka 2004); *Lucknow - Palka Village, KSF Research Station* (Saxena *et al.* 2007), *Behta, Mohanlalganj, Chandiamau Village, Near Bantthara Village, Sesandy Village* (Saxena 2004), *Rehmankhera, Kakori* (Nayaka 2004), Singh & Sinha (2010)
Habitat (substratum): Forest area, Mango orchard (tree)
51. *Lecanora perplexa* Brodo (Lecanoraceae)
Distribution: *Sitapur - Mahmudabad* (Nayaka 2004), Singh & Sinha (2010)
Habitat (substratum): Mango orchard (tree)
52. *Lecanora rugosella* Zahlbr. (Lecanoraceae)
Distribution: *Sitapur - Hargaon* (Nayaka 2004)
Habitat (substratum): Mango orchard (tree)
53. *Lecanora tropica* Zahlbr. (Lecanoraceae)
Distribution: *Lucknow - Badaura Village, Chenunta Village, Rahimabad, Kakori, Hardoi Road, Alinagar, Kurda Village* (Saxena 2004), *Lalnagar Hardoiya* (Nayaka 2004), Singh & Sinha (2010)
Habitat (substratum): Mango orchard (tree)
54. *Letrouitia leprolyta* (Nyl.) Hafellner (Letrouitiaceae)
Distribution: *Bahraich - Katarniaghat* (Awasthi & Srivastava 1989), *Srivastava* (2004), Singh & Sinha (2010)
Habitat (substratum): Forest area (tree)
55. *Letrouitia transgressa* (Malme) Haf. & Bellem (Letrouitiaceae)
Distribution: *Bahraich - Katarniaghat* (Nayaka *et al.* 2011), *Srivastava* (2004)
Habitat (substratum): Forest area (tree)
56. *Letrouitia transgressa* (Malme) Hafellner & Bellem. in Hafellner (Letrouitiaceae)
Distribution: *Bahraich - Chakiamotipur road* (Awasthi & Srivastava 1989), Singh & Sinha (2010)
Habitat (substratum): Forest area (tree)
57. *Malcolmiella granifera* (Ach.) Kalb & Lücking (Pilocarpaceae)
Distribution: *Bahraich - Katarniaghat* (Nayaka *et al.* 2011)
Habitat (substratum): Forest area (tree)
58. *Maronea constans* (Nyl.) Hepp. (Fuscideaceae)
Distribution: *Bahraich - Katarniaghat* (Nayaka *et al.* 2011)
Habitat (substratum): Forest area (tree)
59. *Opegrapha herpetica* (Ach.) Ach. (Roccellaceae)
Distribution: *Lucknow - Malihabad, Behta* (Saxena 2004), *Srivastava* (2004)
Habitat (substratum): Mango orchard (tree)
60. *Opegrapha* cfr. *heterospora* Vainio (Roccellaceae)
Distribution: *Bahraich - Katarniaghat* (Nayaka *et al.* 2011)
Habitat (substratum): Forest area (tree)
61. *Opegrapha leptoterodes* Nyl. (Roccellaceae)
Distribution: *Lucknow - Chandiamau Village* (Saxena 2004)
Habitat (substratum): Mango orchard (tree)
62. *Opegrapha subvulgata* Nyl. (Roccellaceae)
Distribution: *Bahraich - Katarniaghat* (Nayaka *et al.* 2011)
Habitat (substratum): Forest area (tree)
63. *Parmotrema mesotropum* (Müll. Arg.) Hale (Parmeliaceae)



- Distribution: *Bahraich - Katarniaghat* (Nayaka *et al.* 2011)
Habitat (substratum): Forest area (tree)
64. *Parmotrema praesorediosum* (Nyl.) Hale (Parmeliaceae)
Distribution: *Bahraich - Karniaghat; Lakhimpur Kheri - Dudwa National Park* (Divakar & Upreti 2005, Nayaka *et al.* 2011), Singh & Sinha (2010)
Habitat (substratum): Forest area (tree)
65. *Parmotrema saccatilobum* (Taylor) Hale (Parmeliaceae)
Distribution: *Bahraich - Katarniaghat* (Nayaka *et al.* 2011)
Habitat (substratum): Forest area (tree)
66. *Peltula euploca* (Ach.) Poelt (Peltulaceae)
Distribution: *Agra - Buland Darwaza* (Ayub 2005); *Lucknow - Boundary wall of NBRI* (Saxena 2004); *Mirzapur - Shivpur Hills, Sirsi Falls, Wyndom Falls* (Upreti & Büdel 1990), Srivastava (2004), Singh & Sinha (2010)
Habitat (substratum): Monument, Rocky outcrop, Building wall (rock, lime plaster)
67. *Peltula obscurans* (Nyl.) Gyeln. (Peltulaceae)
Distribution: *Agra - Buland Darwaza, Sikandara* (Ayub 2005); *Lucknow - Boundary wall of NBRI Garden, IT College Boundary Wall* (Singh & Upreti 1991, Saxena *et al.* 2004, Ayub 2005), Residency (Saxena 2004); *Mirzapur - Shivpur Hills, Wyndom Falls; Rae Bareli - Pithan Village* (Upreti & Büdel 1990), Srivastava (2004), Singh & Sinha (2010)
Habitat (substratum): Monument, Building wall, rocky outcrop (rock, lime plaster)
68. *Peltula patellata* (Bagl.) Swinscow & Krog (Peltulaceae)
Distribution: *Kanpur - Bithoor* (Ayub 2005); *Lucknow - Dilkusha Fort, Dilkusha Grave wall; NBRI Boundary wall* (Chatterjee *et al.* 1996, Upreti & Büdel 1990, Saxena *et al.* 2004), *Faizabad Road* (Saxena 2004), *Udaiganj; Varanasi - Ramnagar Fort* (Ayub 2005), Srivastava (2004), Singh & Sinha (2010)
Habitat (substratum): Monument, Building wall (lime plaster)
69. *Peltula tortuosa* (Nees) Wetmore (Peltulaceae)
Distribution: *Mirzapur - Sirsi Falls, Wyndom Falls* (Upreti & Büdel 1990), Srivastava (2004), Singh & Sinha (2010)
Habitat (substratum): Rocky outcrop (rock)
70. *Peltula zahlbrucknerii* (Hasse) Wetmore (Peltulaceae)
Distribution: *Mirzapur - Shivpur Hills, Wyndom Falls* (Upreti & Büdel 1990); *Mahoba - Bukar Pahar* (Saxena *et al.* 2004), Srivastava (2004), Singh & Sinha (2010)
Habitat (substratum): Rocky outcrop (rock)
71. *Pertusaria leucostoma* (Bernh.) Massal. (Pertusariaceae)
Distribution: *Lucknow - Kanpur Road* (Saxena 2004)
Habitat (substratum): Mango orchard (tree)
72. *Pertusaria pallidula* Stirton (Pertusariaceae)
Distribution: *Lucknow - Kanpur Road, Sesandy Village, Sitapur Road, Sherpur Village* (Saxena 2004)
Habitat (substratum): Mango orchard (tree)
73. *Pertusaria quassiae* (Fée) Nyl. (Pertusariaceae)
Distribution: *Bahraich - Katarniaghat* (Nayaka *et al.* 2011)
Habitat (substratum): Forest area (tree)
74. *Phaeophyscia orbicularis* (Neck.) Moberg (Physciaceae)
Distribution: *Lucknow - Palka Village* (Saxena 2004, Saxena *et al.* 2007), Singh & Sinha (2010)
Habitat (substratum): Mango orchard (tree)
75. *Phaeophyscia hispidula* (Ach.) Moberg (Physciaceae)
Distribution: *Rae Bareli - near FGU-NTPC* (Bajpai *et al.* 2010)
Habitat (substratum): Mango orchard (tree)
76. *Phylliscum indicum* Upreti (Lichinaceae)
Distribution: *Agra - Etamad-ud-daula Tomb, Buland Darwaza, Sikandra; Allahabad - Kusro Bagh, Akbar's Fort; Faizabad - Maqbara, Gulab Bari; Kanpur - Bithoor* (Ayub 2005); *Lucknow - Dilkusha Fort, Dilkusha Grave wall* (Chatterjee *et al.* 1996, Singh & Upreti 1991), *Bakhiyapur Village, Residency Area, Tikhatganj, Moosabagh* (Saxena 2004), *Udaiganj* (Ayub 2005); *Mahoba - Bukar Pahar* (Saxena *et al.* 2004); *Rae Bareli - Pithan Village* (Upreti 1988); *Varanasi - Ramnagar* (Ayub 2005), Srivastava (2004), Singh & Sinha (2010)
Habitat (substratum): Monument, Building wall (lime plaster)
77. *Physcia dimidiata* (Arn.) Nyl. (Physciaceae)
Distribution: *Bahraich - Katarniaghat* (Nayaka *et al.* 2011)
Habitat (substratum): Forest area (tree)
78. *Pyrenula brunnea* Fée (Pyrenulaceae)
Distribution: *Bahraich - Katarniaghat* (Nayaka *et al.* 2011)
Habitat (substratum): Forest area (tree)
79. *Pyrenula comirana* Vainio (Pyrenulaceae)
Distribution: *Bahraich - Katarniaghat* (Nayaka *et al.* 2011)
Habitat (substratum): Forest area (tree)
80. *Pyrenula mamillna* (Ach.) Trevisan (Pyrenulaceae)
Distribution: *Bahraich - Katarniaghat* (Nayaka *et al.* 2011)
Habitat (substratum): Forest area (tree)
81. *Pyrenula subacutalis* Upreti (Pyrenulaceae)
Distribution: *Bahraich - Katarniaghat* (Nayaka *et al.* 2011)
Habitat (substratum): Forest area (tree)
82. *Pyrenula subglabriuscula* Vainio (Pyrenulaceae)
Distribution: *Bahraich - Katarniaghat* (Nayaka *et al.* 2011)
Habitat (substratum): Forest area (tree)
83. *Pyxine cocoes* (Sw.) Nyl. (Physciaceae)
Distribution: *Bahraich - Katarniaghat* (Nayaka *et al.* 2011); *Lucknow - Palka Village* (Saxena *et al.* 2007), *Rehmankhara, Behta, Banthara, Darogakhera, Amausi, Mamora Airforce Area, Chandiamau Village, Katabhidh Village, Sesandy Village, Kukrail Picnic Spot, Kakori, Amrettiya Salimpur Village, Bakshi Ka Talaba, Sairapur Village, Amarpali Water*



- Park, *Hardoi* Road, Lalnagar, *Hardoiya* Village, Madarpur Village, Fatehganj (Saxena 2004); *Rae Bareli* - near FGU-NTPC (Bajpai *et al.* 2010a,b), Singh & Sinha (2010)
Habitat (substratum): Forest area, Mango orchard, road side (tree)
84. *Pyxine meissnerina* Nyl. (Physciaceae)
Distribution: *Bahraich* - *Katarniaghat* (Awasthi 1980); *Lucknow* - Raihta Village (Saxena 2004), Singh & Sinha (2010)
Habitat (substratum): Forest area, Mango orchard (tree)
85. *Rinodina sophodes* (Ach.) Massal. (Physciaceae)
Distribution: *Kanpur* - Maharajpur, Sannisarai, Ramnagar, Tatiyaganj, Gangauli, Raghunathpur (Satya & Upreti 2009), Karsauli, Gadewa, Devpur, Sujampur (Satya *et al.* 2011); *Lucknow* - Tikhatganj, Behta, Bakshi Ka Talab, NBRI Garden, Chdiamau Village, Seiva Village, Amausi, Dharogakhera, Kanpur Road, Bani, Junavganj, Sesandy Village, Katabidh Village, Kukrail Picnic Spot, Amrai Village, Sikroari Village, Durgaganj, Kamlabad Badoli, Sherpur Village, Rahimabad, Chenunta Village, Kushalganj, Lalnagar Haroiya, Alinagar, Kurda Village; *Rae Bareli* - Near FGU-NTPC (Bajpai *et al.* 2010b); *Sitapur* - Behlidpur (Saxena 2004)
- Habitat (substratum):** Mango orchard (tree)
86. *Sphinctrina anglica* Nyl. (Sphinctrinaceae)
Distribution: *Lucknow* - Behta (Saxena 2004, Saxena *et al.* 2007), Singh & Sinha (2010)
Habitat (substratum): Mango orchard (tree)
87. *Sphinctrina tubaeformis* Massal. (Sphinctrinaceae)
Distribution: *Lucknow* - Chandiamau Village, Badaura Village (Saxena 2004)
Habitat (substratum): Mango orchard (tree)
88. *Strigula subelegans* Vainio (Strigulaceae)
Distribution: *Lucknow* - Bani (Saxena 2004)
Habitat (substratum): Mango orchard (tree)
89. *Thelotrema alborosellum* (Nyl.) Tuck (Thelotremataceae)
Distribution: *Bahraich* - *Katarniaghat* (Nayaka *et al.* 2011)
Habitat (substratum): Forest area (tree)
90. *Thelotrema pachysporum* Nyl. (Thelotre-mataceae)
Distribution: *Bahraich* - *Katarniaghat* (Nayaka *et al.* 2011)
Habitat (substratum): Forest area (tree)