



Discovering and documenting Acari: the first twenty years in *Zootaxa*

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Abstract

Acari represent the most diverse group within the arachnids with some 60,000 described species. It is generally believed that most species of mites are waiting to be discovered and described. *Zootaxa* was the most important journal for mite taxonomy during the last twenty years (2001 to 2020). It published 1,305 papers by 1,057 authors during these two decades, with descriptions of 3,271 new taxa/names, which account for 24.4% of the total indexed in *Zoological Record*. The numbers of new synonyms of Acari in *Zootaxa* (334) also accounted for nearly a quarter (24.9%) of the total published during this period. These data indicate that *Zootaxa* has been an important and leading journal for acarologists to document the diversity of mites and ticks in the world.

Key words: Trends, acarology, diversity, taxonomy, systematics, nomenclature, new species, new genera, new taxa, new synonyms

Introduction

Mites and ticks (Acari) represent the most diverse lineage in the class Arachnida (Zhang 2013). Some 60,000 species have been described (Zhang *et al.* 2019), but it is estimated that half to one million species share this planet with us (Walter & Proctor 1999; Halliday *et al.* 2000). A recent estimate even suggested over 10 million species of mites (including cryptic species) on this planet (Larsen *et al.* 2017). To document this diversity of mites and ticks

in the world is a major task for acarologists, who had published in many different journals, including specialist mite journals. Since the start of *Zootaxa* in 2001, it has quickly become an important outlet for acarologists. The first paper in *Zootaxa* was on a new species of tenuipalpid mite from Brazil (Moraes & Freire 2001). The first monograph of *Zootaxa* (with at least 60 printed pages) was also on mites (Moraes *et al.* 2001). A previous study of papers published during 2007–2012 (Liu *et al.* 2013) showed that *Zootaxa* published about 35% of the total new species of Acari indexed by *Zoological Record* during this period. In the present paper we present an overview of Acari papers published in *Zootaxa* in its first two decades. We summarize the number of new species and other taxa published in *Zootaxa* and compare these with the total indexed in *Zoological Record*. We provide a survey of authors who published in *Zootaxa* and also highlight the top-10 most cited papers during the last 20 years. We also recognize the important roles of editors and review the historical development of the Acari editing team for *Zootaxa*. Trends in two subgroups (Oribatida and water mites) and patterns in two other groups (Mesostigmata and Acariformes excluding Oribatida and water mites) are also summarized.

Methods

For main trends for all Acari, the data on numbers of papers, taxa, authors were extracted from the online edition of *Zoological Record* via Clarivate's Web of Science™. Key word "Acari" was used to search for all papers on Acari for 2001 to 2020; then *Zootaxa* as a publication name was used to obtain a subset of papers in *Zootaxa*; these data were verified by *Zootaxa*'s own papers obtained manually by Z. Zhang over the years (some papers such as editorials were not indexed by *Zoological Record*). The "Systematics Controlled Terms" of *Zoological Record* (e.g. "sp nov") were used to search for papers on them and also to count the number of such items published in the paper (via indexed "Systematics Controlled Terms"). Citation data were also obtained *Zoological Record* via from Web of Science™. Graphs were plotted using Microsoft Excel.

Data on number of papers and number of new taxa of Oribatida were obtained by manually searching and counting. The data on water mites (Hydrachnidia) were acquired mainly from a database set up and maintained by one of the authors (Karl-Heinz Schmidt), as well personal notes of the water mite editors. Data on Mesostigmata and Acariformes were obtained manually from the editors' records and published papers.

Papers published: numbers, patterns, and trends

Zootaxa published on average 65 acarological papers per year during 2001 to 2020: the number of papers per year increased rapidly during the first decade (averaging 43 papers per year) but reached a plateau in the second decade (averaging 87 papers per year) and then fluctuated (Fig. 1). Only about 8.5% of the papers are for open access, reflecting the fact that mite taxonomists were not well funded and only a small number of authors opt for open access. More than 1,200 of *Zootaxa*'s mite papers (out of 1305 in total) are taxonomic in nature, making it the top journal in mite systematics from 2001 to 2020 (Fig. 2).

Of all mite papers published in *Zootaxa*, 77.6% (1030) have new species/subspecies: the number of such papers per year increased rapidly during the first decade from 6 in 2001 to 66 in 2010 (> 10-fold growth!) and peaked during the first few years of the second decade, with an average of 51 per year (Table 1). The number of papers with new species/subspecies in all publications indexed in *Zoological Record* increased from 215 in 2001 to a peak of 326 in 2015 and then decreased. *Zootaxa* accounted for 29.6% of all papers with mite new species/subspecies in 2013 at the peak, but overall, nearly 20% for the two decades.

The number of *Zootaxa* papers with new genera/subgenera increased rapidly during the first decade and reached a peak of 17 in 2010 (Table 1); it reached another peak of 15 in 2014 and then decreased. The number of papers with genera/subgenera in all publications indexed in *Zoological Record* fluctuated around 30 in the last two decades. *Zootaxa* accounted for half of all papers with mite new genus/subgenera in 2010, overall, more than a quarter for the last two decades.

TABLE 1. The numbers of papers with new species/subspecies or genera/subgenera of Acari in *Zootaxa* (N_z) and all publications indexed in *Zoological Record* (N_a) during 2001 and 2020.

	Species and subspecies			Genera & subgenera		
	N_z	N_a	$(N_z/N_a) \%$	N_z	N_a	$(N_z/N_a) \%$
2001	6	215	2.79	0	39	0
2002	17	196	8.67	4	30	13.33
2003	16	262	6.11	1	45	2.22
2004	20	205	9.76	4	37	10.81
2005	26	223	11.66	6	33	18.18
2006	51	228	22.37	9	30	30.00
2007	43	202	21.29	4	31	12.90
2008	54	250	21.60	14	30	46.67
2009	62	250	24.80	15	41	36.59
2010	66	245	26.94	17	34	50.00
2011	74	263	28.14	11	25	44.00
2012	66	281	23.49	11	37	29.73
2013	86	291	29.55	11	25	44.00
2014	84	319	26.33	15	37	40.54
2015	72	326	22.09	14	35	40.00
2016	63	293	21.50	9	32	28.13
2017	57	290	19.66	9	35	25.71
2018	51	264	19.30	9	30	30.00
2019	63	267	23.60	6	24	25.00
2020	36	245	14.69	2	14	14.29
Average	51	256	19.22	9	32	27.10

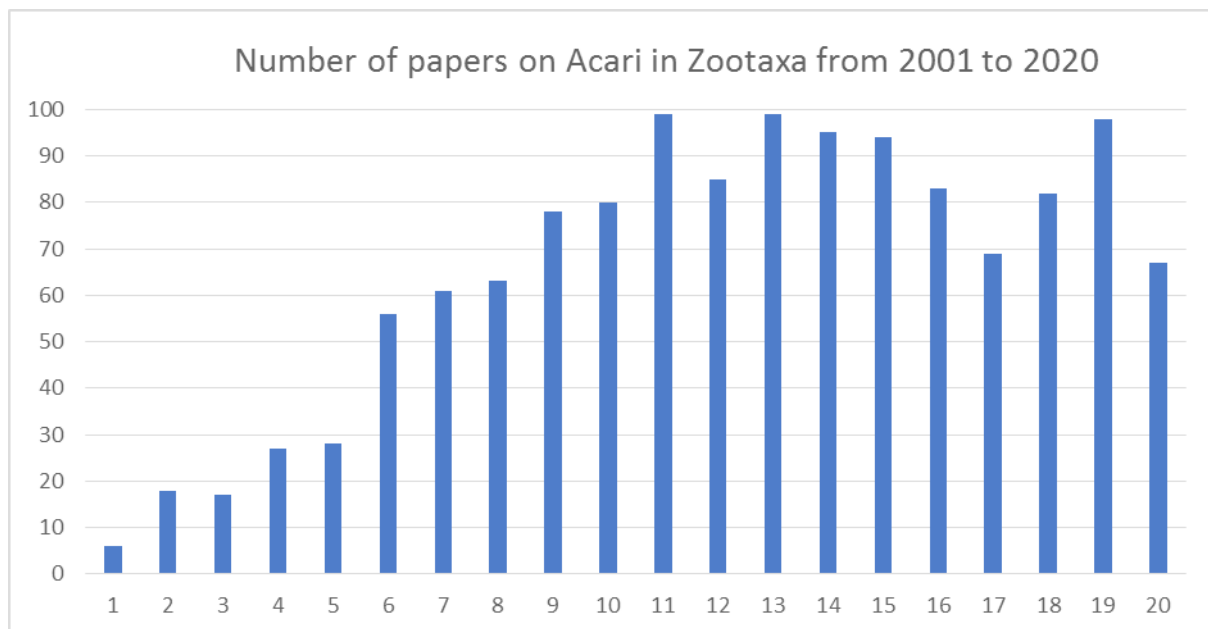


FIGURE 1. The numbers of papers on Acari published in *Zootaxa* from 2001 to 2020.

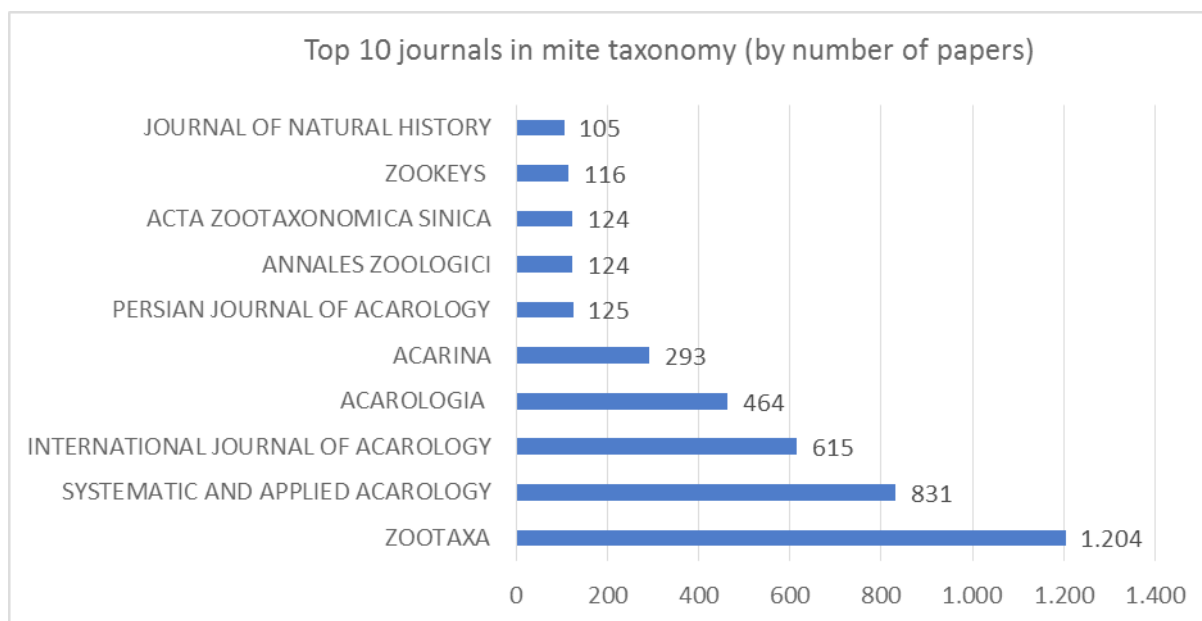


FIGURE 2. Top ten journals in mite taxonomy and systematics from 2001 to 2020 based on the number of papers indexed in *Zoological Record* (here papers are those indexed with at least one of the “Systematics Controlled Terms”).

New taxa, names and synonyms: numbers, patterns, and trends

The number of new Acari species/subspecies described each year in all publications indexed in *Zoological Record* fluctuated around the average of 607 per year, with the highest of 937 in 2010 and lowest of 469 in 2019/2020 (Table 2). The number of new species/subspecies described in *Zootaxa* each year increased rapidly during the first decade (from 13 in 2001 to 192 in 2010 with more than 14-fold growth); it peaked in 2011 at 306, followed by a second peak of 282 in 2014; it then decreased rapidly (Table 2). Overall, *Zootaxa* published 2972 new species/subspecies or 24.4% of all indexed by *Zoological Record*. At its peak in 2011, *Zootaxa* accounted for 48.2% of all mite new species/subspecies indexed in *Zoological Record*. During the last ten years, over a third (34.3%) of all mite new species/subspecies were published in *Zootaxa* (c.f. nearly a quarter for the two decades).

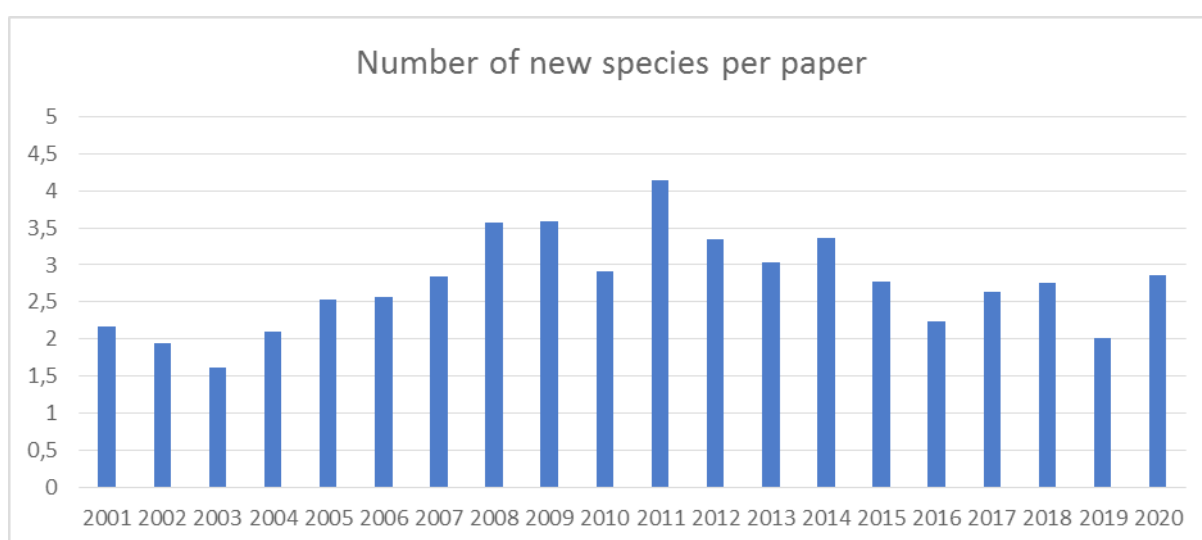


FIGURE 3. The numbers of new species per paper* on Acari published in *Zootaxa* from 2001 to 2020. *Papers with new species.

Among papers with new species/subspecies, each paper on average included 2.7 new species/subspecies over the last twenty years. The average per year varied over the years (Fig. 3): about 2 per paper during the first five years, over 3.2 per paper during the ten years from 2006 to 2015 and 2.5 per year during the last five years; the maximum in 2011 (4.1).

The number of new genera/subgenera described each year in all publications indexed in *Zoological Record* fluctuated around the average of 51 per year, with the highest of 71 in 2001 and lowest of 22 in 2020 (Table 2). The number of new genera/subgenera described in *Zootaxa* each year increased rapidly during the first decade (from 0 in 2001 to 29 in 2009; it then decreased slowly first and then rapidly in the last five years (Table 2). At its peak in 2011, *Zootaxa* accounted for 55% of all mite new genera/subgenera indexed in *Zoological Record*. During the last ten years, nearly a third (32.8%) of all mite new genera/subgenera were published in *Zootaxa* (c.f. nearly a quarter for the two decades).

TABLE 2. The numbers of new species/subspecies or genera/subgenera of Acari in *Zootaxa* (N_z) and all publications indexed in *Zoological Record* (N_a) during 2001 and 2020.

	Species and subspecies			Genera & subgenera		
	N_z	N_a	$(N_z/N_a) \%$	N_z	N_a	$(N_z/N_a) \%$
2001	13	627	2.07	0	71	0
2002	33	566	5.83	4	62	6.45
2003	26	716	3.63	1	72	1.39
2004	42	655	6.41	5	66	7.58
2005	66	537	12.29	6	47	12.77
2006	131	619	21.16	10	38	26.32
2007	122	521	23.42	6	49	12.24
2008	193	660	29.24	22	67	32.84
2009	222	664	33.43	29	62	46.77
2010	192	937	20.49	21	67	31.34
2011	306	635	48.19	22	40	55.00
2012	221	599	36.89	13	46	28.26
2013	261	611	42.72	15	36	41.67
2014	282	701	40.23	21	53	39.62
2015	200	614	32.57	17	47	36.17
2016	141	544	25.92	14	42	33.33
2017	150	529	28.36	13	54	24.07
2018	141	462	30.50	13	43	30.20
2019	127	469	27.08	7	38	18.42
2020	103	469	21.96	3	22	13.64
Average	149	607	24.62	12	51	24.91

The total number of new taxa/names was dominated by those of species/subspecies; as a result, the temporal pattern as well as the most important statistics (e.g., *Zootaxa* accounts for near a quarter of all new taxa/names) for these two are very similar (Table 3 left half versus Table 1 left half). Overall, 3271 new taxa/names were published in *Zootaxa* during the last twenty years, accounting for 24.1% of all indexed in *Zoological Record*.

The numbers of new synonyms of Acari in *Zootaxa* (334) accounted for nearly a quarter (24.9%) of the total indexed in *Zoological Record* during 2001 to 2020 (Table 3). However, the temporal patterns were completely different with multiple peaks yet without obvious trends: the number of new synonyms in *Zootaxa* peaked at 50 in 2009 but that for all publications in 2004 at 180 (Table 3).

Authors and statistics

A total of 1,057 authors published in *Zootaxa* from 2001 to 2020 and only 68 of these have authored or co-authored 10 or more papers (Table 4). It is of interest to note that 61.8% of these prolific authors are from the top five countries: Brazil (11), China (9), Iran (9), Russia (7) and Poland (6). The most prolific author is Gilberto J. De Moraes (Brazil, 94 papers) who has published on Phytoseiidae and other plant-inhabiting mites in *Zootaxa* since its inception (Moraes & Freire 2001). However, an overwhelming majority of authors (80.8%) published three or fewer papers in *Zootaxa* during the last twenty years and most of these authors (59.1%) published only one paper (Table 4).

TABLE 3. The numbers of new taxa*/names or synonyms of Acari in *Zootaxa* (N_z) and all publications indexed in *Zoological Record* (N_a) during 2001 and 2020. *All ranks including species-group, genus-group, family-group and higher taxa.

	New taxa/names			New synonyms		
	N_z	N_a	$(N_z/N_a) \%$	N_z	N_a	$(N_z/N_a) \%$
2001	13	711	1.83	1	130	0.77
2002	37	640	5.78	1	34	2.94
2003	28	799	3.50	1	123	0.81
2004	47	821	5.72	2	180	1.11
2005	72	599	12.02	17	57	29.82
2006	141	682	20.67	3	59	5.08
2007	134	584	22.95	4	32	12.50
2008	217	772	28.11	7	37	18.92
2009	262	749	34.98	50	114	43.86
2010	216	1044	20.69	26	73	35.62
2011	329	680	48.38	37	68	54.41
2012	235	652	36.04	22	48	45.83
2013	283	656	43.14	25	39	64.10
2014	310	766	40.47	17	34	50.00
2015	218	669	32.59	33	46	71.74
2016	162	606	26.73	14	97	14.43
2017	166	599	27.71	17	32	53.13
2018	159	515	30.90	38	66	57.60
2019	134	519	25.82	13	37	35.14
2020	108	496	21.77	6	36	16.67
Average	164	678	24.48	17	67	30.72

TABLE 4. Authors (family name first) of *Zootaxa* with 10 or more papers during 2001 to 2020. Authors with fewer than 10 papers are not listed individually here. Total authors: 1,057.

Number of papers	Names	Country
94	DE MORAES GILBERTO J	Brazil
79	PEŠIĆ VLADIMIR	Montenegro
66	ERMILOV SERGEY G	Russia
62	SMIT HARRY	The Netherlands
41	SKORACKI MACIEJ	Poland
40	KHAUSTOV ALEXANDER A	Russia
40	XUE XIAO-FENG	China

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TABLE 4. (Continued)

Number of papers	Names	Country
39	ZHANG ZHI-QIANG	New Zealand
38	HONG XIAO-YUE	China
37	SABOORI ALIREZA	Iran
33	HALLIDAY BRUCE	Australia
30	FLECHTMANN CARLOS H W	Brazil
29	KHANJANI MOHAMMAD	Iran
27	FAN QING-HAI	New Zealand
26	TUZOVSKIJ PETR V	Russia
24	SEEMAN OWEN D	Australia
23	JOHARCHI OMID	Iran
23	SONG ZI-WEI	China
22	MIRONOV SERGEY V	Russia
21	BOCHKOV ANDRE V	Russia
21	NIEDBAŁA WOJCIECH	Poland
21	UECKERMANN EDWARD A	South Africa
19	OLIVEIRA ANIBAL R	Brazil
18	KLOMPEN HANS	USA
18	KONTSCHÁN JENŐ	Hungary
18	LIU DONG	China
18	LOFEGO ANTONIO C	Brazil
18	MASAN PETER	Slovak Republic
18	YI TIAN-CI	China
17	FERES REINALDO J F	Brazil
17	HERNANDES FABIO A	Brazil
17	JIN DAO-CHAO	China
17	STARÝ JOSEF	Czech Republic
16	COLLOFF MATTHEW J	Australia
16	NORTON ROY A	USA
16	OCHOA RONALD	USA
15	ASADI MAHDIEH	Iran
15	BEHAN-PELLETIER VALERIE M	Canada
16	FERLA NOELI JUAREZ	Brazil
14	CASTILHO RAPHAEL C	Brazil
14	GUO JIAN-JUN	China
14	NAVIA DENISE	Brazil
13	BEARD JENNIFER J	Australia
13	DEMITE PETERSON R	Brazil
13	GERECKE REINHARD	Germany
13	GLOWSKA ELIZA	Poland
13	OCONNOR BARRY M	USA
13	WALTER DAVID E	Australia
12	BAYARTOGTOKH BADAMDORJ	Mongolia
12	CHEKTERIKOV PHILIPP E	Russia

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TABLE 4. (Continued)

Number of papers	Names	Country
12	HUGO-COETZEE ELIZABETH A	South Africa
12	LINDQUIST EVERT E	Canada
12	SENICZAK ANNA	Poland
12	SENICZAK STANISŁAW	Poland
11	BABAEIAN ESMAEIL	Iran
11	CHATTERJEE TAPAS	India
11	HAJIQANBAR HAMIDREZA	Iran
11	KALÚZ STANISLAV	Slovak Republic
11	MORAZA MARIA L	Spain
11	SIKORA BOŽENA	Poland
11	WANG GUO-QUAN	China
11	WEI SUI-GAI	China
10	FUANGARWORN MARUT	Thailand
10	HAKIMITABAR MASOUD	Iran
10	IRANI-NEJAD KARIM HADDAD	Iran
10	MIKO LADISLAV	Czech Republic
10	SEMENCHENKO KSENIA A	Russia
10	ZANNOU IGNACE D	Brazil
9	9 authors	Various
8	9 authors	Various
7	16 authors	Various
6	23 authors	Various
5	37 authors	Various
4	40 authors	Various
3	81 authors	Various
2	148 authors	Various
1	625 authors	Various

Editors: timeline and subject areas

Editors provide an important role in the facilitation of the peer review process and also the leadership of the journal (Zhang 2014). During the first four years, Zhi-Qiang Zhang edited all the mite papers. However, the number of papers were increased, and he invited three subject editors to the editing team for the Acari section: Dr Bruce Halliday (Australia) joined to take responsibility for Mesostigmata, Dr Hans Klompen (USA) for other Parasitiformes (esp. ticks) and Dr Heather Proctor (Canada) for Acariformes (Table 5). Dr Proctor left the team the second year and was succeeded by Dr Owen Seeman (Australia) who also covered for small orders and Dr Qinghai Fan (New Zealand) who focused on Prostigmata. As *Zootaxa* became more popular with acarologists, it was clear that more specialist editors were needed: Dr Jim Amrine (USA) covered Eriophyoidea during 2007–2008 and was then followed by the late Dr Danuta Knihinicki (Australia) during 2010–2016; Dr Heinrich Schatz (Austria) joined in 2008 to take on Oribatida and in 2012 he was joined by the late Ekaterina Sidorchuk (Russia) who was succeeded by Dr Tobias Pfingstl in 2016; Dr Tom Goldschmidt (Germany) joined as a subject editor for water mites in 2008. The late Dr Andrey Bochkov (Russia) joined the team in 2010 to provide additional cover for Acariformes and was succeeded by Dr Sergei Mironov (Russia) in 2017. Dr Peter Martin (Germany) teamed up with Dr Tom Goldschmidt as submissions on water mites increased; he was succeeded by Dr Marcia Ramírez (Mexico) and Vladimir Pešić (Montenegro) in 2019. Recently Alihan Katlav (Australia) joined to provide additional cover for Acariformes.

Zootaxa also published a few mite special volumes with help by several guest editors. Dr Roy Norton joined as a guest editor for a special volume in memory of Dr Ekaterina Alekseevna Sidorchuk (Zhang, Pfingstl, Norton, Mironov & Seeman 2014). Dr Marut Fuangarworn joined as a guest editor for Oribatida for all four special volumes on “Ontogeny and morphological diversity in immature mites” (Zhang *et al.* 2018, 2019, 2020a,b). Dr Qing-Hai Fan joined as a guest editor for two of these volumes (Zhang *et al.* 2008, 2020a). Dr Tian-Ci Yi joined as a guest editor for one of these volumes (Zhang *et al.* 2020a).

A special volume on “Research on the Terrestrial Arthropods of Sardinia (Italy)” (Cerretti *et al.* 2009) also included a large paper on oribatid mites (Migliorini 2009) edited by P. Cerretti.

TABLE 5. Editors of Acari in *Zootaxa*.

Editors	Year(s) in service	Subject areas
Zhang, Zhi-Qiang	2001–	General
Halliday, Bruce	2005–	Parasitiformes: Mesostigmata
Klompen, Hans	2005–2007	Parasitiformes & Opilioacariformes
Proctor, Heather	2005–2006	Acariformes
Seeman, Owen	2006–	Acariformes & small orders
Fan, Qing-Hai	2006–2010	Acariformes: Prostigmata
Amrine, Jim W. Jr	2007–2008	Acariformes: Prostigmata: Eriophyoidea
Goldschmidt, Tom	2008–	Acariformes: Prostigmata: water mites
Schatz, Heinrich	2008–2013	Acariformes: Oribatida
Knihinicki, Danuta	2010–2016	Acariformes: Prostigmata: Eriophyoidea
Martin, Peter	2010–2019	Acariformes: Prostigmata: water mites
Bochkov, Andrey	2010–2017	Acariformes
Sidorchuk, Ekaterina	2012–2016	Acariformes: Oribatida
Pfingstl, Tobias	2016–	Acariformes: Oribatida
Mironov, Sergey	2017–	Acariformes
Ramírez, Marcia	2019–	Acariformes: Prostigmata: water mites
Pešić, Vladimir	2019–	Acariformes: Prostigmata: water mites
Katlav, Alihan	2021–	Acariformes

Most cited papers and highlights

Some papers on mites published in *Zootaxa* are very highly cited. We highlight here top-10 papers published in *Zootaxa* during 2001 to 2020 (Table 6). The most cited paper is a checklist of valid names of ticks which include the many pests of medical and veterinary importance: this paper has 266 cites in Web of Science (Table 6). It is noteworthy that six of the top-10 cited papers are catalogues/checklists; four of these are monographic in size (*i.e.* at least 60 pages). The other highly cited papers include two large monographs (Barker & Walker 2014; Skoracki 2011) and two papers using DNA barcode in descriptions in addition to morphology (Dabert *et al.* 2008; Mironov *et al.* 2012).

TABLE 6. Top 10 most-cited papers on Acari during 2001 to 2020 in *Zootaxa*. Ranked by citations from Web of Science (WoS) as of 5 May 2021.

Rank	Publication	Cites in WoS
1	The Argasidae, Ixodidae and Nuttalliellidae (Acari: Ixodida) of the world: a list of valid species names [†] Guglielmone <i>et al.</i> (2010)	266
2	A revised catalog of the mite family Phytoseiidae [†] Moraes <i>et al.</i> (2004)	246
3	Ticks of Australia. The species that infest domestic animals and humans [†] Barker & Walker (2014)	141
4	Catalogue and historical overview of juvenile instars of oribatid mites (Acari: Oribatida) [†] Norton & Ermilov (2014)	122
5	A catalog of the Tenuipalpidae (Acari) of the World with a key to genera [†] Mesa <i>et al.</i> (2009)	120
6	<i>Glaucalges tytonis</i> sp. n. (Analgoidea, Xolalgidae) from the barn owl <i>Tyto alba</i> (Strigiformes, Tytonidae): compiling morphology with DNA barcode data for taxon descriptions in mites (Acari) [†] Dabert <i>et al.</i> (2008)	114
7	A new feather mite species of the genus <i>Proctophyllodes</i> Robin, 1877 (Astigmata: Proctophyllodidae) from the Long-tailed Tit <i>Aegithalos caudatus</i> (Passeriformes: Aegithalidae)-morphological description with DNA barcode data Mironov <i>et al.</i> (2012)	103
8	Quill mites (Acari: Syringophilidae) of the Palaearctic region [†] Skoracki (2011)	91
9	Checklist of the mites (Arachnida : Acari) of Turkey. Second supplement Erman <i>et al.</i> (2007)	80
10	Terrestrial and freshwater invertebrate fauna of the High Arctic Archipelago of Svalbard [†] Coulson (2007)	66

Subgroup patterns, trends and statistics

Oribatida. The oribatid mites (excluding Astigmata) are the most diverse group in the soil and litter. Till the end of 2020, *Zootaxa* published 252 oribatid papers, which accounts for just over 19.0% of all mite papers published in *Zootaxa* during the last twenty years. Most of these papers (193) were published in the last ten years, with a peak of 31 in 2019 (Table 1). It is obvious that the number of papers increased after the appointment of subject editors for Oribatida (Table 5; Table 7).

TABLE 7. The number of papers and new taxa (including fossils) on Oribatida during 2001 to 2020: *Zootaxa* versus all publications (from data of H Schatz).

Year	No. of papers	No. of new taxa								
		Species & subspecies			Genera and subgenera			Families & subfamilies		
		ZT	All	%	ZT	All	%	ZT	All	%
2001	0	0	107	0	0	8	0	0	1	0
2002	1	1	109	0.9	1	14	7.	0	1	0
2003	0	0	147	0	0	8	0	0	0	0
2004	1	2	253*	0.8	0	11	0	0	1	0

...Continued on the next page

TABLE 7. (Continued)

Year	No. of papers	No. of new taxa								
		Species & subspecies			Genera and subgenera			Families & subfamilies		
		ZT	All	%	ZT	All	%	ZT	All	%
2005	1	0	50	0	0	6	0	0	1	0
2006	5	15	171	8.8	0	6	0	0	0	0
2007	10	16	80	20.0	1	2	50.0	0	0	0
2008	8	13	110	11.8	0	10	0	0	1	0
2009	15	28	181	15.5	0	14	0	0	2	0
2010	18	48	168	28.6	0	7	0	0	0	0
2011	22	57	185	30.8	1	9	11.1	0	0	0
2012	15	31	152	20.4	0	14	0	0	0	0
2013	23	61	166	36.7	4	9	44.4	1	1	100
2014	13	53	184	28.8	0	7	0	0	0	0
2015	19	28	136	20.6	1	6	16.7	1	1	100.0
2016	13	19	128	14.8	0	8	0	0	1	0
2017	17	32	135	23.7	4	10	40.0	0	0	0
2018	21	22	99	22.2	0	5	0	0	0	0
2019	31	32	120	26.7	0	6	0	0	0	0
2020	19	11	96	11.5	1	1	100.0	0	0	0
Total	252	469	2,777	16.9	13	161	8.1	2	10	20.0

*This high number of new species in 2004 is based on the publication of Subías (2004) with many new names for homonyms.

These oribatid papers in *Zootaxa* include 469 new species, about 16% of all in *Zootaxa* during the last twenty years. The number of new species per year also varied greatly over the years. The second decade accounts for 65% of the total new species of oribatid species. There were also 13 new genera and 2 new families (Table 7).

Water mites. Within the last 20 years 458 taxonomic papers on water mites were published in 77 different journals, with 163 (29%) of these in *Zootaxa*. In these papers 1412 new water mite species and 89 new genera and subgenera were described. Among these, 526 species (37%) and 26 genera/subgenera (30%) were published in *Zootaxa* (Figs. 4, 5). In the same period 164 new halacarid (Halacaridae) species were described and 25 (15%) of them are published in 13 papers in *Zootaxa*.

In the first year (2001) the share of *Zootaxa* was just 3.1%—only one water mite paper was published by Vladimir Pešić who described *Stygohydracarus karanovici* and redescribed *Atractides inflatipes* both from Montenegro (Pešić 2001), whereas during the first 5 years the share of *Zootaxa* papers was between 3.1 and 16.7% of all water mite descriptions worldwide, in some of the following years this number rose to up to 80.0% (Fig. 4).

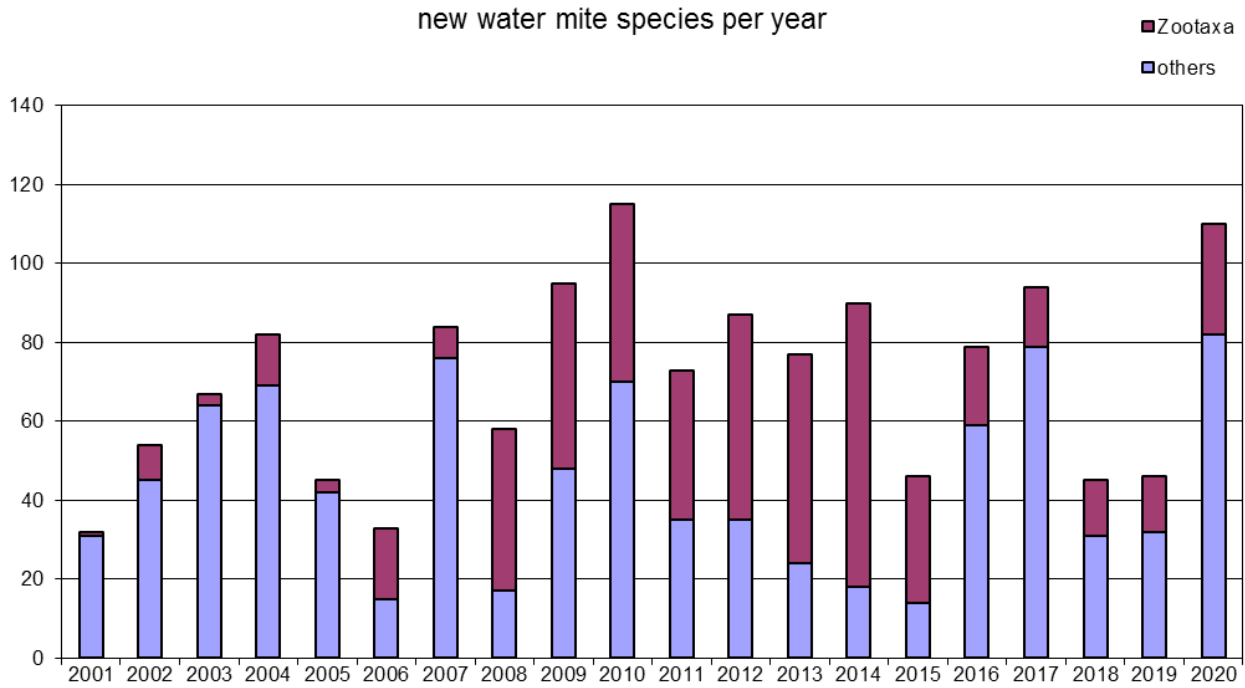


FIGURE 4. Number of new water mite species published in *Zootaxa* (purple) and in other journals (lavender) between 2001 and 2020.

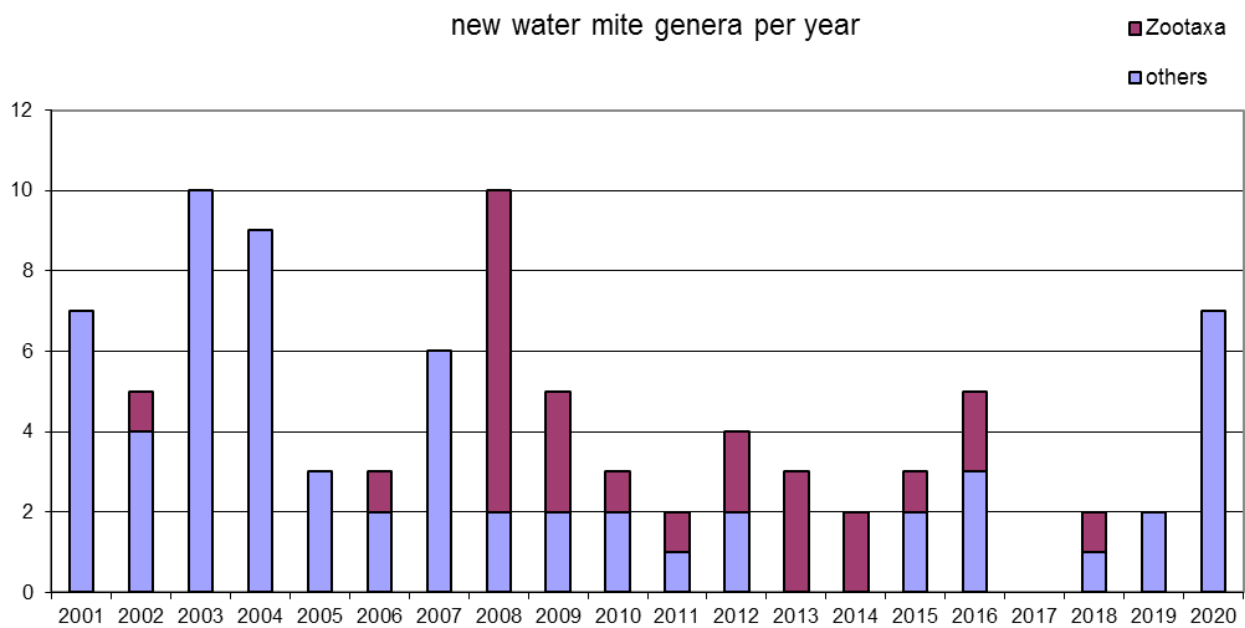


FIGURE 5. Number of new water mite genera published in *Zootaxa* (purple) and in other journals (lavender) between 2001 and 2020.

The new species described in these papers during the last twenty years came from 48 different countries from all over the world (Fig. 6), most papers dealt with new species from Asia (14 each from Iran and Russia, followed by 10 from Turkey, 9 from Australia, 8 from China). The majority of described species came from Australia (63 species), Malaysia (53 species), Madagascar (51 species in two papers), Russia (46 species) and Iran (44 species).

A second group of countries (the Comoros, Ghana, South Africa, USA, China, India, Indonesia, Thailand, Turkey and New Zealand) contributed between 12 and 26 new species each; the majority of countries were represented by single to nine species respectively.

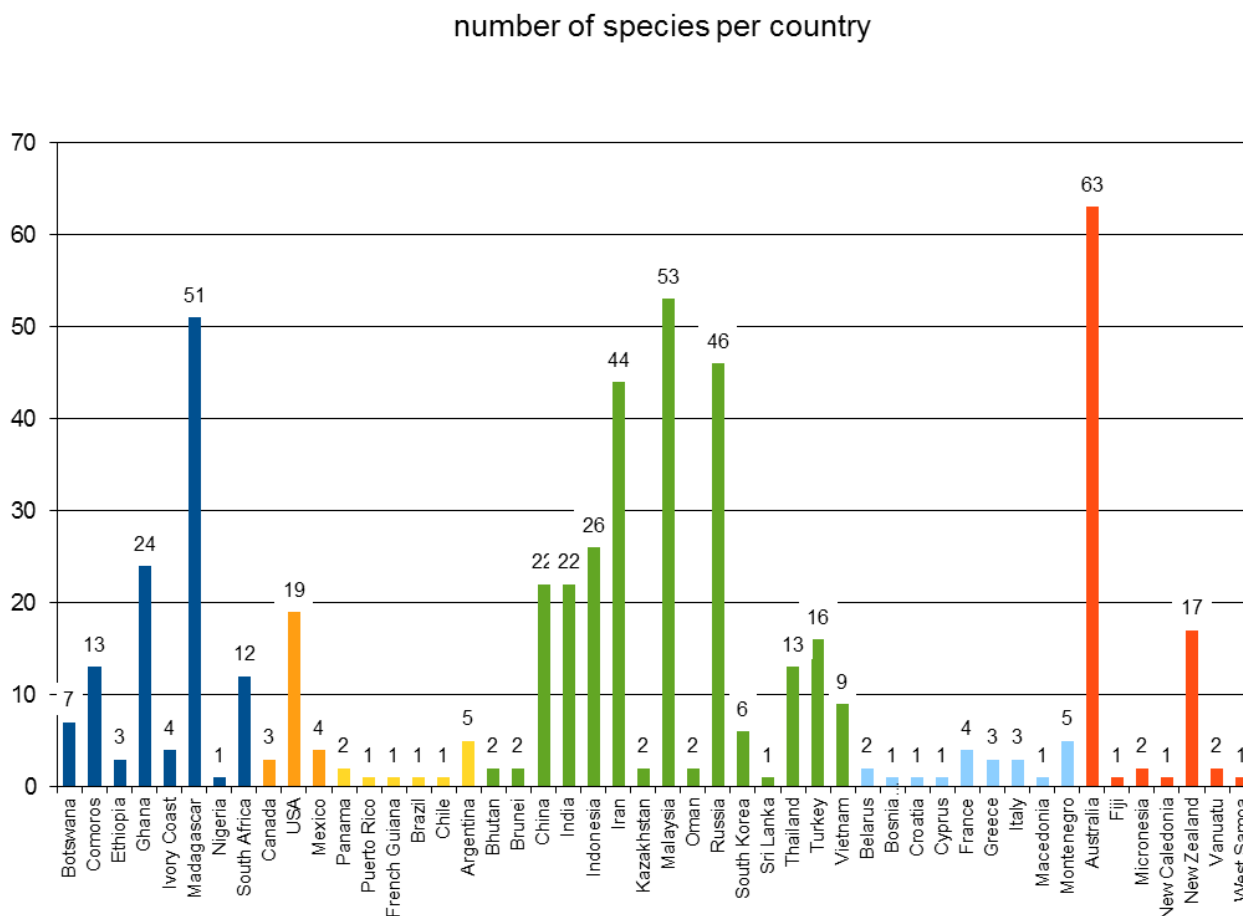


FIGURE 6: Number of new water mite species published in *Zootaxa* from 2001 to 2020, sorted by country. Within the graph the countries are sorted by continents (Africa—dark blue, North America—orange, Central and South America—yellow, Asia—green, Europe—light blue, Australia and Pacific—light red).

Overall, within the last 20 years, 58 first authors described new water mite species—25 (43%) of these published these descriptions as well or exclusively in *Zootaxa*.

We approximate that about 1/3 of all larger, innovative papers as well as revisions on water mites during the last 20 years have been published in *Zootaxa*. Overall, we think the fact that single species descriptions are only accepted, if an additional value such as revisions, keys, *etc.* are included in the paper, is helping to keep the quality of *Zootaxa* papers high. During the last 10 years we accepted about 90–100% of all submitted manuscripts.

Mesostigmata. Since early 2008, 326 papers on the systematics of Mesostigmata were submitted for publication in *Zootaxa*. Of these, 242 were published, 57 rejected, 14 withdrawn or lapsed, and 13 are currently under consideration (May 2021). The most-studied families were Phytoseiidae (51 papers) and Laelapidae (40 papers); there were 19 papers on various families of Uropodina, 10 each on Zerconidae, Parasitidae, Blattisociidae, Ascidae, and Macrochelidae, and smaller numbers of papers on 22 other families. A further 13 papers included data on several families from a particular geographic area. In the 242 published papers, authors described 459 new species, 32 new genera, and two new families. The rate of description of new species of Mesostigmata in *Zootaxa* was 35 per year. Some papers included the description of a single new species. Those descriptions were always supported by a revised concept of the genus, analysis of new character states, a key to the genus, or additional information about the economic or scientific importance of the species.

The increasing availability of powerful bibliographic tools made it possible for authors to compile world-wide catalogues of particular families. These catalogues review the state of knowledge of the families Rhodacaridae, Ologamasidae, Ascidae, Blattisociidae, Melicharidae, Podocinidae and Pachylaelapidae to the species level, and summarise the available names of Uropodina to the family and genus levels. It is important to note that all these catalogues include long lists of taxa *incertae sedis*. These are mostly genera and species described in old publications, where the descriptions do not include enough data to allow the taxon to be placed in a modern classification with any confidence. The purpose of these lists is to draw attention to these questionable taxa so they can be included in future studies.

Fifty-six of the published papers did not contain descriptions of new taxa. These should still be regarded as taxonomic works because they contain critical reviews of existing taxa, regional inventories and taxonomic catalogues, discussion and resolution of nomenclatural questions, and the development and testing of new techniques, especially molecular and analytical methods.

Acariformes and minor orders. The Acariformes on the whole was handled by several subject editors over the past 20 years, making the analysis of data difficult. I, Owen Seeman, have been the longest serving editor for the Acariformes (2006–2020) and Ixodida, Holothyrida and Opilioacarida (2008–present), as well as editor for 35 papers on Mesostigmata authored by editors. From this perspective, I provide some general statistics. During this time, I received 499 submissions on all these groups, of which 370 were published, 120 rejected, 3 lapsed and 6 are currently being processed, giving an overall rejection rate of 24%. Many of these papers were not rejected for being scientifically poor, but rather authors were encouraged to submit short papers to one of the several acarological journals on offer. Ixodida was the most difficult group to publish in with a 40% rejection rate (18/45 papers), ignoring, due to the small sample size, three submissions on Holothyrida that were all rejected.

The most-studied group of Acariformes was Eriophyoidea and, due to this, a specialist editor for this group was recruited twice: first Dr Jim Amrine (2007–08) and then Dr Danuta Knihinicki (2010–16) (Table 5). *Zootaxa* has published 139 papers on Eriophyoidea, describing 420 new species and 40 new genera. During this same time, 1602 new species in 188 new genera were described, making *Zootaxa*'s contribution 26% and 21% of these totals. The description of new taxa has been largely driven by a laudable effort to describe the Chinese eriophyoid fauna, with the top three authors (Drs Xiao-Feng Xue, Xiao-Yue Hong, Zi-Wei Song) and six of the top ten from China. Similar resources towards taxonomic endeavours are required throughout much of the world where this exceptionally diverse group of mites are poorly studied.

The journal and taxonomic acarology have changed significantly over the past 20 years. To capture some of these developments, I compared data from papers on Acariformes published in 2008–9 with manuscripts published from 2019–present. I chose 2008–9 as it best reflects editors' current role for Acariformes, that is, all Acariformes except water mites and oribatid mites. During 2008–9, 59 papers were published with an average and standard error of 3.5 ± 0.5 species per paper and 20.6 ± 3.5 pages per publication at 5.9 pages per species described (data from OS and QHF). During 2019–2021, 43 papers were published with an average of 2.5 ± 0.5 species per paper and 41 ± 7.1 pages per publication, i.e., approximately 15 pages per species described (data from OS and SM). In part this is due to more catalogues being published, but even with these removed, the number has almost doubled (5.3 versus 9.9 pages per species). This pattern is probably caused by larger phylogenetic and revisionary works, which comprise redescriptions, and possibly combined with descriptions being more detailed than ever before. It is a telling statistic that 9 of the 10 most cited papers describe a total of only two species (Table 6). Whatever the cause, the process of species discovery and description is slowing despite an enormous diversity of taxa remaining to be described.

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Zhi-Qiang Zhang thanks all the subject editors (past and the present) and reviewers for their help and support. The water mite editors want to acknowledge that as just a small number of colleagues are working on water mites, they always have to fall back on the same few potential referees (and many of them don't even have an academic position). Nevertheless, they have managed to find colleagues willing to take over the important task of carefully reviewing the manuscripts submitted to them—they cordially want to thank all of them. Heinz Schatz sincerely thanks R.A. Norton for continuing support of his work.

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