Photo Story

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Wild bees in the Cherished Meadow, Moscow, Russia

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The Cherished Meadow (Russian: Zapovedniy lug) is a nature site in the Akademichesky district, Moscow. It is a 3-hectare (7.5-acre) strip surrounded by urban structures. More than a half of the territory is represented by wild grassland.

In line with the latest trends in Moscow's greening efforts, wild grasses are being replaced with artificial turf grass and mown lawns lacking entomophilous flowers. Some wild grasslands have also been eliminated by tree planting. So now wild grasslands in Moscow are under threat of destruction, and this is especially true of important sites along the Moskva river plain in Krylatskoe Hills, Kolomenskoe, Brateevo, and some others.

Sooner or later, the idea of conserving wild grasslands will grow, and not only in the minds of biologists. Coincidently, residents, architects, local officials, and biologists did get together in Akademichesky district in 2017. The aim of the Cherished Meadow project is to organize a public park with natural habitats in the urban environment. Architects tried to consider everyone who lives in the vicinity: people, birds, insects, and other animals. Here's a link to an inspiring story of the Cherished Meadow by Nadezhda Kiyatkina, the one who provided the spark for the project's initiation:

https://www.thenatureofcities.com/2019/11/29/inspiring-district-residents-specialists-and-government-officials-to-work-together-to-create-a-park-that-would-sustain-biodiversity-and-meet-peoples-desires/

At present the project cannot be implemented. However, thanks to the efforts of those involved, the grassland has been saved and authorized at municipal level. It is the only official wild grassland site in the 583-hectare Akademichesky district.

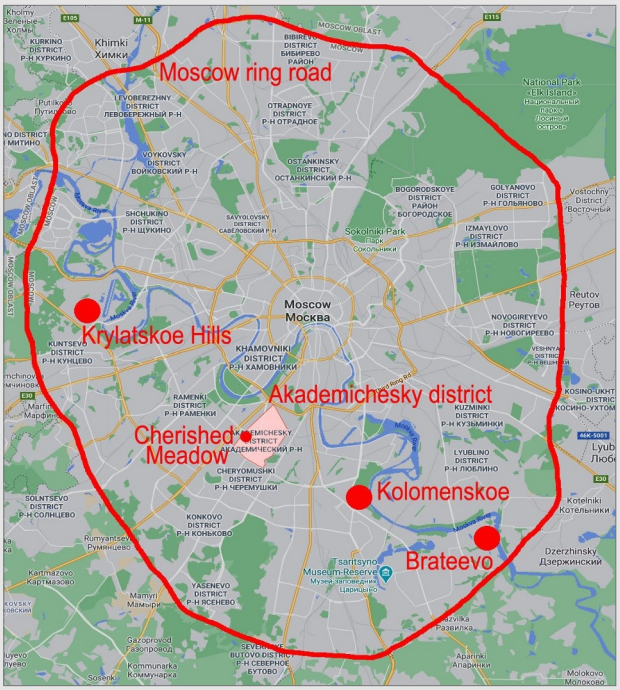
More than 300 animal species, including over 60 bee species, were found in the Meadow over the period 2018–2020:

https://www.inaturalist.org/projects/zapovednyy-lug-cherished-meadow

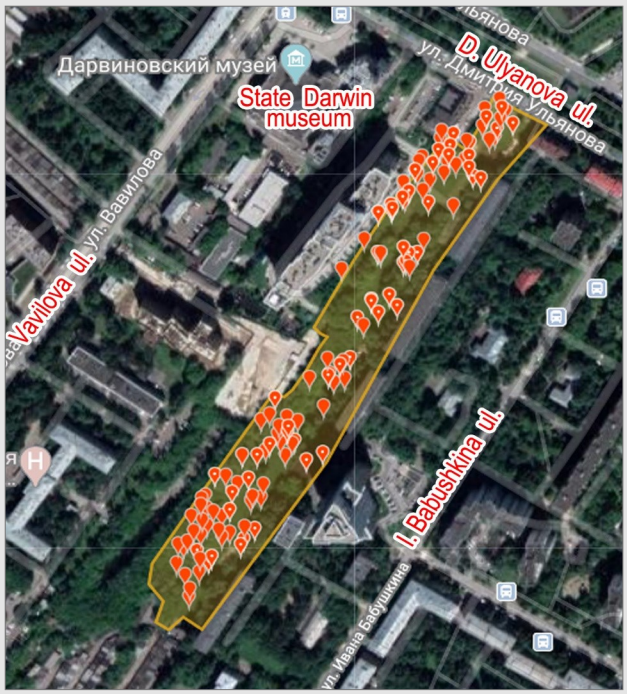
This amounts to about 28% of the recently registered wild bee fauna of Moscow within the boundaries of the Moscow Ring Road. In comparison, the well-studied local bee fauna of the most valuable wild grassland in Krylatskoe Hills is twice as rich:

https://www.researchgate.net/publication/338123951

In this Photo Story, you'll meet some remarkable bee species from the Meadow.



Location map of Cherished Meadow in Moscow.



Map of observations in the Cherished Meadow (iNaturalist project).

You can see wild bees during the growing season, usually from April to September. The flying season begins with first spring flowers, including *Pulmonaria obscura.*

***Anthophora plumipes* male with remarkable middle legs is waiting for the female near some *Pulmonaria*. In Moscow, the species has restricted distribution range and flies for only 2–4 weeks in spring.**

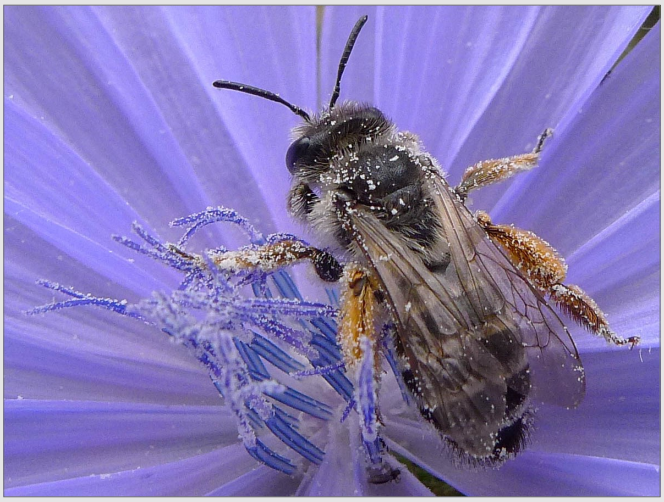
Female of *Andrena praecox* collecting pollen from *Salix alba*. This spring species feeds its larvae exclusively on pollen collected from *Salix* flowers.

***Melitta tricincta* is a very special bee species. It feeds on the pollen of the semi-parasitic plant *Odontites vulgaris*. The bees fly during the *Odontites'* flowering period at the end of summer.**

The bee species *Colletes daviesanus* is a specialist feeder on flowers of the family Asteraceae. This plant family accounts for about one tenth of the flora of Middle Russia. The success of the Asteraceae could be due to co-evolution with many bee species.

Most bees are not specialists. For example, *Bombus hypnorum* is a social species and flies during the whole warm season. It thus needs a constant supply of flowers providing pollen and nectar over the season.

Bees exhibit distinct sexual dimorphism. The images above show a resting male of *Lasioglossum pauxillum* (image on the left) and a working female (image in the middle). It is a ground-nesting social species. Its colonies comprise a female queen and a few female workers. The egg cells and food provisioned by the female workers are used by cuckoo bees, *Sphecodes crassus* (image on the right). Cuckoo bees do not build nests of their own and can only survive if host nests are numerous.



***Andrena flavipes* has two generations a year: early spring and mid-summer. The female in the photo is pollinating *Cichorium intybus*.**

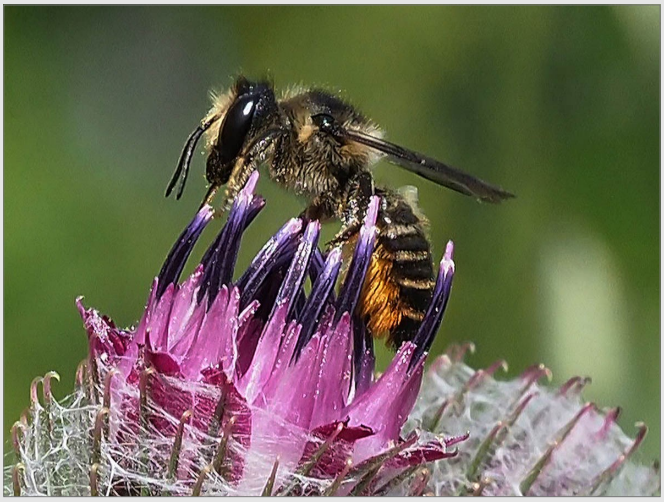
Female cuckoo bee *Nomada fucata* drinking nectar from *Melilotus albus*. The bee lays eggs in the nests of *Andrena flavipe*. It can also be seen twice during the warm season.

***Andrena flavipes* build their nests in the soil. This species can be observed in spring in the part of the meadow shown in the image above.**

Biotope of *Andrena flavipes* in the late summer. At this time of year it uses other flowers.

Female of *Anthidium florentinum* using its middle and hind legs to place pollen of *Cirsium vulgaris* onto its abdominal pollen brush. Females also need plant hair taken from *Arctium*, *Leonurus* and some other species to build their nest cells.

Male of *Anthidium florentinum* is sleeping after a hard day spent protecting its territory from other males. When male bees sleep, they only use mandibles to secure their body. Females do not allow them to sleep in the nest.



***Megachile centuncularis* is the most common leaf-cutter bee species in the Meadow. A female is visiting *Arctium tomentosum* in the image above.**

Leaf damage caused by a *Megachile* female's mandibles. It cuts rounded pieces of leaves to build its nest cells.

Female of *Anthophora furcata* visiting *Leonurus quinquelobatus*. This species forages for pollen in grasslands and builds nests in nearby rotten wood.

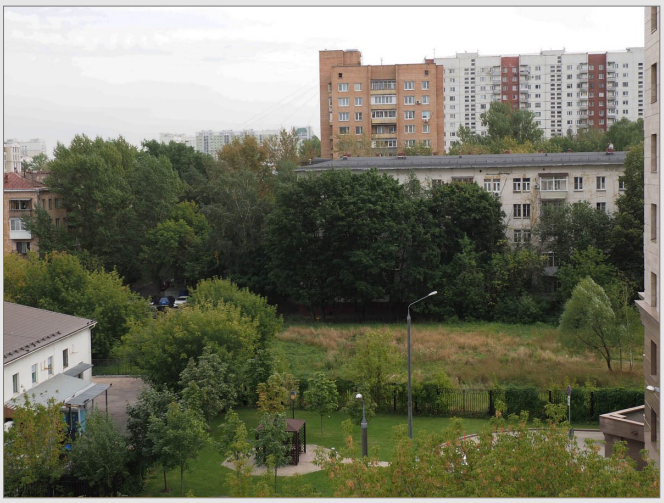
***Anthophora furcata* possibly uses rotten branches of *Salix alba*. Last summer, a female was seen near the trunks (right side of the image).**

This tiny summer bee is *Hoplitis leucomelaena*. It builds nests in holes. It uses wood, raspberry branches and herb stems. In the Meadow, it will use *Artemisia* stems.

Osmia bicornis builds nests in the hollows found in trees, stones, and bricks. Consequently it is able to locate suitable nesting sites in the city. However, it also needs spring flowers to survive.

Hylaeus leptocephalus resembles a small wasp. It has no special pubescence. Thus *Hylaeus* collects pollen in its mouth. It builds nests in different hollows, including those found in dead wood.

Heriades truncorum is a very common bee in the Meadow. It is known to be a tree hollow nester. However, in Moscow's streets, it seems to use other materials for nesting.



Part of the Cherished meadow seen from the roof of the State Darwin Museum. Dried grass stems (beyond the fence) are saved for bees and other overwintering insects.

Contrast between the flowering wild grassland of the Meadow and the mown lawn on D. Ulyanova ul. Bees could use the sparse herbage for ground nesting. However, the lawn does not provide food for bees to survive.