

**Figure S1.** Ukraine’s heritage destroyed during the Russian invasion of Ukraine (https://www.unesco.org/en/articles/damaged-cultural-sites-ukraine-verified-unesco), distributed by Oblasts (A) and heritage type (B).

**Table S1.** Cultural heritage and the materials used for its construction, including its characteristics, applications, examples, and fungi associated with its degradation (the most common fungi are presented in bold).

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| **Material** | **Characteristics** | **Applications** | **Examples** | **Fungi associated with degradation** |
| Stone | Marble | • Metamorphic rock • Composed of calcite (CaCO3)• Translucency• Ability to be polished• Various colors | • Building material (columns, facades)• Decorative elements (flooring, sculptures, and statues) | • Parthenon in Athens, Greece• David by Michelangelo | • *Acanthostigma* spp.• *Acremonium charticola*• *Aeminium* spp.• ***Alternaria* *alternata***• ***Aspergillus flavus***• ***Aspergillus fumigatus***• ***Aspergillus protuberus*****• *Aspergillus niger*****• *Aspergillus versicolor*****• *Aureobasidium pullulans***• *Botrytis* spp.• *Caloplaca* spp.• *Capnobotryella* spp.**• *Chaetomium* spp.****• *Cladosporium allicinum***• ***Cladosporium cladosporoides***• ***Cladosporium herbarum***• ***Cladosporium sinuosum*****• *Cladosporium sphaeospermum***• *Clitopilus* spp.• *Coniosporium uncinatum*• *Constantinomyces* sp.• *Cunninghamela echinulata*• *Curvularia lunata*• *Cyphellophora olivacea*• *Dematium* spp.• *Epicoccum* *purpurascens*• *Eurotium amsteldomi*• *Exophiala bonariae*• *Exophiala oligosperma*• *Fusarium oxysporum*• *Hortaea werneckii*• *Knufia karalitana*• *Knufia marmoricola*• *Knufia mediterrânea*• *Knufia petrícola*• *Lithophila* sp.• *Moniliales*• *Mucor hiemalis*• *Mucor racemosus*• *Mycocalicium* sp.• *Neocatenulostroma* sp.• *Neodevriesia bulbillosa*• *Neodevriesia capensis*• *Neodevriesia sardiniae*• *Neophaeotheca triangularis*• *Ochroconis* sp.• *Paecilomyces variotti*• *Parengyodontium album****• Penicillium brevicompactum******• Penicillium chrysogenum***• ***Penicillium citrinum****•* ***Penicillium crustosum*****• *Penicillium frequentans*****• *Penicillium verrucosum***• *Phaeosclera* spp.• *Phaeococcomyces* spp.**• *Phoma* spp.**• *Pseudotaeniolina* spp.• *Rhinocladiella* spp.• *Rhodotorula* spp.• *Salinomyces thailandicus*• *Schizophyllum commune*• S*accotheciaceae* spp.• *Sarcinomyces* sp.• *Saxophyla tyrrhenica*• *Sporobolomyces* spp.• *Stachybotrys chartarum*• *Stereum hirsutum*• *Tapesia fusca*• *Talaromyces purpurogenus*• *Tolypocladium* spp.• *Toxicocladosporium* spp.• ***Trichoderma* spp.**• *Trimmatostroma* spp.• *Vermiconidia calcícola*• *Verrucocladosporium dirinae*• *Xanthoria* spp. |
| Limestone | • Sedimentary rock• Composed of calcium carbonate (CaCO3), in the form of calcite or aragonite, magnesium carbonate (MgCO3; dolomite), and minor constituents (e.g., clay, iron carbonate, feldspar, pyrite, and quartz)• Relatively soft • Easy to carve• Various colors | • Building material• Decorative elements (architectural details and sculptures) | • Chartres Cathedral in Chartres, France• Great Sphinx in Giza, Egypt |
| Granite | • Igneous rock • Composed by feldspar, quartz, and mica, and minor constituents (e.g., hornblende, biotite, and pyroxene)• Hardness, durability, and elevated resistance to erosion and weathering• Various colors | • Building material • Decorative element (sculptures or flooring) | • Mount Rushmore National Memorial in South Dakota, USA• Avukana Buddha Statue in Sri Lanka |
| Wood | Oak | • Hardwood• Strength• Durability• Resistance to decay | • Building material (frameworks)• Decorative elements (flooring, furniture, cabinetry, and other elements) | • The Hall of Mirrors in the Palace of Versailles, France | *• Acremonium charticola**• Aleurodiscus fennicus**• Alternaria tenuissima**• Antrodia serialis**• Antrodia sinuosa**• Antrodia sordida**• Antrodia vailantii**• Antrodia xantha**• Antrodiella* spp.*• Armilaria ostoyae**• Aspergillus conicus**• Aspergillus niger**• Asterostroma cervicolor**• Athelia epiphylla**• Athelia neuhoffii**• Aureobasidium pullulans**• Auricularia mesenterica**• Bjerkandera adusta**• Botryobasidium candicans**• Cadophora* spp.*• Ceriporia excelsa**• Ceriporis purpúrea**• Chaetomium elatum**• Chaetomium globosum**• Ceraceomyces sublaevis**• Ceriporia reticulata**• Cladosporium cladosporioides**• Cladosporium phaenocomae**• Coniochaeta* spp.***• Coniophora arida*** ***• Coniophora puteana****• Coprinellus* aff. *radians**• Coprinopsis* sp.*• Crepidotus mollis* *• Cylindrobasidium evolvens* *• Dacryobolus sudans**• Engyodontium álbum**• Eupenicillium tropicum**• Fomitopsis pinícola**• Fusarium* spp.*• Gleocystidiellum cf luridum****• Gloeophyllum abietinum******• Gloeophyllum sepiarium******• Gloeophyllum trabeum****• Graphium* spp.*• Hyphoderma obtsusum**• Hyphoderma praetermissum**• Hyphoderma puberum**• Hyphodontia alutacea**• Hyphodontia aspera**• Hyphodontia crustosa**• Hypholoma fasciculare**• Hypochniciellum spp.**• Hypochnicium bombycinum**• Hypochnicium punctulatum**• Laeticorticium roseum**• Lecanicillium sp.**• Lentinus lepideus**• Leucigyrophana pinastri**• Leucigyrophana pseudomolusca**• Meruliopsis corium****• Meruliporia incrassate****• Mocladium* spp.*• Mortierella* spp.*• Mucor* spp.*• Oligoporus caesius**• Oligoporus placentus**• Oligoporus tephroleucus**• Paxillus panuoides**• Penicillium commune**• Penicillium chrysogenum**• Penicillium crustosum**• Penicillium digitatum**• Penicillium expansum**• Penicillium granulatum**• Penicillium virgatum**• Peniophora cinereae**• Peniophora incarnata**• Phaeolus schweinitzii**• Phanerochaete sordida**• Phanerochaete tuberculata**• Phanerochaete velutina**• Phebiopsis gigantea**• Phellinus chrisoloma**• Phlebiopsis gigantea**• Pholiota* spp.*• Phoma* spp.*• Pluteus semibulbosus****• Postia placenta******• Postia stiptica****• Pseudotaeniolina globosa**• Pycnoporellus fulgens**• Resinicium bicolor**• Schizopora paradoxa**• Scytinostroma cf. Odoratum**• Sebacina calcea****• Serpula himantioides******• Serpula lacrymans****• Shizophyllum commune**• Skeletocutis carneogrisea**• Stachybotrys chartarum**• Stereum sanguinolentum**• Thielavia hyalocarpa****• Trametes versicolor****• Trichaptum abietinum**• Trichoderma atroviride**• Trichoderma viride**• Trichopyton* sp.*• Tubulicrinis glebulosus**• Umbelopsis isabellina**• Vesiculomyces citrinus* |
| Cherry | • Hardwood | • Decorative elements (cabinetry, fine cravings, furniture, paneling, and moldings) | • Shaker Village of Pleasant Hill in Kentucky, USA |
| Maple | • Hardwood | • Decorative elements (cabinetry, flooring, and interior details) | • Maple Leaf Gardens in Toronto, Canada |
| Cedar | • Softwood• Resistance to decay• Resistance to insects• Resistance to rot | • Building material (roofing)• Decorative elements (doors, and other elements) | • Cedar Shingle Mill at Old Sturbridge Village, Massachusetts, USA) |
| Pine | • Softwood• Affordable choice for construction• Can be treated to become durable | • Building material (framing, sheathing, and interior woodwork) | • Old North Church in Boston, USA |
| Redwood | • Softwood• Durability• Resistance to insects• Resistance to decay | • Building material• Decorative elements (doors and siding) | • Ahwahnee Hotel in Yosemite National Park in California, USA |
| Teak | • Exotic hardwoods• Durability• Resistance to insects• Resistance to moisture | • Decorative elements (carvings, panels, and outdoor elements) | • Phra Thinang Dusit Maha Prasat Hall at the Royal Palace of Bangkok, Thailand |
| Mahogany | • Exotic hardwood | • Building material• Decorative elements (cabinetry, carvings, furniture, and other elements) | • Mahogany Bay Village in Belize |
| Metal | Bronze | • Alloy of copper and tin• Durability• Resistance to corrosion • Attractive patina | • Decorative elements (plaques, statues, and sculptures) | • Statue of Liberty in New York, USA• Little Mermaid in Copenhagen, Denmark | • *Acremonium kiliense*• *Alternaria alternata*• *Arthrinium phaeospermum*• ***Aspergillus amstelodami***• ***Aspergillus fumigatus***• ***Aspergillus niger***• ***Aspergillus terreus***• ***Aspergillus versicolor****• Aureobasidium microstrictum*• ***Aureobasidium pullulans***• *Chrysosporium merdarium*• *Cladosporium cladosporioides*• *Cladosporium herbarum*• *Cladosporium resinae**• Cladosporium tenuissimum*• *Coniochaeta ligniaria*• *Cryptococcus laurentii**• Cylindrocarpon destructans*• *Debaryomyces nepalensis*• *Exophiala dermatitidis*• *Exophiala jeanselmei**• Fusarium moniliforme*• *Fusarium oxysporum*• *Fusarium solani*• *Hormoconis resinae**• Mortierella hyalina*• *Oidiodendron echinulatum*• *Paecilomyces lilacinus*• *Paecilomyces parvus*• *Paecilomyces variotii*• *Pichia guilliermondii*• ***Penicillium brevicompactum****•* ***Penicillium cyclopium****•* ***Penicillium frequentans*****• *Penicillium polonicum***• *Rhizopus stolonifer**• Scytalidium lignicola*• *Talaromyces flavus*• *Trichoderma citrinoviride*• *Trichoderma harzianum**• Trichoderma longibrachiatum* |
| Iron | • Strength• Versatility | • Building material (structural component)• Decorative elements (gates, railings, and balconies) | • Eiffel Tower in Paris, France• French Quarter in New Orleans, USA |
| Steel | • Alloy of iron and carbon• Versatility• Robustness | • Building material (structural components, frameworks, and support systems) | • Gateway Arch in Missouri, USA |
| Cooper | • Maleable• Resistance to corrosion• Patina over time | • Building material (cladding and roofing)• Decorative elements | • Top of the Washington Monument in Washington, D.C., USA |
| Stainless steel | • Alloy of iron, chromium, and nickel• Resistancece to corrosion | • Building material (structural components, cladding)• Decorative elements (sculptures) | • Cloud Gate sculpture in Millennium Park in Chicago, USA |
| Aluminium | • Lightweight metal• Resistance to corrosion | • Building material (structural components, facades• Decorative elements (modern architectural designs) | • Christ the Redeemer statue in Rio de Janeiro, Brazil |
| Lead | • Heavy metal• Maleable• Density• Resistance to corrosion | • Building material (roofing)• Decorative elements (ornamental details in traditional architecture) | • Roof of the Lincoln Memorial in Washington, D.C., USA |
| Gold leaf | • Made from thin sheets of gold | • Decorative elements (gilding architectural details and sculptures) | • Golden Temple in Amritsar, India |
| Glass | Crown Glass | • Characteristic circular pattern• Relatively good optical quality | • Decorative elements (windows of ancient monuments) | • Crown Glass Windows in St. Mary's Church, Fairford, England | • *Alternaria* spp.• *Aspergillus sp.*• *Aspergillus arenarioides*• *A. pullulans*• *Cladosporium* spp.• *Coniosporum* spp.• *Capnobotryella* spp.• *Engyodontium* spp.• *Fusarium oxysporum*• *Geomyces* spp.• *Hortaea werneckii*• *Kirschsteiniothelia* spp.• *Leptosphaeria* spp.• *Parengyodontium album*• *Penicillium polonicum*• *Rhodotorula* spp.• *Stanjemonium* spp.• *Trichoderma longibrachiatum*• *Ustilago* spp.• *Verticillium* spp. |
| Stained glass | • Small pieces of colored glass assembled to form patterns, images, or scenes  | • Decorative elements (windows of ancient monuments) | • Notre-Dame Cathedral in Paris, France• Sagrada Família, in Barcelona, Spain |
| Glass tesserae | • Small colored glass pieces that create designs or patterns | • Decorative elements (flooring, wall coverings, and other elements) | • Hagia Sophia in Istanbul, Turkey• Temple of the Reclining Buddha in Bangkok, Thailand |
| Clay-based ceramics | Brick | • Made of clay, shale, or a combination of both• Different shapes, sizes, and colors • Durability• Versatility• Ease of manufacturing | • Building material (arches, walls, and structural elements) | • Great Wall of China• Red Fort in Delhi, India | • *Acremonium* spp.• *Alternaria* spp.**• *Aspergillus flavus*****• *Aspergillus niger****•* ***Aureobasidium pullulans***• *Chaetomium* spp.*• Cladophialophora* spp.**• *Cladosporium cladosporioides***• ***Cladosporium halotolerans*****• *Cladosporium sphaerospermum***• *Clonostachys rosea**• Coniosporium* spp.• *Devriesia imbrexigena*• *Didymella* spp.*• Exophiala* spp.• *Extremus* spp.• *Fusarium* spp.• *Humicola* spp.• *Knufia* spp.• *Lecanicillium aphanocladii*• *Mortierella alpina*• *Penicillium aurantiogriseum*• *Penidiella venezuelensis**• Phoma glomerata**• Rhizopus* sp.• *Stachybotrys chartarum*• Lichen-forming fungi(*Verrucaria* and *Acarospora*) |
| Terracota | • Made from clay • Red-dish-brown color | • Decorative element (architectural detail, sculptures, ornamental facades, and pottery) | • Terracotta Army in China's Qin Shi Huang Mausoleum• Roof of the Watts Towers in Los Angeles, USA |
|  | Concrete | • Mixture of cement, water, aggregates (e.g., sand, gravel, or crushed stone), and additives • Strength• Durability• Adaptability | • Building material (structural elements) | • Hoover Dam,Colorado River, Arizona and Nevada, USA• Sydney Opera House, Australia | *• Alternaria* spp.*• Aspergillus carbonaurius**• Aspergillus tamarii**• Aureobasidium pullulans*• *• Cladosporium sphaerospermum*• *Epicoccum* spp.• ***Fusarium* *oxysporum***• *Mucor* spp.• *Pestalotiopsis* spp.• *Penicillium* spp• *Trichoderma* spp. |