TourCount 3.2

1. Introduction

Fig. 1: Starting page

TourCount is an Android App (Fig. 1) that supports you when recording butterflies in the field. It allows species-specific and separated by sexus and metamorphic stages as well as individually localized counting when walking in nature. It can substitute your field book and pencil, and with a modern smartphone you carry a camera for pictures of interesting species anyway.

The integrated database is related to tours/walks and 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) 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 form GPS coordinates.)

2. Setting up

Before initial use you should adapt the settings to your liking.
If you use the app on a tablet in landscape mode you should set in the Android Display settings the rotation to automatic (with 0 and 270 ° for right hander and respectively with 0 and 90 ° for left hander).

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

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 files directory of TourCount (see 5. Glossary), then import and adapt it suitably.

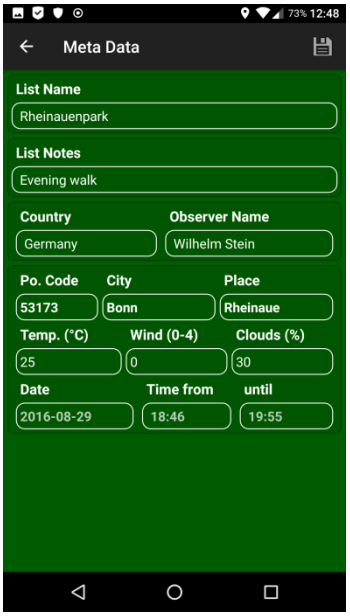

Fig. 2: Edit Meta Data

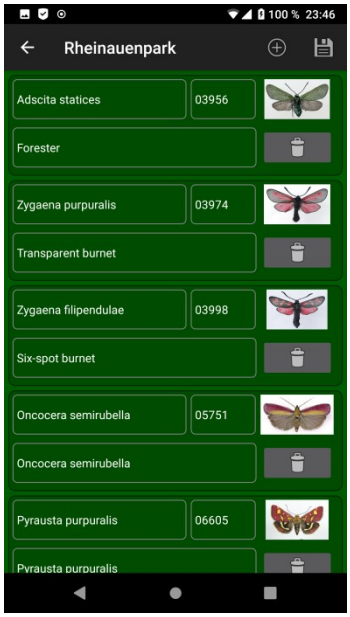

Fig. 3: Edit Species List

Then you may enter universal parts of the master data for the planned tour under “PREPARE RECORDING” (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. It is a good idea to choose the bigger 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 by the Edit button of the counting action bar.

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 will be used as a template for further tour recordings. You may export the Basic DB anytime later, e.g. when you modified its structure or 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 corresponding (+)-Button of the seen 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 allows 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 heavy calculations.

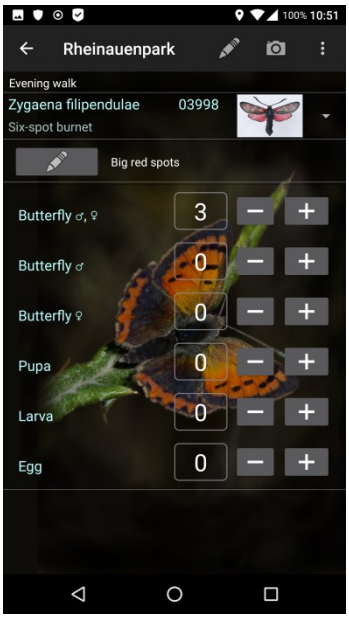

Fig. 4: Counting page

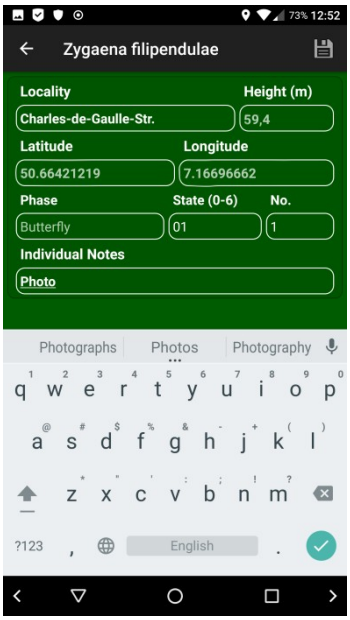

Fig. 5: Edit Individual

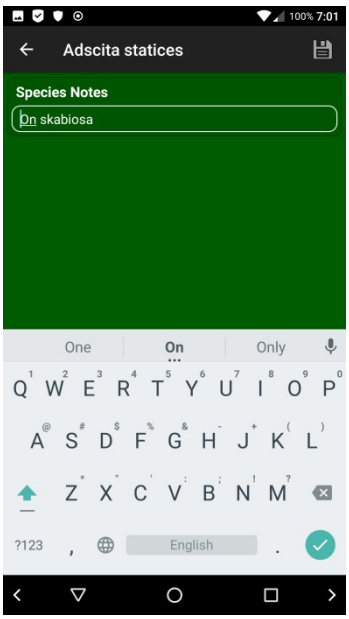

Fig. 6: Edit Species Notes

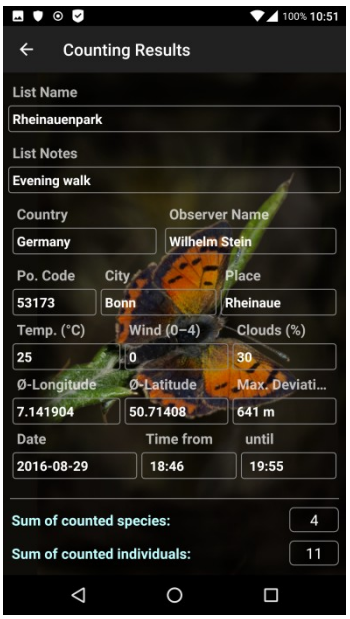

Fig. 7: Results page

The results page (Fig. 7) can be opened 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.

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 an feel in some aspects to your wishes, e.g. sounds, sorting order, background or left-/right-hand counting.

Reverse Geocoding[1] 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

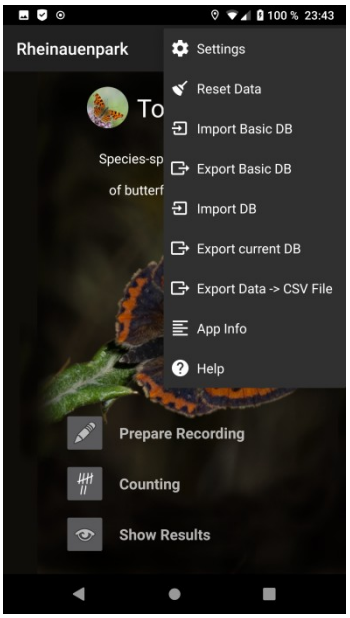

Fig. 8: Main menu

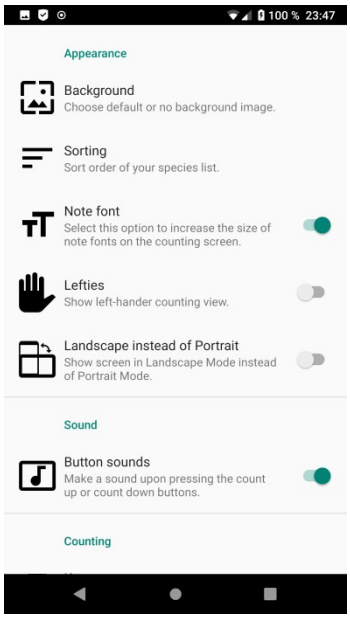

Fig. 9: Settings (partly)

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 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 "/storage/emulated/0/Android/data/com.wmstein.tourcount/files/ tourcount_YYYY-MM-DD_hhmmss.db".

The function "Export Data -> CSV File" writes the counting results into a MS Excel readable .csv-file to "/storage/emulated/0/Android/data/com. wmstein.tourcount/files/ tourcount_YYYY-MM-DD_hhmmss.csv".

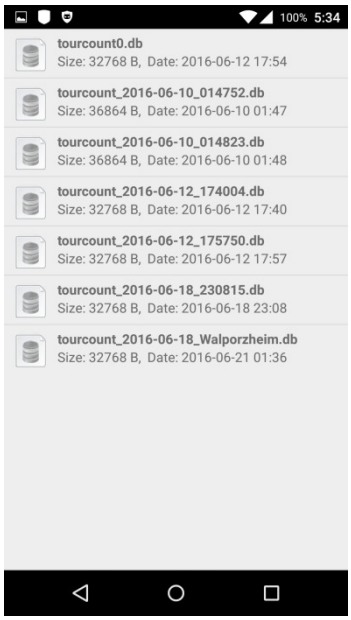

Fig. 10: Import file selection

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.

From Android version 5.01 on, the app switches off screen and input function of the counting page, as soon as the phone is pocketed or hold closely to the body (controlled by the proximity sensor).

1 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 for further processing (e.g. MS Excel) as a

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

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

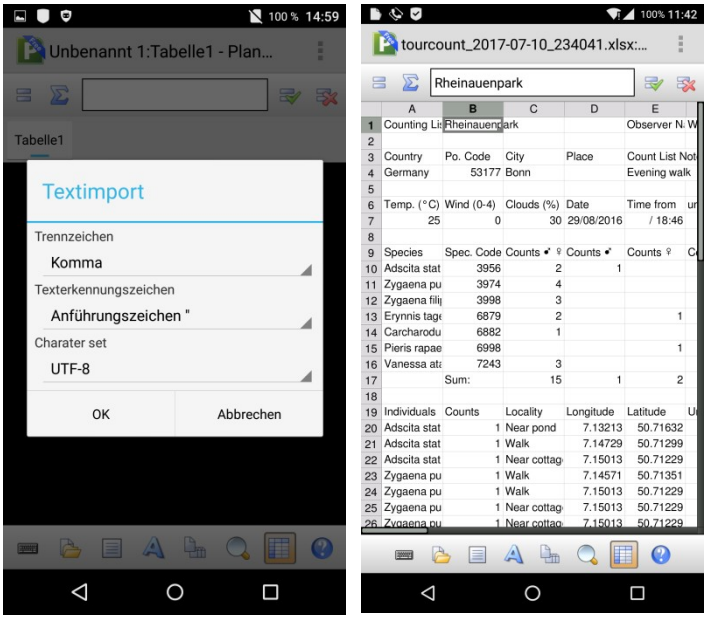

Fig. 11 and 12: CSV-import in a smartphone office suite

Fig. 11 shows the csv formatting parameters for a correct representation in the free Android app PlanMaker Mobile Free. Fig. 12 shows part of PlanMaker's view of the imported .csv-table.

5. Glossary

CSV-file:
Comma-separated values file. A text based file format for data exchange of data in tabular form (e.g. for import of the TransektCount results into a spreadsheet software).

Documentation:
You find the documentation including example databases und infos under https://github.com/wistein/TourCount/tree/master/docs.

Files directory of TourCount:
Had to be changed for the restrictive date access introduced by Android 10 from the common directory

```
/storage/emulated/0
```

to the app-specific files directory

```
/storage/emulated/0/Android/data/com.wmstein.tourcount/files
```

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