

# TourCount 3.4

## 1. Introduction

This counting app (Fig. 1) should support you when recording butterflies. It allows to register individuals species-specific, separated by sex and metamorphic stages as well as individually localized in the field. It facilitates this comfortably without field book and pencil on every stay in nature.

The integrated database can be individually created and adapted regarding expected butterfly species. The recorded data (meta data, counts and remarks) may either be read on the smartphone for transfer into the butterfly registration system (e.g. on [www.science4you.org](http://www.science4you.org)) or transferred to a PC for your own processing.

The app is open source (published under <https://github.com/wistein/TourCount>), has no tracking or advertising functions, demands only for permits which are needed for recording the data: Access rights for storage and GPS, and internet for reverse geocoding (gets address data derived from GPS coordinates by Nominatim service of OpenStreetMap.)

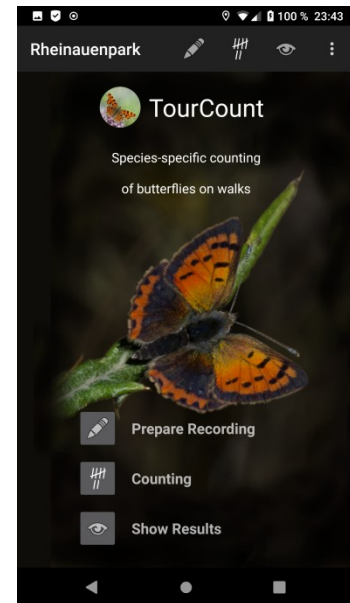


Fig. 1: Starting page

## 2. Setting up

Before initial use you should adapt the settings to your liking (see → 4. Further Functions).

Then you should edit the preliminary species list. (On the counting page use the Pencil-Button in the action bar for this). Here you may add more species per (+)-Button from an integrated list of european species.

Alternatively, you could download a more comprehensive or special example Basic DB from <https://github.com/wistein/TourCount/tree/master/docs>. Copy it to the app's files directory (Android/data/com.wmstein.tourcount/files), then import and adapt it suitably.



Fig. 2: Edit Meta Data

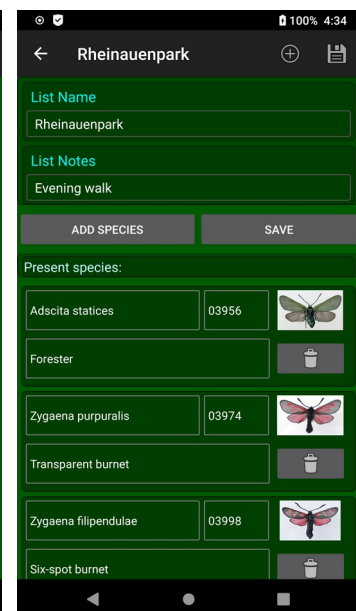


Fig. 3: Edit Species List

Then you may enter general parts of the master data for the planned tour on the "PREPARE RECORDING" page (Fig. 2) and finish this by clicking the saving symbol. Location-related meta data will be derived from GPS coordinates and will be inserted automatically, when reverse geocoding is activated under "Settings". The editable meta data may be modified anytime later.

```
...
Pieris rapae          06998
Small white
Pieris napi          07000
Green-veined white
Pieris na./ra.-compl. 07000*
Small whites compl.
...
```

TourCount species list (partly)

Then edit the species list on "COUNTING". Use the pencil button in the action bar for that. The species list page opens (Fig. 3). Add an entry by the (+)-Button and select the species from the scroll-down list. At the end of this list you may select a non-existing species (NN). This can then be edited by entering its scientific name, common name and code (five-digit with leading zeros, see left table).

The codes will be used as an option to sort the list and as a reference to show corresponding butterfly pictures on the counting and results page. The codes derive from the numbering scheme of european butterflies by Karsholt/Razowski, as used e.g. in the German Lepiforum (<http://www.lepiforum.de>).

The appended \*-symbol marks a species group. Practically choose the biggest code of the species of this group for sorting. Click "Save List" to store the input into the database. This list can be changed or supplemented anytime afterwards.

When you have entered the meta data and created the counting list for all expected species, the database is ready for export as the "Basic Database". To do this, you can use the function "Export as Basic DB" in the menu of the starting page (Fig. 9). After that you have a copy of the empty database saved as "Basic Database" (tourcount0.db) within the app's files directory (Android/data/com.wmstein.tourcount/files/).

The Basic DB may be used as a template for further tour recordings. You may export the Basic DB anytime later, e.g. when you inserted new species.

### 3. Usage

Start with "COUNTING" (Fig. 4). Select the species by clicking the species line to scroll down the species list.

To count just tip on the (+)-Button of the corresponding category of the species. The counter will increment and a page opens to enter individual data (Fig. 5). Location info, latitude, longitude, height as well as date and time will be added automatically. Location may be edited and state info as well as multiple counts may be applied here. Go back to the counting page by clicking the "Save" button.

The (-)-Buttons allow for corrections. Mind that the (-)-Button reduces the individuals list in a last-in-first-out-mode for the corresponding category.

The Pencil-Button in the action bar of the counting page opens the counting list editing page for editing the list of species.

The Pencil-Button on top of the counting field opens the species editing page that lets you add a remark for each species that will be shown aside of it.

To move back one page you can use the back-button or the arrow in the left upper corner. To make sure to save edited content you should go back by tipping the Save-Button.

Before leaving TourCount after a tour you should complete the meta data and save the current countings by exporting the internal DB (->tourcount\_yyyy-mm-dd\_hhmmss.db).

When you have a large list or have collected big amounts of data the start of the results page may be delayed, as this needs some calculations.

The results page (Fig. 7) can be opened on the starting page with "SHOW RESULTS". It shows all the registered data orderly arranged. Beneath the meta data it shows the totals followed by a list of all counted species with their individual records.

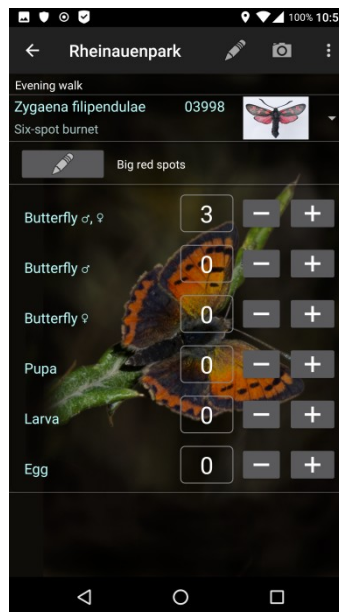


Fig. 4: Counting page

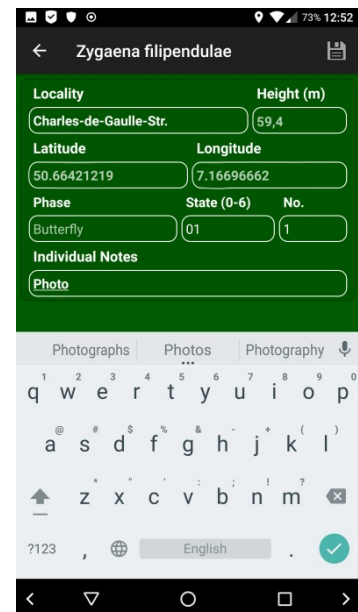


Fig. 5: Edit Individual

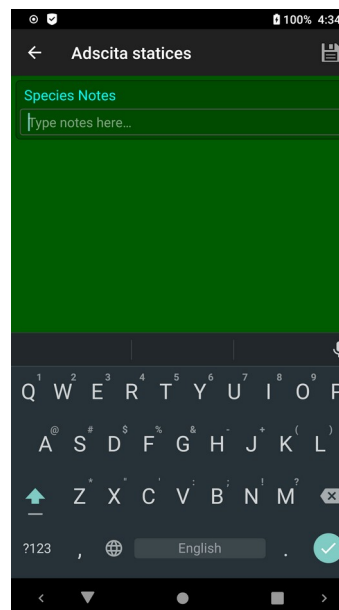


Fig. 6: Edit Species Notes

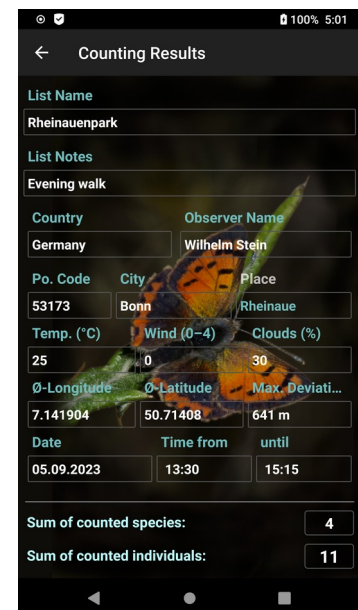


Fig. 7: Part of the Results page

## 4. Further functions

The menu on the starting page (Fig. 8) has Settings, Reset, Import, Export, Info and Help functions.

In "Settings" (Fig. 9) you may adapt the look and feel in some aspects to your wishes, e.g. sounds, sorting order, background or left-/right-hand counting.

Reverse Geocoding<sup>1</sup> allows for automatic insertion of statements of place (*postal code*, *city*, *place*) into meta data and *location* data into the individual's record.

For preparing a new tour you may use "Reset Data" to reset the tour-specific meta data and count data. Alternatively you may import the Basic DB tourcount0.db

Internally, TourCount stores the data in a single SQLite-DB file in the app's own system storage area. As this file cannot be read or changed directly by the user, exporting the data to files in a user reachable storage area is necessary.

By "Export Basic DB" you may export the DB as an empty "Basic DB" which is reasonable, when lasting changes of a counting list have been made (e.g. new species added).

You may import (Fig. 10) any previously exported TourCount-DB. This supports monitoring on different tours. To achieve this you may create tour-specific Basic DBs which may be renamed by a file manager into e.g. tourcount1.db, tourcount2.db, etc.

(**Mind:** The db file name must always start with the string "tourcount", otherwise the file cannot be imported).

Exporting the current database (Export DB) writes a copy of the complete DB to "Android/data/com.wmstein.tourcount/files/tourcount\_YYYY-MM-DD\_hhmmss.db".

The function "Export Data -> CSV File" writes the counting results into the pre-formatted spreadsheet-readable .csv-file "tourcount\_YYYY-MM-DD\_hhmmss.csv" to "Documents/TourCount". This directory allows accessing the files by other spreadsheet apps, like Collabora (obtainable from F-Droid).

Under "App Info" you find the email address of the author, the history of the app and the license notes. The menu of the counting page provides a "Share" function for sending notes using a standard app like SMS or email.

The counting page is temporarily switched off by means of the proximity sensor when the phone is put into a pocket or held closed to the body. This saves energy, prohibits unwanted input and recalls the app into its current state immediately when used again.

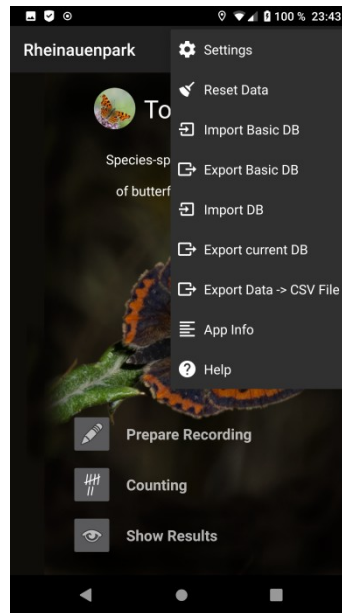


Fig. 8: Main menu

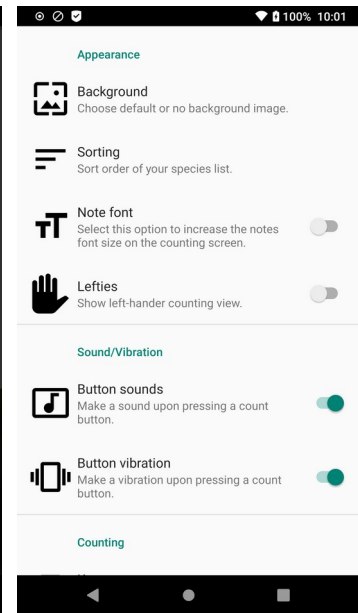


Fig. 9: Settings (partly)

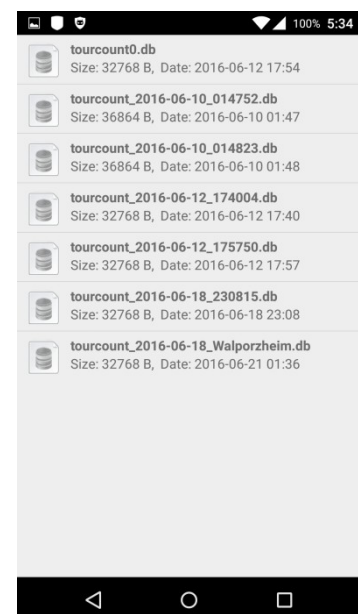


Fig. 10: Import file selection

<sup>1</sup> For Reverse Geocoding (to produce address info from GPS coordinates) the service of Nomination from OpenStreetMap is used. A valid own email address is necessary for durably reliable queries of address data and to exclude abuse. The mail address will be treated confidentially and will only be used to contact you in case of service problems. For more info see <https://wiki.openstreetmap.org/wiki/Nominatim>.

IT-affine users may transfer the exported "tourcount\_YYYY-MM-DD\_hhmmss.db" or "...csv" files to a PC.

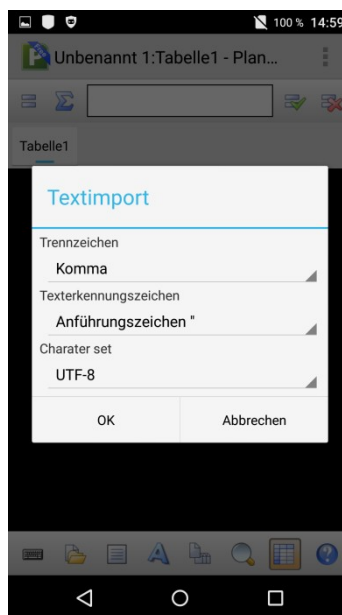
With a free tool like "SqliteBrowser" (<http://sqlitebrowser.org>) you may examine the db-file.

The .csv file may be imported into a spreadsheet program as a

- comma-delimited text file with
- file origin "Unicode UTF-8",
- quotations marks for text field recognition
- and all columns in text format

for further processing.

The exported table is optimized for easy transmission of the results into the Monitoring web page.



Counting List	Observer	N. Wilhelm Stein
Country	Po. Code	City
Germany	53173	Bonn
Temp. (°C)	Wind (0-4)	Clouds (%)
25	0	30
Date	Time from	until
05.09.2023	13:30	15:15
Species Na	English Na	Spec. Code
Zygaena pu	Transparent	3974
Zygaena filii	Six-spot bur	3998
Pieris rapae	Small white	6998
Vanessa atre	Red admiral	7243
Diff. Species	4 Totals:	9
Individuals	Counts	Locality
Zygaena pu	1	Martin-Luth
Zygaena pu	1	Löffelwald, f
Zygaena pu	1	Löffelwald, f
Zygaena pu	1	Löffelwald, f
Zygaena filii	1	Martin-Luth
Zygaena filii	1	Löffelwald, f
Zygaena filii	1	Löffelwald, f
Pieris rapae	1	Charles-de
Vanessa atre	3	Charles-de
Average Co	7.1419	50.71408
Uncertainty (m)		641

Fig. 11 and 12: CSV-import in a smartphone office suite

Fig. 11 shows the csv formatting parameters for a correct representation in a free Android spreadsheet app. Fig. 12 shows a part of the imported .csv-table.

## 5. Glossary

### **CSV file:**

Comma-separated values file. Text-based file format for exchanging data in tabular form (e.g. for importing transect count result data into spreadsheet programs).

### **File directories of TourCount:**

The public app-specific files directory (for DB files and exported CSV files) is:

**"Documents/TourCount/"**

Data stored here can also be read by other apps. The data is not automatically deleted when the app is uninstalled.

The previous app-specific directory for the DB files:

**"Android/data/com.wmstein.tourcount/files/"**

is no longer used from TransektCount version 4.0.0, as data stored here cannot be read by other apps in newer Android versions and is deleted when the app gets uninstalled.

### **Documentation:**

You find the documentation including example databases und infos under

<https://github.com/wistein/TourCount/tree/master/docs>.

### **File directories of TourCount:**

The public app-specific files directory (for exported .csv-files):

**Documents/TourCount**

The files stored here are readable by other apps. The files will not be deleted when the app is deinstalled.

The internal app-specific files directory (for DB-files):

**Android/data/com.wmstein.tourcount/files**

Files stored here cannot be accessed by other apps. The files and the directory will be deleted upon deinstallation of TourCount.

### **GitHub:**

Is a file hosting site for software development projects including version control. It is free of charge for Open Source Projects. Eponymous was the version control and source code management system Git. Run by GitHub, Inc. from San Francisco, USA. Since Dezember 2018 the company belongs to Microsoft. According to Microsoft GitHub will remain an independent platform.

### **Numbering scheme according to Karsholt/Razowski:**

The entomologists O. Karsholt and J. Razowski developed a numbering scheme for all European butterfly species, that among others is used by the German Lepiforum. According to that numbering scheme TourCount uses Codes for the identification of species. However, this limits the utilization of TourCount to European faunal areas, as there is no adequate global scheme.

### **Open Source:**

Source code of software, which can be edited and used publicly. Open source software can mostly be used free of charge and does not contain propriately licensed or closed source elements.

## 6 References

### **TourCount project:**

The repository of the TourCount project is situated on <https://github.com/wistein/TourCount>. It contains all published files with source code, configuration of the Android Studio Development platform, documentation and installable APK files.

### **Documents:**

You find documents, example databases, SQL scripts for manipulating TourCount DBs and other information under <https://github.com/wistein/TourCount/tree/master/docs>.