

PhlebKeyTool: description

PhlebKeyTool has been developed within the framework of the European project MediLabSecure -> is a project funded by the European Commission (EU DG DEVCO: IFS/2018/402-247).

Phlebotomine sand flies identification tool using Xper2 software to open an illustrated dataset describing the different species of Phlebotomine sand flies (Genera: *Phlebotomus* and *Sergentomyia*) in Europe, Mediterranean areas and Arabian Peninsula.

The dataset has been developed by a consortium of specialists of many countries coordinated **by Dr Ozge Erisoz** and **Pr. Bulent Alten's lab** (VERG) in Hacettepe University, Ankara.

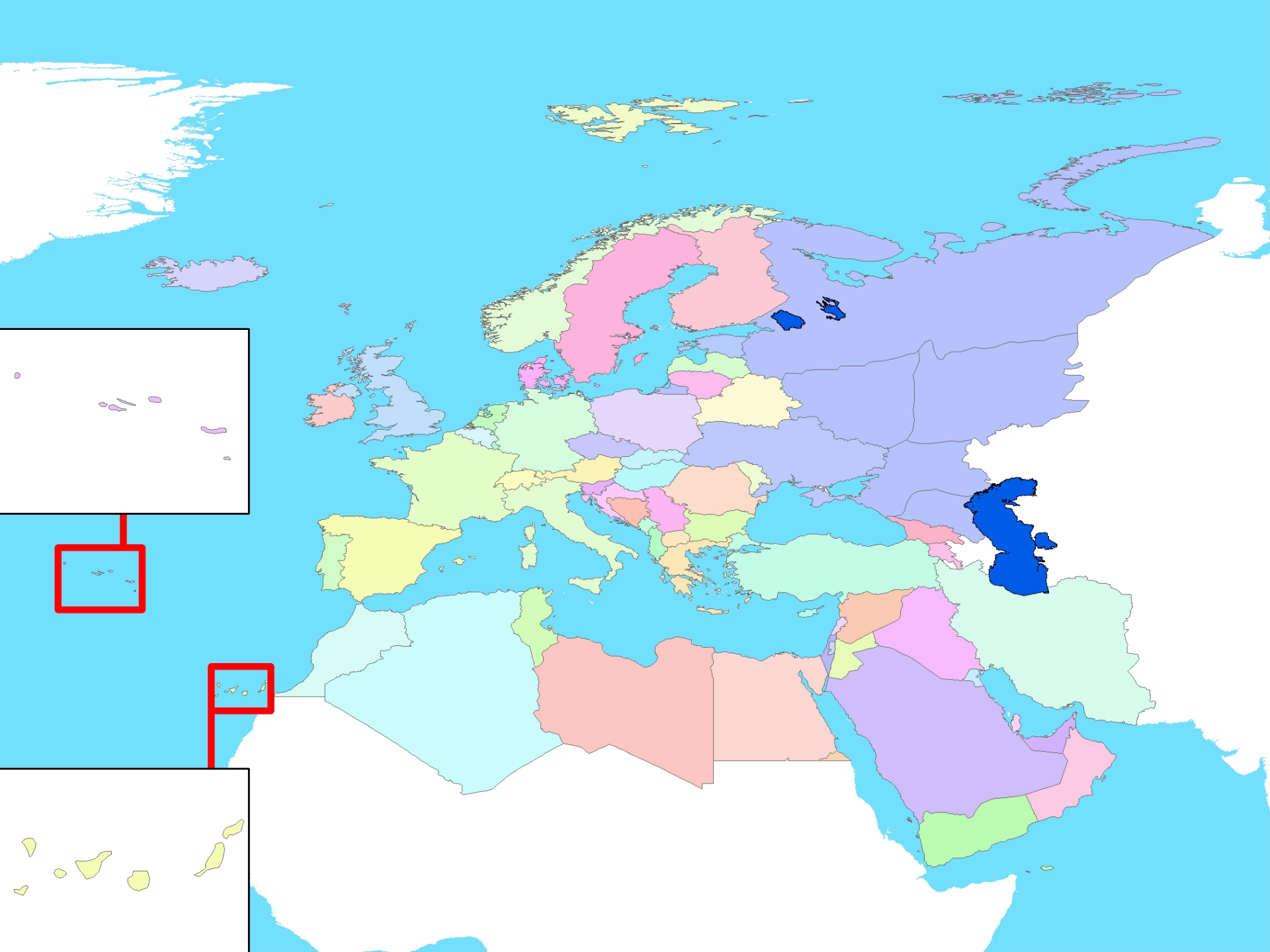
Xper2 is a free access software available on Windows, MacOS or Linux allowing computer-assisted identification [available on line](#) and locally. Here is a tutorial on how to use Xper2 as an identification tool:

http://www.infosyslab.fr/?q=en/resources/scientific_videos

PhlebKeyTool: why this tool was needed? Aims?

PhlebKeyTool is intended to be an interactive identification key for Phlebotomine sand flies of the Greater Palaearctic Region including Europe + Mediterranean Region and Arabian Peninsula.

- A) Achievements of MosKeyTool
- B) To create a more user-friendly identification key for entomologists and particularly non-entomologists.
- C) Very limited body characters for identification with naked eyes. Not like mosquitoes.
- D) It can be able to identify a specimen even if some characters are missing by using independent descriptors.
- E) To use images as much as possible to identify especially close species
- F) To perfectly identify species using lesser steps as much as possible (even 2-3 steps are possible).
- G) To make easier the life of taxonomists.



PhlebKeyTool: features?

- **for *Phlebotomus* and *Sergentomyia* genera**
- for adult female and male specimens
- a single basis for genus, subgenus and species identification
- mainly based on morphological characters
- supported with images, drawings and descriptions
- non-morphological characters will also be included (MALDI-TOF and DNA Barcoding data) in Version 2.
- training / informative tool

PhlebKeyTool: features?

- A total of 84 species (female and male) and some subspecies
- 130 references
- Achievements : **90%** (for Version 1)
 - 9 species without description or poorly describe
 - 15 species without any photo/drawings

Note: most of the species which we have no description / photo are from Arabian Peninsula.
Most of them was identified many years ago with 1 or 2 specimens and very limited information.

Some of them could be previously misidentified.

PhlebKeyTool: the team

Özge Erisoz Kasap – Scientific Coordinator- Hacettepe University, Turkey

Bülent Alten – General Coordinator- Hacettepe University, Turkey

Vincent Robert – Project Coordinator (WP3 Entomology, Coordinator) – IRD, France

Marie Picard- Technical Coordinator – IRD, France

Jérôme Depaquit – Université de Reims, France

Nil Rahola – IRD, France

Nabil Haddad – Lebanese University, Lebanon

Filiz Gunay – Hacettepe University, Turkey

Mohammad Akhoundi – Avicenne Hospital – France

Vit Dvorak – Charles University, Czech Republic

Vladimir Ivovic – University of Primorska, Slovenia

Yusuf Özbel – Ege University, Turkey

Samer Sawalha – Ministry of Health, Palestine

Suggested citation:

Erisoz Kasap O, Depaquit J, Rahola N, Haddad N, Gunay F, Akhoundi M, Dvorak V, Ivovic V, Ozbel Y, Sawalha S, Picard M, Robert V and Alten B. 2021. PhlebKeyTool, Version 1, <https://www.medilabsecure.com/phlebkeytool.html>.

Special thanks to **Prof. Nicole Leger**

PhlebKeyTool: the team

Although the authors' contributions for version 1 are not equal, according to the division of work we initially made, all team members will make a great contribution in the validation / correction / completion stages to ensure that version 2, which will be published in about 1 year, is close to perfection.

MediLabSecure



Hacettepe, VERG Lab

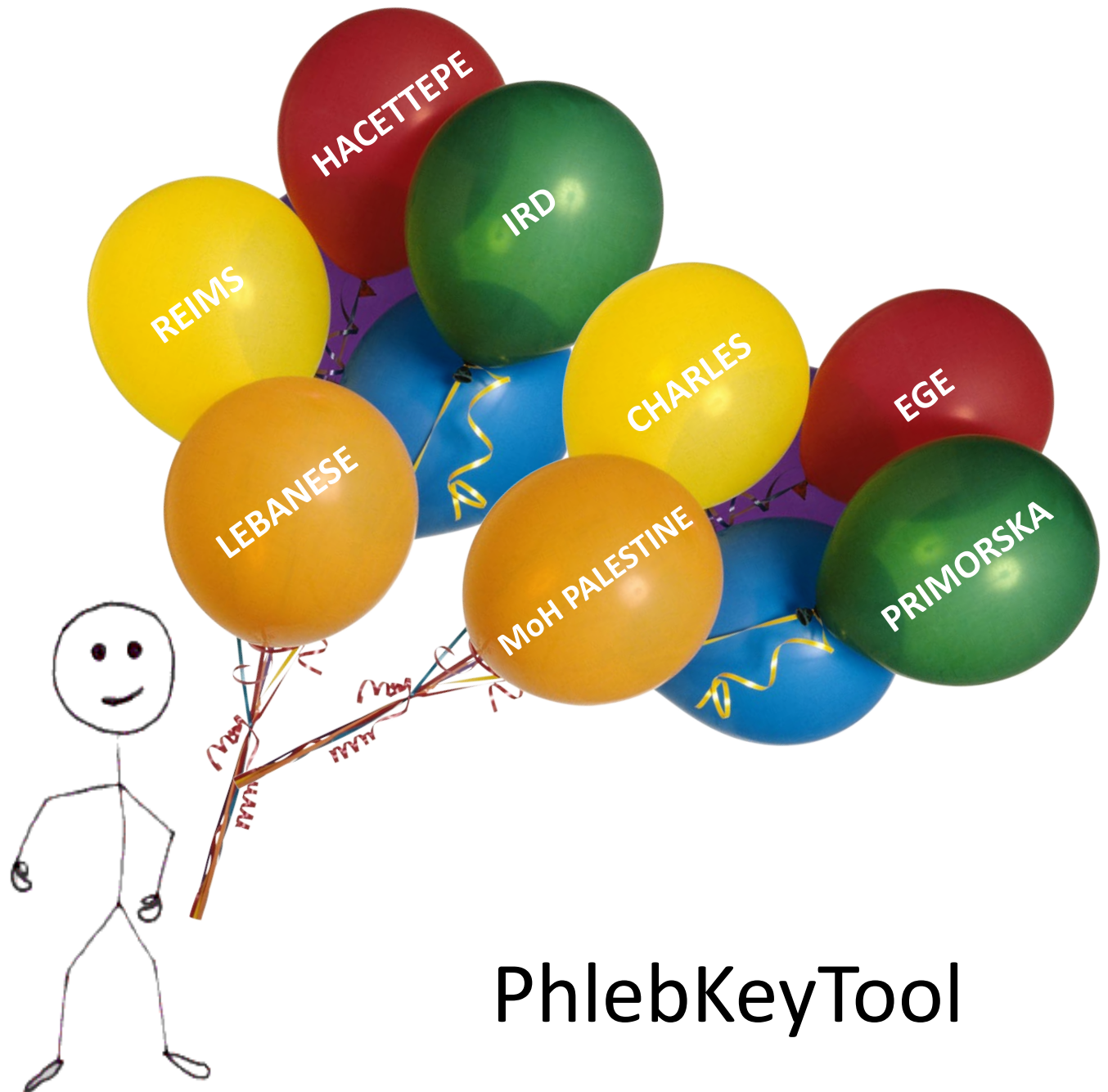


MosKeyTool

HACETTEPE
UNIVERSITY



MediLabSecure



PhlebKeyTool

DIFFICULTIES RELATED TO SAND FLY TAXONOMY

- Adult morphology
- Small in size (2 - 4 mm)
- Keys are old and difficult to obtain, descriptions can be blurry
- A few online or computer based keys
- Phenotypic plasticity



Karaoğlu & Yılmaz

| | |
|---|----|
| 1. Аф 2/3-15 | 2 |
| - Сегменты А9-А15 с 1 аскоидом | 3 |
| 2. Субтерминальный бугор далеко (30-35 мкм) от вершины эдеагуса <i>P. chinensis</i> | |
| - Субтерминальный бугор около (6-8 мкм) вершины эдеагуса <i>P. simici</i> | |
| 3. А8 с 2 аскоидами | 4 |
| - А8 с 1 аскоидом | 11 |
| 4. Коксит с 14-27 волосками, редко до 29 | 5 |
| - Коксит с 29-115 волосками, редко до 27 | 6 |
| 5. Все волоски на базальной половине коксита. Бугор в 6-16 мкм от вершины эдеагуса <i>P. turanicus</i> | |
| - Часть волосков на дистальной половине коксита. Бугор в 19-28 мкм от вершины эдеагуса <i>P. brevis</i> | |
| 6. Все волоски коксита (числом 69-114) на его базальной половине; коксит широкий <i>P. rupester</i> | |
| - Часть волосков (всего 27-85) на дистальной половине коксита | 7 |
| 7. Эдеагус с прямоугольной субтерминальной вырезкой | |
| <i>P. halopensis</i> | |
| - Эдеагус с обычной тупоугольной вырезкой | 8 |

9c. PSYCHODIDAE - PHLEBOTOMINAE

VON

O. THEODOR

MIT 4 TAFELN SOWIE 95 ABBILDUNGEN IM TEXT
UND AUF 11 BEILAGEN



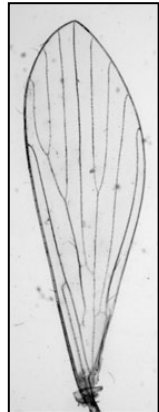
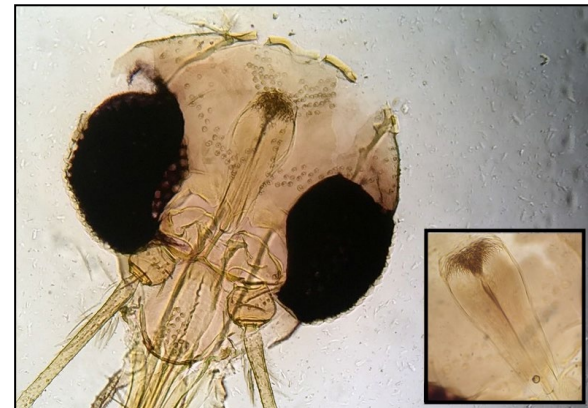
STUTTGART

E. SCHWEIZERBART'SCHE VERLAGSBUCHHANDLUNG
(NAGELE u. OBERMILLER)

1958

PhlebKeyTool

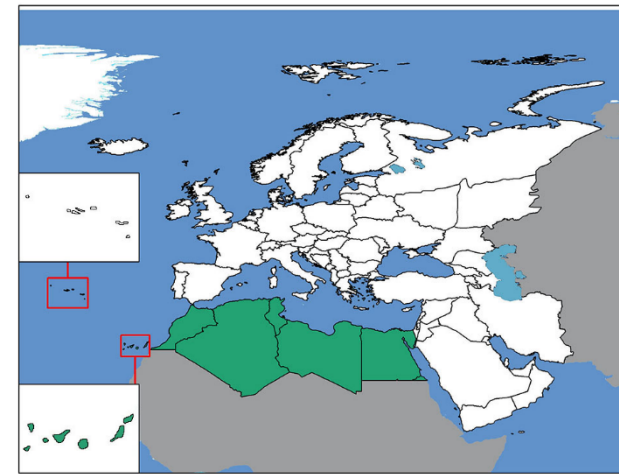
- Developed with Xper2 v.2.3.2
- Included 84 taxa
(*Phlebotomus* and *Sergentomyia* genera)
- For adult males and females
- 61 morphological criteria
(Head, Thorax, Genitalia)
- Base construction with published/online keys and descriptions
- Pictures and drawings are included



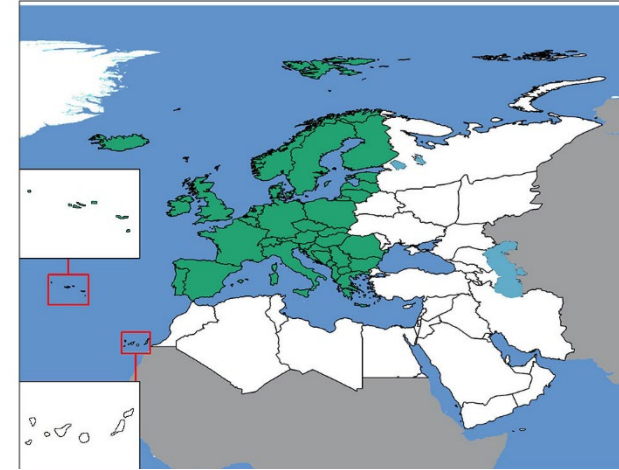
PhlebKeyTool

- Includes all the Western Palearctic sand fly species
- Geographic origin (sampling area) as a criteria
- 67 geographic units representing individual countries
- One country can be a member of more than one sampling area
- Islands are represented as independent geographic units
- Comprehensive literature search for species distribution data base construction

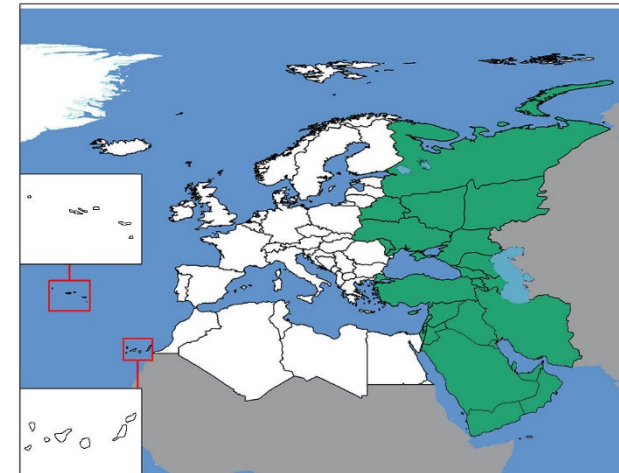
southern



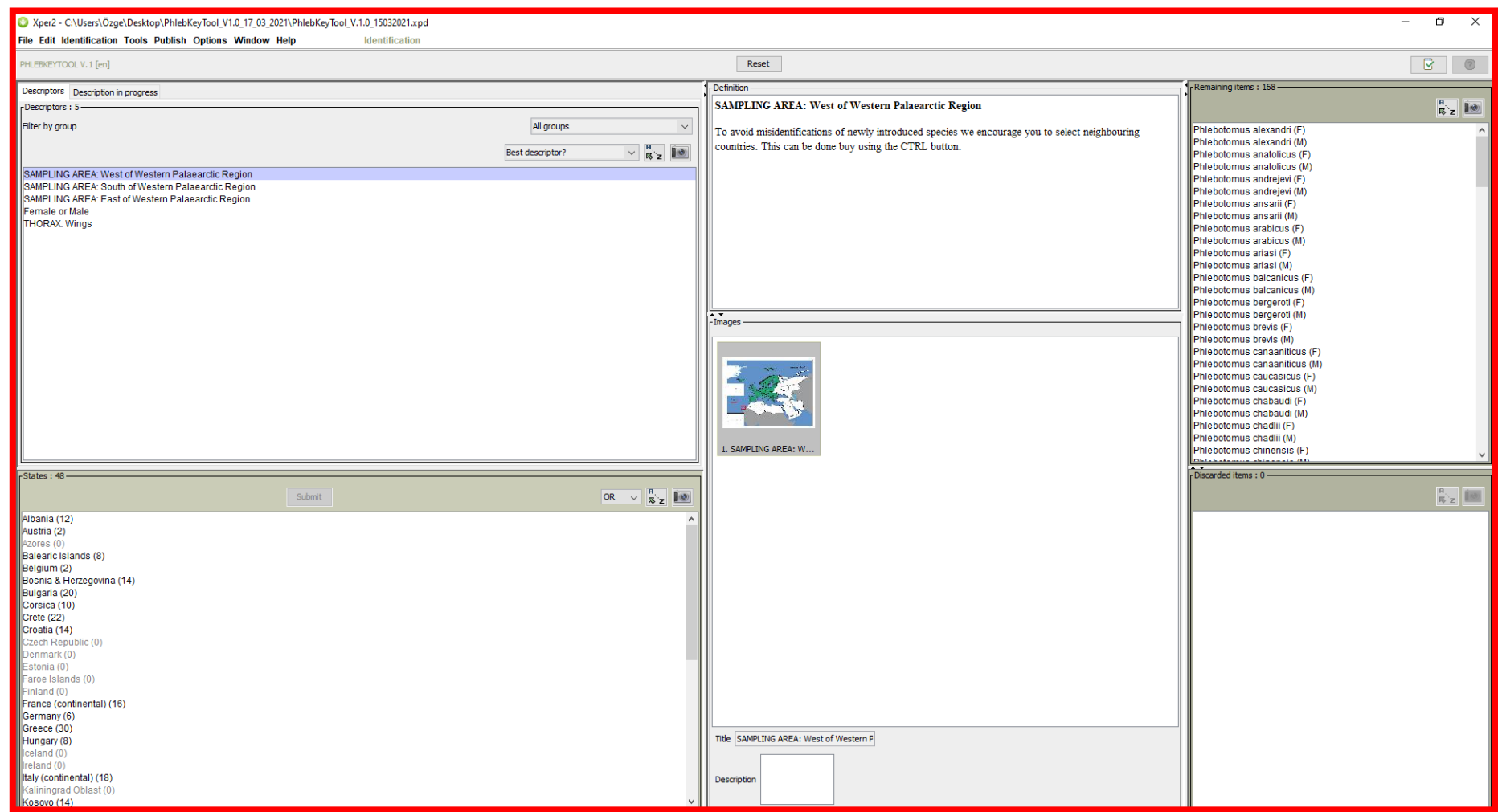
western



eastern



PhlebKeyTool



PhlebKeyTool

File Edit Identification Tools Publish Options Window Help

PHLEBKEYTOOL V.1 [en]

Descriptors Description in progress

Descriptors : 5

Filter by group

All groups

Best descriptor?

SAMPLING AREA: West of Western Palaearctic Region

SAMPLING AREA: South of Western Palaearctic Region

SAMPLING AREA: East of Western Palaearctic Region

Female or Male

THORAX: Wings

states = answers

Reset

Definition

SAMPLING AREA: West of Western Palaearctic Region

To avoid misidentifications of newly introduced species we encourage you to select neighbouring countries. This can be done buy using the CTRL button.

Images

1. SAMPLING AREA: W...

Title: SAMPLING AREA: West of Western P

Description

Remaining items : 168

Phlebotomus alexandri (F)

Phlebotomus alexandri (M)

Phlebotomus anatolicus (F)

Phlebotomus anatolicus (M)

Phlebotomus andrejevi (F)

Phlebotomus andrejevi (M)

Phlebotomus ansarii (F)

Phlebotomus ansarii (M)

Phlebotomus arabicus (F)

Phlebotomus arabicus (M)

Phlebotomus ariasi (F)

Phlebotomus ariasi (M)

Phlebotomus balcanicus (F)

Phlebotomus balcanicus (M)

Phlebotomus bergeroti (F)

Phlebotomus bergeroti (M)

Phlebotomus brevis (F)

Phlebotomus brevis (M)

Phlebotomus canaaniticus (F)

Phlebotomus canaaniticus (M)

Phlebotomus caucasicus (F)

Phlebotomus caucasicus (M)

Phlebotomus chabaudi (F)

Phlebotomus chabaudi (M)

Phlebotomus chadlii (F)

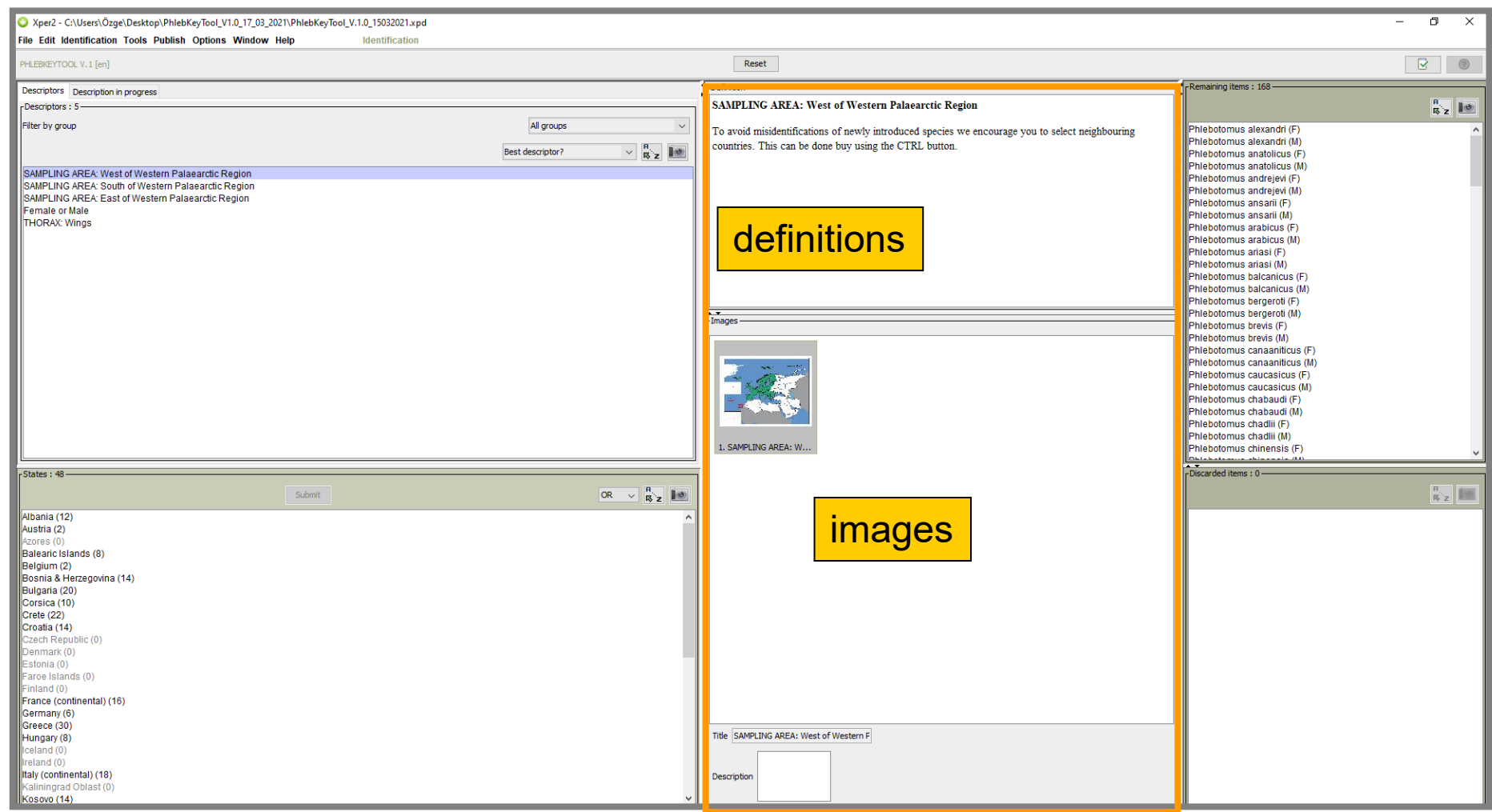
Phlebotomus chadlii (M)

Phlebotomus chinensis (F)

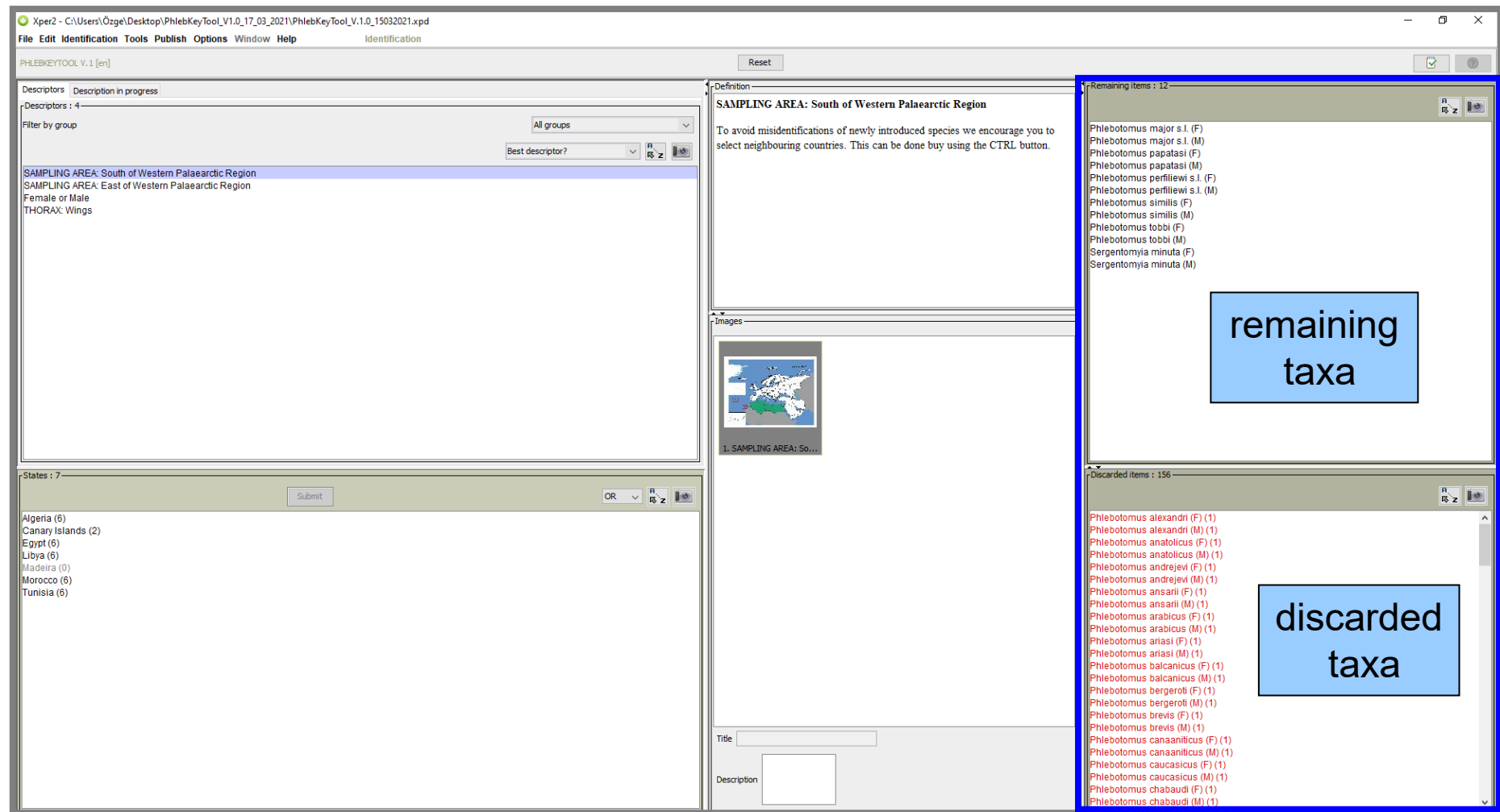
Phlebotomus chinensis (M)

Discarded items : 0

PhlebKeyTool



PhlebKeyTool



PhlebKeyTool

File Edit Identification Tools Publish Options Window Help

PHLEBKEYTOOL V.1 [en]

Descriptors: Description in progress

Descriptors: 5

Filter by group

All groups

Best descriptor?

Best descriptor?

Xper original sort

Sokal and Michener sort

Jaccard sort

SAMPLING AREA: West of Western Palaearctic Region

SAMPLING AREA: South of Western Palaearctic Region

SAMPLING AREA: East of Western Palaearctic Region

Female or Male

THORAX: Wings

States: 48

Submit

OR

Best descriptor?

Albania (12)

Austria (2)

Azores (0)

Balearic Islands (8)

Belgium (2)

Bosnia & Herzegovina (14)

Bulgaria (20)

Corsica (10)

Crete (22)

Croatia (14)

Czech Republic (0)

Denmark (0)

Estonia (0)

Faroe Islands (0)

Finland (0)

France (continental) (16)

Germany (6)

Greece (30)

Hungary (8)

Iceland (0)

Ireland (0)

Italy (continental) (18)

Kaliningrad Oblast (0)

Kosovo (14)

Reset


Definition

SAMPLING AREA: West of Western Palaearctic Region

To avoid misidentifications of newly introduced species we encourage you to select neighbouring countries. This can be done buy using the CTRL button.

Images

1. SAMPLING AREA: W...



Title

SAMPLING AREA: West of Western F

Description

Remaining items: 168

Best descriptor?

Best descriptor?

Xper original sort

Sokal and Michener sort

Jaccard sort

Phlebotomus alexandri (F)

Phlebotomus alexandri (M)

Phlebotomus anatolicus (F)

Phlebotomus anatolicus (M)

Phlebotomus andrejevi (F)

Phlebotomus andrejevi (M)

Phlebotomus ansarii (F)

Phlebotomus ansarii (M)

Phlebotomus arabicus (F)

Phlebotomus arabicus (M)

Phlebotomus ariasi (F)

Phlebotomus ariasi (M)

Phlebotomus balcanicus (F)

Phlebotomus balcanicus (M)

Phlebotomus bergeroti (F)

Phlebotomus bergeroti (M)

Phlebotomus brevis (F)

Phlebotomus brevis (M)

Phlebotomus canaaniticus (F)

Phlebotomus canaaniticus (M)

Phlebotomus caucasicus (F)

Phlebotomus caucasicus (M)

Phlebotomus chabaudi (F)

Phlebotomus chabaudi (M)

Phlebotomus chadlii (F)

Phlebotomus chadlii (M)

Phlebotomus chinensis (F)

Phlebotomus chinensis (M)

Discarded items: 0

Best descriptor?

Best descriptor?

Xper original sort

Sokal and Michener sort

Jaccard sort

PhlebKeyTool

File Edit Identification Tools Publish Options Window Help

Identification

PHLEBKEYTOOL V.1 [en]

Reset

Descriptors Description in progress

Descriptors : 5

Filter by group

All groups

Xper original sort

Female or Male [3.87]

SAMPLING AREA: South of Western Palaearctic Region [3.57]

SAMPLING AREA: East of Western Palaearctic Region [3.48]

THORAX: Wings [3.47]

SAMPLING AREA: West of Western Palaearctic Region [3.42]

States : 2

Submit

OR

1 Female (84)

2 Male (84)

Definition

Female or Male

No definition available

Images

1. Female or Male

Title Female or Male

Description

Remaining items : 168

Phlebotomus alexandri (F)

Phlebotomus alexandri (M)

Phlebotomus anatolicus (F)

Phlebotomus anatolicus (M)

Phlebotomus andrejevi (F)

Phlebotomus andrejevi (M)

Phlebotomus ansarii (F)

Phlebotomus ansarii (M)

Phlebotomus arabicus (F)

Phlebotomus arabicus (M)

Phlebotomus ariasi (F)

Phlebotomus ariasi (M)

Phlebotomus balcanicus (F)

Phlebotomus balcanicus (M)

Phlebotomus bergeroti (F)

Phlebotomus bergeroti (M)

Phlebotomus brevis (F)

Phlebotomus brevis (M)

Phlebotomus canaaniticus (F)

Phlebotomus canaaniticus (M)

Phlebotomus caucasicus (F)

Phlebotomus caucasicus (M)

Phlebotomus chabaudi (F)

Phlebotomus chabaudi (M)

Phlebotomus chadlii (F)

Phlebotomus chadlii (M)

Phlebotomus chinensis (F)

Phlebotomus chinensis (M)

Discarded items : 0

select a state
based on your
answer and
submit

PhlebKeyTool

Xper2 - C:\Users\Özge\Desktop\PhlebKeyTool_V1.0_17_03_2021\PhlebKeyTool_V1.0_15032021.xpd

File Edit Identification Tools Publish Options Window Help Identification

PHLEBKEYTOOL V.1 [en]

Descriptors Description in progress

Descriptors : 20

Filter by group

All groups

Xper original sort

MALE GENITALIA: Gonocoxite with or without basal lobe [3.87]

MALE GENITALIA: General shape of aedeagus (Parameral sheath) [3.74]

MALE GENITALIA: Aedeagal duct / sperm pump ratio (µm) [3.63]

MALE GENITALIA: Gonostyle [3.59]

SAMPLING AREA: South of Western Palaearctic Region [3.58]

MALE GENITALIA: Position of gonocoxal hairs [3.52]

SAMPLING AREA: East of Western Palaearctic Region [3.48]

THORAX: Wings [3.48]

MALE CIBARIUM: Cibarial armature [3.48]

MALE GENITALIA: Position of seta on the style [3.43]

SAMPLING AREA: West of Western Palaearctic Region [3.42]

MALE HEAD: Palpal formula [3.37]

MALE HEAD: AIII / L (µm) [3.35]

ANTENNA: Length of A III [3.34]

MALE HEAD: Antennal Formula [3.32]

MALE GENITALIA: Epandrial lobe (Surstyle) / gonocoxite ratio (µm) [3.18]

MALE GENITALIA: Paramere [3.15]

MALE GENITALIA: Epandrial lobe (Surstyle) [3.11]

MALE PHARYNX: Presence of pharyngeal teeth [3.1]

FEMALE HEAD: Palpal formula [3.0]

States : 4

Submit

OR

1. Gonocoxite with small basal lobe (Phlebotomus subgenus) (4)

2. Gonocoxite with developed and simple basal lobe that bears most of the hairs on the terminal surface (Paraphlebotomus, Synphlebotomus subgenera) (14)

3. Gonocoxite with developed and complex basal lobe that bears most of the hairs on the ventral surface (Paraphlebotomus subgenus) (1)

4. Gonocoxite without basal lobe (Other subgenera) (65)

Reset

Definition

MALE GENITALIA: Gonocoxite with or without basal lobe

No definition available

Images

1. MALE GENITALIA: G...

2. MALE GENITALIA: G...

Title

Description

Remaining items : 84

Phlebotomus alexandri (M)

Phlebotomus anatolicus (M)

Phlebotomus andrejevi (M)

Phlebotomus ansarii (M)

Phlebotomus arabicus (M)

Phlebotomus ariasi (M)

Phlebotomus balcanicus (M)

Phlebotomus bergeroti (M)

Phlebotomus brevis (M)

Phlebotomus canaaniticus (M)

Phlebotomus caucasicus (M)

Phlebotomus chabaudi (M)

Phlebotomus chadlii (M)

Phlebotomus chinensis (M)

Phlebotomus comatus (M)

Phlebotomus duboscqi (M)

Phlebotomus economidesi (M)

Phlebotomus eleanorae (M)

Phlebotomus fortunatarum (M)

Phlebotomus halepensis (M)

Phlebotomus ilami (M)

Phlebotomus jacusieli (M)

Phlebotomus kabulensis (M)

Phlebotomus kandelakii s.l. (M)

Phlebotomus kazeruni (M)

Phlebotomus keshishiani (M)

Phlebotomus kilickii (M)

Discarded items : 84

Phlebotomus alexandri (F) (1)

Phlebotomus anatolicus (F) (1)

Phlebotomus andrejevi (F) (1)

Phlebotomus ansarii (F) (1)

Phlebotomus arabicus (F) (1)

Phlebotomus ariasi (F) (1)

Phlebotomus balcanicus (F) (1)

Phlebotomus bergeroti (F) (1)

Phlebotomus brevis (F) (1)

Phlebotomus canaaniticus (F) (1)

Phlebotomus caucasicus (F) (1)

Phlebotomus chabaudi (F) (1)

Phlebotomus chadlii (F) (1)

Phlebotomus chinensis (F) (1)

Phlebotomus comatus (F) (1)

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Phlebotomus eleanorae (F) (1)

Phlebotomus fortunatarum (F) (1)

Phlebotomus halepensis (F) (1)

Phlebotomus ilami (F) (1)

Phlebotomus jacusieli (F) (1)

Phlebotomus kabulensis (F) (1)

Phlebotomus kandelakii s.l. (F) (1)

the questions are sorted based on their discriminatory power

Double click on the images

PhlebKeyTool


Xper2 - C:\Users\Özge\Desktop\PhlebKeyTool_V1.0_17_03_2021\PhlebKeyTool_V1.0_15032021.xpd

File Edit Identification Tools Publish Options Window Help

Identification

GENITALIA: Gonocoxite with or without basal lobe [1/2]

0 2.0 3.0 4.0 5.0 Zoom 1:1 << < > >> Resource File ?



gonocoxite

Jérôme Depaquit and Nicole Léger Collection


Weight 1024 x 768

GENITALIA: Gonocoxite with or without basal lobe


MALE GENITALIA: Gonocoxite with or without basal lobe [2/2]

0.0 1.0 2.0 3.0 4.0 5.0 Zoom 1:1 << < > >> Resource File ?


1




2



3



4



Title MALE GENITALIA

Description

Scale 100% - Weight 1024 x 768

Remaining items : 84

Jérôme Depaquit and Nicole Léger Collection

PhlebKeyTool

File Edit Identification Tools Publish Options Window Help

Identification

PHLEBKEYTOOL V.1 [en]

Descriptors Description in progress

Descriptors : 20

Filter by group

All groups

Xper original sort

MALE GENITALIA: Gonocoxite with or without basal lobe [3.87]

MALE GENITALIA: General shape of aedeagus (Parameral sheath) [3.74]

MALE GENITALIA: Aedeagal duct / sperm pump ratio (µm) [3.63]

MALE GENITALIA: Gonostyle [3.59]

SAMPLING AREA: South of Western Palaearctic Region [3.58]

MALE GENITALIA: Position of gonocoxal hairs [3.52]

SAMPLING AREA: East of Western Palaearctic Region [3.48]

THORAX: Wings [3.48]

MALE CIBARIUM: Cibarial armature [3.48]

MALE GENITALIA: Position of seta on the style [3.43]

SAMPLING AREA: West of Western Palaearctic Region [3.42]

MALE HEAD: Palpal formula [3.37]

MALE HEAD: AIII / L (µm) [3.35]

ANTENNA: Length of AIII [3.34]

MALE HEAD: Antennal Formula [3.32]

MALE GENITALIA: Epandrial lobe (Surstyle) / gonocoxite ratio (µm) [3.18]

MALE GENITALIA: Paramere [3.15]

MALE GENITALIA: Epandrial lobe (Surstyle) [3.11]

MALE PHARYNX: Presence of pharyngeal teeth [3.1]

FEMALE HEAD: Palpal formula [3.0]

States : 4

Submit

OR

1. Gonocoxite with small basal lobe (Phlebotomus subgenus) (4)

2. Gonocoxite with developed and simple basal lobe that bears most of the hairs on the terminal surface (Paraphlebotomus, Synphlebotomus subgenera) (14)

3. Gonocoxite with developed and complex basal lobe that bears most of the hairs on the ventral surface (Paraphlebotomus subgenus) (1)

4. Gonocoxite without basal lobe (Other subgenera) (65)

Reset

Definition

Remaining items : 84

MALE GENITALIA: Gonocoxite with or without basal lobe [2/2]

0.0 1.0 2.0 3.0 4.0 5.0

Zoom 1:1

<< < > >>

Resource File ?

1

2

3

4

Double-click to close this window

Scale 100% - Weight 1024 x 768

Phlebotomus

Phlebotomus kabulensis (F) (1)

Phlebotomus kandelakli s.l. (F) (1)

select the 3rd state
and submit

PhlebKeyTool

File Edit Identification Tools Publish Options Window Help

Identification

PHLEBKEYTOOL V.1 [en]

Reset

Descriptors Description in progress

Descriptors : 22

Filter by group

All groups

Xper original sort

SAMPLING AREA: West of Western Palaearctic Region

SAMPLING AREA: South of Western Palaearctic Region

SAMPLING AREA: East of Western Palaearctic Region

THORAX: Wings

MALE GENITALIA: Paramere

ANTENNA: Length of A III

FEMALE HEAD: Palpal formula

MALE CIBARIUM: Cibarial armature

MALE GENITALIA: Aedeagal duct / sperm pump ratio (µm)

MALE GENITALIA: Epandrial lobe (Surstyle)

MALE GENITALIA: Epandrial lobe (Surstyle) / gonocoxite ratio (µm)

MALE GENITALIA: General shape of aedeagus (Parameral sheath)

MALE GENITALIA: Gonostyle

MALE GENITALIA: Position of gonocoxal hairs

MALE GENITALIA: Position of seta on the style

MALE HEAD: Antennal Formula

MALE HEAD: AIII / L (µm)

MALE HEAD: Palpal formula

MALE PHARYNX: Presence of pharyngeal teeth

MALE GENITALIA: Number of hairs on the gonocoxal basal lobe (Average)

MALE GENITALIA: Length of gonostyle

MALE GENITALIA: Position of the apical spines on the gonostyle

State : 0

Submit

OR

Definition

Phlebotomus caucasicus (M)

Phlebotomus caucasicus Marznowsky, 1917

Subgenus: Paraphlebotomus Theodor, 1948

Males of *P. caucasicus* is easily distinguished from the other *Paraphlebotomus* males by its characteristic, complex gonocoxal basal lobe.

Images

3. Phlebotomus caucasicus (M)

4. Phlebotomus caucasicus (M)

5. Phlebotomus caucasicus (M)

Title

Description

Remaining items : 1

Phlebotomus caucasicus (M)

Discarded items : 167

Phlebotomus alexandri (F) (1)

Phlebotomus alexandri (M) (1)

Phlebotomus anatolicus (F) (1)

Phlebotomus anatolicus (M) (1)

Phlebotomus andrejevi (F) (1)

Phlebotomus andrejevi (M) (1)

Phlebotomus ansarii (F) (1)

Phlebotomus ansarii (M) (1)

Phlebotomus arabicus (F) (1)

Phlebotomus arabicus (M) (1)

Phlebotomus ariasi (F) (1)

Phlebotomus ariasi (M) (1)

Phlebotomus balcanicus (F) (1)

Phlebotomus balcanicus (M) (1)

Phlebotomus bergeroti (F) (1)

Phlebotomus bergeroti (M) (1)

Phlebotomus brevis (F) (1)

Phlebotomus brevis (M) (1)

Phlebotomus canaaniticus (F) (1)

Phlebotomus canaaniticus (M) (1)

Phlebotomus caucasicus (F) (1)

Phlebotomus chabaudi (F) (1)

Phlebotomus chabaudi (M) (1)

Phlebotomus chadlii (F) (1)

End of identification

Your specimen seems to be the item 'Phlebotomus caucasicus (M)'

OK

PhlebKeyTool

File Edit Identification Tools Publish Options Window Help

Identification

PHLEBKEYTOOL V.1 [en]

Reset

Descriptors Description in progress

Definition

Descriptors : 22

Filter by group

Xper orig

SAMPLING AREA: West of W

SAMPLING AREA: South of W

SAMPLING AREA: East of W

THORAX: Wings

MALE GENITALIA: Paramere

ANTENNA: Length of A III

FEMALE HEAD: Palpal formula

MALE CIBARIUM: Cibarial an

MALE GENITALIA: Aedegial d

MALE GENITALIA: Epandrial

MALE GENITALIA: General st

MALE GENITALIA: Gonostyle

MALE GENITALIA: Position of

MALE HEAD: Antennal Formu

MALE HEAD: AIII / L (µm)

MALE HEAD: Palpal formula

MALE PHARYNX: Presence o

MALE GENITALIA: Number of

MALE GENITALIA: Length of

MALE GENITALIA: Position of

State : 0

Submit


Phlebotomus caucasicus (M)


Phlebotomus caucasicus (M)


Phlebotomus caucasicus Marzinowsky, 1917


Subgenus: Paraphlebotomus Theodor, 1948


Males of *P. caucasicus* is easily distinguished from the other *Paraphlebotomus* males by its characteristic, complex gonocoxal basal lobe.











Phlebotomus caucasicus (M)

Phlebotomus caucasicus (M)

Phlebotomus caucasicus (M)

Phlebotomus caucasicus (M)

Phlebotomus caucasicus (M)

● Female or Male : 2. Male

SAMPLING AREA

● SAMPLING AREA: West of Western Palaearctic Region : [not described](#)

● SAMPLING AREA: South of Western Palaearctic Region : [not described](#)

● SAMPLING AREA: East of Western Palaearctic Region : Armenia ; Azerbaijan ; Georgia ; Iran ; Turkey (Anatolia)

FEMALE GENITALIA

FEMALE HEAD

● ANTENNA: Length of A III : 2. A III > A IV + A V

● FEMALE HEAD: Palpal formula : [not described](#)

MALE GENITALIA

● MALE GENITALIA: Gonostyle : 2. Short and bears 4 long spines, both median and apical spines present

● MALE GENITALIA: Paramere : 1. Unilobed

● MALE GENITALIA: Gonocoxite with or without basal lobe : 3. Gonocoxite with developed and complex basal lobe that bears most of the hairs on the ventral surface (Paraphlebotomus subgenus)


● MALE GENITALIA: General shape of gonostylus (Paramerulobes) : 1. Short and conical

Save Print Close

Remaining items : 1

Phlebotomus caucasicus (M) [1/5]


0.0 1.0 2.0 3.0 4.0 5.0 Zoom 1:1 << < > >>



Phlebotomus caucasicus

Phlebotomus caucasicus (M) [5/5]

0 1.0 2.0 3.0 4.0 5.0 Zoom 1:1 << < > >> Resource



PhlebKeyTool

File Edit Identification Tools Publish Options Window Help

PHLEBKEYTOOL V.1 [en]

Descriptors | Description in progress |

Descriptors : 5

Filter by group

All groups

Best descriptor?

SAMPLING AREA: West of Western Palaearctic Region

SAMPLING AREA: South of Western Palaearctic Region

SAMPLING AREA: East of Western Palaearctic Region

Female or Male

THORAX: Wings

States : 48

Submit

OR

Albania (12)

Austria (2)

Azores (0)

Balearic Islands (8)

Belgium (2)

Bosnia & Herzegovina (14)

Bulgaria (20)

Corsica (10)

Crete (22)

Croatia (14)

Czech Republic (0)

Denmark (0)

Estonia (0)

Faroe Islands (0)

Finland (0)

France (continental) (16)

Germany (6)

Greece (30)

Hungary (8)

Iceland (0)

Ireland (0)

Italy (continental) (18)

Kaliningrad Oblast (0)


Kosovo (14)

Definition

SAMPLING AREA: West of Western Palaearctic Region

To avoid misidentifications of newly introduced species we encourage you to select neighbouring countries. This can be done buy using the CTRL button.

Images



1. SAMPLING AREA: W...

Title

SAMPLING AREA: West of Western F

Description

Reset

Remaining items : 168

Phlebotomus alexandri (F)

Phlebotomus alexandri (M)

Phlebotomus anatolicus (F)

Phlebotomus anatolicus (M)

Phlebotomus andrejevi (F)

Phlebotomus andrejevi (M)

Phlebotomus canaaniticus (M)

Phlebotomus caucasicus (F)

Phlebotomus caucasicus (M)

Phlebotomus chabaudi (F)

Phlebotomus chabaudi (M)

Phlebotomus chadlii (F)

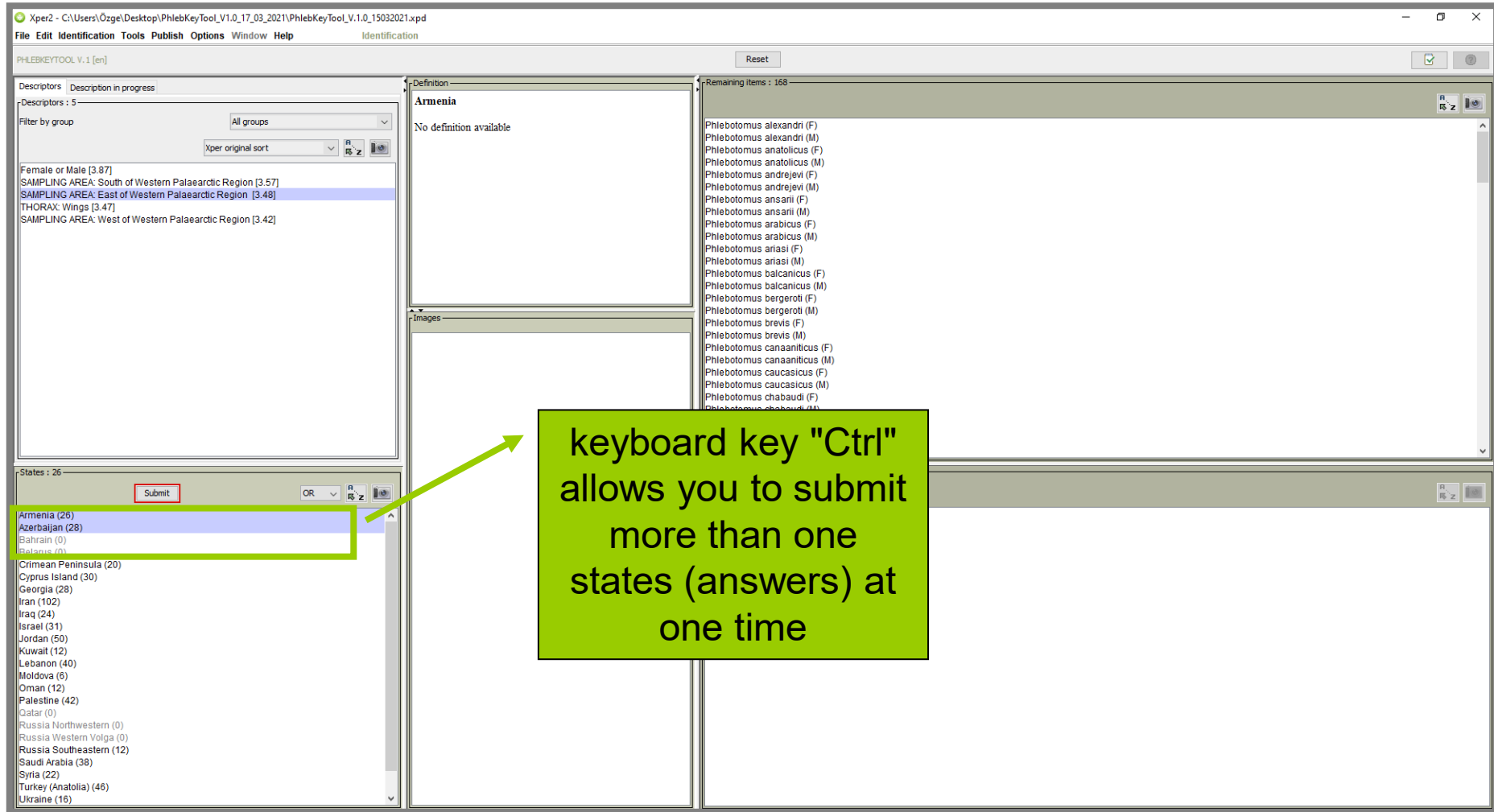
Phlebotomus chadlii (M)

Phlebotomus chinensis (F)

Discarded items : 0

Click on 'reset' to start a new specimen identification

PhlebKeyTool



PhlebKeyTool

PhlebKeyTool V.1 [en]

Descriptors : 14

Filter by group

- All groups
- SAMPLING AREA
- FEMALE GENITALIA
- FEMALE HEAD
- MALE GENITALIA
- MALE HEAD
- THORAX

FEMALE CIBARIUM: Cibarial armature [4.0]

FEMALE GENITALIA: Base of spermathecal ducts [3.52]

SAMPLING AREA: South of Western Palearctic [3.49]

FEMALE GENITALIA: Number of spermathecal elements (pairs) [3.49]

FEMALE GENITALIA: Terminal knob [3.52]

SAMPLING AREA: West of Western Palearctic Region [3.49]

FEMALE GENITALIA: General shape of spermatheca [3.49]

FEMALE GENITALIA: Spermathecal ducts [3.4]

FEMALE HEAD: All / L (µm) [3.35]

FEMALE HEAD: Palpal formula [3.27]

THORAX: Wings [3.22]

ANTENNA: Length of A III [3.19]

FEMALE GENITALIA: Width and surface of spermathecal ducts [3.12]

FEMALE HEAD: Antennal formula [3.04]

Definition

FEMALE CIBARIUM: Cibarial armature

No definition available

Reset

Remaining items : 17

Phlebotomus alexandri (F)

Images

1. FEMALE CIBARIUM: ...

2. FEMALE CIBARIUM: ...

States : 2

Submit

OR

1. With well developed teeth (2)

2. Without teeth or with rudimentary teeth (15)

Discarded items : 151

- Phlebotomus alexandri (M) (1)
- Phlebotomus anatolicus (F) (1)
- Phlebotomus andrejevi (F) (1)
- Phlebotomus ansarii (F) (1)
- Phlebotomus arabicus (F) (1)
- Phlebotomus ariasi (F) (1)
- Phlebotomus balcanicus (M) (1)
- Phlebotomus bergeroti (F) (1)
- Phlebotomus brevis (M) (1)
- Phlebotomus canaaniticus (F) (1)
- Phlebotomus caucasicus (M) (1)
- Phlebotomus chabaudi (F) (1)
- Phlebotomus chadlii (F) (1)
- Phlebotomus chinensis (F) (1)
- Phlebotomus comatus (F) (1)
- Phlebotomus duboscqi (F) (1)
- Phlebotomus economidesi (F) (1)
- Phlebotomus eleanorae (F) (1)
- Phlebotomus fortunatarum (F) (1)
- Phlebotomus halepensis (M) (1)
- Phlebotomus ilami (F) (1)
- Phlebotomus jacusieli (M) (1)
- Phlebotomus kabulensis (F) (1)
- Phlebotomus kandelakii s.l. (M) (1)

PhlebKeyTool

PhLEBKEYTOOL V.1 [en]

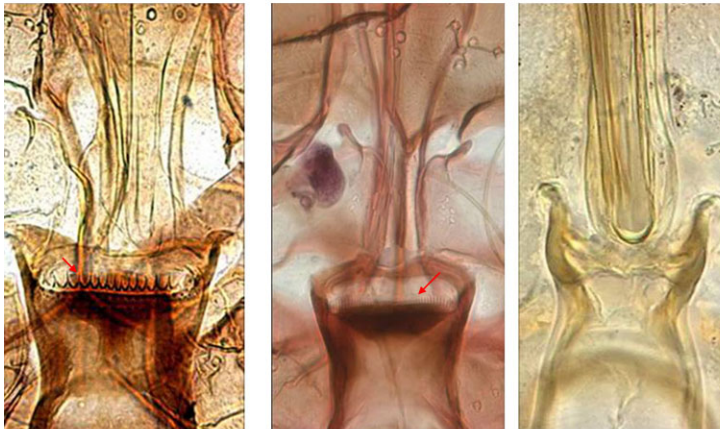
Descriptors : 5
Filter by group
Xper original sort

FEMALE CIBARIUM: Cibarial armature [4.0]
FEMALE HEAD: AIII / L (µm) [3.35]
FEMALE HEAD: Palpal formula [3.27]
ANTENNA: Length of AIII [3.19]
FEMALE HEAD: Antennal formula [3.04]

States : 2
Submit
OR
1. With well developed teeth (2)
2. Without teeth or with rudimentary teeth (15)

Definition
FEMALE CIBARIUM: Cibarial armature [2/2]
Remaining items : 17

0.0 1.0 2.0 3.0 4.0 5.0
Zoom 1:1
<< < > >>
Resource File ?



1 1 2

Jérôme Depaquit and Nicole Léger Collection

Scale 100% - Weight 1024 x 768
Description
Phlebotomus jacusii (M) (1)
Phlebotomus kabulensis (F) (1)
Phlebotomus kandakii s.l. (M) (1)

select the first state then submit

PhlebKeyTool

File Edit Identification Tools Publish Options Window Help

PHLEBKEYTOOL V.1 [en]

Descriptors | Description in progress

Descriptors : 14

Filter by group

FEMALE HEAD

Xper original sort

FEMALE HEAD: Palpal formula [4.0]

FEMALE HEAD: AIII / L (µm) [4.0]

FEMALE CIBARIUM: Alignment of the cibarial teeth [4.0]

FEMALE CIBARIUM: Shape and/or size of median and lateral cibarial teeth [4.0]

FEMALE CIBARIUM: Number of cibarial teeth [4.0]

FEMALE CIBARIUM: Anterior teeth [4.0]

FEMALE PHARYNX: Pharyngeal armature [4.0]

ANTENNA: Length of A III [3.0]

FEMALE HEAD: Antennal formula [3.0]

FEMALE CIBARIUM: Tip of cibarial teeth [3.0]

FEMALE CIBARIUM: Pigmented area [3.0]

FEMALE CIBARIUM: Presence of notch [3.0]

FEMALE CIBARIUM: Shape of pigmented area [3.0]

FEMALE PHARYNX: Shape of posterior pharynx [3.0]

States : 7

Submit

OR

1 1 - 2 - 3 - 4 - 5 (1)

2 1 - 2 - (3 - 4) - 5 (0)

3 1 - 2 - 4 - 3 - 5 (1)

4 1 - (2 - 4) - 3 - 5 (0)

5 1 - 4 - 2 - 3 - 5 (0)

6 1 - 4 - (2 - 3) - 5 (0)

7 1 - 4 - 3 - 2 - 5 (0)

Definition

FEMALE HEAD: Palpal formula

The relative lengths of the segment are expressed as the palp formula in which the segments are listed in ascending order of length.

Remaining items : 2

Sergentomyia palestinesis (F)

Sergentomyia pawlowskyi (F)

FEMALE HEAD: Palpal formula [1/1]

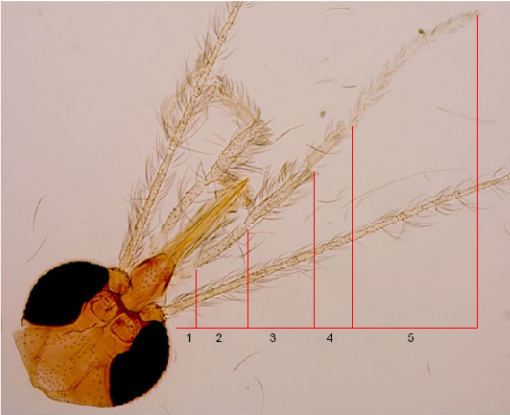
0.0 1.0 2.0 3.0 4.0 5.0

Zoom 1:1

Resource

File

?



Palpal Formula

Scale 90% - Weight 921 x 691

select the first state then submit

PhlebKeyTool

Xper2 - C:\Users\Özge\Desktop\PhlebKeyTool_V1.0_17_03_2021\PhlebKeyTool_V1.0_15032021.xpd

File Edit Identification Tools Publish Options Window Help

PHLEBKEYTOOL V.1 [en]

Reset

Checkmark icon

Help icon

Descriptors Description in progress

Descriptors : 13

Filter by group

FEMALE HEAD


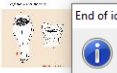

Xper original sort

ANTENNA: Length of A III
FEMALE HEAD: All / L (µm)
FEMALE HEAD: Antennal formula
FEMALE CIBARIUM: Alignment of the cibarial teeth
FEMALE CIBARIUM: Shape and/or size of median and lateral cibarial teeth
FEMALE CIBARIUM: Tip of cibarial teeth
FEMALE CIBARIUM: Number of cibarial teeth
FEMALE CIBARIUM: Anterior teeth
FEMALE CIBARIUM: Pigmented area
FEMALE CIBARIUM: Presence of notch
FEMALE CIBARIUM: Shape of pigmented area
FEMALE PHARYNX: Shape of posterior pharynx
FEMALE PHARYNX: Pharyngeal armature

Definition

Sergentomyia palestinensis (F)
Sergentomyia palestinensis (Adler & Theodor, 1927)
Subgenus: *Parrotomyia* Theodor, 1958

Images



1. Sergentomyia palest...

2. Sergentomyia

3. Sergentomyia palest...

Title

Description

Remaining items : 1

Sergentomyia palestinensis (F)

Discarded items : 167

Phlebotomus balcanicus (F) (1)
Phlebotomus brevis (F) (1)
Phlebotomus halepensis (F) (1)
Phlebotomus mongolensis (F) (1)
Phlebotomus similis (F) (1)
Phlebotomus tobii (F) (1)
Sergentomyia africana africana (F) (1)
Sergentomyia africana asiatica (F) (1)
Sergentomyia bedfordi (F) (1)
Sergentomyia cincta (F) (1)
Sergentomyia dreyfussi (F) (1)
Sergentomyia eremilis (F) (1)
Sergentomyia fallax (F) (1)
Sergentomyia fallax fallax (F) (1)
Sergentomyia hirta (F) (1)
Sergentomyia iranica (F) (1)
Sergentomyia lewisi (F) (1)
Sergentomyia mervynae (F) (1)
Sergentomyia pawlowskyi (F) (1)
Sergentomyia squamipleuris (F) (1)
Sergentomyia talai (F) (1)
Phlebotomus alexandri (F) (2)
Phlebotomus arabicus (F) (2)
Phlebotomus canaaniticus (F) (2)

End of identification

Your specimen seems to be the item 'Sergentomyia palestinensis (F)'

OK

PhlebKeyTool

- Missing data for some taxa
- Missing pictures and/or drawings for some taxa and descriptors
- No molecular data is available
- The first version is open to improvements
- Feedbacks and contributions are welcome

<https://mivegec.ird.fr/en/identiciels-en-gb-8?Itemid=523&>



PhlebKeyTool (The phlebotomine sandflies of Europe, Mediterranean area, Middle-East, Arabian Peninsula and Iran). Identification tool for males and females of 84 species and sub-species of Phlebotominae (52 *Phlebotomus* et 32 *Sergentomyia*). A single common basis for genus, species and sub-species identification.

The dataset has been developed in the framework of the European project MediLabSecure by a consortium coordinated by Dr Ozge Erisoz and Pr. Bulent Alten's lab (VERG) in Hacettepe Univ, Ankara, Turkey

Erisoz Kasap O, Depaquit J, Rahola N, Haddad N, Gunay F, Akhoundi M, Dvorak V, Ivovic V, Ozbel Y, Sawalha S, Picard M, Robert V & Alten B (2021) PhlebKeyTool, identification of phlebotomine sandfly species in Europe, Mediterranean area and Middle-East, Version 1. Version 1, posted 23/03/2021



[Download the database](#)



[Version HTML](#)

How to install this identification tool ?

1. Download and install the Xper2 identification software

Version 2.3.2 for [Windows XP/Vista/7 / Linux / MacOS X \(>10.10\) / MacOS X \(<10.11\)](#). More infos on [Xper2](#).

2. Download the arthropod database (.zip file) of your choice.

Extract the zip archive inside a directory, you must have 1 folder and 4 files:

folder " images"

file "[name of the database].xpd"

file "[name of the database].xpx"

file "[name of the database].xpw"

file "[name of the database].xpr"

3. Open the Xper2 software .

Go to File -> Open a Database, and select the file "[name of the database].xpd"

THANK YOU FOR YOUR ATTENTION !