



A database for Soil Invertebrate
Biological and Ecological Traits

<https://portail.betsi.cnrs.fr/>

From 01/03/2020 to 01/03/2021 :

New members

39/154 consortium members

New data

> 15 000

New traits informed

> 20

New taxonomical groups

Acari & Gastropoda

More European species

(Roumania, Italy, Spain, Poland...)

Some very well informed traits

90 - 100% of french species informed for spatial niche and/or body length...



Arachnida (mainly Aranae)

New Group : Acari

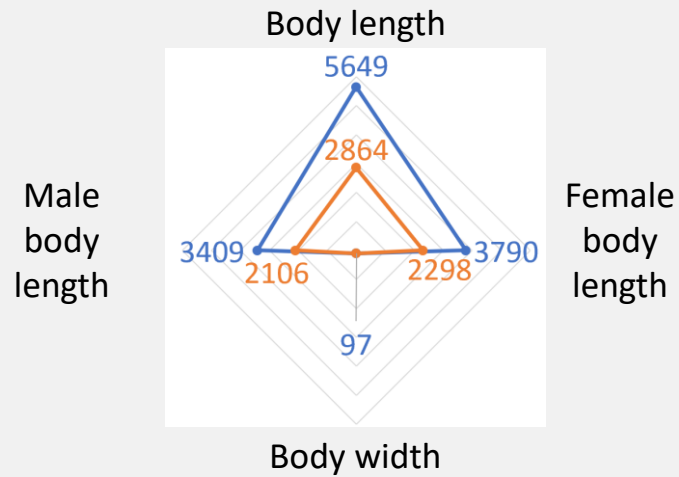
Body length, Diet, Reproduction

3 000 New data on Aranae

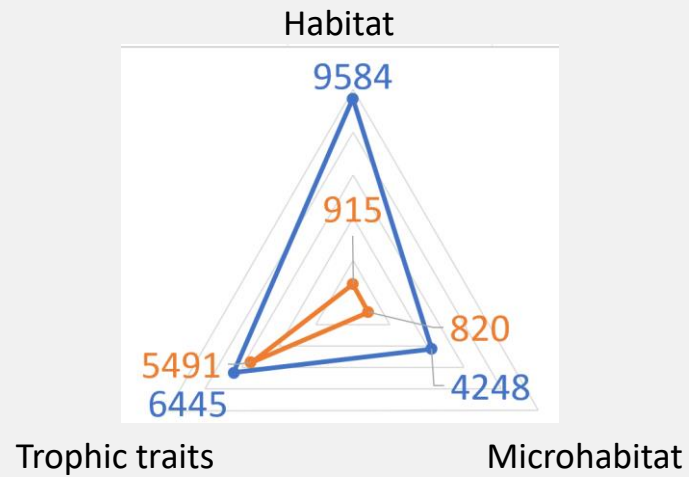
Body length, Balloning,
Circadian rhythm, Diet,
Foraging, Habitat,
Microhabitat, Humidity



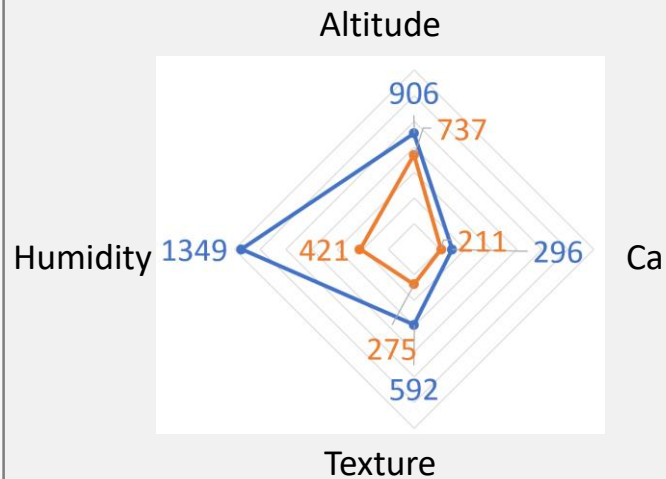
Morphological traits



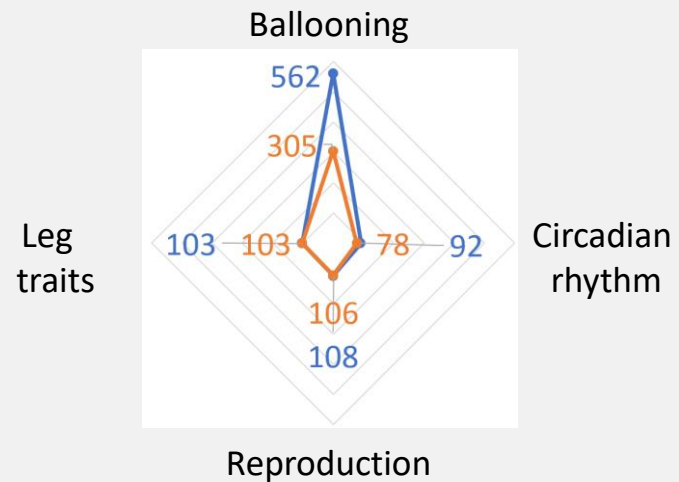
Spatial and trophic niche



Abitotic preferences



Other key traits



Arachnida



22 traits
538 references
5 511 species
59 536 recorded data

Contributors :

Baillo, A., Hedde, M., Nahmani J.

Legend :

—●— Number of data

—●— Number of species informed

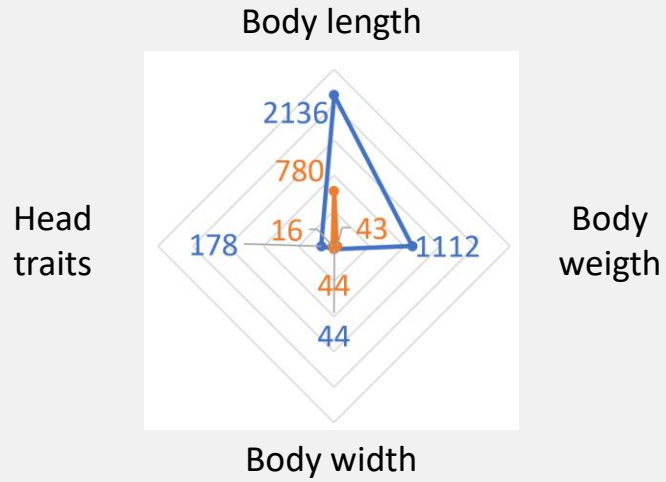
Coleoptera (Mainly Carabidae)



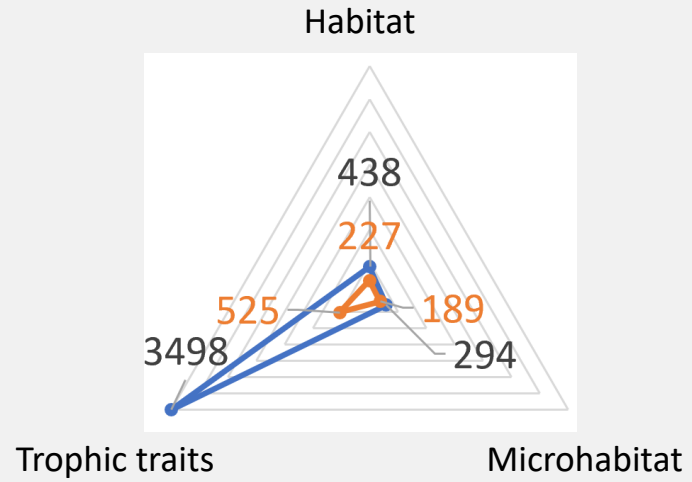
2 500 New data :

Altitude, Body length, Clutch size, Habitat, Humidity, Eye diameter, Leg & Wing traits, Circadian rythm

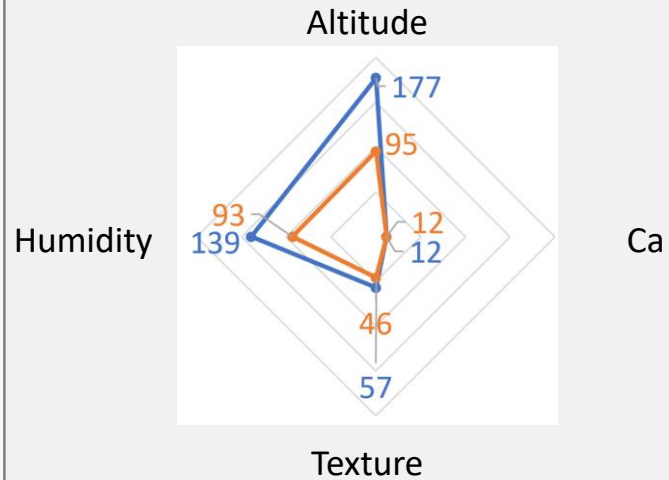
Morphological traits



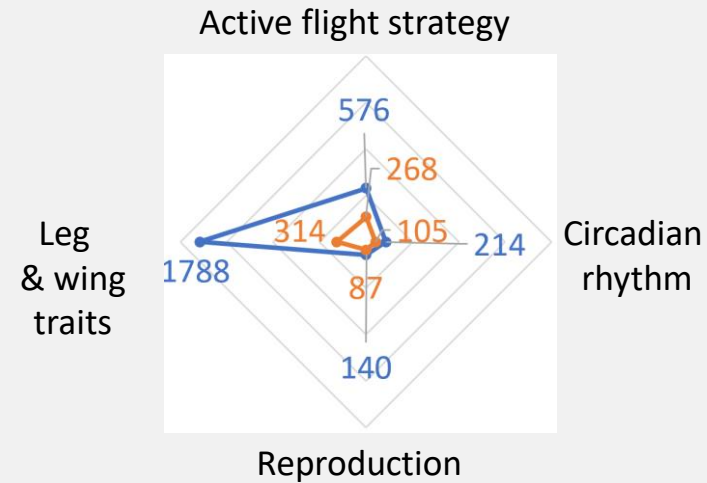
Spatial and trophic niche



Abitotic preferences



Other key traits



Coleoptera



43 traits
1148 references
30290 species
73386 recorded data

Contributors :

Brondani, M., Ganault, P., Hedde, M.,
 Nahmani J.

Legend :

—●— Number of data

—●— Number of species informed

Collembola

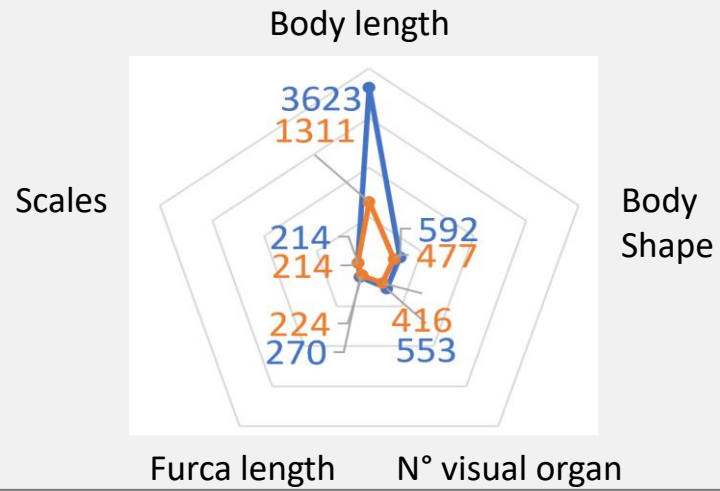
350 New data :

Altitude

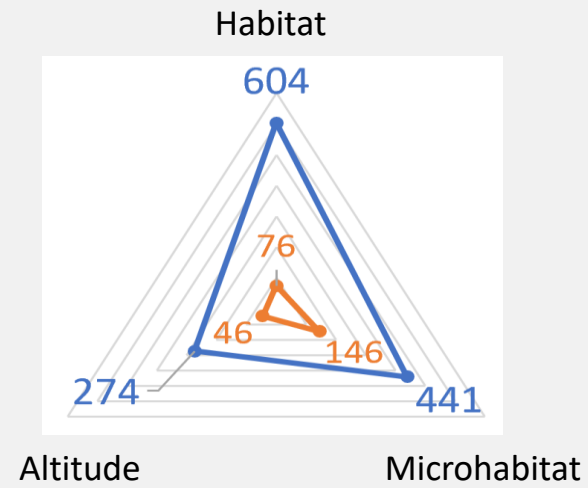
Ecomorphosis



Morphological traits

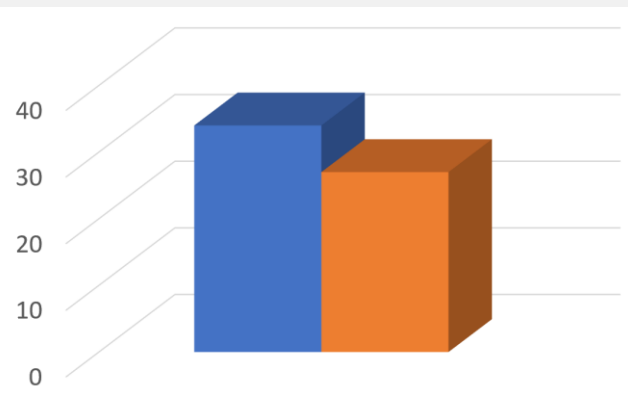


Spatial niche



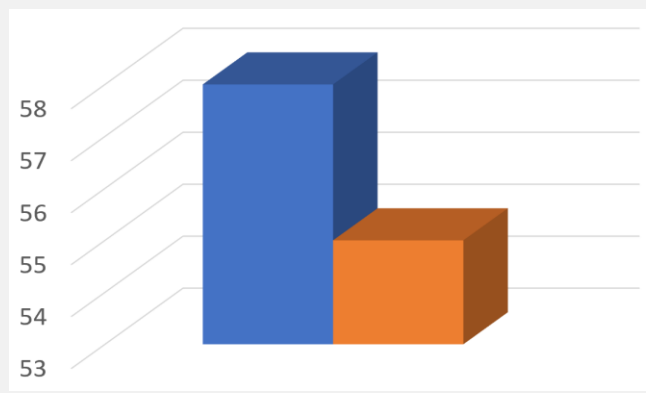
New trait

Ecomorphosis



Other key trait

Pao



Collembola



15 traits

50 references

2 279 species

13 710 recorded data

Contributors :

Bonfanti, J., Cortet, J., Joimel, S., Nahmani, J., Pernin, C., Salmon, S., Santorufo, L., , Vincent, Q.

Legend :

—●— Number of data

—●— Number of species informed

Dermaptera

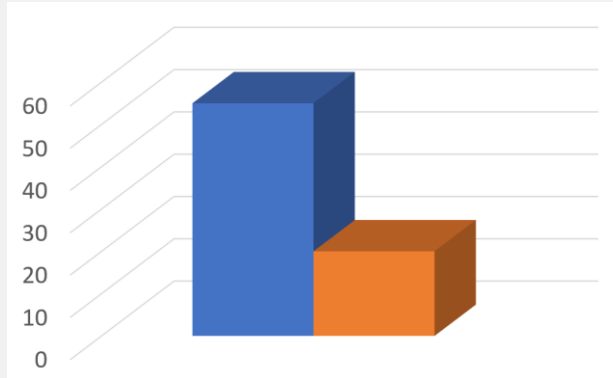
300 New data :

Altitude, Body length
Burrowing, Clutch size
Diet, Microhabitat
Parental care

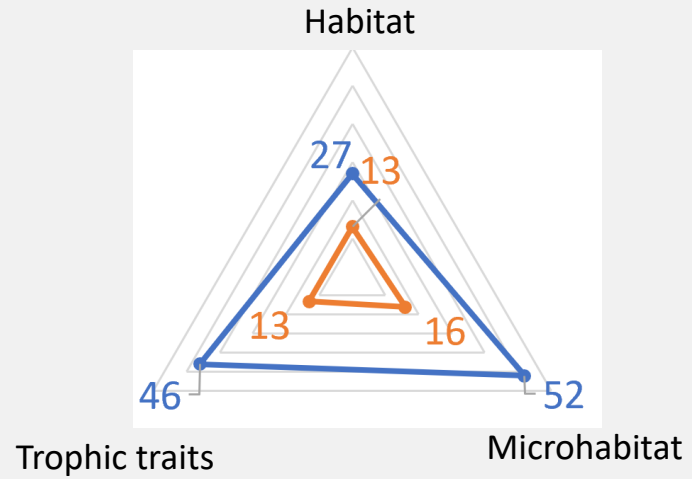


Morphological traits

Body length

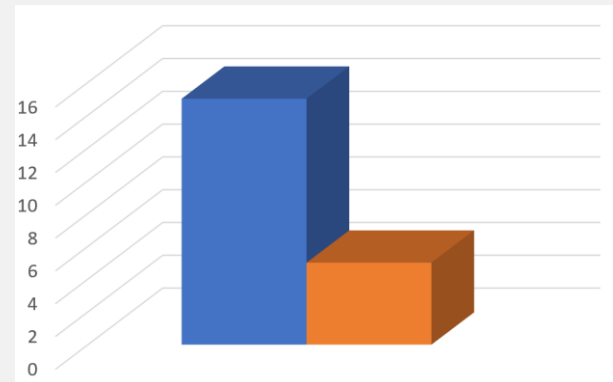


Spatial and trophic niche

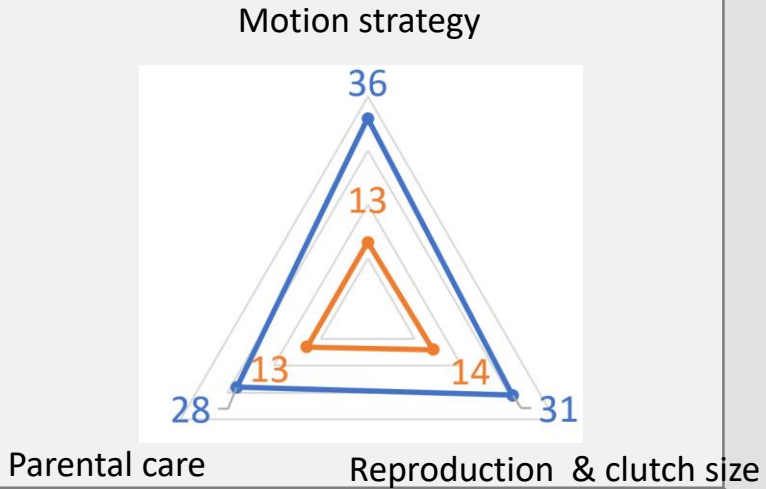


Abitotic preferences

Altitude



Other key traits



Dermaptera



17 traits
7 references
120 species
536 recorded data

Contributors :

Hedde, M., Nahmani J.

Legend :

—●— Number of data

—●— Number of species informed

Gastropoda

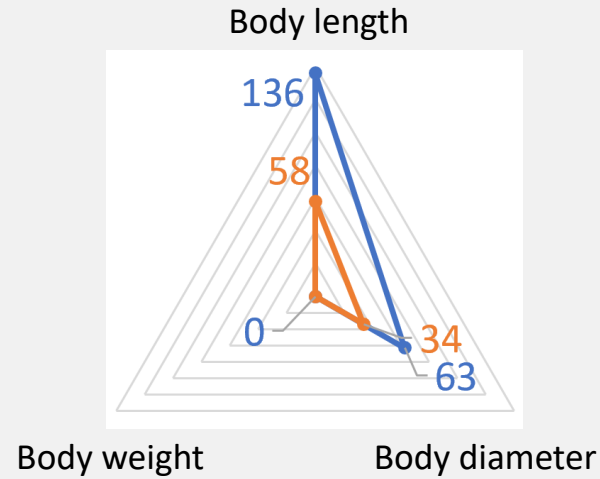
**New
Group!!!**



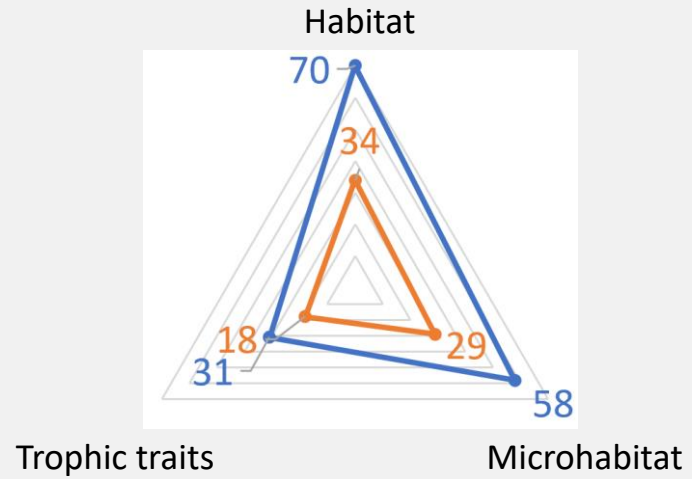
Gastropoda



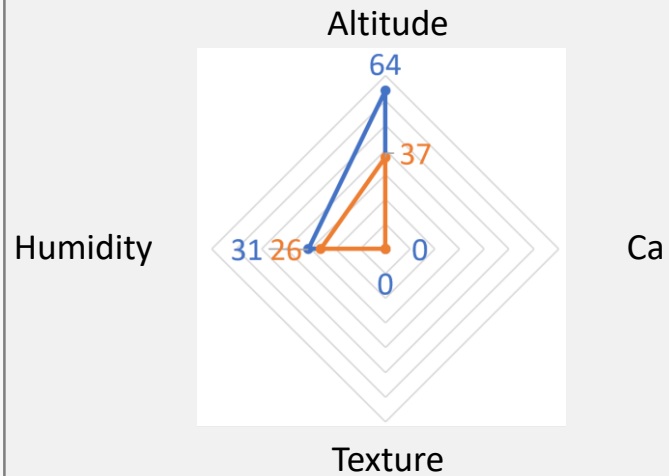
Morphological traits



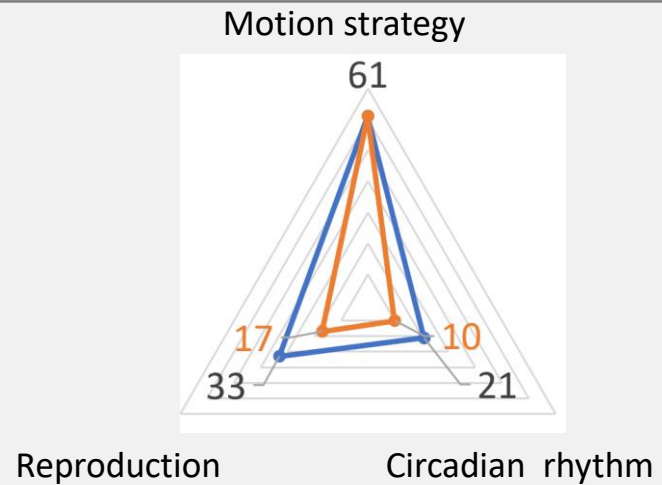
Spatial and trophic niche



Abitotic preferences



Other key traits



14 traits
5 references
68 species
713 recorded data

Contributors :

Hedde, M., Nahmani J.

Legend :

—●— Number of data

—●— Number of species informed

Hymenoptera - Formicidae

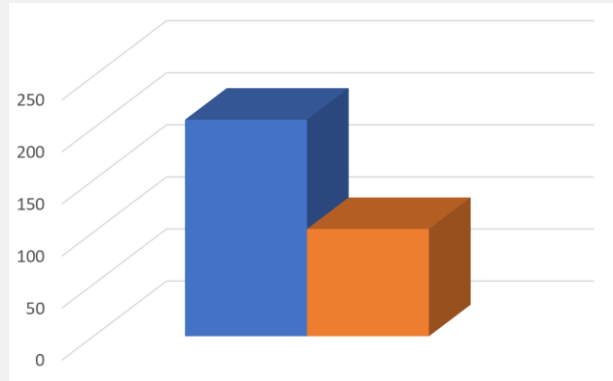
50 New data :

Calcareous & Humidity preferences, Soil texture

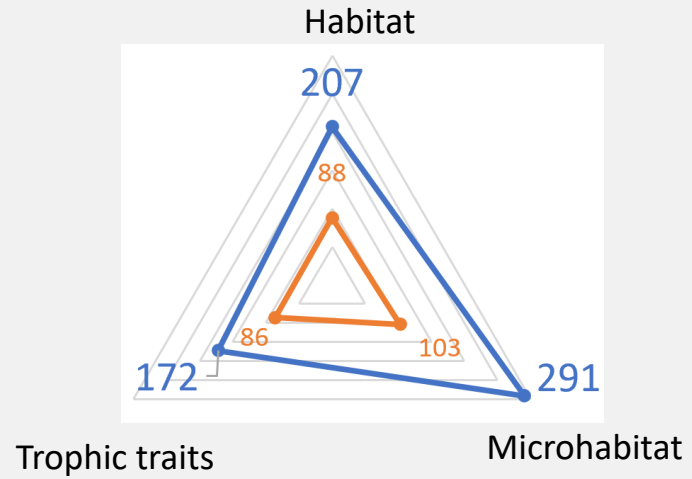


Morphological traits

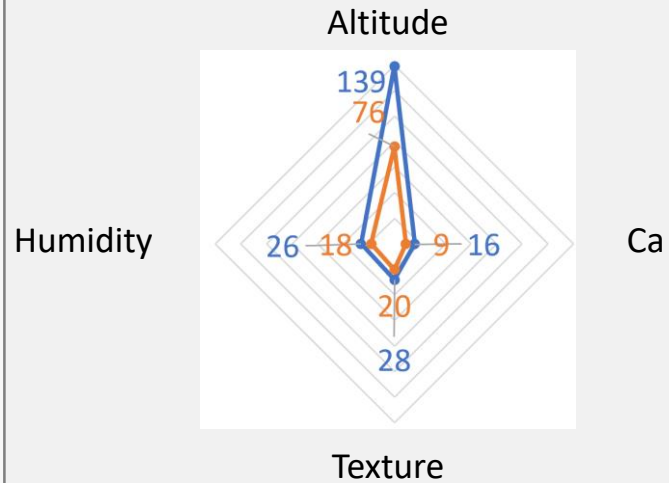
Body length



Spatial and trophic niche



Abitotic preferences



Other key traits

Work in progress...



Hymenoptera



13 traits
10 references
912 species
2995 recorded data

Contributors :

Hedde, M., Nahmani J.

Legend :

—●— Number of data

—●— Number of species informed

Isopoda

2 100 New data:

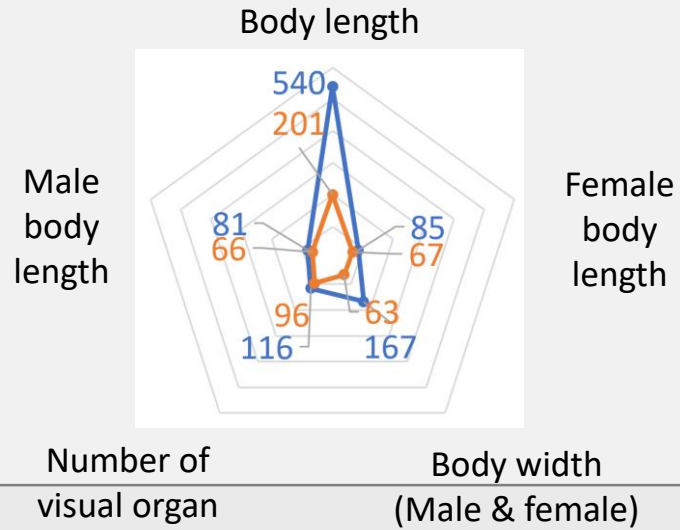
Altitude, Antenna length
Antipredator behaviour
Body length, width, shape
(male & female)



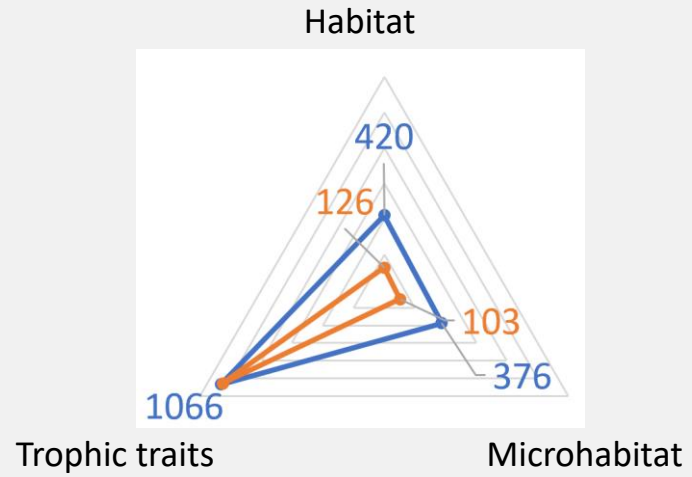
And also :

Clutch size, Diet, Habitat, Microhabitat, n°of visual organs, Reproduction, Soil pH, texture, Burrowing, Calcareous and Humidity preferences, Circadian rhythm

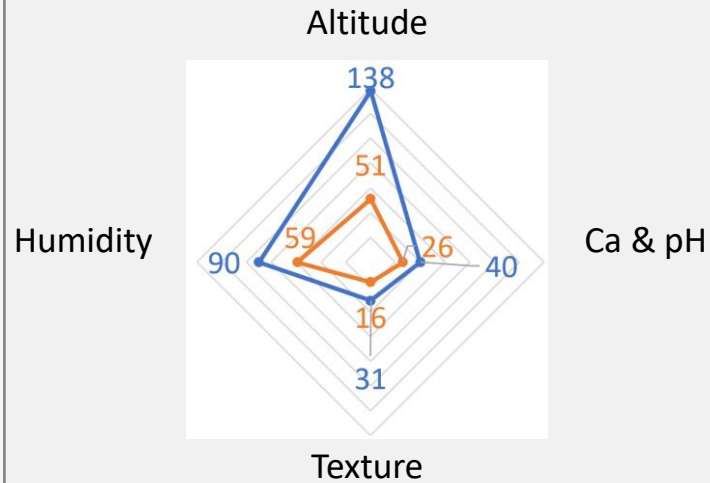
Morphological traits



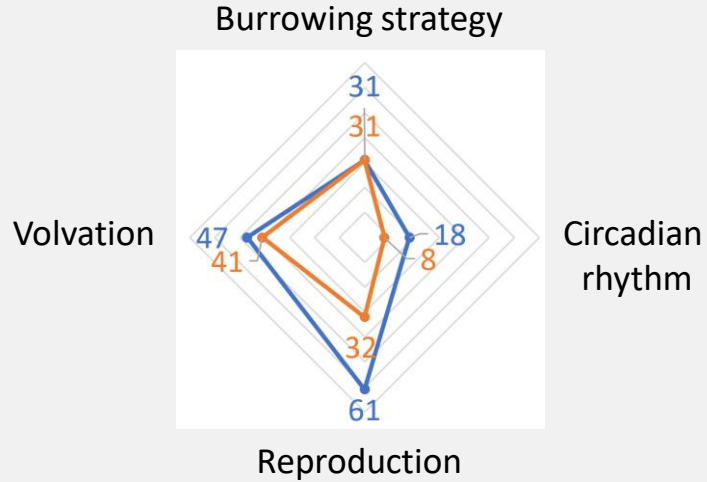
Spatial and trophic niche



Abitotic preferences



Other key traits



Isopoda



29 traits
36 references
1 330 species
8 834 recorded data

Contributors :

Dubs, F., Hedde, M., Nahmani J.

Legend :

—●— Number of data

—●— Number of species informed

Myriapoda - Chilopoda



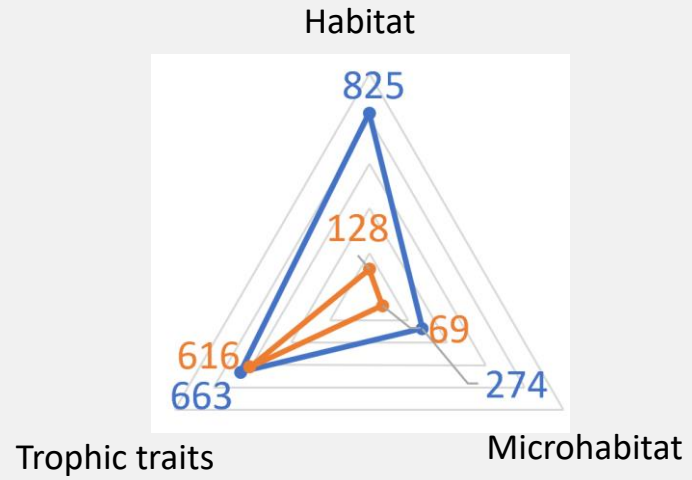
1 700 New data:

Altitude, Body length, Antenna length, Ca & Humidity preferences, Circadian rhythm, Diet, Foraging, Habitat, Microhabitat, Soil texture, Leg length, n° of visual organs, Burrowing, Parental care, Reproduction

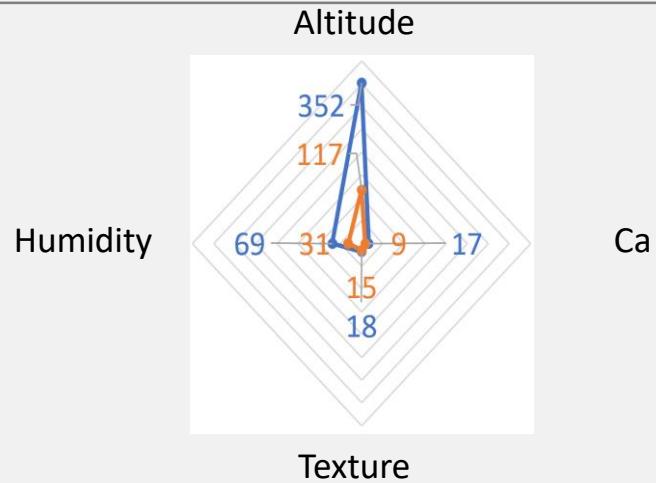
Morphological traits



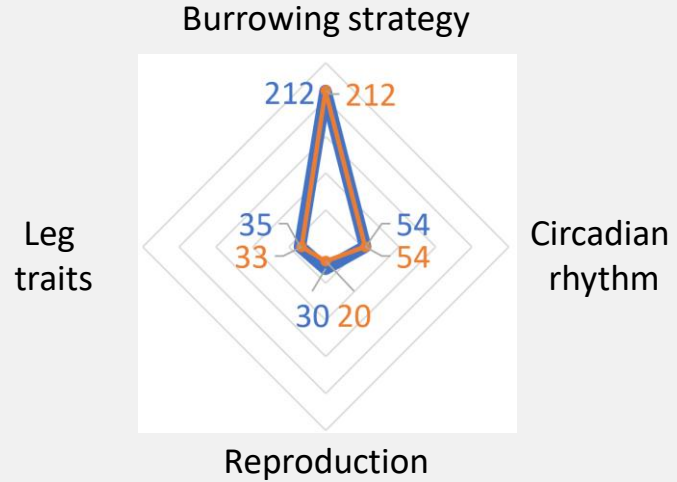
Spatial and trophic niche



Abitotic preferences



Other key traits



Chilopoda



21 traits
54 references
616 species
6511 recorded data

Contributors :

Dubs, F., Hedde, M., Nahmani J.

Legend :

—●— Number of data

—●— Number of species informed

Myriapoda - Diplopoda

2 200 New data:

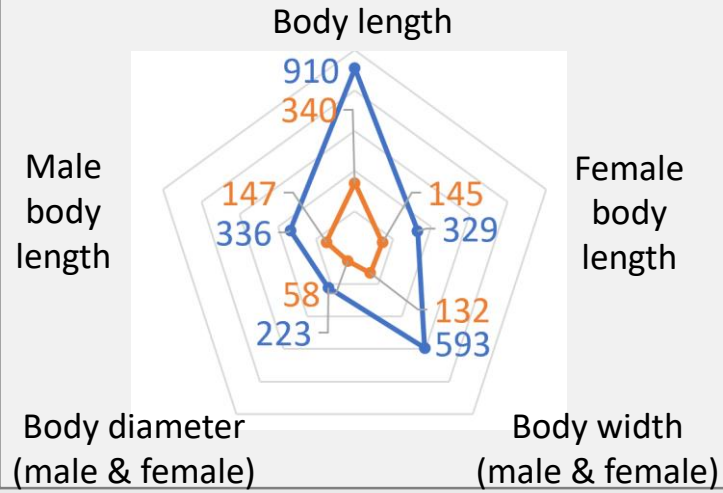
Altitude, Burrowing, Ca and humidity preferences, Body diameter, length, width (male, female)

And also:

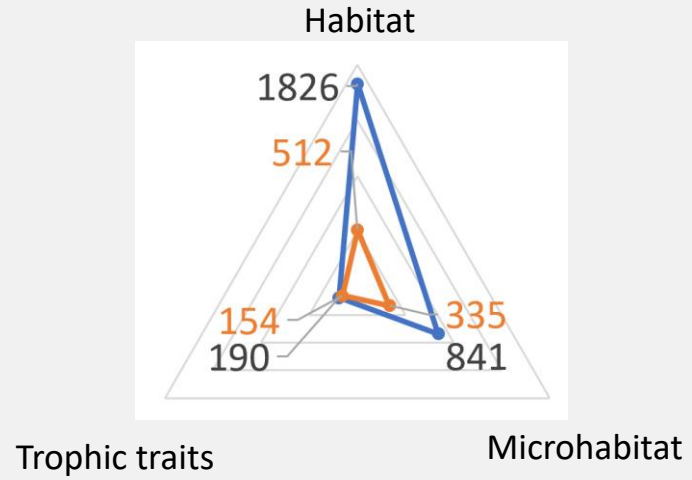
Circadian rhythm, Diet, Habitat, Microhabitat, Leg length, n° of visual organs, Parental care, Clutch size
Reproduction type, Humus, Soil pH, Texture



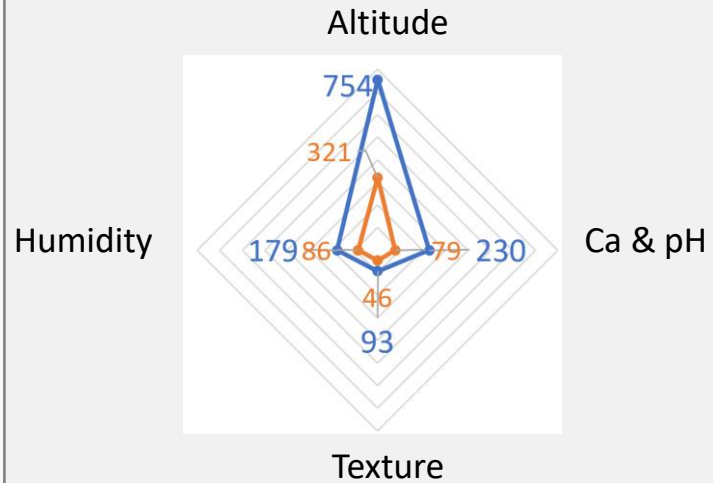
Morphological traits



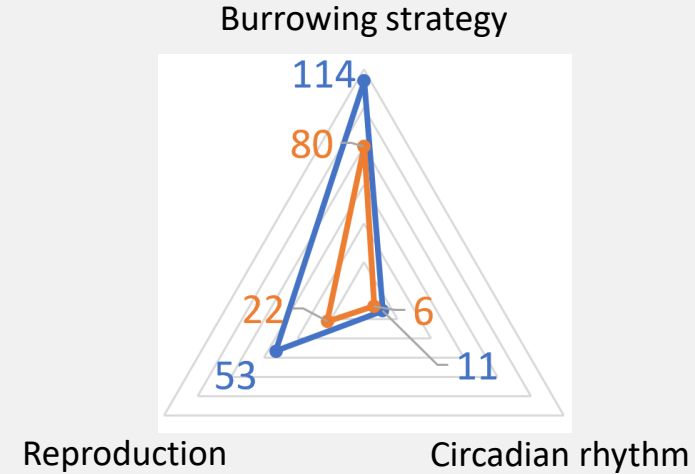
Spatial and trophic niche



Abitotic preferences



Other key traits



Diplopoda



31 traits
193 references
1 889 species
16 140 recorded data

Contributors :

Dubs, F., Hedde, M., Nahmani J.

Legend :

—●— Number of data

—●— Number of species informed

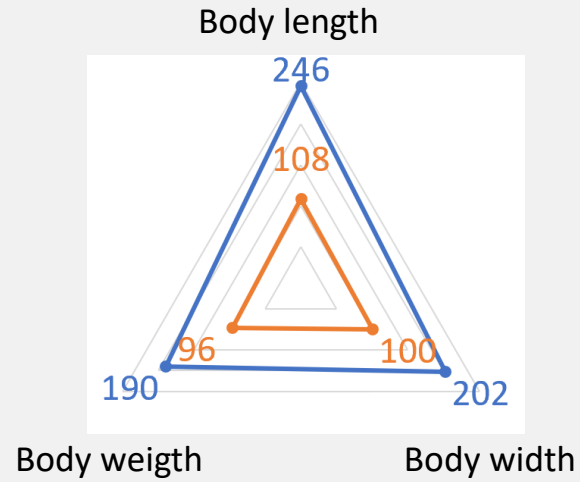
Oligochaeta

1 100 New data:

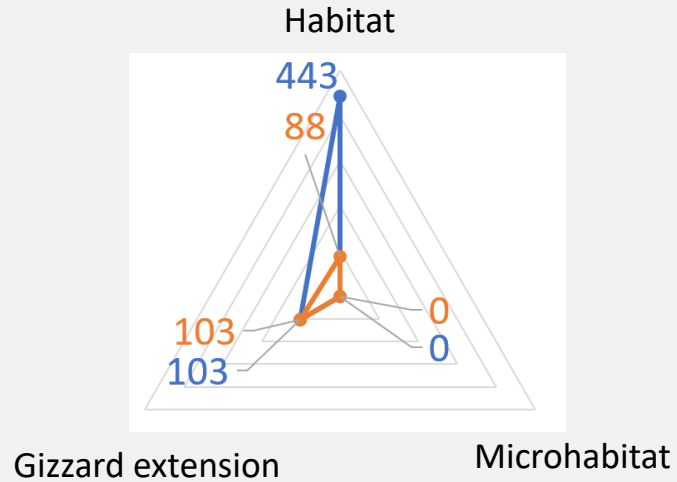
Altitude, Gizzard extension,
Habitat, Soil pH, Carbon,
Nitrogen, C/N



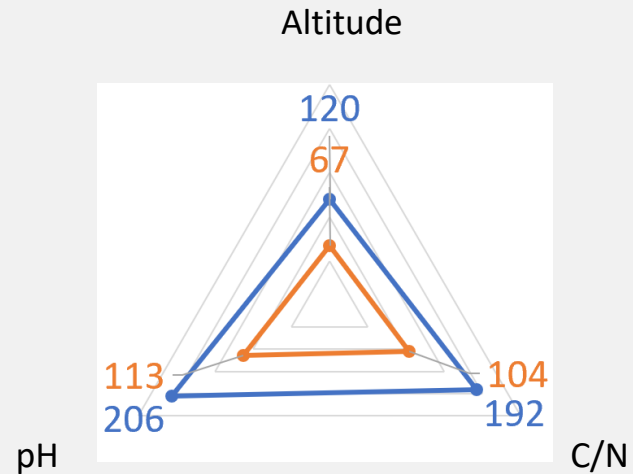
Morphological traits



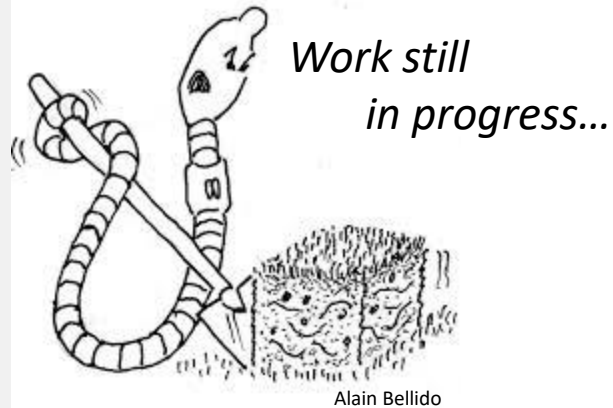
Spatial and trophic niche



Abitotic preferences



Other key traits



Oligochaeta



18 traits
14 references
176 species
2 594 recorded data

Contributors :

Guernion, M., Hedde, M., Nahmani J.,
 Pey, B. Si-Moussi, S.

Legend :

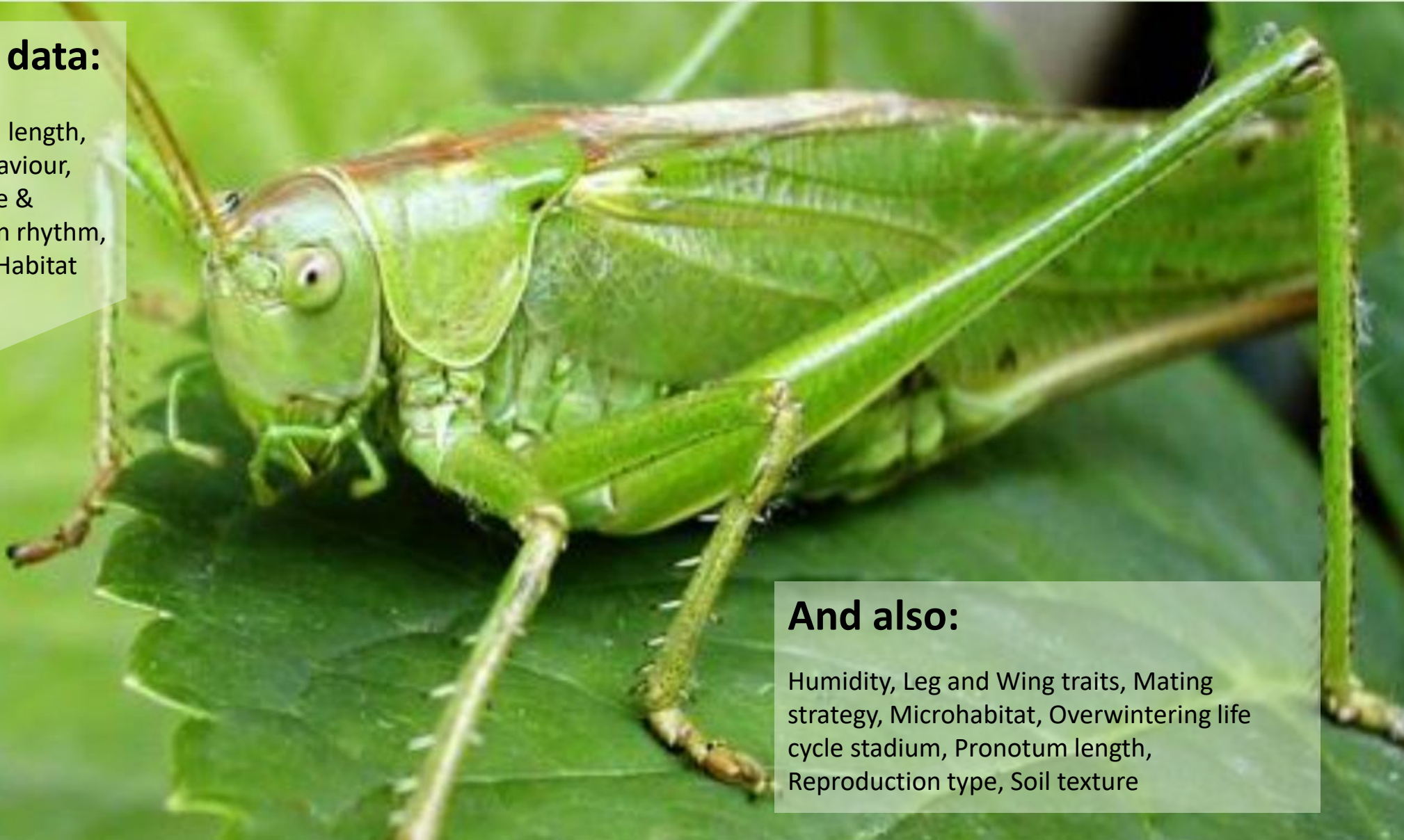
—●— Number of data

—●— Number of species informed

Orthoptera

1 900 New data:

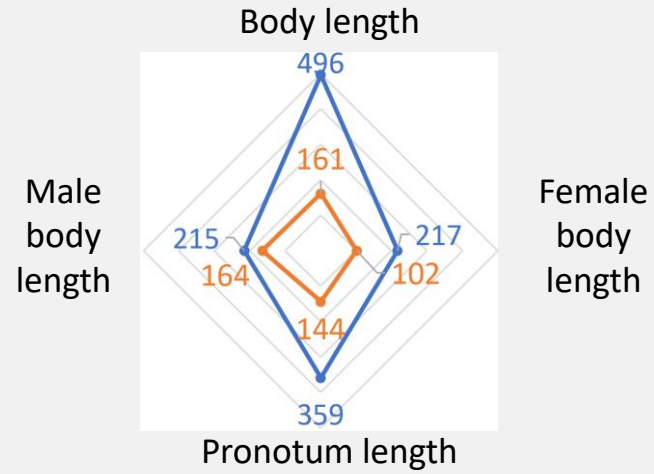
Altitude, Antenna length,
Antipredator behaviour,
Body length (Male &
Female), Circadian rhythm,
Clutch size, Diet, Habitat



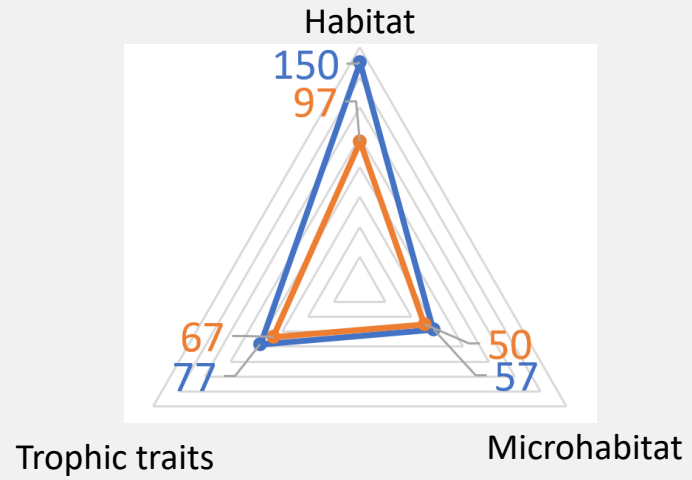
And also:

Humidity, Leg and Wing traits, Mating
strategy, Microhabitat, Overwintering life
cycle stadium, Pronotum length,
Reproduction type, Soil texture

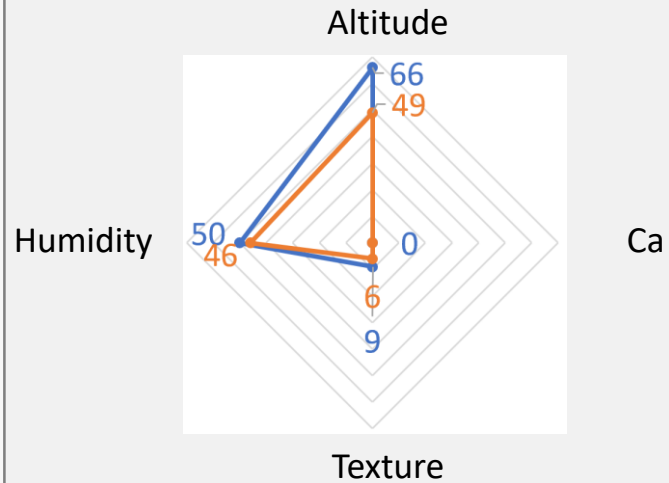
Morphological traits



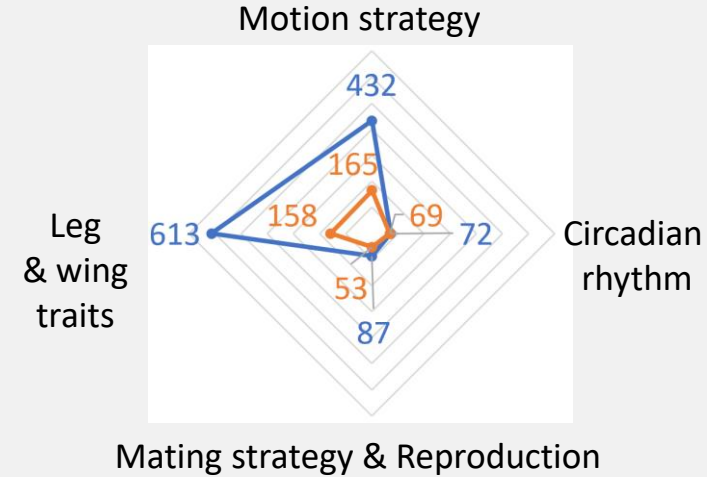
Spatial and trophic niche



Abitotic preferences



Other key traits



Orthoptera



22 traits
7 references
1354 species
4 346 recorded data

Contributors :

Coq, S., Hedde, M., Nahmani J.

Legend :

—●— Number of data

—●— Number of species informed

Publications citing and/or using BETSI database (2020-2021)

- ✓ Boinot, S., Mézière, D., Poulmarc'h, J., Saintilan, A., Lauria, P-E., 2020 [PDF](#)
- ✓ Bonfanti, J., 2021, PhD thesis, [PDF](#)
- ✓ Bottinelli, N., Capowiez, Y., , 2021, [PDF](#)
- ✓ Bottinelli, N. Hedde, M., Jouquet, P., Capowiez, Y., 2020 [PDF](#)
- ✓ Braschi, J., Hélard, O., Mazzia, C., Oger, P., Ponel, P., Buisson, E., 2021 [PDF](#)
- ✓ Ganault, P., 2020, PhD thesis, [PDF](#)
- ✓ Gardarin, A., Valantin-Morison, M. 2020 [PDF](#)
- ✓ Leclercq-Dransart J., Demuynck, S., Douay, F., Grumiaux, F., Pernin, C., Leprêtre, A., 2020 [PDF](#)
- ✓ Perrin, W., 2020, PhD thesis, [PDF](#)
- ✓ Potapov, A., Bellini, B.C., Chown, S.L., Deharveng, L., Janssens, F., Kováč, L., Kuznetsova, N., Ponge, J-F., Potapov, M., Querner, P., Russell, D., Sun, X., Zhang, F., Berg, M.P., 2020, [PDF](#)
- ✓ Santorufo, L., Joimel, S., Auclerc, A., Deremiens, J., Grisard, G., Hedde, M., Nahmani, J., Pernin, C., Cortet, J., 2021 [PDF](#)

Publications citing and/or using BETSI database (2018-2019)

- ✓ Aubert, M., Bureau, F., 2018, [PDF](#)
- ✓ Bonfanti, J., Hedde, M., Joimel, S., Henning Krogh, P., Violle, C., Nahmani, J., Cortet, J., 2018, [PDF](#)
- ✓ Brousseau, P.M., Gravel, D., Handa, I.T. 2018 [PDF](#)
- ✓ Gillespie, M.A.K., Alfredsson, M., Barrio, I.C., Bowden, J., Convey, P., Coulson, S.J., Culler, L.E., Dahl, M.T., Daly, K.M., Koponen, S., Loboda, S., Marusik, Y., Sandstrom, J.P., Sikes, D.S., Slowik, J., Hoyer, T.T., 2019, [PDF](#)
- ✓ Hedde, M., Nahmani, J., Séré, G., Auclerc, A., Cortet, J., 2018, [PDF](#)
- ✓ Joimel, S., Capioux, H., Schwartz, C., Hedde, M., Lebeau, T., Le Guern, C., Nahmani, J., Pernin, C., Salmon, S., Santorufo, L., Bechet, B., Cortet, J., 2018 [PDF](#)
- ✓ Joimel, S., Grard, B., Auclerc, A., Hedde, M., Le Doaré, N., Salmon, S., Chenu, C., 2018, [PDF](#)
- ✓ Joimel, S., Schwartz, C., Maurel, N., Magnus, B., Machon, N., Bel, J., Cortet, J., 2019 [PDF](#)
- ✓ Seibold, S., Cadotte, M.W., MacIvor, J.S., Thorn, S., Müller, J., 2018 [PDF](#)
- ✓ Schneider, F.D., Fichtmueller, D., Gossner, M.M., Güntsch, A., Jochum, M., König-Ries, B., Le Provost, G., Manning, P., Ostrowski, A., Penone, C., Simons, N.K., 2019, [PDF](#)
- ✓ Vincent, Q., 2018, PhD Thesis, [PDF](#)
- ✓ Vincent, Q., Leyval, C., Beguiristain, T., Auclerc, A., 2018 [PDF](#)

Publications citing and/or using BETSI database (2015-2017)

- ✓ Abgrall, C., Chauvat, M., Langlois, E., Hedde, M., Mouillot, D., Salmon, S., Winck, B., Forey, E., 2017 [PDF](#)
- ✓ Burrow 2015 PhD Thesis, [PDF](#)
- ✓ Cameron, E.K., Decaëns, T., Lapied, E., Porco, D., Eisenhauer, N., 2016, [PDF](#)
- ✓ Hedde, M., Mazzia, C., Decaëns, T., Nahmani, J., Pey, B., Thénard, J., Capowiez, Y., 2015 [PDF](#)
- ✓ Henneron, L., Bernard, L., Hedde, M., Pelosi, C., Villenave, C., Chenu, C., Bertrand, M., Girardin, C., Blanchart, E., 2015, [PDF](#)
- ✓ Joimel, S., 2015, PhD Thesis, [PDF](#)
- ✓ Leigh, C., Laporte, B., Bonada, N. Fritz, K., Pella, H., Sauquet, E., Tockner, C., Datry, T., 2017, [PDF](#)
- ✓ Maisto, G., Milano, V., Santorufo, L., 2017 [PDF](#)
- ✓ Marliac, G., Mazzia, C., Pasquet, A., Cornic, J-F., Hedde, M., Capowiez, Y. 2016 [PDF](#)
- ✓ Mazzia, C., Pasquet, A., Caro, G., Thenard, J., Cornic, J-F., Hedde, M., Capowiez, Y., 2015, [PDF](#)
- ✓ Milano, V., 2017, PhD Thesis, [PDF](#)
- ✓ Pelosi, C., Pey, B., Caro, G., Cluzeau, D., Peigné, J., Bertrand, M., Hedde, M., 2016 [PDF](#)
- ✓ Santorufo, L., Cortet, J., Nahmani, J., Pernin, C., Salmon, S., Pernot, A., Morel, J.L., Maisto, G., 2015 [PDF](#)

Publications citing and/or using BETSI database (2012-2014)

- ✓ Auclerc, A., 2012, PhD Thesis, [PDF](#)
- ✓ Duflot, R., Georges, R., Ernoult, A., Aviron, S., Burel, F., 2014 [PDF](#)
- ✓ Hedde, M., van Oort, F., Boudon, E., Abonnel, F., Lamy, I., Hedde, M., 2013 [PDF](#)
- ✓ Hedde, M., van Oort, F., Renou, E., Thénard, J., Lamy, I., 2013 [PDF](#)
- ✓ Hedde, M., Lamy, I., van Oort, F., 2012, [PDF](#)
- ✓ Pelosi, C, Pey, B., Hedde, M., Caro, G., Capowiez, Y., Guernion, M., Peignée, J., Pirond, D., Bertrand, M., Cluzeaud, D., 2014, [PDF](#)
- ✓ Pey, B., Laporte, M.A., Nahmani, J., Auclerc, A., Capowiez, Y., Caro, G., Cluzeau, D., Cortet, J., Decaens, T., Dubs, F., Joimel, S., Guernion, M., Briard, C., Grumiaux, F., Laporte, B., Pasquet, A., Pelosi, C., Pernin, C., Ponge, J-F., Salmon, S., Santorufo, L., Hedde, M., 2014. [PDF](#)
- ✓ Pey, B., Nahmani, J., Auclerc, A., Capowiez, Y., Cluzeau, D., Cortet, J., Decaëns, T., Deharvengi, L., Dubs, F., Joimel, S., Briard, C., Grumiaux, F., Laporte, M.A., Pasquet, A., Pelosi, C., Pernin, C., Ponge, J-F., Salmon, S., Santorufo, L., Hedde, M., 2014, [PDF](#).
- ✓ Salmon, S., Ponge, J-F., Gachet, S., Deharveng, L., Lefebvre, N., Delabrosse, F., 2014 [PDF](#)
- ✓ Santorufo, L., Cortet, J., Arena, C., Goudon, R., Rakoto, A., Morel, J.L., Maisto, G., 2014, [PDF](#)
- ✓ Santorufo, L., 2013, PhD Thesis, [PDF](#)

Many thanks to the taxonomists, contributors, users and computer scientists ...



Please remember:
we still need you to complete the database !

Illustrations :
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