DOCTORAL SCHOOL OF NATURAL AND AGRICULTURAL SCIENCES

Research communication: Preparing scientific publications, peer review, and grant proposals

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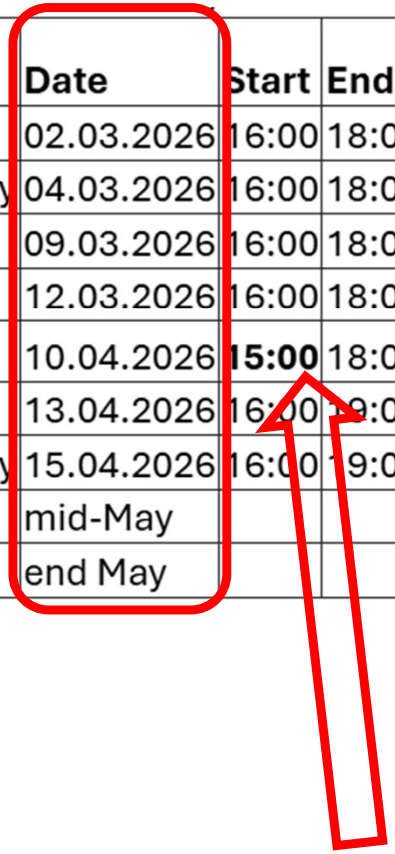
https://www.cyfronet.krakow.pl/~uxlaskow

Organizational matters

- 30 contact hours: 5 lectures (discussion classes) + 5 workshops
- Two parts:
  - Preparing scientific publications, article reviews & grant proposals (RL)
  - Effective presentation (Prof. Marcin Czarnołęski)
- Evaluation:
  - short scientific paper – 30 points (*2 students per paper*);
  - manuscript review – 20 points (*1 student per review*);
  - oral presentation – 20 points (*each student 10 min*);
  - poster – 20 points (*two students per poster*);
  - active participation in discussions – 10 points;
  - attending at least 26 hours out of 30 (special cases on individual basis).

Organizational matters

Week day	Date	Start	End	On site/on-line	Class type	Lecturer	Place	Room
Monday	02.03.2026	16:00	18:00	on site	lecture	prof. Ryszard Laskowski	INoŚ UJ, Gronostajowa 7	**1.1.3.**
Wednesday	04.03.2026	16:00	18:00	on site	lecture	prof. Ryszard Laskowski	INoŚ UJ, Gronostajowa 7	**1.1.2.**
Monday	09.03.2026	16:00	18:00	on site	lecture	prof. Ryszard Laskowski	INoŚ UJ, Gronostajowa 7	**1.1.3.**
Thursday	12.03.2026	16:00	18:00	on site	lecture	prof. Marcin Czarnołęski	INoŚ UJ, Gronostajowa 7	**1.1.3.**
Friday	10.04.2026	**15:00**	18:00	on site	workshop	prof. Marcin Czarnołęski	INoŚ UJ, Gronostajowa 7	**1.0.4.**
Monday	13.04.2026	16:00	19:00	on site	workshop	prof. Marcin Czarnołęski	INoŚ UJ, Gronostajowa 7	**1.1.3.**
Wednesday	15.04.2026	16:00	19:00	on site	workshop	prof. Marcin Czarnołęski	INoŚ UJ, Gronostajowa 7	**1.1.2.**
	mid-May			on-line	workshop	prof. Ryszard Laskowski		
	end May			on-line	workshop	prof. Ryszard Laskowski		

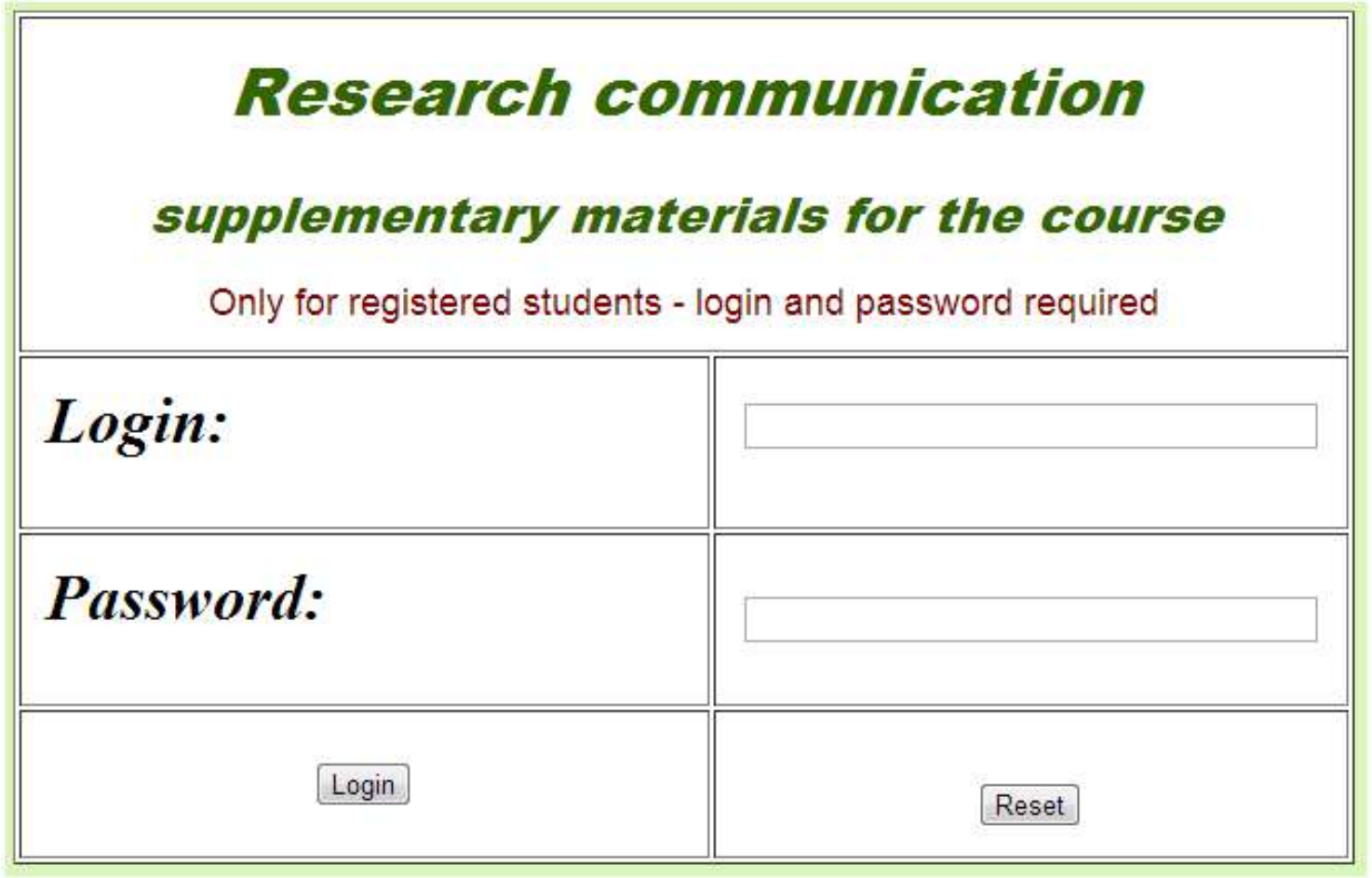


Recommended books

- Glasman-Deal, H. (2010) *Science research writing for non-native speakers of English*. London Imperial College Press, 257 pp.
- Day, R. A. & Gastel, B. (2006) *How to write and publish a scientific paper*. Greenwood, 320 pp.
- Katz, M. J. (2009) *From research to manuscript: a guide to scientific writing*. Springer, 210 pp.
- Peat, J., Elliott, E., Baur, L. & Keena, V. (2002). *Scientific writing: easy when you know how*. Wiley-Blackwell, 312 pp.

Supplementary materials

www.cyfronet.krakow.pl/~uxlaskow



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Supplementary materials for course participants

Click to download:

- Letter from the editor - major revision
- Letter from the editor - minor revision
- Letter from the editor - rejection
- Review: "I love this study..."
- Habits of successful writing
- How to write a scientific article (Carpenter)
- How to write a scientific article (Collier)
- How to write a scientific article (Shubroook)
- How to write a scientific article (Stirling)
- Maximizing the impacts of your research: A handbook for social scientists
- San Francisco Edit - 00: Title
- San Francisco Edit - 01: Focusing
- San Francisco Edit - 02: Outline
- San Francisco Edit - 03: First draft
- San Francisco Edit - 04: Abstract
- San Francisco Edit - 05: Introduction
- San Francisco Edit - 06: Methods
- San Francisco Edit - 07: Discussion
- San Francisco Edit - 08: Results
- San Francisco Edit - 09: Tables & Figures

Homework

- Read the supplementary materials
  - ‘How to write a scientific article’ by:
    - Carpenter
    - Collier
    - Shubrook
  - www.sfedit.net
  - reviews: ‘minor revision’, ‘major revision’, ‘rejection’
  - visit a couple of journal websites – see instructions for authors
- Write a short scientific paper based on your own data, meta-analysis, etc. (2 authors per paper)
  - manuscript should follow a specific journal style (ASE)!

Homework 1: research article

- Six pages long, line spacing 1.5 – 2
- Follow all the rules learned during the lectures
- Follow the '*short communication*' style as specified in the Guide for Authors for Applied Soil Ecology with separate Results and Discussion sections
  (as long as it fits your specialty)
- Must be editorially perfect!
  - no typos!
  - proper referencing
  - etc...

Homework 2: review

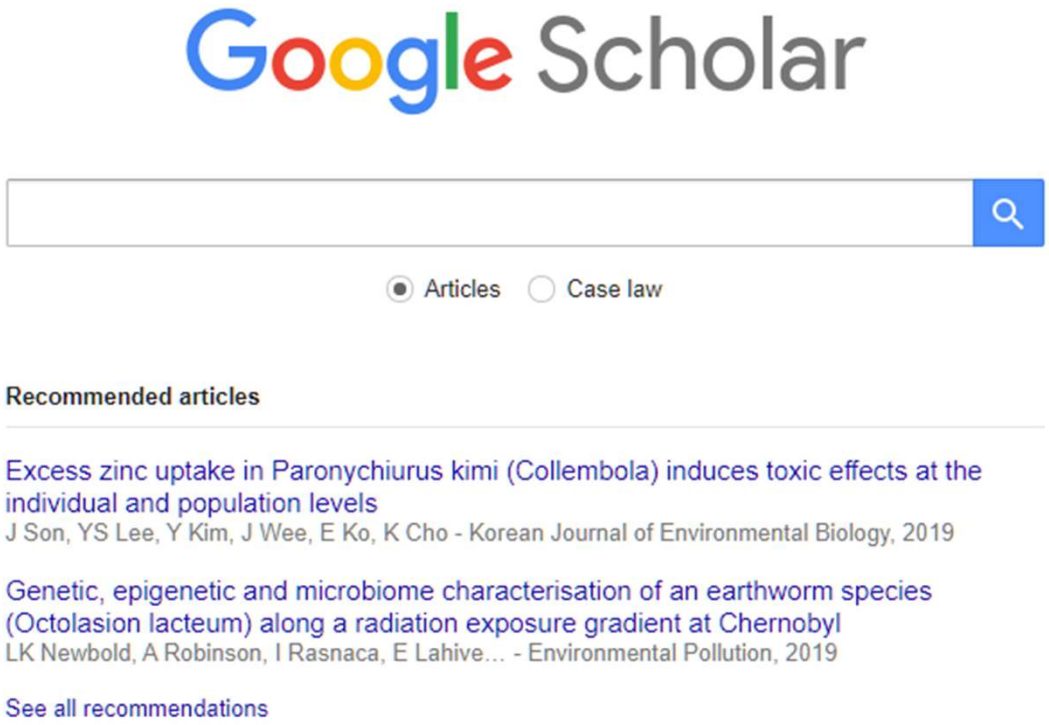
- Detailed review of your colleagues' manuscript
  - check against journal-specific criteria
  - evaluate against everything you have learned about preparing and submitting a manuscript
  - consider all criteria listed in the manuscript evaluation table
  - be critical but give positive feedback on how to improve the manuscript or even the experiments in the future

PART 1:

Handling scientific information

Google Scholar – basic yet fine

http://scholar.google.com

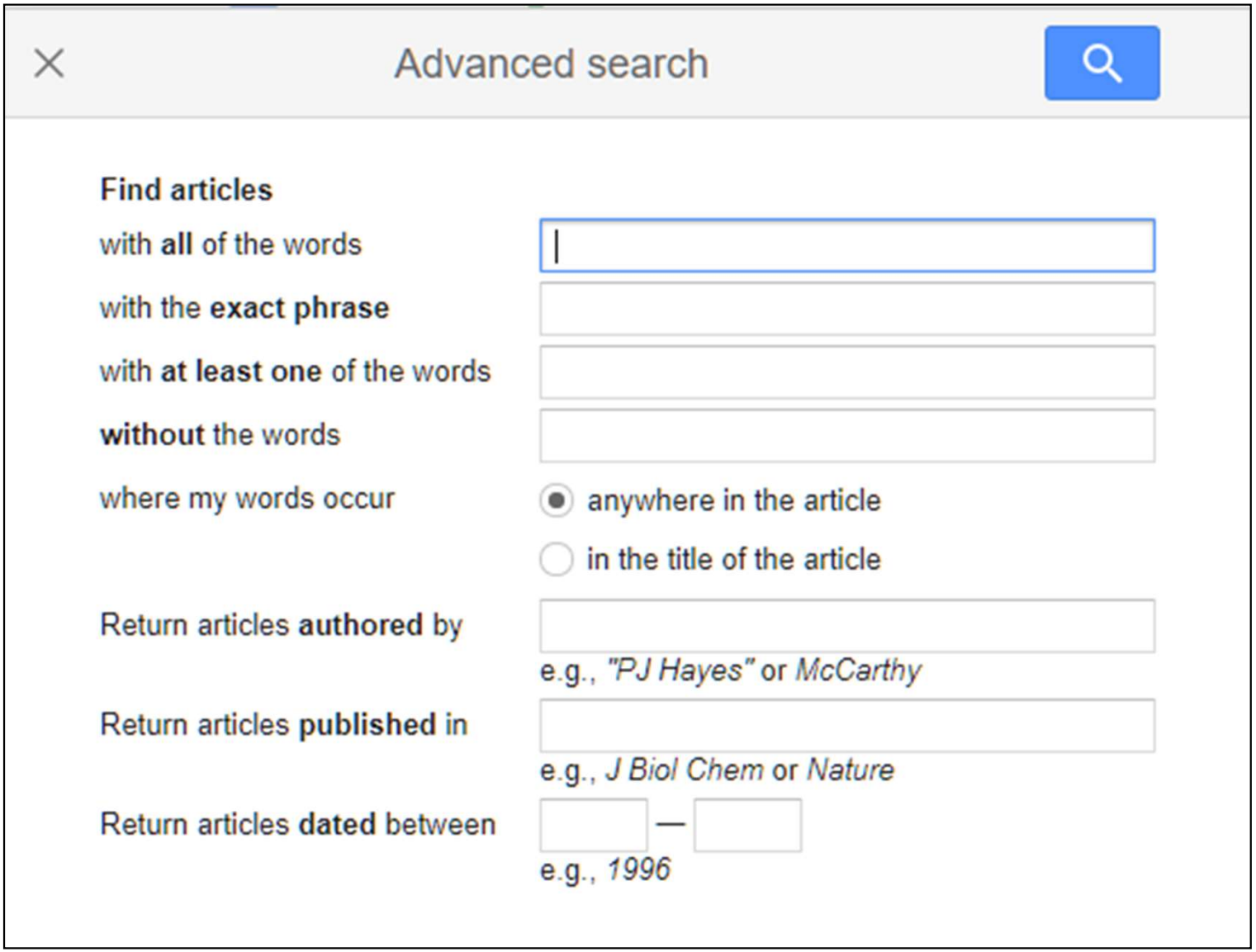


- Advantages:
  - free
  - easy to use
  - gives access to pdfs located even on private servers

Disadvantages:

- limited search options
- Google does not maintain formal database

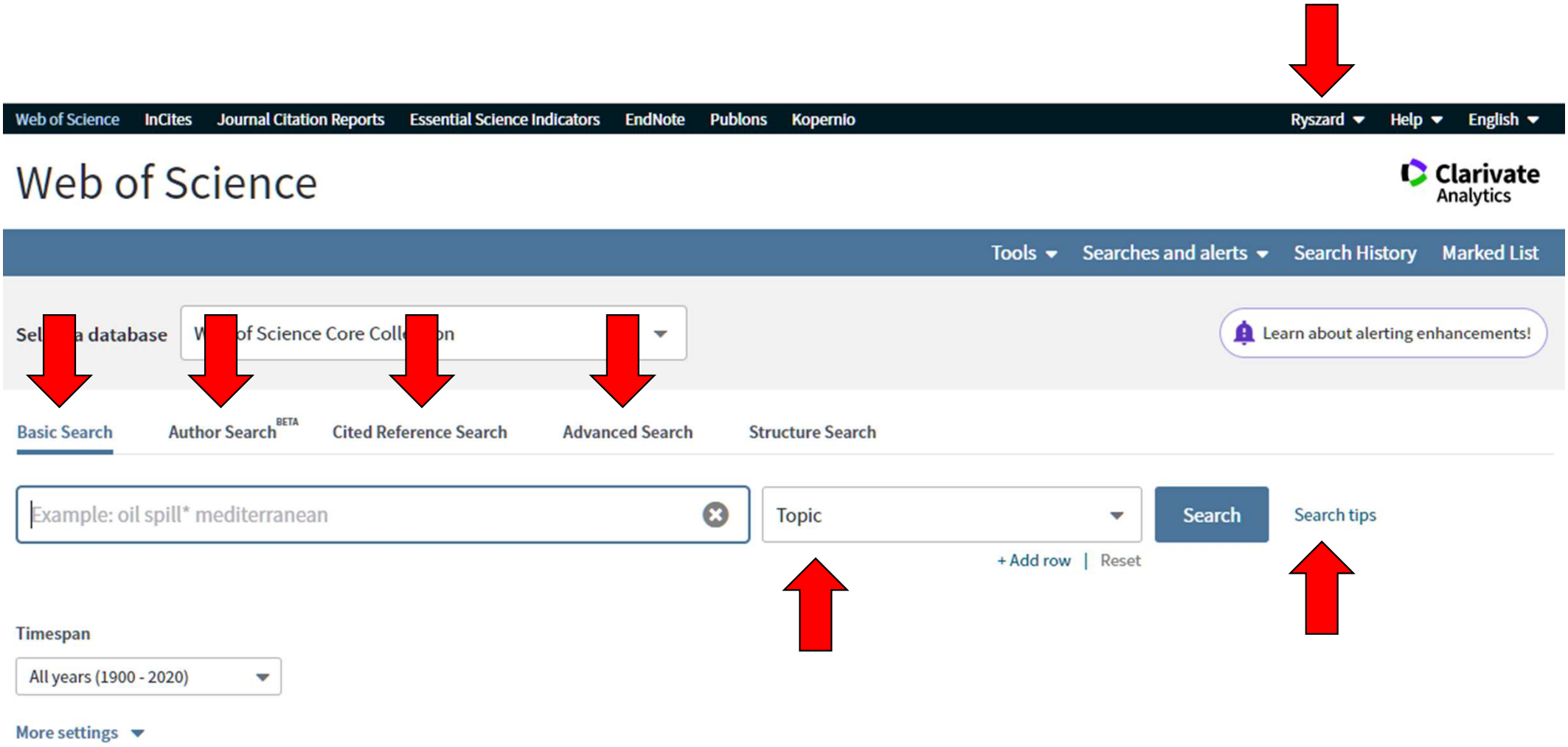
Google Scholar – Advanced search



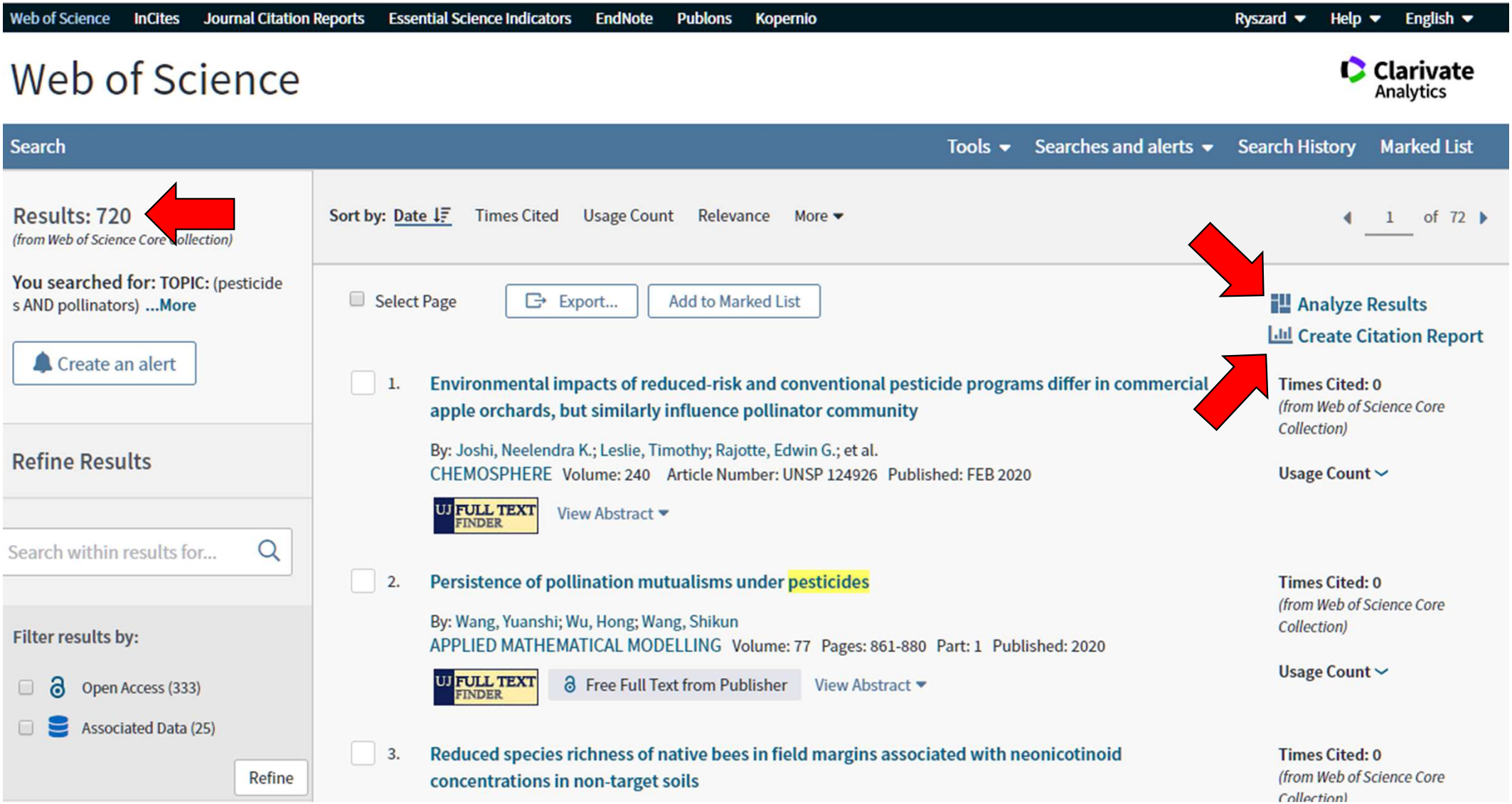
Web of Science: the benchmark

- Advantages:
  - Formal database by Thomson Reuters
  - Special section for science (Web of Science)
  - Covers all important journals
  - Allows for complex queries
  - Highly customizable (lemmatization, with or without conference proceedings, timespan, etc.)
  - Recognized by universities etc.
  - Useful add-ins (EndNote, Citation Alerts, Publons)
- Disadvantages
  - Not free (but most universities have access)
  - Search limited to publications covered by the data base

http://apps.webofknowledge.com



Web of Kowledge: search results



Constructing effective queries

- NOT just one keyword in one form:

~~metals~~ ~~insects~~ ~~forest~~ ~~pollution~~ ~~DNA~~

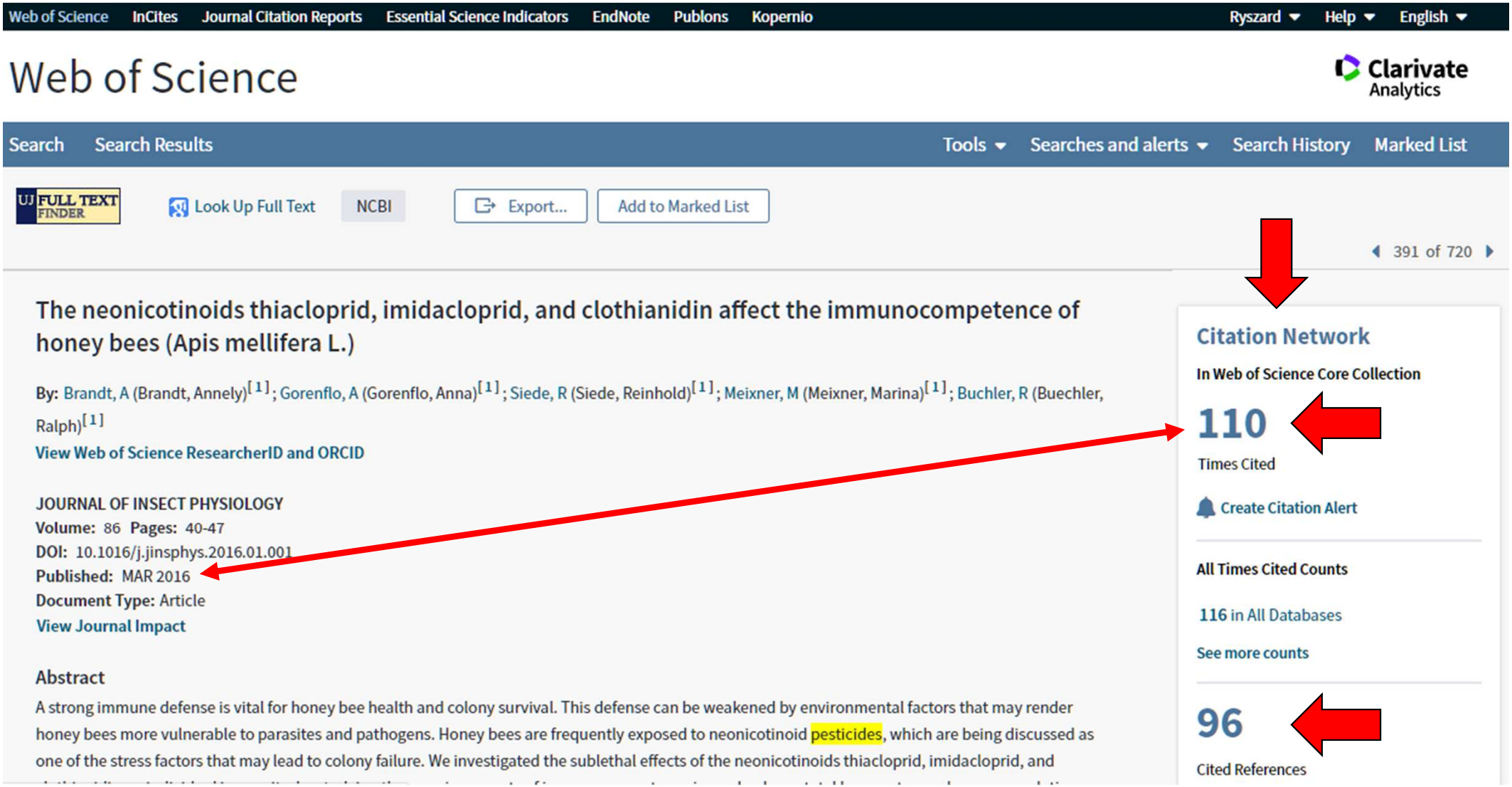
- Lemmatization, plural forms, etc. – using asterisks:

metal* insect* forest* pollut* ....

- Complex formulas:

(metal* OR Zn OR zinc) AND (insect* OR inverteb*) NOT...

Making good use of citations: citation network



Making good use of citations: citation network

Cited References: 96

Showing 30 of 96 **View All in Cited References page** *(from Web of Science Core Collection)*

1. **How should behavioural ecologists interpret measurements of immunity?** **Times Cited: 253**
   By: Adamo, SA
   ANIMAL BEHAVIOUR Volume: 68 Pages: 1443-1449 Part: 6 Published: DEC 2004

2. **The Global Stock of Domesticated Honey Bees Is Growing Slower Than Agricultural Demand for Pollination** **Times Cited: 396**
   By: Aizen, Marcelo A.; Harder, Lawrence D.
   CURRENT BIOLOGY Volume: 19 Issue: 11 Pages: 915-918 Published: JUN 9 2009

3. **Brain, physiological and behavioral modulation induced by immune stimulation in honeybees (Apis mellifera): A potential mediator of social immunity?** **Times Cited: 13**
   By: Alaux, Cedric; Kemper, Nele; Kretzschmar, Andre; et al.
   BRAIN BEHAVIOR AND IMMUNITY Volume: 26 Issue: 7 Pages: 1057-1060 Published: OCT 2012

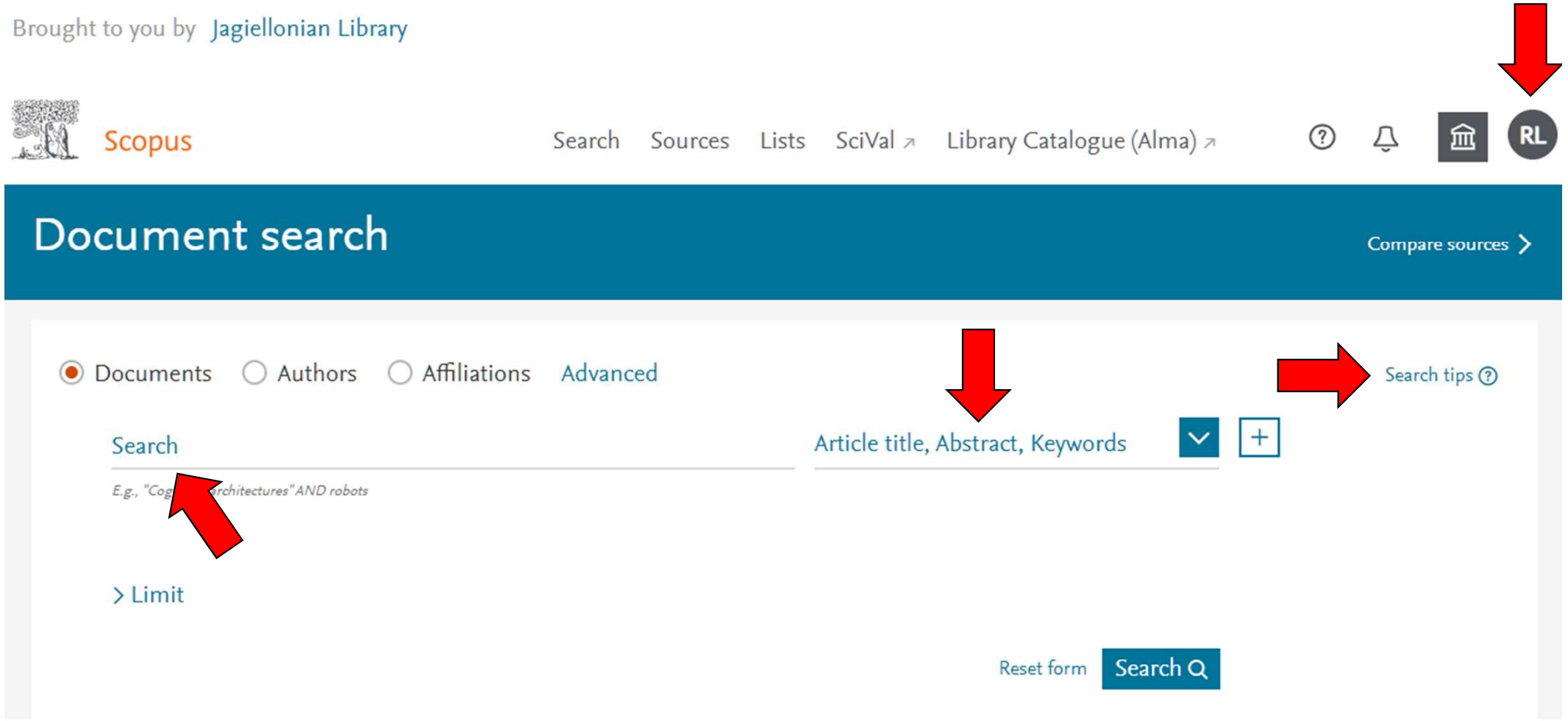
4. **Interactions between Nosema microspores and a neonicotinoid weaken honeybees (Apis mellifera)** **Times Cited: 288**
   By: Alaux, Cedric; Brunet, Jean-Luc; Dussaubat, Claudia; et al.
   ENVIRONMENTAL MICROBIOLOGY Volume: 12 Issue: 3 Pages: 774-782 Published: MAR 2010

5. **Immune defence reaction in bumble-bee workers after a previous challenge and parasitic coinfection** **Times Cited: 33**
   By: Allander, K; Schmid-Hempel, P
   FUNCTIONAL ECOLOGY Volume: 14 Issue: 6 Pages: 711-717 Published: DEC 2000

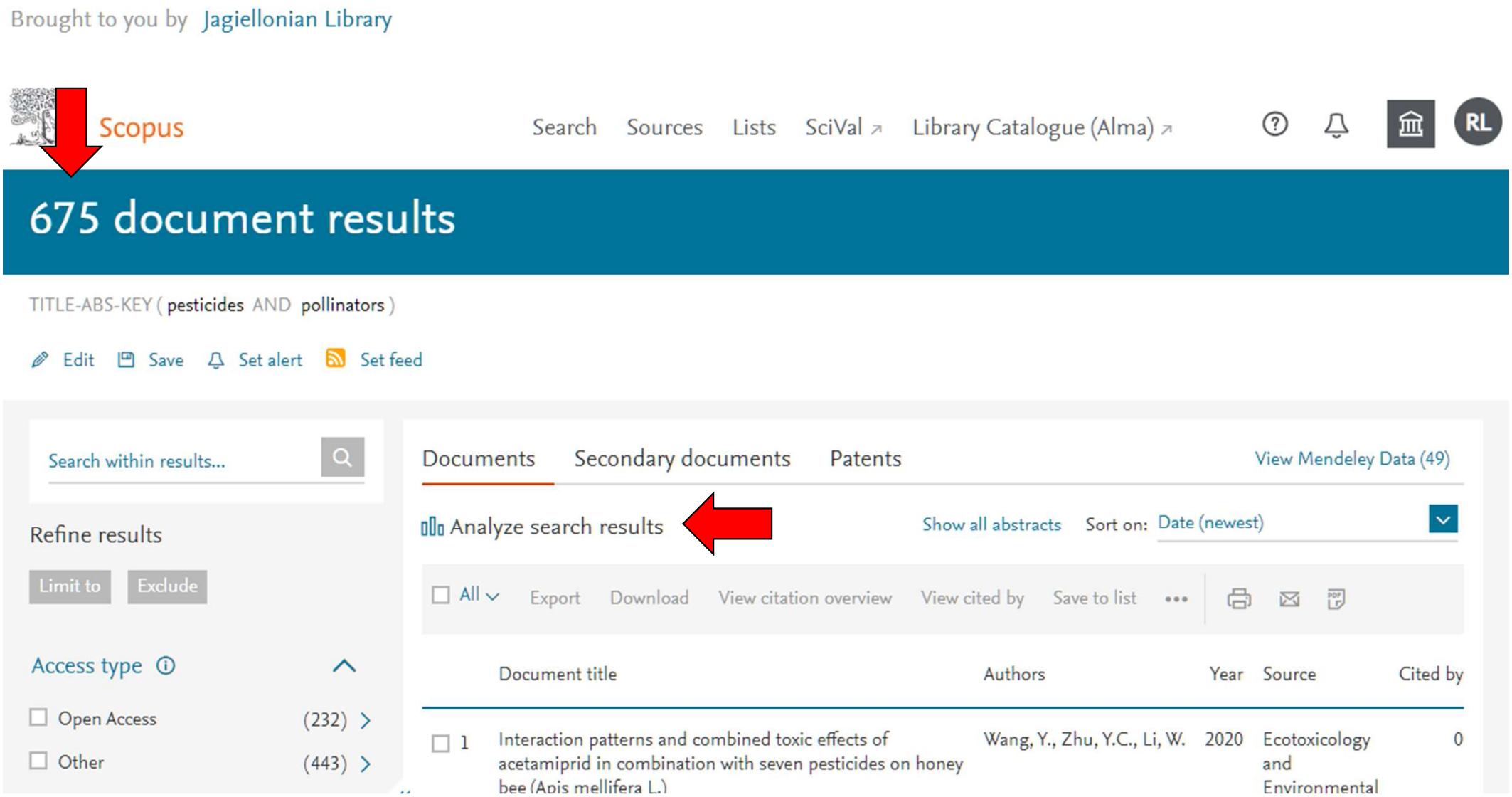
SCOPUS: next to the benchmark

- Advantages:
  - Formal data base by Elsevier
  - Claims to be “the largest abstract and citation database of peer-reviewed literature”
  - Covers all important journals
  - Allows for simple and very complex queries
  - Customizable
  - Recognized by some universities etc.
  - Useful add-ins (Analyze Results)
- Disadvantages
  - Not free (but most universities have access)
  - Search limited to publications covered by the data base

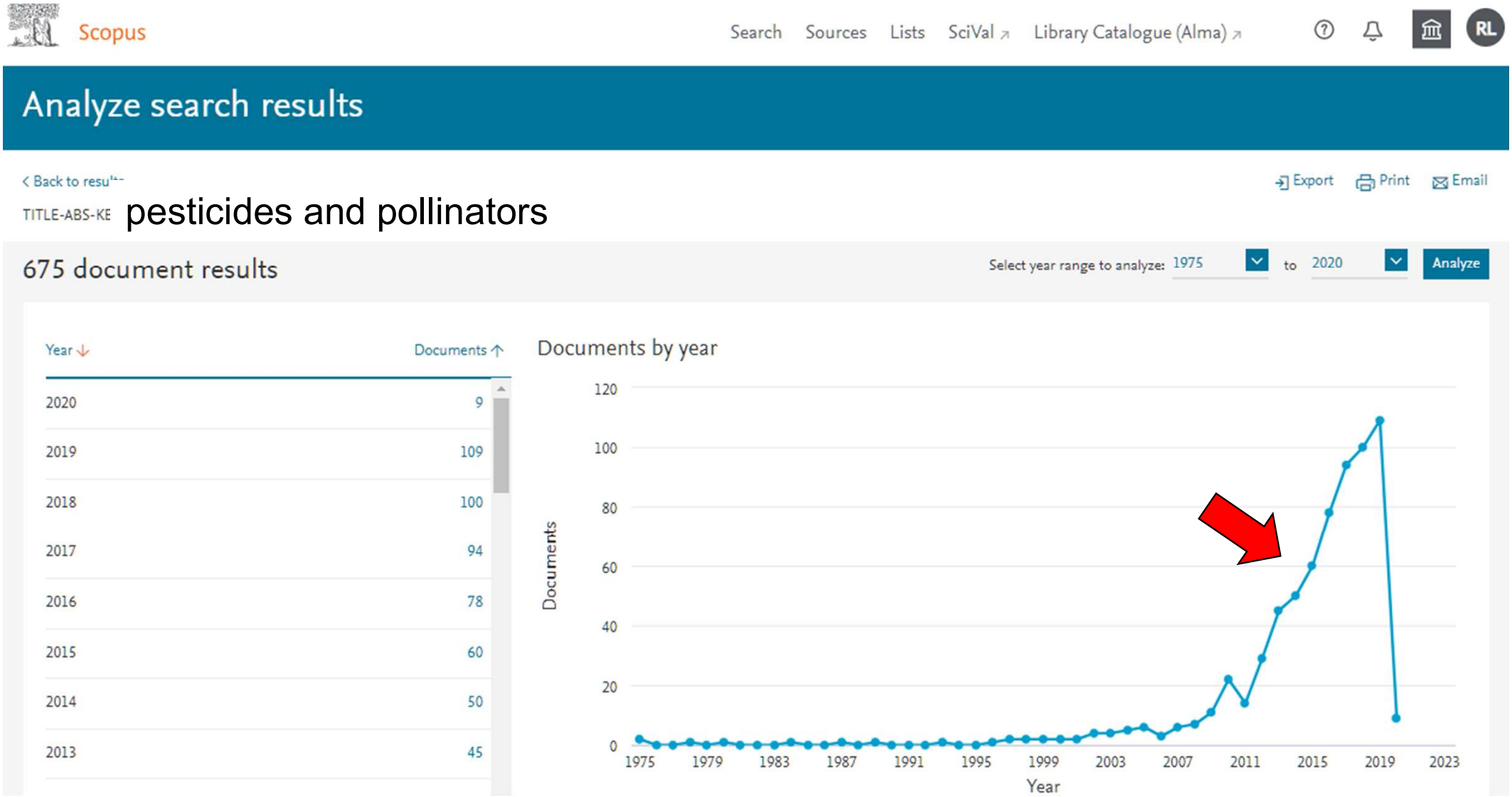
http://www.scopus.com



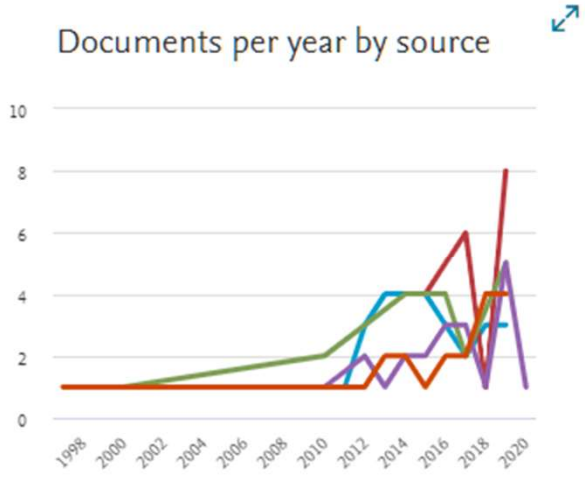
SCOPUS: search results

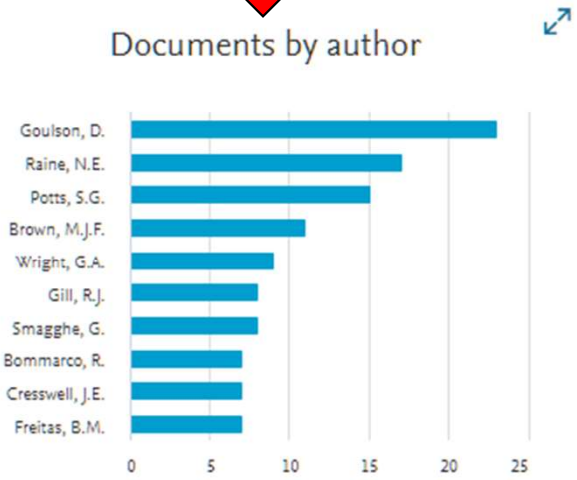


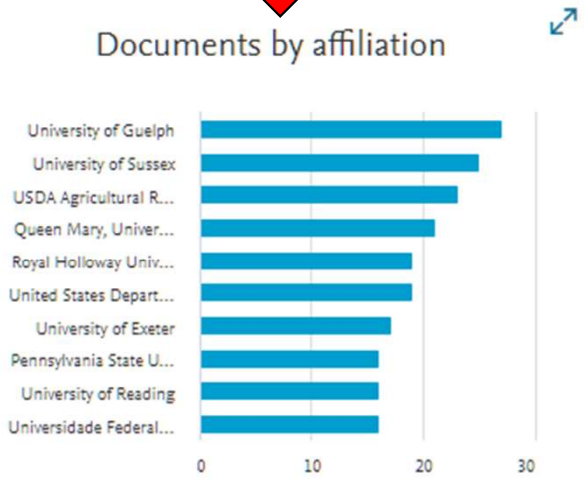
SCOPUS: ‘Analyze search results’

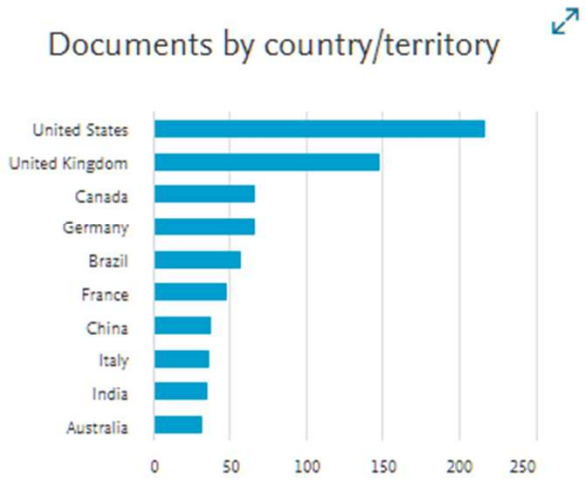


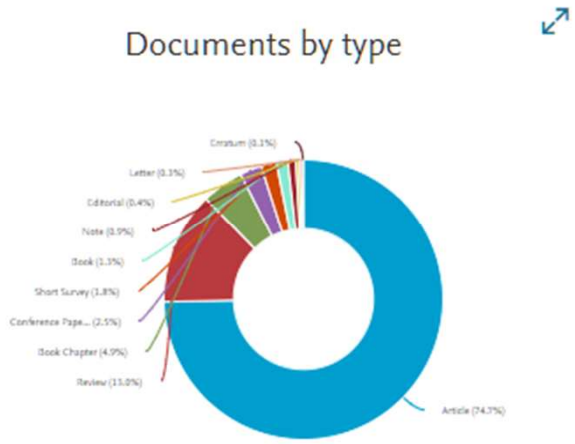
SCOPUS: ‘Analyze search results’

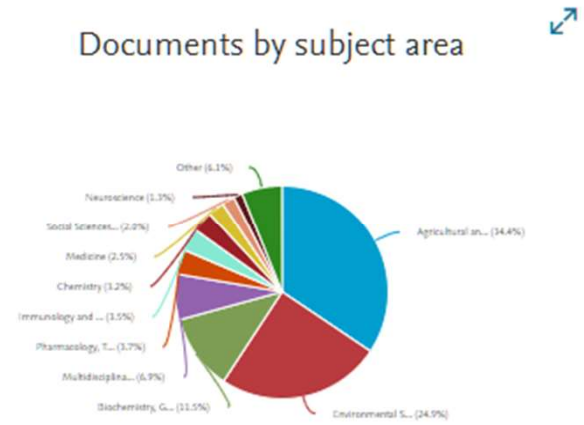










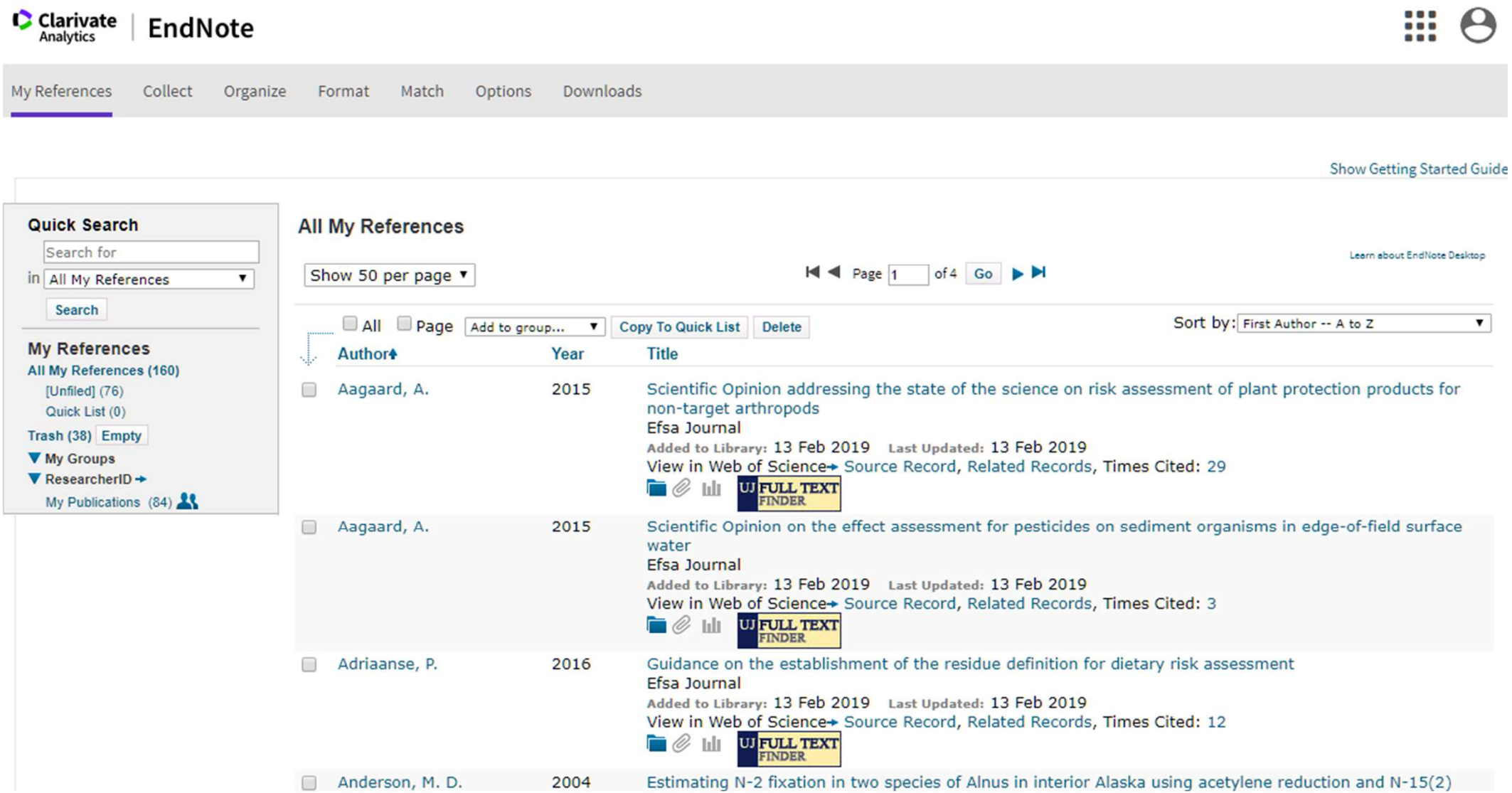


Managing your references

- Minimum requirements:
  - bibliographic database of your reprints/pdfs
  - searchable database
  - generating reference lists for articles
- Better also:
  - database entries linked to the respective files
  - integration with word processor (‘cite while you write’)
  - exchange of pdfs with colleagues
  - networking
  - collections (e.g., for different projects), etc...

EndNote Web: minimal but classic and not bad

http://www.myendnoteweb.com

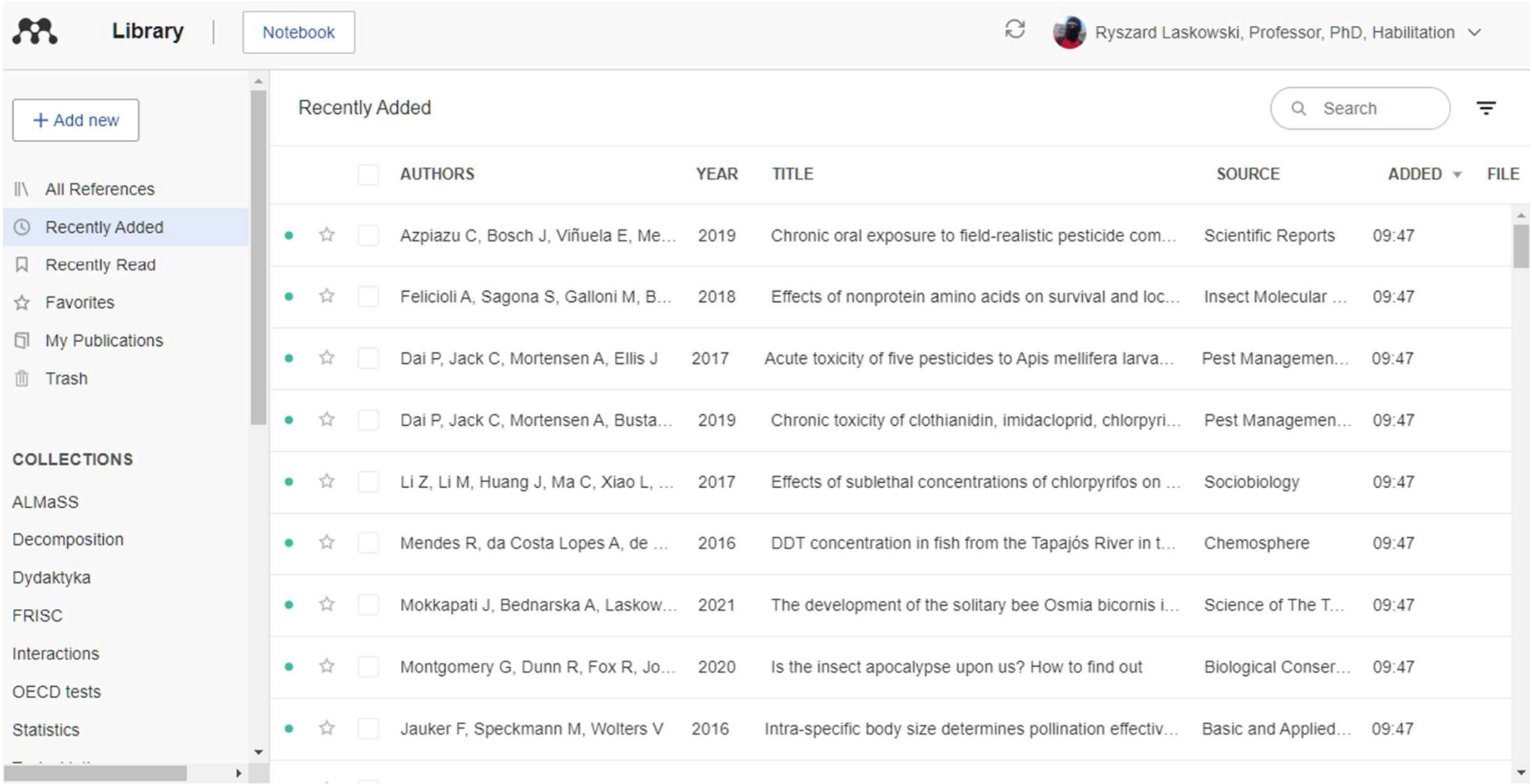


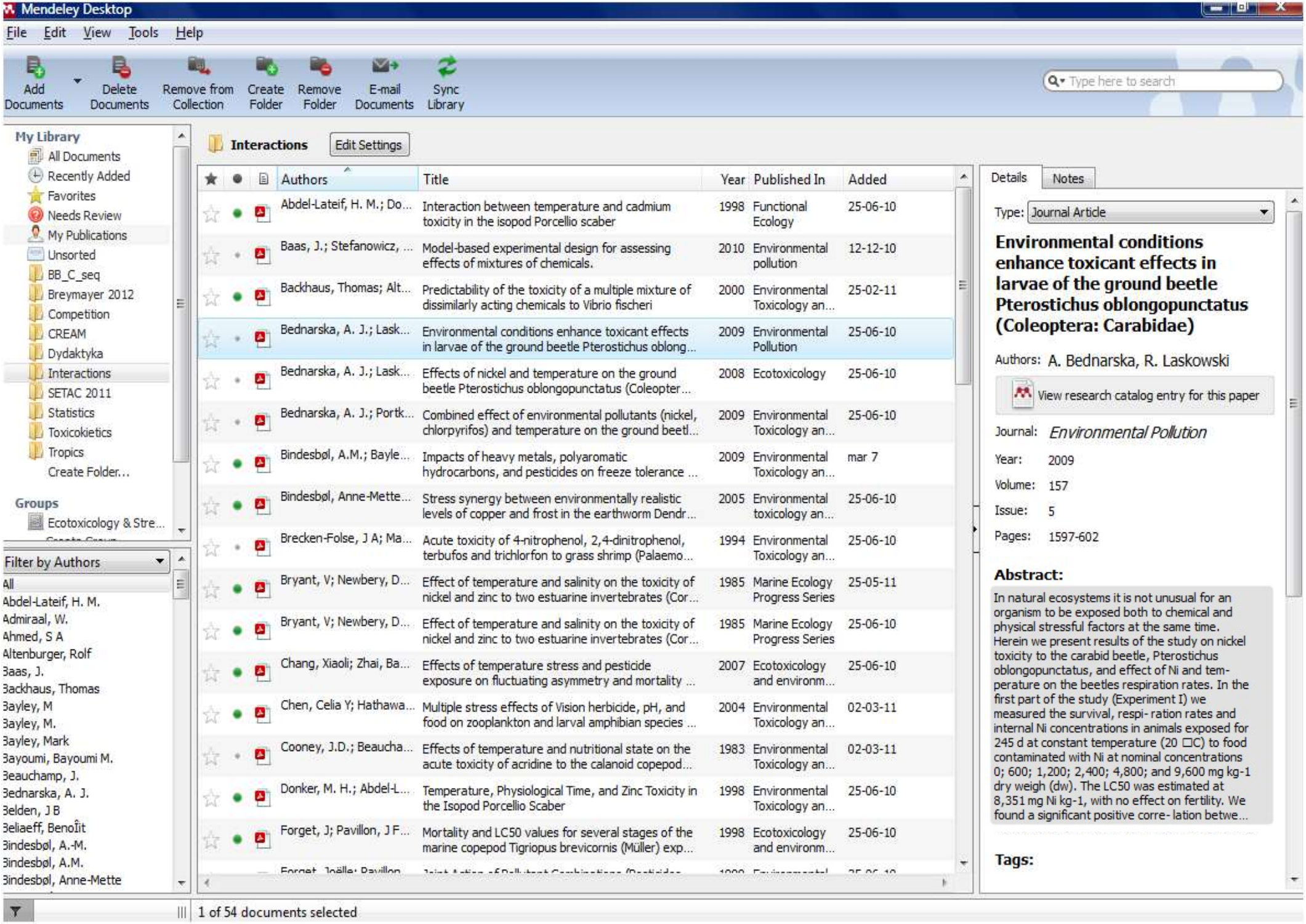
Mendeley: probably the best RM

- Full-featured reference manager
- Free
- Both desktop and Internet based
- Data base synchronized between computer and server
- Working groups → team work
- Direct download of your articles by researchers
- Collections (e.g., for different projects, publications)

http://www.mendeley.com

Team work – sharing references




Mendeley Desktop
File Edit View Tools Help
Add Documents
Delete Documents
Remove from Collection
Create Folder
Remove Folder
E-mail Documents
Sync Library
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My Library
All Documents
Recently Added
Favorites
Needs Review
My Publications
Unsorted
BB_C_seq
Breymayer 2012
Competition
CREAM
Dydaktyka
Interactions
SETAC 2011
Statistics
Toxicokietics
Tropics
Create Folder...
Groups
Ecotoxicology & Stre...
Interactions
Edit Settings
Authors
Title
Year
Published In
Added
Abdel-Lateif, H. M.; Do... Interaction between temperature and cadmium toxicity in the isopod Porcellio scaber 1998 Functional Ecology 25-06-10
Baas, J.; Stefanowicz, ... Model-based experimental design for assessing effects of mixtures of chemicals. 2010 Environmental pollution 12-12-10
Backhaus, Thomas; Alt... Predictability of the toxicity of a multiple mixture of dissimilarly acting chemicals to Vibrio fischeri 2000 Environmental Toxicology an... 25-02-11
Bednarska, A. J.; Lask... Environmental conditions enhance toxicant effects in larvae of the ground beetle Pterostichus oblong... 2009 Environmental Pollution 25-06-10
Bednarska, A. J.; Lask... Effects of nickel and temperature on the ground beetle Pterostichus oblongopunctatus (Coleopter... 2008 Ecotoxicology 25-06-10
Bednarska, A. J.; Portk... Combined effect of environmental pollutants (nickel, chlorpyrifos) and temperature on the ground beetl... 2009 Environmental Toxicology an... 25-06-10
Bindesbøl, A.M.; Bayle... Impacts of heavy metals, polyaromatic hydrocarbons, and pesticides on freeze tolerance ... 2009 Environmental Toxicology an... mar 7
Bindesbøl, Anne-Mette... Stress synergy between environmentally realistic levels of copper and frost in the earthworm Dendr... 2005 Environmental toxicology an... 25-06-10
Brecken-Folse, J A; Ma... Acute toxicity of 4-nitrophenol, 2,4-dinitrophenol, terbufos and trichlorfon to grass shrimp (Palaemo... 1994 Environmental Toxicology an... 25-06-10
Bryant, V; Newbery, D... Effect of temperature and salinity on the toxicity of nickel and zinc to two estuarine invertebrates (Cor... 1985 Marine Ecology Progress Series 25-05-11
Bryant, V; Newbery, D... Effect of temperature and salinity on the toxicity of nickel and zinc to two estuarine invertebrates (Cor... 1985 Marine Ecology Progress Series 25-06-10
Chang, Xiaoli; Zhai, Ba... Effects of temperature stress and pesticide exposure on fluctuating asymmetry and mortality ... 2007 Ecotoxicology and environm... 25-06-10
Chen, Celia Y; Hathawa... Multiple stress effects of Vision herbicide, pH, and food on zooplankton and larval amphibian species ... 2004 Environmental Toxicology an... 02-03-11
Cooney, J.D.; Beaucha... Effects of temperature and nutritional state on the acute toxicity of acridine to the calanoid copepod... 1983 Environmental Toxicology an... 02-03-11
Donker, M. H.; Abdel-L... Temperature, Physiological Time, and Zinc Toxicity in the Isopod Porcellio Scaber 1998 Environmental Toxicology an... 25-06-10
Forget, J; Pavillon, J F... Mortality and LC50 values for several stages of the marine copepod Tigriopus brevicornis (Müller) exp... 1998 Ecotoxicology and environm... 25-06-10
Details
Notes
Type: Journal Article
Environmental conditions enhance toxicant effects in larvae of the ground beetle Pterostichus oblongopunctatus (Coleoptera: Carabidae)
Authors: A. Bednarska, R. Laskowski
View research catalog entry for this paper
Journal: Environmental Pollution
Year: 2009
Volume: 157
Issue: 5
Pages: 1597-602
Abstract:
In natural ecosystems it is not unusual for an organism to be exposed both to chemical and physical stressful factors at the same time. Herein we present results of the study on nickel toxicity to the carabid beetle, Pterostichus oblongopunctatus, and effect of Ni and temperature on the beetles respiration rates. In the first part of the study (Experiment I) we measured the survival, respi- ration rates and internal Ni concentrations in animals exposed for 245 d at constant temperature (20 □C) to food contaminated with Ni at nominal concentrations 0; 600; 1,200; 2,400; 4,800; and 9,600 mg kg-1 dry weigh (dw). The LC50 was estimated at 8,351 mg Ni kg-1, with no effect on fertility. We found a significant positive corre- lation betwe...
Tags:
Filter by Authors
All
Abdel-Lateif, H. M.
Admiraal, W.
Ahmed, S A
Altenburger, Rolf
Baas, J.
Backhaus, Thomas
Bayley, M
Bayley, M.
Bayley, Mark
Bayoumi, Bayoumi M.
Beauchamp, J.
Bednarska, A. J.
Belden, J B
Beliaeff, Benoît
Bindesbøl, A.-M.
Bindesbøl, A.M.
Bindesbøl, Anne-Mette
1 of 54 documents selected

Google Scholar: My profile

Ryszard Laskowski

OBSERWUJ

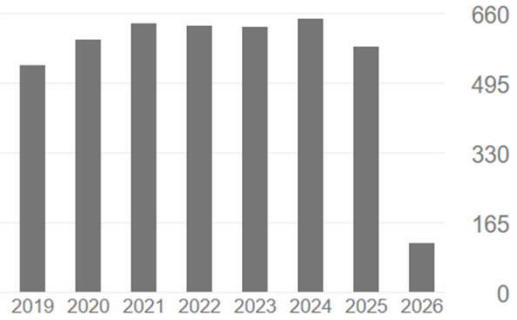
Professor of Ecology, Jagiellonian University
Zweryfikowany adres z uj.edu.pl - Strona główna

Ecotoxicology Stress ecology Biogeochemistry Ecosystem ecology

TYTUŁ	CYTOWANE PRZEZ	ROK
Combined effects of commercial insecticides on survival of the red mason bee Osmia bicornis A Misiewicz, M Zbrozek, R Laskowski, AJ Bednarska Ecotoxicology and Environmental Safety 304, 119023		2025
Species Sensitivity Distribution (SSD) profiles of carabid beetle communities exposed to acetamiprid, chlorpyrifos or λ-cyhalothrin AJ Bednarska, G Sowa, D Frydryszak, R Śliwińska-Grochot, R Laskowski Science of the Total Environment 996, 180154	1	2025
Trace metal accumulation with age in bats: a case study on *Pipistrellus kuhlii lepidus* from a relatively unpolluted area O Timofieieva, AM Labecka, A Vlaschenko, A Shulenko, R Laskowski Environmental Science and Pollution Research 31 (57), 65638-65647	2	2024
From advisors to mentors: fostering supportive mentorship in academia H Azarbad, R Laskowski, H Stoeger, NM van Straalen Trends in Microbiology 32 (12), 1145-1147	2	2024
Species sensitivity distribution (SSD) profiles towards λ-cyhalothrin for key ecosystem service provider (ESP) species across five European countries representing different	10	2024

Cytowane przez WYŚWIETL WSZYSTKO

	Wszystkie	Od 2021
Cytowania	8873	3252
h-indeks	45	27
i10-indeks	107	65



Dostęp publiczny WYŚWIETL WSZYSTKO

1 artykuł 17 artykułów

niedostępne dostępne

Objęte finansowaniem

Web of Science: your personal researcher's website

Ryszard Laskowski

(Laskowski, Ryszard) | Jagiellonian University

Edit

Identifiers

Web of Science ResearcherID: Q-1505-2019

https://orcid.org/0000-0002-1968-3230

Subject Categories

Environmental Sciences & Ecology; Toxicology; Food Science & Technology; Agriculture; Plant Sciences

Documents | Peer Review

All Indexed Documents (119)

Web of Science Core Collection (118)

Other Collections (1)

Non-Indexed Documents (20)

Metrics

Open dashboard

Profile summary

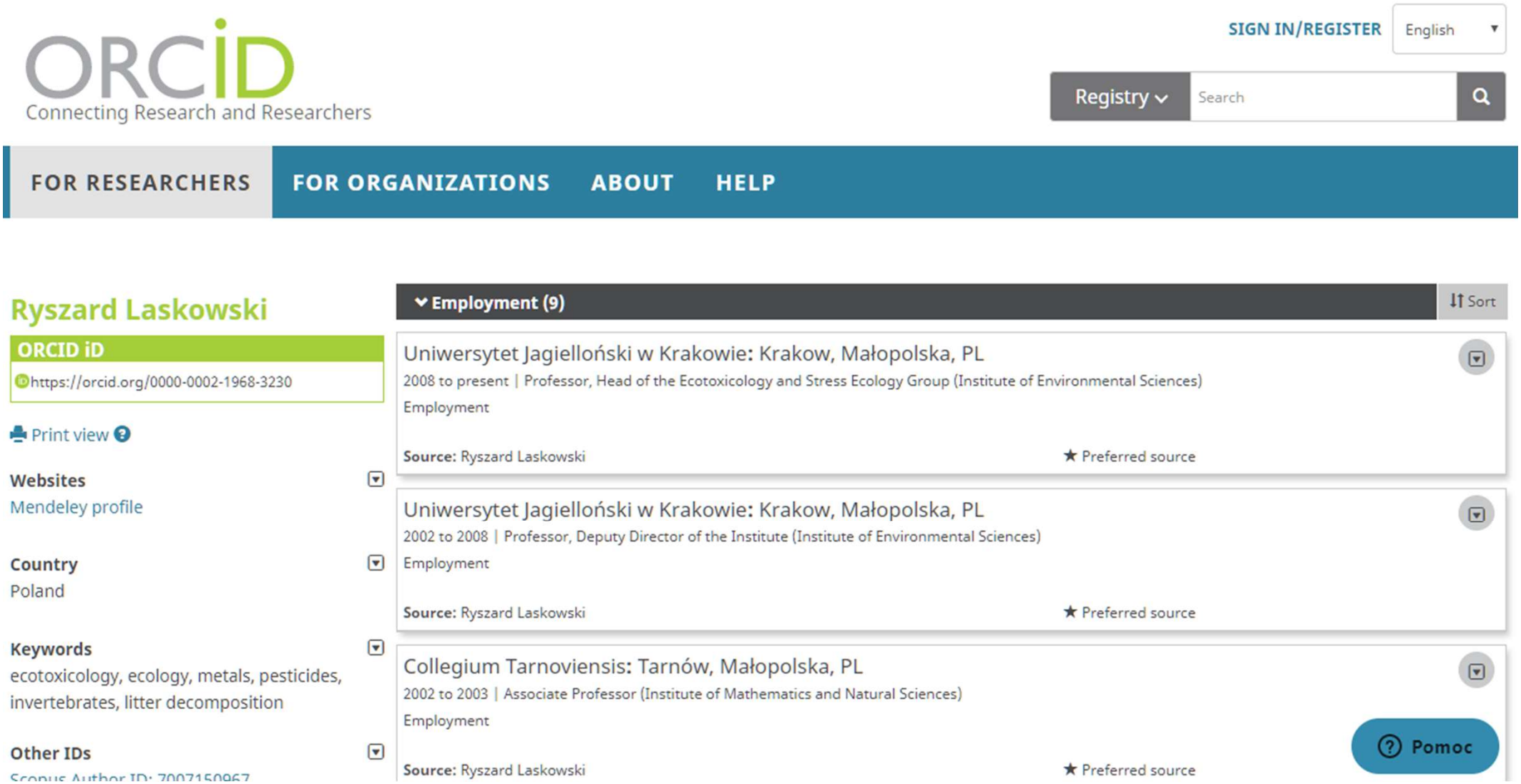
139	Total documents
119	Publications indexed in Web of Science
118	Web of Science Core Collection publications
0	Preprints
0	Dissertations or Theses
20	Non-indexed publications
28	Verified peer reviews
0	Verified editor records
0	Awarded grants

Web of Science Core Collection metrics

39	118
H-Index	Publications
5,955	4,803
Sum of Times Cited	Citing Articles

33

ORCID: your personal research website https://orcid.org



Part 2:
Writing a scientic article

Why to publish?

- This is your job!
- You are spending PUBLIC money
- Making research without communicating its results to the public doesn’t make sense!
- Scientific progress is impossible without extensive exchange of information and ideas
- Working on a publication helps in gathering thoughts and clarifying ideas
- „Publish or perish” imperative – a pitfall?
- **IT GIVES JOY AND SATISFACTION!**

Let’s start writing!

- Scientific writing is a technique rather than art → you HAVE to learn it and you CAN do it
- Crucial ingredients of a scientific paper:
  - thought – results – message
  - structure: proper and simple order of presenting things
  - style: brief and to the point; good grammar
- Planning the manuscript
  - use your BRAIN rather than ‘cut and paste’ approach!
  - prepare and interpret your data
  - decide on authorship

Authorship: the Vancouver Protocol

- Each and every author of a publication needs to have been involved in the:
  1. Conception and design, OR analysis and interpretation of data

  AND

  2. Drafting the article or revising it critically for important intellectual content

  AND

  3. Final approval of the version to be published.

➔ Each and every author, without the help from co-authors, should be able to understand, to present and to defend the general ideas and findings published in the paper.

Authorship: YES or NO?

YES: Scientific contributions	NO: Non-scientific contribution
Design of the study	Obtaining funds for the research
Contributing to data analysis decisions	Supervision of a research group
Interpretation of data	Running an experiment, technical support
Interpretation of results	Involvement in the collection of data
Major modifications of existing model or implementation of a new model	Running models with only slight (if any) modifications to existing models
Developing a new conceptual model	Statistical analysis according to instructions
Integrating diverse theoretical perspectives	Proof-reading, commenting on the paper
Intellectual contribution that significantly alters the content of the paper	Literature search
Writing portions of the manuscript	Providing data or important materials (but...)

http://www.boku.ac.at/fileadmin/_/cdr/CDR_Authorship_Guidelines_20100614.pdf; modified

Authorship: order

- **Vancouver Protocol**: ‘the order of the authorship on the byline should be a joint decision of the co-authors. Authors should be prepared to explain the order in which authors are listed’.
- **Equal contribution:** alphabetically or ‘rotation’ (if more than one paper)
- First author vs. corresponding author
- Student-supervisor manuscripts
- The problem of ‘honorary authorships’ and ‘gift authorships’
- Acknowledgments: a written permission from all!

Authorship: first author - coauthors

- First author
  - Primary responsibility
  - Conducts/supervises data analysis
  - Interprets results
  - Writes the paper (with coauthors)
  - Ownership of the master documents
  - Submits the paper to a journal
  - Archives all data
- Coauthors
  - Participate in decision about the aims of the paper
  - Contribute intellectually to data analysis
  - Contribute intellectually to interpretation of the results
  - Review each draft
  - Keep the paper on track of the main messages
  - Take responsibility for the content and results

Acknowledgements

- "*By all means recognise secretaries, wives or husbands, lovers and parents – **but not in the manuscript***" (A. A. Spence. 1994. Discussions. In G. M. Hall (ed.): How to write a paper: 30–32)
- Who and what **should be acknowledged**:
  - General support by a department head or an institution
  - Technical help, laboratory work, and data collection
  - Input of students, trainees, and research assistants
  - Statistical, graphics, or library support
  - Critical review of the drafts
  - Financial support from granting bodies

The manuscript production line

PLANNING
- Hypotheses/questions to be addresses
- Analyses to be reported
- Target journals

MANUSCRIPT FRAMEWORK
Document name, page size, headings, line numbering, etc.

FIRST ROUGH DRAFT
- Hypotheses/questions formulated
- Chapters and leading paragraphs
- Tables and figures

SECOND DRAFT (for coauthors)
- General schedule of major parts ready
- Identified gaps to be filled by coauthors
- Construction following the journal style

THIRD DRAFT
- All coauthors' input combined
- Manuscript polished for the journal style

FOURTH DRAFT
Corrected and commented by coauthors and peers

FINAL DOCUMENT: SUBMISSION!
Checked in all details against the journal requirements

Structure of the scientific article

- **IMRD**:
  - **I**ntroduction (1-2 pp)

    brief and arresting
  - **M**ethods (1-2 pp)

    VERY detail
  - **R**esults (1-2 pp)

    to the point and clear
  - **D**iscussion (2-3 pp)

    compare your results to those by other researchers

- Additional parts of the manuscript:
  - abstract (100-200 words)
  - acknowledgements
  - references (max 30)
  - tables
  - figure captions
  - figures (max 6 tabs AND figs)
  - (supplementary material)

Title of the paper

- Concise, to the point, informative, attractive
- Factually correct
- Consider the (real) examples:
  - "*Further studies on environmental factors which may affect the influence of some metals on selected soil dwelling and epigeal invertebrates*"
  - "*Temperature and soil moisture increase susceptibility of earthworms and carabids to zinc and copper*"

Which one do you think is better?

Abstract

- The most important part of the manuscript
  - too many papers to read them all – abstracts help in selecting the most relevant and important ones
  - much wider availability than the paper itself
- Whole article in 100 – 200 words
  - *Sentence 1*: aim of the study
  - *Sentences 2-3*: methods
  - *Sentences 4-5*: main results
  - *Sentence 6*: conclusions

Abstract: be brief!

"*Multi-generation exposure of organisms to toxicants may lead to adaptations increasing their resistance to a chemical. However, the increased tolerance may have a negative effect on fitness in uncontaminated environments due to increased maintenance costs in adapted individuals. Herein we present results of a multi-generation experiment on the flour beetle, Tribolium confusum, showing that animals bred for ca. 10–13 generations in copper-contaminated medium had higher maintenance costs than their counterparts originating from uncontaminated medium. The results show that significant changes in energy budgets may occur even after relatively short selection in small laboratory cultures.*"

Word count: 95

P. Lukasik, R. Laskowski (2007) Increased respiration rate as a result of adaptation to copper in confused flour beetle, *Tribolium confusum* Jacquelin du Val, Bulletin of Environmental Contamination and Toxicology, 79: 311-314.

Introduction

- **2-3 pages**: do not bore readers to death!
- *Paragraph 1*: **what we know**
  - summary of the contemporary knowledge on the topic
  - the importance of the first two sentences
- *Paragraph 2*: **what we don't know**
  - identifying the gaps in knowledge
- *Paragraph 3*: **what we did and why**
  - the goal of your study and how you approached the problem
- **Do not:**
  - attempt to review all literature on the subject
  - refer to textbook knowledge
  - present a review of history of your research

Introduction: examples

Bad:

"As early as 1837 and then again 1881, Darwin called attention to the important ecological role that earthworms play in many terrestrial ecosystems" (in a paper on effects of heavy metals on earthworms)

Better:

- *"Metal pollution may disturb soil ecosystems by affecting soil invertebrate populations"* (from a paper on Cd and Pb effects on earthworms)
- *"Earthworms can accumulate high metal burdens from contaminated substrates due to highly permeable body surface, the detritivorous feeding habit, and metal-sequestration mechanisms"* (from a paper on Cd, Cu, Pb and Ni effects on earthworms)

Methods

- Frequently: "*Materials and methods*"
- Very detailed (as long as necessary, as short as possible)
- Making it possible to repeat the experiment in every single step and detail
- Leaving no doubts about the exact methodology used, e.g.:
  - breeding animals (species, food, conditions...)
  - study design (including number of replicates, etc.)
  - specific methods (e.g., chemical analyses, measurements, etc. – equipment, make)
  - data analysis (methods, software)

Results

- The second most important part of the manuscript
- Put stress on the most important results
- Each sentence should bring a message (avoid ‘empty’ sentences)
- Present the data in relation to hypotheses tested
- Whenever possible, use clear, well described graphs to illustrate your results
- Do NOT mix with discussion (unless the journal uses the combined form of ‘Results and discussion’

Results: examples

Bad start of the section:

"Results of the chemical analyses are shown in Table 1, and differences between the groups are illustrated on Fig. 1"

Better:

"Average Zn concentrations in soil were 87±13 mg/kg at site A, and 465±34 mg/kg at site B, while concentrations of other chemical elements were similar at both sites (Table 1). The respiration rate of soil microorganisms was significantly higher at site A ($p<0.001$; Fig. 1). The sites did not differ, however, in microbial biomass ($p>0.1$; Fig. 2).

➔ **Message:** all sentences should be meaty

Results: scheme

- *Paragraph 1*: what did you study

  "*A total of 574 male beetles were used in the study. Before the start of the experiment, the treatment groups did not differ from each other in terms of body mass or respiration rates.*"

- *Paragraph 2*: what is the main result

  "*The respiration rate decreased significantly with pesticide concentration (p=0.02) and increased with temperature (p=0.003) with no interaction between the factors (Fig. 1). After two weeks no effect on body mass was found (p>0.6; Fig. 2).*"

- *Paragraph 3*: what else came out from the study

  "*As expected, respiration rate increased with body mass...* „

Results: **do not**

- Do not make confusing statements

  "*There was a clear although not significant trend of decreasing respiration rate with increasing Zn concentration in soil*"

- Do not over-interpret your data (relates also to Discussion)
- Do not extrapolate your models beyond the range actually studied
- Do not confuse the *p* value with importance or magnitude of the effect: 'highly significant' (e.g., $p<0.0001$) does not necessarily mean that the effect is large or important for a population (but it can be!)

Technical issues: reporting numbers

- Single-digit numbers – use words (*five beetles*)
- Multi-digit numbers – use numbers (*26 beetles*)
- Never start a sentence with a number (*Twenty six beetles died during the experiment*)
- Put a hard space between a number and its unit (*58 km*; *0.125 g*)
- No space between a number and % sign (*96%*)
- Do not report numbers with greater precision than actual measurements; one decimal place more for statistics (means, medians, SD, CI, etc.)

Results: tables

- Follow the journal style
- No grids, only few basic horizontal lines
- Sufficient space separating rows and columns
- Do to not overload tables (better split into two)
- Place columns in a sensible order (left to right)
- Do not repeat the same information in tables and graphs

Results: tables and graphs

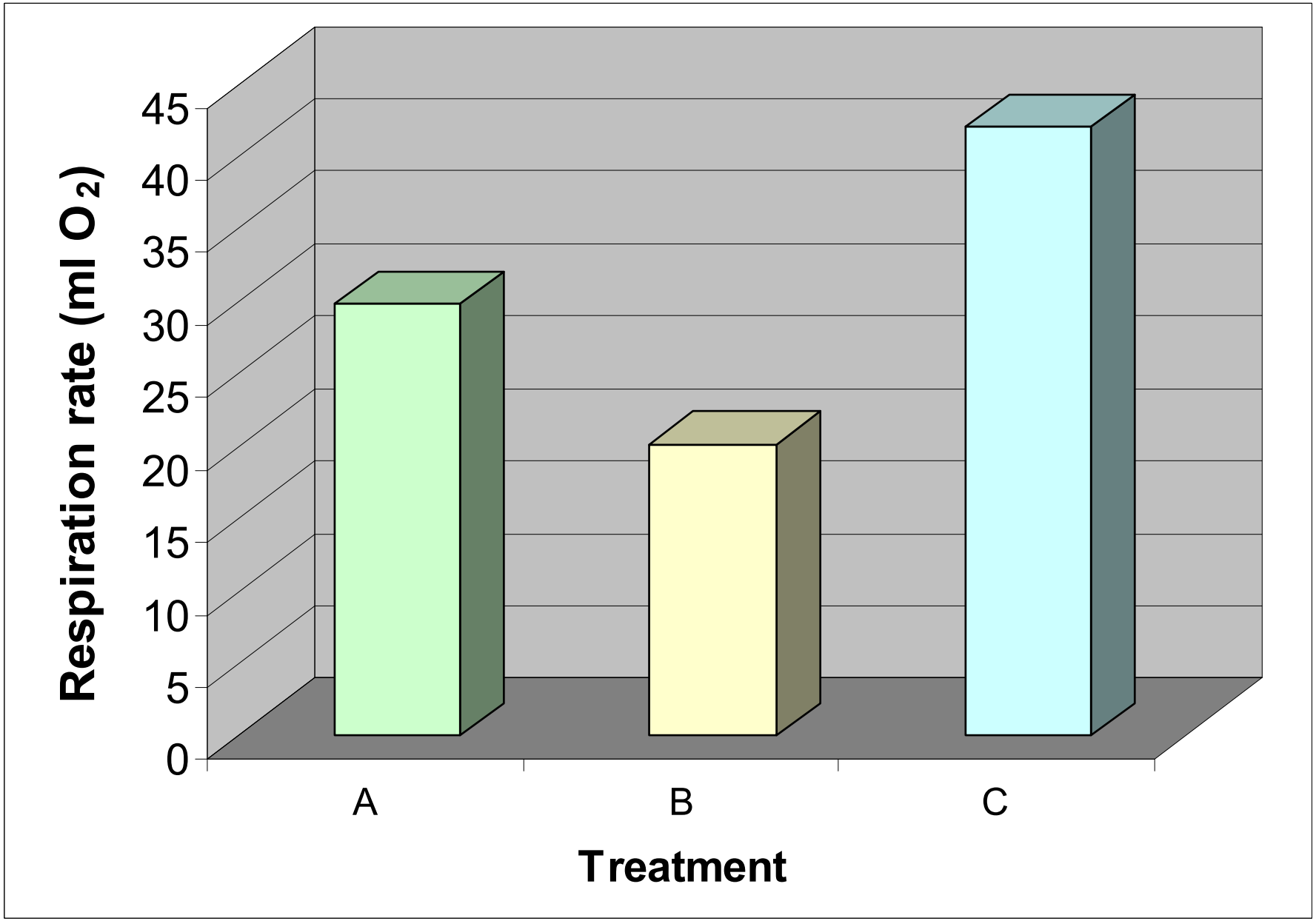
- Formatting tables

- *These data will be used to illustrate bad and good ways of presenting the data on figures*

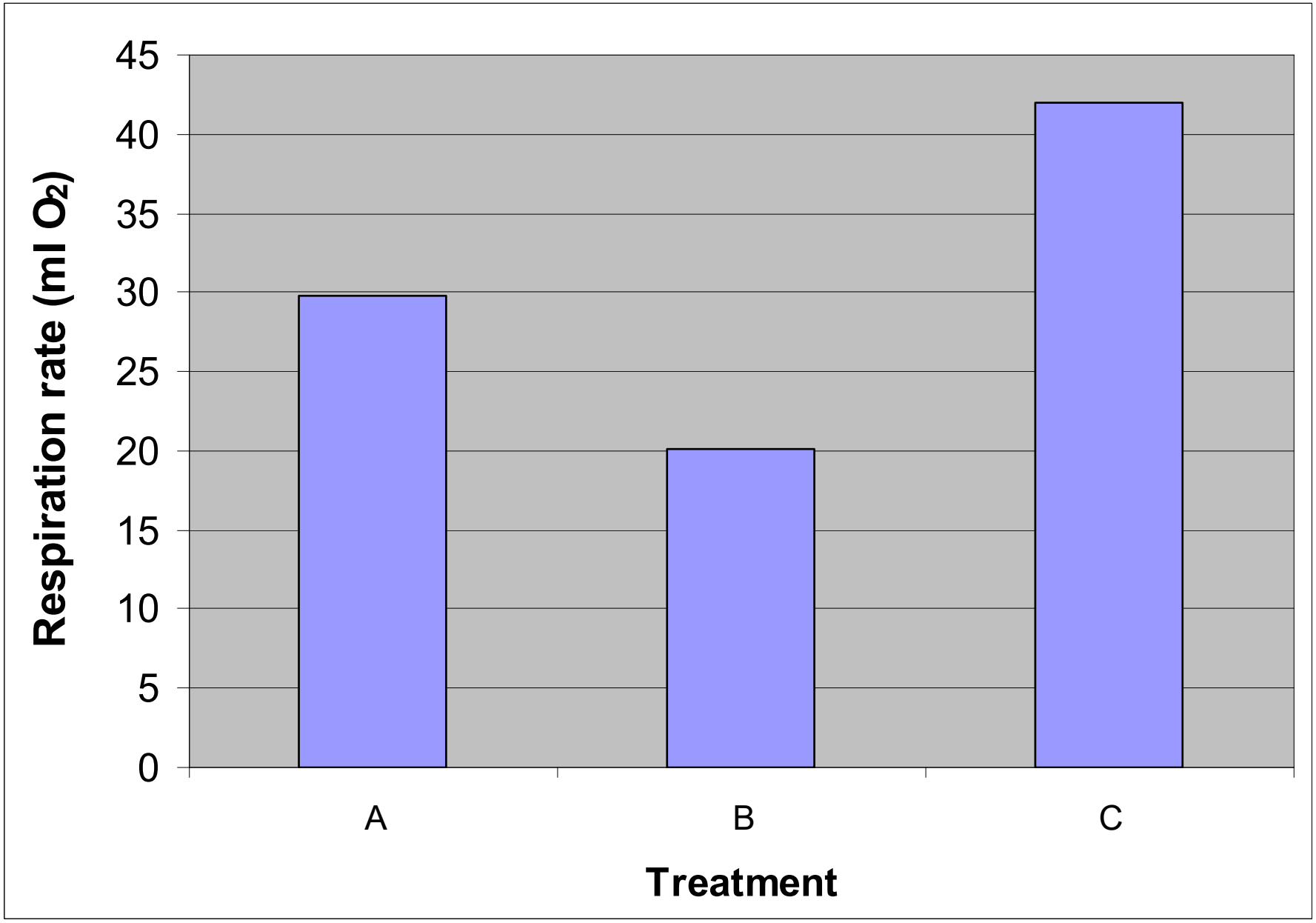
Respiration rate of animals (ml O_2/h)

Experimental groups		
A	**B**	**C**
23	12	38
25	14	40
27	16	42
29	18	44
31	20	46
33	22	48
35	24	50
37	26	52
39	28	54

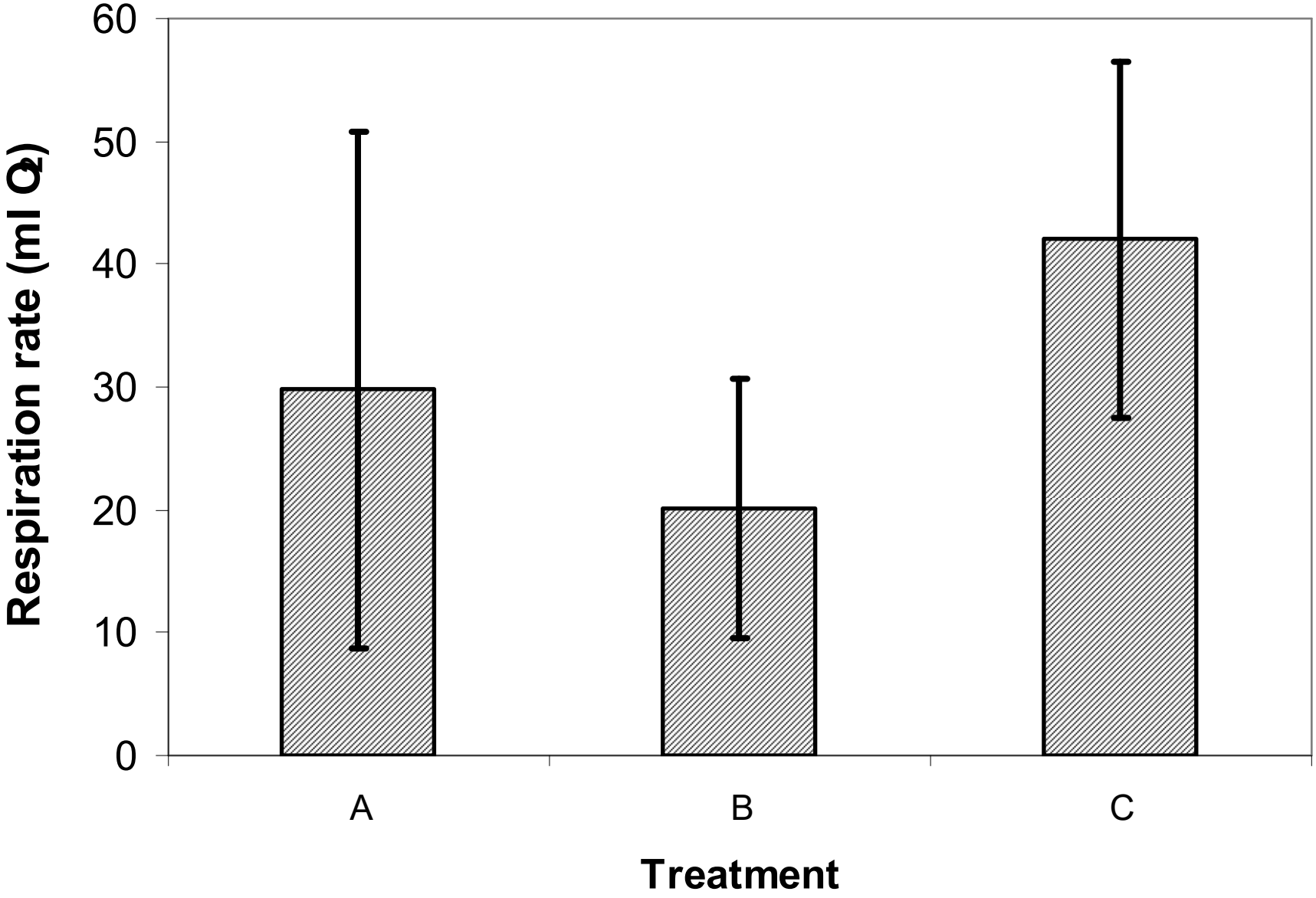
Results: graphs



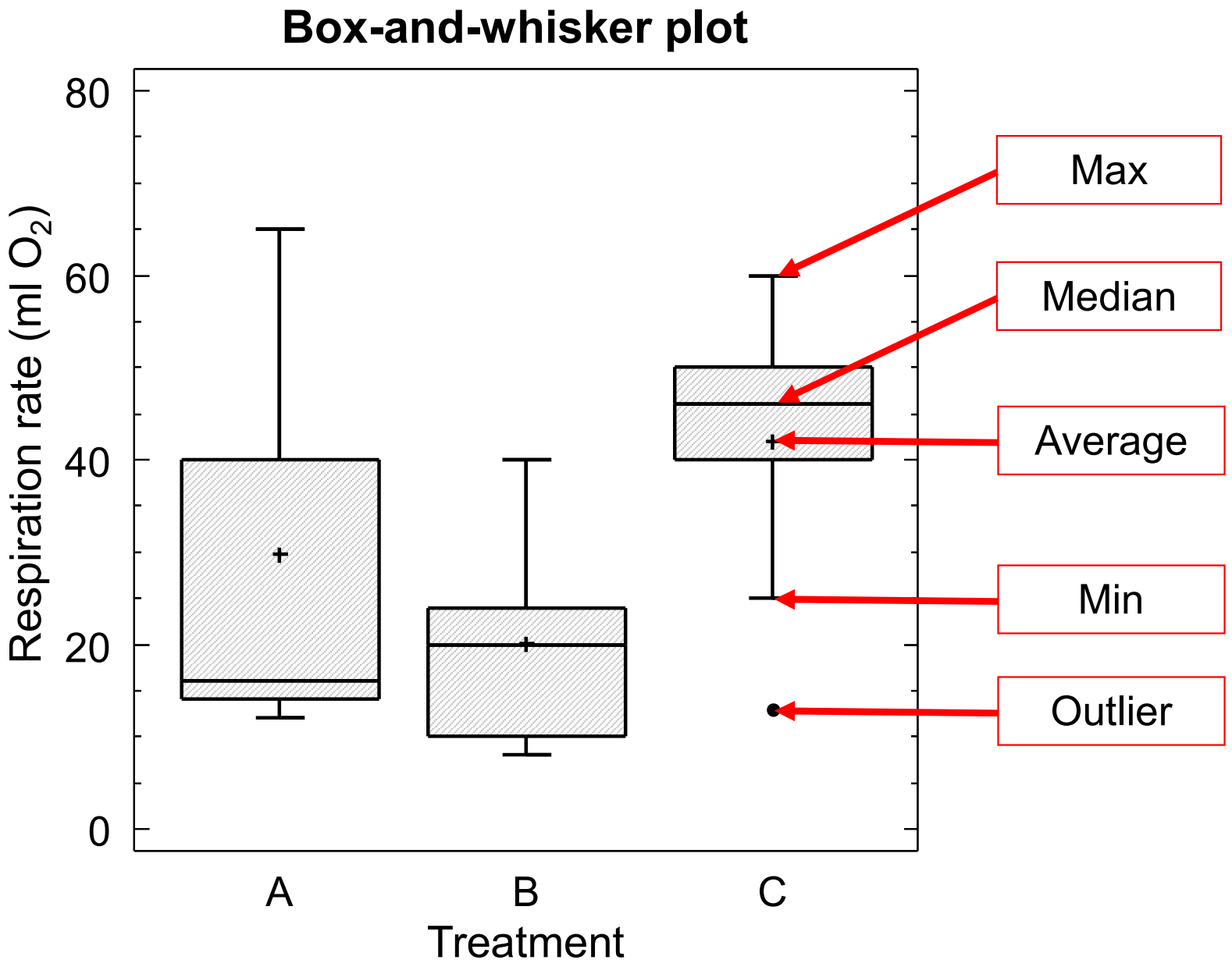
Results: graphs



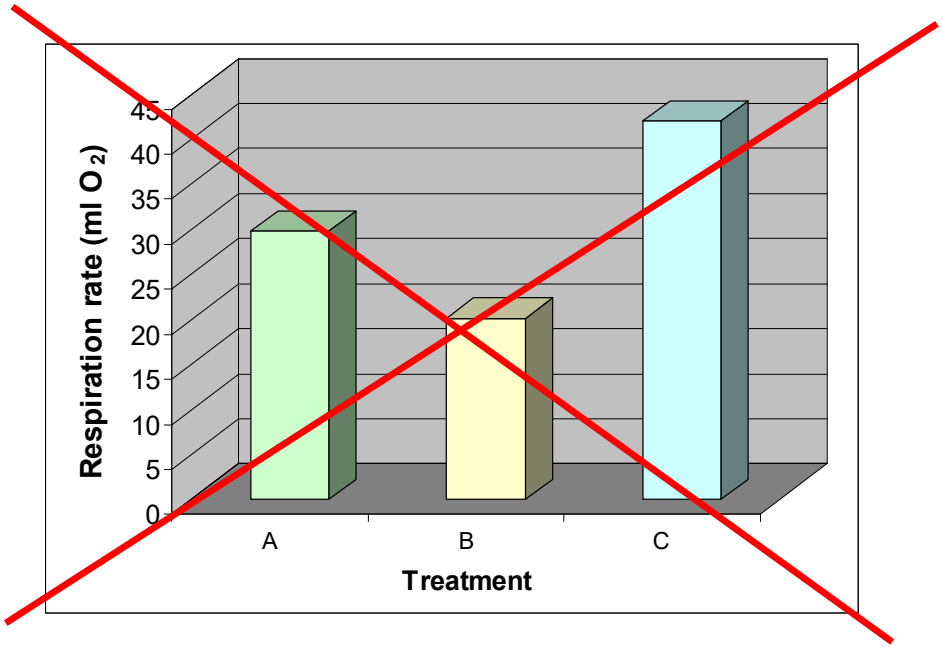
Results: graphs

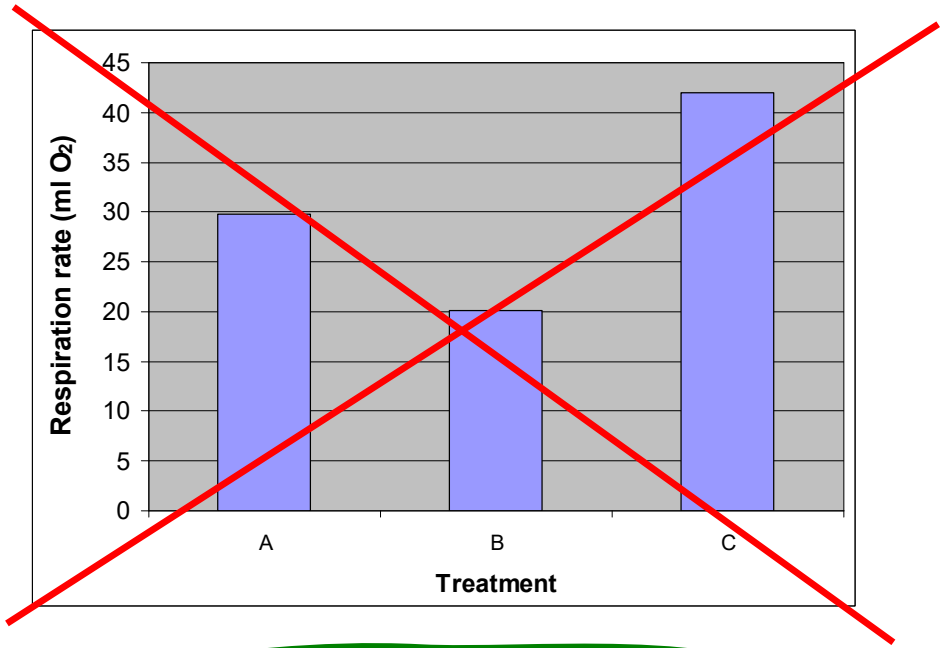


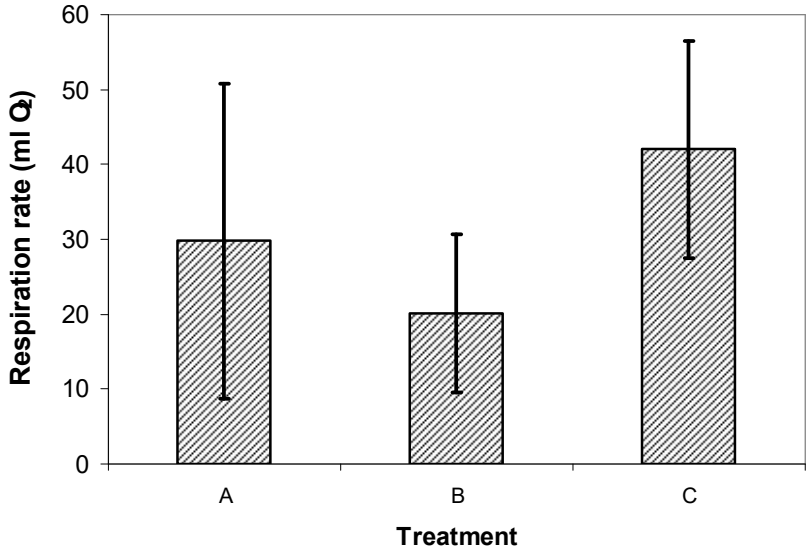
Results: graphs

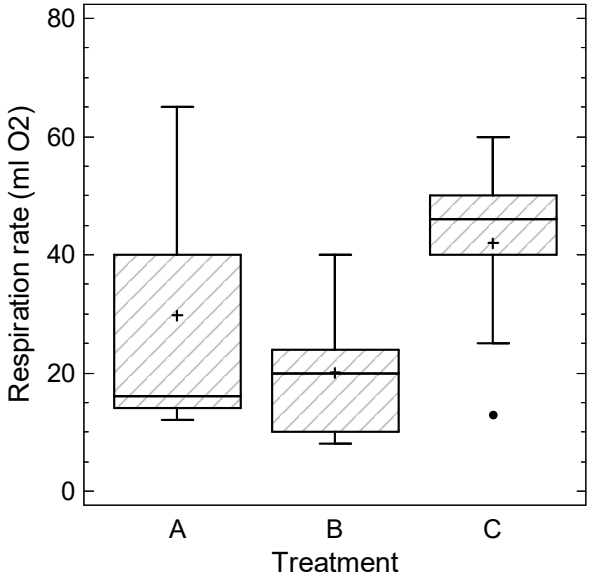


Results: graphs









Methods: graphs summary

- Never ever use pseudo-three-dimensional graphs!
- Avoid using solid colors or shades of grey – different hatchings or line patterns are better
- Use labeling large enough to be readable after substantial reduction of size (check it!)
- No unnecessary lines, text, etc.
- Figures should be easy to interpret!
- Figures are printed on separate pages at the end of the manuscript; captions are printed on a separate page

Discussion

Put your results into the context of furthering knowledge

- *Paragraph 1*
  - **What did your study show?** How do the results relate to aims and hypotheses formulated in the Introduction?
- *Paragraph 2*
  - Describe strengths and weaknesses of the study/methods
- *Paragraph 3* (possibly more than one)
  - How do your results fit into the current knowledge? Do they agree with the literature or oppose it?
- *Last paragraph*
  - What are the consequences of your study? What should be done next?

Discussion: things **to do** and **not to do**

- **Make a strong message** from your results
- **Be absolutely honest** about any problems, inconsistencies, and limitations of your study
- **Do not** try to discuss your results against every single article relating to your study
- **Do not** over-interpret your results (formulating new hypotheses and forwarding suppositions is OK, speculating is NOT)
- **Avoid** statements like: „Further studies are needed... „

References

- Use only the most important and up-to-date literature (but do not forget that science existed before Internet and valuable data and papers are sometimes decades old)
- Include only published articles and books
- Do not quote second-hand
- Do not exceed ca. 30-40 references
- Format all references exactly as required for the selected journal

Writing style

- **Use plain English:** no jargon, no elaborate phrases
- Each paragraph needs a **defined topic**
  - topic sentences, e.g.:
    - "*The mortality of beetles did not exceed 10%. The initial body mass of female beetles (0.0590 g) was significantly higher than that of male beetles (0.0537 g) ($p<0.0001$), with no significant differences between the temperatures to which they were assigned ($p = 0.9$).*"
    - "*At the end of experiment, Ni levels in the beetles were much higher than at the beginning of the experiment at all temperatures ($p<0.03$; Table 3)...*"

A. J. Bednarska, A. Brzeska, R. Laskowski (2011) Two-phase uptake of nickel in the ground beetle *Pterostichus oblongopunctatus* (Coleoptera: Carabidae): Implications for invertebrate metal kinetics, Archives of Environmental Contamination and Toxicology, 60: 722-733.

Writing style

- **Short sentences**
- Simple structure: **subject** – **verb** – **object**
  - "The results of statistical analyses (Table 1), together with graphs shown in Fig. 1, clearly indicate that the classic two-phase model does not really fit to the data."
  - "A detailed and formal comparison of the models indicated that the highest R_{adj}^2 and the lowest AIC values were obtained for the three-phase model with estimated breakpoint..."

R. Laskowski, A. J. Bednarska, D. J. Spurgeon, C. Svendsen, C. A. M. van Gestel (2010) Three-phase metal kinetics in terrestrial invertebrates exposed to high metal concentrations. The Science of the Total Environment, 408: 3794-802.

Writing style – examples

Don't use	Better
based on the fact that	because
for the purpose of	for / to
fact	evidence
prove	support
plays an important role	is important because
decreased number of	fewer
time period	time
longer time period	longer
brown in color	brown
round in shape	round
a number of	some
has been shown to be	is
by means of	by
it is possible that	may
in order to	to
during the course of	during
a majority of	most

Preparing manuscript: final touch

- **Follow journal's Instructions for Authors!**
- Page: A4 or Letter, all margins 2.5 cm (1")
- Separate title page: title, authors, addresses
- Numbered pages and lines (*preferred continuous line numbering*)
- Text left-justified, double-spaced, Times 10-12 p.
- No hyphenation
- No orphans and widows
- Each section starts on a new page
- Separate paragraphs for each topic

Submitting the manuscript: letter to the editor

Dear Editor,

Attached please find a paper entitled ‘Decreased functional diversity of soil microbial communities in soils polluted with metals’. We would be grateful if you consider it for publication in your journal. We believe that the study is quite unique as it is based on four different pollution gradients, located in two countries and polluted with different mixtures of metals.

The data reported in this manuscript have not been published earlier, and the manuscript is not under consideration for another journal. All authors have approved this version for submission.

Yours sincerely,

.....

TAKE-HOME SUMMARY

- Be brief and accurate throughout the manuscript
- Be extremely precise in describing the methods
- Describe the results as clearly as possible, concentrating on those most important for the hypothesis tested and aims of the study
- Do not be tempted to see in the data what is not there (what you cannot prove)
- Limit the number of tables AND figures to ca. six
- Comply with “Instructions to authors” in every detail

PART 3:
Publication process and reviews

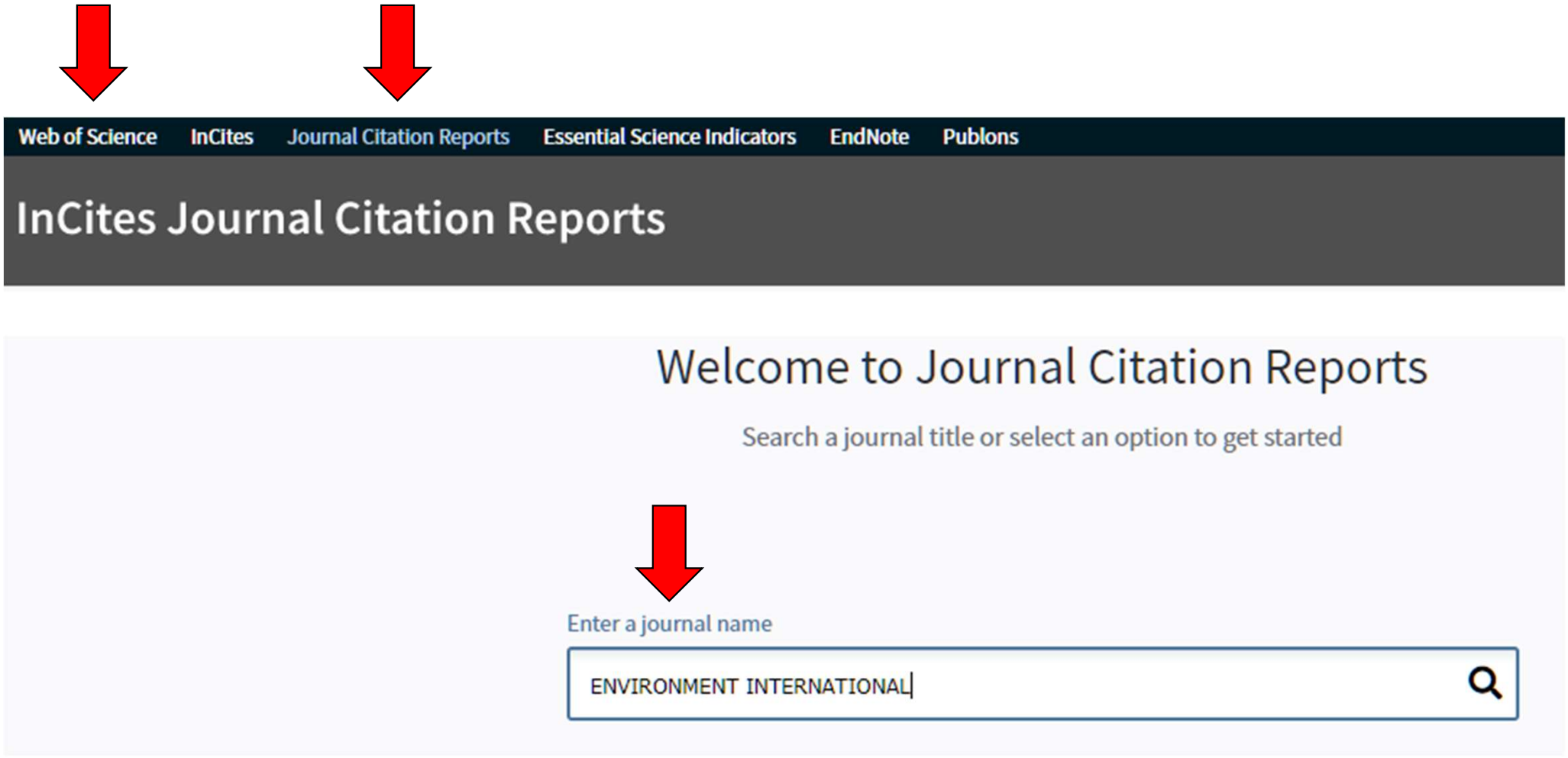
Where to publish: selecting the journal

- **Publish you work in the best journal you can!**

BUT:

- Your article MUST fit perfectly to the journal profile
- The article has to follow one of the forms accepted by the journal (e.g., extensive research paper, short communication, review paper)
- The quality of your work must meet the journal status

How to know what is “the best journal”?



JCR: impact factors, half-life, etc...

Mark	Rank	Abbreviated Journal Title (linked to journal information)	ISSN	JCR Data						Eigenfactor™ Metrics	
				Total Cites	Impact Factor	5-Year Impact Factor	Immediacy Index	Articles	Cited Half-life	Eigenfactor™ Score	Article Influence™ Score
☐	1	ENERG ENVIRON SCI	1754-5692	1766	9.488	9.488	0.944	198	1.7	0.00941	2.922
☐	2	FRONT ECOL ENVIRON	1540-9295	2994	8.820	7.931	1.309	55	4.1	0.01592	3.132
☐	3	GLOBAL CHANGE BIOL	1354-1013	13987	6.346	7.814	1.378	262	5.1	0.06034	3.049
☐	4	ENVIRON HEALTH PERSP	0091-6765	26174	6.087	7.024	1.289	270	7.1	0.06206	2.103
☐	5	GLOBAL BIOGEOCHEM CY	0886-6236	8761	5.263	5.936	0.853	102	7.7	0.02896	2.881
☐	6	GLOBAL ENVIRON CHANG	0959-3780	2722	4.918	7.840	0.731	67	5.1	0.00955	2.390
☐	7	CONSERV BIOL	0888-8892	15680	4.894	5.963	0.789	171	8.4	0.03558	2.160
☐	8	J ENVIRON SCI HEAL C	1059-0501	283	4.840	4.380	0.091	11	3.4	0.00114	1.176
☐	9	ENVIRON SCI TECHNOL	0013-936X	72582	4.827	5.398	0.747	1400	6.2	0.18254	1.490
☐	10	ENVIRON INT	0160-4120	6437	4.691	4.786	0.623	114	5.8	0.01762	1.322
☐	11	WATER RES	0043-1354	34724	4.546	4.966	0.656	546	7.9	0.05965	1.247
☐	12	ECOL APPL	1051-0761	13617	4.276	5.067	0.621	177	8.1	0.03610	2.036
☐	13	J TOXICOL ENV HEAL B	1093-7404	807	4.041	4.583	0.538	26	5.2	0.00240	1.289
☐	14	BIOENERG RES	1939-1234	236	4.019	4.077	0.568	37	2.3	0.00099	0.982
☐	15	CRIT REV ENV SCI TEC	1064-3389	1511	4.000	7.653	0.600	20	8.7	0.00296	2.118
☐	16	REMOTE SENS ENVIRON	0034-4257	15619	3.954	4.607	0.602	244	7.4	0.03506	1.422
☐	17	ANNU REV ENV RESOUR	1543-5938	973	3.737	8.072	0.385	13	5.3	0.00494	3.070
☐	18	J HAZARD MATER	0304-3894	28060	3.723	3.997	0.571	1638	3.0	0.08923	0.810
☐	19	ENVIRON RES	0013-9351	5481	3.500	3.670	0.558	104	6.5	0.01504	1.143
☐	20	BIOL CONSERV	0006-3207	14745	3.498	4.042	0.702	315	6.4	0.04184	1.319

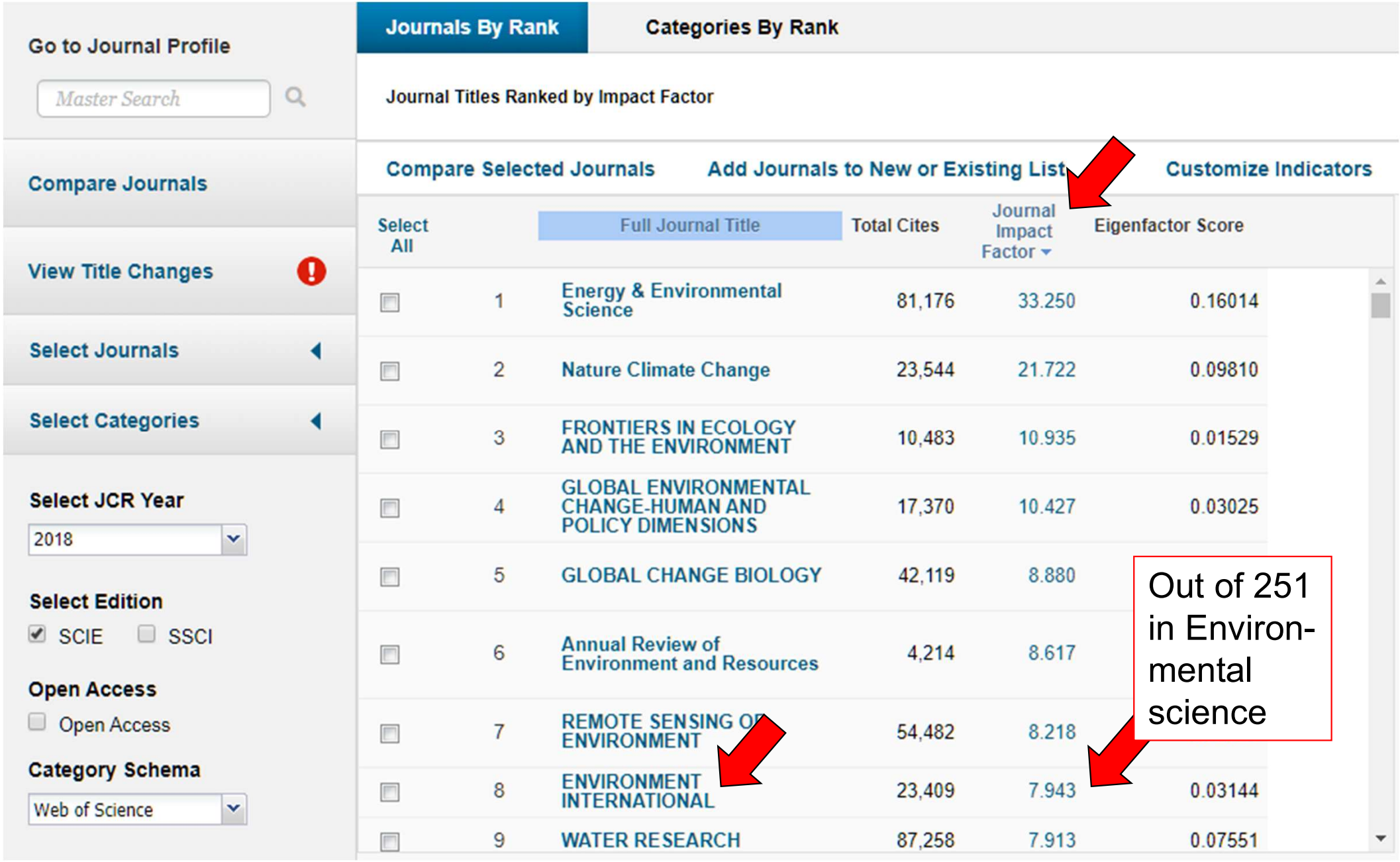
MARK ALL | UPDATE MARKED LIST

Journals 1 - 20 (of 193)

[1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10]

Page 1 of 10

How to know what is “the best journal”?



JCR: impact factors, half-life, etc...

- **Journal Impact Factor**
  - the average number of times articles from the journal published in the past two years have been cited in the JCR year
- **5-Year Journal Impact Factor**
  - the average number of times articles from the journal published in the past five years have been cited in the JCR year
- **Journal Cited Half-Life**
  - The median age of the articles that were cited in the JCR year
- Balance between journal rank and acceptance ratio

Ethics in science

- **Fraud:**
  - intentional deception, deliberate trickery intended to gain an advantage
- Multiple publication
  - never ever publish the same article more than once!
  - using the same data in different papers?
- Authorship
  - no „gift authorships”!
  - all collaborators with significant scientific input should be coauthors

Review process

- Peer review – what does it mean and is it important?
- It takes ca. 2-4 months to receive a review
  - be patient (but not over 4 months – a polite reminder to the editor can help)
- Acceptance ratio: best journals accept only a small proportion of the submitted manuscripts (10-20%)
- It almost never happens to have a paper accepted without any revisions
- You can always withdraw your manuscript from a journal

How to deal with a review?

- Never get angry at the review or reviewers – that does not help! Positive attitude is the key!
- If a reviewer does not understand parts of your paper, this is probably *your* fault. In 90% cases reviewers are right.
- Go through the review and make all simple corrections first.
- Then, concentrate on more serious issues.
- Incorporate all sensible suggested changes.
- Rebut those, where the reviewer was wrong.

After the review

1. Prepare clean revised manuscript
2. Letter to the editor: brief summary of the revisions
3. Detailed list of changes and rebuttals
   - copy ALL suggestions made by reviewers and comment each one:
     - if simply accepted – ‘Done’
     - if more elaborate changes – detail them and indicate respective place in the revised manuscript (page, line)

- In case of rejection:
  1. use the reviews anyway to improve the manuscript
  2. go for another journal

Proofreading:
Your last work on the accepted manuscript

- More difficult task than you think
- Do not neglect it – this is your last chance to make corrections (publishing papers with typos, mistaken numbers, etc. doesn't build good reputation!)
- There are standard RULES of marking corrections on proofs: do not invent yours!
  - frequently can be found on publishers' websites
  - for general rules, see complementary materials
- Be fast: the publisher will not wait for your work

Reviewing others' work

- Peer review is your duty!
- Assuring good science is the prime reason
- It allows to shape your field
- Make the review in a way you would expect from others:
  - politeness – ALWAYS, no excuses!
  - constructiveness
  - encouragement – if justified
- Accept a paper for review only if:
  - you have enough expertise
  - there is no conflict of interest
  - you are able to complete the review in due time (2-3 w.)

Reviewer's tasks

- General recommendation:
  - **Accept** / **Minor revision** / **Major revision** / **Reject**
- Assessing scientific merits of the manuscript:
  - is the study up to date with contemporary knowledge
  - are the results new and important
  - is the study methodologically correct (experimental design, tools and methods used, etc.)
  - is the statistics correct
  - are the conclusions supported by the data and analyses
- Assessing quality of the manuscript itself
  - is the language good and the text easy to understand
  - are the tables and graphs of good quality, etc.

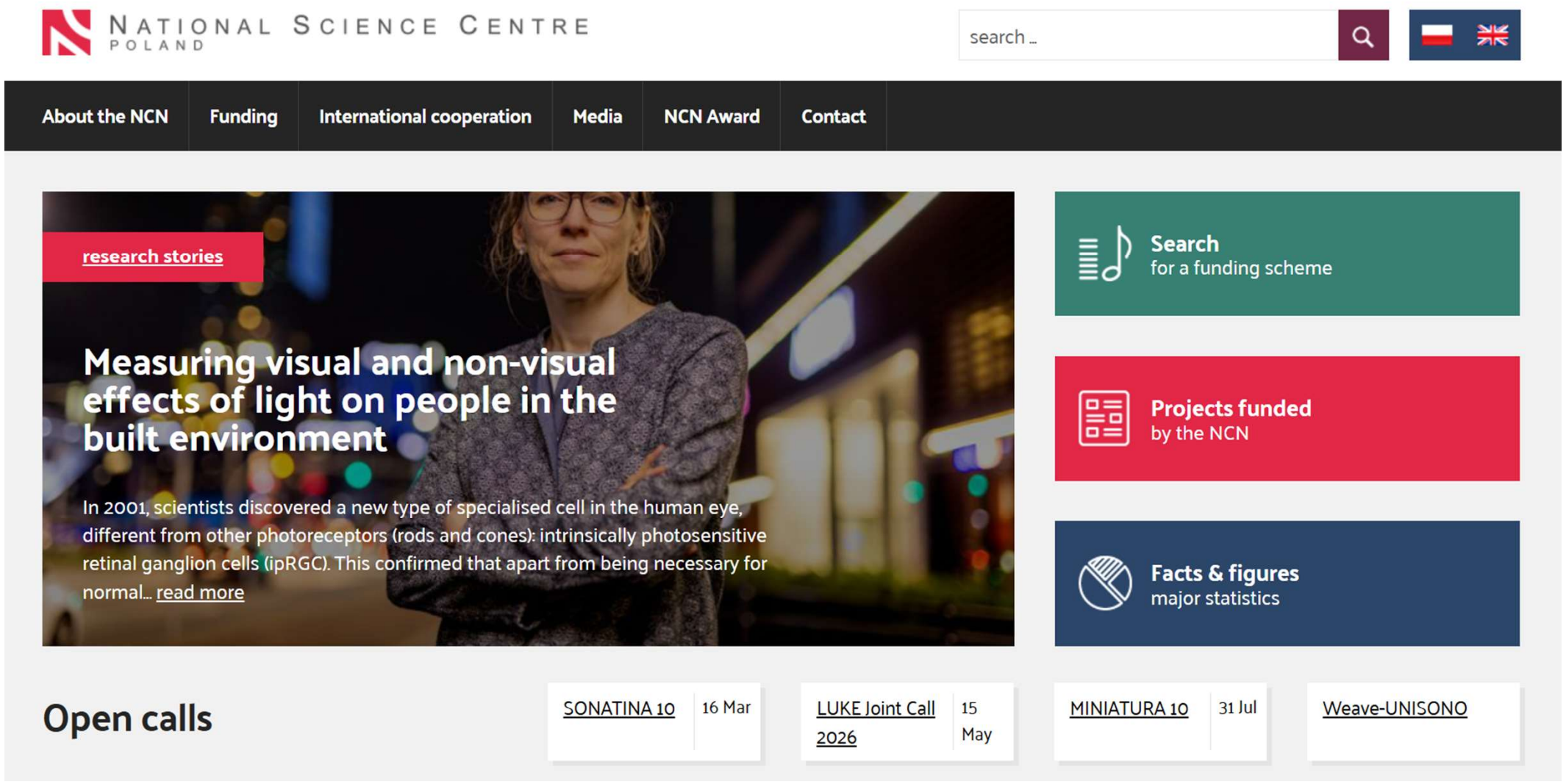
PART 4:
Making a successful grant proposal

Major granting bodies

- **Poland**:
  - National Science Centre (NCN) - www.ncn.gov.pl
  - National Centre for Research and Development (NCBiR) - www.ncbir.gov.pl
  - Foundation for Polish Science (FNP) - www.fnp.org.pl
- **Europe:**
  - EC funded research: https://research-and-innovation.ec.europa.eu/funding_en
  - European Science Foundation - www.esf.org
- **US**
  - National Science Foundation - www.nsf.gov
  - National Institute of Health - www.nih.gov
- etc...

National Science Centre

www.ncn.gov.pl



National Science Centre

www.ncn.gov.pl

- **Basic research**
  - "*original experimental or theoretical research work undertaken primarily to acquire new knowledge of the underlying foundations of phenomena and observable facts, without any direct practical application or use*"
- Funding:
  - **basic research** in the form of research projects,
  - **doctoral fellowships and post-doctoral internships**,
  - research projects carried out by experienced researchers aimed at implementing pioneering research important for the development of science,
  - research projects outside the scope of research funded by the National Centre for Research and Development

National Science Centre (NCN)

- Examples of calls for proposals:
  - OPUS: *general grants*
  - PRELUDIUM: *pre-doctoral grants*
  - PRELUDIUM BIS: PhD students
  - SONATINA: *<3 years after PhD*
  - SONATA: *2 – 7 years after PhD*
  - SONATA BIS: *5 – 12 years after PhD*
  - HARMONIA: *non-co-financed international grants*
  - MAESTRO: *advanced researchers grants*

National Centre for Research and Development (NCBiR) - www.ncbir.gov.pl

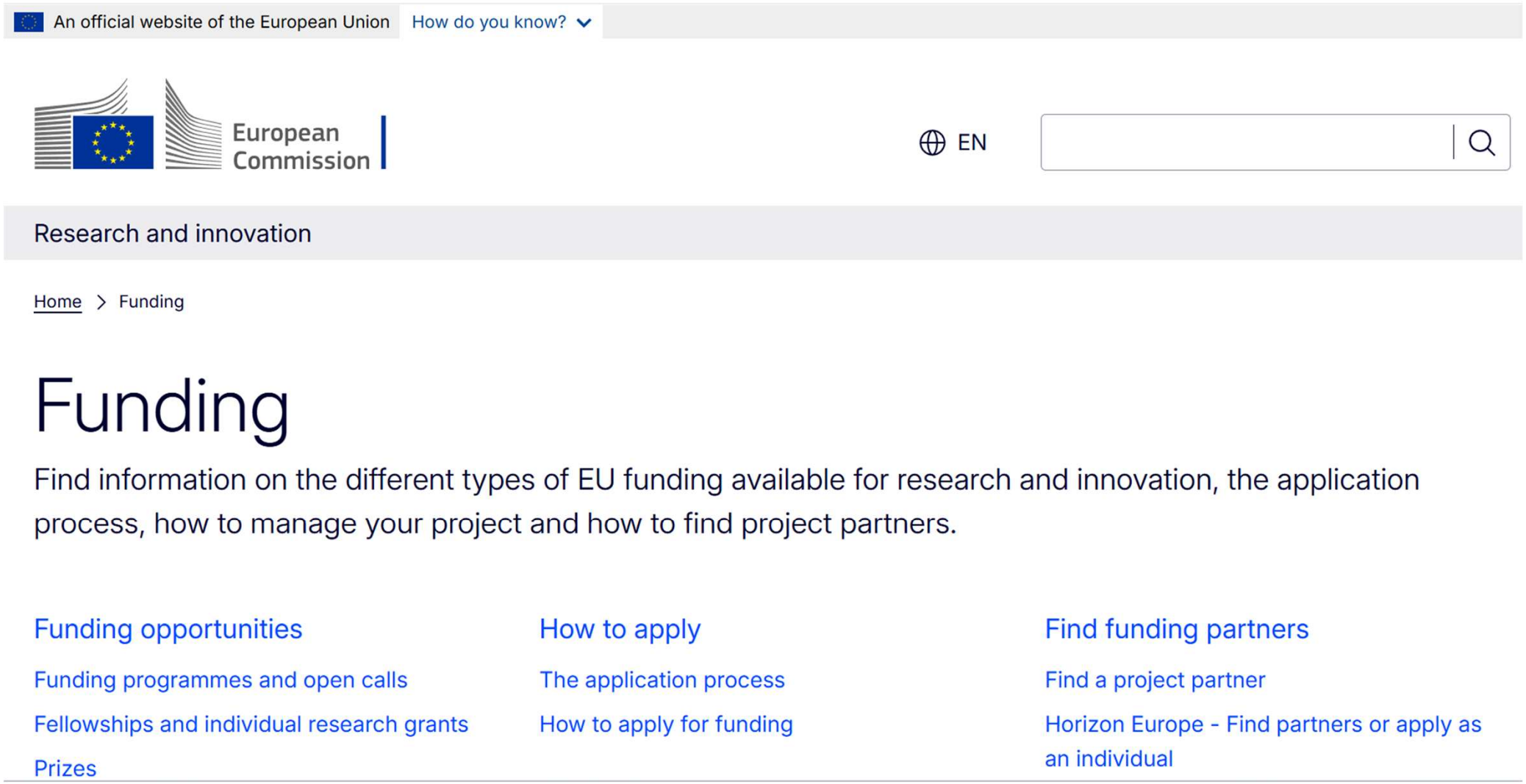
- Mission and tasks:
  - "*Support of the Polish research units and enterprises in developing their abilities to create and use solutions based on scientific research results in order to encourage economy development and to the benefit of society*"
  - the management of **applied research programs**
  - strategic research and development programs, which lead directly to the development of innovativeness
  - support of commercialization and other forms of transfer of scientific research results
  - performance of national security and defense projects

National Centre for Research and Development

- Strategic research and development programmes:
  - Advanced Technologies for Energy Generation;
  - Interdisciplinary System for Interactive Scientific and Scientific Technical Information;
- Strategic research projects:
  - Integrated System for Reducing Energy Consumption in the Maintenance of Buildings,
  - Work Safety Optimization in Mines;
  - Safe Nuclear Power Engineering Development Technologies.

European Commission

https://research-and-innovation.ec.europa.eu/funding_en



European Commission

Funding opportunities in research and innovation

Funding programmes and open calls

Information about research and innovation funding programmes, including Horizon Europe, the Cohesion Fund, LIFE, ERDF, ESIF and RFCS

Fellowships and individual research grants

ERC grants for frontier research

Marie Skłodowska-Curie actions - Research Fellowship Programme

Prizes

EU Award for Gender Equality Champions

EIC Horizon Prizes

SOFT Innovation prize

Prize for Governance Innovations in Energy Communities

Nuclear Innovation

EU Contest for Young Scientists (EUCYS)

Contest for young science students at European level.

Seal of Excellence

What the Seal of Excellence is, how to use it, funding opportunities, information for funding bodies and latest news.

EU TalentOn

Event that challenges young researchers to find solutions to the most pressing global issues.

European Commission

Horizon Europe

Research and innovation funding programme until 2027. How to get funding, programme structure, missions, European partnerships, news and events.

What is Horizon Europe?

Horizon Europe is the EU's key funding programme for research and innovation. Following the Multiannual Financial Framework Midterm Review (MTR) decision, the indicative funding amount for Horizon Europe for the period 2021-2027 is EUR 93.5 billion.

It tackles climate change, helps to achieve the UN's Sustainable Development Goals and boosts the EU's competitiveness and growth.

The programme facilitates collaboration and strengthens the impact of research and innovation in developing, supporting and implementing EU policies while tackling global challenges. It supports creating and better dispersing of excellent knowledge and technologies.

It creates jobs, fully engages the EU's talent pool, boosts economic growth, promotes industrial competitiveness and optimises investment impact within a strengthened European Research Area.

Structure of a grant proposal

- **Title:** briefly indicating the aim(s) of the study
- **Introduction:** similar to introduction in a paper – presenting your planned research as the one filling important gaps in knowledge
- **Aims:** clearly defined goal(s), which can be easily evaluated by the end of the project (formal hypotheses are sometimes the best option)
- **Expected results:** should be easy to evaluate at the end whether the project was successful
- **Budget:** the clearer the better
- **Investigators' CVs**
- **Presentation of the research institution(s)**

Making a successful grant proposal

- **Formulating research question(s)**
  - "*The main aim of the project is the quantitative description of leaf litter decomposition and nutrient balance in litter and soil of tropical montane cloud forests in the Venezuelan Coast Range, in cooperation with Venezuelan researchers. The major hypothesis that will be tested in the project is the assumption that the most important factor limiting organic matter decomposition rate in tropical montane cloud forests is the availability of nutrients. This would be in contrast to patterns observed in most other biomes, where actual evapotranspiration is the most important factor determining the decomposition rate.*"

Making a successful grant proposal

- **Justifying the proposed study**
  - "*Tropical montane cloud forests belong to the least studied ecosystems on Earth. At the same time, they represent the highest known biodiversity on the one hand and are extremely endangered by various human activities on the other. They are also immensely important because of specific ecosystem services they provide; for example, they are the major source of drinking water for millions of people inhabiting foothills – hence the biogeochemical studies have very special importance there.*"

Making a successful grant proposal

- **Proving that success is highly probable**
  - "*Researchers from the partner institution have been working in the Coast Range for years, which guarantees not only that the studies will be properly designed but also doable...*"
  - "*The question about nutrients as limiting factors for organic matter decomposition was not formally well studied at all and is virtually unknown for tropical (montane) forests. Hence, we are convinced that our data will be published in the best ecological journals.*"
  - Researchers' CVs, publication lists, and outcome of completed projects

Budgeting grant proposal

- **Direct costs:**
  - all your actual planned spendings, e.g.:
    - employment costs (labour: assistants, technicians, students)
    - travel (field work, conferences, staff exchange)
    - equipment (*not all granting programmes allow for that*)
    - consumables (chemicals, glassware, stationery, etc.)
- **Indirect costs:**
  - overheads imposed by the institution (*vary widely, usually ca. 25-50% of direct costs*

Budgeting grant proposal

- **All items need to be specified with their costs**
- **Employment costs:**
  - based on actual cost of a work unit (e.g., hour or month) for specific position
  - including ALL derived costs: taxes, insurances, employer's costs, etc.
  - total cost calculated based on actual time devoted to the project ('person-hours'; person-months')
  - remember that people do not work 24 hours a day (e.g., if a person works also in other projects)

Thank you

Good luck in science!