



Publication Analysis 1996-2007

Plant & Animal Ecology

Photo: Wikimedia/Nicolas Guérin

England dominates Europe's plant and animal ecology. However, publications and citations are distributed rather differently between the individual countries when drawing comparisons across the whole life science sector.

The title clearly indicates the fact that researchers working in the currently rather trendy field of microbial ecology were excluded from this ecology analysis.

Why? First of all, the average citation level for microbial ecology is presently so high that they would disproportionately out-compete their plant and animal colleagues.

However, another reason is even more important with respect to the concept of our publication analyses. The key criterion lies in which journals the people publish their work. The rationale is that they thereby reveal in which context they want their results to be discussed and, furthermore, to which community they feel they belong.

Getting to the point now, papers in microbial ecology are almost never found in general ecology journals but, instead, are published in general microbiology journals (including, of course, journals exclusively dedicated to microbial ecology). That's why it seems more appropriate not to include them under the heading "ecology" but rather in a future analysis under "microbiology".

Hard to compare

However, even if restricted to "plant and animal ecology", the field remains quite heterogenous. In fact, clear borders cannot be drawn since the whole field obviously receives input from a wide variety of disciplines. This, for example, is nicely illustrated by the institute addresses listed in the papers appearing in ecology journals: you'll find botany, zoology, molecular biology, toxicology, (population) genetics, evolutionary biology, environmental chemistry, geosciences, oceanography, mathematics and informatics...

It's not so easy, therefore, to come up with a fair and comparative analysis. In particular, due to an additional drawback when

analysing ecology papers from the period 1996-2007. Despite many of the ecological "top papers" being published in multidisciplinary science journals like *Nature*, *Science* or *PNAS*, we nevertheless had to restrict a certain part of the analysis to the 124 expert journals listed in the subject category "Ecology" of Thomson Reuter's database *Web of Science*. The reason is a technological one: *Web of Science*, which was used for this analysis, doesn't provide any sufficiently reliable tools to automatically extract relevant ecology articles from the multidisciplinary journals. Of course, as a result, some of the most prominent papers in the field have been omitted from the performance analysis of individual countries (see tables p. 41). Despite this limitation, however, we believe that a survey, restricted to the specialist journals only, still provides sufficiently valid indicators for the countries' overall productivity in ecology research. On the contrary, rankings of the most-cited researchers and papers (see tables p. 42) could be analysed from publications in all journals.

A different picture

With these directives in mind, we can now turn to the results. Between 1996 and 2007, more than 47,000 research articles and reviews were published in the analysed ecology journals, which included at least one author from Europe or Israel. The USA, in comparison, achieved almost the same number of publications this way (slightly below 47,000). These US articles, however, have altogether been cited slightly more frequently to-date than the European articles (864,000 times versus 806,000 times).

The pan-European leader, as in most other life science disciplines, is England. The extent of its lead over the following nations, however, is clearly more striking than usual. Scientists

working in England appeared on more than 10,500 papers in the ecology journals from 1996-2007, which in turn were cited more than 216,000 times to-date. France, in second place, produced more than 4,000 fewer articles and has fallen behind England by more than 100,000 citations. France, nevertheless, this time succeeded in sending Germany, the “usual number two” in Europe’s life sciences, down to the third place.

This, however, is not the only significant deviation from the “usual” countries’ pattern. The Scandinavian countries, for example, performed much stronger than in most other disciplines – in particular, Sweden as fourth by total number of citations (Finland, Norway and Denmark followed in 9th, 10th and 11th place). At the opposite end of the line, there are countries like Italy (12th), Belgium (13th) and Israel (14th), which ended up clearly lower than “usual”.

Software and the Ice Age

This kind of obvious deviation from the “life science norm” continues far beyond the European borders. Japan, for example, collected “only” 36,000 citations for its ecology papers, which is even fewer than Norway. On the other hand, Canada and Australia performed so strongly that they would occupy a clear 2nd and 3rd place respectively, if integrated into the European nations’ list.

In conclusion, it therefore remains to state that in the subfield “ecology”, the distribution of papers and citations among the European countries differs considerably from the situation in the whole life science sector.

The “English dominance” within Europe’s plant and animal ecology is also documented by the lists of the most-cited papers and authors. Out of the five most-cited papers, 1st, 2nd and 5th places have correspondence addresses in England; furthermore, 12 of the 30 most-cited authors were working at English institutes most of the time between 1996 and 2007.

The five most-cited papers basically centre around two distinct ecology topics. Places 1, 3 and 5 describe software developed to help analyse different data sets in ecological contexts. The remaining two articles in 2nd and 4th place both try to reconstruct the consequences of the Ice Age on ecological parameters like phylogeography, colonisation and population genetics of whole ranges of species.

Most productive

The list of the most-cited authors, of course, reveals a couple of more “hot” ecology topics. A very obvious one is biodiversity and conservation as represented, for example, by Kevin Gaston (2nd) and Bernhard Schmid (6th). Others include forest-driven carbon cycles (Ernst-Detlef Schulze, 7th; Riccardo Valentini, 13th; Roland Ceulemans, 17th), large scale ecological patterns of population densities (Nils Stenseth, 5th; Pierre Taberlet, 14th; Ilkka Hanski, 15th), ecological aspects of chemical communication (Ian Baldwin, 9th) and molecular population genetics (Godfrey Hewitt, 3rd; Josephine Pemberton, 11th).

That leaves “number one”, bird specialist Anders Pape Møller from Paris, whose main contributions come from long-term studies on barn swallow populations in response to changes in environmental factors. Altogether, Møller published 329 articles and reviews between 1996 and 2007, by far the most of all ecology researchers analysed. By applying simple mathematics, that means he published one paper every 13 days! Not bad for someone who actually has to spend a great deal of his research time out in the fields.

RALF NEUMANN

Europe...

Country	Citations	Articles	Cit./Art.
1. England	216,212	10,542	20.6
2. France	114,904	6,170	18.6
3. Germany	104,637	6,125	17.1
4. Sweden	83,933	3,847	21.8
5. Netherlands	74,023	3,575	20.7
6. Spain	66,087	4,364	15.1
7. Scotland	64,649	2,978	21.7
8. Switzerland	51,350	2,341	21.9
9. Finland	48,008	2,494	19.3
10. Norway	38,717	2,157	18.0
11. Denmark	35,886	1,866	19.2
12. Italy	34,152	2,433	14.0
13. Belgium	25,623	1,411	18.2
14. Israel	16,579	1,042	15.9
15. Wales	14,689	802	18.3
16. Austria	13,023	779	16.7
17. Portugal	10,922	741	14.7
18. Czech Rep.	9,718	670	14.5
19. Russia	8,885	1,679	5.3
20. Poland	8,272	820	10.1

Articles appearing between 1996 and 2007 in ecology journals as listed by Thomson Scientific’s *Web of Science*. The numbers of citations are accurate as of September 2009. A country’s figures are derived from articles where at least one author working in the respective European nation is included in the author’s list. Israel is included because it is a member of many European research organisations and programmes (EMBO, FP7 of the EU...).

... and the World

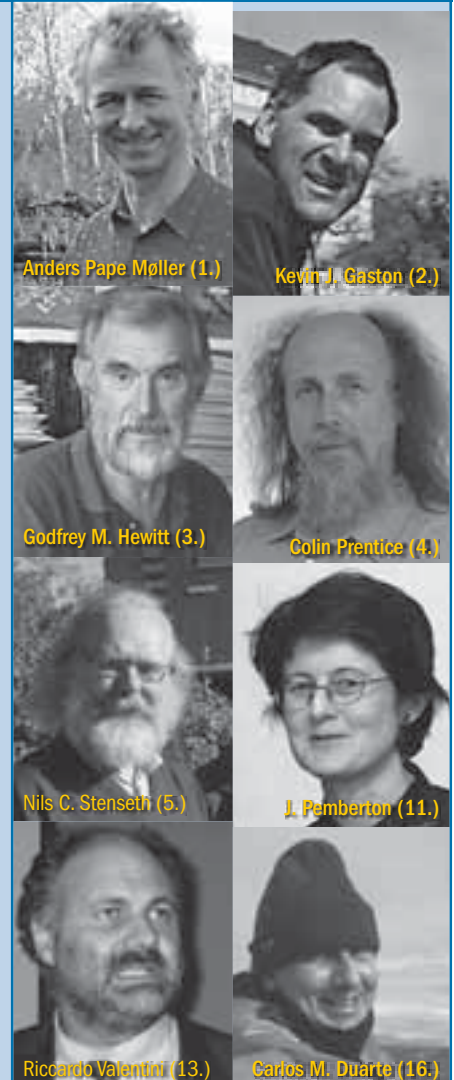
	Citations	Articles	Cit./Art.
Europe	805,804	47,191	17.1
USA	864,052	46,789	18.5
Canada	159,777	8,839	18.1
Australia	145,916	8,085	18.1
New Zealand	43,948	2,392	18.4
Japan	36,039	3,477	10.4
South Africa	31,791	2,204	14.4



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Most Cited Authors...

	Cit-ations	Art-icles
1. Anders Pape Møller , Lab Parasitol. Evol., CNRS, Univ. Paris	10,686	329
2. Kevin J. Gaston , Anim. & Plant Sci. Univ. Sheffield	8,749	250
3. Godfrey M. Hewitt , Sch. Biol. Sci. Univ. East Anglia Norwich	7,374	91
4. I. Colin Prentice , Dept. Earth Sci. Univ. Bristol	7,280	80
5. Nils C. Stenseth , Zool. Univ. Oslo	7,020	229
6. Bernhard Schmid , Environm. Sci. Univ. Zürich	6,371	162
7. Ernst-Detlef Schulze , Max Planck Inst. Biogeochem. Jena	6,278	117
8. John H. Lawton , Ctr. Populat. Biol. Imperial Coll. Univ. London	6,147	63
9. Ian T. Baldwin , Max Planck Inst. Chem. Ecol. Jena	5,722	125
10. David A. Wardle , Forest Ecol. Swedish Univ. Agricultural Sci. Umeå	5,561	91
11. Josephine M. Pemberton , Mol. Ecol. Evol. Biol. Univ. Edinburgh	5,375	80
12. Tim H. Clutton-Brock , Large Anim. Res. Grp. Zool. Univ. Cambridge	5,330	113
13. Riccardo Valentini , Forest Ecol. Lab Univ. Tuscia Viterbo	5,228	63
14. Pierre Taberlet , Lab Biol. Populat. Altitude, CNRS, Univ. Grenoble	5,117	99
15. Ilkka Hanski , Ecol. & Systemat. Univ. Helsinki	5,077	91
16. Carlos M. Duarte , Inst. Mediterr. de Estud. Avanzados Univ. Mallorca	5,025	198
17. Reinhart Ceulemans , Plant & Vegetat. Ecol. Grp. Univ. Antwerp	5,008	150
18. Rémy J. Petit , INRA-UMR Biodiv., Genes & Commun. Univ. Bordeaux	4,883	74
19. André Granier , INRA Res. Ctr. Forest Ecol & Ecophysiol. Champenoux	4,716	78
20. Chris D. Thomas , Dept. Biol. Univ. York	4,582	79
21. Christian Körner , Bot. Univ. Basel	4,578	128
22. Alastair H. Fitter , Dept. Biol. Univ. York	4,527	84
23. Ben C. Sheldon , Zool. Univ. Oxford	4,508	77
24. Josep Peñuelas , Ctr. Ecol. Res. & Forestry Appl. Univ. Barcelona	4,146	178
25. David W. MacDonald , Zool. Univ. Oxford	4,104	250
26. Tim M. Blackburn , Inst. Zool. Zool. Soc. London (ZSL)	4,051	111
27. Sandra Lavorel , Alpine Ecol. Lab, CNRS, Univ. Grenoble	3,991	55
28. Peter Högberg , Forest Ecol. & Manag. Swe. Univ. Agric. Sci. Umeå	3,902	66
29. Richard D. Bardgett , Soil & Ecosyst. Ecol. Grp. Univ. Lancaster	3,899	84
30. J. Philip Grime , Comp. Plant Ecol. Univ. Sheffield	3,848	48



Citations of articles published between 1996 and 2007 were recorded until September 2009 using the *Web of Science* database from Thomson Scientific. The "most cited papers" had correspondence addresses in Europe or Israel.

... and Papers

	Citations
1. Marshall, TC; Slate, J; Kruuk, LEB; Pemberton, JM Statistical confidence for likelihood-based paternity inference in natural populations. <i>MOLECULAR ECOLOGY</i> , 7 (5): 639-655 MAY 1998	1,405
2. Hewitt, GM Some genetic consequences of ice ages, and their role in divergence and speciation. <i>BIOLOGICAL JOURNAL OF THE LINNEAN SOCIETY</i> , 58 (3): 247-276 JUL 1996	1,122
3. Milo, R; Shen-Orr, S; Itzkovitz, S; Kashtan, N; Chklovskii, D; Alon, U Network motifs: Simple building blocks of complex networks. <i>SCIENCE</i> , 298 (5594): 824-827 OCT 25 2002	905
4. Taberlet, P; Fumagalli, L; Wust-Saucy, AG; Cosson, JF Comparative phylogeography and postglacial colonization routes in Europe. <i>MOLECULAR ECOLOGY</i> , 7 (4): 453-464 APR 1998	857
5. Van Oosterhout, C; Hutchinson, WF; Wills, DPM; Shipley, P MICRO-CHECKER: software for identifying and correcting genotyping errors in microsatellite data. <i>MOLECULAR ECOLOGY NOTES</i> , 4 (3): 535-538 SEP 2004	854