

Citibats: Citizen science-based bat acoustic monitoring program

Due to the COVID-19 pandemic, bats have become a target for persecution in some countries (MacFarlane & Rocha, 2020, *Biol. Conserv.*). Running public education programs to help bat conservation is increasingly important for researchers and conservationists in this uncertain era. Citizen science is an effective way to facilitate public education and change public attitudes towards the target species (Chase & Levine, 2018, *Conserv. Lett.*). Though more studies are needed, this may be effective for bats as well.

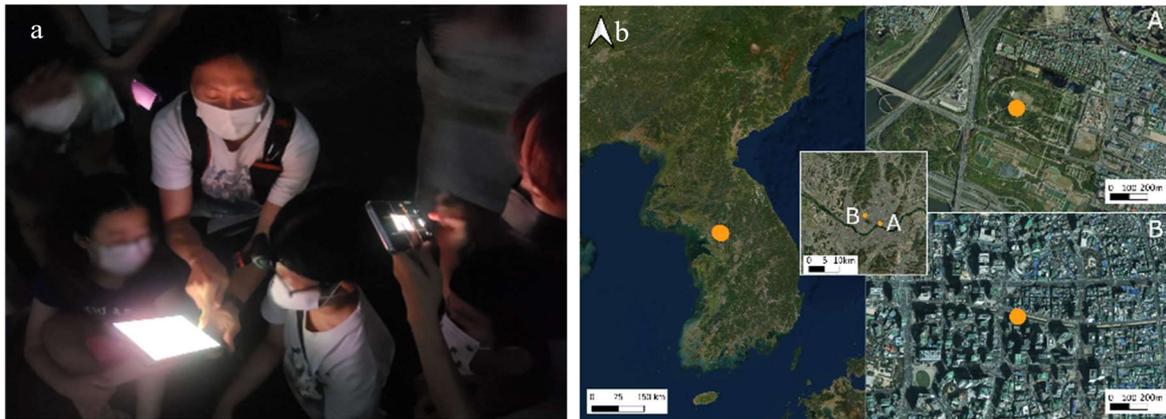


Figure 1. a) young citizen scientist in a training workshop in 2020; b) Two locations (A, B) in Seoul for planned workshops in 2021.

In 2020, I launched a citizen science-based bat monitoring program in Korea to help the public to understand bats better. Despite the initial concern about poor participation, 34 citizen scientists actively participated in training workshops and surveys (Figure 1a). Young people were particularly highly motivated and engaged well with the outdoor activities. Although the project in 2020 was designed to be a pilot study, we found four important locations for Japanese house bats (*Pipistrellus abramus*) in Seoul and detected between 14 and 16 species of bat across the country. As 19 bat species have been recorded in South Korea, this means we detected over 70% of the known bat fauna.

Goals in 2021

In 2021, I will continue the program with three main aims: 1) Monitoring Japanese house bats with citizens in Seoul, 2) Trying to confirm the presence of bird-like noctules (*Nyctalus aviator*) and East Asian free-tailed bats (*Tadarida insignis*) on Jeju island, 3) Seeking hot spots for bats in South Korea. As a key part of this project, I will run online and outdoor training workshops to train participants for acoustic monitoring and bat identification. The outdoor training workshops will be held at two locations in Seoul where we found the house bats in 2020 (Figure 1b). The first outdoor workshop will be in May in Seoul Forest (A) when bats start daily feeding. The second one will be in July at Cheonggye Stream (B) when newborn bats start their first feeding flight. The last workshop will be in Seoul Forest (A) in September when house bats use social calls for mate attraction. I expect that 15 to 20 teams (50 people) will join each workshop. Ad-hoc online training courses are also planned in case we could not run outdoor workshops.

Goals of the train workshops

1. Training citizen scientists: how to use Echo meter touch 2 to survey bats and recognize their calls
2. Online training: how to identify bats from sound files and upload data to a central database