

Recent literature on lichens—266

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- Abas, A., M. S. Nizam & A. W. Aquif. 2016. Elevated CO₂ effects on lichen frequencies and diversity distributions in free-air CO₂ enrichment (FACE) station. *Journal of Environmental Protection* 7: 1192–1197.
- Aspiotis, S., J. Schlüter, K. Harter-Uibopuu & B. Mihailova. 2021. Crack-enhanced weathering in inscribed marble: A possible application in epigraphy. *European Journal of Mineralogy* 33(2): 189–202.
- Bakka, S. V., N. Y. Kiseleva, A. A. Shestakova, P. M. Shukov, S. G. Surov & J. V. Zikov. 2021. An attempt to estimate the habitat capacity of reintroduction sites for the forest reindeer in the Nizhny Novgorod region. *IOP Conference Series: Earth and Environmental Science* 723(2): 022095.
- Barták, M., J. Hájek, A. Orehkova, J. Villagra, C. Marín, G. Palfner & A. Casanova-Katny. 2021. Inhibition of primary photosynthesis in desiccating Antarctic lichens differing in their photobionts, thallus morphology, and spectral properties. *Microorganisms* 9(4): 818.
- Bizarov, L. G. 2014. Stable nitrogen isotopes ($\delta^{15}\text{N}$) in podetias of lichenized fungi *Cladonia pocillum* from different altitudes of habitats. *Open Access Library Journal* 1: 1–19.
- Boch, S., A. Martins, M. Sim-Sim & A. Bergamini. 2021. Effects of elevation and disturbances on the associations between the diversities of bryophyte and macrolichen functional-taxonomic groups on Madeira Island. *The Bryologist* 124(2): 178–190.
- Boggess, L. M., G. R. Harrison & G. Bishop. 2021. Impacts of rock climbing on cliff vegetation: A methods review and best-practices. *Applied Vegetation Science* 24(2): e12583.
- Bokhorst, S., J. Asplund & P. Convey. 2021. Intra-specific variation in lichen secondary compounds across environmental gradients on Signy Island, maritime Antarctic. *Polar Biology*: 10.1007/s00300-021-02839-y.
- Brodo, I. M. & J. P. Bennett. 2020[2021]. Clifford M. Wetmore, 1934–2020. *Evansia* 37(3): 103.
- Brodo, I. M. & J. P. Bennett. 2021. Remembering Clifford Major Wetmore (1934 – 2020). *The Bryologist* 124(2): 172–177.
- Brodo, I. M. 2021. *Calogaya schistidii* (Ascomycota, Teloschistaceae), a lichen new to North America from the northern Rocky Mountains. *Evansia* 38(1): 28–31.
- Chen, X., M. Wang, F. Wu, B. Sun, T. Yang & H. Song. 2021. Soil bacteria and fungi respond differently to organisms covering on Leshan giant buddha body. *Sustainability (Switzerland)* 13(7): 3897.
- Chi, H. B. L., B. Van Muoi, N. T. H. Thu & N. K. P. Phung. 2021. A new phenolic compound from the lichen *Parmotrema praesorediosum* (Nyl.) Hale. *Vietnam Journal of Chemistry* 59(1): 47–51.
- Corning, P. A. 2021. “How” vs. “Why” questions in symbiogenesis, and the causal role of synergy. *Biosystems* 205: 104417.
- Cunha, I. P. R., M. P. Marcelli & E. C. Pereira. 2015. *Canoparmelia* species s.l. (Parmeliaceae, lichenized ascomycetes) of the tocaninan region, Maranhão and Tocantins States, Brazil [Espécies de *Canoparmelia* s.l. (Parmeliaceae, ascomycetes liquenizados) da região tocanina, MA e TO, Brasil]. *Hoehnea* 42(2): 265–272. [In Portuguese with English abstract.]
- Czernyadjeva, I. V., E. A. Davydov, A. A. Efimova, R. M. Gogorev, D. E. Himelbrant, V. M. Kotkova, E. Yu. Kuzmina, A. V. Leostrin, E. L. Moroz, V. Yu. Neshataeva, A. A. Notov, Yu. K. Novozhilov, A. G. Paukov, N. N. Popova, A. D. Potemkin, I. S. Stepanchikova, Yu. V. Storozhenko, L. S. Yakovchenko, M. I. Yurchak, L. F. Volosnova, M. P. Zhurbenko & M. V. Zyatnina. 2021. New cryptogamic records. 7. *Novosti Sistematiki Nizshikh Rastenii* 55(1): 249–277. [Notes on: Notes on *Arthonia didyma*, *Athelia arachnoidea*, *Biatora chrysantha*, *Calicium lenticulare*, *Carbonicola myrmecina*, *Cercidospora parva*, *Chaenotheca gracilentia*, *Clypeococcum hypocenomyces*, *Collema subflaccidum*, *Fuscopannaria cheiroloba*, *Gyalecta foveolaris*, *Lepra multipuncta*, *Lepraria finkii*, *Lichenopeltella ramalinae*, *Micarea laeta*, *Parmeliella triptophylla*, *Phaeocalicium praecedens*, *Phaeopyxis punctum*, *Polysporina urceolata*, *Pyrenidium actinellum*, *Taeniolella delicata*.]
- Davydov, E. A., L. S. Yakovchenko, J. Hollinger, F. Bungartz, C. Parrinello & C. Printzen. 2021. The new genus *Pulvinora* (Lecanoraceae) for species of the ‘*Lecanora pringlei*’ group, including the new species *Pulvinora stereothallina*. *The Bryologist* 124(2): 242–256. [New: *Lecanora brandegeei* (Tuck.) Davydov, Yakovczenko & Printzen nom. inval. (\equiv *Lecidea brandegeei* Tuck., lectotypified), *Pulvinora* Davydov, Yakovczenko & Printzen (type: *P. stereothallina*), *P. stereothallina* Davydov & Yakovczenko (from Kazakhstan & Russia), *P. pringlei* (Tuck.) Davydov, Yakovczenko, Hollinger, Bungartz & Printzen (\equiv *Lecidea pringlei* Tuck., lectotypified).]
- Davydov, E. A., L. S. Yakovchenko, L. Konoreva, S. Chesnokov, A. Ezhkin, I. Galanina & A. Paukov. 2021. New records of lichens from the Russian Far East. II. Species from forest habitats. *Opuscula Philolichenum* 20: 47–70.

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- Davydov, E. A., L. Yakovchenko & C. Printzen. 2021. Validation of the combination *Lecanora brandegeei* (\equiv *Lecideia brandegeei*). *Opuscula Philolichenum* 20: 71–72. [New: *Lecanora brandegeei* (Tuck.) Davydov, Yakovczenko & Printzen (\equiv *Lecideia brandegeei* Tuck.).]
- Do, T.-H., T.-T. Nguyen, T.-B.-N. Dao, H.-C. Vo, B.-L.-C. Huynh, T.-A.-T. Nguyen, D.-T. Mai, T.-P.-G. Vo, J. Sichaem, N.-H. Nguyen & T.-H. Duong. 2021. A new diphenyl ether from *Parmotrema indicum* Hale growing in Vietnam. *Natural Product Research*: 10.1080/14786419.2021.1907748.
- Eldridge, D. J., M. Mullen-Cooper & J. Ding. 2021. Biocrust functional traits reinforce runoff patchiness in drylands. *Geoderma* 400: 115152.
- Ellis, C. J., J. Asplund, R. Renato Benesperi, C. Branquinho, L. Di Nuzzo, P. Hurtado, I. Martínez, P. Matos, J. Nascimbene, P. Pinho, M. Prieto, B. Rocha, C. Rodríguez-Arribas, H. Thüs & P. Giordani. 2021. Functional traits in lichen ecology: A review of challenge and opportunity. *Microorganisms* 9(4): 766.
- Farkas, E. 2021. Notes and schedae to Lichenes Delicati Exsiccati Editae in Memoriam Antonín Vězda (1920–2008), Fasc. 6. *Acta Botanica Hungarica* 63(1-2): 51–66.
- Fortuna, L., G. Adami, F. Princivale & M. Tretiach. 2021. New insight on element bioaccumulation performance of two lichen biomonitors: When morpho-chemical details mark the difference. *Science of The Total Environment* 782: 146360.
- Fraser, R. H., D. Pouliot & J. van der Sluijs. 2021. UAV and high resolution satellite mapping of forage lichen (*Cladonia* spp.) in a rocky Canadian Shield landscape. *Canadian Journal of Remote Sensing Journal*: 10.1080/07038992.2021.1908118.
- Frye, H. A., Z. Muscavitch & B. Goffinet. 2021. Discovery of epiphytic lichens in Connecticut suggests novel introduction and reintroduction via horticultural practices. *The Bryologist* 124(2): 191–197.
- Galanina, I. A., L. S. Yakovchenko, E. V. Zheludeva & Y. Ohmura. 2021. The genus *Rinodina* (Physciaceae, lichenized Ascomycota) in the Magadan Region (Far East of Russia). *Novosti Sistematiki Nizshikh Rastenii* 55(1): 97–119.
- Gasulla, F., E. M. Del Campo, L. M. Casano & A. Guéra. 2021. Advances in understanding of desiccation tolerance of lichens and lichen-forming algae. *Plants* 10(4): 807.
- Gonzalez, E., F. Hébert, J.-F. Boucher, P. Sirois & D. Lord. 2013. Lichen-spruce woodland early indicators of ecological resilience following silvicultural disturbances in Québec's closed-crown forest zone. *American Journal of Plant Sciences* 4(3A): 749–765.
- Gorji, M., M. Bakhosh, M. Sohrabi & A. A. Pourbabaei. 2021. Assessing the function of biological soil crusts on soil fertility (case study: Kiamaky Wildlife Refuge, East Azerbaijan, Iran). *Eurasian Soil Science* 54(3): 409–416.
- Haldeman, M. 2020[2021]. New and interesting records of lichens, lichenicolous fungi and other Ascomycota from northwestern USA III. *Evansia* 37(3): 71–80.
- Haldeman, M. & B. McCune. 2021. *Tephromela eviolacea*, a new species of *Tephromela* (Tephromelataceae) lacking a violet hymenium from northwestern North America. *The Bryologist* 124(2): 230–241. [New: *T. eviolacea* Haldeman & McCune (from U.S.A.).]
- Hamida, R. S., M. A. Ali, N. E. Abdelmeguid, M. I. Al-Zaban, L. Baz & M. M. Bin-Meferij. 2021. Lichens—a potential source for nanoparticles fabrication: A review on nanoparticles biosynthesis and their prospective applications. *Journal of Fungi* 7(4): 291.
- Himelbrant, D. E., I. S. Stepanchikova, T. Ahti & V. Neshataeva. 2021. New exploration in Koryakia – the lichens of the Cape Goven, Bering Sea coast (Northern Kamchatka, Russia). *Novosti Sistematiki Nizshikh Rastenii* 55(1): 121–162.
- Huynh, B. L. C., N. K. T. Pham & T. P. Nguyen. 2022[2021]. Paresordin A, a new diphenyl cyclic peroxide from the lichen *Parmotrema praesorediosum*. *Journal of Asian Natural Products Research* 24(2): 190–195.
- Ismailov, A. B. 2021. New species of lichens for Dagestan. *Botanicheskii Zhurnal* 106(1): 77–80.
- Joshi, Y. 2021. Two new species of lichenicolous fungus *Sclerococcum* (Dactylosporaceae, Sclerococcales) from India. *Acta Botanica Hungarica* 63(1–2): 10.1556/034.63.2021.1–2.5. [New (from India): *S. dendriscostictae* Y. Joshi (on *Sticta nylanderiana*/ *Dendriscosticta platyphylla*, *S. wrightii*/ *D. wrightii*), *S. physciae* Y. Joshi (on *Physcia* sp.).]
- Kalra, R., X. A. Conlan & M. Goel. 2021. Lichen allelopathy: A new hope for limiting chemical herbicide and pesticide use. *Biocontrol Science and Technology* 31(8): 773–796.
- Kiviat, E., P. G. Davison, R. C. Harris & S. Dickman. 2021. Novel hepatic and lichen assemblage on *Phragmites* stubble in a Florida freshwater swamp. *Evansia* 38(1): 9–14.
- Knudsen, K., J. Kocourková, E. Hodková, J. N. Adams & Y. Wang. 2021. Three species of *Trimmatothelopsis* (Acarosporaceae) from Europe and North America. *The Bryologist* 124(2): 271–280. [New: *T. oreophila* (K. Knudsen) K. Knudsen, Kocourk., Hodková & Wang (\equiv *Acarospora oreophila* K. Knudsen), *T. benedarensis* (M. Knowles) K. Knudsen & Kocourk. (\equiv *A. benedarensis* M. Knowles), *T. sphaerosperma* (K. Knudsen & R. C. Harris) K. Knudsen & Kocourk. (\equiv *A. sphaerosperma* K. Knudsen & R. C. Harris).]
- Kondratyuk, S. Y., L. P. Popova, O. Y. Khodosovtsev, L. Lököš, N. M. Fedorenko & N. V. Kapets. 2021. The fourth checklist of Ukrainian lichen-forming and lichenicolous fungi with analysis of current additions. *Acta Botanica Hungarica* 63(1–2): 97–163.
- Konoreva, L. A., S. V. Chesnokov & G. M. Tagirdzhanova. 2021. Remarkable records of *Micarea* (Pilocarpaceae) from the Russian Far East. II. *Novosti Sistematiki Nizshikh Rastenii* 55(1): 163–177.
- Kosecka, M., B. Guzow-Krzemińska, I. Černajová, P. Škaloud, A. Jabłońska & M. Kukwa. 2021. New lineages of photobionts in Bolivian lichens expand our knowledge on habitat preferences and distribution of *Asterochloris* algae. *Scientific Reports* 11(1): 8701.
- Kumar, V., R. Ngangom, S. Nayaka & K. K. Ingle. 2021. New species and new records in the lichen genus *Rinodina* (Physciaceae) from India. *Taiwania* 66(2): 193–202. [New: *R. indica* Vishal Kumar, R. Ngangom & Nayaka (from India).]
- Kuznetsova, E. S., I. S. Stepanchikova, I. F. Skirina, S. V. Chesnokov & D. E. Himelbrant. 2021. A revision of the lichen genus *Platismatia* (Parmeliaceae) in Russia, with a key to the species. *Novosti Sistematiki Nizshikh Rastenii* 55(1): 179–194.
- Langmann, U., P. Madl, R. Türk, W. Hofmann & G. Brunauer. 2014. Sensitivity of lichens to diesel exhaust under laboratory conditions. *Journal of Environmental Protection* 5: 1331–1341.
- Larsen, H. M. E. & H. N. Rasmussen. 2021. Bark extract influence on spore germination in corticolous lichen *Xanthoria parietina* in vitro. *Mycological Progress* 20(3): 313–323.
- Li, B., Z. Wu, Y. Tao, X. Zhou & B. Zhang. 2021. Effects of biological soil crust type on herbaceous diversity in the Gurbantunggut Desert. *Arid Zone Research* 38(2): 438–449.

- Liu, R., W. Kim, J. A. Paguirigan, M.-H. Jeong & J.-S. Hur. 2021. Establishment of agrobacterium tumefaciens-mediated transformation of *Cladonia macilenta*, a model lichen-forming fungus. *Journal of Fungi* 7(4): 252.
- Lubek, A., M. Kukwa, B. Jaroszewicz & P. Czortek. 2021. Composition and specialization of the lichen functional traits in a primeval forest—does ecosystem organization level matter? *Forests* 12(4): 485.
- Magnússon, R. Í., J. Limpens, D. Kleijn, K. van Huissteden, T. C. Maximov, S. Lobry & M. M. P. D. Heijmans. 2021. Shrub decline and expansion of wetland vegetation revealed by very high resolution land cover change detection in the Siberian lowland tundra. *Science of The Total Environment* 782: 146877.
- Mahr, W. P. & P. M. Mathis. 1981. Foliose and fruticose lichens of the cedar clades in Stones River National Battlefield Park (Rutherford County, Tennessee). *Journal of the Tennessee Academy of Science* 56(2): 66–67.
- Mark, C. J., C. J. Painting, J. C. O'Hanlon & G. I. Holwell. 2021. Lichen moths do not benefit from 'element imitation' masquerade in the absence of a matching background. *Evolutionary Ecology* 35: 401–412.
- McCarthy, D. P. 2021. A simple test of lichenometric dating using bidecadal growth of *Rhizocarpon geographicum* agg. and structure-from-motion photogrammetry. *Geomorphology* 385: 107736.
- Mercado-Díaz, J. A. & A. Merced. 2021. Effects of hurricanes on the bryological and lichenological flora of Puerto Rican forests. *Acta Científica* 32(1–3): 55–72.
- Mitrović, T., S. Stamenković, V. Cvetković, T. Đekić, R. Baošić, J. Mutić, T. Anđelković & A. Bojić. 2012. Bioindication of heavy metal pollution in the area of Southeastern Serbia by using epiphytic lichen *Flavoparmelia caperata* (L.) Hale. *Biologica Nyssana* 3(2): 53–60.
- Mitrović, T., S. Stamenković, V. Cvetković, M. Nikolić, S. Tošić & D. Stojičić. 2011. Lichens as source of versatile bioactive compounds. *Biologica Nyssana* 2(1): 1–6.
- Moniri, H. M. 2014. Further investigations on *Rhizocarpon* of north-eastern Iran: *R. geographicum*. *Journal of Mycology* 2014: 528041.
- Nazem-Bokaei, H., E. F. Y. Hom, A. C. Warden, S. Mathews & C. Gueidan. 2021. Towards a systems biology approach to understanding the lichen symbiosis: Opportunities and challenges of implementing network modelling. *Frontiers in Microbiology* 12: 667864.
- Nepal, B. K. 2010. [Thesis] Characterization of the vegetational communities associated with ancient *Juniperus virginiana* L. stands in the Obed Wild and Scenic River Gorge. Department of Biology, Appalachian State University, Boone. i–xii, 1–72 pages.
- Nguyen, T. T., T. B. Q. Chau, H. M. Van, T. P. Quoc, Q. D. Phuoc, T. F. Nguyen, P. D. Nguyen, T. N. T. Thu, T. D. Le, T. D. T. Xuan, K. Kaeko & K. Kenji. 2021. A new hopane derivative from the lichen *Dirinaria appplanata*. *Natural Product Research* 35(7): 1167–1171.
- Ojha, M., Y.-S. Kil, U. J. Youn, Y. J. Ok, H. Choi & J.-W. Nam. 2021. Compositional variation of atranorin-related components of lichen *Myelochroa leucotyloza* dependent on extraction solvent and their quantitative analysis by qHNMR. *Phytochemical Analysis* 32(6): 1067–1073.
- Oset, M. 2021. On the identity of some taxa of *Pertusaria* (lichens) described by C.F.E. Erichsen. *Phytotaxa* 497(2): 165–171. [Lectotypified: *P. inopinata* Erichsen (= *Leptra excludens*), *P. jurana* Erichsen (= *L. albescens*). *Pertusaria jurana* var. *confluens* Erichsen synonymized with *Ochrholechia turneri*.]
- Panov, A. V., A. S. Prokushkin, G. K. Zrazhevskaya, A. B. Urban, V. I. Zyryanov, N. V. Sidenko & M. Heimann. 2021. Winter CO₂ fluxes in ecosystems of Central Siberia: Comparative estimates using three different approaches. *Russian Journal of Ecology* 52(2): 126–135.
- Park, S.-H., C. W. Lee, D.-W. Bae, H. Do, C.-S. Jeong, J. Hwang, S.-S. Cha & J. H. Lee. 2021. Structural basis of the cooperative activation of type II citrate synthase (HyCS) from *Hymenobacter* sp. PAMC 26554. *International Journal of Biological Macromolecules* 183: 213–221. [The bacterium was extracted from a lichen.]
- Payandi-Rolland, D., L. S. Shirokova, F. Labonne, P. Bénéthet & O. S. Pokrovsky. 2021. Impact of freeze-thaw cycles on organic carbon and metals in waters of permafrost peatlands. *Chemosphere* 279: 130510.
- Pérez, F. L. 2021. Cryptogams build up a living microcosm: Geoeological effects of biocrusts on volcanic tephra (Haleakalā, Maui, Hawai'i). *Catena* 203: 105320.
- Petersen, E. B. 2021. *Stenocybe procrastinata* (Mycocaliciaceae), a new calicioid fungus on *Cercocarpus* in western North America. *Opuscula Philolichenum* 20: 37–43. [New: *S. procrastinata* E.B.Peterson (from U.S.A.).]
- Phillips, T., K. Storms, N. Slack & S. LaGreca. 2021. The mosses, liverworts and lichens of the Dyken Pond Environmental Education Center, Grafton, NY. *Evansia* 38(1): 1–8.
- Pino-Bodas, R., M. P. Martín, A. R. Burgaz & H. T. Lumbsch. 2013. Species delimitation in *Cladonia* (Ascomycota): A challenge to the DNA barcoding philosophy. *Molecular Ecology Resources* 13(6): 1058–1068.
- Popovici, V., L. Bucur, A. Popescu, V. Schröder, T. Costache, D. Rambu, I. E. Cuculea, C. E. Gird, A. Caraiane, D. Gherghel, G. Vochita & C. Badea. 2021. Antioxidant and cytotoxic activities of *Usnea barbata* (L.) F.H. Wigg. dry extracts in different solvents. *Plants* 10(5): 909.
- Putzke, J., A. L. Schünemann & A. B. Pereira. 2021. Growth rate and behavior over 20 years in the crustose lichen *Haematomma erythromma* at Elephant Island, Antarctica. *Oecologia Australis* 25(1): 103–116.
- Quarterman, E. 1950. Major plant communities of Tennessee cedar glades. *Ecology* 31: 234–254. [Discusses: *Cladonia furcata*, *C. turgida*, *Dermatocarpon hepaticum*, *Leptogium tremelloides* and *L. dactylinum*.]
- Rashki, S., H. Abbas Alshamsi, O. Amiri, H. Safardoust-Hojaghan, M. Salavati-Niasari, A. Nazari-Alam & A. Khaledi. 2021. Eco-friendly green synthesis of ZnO/GQD nanocomposites using *Protoparmeliopsis muralis* extract for their antibacterial and antibiofilm activity. *Journal of Molecular Liquids* 335: 116195.
- Rattan, R., S. Shukla, B. Sharma & M. Bhat. 2021. A mini-review on lichen-based nanoparticles and their applications as antimicrobial agents. *Frontiers in Microbiology* 12: 633090.
- Root, H. T., S. Jovan, M. Fenn, M. Amacher, J. Hall & J. D. Shaw. 2021. Lichen bioindicators of nitrogen and sulfur deposition in dry forests of Utah and New Mexico, USA. *Ecological Indicators* 127: 107727.
- Sahfée, M. & M. Sohrabi. 2021. Antibacterial activity of *Candelariella rhodax* and *Protoparmeliopsis muralis*. *Iranian Journal of Biology* 34(1): 1–17.
- Saipunkaew, W., P. Mungkornasawakul, B. Srithai & C. Kheawsalab. 2021. Anthropogenic effects on the distribution of four

- epiphytic lichens in Chiang Mai-Lamphun Basin, Thailand. *Chiang Mai Journal of Science* 48(2): 382–394.
- Samdudin, M. W., H. Azahar, A. Abas & Z. Zakaria. 2013. Determination of heavy metals and polycyclic aromatic hydrocarbons (PAH) contents using the lichen *Dirinaria picta* in Universiti Kebangsaan Malaysia. *Journal of Environmental Protection* 4: 460–465.
- Seaward, M. R. D. & A. Aptroot. 2000. The lichen flora of the Chagos Archipelago, including a comparison with other island and coastal tropical floras. *Tropical Bryology* 18: 185–198.
- Shukla, A. N. & K. P. Singh. 2012. Glimpses of the lichen flora of Achanakmar-Amarkantak Biosphere Reserve in Central India. *American Journal of Plant Sciences* 3: 697–708.
- Sokolskaya, O. B., T. A. Andrushko, V. M. Tokareva & M. A. Yarmashevich. 2021. Diagnostics of the genus *Acer* L. diseases using the pathographic method on the territory of Sokolovogorsk Park in Saratov. IOP Conference Series: Earth and Environmental Science 723(2): 022069. [Fungal treatments also remove lichens.]
- Soto-Medina, E. A., A. Castaño-Naranjo, J. Granobles & A. Aptroot. 2021. A new species and new records of lichens for South America and Colombia from the tropical dry forest in the middle basin of the Cauca River [Una nueva especie y nuevos registros de líquenes en Colombia y Suramérica en el bosque seco tropical de la cuenca media del río Cauca]. *Revista de la Academia Colombiana de Ciencias Exactas, Físicas y Naturales*: 10.18257/raccefy.1322. [New: *Synarthonia robertiana* Soto-Medina & Aptroot (from Colombia).]
- Studzińska-Sroka, E., A. Majchrzak-Celińska, P. Zalewski, D. Szwajgier, B. Baranowska-Wójcik, M. Żarowski, T. Plech & J. Cielecka-Piontek. 2021. Permeability of *Hypogymnia physodes* extract component—physodic acid through the blood-brain barrier as an important argument for its anticancer and neuroprotective activity within the central nervous system. *Cancers* 13(7): 1717.
- Sulman, B. N., V. G. Salmon, C. M. Iversen, A. L. Breen, F. Yuan & P. E. Thornton. 2021. Integrating arctic plant functional types in a land surface model using above- and belowground field observations. *Journal of Advances in Modeling Earth Systems* 13(4): e2020MS002396.
- Suno, H., M. Machida, T. Dohi & Y. Ohmura. 2021. Quantum chemical calculation studies toward microscopic understanding of retention mechanism of Cs radioisotopes and other alkali metals in lichens. *Scientific Reports* 11(1): 8228.
- Swamy, C. T. & D. Gayathri. 2021. High throughput sequencing study of foliose lichen-associated bacterial communities from India. *Molecular Biology Reports* 48(3): 2389–2397.
- Swarnalatha, G. 2021. A new species of *Diorygma* (Graphidaceae) from India. *Archive for Lichenology* 26: 1–4. [New: *D. isidiatum* Swarnal. (from India).]
- Tatipamula, V. B., H. Polimati, K. V. Gopaiah, A. K. Babu, S. Vantaku, P. R. Rao & K. N. Killari. 2020. Bioactive metabolites from manglicolous lichen *Ramalina leiodea* (Nyl.) Nyl. *Indian Journal of Pharmaceutical Sciences* 82(2): 379–384.
- Thor, G. 1990. The lichen genus *Chiodecton* and five allied genera. *Opera Botanica* 103: 1–92.
- Tiwari, P., H. Rai, D. K. Upreti, S. Trivedi & P. Shukla. 2011. Assessment of antifungal activity of some Himalayan foliose lichens against plant pathogenic fungi. *American Journal of Plant Sciences* 2: 841–846.
- Tsurykau, A. G. & E. E. Muchnik. 2021. Taxonomic analysis of lichen biota of Belarus. *Botanicheskii Zhurnal* 106(1): 3–21.
- Tuan, N. N., P. C. Kuo, T. T. Hieu, L. N. T. Vi, Q. T. Hung, L. T. Dunge, N. D. Trinh, N. Q. Trung, N. C. Khoa, H. V. Hai & T. D. Thang. 2021. A new triterpenoid and other compounds from lichens *Cryptothecia faveomaculata* Makhija & Patw. *Natural Product Research* 35(8): 1349–1356.
- Urbanavichene, I. N. & G. P. Urbanavichus. 2021. Additions to the lichen flora of the Kerzhensky Nature Reserve and Nizhny Novgorod Region. *Novosti Sistematiki Nizshikh Rastenii* 55(1): 195–213.
- Uzunov, B. A. 2015. Mushrooms and lichens in Bulgarian ethnomycolgy. *Journal of Mycology* 2015: 361053.
- Wang, Y., H. Zhang, X. Liu, X. Liu & W. Song. 2021. Fungal communities in the biofilms colonizing the basalt sculptures of the Leizhou Stone Dogs and assessment of a conservation measure. *Heritage Science* 9(1): 36.
- Weerakoon, G., S. C. Wijeyaratne, P. Wolseley, E. Rivas Plata, R. Lücking & H. T. Lumbsch. 2012. Six new species of Graphidaceae from Sri Lanka. *The Bryologist* 115(1): 74–83. [New (all from Sri Lanka): *Fissurina srilankensis* Weerakoon, Wijeyaratne & Lücking, *Graphis allugallenensis* Weerakoon, Wijeyaratne & Lücking, *G. dotalugalensis* Weerakoon, Wijeyaratne & Rivas Plata, *G. knucklensis* Weerakoon, Wijeyaratne & Wolseley, *G. srilankensis* Weerakoon, Wijeyaratne & Lumbsch, *Thelotrema pseudosimilans* Weerakoon, Wijeyaratne & Lumbsch.]
- Werth, S., P. Meidl & C. Scheidegger. 2021. Deep divergence between island populations in lichenized fungi. *Scientific Reports* 11: 7428.
- Wieder, R. K., M. A. Vile, K. D. Scott, C. M. Albright, J. C. Quinn & D. H. Vitt. 2021. Bog plant/lichen tissue nitrogen and sulfur concentrations as indicators of emissions from oil sands development in Alberta, Canada. *Environmental Monitoring and Assessment* 193(4): 208. [Study included *Cladonia mitis*.]
- Yatsyna, A. P. 2021. Lichens and related fungi of the reserve “Svislochsko-Berezinsky” (Belarus). *Novosti Sistematiki Nizshikh Rastenii* 55(1): 215–227. [In Russian with English abstract.]
- Zhang, H.-B., Y.-J. Liu & L.-F. Han. 2021. Two new lichen species of the genus *Ramalina* (Ramalinaceae) from China. *The Bryologist* 124(2): 162–171. [New (from China): *R. ailaoshanensis* S.Y.Guo & L.F.Han, *R. qinlingensis* S.Y.Guo & L.F.Han.]
- Zhurbenko, M. P. 2021. Lichenicolous fungi from the Holarctic. Part IV: New reports and a key to species on *Dermatocarpon*. *Opuscula Philolichenum* 20: 44–53.