Flower-Insect Timed Counts (FIT Count): Protocol Adaptation and Preliminary Results in Brazil

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Abstract

FIT Count (Flower-Insect Timed Counts) is a citizen science initiative that seeks to monitor flower visitation by diverse pollinator groups, including bumblebees, stingless bees, honeybees, flies, hummingbirds, among others. The protocol entails determining a 50 x 50 cm plot area around a target plant species, photographing the plant and conducting a standardized 10-minute survey on this area to estimate the frequency of flower visits by different pollinator groups. Conducting FIT Counts in different habitats and locations produces data on the temporal and spatial dynamics of these interactions (Carvell 2022, UK Pollinator Monitoring Scheme 2018).

FIT Count methodology was originally developed by the UK Pollinator Monitoring Scheme (PoMS) and has been used in the United Kingdom since 2017, with over 8,500 counts conducted to date. In 2021, the FIT Count application (app) was launched in the United Kingdom, and became available in Brazil, Chile, Argentina, and some other European countries in 2022.

After installation, users may select in which country the observations will be conducted and their preferred language, either English or the main native language of participating countries. The adaptation of the application for use by Brazilian citizen scientists involved not only the translation of the interface, but also relied on the expertise of a local team who helped select which plant species and pollinator groups would be appropriate and representative of biodiversity within the country (Fig. 1). The application is supported by a website that features a dedicated page for each country. Users can download the app on Google Play or App Store (Fig. 2).

To allow the participation of non-experts, who generally are not familiar with taxonomy or species identification, the flower visitors are identified in general categories such as bumblebees and carpenter bees (grouped together), flies, and others (see Fig. 1), representing the main functional groups of pollinators. If a flower visitor cannot be identified, it should be classified as "other insect" or marked as "I don't know". Including the possibility of uncertainty in flower visitor identification was a suggestion of the Brazilian team for quality assurance during data collection.

Currently, 834 flower visits have been counted by 15 participants, who performed 109 FIT Counts across Brazil as a pilot testing phase of the app. Two training workshops were held to disseminate the app, and an illustrated guide was published to help participants identify flower types and flower visitor groups (Koffler 2022). Nineteen plant species were monitored, but most flower-visits counted were on basil (*Ocimum basillicum*, n = 47) and false heather (*Cuphea hyssopifolia*, n = 33). The mean number of flower visitors per FIT Count was 8 (min = 0, max = 45). While most visits were performed by honeybees, participants also recorded visits by beetles, butterflies or moths, small insects, solitary bees, wasps and other insects. Next steps include assessing data quality and promoting strategic partnerships to further disseminate this citizen science initiative. For instance, quality control measures may include assessing whether participants perform the protocol steps according to instructions and whether plants and flower visitors are correctly identified and counted. Also, we are exploring the prospective implementation of the Darwin Core standard (Darwin Core Task Group 2009) along with the Plant-Pollinator Interactions vocabulary (Salim 2022) to standardize data description.

Keywords

participatory monitoring, biodiversity, pollination

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Conflicts of interest

The authors have declared that no competing interests exist.

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Figure 1.

Pollinator groups in the UK and Brazil.

Figure 2.

QR Codes to download the application.