



The M.G. Kholodny Institute of Botany and the National Herbarium of Ukraine (KW), Kyiv: Damage due to the missile strikes on 10 October 2022

Having no recent observable success at the battlefield, ruscists (for the origin, meaning and use of the term, see Snyder, 2022a; see also Snyder, 2022b) unleashed in October 2022 the cruel, mean, indiscriminate, and militarily senseless series of missile and drone strikes aimed at the Ukrainian critical civilian infrastructure (in particular, power and heat generation facilities), the civilian areas and population, and cultural and historical heritage of Ukrainian cities, including Kyiv (see https://en.wikipedia.org/wiki/October_2022_missile_strikes_on_Ukraine). In particular, in the morning of 10 October 2022, the historical center of the City of Kyiv was hit by several missiles.

Two missile strikes at the Taras Shevchenko Park and the crossroad of Taras Shevchenko Boulevard and Volodymyrska Street hit the very center of Kyiv's cultural, scientific and historical heritage. One missile hit the children playground in the park, another came to the crossroad, where several people were killed and burned in their cars (including one of Ukraine's top children's cancer surgeons, Dr. Oksana Leontyeva; see Finch, 2022), while some other people were wounded or injured. Many photographs and videos from the area are available online; see also the comments by Vitali Klitschko, Mayor of Kyiv (Klitschko, 2022).

Shortly after the strikes Sergei Mosyakin, Director of the M.G. Kholodny Institute of Botany, shared the following brief information, plus several pictures, with some colleagues:

"The KW Herbarium today. Mostly windows, roofs, some non-critical structures. Anyway, some serious renovation will be needed before the winter. Right now, no irreversible loss of specimens, no harm to our staff. Our people who today worked here, did some basic repair and cleared the mess are fantastic. More info later."

Responding to a request of another colleague to provide more information about the area affected and its historical and cultural background and significance, Sergei Mosyakin provided the following [the links in square brackets are added here]:

"The damaged buildings and facilities are (info is preliminary):

- *Ministry of Education & Science of Ukraine (the building with mainly science departments and offices) – severely damaged, almost destroyed;*
- *Taras Shevchenko National University of Kyiv [see https://en.wikipedia.org/wiki/Taras_Shevchenko_National_University_of_Kyiv] – two famous buildings of the 19th century: the Main (Red) Building [see https://en.wikipedia.org/wiki/Red_University_Building] – moderately damaged; the Humanities & Philology (Yellow) Building (formerly the First Gymnasium of Kyiv, which was Alma Mater for many famous people) – severely damaged;*
- *some (probably considerable) damage to the nearby hospital (former Kyiv University Hospital and Clinic);*
- *two art museums: Khanenko Museum of Western & Oriental Art [see https://en.wikipedia.org/wiki/Khanenko_Museum] and the National Museum "Kyiv Art Gallery" (formerly the Museum of Russian Art) [see https://en.wikipedia.org/wiki/National_Art_Museum_of_Ukraine] – both severely damaged;*
- *Taras Shevchenko Museum [see https://en.wikipedia.org/wiki/National_Museum_Taras_Shevchenko] – some damage (windows, etc.);*
- *Presidium of the National Academy of Sciences of Ukraine [formerly the Institute for Noble Maidens: https://ua.igotoworld.com/en/poi_object/86076_prezidium-akademii-nauk.htm] – severely damaged;*
- *Main Conference Hall of the National Academy of Sciences of Ukraine – damaged;*
- *the House of Teachers [see https://en.wikipedia.org/wiki/Teacher%27s_House] (educational museum and conference center; formerly the building of Tsentralna Rada [The Central Council of Ukraine, the revolutionary parliament of the Ukrainian People's Republic (1917–1918) in the interbellum lasting until the Ukrainian-Soviet War – S.M.]) – damaged;*
- *M.G. Kholodny Institute of Botany of the National Academy of Sciences of Ukraine – considerably damaged;*



Fig. 1. A damaged panorama window in the Main Conference/Herbarium Hall

- *National Museum of Natural History of the National Academy of Sciences of Ukraine* – [considerable] damage to backyard windows;
- *I.I. Schmalhausen Institute of Zoology of the National Academy of Sciences of Ukraine* – a few windows;
- several monuments, several other buildings,
- etc.

As you see, those are mostly educational institutions, museums and other units of the national historical, scientific and art heritage, no military targets at all".

That information was placed at Taxacom (<https://markmail.org/message/rdhjnrmxuwm4nfnr> and <https://markmail.org/message/lxpnqf5pqtiumbzyv>) and also reposted and shared in some other social media and news resources.

Here we report some additional details of the damage caused to the buildings and facilities of the M.G. Kholodny Institute of Botany and the National Herbarium of Ukraine (KW).

The basic information about the National Herbarium of Ukraine is available from *Index Herbariorum* (Thiers, 2022: <http://sweetgum.nybg.org/science/ih/herbarium-details/?irn=125430>) and books and online resources about herbaria of Ukraine (Shiyan, 2011; Mosyakin et al., 2019, and references therein).

In an introductory address written for the book dedicated to the centenary of the KW Herbarium, we wrote (Mosyakin, Shiyan, 2021: 8–10):

"The scientific, historical and cultural riches and treasures of the KW Herbarium cannot be even briefly mentioned in a short introductory text. However, we should all understand that our Herbarium and many other important herbaria of Ukraine represent and



Fig. 2. A broken window in the Schmalhausen & Rogowicz Memorial Herbaria Room



Fig. 3. The damaged ceiling in the Lesser Herbarium Hall

preserve the national and global natural and cultural heritage consisting of countless specimens collected from the 18th century until our days by many devoted researchers, both near their homes and during their long and often dangerous travels to distant lands. <...>

But all those specimens are not just dead relics of the past scientific exploits – they are our living scientific



Fig. 4. Staff members of the Institute repairing the damaged windows

heritage, they still hold a plethora of knowledge to be revealed and explored, now and in the future. Those pieces of knowledge are like integral parts of an immense mosaic of Life on Earth, and each and every element of that knowledge is unique and indispensably important for achieving an integral vision and understanding of the patterns and processes in our environment that keep our planet alive and thriving in the unbelievable cold vastness of the Universe. That understanding is especially important in our times of global changes and environmental challenges. <...>

And indeed, our Herbarium is a real depository of already revealed and partly still hidden scientific knowledge about the fantastic and beautiful living world of our planet and of one of its most beautiful and interesting parts – our country, our beloved Ukraine".

We also emphasized that, with its more than two million specimens representing all major groups of plants and fungi, KW is the largest and most important collection of botanical and mycological specimens in Ukraine, the second largest herbarium in Eastern Europe. By the number of specimens, it is comparable

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Fig. 5. Broken backyard windows temporarily boarded with plywood and cardboard

to such Central European herbaria as BP, PR, and PRC (herbarium acronyms are given according to *Index Herbariorum*: Thiers, 2022).

Both buildings of the Institute of Botany located in the central part of Kyiv were partially damaged by the missile strikes of 10 October 2022. Fortunately, the staff members of the Institute have not been affected, except for the psychological shock of the guardians and several other people who were already in the buildings in the morning of that day.

The historical buildings of the Institute (mostly the one housing the main part of the Herbarium) were hit by the shock waves (both direct and reflected ones) and some fragments of missiles or damaged structures. The damage to facilities has been done mostly to windows (Figs. 1 and 2), attic windows and doors, and roofs; however, some parts of the plaster cover were damaged as well. In particular, the ceiling in the Lesser Herbarium Hall has been damaged (Fig. 3). About 20 windows were destroyed or severely damaged. In addition to that, some other windows with plastic and composite (aluminum +uPVC) frames cannot be properly opened/closed

because of shock wave deformations; they will need repair or replacement. During recent rainy days, we also discovered several roof leaks; the holes were caused by the missile fragments. Urgent basic repair has been done wherever possible (Figs. 4 and 5), some broken windows were boarded with plywood, cardboard or plastic, but additional repair and renovation are still needed.

The coming winter of 2022–2023 is expected to be one of the hardest winters in the new history of independent Ukraine. Being unable to win the conventional war and to subjugate our nation, the enemy is trying to use the cowardly and genocidal¹ strategy of targeting Ukraine's critical civilian infrastructure, first of all power and heat generating facilities, to leave the Ukrainian cities, towns and villages without heat, electricity, water, and other life-supporting services and resources. Under these circumstances, we see one of our most important goals in preserving the globally important scientific and cultural treasures of our collections, first of all the National Herbarium of Ukraine. We are sure that the staff of our Institute will do their best, despite all hardships and threats. Any support from colleagues and institutions worldwide will be also greatly appreciated; if you would like to help, please contact the administration of the Institute of Botany. We also hope that the governments and people of the Free World will continue their support of Ukraine in our country's struggle against aggression and tyranny.

Sergei MOSYAKIN, *on behalf of the administration and staff of the Institute of Botany*

Natalia SHIYAN, *on behalf of the staff of the National Herbarium of Ukraine (KW)*

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¹ By definition: see Article II of the *UN Convention on the Prevention and Punishment of the Crime of Genocide*: <https://www.un.org/en/genocideprevention/genocide.shtml>