

1 **Taxonomic bias: a persistent issue in ecology and evolution**

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10

11 **Abstract**

12 Scientific hyperfocus on certain organisms slows innovation and hinders the generality of
13 ecological and evolutionary inference. Yet, the extent of taxonomic bias in this field and its
14 potential changes over time remain poorly quantified. By assessing 1,383,803 papers and 612
15 journals, we show that ecology and evolution research is strongly taxonomically biased. We found
16 that studies on vertebrates, relative to those on invertebrates, (1) became more frequent over time,
17 (2) were more prevalent in higher impact journals, and (3) received a greater number of citations
18 and mentions in the media. However, classifying animals into more specific groups led to context-
19 dependent temporal and attention patterns. We propose a series of urgent affirmative actions to
20 ameliorate taxonomic imbalances in ecology and evolution.

21

22 **Key-words:** knowledge imbalance, journal citation indicator, journal impact factor, research bias,
23 research impact, taxonomic chauvinism, taxonomic specialisation.

24

25 **Introduction**

26 More than 1.5 million animal species have been described to date (1), with many more yet to be
27 discovered (2, 3). Despite this enormous diversity, analyses of awarded grants (4), biodiversity
28 databases (5, 6), conservation or reintroduction projects (7–10), scientific articles (4, 11–20), and
29 textbooks (21) have identified that certain taxa receive disproportionate attention in the field of
30 ecology and evolution relative to their diversity. For example, vertebrates, especially birds and
31 mammals, often concentrate conservation (7–10) and research (13, 16, 18–20) efforts even though
32 they represent only a minute portion of existing animals (1). This inequity, called taxonomic bias
33 or taxonomic chauvinism (11), can stifle innovation in medicine and engineering by limiting
34 biomimetics (22, 23) and curb scientific advancement by impeding theoretical generality (11, 24).
35 However, it is unclear whether taxonomic patterns in the ecology and evolution literature are
36 universal as previous studies on taxonomic bias had small samples due to manual taxonomic
37 identifications and restrictions to certain journals (12, 16) or topics (13, 14). Most importantly,
38 whether these patterns changed since taxonomic bias was first discussed by researchers in the early
39 2000s (11, 12) remains unknown.

40 Here, we explored several facets of taxonomic bias in the entire literature of ecology and
41 evolution (612 journals and 1,383,803 papers), primarily focusing on animals. We aimed to
42 quantify the extent of taxonomic bias and assess whether and how it has changed over time. To do
43 so, we first assessed patterns related to journal taxonomic specialisation. Second, we investigated
44 the proportion of papers on distinct taxonomic groups over time. Third, we evaluated the
45 relationship between journals' impact metrics and the proportion of papers they published on each
46 animal group. Fourth, we examined how the attention given to individual papers within journals
47 varied with the animal group studied. We hypothesised that taxonomic patterns have not changed

48 over time, and that papers on vertebrates, especially birds and mammals, are not only more
49 prevalent in journals with higher impact metrics but also receive more attention than papers on
50 other animals within the same journal and year. If these hypotheses are true, it would mean that
51 researchers are limiting our understanding of the world and stifling potential innovation, possibly
52 to pursue metrics that maximise their own research exposure.

53

54 **Results**

55 *Taxonomic patterns across journals*

56 Almost 40% (235 out of 612) of journals had explicit taxonomic restrictions, and 42.1% of these
57 taxonomically specialised journals (99 out of 235) focused exclusively on all or some arthropods
58 (Fig. 1A). Only journals specialised on birds had, on average, a lower impact factor than
59 taxonomically unrestricted journals or those specialised in humans or non-animal organisms (Fig.
60 1B). However, the small number of journals specialised in other animal groups (e.g. arachnids,
61 molluscs) may have limited our ability to detect statistical differences between their average
62 impact factor and that of taxonomically unrestricted journals.

63 Following Clarivate's Journal Citation Report (hereby *JCR*; Fig. S1) classification system,
64 we found that, unsurprisingly, most journals assigned to taxonomically driven JCR categories (i.e.
65 entomology and ornithology) were taxonomically specialised (Fig. 1C). Meanwhile,
66 taxonomically unrestricted journals dominated other JCR categories (Fig. 1C).

67

68 *Taxonomic patterns across papers*

69 We found that most papers in the field of ecology and evolution mention a single animal group
70 (hereby *single-animal-group papers*) from the 10 categories we used for taxonomic classification

71 ([1] amphibians; [2] arachnids; [3] birds; [4] crustaceans, i.e. non-hexapod pancrustaceans; [5]
72 fish, i.e. non-tetrapod vertebrates; [6] insects; [7] mammals; [8] molluscs; [9] (non-avian) reptiles,
73 and [10] others, i.e. unmentioned invertebrates) (Fig. S2A). However, the prevalence of single-
74 animal-group papers in the literature has slightly decreased over the last five decades (Fig. S2A;
75 Supplementary file S1). We also observed that journals with higher impact factor and higher
76 journal citation indicator were more likely to publish papers that did not specifically mention
77 animals (e.g. conceptual or theoretical studies, empirical studies on humans, non-animal
78 organisms, or the environment; Fig. S2B, C; Supplementary file S1). Although the distribution of
79 both journal impact factor and journal citation indicator was right-skewed (Fig. S2D, E), the
80 patterns we found related to these metrics persisted when high-impact journals were excluded from
81 our analyses (Supplementary file S1).

82 We gathered 991,894 ecology and evolution papers involving animals, the oldest of them
83 published in 1877. 457,064 (46.1%) of these papers involved only invertebrates, 447,800 (45.1%)
84 only vertebrates, and 8,730 (8.8%) both invertebrates and vertebrates. When partitioning animals
85 into the 10 aforementioned groups, we observed that insects, mammals, and fish were the most
86 popular animals in this literature (Fig. 2A). Still, insects were the least investigated animal group
87 in relation to its diversity, while mammals and fish were the most overrepresented by the same
88 standard (Fig. 2B).

89 Studies predominantly investigated each animal group in isolation, but the number of
90 animal groups examined varied depending on the animals involved (Fig. 2A). For instance, while
91 81.4% of papers involving insects focused solely on them, almost half (47.7%) of papers on
92 arachnids concomitantly involved other animals (Fig. 2A). This pattern could be even stronger
93 when considering particular animals, such as ticks, a group of obligate parasites that represents

94 0.08% of all living arachnids (25) but is mentioned by 20.1% of papers involving arachnids
95 alongside other animals.

96 Nearly half of all single-animal-group papers on insects and arachnids were published in
97 taxonomically specialised journals (Fig. 2C). Single-animal-group papers on other animals were
98 mostly published in taxonomically unrestricted journals, although some more than others (Fig.
99 2C).

100 We hereon focus on single-animal-group papers (N = 560,364) published in taxonomically
101 unrestricted journals (N = 375). Most of these papers focused on vertebrates overall (Fig. 3A).
102 However, when animals were divided into more specific groups, insects emerged as the single
103 most frequently studied group, followed closely by fish, mammals, and birds. Furthermore, when
104 separating journals into five distinct sets (largely based on JCR categories), we noted that
105 taxonomic patterns were not uniform across the literature of ecology and evolution. For instance,
106 in 2025, approximately half of the papers published in aquatic-related journals focused on fish,
107 while most of the remaining papers examined invertebrates other than arachnids and insects (Fig.
108 3B). By contrast, mammals and birds were particularly popular in journals focusing on behaviour,
109 conservation, and general ecology and evolution (Fig. 3C-E), while zoology journals published
110 mainly papers on invertebrates by 2025, primarily due to the high prevalence of papers on insects
111 (Fig. 3F). We additionally found that many taxonomically unrestricted journals showed extreme
112 bias towards a single group of animals (Fig. S3).

113

114 *In relation to time*

115 The prevalence of papers on vertebrates remained the same over the last 25 years in the literature
116 as a whole (Fig. 3A) and in conservation journals (Fig. 3D), yet the same could not be said for

117 other journal sets. For instance, we observed that vertebrates became proportionally more studied
118 than invertebrates in aquatic, behaviour, and general ecology and evolution journals (Fig. 3B, C,
119 E). By contrast, vertebrates became proportionally less studied than invertebrates in zoology
120 journals (Fig. 3F).

121 Changes over time were more frequently observed when classifying animals into specific
122 categories, as the prevalence of papers on 8 (out of 10) animal groups changed in the literature as
123 a whole over the last 25 years (Fig. 3A). However, these trends were small in magnitude: the
124 strongest absolute change was the increase of 3.7% of papers on fish (Fig. 3A). Temporal trends
125 regarding taxa also occurred across various subfields, but often in distinct directions. For example,
126 the proportion of papers on mammals increased in behaviour journals as well as in general ecology
127 and evolution journals (Fig. 3C, E) but remained constant in aquatic journals (Fig. 3B) and
128 decreased in conservation and zoology journals (Fig. 3D, F). Importantly, some changes in
129 taxonomic patterns over time within journal sets were enormous: fish accounted for 35.8% of
130 papers published in aquatic journals in 2001 but 49.7% in 2025 (Fig. 3B), while insects increased
131 from 21.5% in 2001 to 41.3% in 2025 in zoology journals (Fig. 3F).

132

133 *In relation to journal impact metrics*

134 Papers published in journals with greater impact factor and citation indicator were more likely to
135 focus on vertebrates (Fig. 4). However, there were exceptions for this pattern: general ecology and
136 evolution journals showed either a negative or an absent relationship between their impact metrics
137 and prevalence of papers on vertebrates (Fig. 4E, K), and behaviour journals strangely showed a
138 positive trend between vertebrate pervasiveness in relation to journal citation indicator (Fig. 4I)
139 but a negative one for journal impact factor (Fig. 4C). Despite these trends, the prevalence of more

140 specific animal groups in papers was rarely associated with journal impact metrics (Fig. 4;
141 Supplementary file S1). For example, birds were as likely to be the focus of papers in high-impact
142 journals as in lower-impact journals, regardless of journal set (Supplementary file S1). We
143 observed, however, a few trends related to taxon prevalence and journal impact metrics. For
144 instance, the proportion of papers on insects across the entire literature was not associated with
145 journal impact factor but increased with journal citation indicator (Fig. 4A, B). The prevalence of
146 papers on crustaceans, both in the literature as a whole and across aquatic journals, decreased with
147 journal impact factor but not with journal citation indicator (Fig. 4C-F). Meanwhile, taxonomic
148 trends regarding journal impact factor and journal citation indicator were congruent for fish and
149 invertebrates other than arachnids, crustaceans, insects, and molluscs in aquatic journals (positive
150 and negative relationship, respectively; Fig. 4G-J), and for mammals in journals of general ecology
151 and evolution (negative relationship; Fig. 4K, L).

152

153 *In relation to individual attention received*

154 Compared with papers on invertebrates, papers on vertebrates in the ecology and evolution
155 literature as a whole received, on average, 10.6% more citations, accumulated 44.3% more online
156 mentions, attracted 24.2% more readers in Mendeley, and achieved 46.5% higher Altmetric scores
157 (Fig. 5). The same qualitative pattern occurred within journal sets, except for the number of
158 citations in conservation journals, for which no difference was detected between papers on
159 vertebrates vs. invertebrates (Fig. S5C). Meanwhile, the attention received by papers on different
160 animal groups varied substantially across metrics and journal sets (Fig. 5, S5). For example, birds
161 and mammals attracted the greatest online attention in most cases (Fig. 5B; Fig. S4F-J), but this
162 pattern was not always reflected in citation counts (Fig. 5A; Fig. S4A-E).

163

164 **Discussion**

165 Our results show that ecology and evolution research is profoundly taxonomically unbalanced as
166 certain animal groups are consistently neglected, both in representation (relative to diversity) in
167 the literature and in the attention they receive. Although this imbalance has occurred for a long
168 time, it has remained largely stable over the last 25 years. Below, we discuss these patterns in
169 detail, consider their implications for the study of ecology and evolution, and propose actions to
170 ameliorate this issue.

171 We found that vertebrates are greatly overrepresented in the literature of ecology and
172 evolution: they appear in 53.9% of all papers in this field mentioning animals despite representing
173 only 4.3% of animal biodiversity (1). This corroborates and expands previous findings from
174 specific pockets of ecology and evolution (11–13, 16), revealing that taxonomic bias is a problem
175 pertaining to the entire field and confirming an “institutional vertebratism” (*sensu* (26)).
176 Nonetheless, we found substantial variation in taxonomic patterns across the ecology and evolution
177 literature when animals were classified in more specific groups. For instance, research published
178 in aquatic journals often involved fish, crustaceans, molluscs, and other non-arthropod
179 invertebrates, while behaviour journals more commonly published research on mammals and
180 birds. This variability indicates that there is not a single popular animal group across ecology and
181 evolution. Furthermore, our discovery that species-rich invertebrate groups (e.g. arachnids,
182 insects) are often relegated to taxonomically specialised journals, which probably reach a narrower
183 audience, suggests that the existing hyperfocus on vertebrates may be even more pronounced from
184 the perspective of an average researcher.

185 The intense taxonomic bias favouring vertebrates in ecology and evolution has shown no
186 signs of improvement since taxonomic bias was first discussed in the early 2000s. More
187 specifically, we observed that the overrepresentation of vertebrates across the literature of ecology
188 and evolution as a whole has remained stable or even increased in certain pockets of this field over
189 the last 25 years. The only temporal increase in invertebrate-focused studies during this period
190 occurred in zoology journals, likely because these outlets concentrate much of (if not all) the
191 existing research on systematics. This includes the revision of taxa and the description of new
192 species, which are predominantly invertebrates precisely because of their immense and still largely
193 undocumented diversity, thus naturally inflating their representation within this journal set.
194 Temporal trends regarding specific animal groups also varied across subdisciplines of ecology and
195 evolution, suggesting that efforts to mitigate taxonomic bias will need to be tailored to the norms
196 and priorities of each subfield. However, increasing research on invertebrates is undoubtedly
197 critical to all subpockets of ecology and evolution.

198 We hypothesised that vertebrates, especially birds and mammals, would receive more
199 attention than invertebrates across and within ecology and evolution journals. Indeed, compared
200 with invertebrates, vertebrates were more likely to be the focus of papers published in journals
201 with higher impact metrics. Likewise, papers on vertebrates acquired more citations, online
202 coverage, Mendeley readers, and greater Altmetric scores than papers on invertebrates. These
203 results are congruent with existing research on the attention given to distinct animal groups within
204 and beyond academia. For instance, Rosenthal et al. (16) found that studies on vertebrates were
205 cited more frequently than those on arthropods. Moreover, vertebrates have been shown to receive
206 more attention than invertebrates on social media (e.g. Instagram (27)) and online knowledge
207 platforms (e.g. Wikipedia; (28)). Nonetheless, using finer animal classifications showed more

208 nuanced attention patterns. While journal impact metrics were rarely associated with the likelihood
209 of publication for a specific animal group, the attention given to each animal group within a journal
210 varied within and across subdisciplines and metrics.

211 It is possible that the attention patterns we identified within and across journals stem from
212 researchers behaving differently depending on the organisms they study. For instance, ecologists
213 and evolutionary biologists working on invertebrates may be more likely to submit their research
214 manuscripts to taxonomically specialised or lower-impact journals than those working with
215 vertebrates. Researchers focusing on invertebrates may also struggle to contextualise their research
216 into the existing theory, lowering their chances of publishing in impactful journals and receiving
217 attention overall. However, studies on invertebrates were previously found to cite vertebrates more
218 often than studies on birds and mammals cited other taxa (29), which suggests the opposite pattern
219 (i.e. studies on vertebrates are less broadly contextualised than those on invertebrates). Thus, the
220 taxonomic bias we identified in the ecology and evolution literature (and its persistence over time)
221 probably occurs because of a more pervasive process—the idea that certain taxa are more valuable
222 than others.

223 The perception that vertebrates are “better” or more important than invertebrates, a view
224 widespread in society (30, 31), likely influences scientists’ choice of research organisms (32). This
225 skewed valuation system, which is potentially used by gatekeepers (e.g. committees, journal
226 editors, reviewers) to ascertain research appeal, may then result in taxonomically biased decisions.
227 We argue that conducting science as a congeniality contest slows innovation (22, 23), curbs the
228 generality of ecological and evolutionary knowledge (11, 24), underexposes society to animals
229 that are ubiquitous in nature (26), and inhibits the formation of academics exploring such animals
230 (e.g. insect taxonomists (4, 33)), further contributing to the problem in a vicious cycle.

231 While several actions needed to reduce taxonomic bias involve the society at large (32),
232 we focus on possible interventions within academia to ameliorate this issue as they may be readily
233 implemented. First, we urge publishers, journals, and scientific societies to be more transparent
234 about their decisions regarding publications and funding. This includes systematically collecting
235 and publicly reporting information on the taxa investigated in submitted and accepted manuscripts,
236 as well as in funded projects. This would be a relatively simple task by journals and funding
237 institutions as authors or applicants can populate this information on submission. Second,
238 taxonomic diversity should be explicitly incorporated into the guidelines for awards, grants, hiring,
239 and publication decisions, mitigating implicit biases among decision-makers. Third, targeted
240 financial and publishing incentives should be established to support researchers working on
241 understudied taxa. Fourth, fomenting descriptive and fundamental research, such as taxonomy (4,
242 33) and natural history (34, 35), is paramount to strengthen hypothesis-driven and applied research,
243 as one cannot test or apply undescribed organisms, processes, and patterns. Although these
244 propositions may be ambitious or even unrealistic, similar criticisms were once directed at
245 affirmative action policies aimed at increasing the participation of underrepresented groups in
246 academia. Many journals now state their commitment to diversity, equity, and inclusion, yet none
247 of those we examined explicitly promote research on neglected taxa. We hope that institutions will
248 consider implementing our recommendations to foster a more taxonomically inclusive scientific
249 community.

250 **Material and methods**

251 *Preregistration*

252 Some of our methodology was described in our preregistration (36). However, we greatly
253 expanded our original plan, which culminated in two separate projects: the present study
254 describing patterns of taxonomic bias in the literature of ecology and evolution, and another study
255 exploring the potential drivers of taxonomic bias from data collected *via* a survey with behavioural
256 ecologists (32). Changes from our preregistration are summarised as follows. First, we initially
257 planned to examine taxonomic bias in papers published in 10 behaviour journals, but later
258 expanded the range of our study to a much broader selection of journals related to ecology and
259 evolution (see details below). Second, we originally planned to include non-animal organisms
260 when classifying papers' taxonomic focus. Nonetheless, distinguishing the use of non-animal
261 organisms as research objects from their use as animals' environment, substrate, or food proved to
262 be difficult. Therefore, we opted to only identify animal taxa in our study. Third, we originally
263 planned to improve the algorithm using up to 500 papers, but used many more instead to ensure
264 the reliability of the taxonomic classification algorithm (see details below). Fourth, many analyses
265 in the present study, such as those involving data from Altmetric, were not initially planned in our
266 preregistration.

267

268 *Journal selection and classification*

269 PP selected all journals that were classified as “behavioral sciences”, “biodiversity conservation”,
270 “ecology”, “entomology”, “evolutionary biology”, “marine & freshwater biology”, “ornithology”
271 or “zoology” by Clarivate’s Journal Citation Records (JCR), tallying 696 journals. PP then retained
272 only journals (1) whose Clarivate’s journal impact factor (2024) was available and (2) were also

273 indexed by Scimago Journal Rank as “agricultural and biological sciences” or “environmental
274 sciences”, which resulted in the selection of 612 journals (Fig. S1). Afterwards, PP collated the
275 scope of each journal (available in their respective website) and used this information to determine
276 journals’ taxonomic focus. Note that some journals that vaguely described their taxonomic criteria
277 (e.g. laboratory animals) or that only inadvertently excluded certain organisms because of the
278 subject they specialised on (e.g. soil ecology journals probably do not publish research on fish but
279 have no such explicit restrictions) were still considered taxonomically unrestricted. Moreover,
280 journals on entomology or insect science were deemed to include all arthropods unless they
281 explicitly mentioned focusing on a particular insect group (e.g. lepidopterans, orthopterans).

282

283 *Journal impact metrics*

284 PP used two journal impact metrics in the present study: the journal citation indicator (JCI) and
285 the journal impact factor (JIF). Both metrics are calculated by JCR and were thus extracted during
286 the journal selection process (see subsection above). The year in which these metrics are calculated
287 by Clarivate is referred to as the JCR year, which was 2024 for the present study. Both JCI and JIF
288 quantify citation performance but differ in key aspects. The JCI is normalised for field, document
289 age, and document type; it uses citations from the JCR year plus previous three years (i.e. 2024-
290 2021) for articles and reviews (but not other document types, e.g. letters or editorials) published
291 in the previous three years (i.e. 2023-2021). By contrast, JIF is an absolute metric based on
292 citations received in the JCR year (i.e. 2024) to all documents published in the previous two years
293 (i.e. 2023-2022).

294 *Literature searches*

295 On 29 December 2025, PP retrieved information from 1,695,614 documents by searching the
296 International Standard Serial Number (ISSN) of the 612 journals aforementioned on Scopus
297 (accessed through the University of New South Wales). 1,389,068 documents from 606 journals
298 remained in the dataset after PP excluded documents that were (1) officially published in 2026, (2)
299 duplicated, or (3) had missing information (DOI, journal name, abstract, title, and/or author
300 names). PP further excluded documents that were classified by Scopus as “book” (n = 9), “book
301 chapter” (n = 13), “editorial” (n = 870), “erratum” (n = 4,159), and “retracted” (n = 214) as these
302 do not represent valid standard research outputs. Conversely, other documents (hereby *papers*)
303 classified by Scopus as “article” (n = 1,305,271), “conference paper” (n = 17,448), “data paper”
304 (n = 290), “letter” (n = 2,627), “note” (n = 4,104), “review” (n = 52,165), or “short survey” (n =
305 1,898) remained in the dataset, tallying 1,383,803 papers from 606 journals.

306

307 *Altmetric data*

308 On 20 January 2026, PP used the Altmetric API (“Counts Only” version) to gather all available
309 metrics of attention indexed by Altmetric related to the papers retrieved. However, note that only
310 44.4% (613,768 out of 1,383,803) of the papers in our dataset were found in the Altmetric database.
311 We specifically used three metrics of attention collected by Altmetric in our analyses (see details
312 below): mentions in online documents (e.g. blogs, news outlets, patents, policies, social media,
313 Wikipedia), readers in Mendeley, and Altmetric score (i.e. a weighted estimate of several attention
314 metrics).

315

316 *Taxonomic classification*

317 PP selected ten animal groups to identify papers' taxonomic focus from their title, abstract, and
318 author keywords: (1) amphibians, (2) arachnids, (3) birds, (4) crustaceans (i.e. non-hexapod
319 pancrustaceans), (5) fish (i.e. non-tetrapod vertebrates), (6) insects, (7) mammals, (8) molluscs,
320 (9) (non-avian) reptiles, and (10) other (unnamed invertebrates). MMK and PP independently
321 evaluated the taxonomic focus of 100 papers, resulting in eight conflicts that were resolved after
322 discussion and that generated clear criteria to evaluate papers' taxonomic focus, as follows. First,
323 humans (i.e. any species of the genus *Homo*) were treated as non-animal organisms for
324 classification purposes. Second, papers could focus on distinct animal groups by exploring
325 interactions (e.g. predator-prey, host-parasite) between species of different groups or simply by
326 using or collecting data related to multiple taxa. However, animal groups were only identified as
327 being the focus of a paper when they were directly or indirectly (e.g. byproducts, images) involved
328 in the research presented (regardless of whether the research was empirical, theoretical, or a
329 review), but not when they were simply mentioned as references (see Table S1 for examples).
330 Third, papers needed to specify taxonomic information to the level of our taxonomic classification,
331 meaning that vague or high-level terms (e.g. shellfish, vertebrates, zooplankton) were ignored if
332 no specific taxonomic terms were given. Applying these criteria, PP manually identified the animal
333 taxa examined in 6,749 papers, which were used to train and test an algorithm that automates this
334 process (see below).

335 In order to automate the classification of papers' taxonomic focus, PP compiled a set of
336 words associated with different taxa (hereby *taxonomic keywords*), which included part of the
337 GBIF Backbone Taxonomy (37) (Supplementary file S2) and a customised set of keywords
338 (Supplementary file S3). PP then developed a simple algorithm to identify papers' taxonomic focus

339 based on taxonomic keywords detected in papers' title, abstract, and author keywords. PP used
340 4,934 papers that he inspected as a training set to manually add and adjust taxonomic keywords,
341 improving the algorithm. The algorithm was also able to identify some combinations of keywords
342 that would generate incorrect labels if left unchecked. For instance, spider monkey is a mammal,
343 but the terms "spider" and "monkey" are taxonomic keywords that the algorithm uses to identify
344 studies focusing on arachnids and mammals, respectively. PP thus added a step in the algorithm
345 that corrects for these occurrences.

346 PP evaluated the efficacy of the algorithm mentioned above in three ways. First, PP
347 compared the manually identified taxonomic focus of the remaining 1,815 papers he inspected
348 with the equivalent labels generated by the algorithm. PP found that the algorithm had, for each
349 taxonomic group (Table S2), at least 97.2% accuracy (i.e. proportion of correct predictions; (38)),
350 84.4% precision (i.e. proportion of predicted positives that are truly positive; (39)), 95.4%
351 sensitivity (i.e. true positive rate, also called recall; (39, 40)), 96.9% specificity (i.e., true negative
352 rate; (40)), and 91.2% F1-score (i.e. harmonic mean of precision and sensitivity; (41)). Note that
353 the training and the test sets each contained at least three papers from each of the 605 journals in
354 the dataset (one other journal had only one paper in the dataset, which was used in the training
355 set), ensuring a reliable comparison. Second, PP verified the proportion of papers from
356 taxonomically specialised journals receiving impossible taxonomic labels, such as studies
357 published in the Journal of Mammalogy identified by the algorithm as involving only animals
358 other than mammals. He detected these gross errors in only 0.06% of all such papers (see also Figs.
359 S5 and S6). Third, PP compared the taxonomic labels generated by the algorithm with the dataset
360 from Stahlshmidt (13), who manually identified a single animal taxon focused by 82 papers present
361 in our dataset. PP found that the algorithm's taxonomic classifications matched Stahlshmidt's,

362 except for a paper on humans (classified by Stahlshmidt as mammal). However, the algorithm also
363 identified additional animal groups for 14 of these papers besides those identified by Stahlshmidt.

364

365 *Statistical analyses*

366 PP fitted several models to analyse taxonomic patterns of journals and papers. He first conducted
367 a linear regression with journal impact factor as the response variable and journal taxonomic scope
368 as the predictor variable. He then performed three Dirichlet regressions, all with the same response
369 variable (proportions of papers involving zero, one, or two or more animal groups) and random
370 effect (journal identity), but each with a different predictor variable (year of publication, journal
371 impact factor, or journal citation index).

372 To conduct all other analyses, i.e. those involving single-animal-group papers published in
373 taxonomically unrestricted journals, PP used two complementary approaches. He analysed papers
374 from all journals combined to characterise overall taxonomic patterns in the ecology and evolution
375 literature, but also assessed how taxonomic patterns varied across this field by examining papers
376 within one of five journal sets: aquatic (journals classified by JCR as “marine or freshwater
377 biology”; N = 76), behaviour (journals classified as “behavioral sciences”; N = 16), conservation
378 (journals classified as “biodiversity conservation” but not included in the aquatic set; N = 62),
379 general ecology and evolution (remaining journals classified as “ecology” or “evolutionary
380 biology”; N = 142), and zoology (all remaining journals, mostly classified as “zoology” but some
381 as “entomology”; N = 79). Within each of these approaches, two different taxonomic levels were
382 analysed: binary (vertebrates vs. invertebrates) and specific (10 animal groups previously
383 mentioned).

384 Under the scenarios described above, PP performed logistic regressions (binary taxa) or
385 Dirichlet regressions (specific taxa), with journal identity as a random effect and a single predictor
386 variable (year of publication, journal impact factor, or journal citation index). PP made sensitive
387 analyses of these models by excluding journals with impact factor greater than 6 and citation
388 indicator greater than 2, considering the relationship between a journal impact metric and the
389 prevalence of papers on an animal group as different from zero when both model versions yielded
390 the same qualitative results.

391 Lastly, PP fitted several generalised linear mixed models (GLMMs) with a negative
392 binomial error distribution to explore the attention given to single-animal-group papers depending
393 on the taxon they focused on. In these GLMMs, the response variable could be one of four attention
394 metrics: the number of (1) citations by other papers according to Scopus, (2) mentions in online
395 documents, (3) readers in Mendeley, or (4) (rounded) Altmetric score. In these models, journal
396 identity, year of publication, and their interaction were random factors and either binary or specific
397 animal groups was the predictor variable.

398 Analyses involved papers published over a certain timespan: 2001-2025 for most models,
399 but 1976-2025 to assess temporal patterns regarding number of taxa covered, and 2021-2025 to
400 assess the association between journal impact metrics and focused animal group. Continuous
401 variables in all models fitted were scaled by subtracting the mean from each value and then
402 dividing the result by the standard deviation.

403 PP conducted all analyses using R v. 4.5.1 (42). PP fitted GLMMs using the package
404 *glmmTMB* v. 1.1.12 (43, 44) and performed pairwise comparisons for these models using the
405 packages *emmeans* v. 1.11.2.8 (45), *multcomp* v. 1.4.28 (46), and *multcompView* v. 0.1.10 (47).
406 PP conducted logistic and Dirichlet regressions using the package *brms* v. 2.23.0 (48–50) and the

407 package *cmdstanr* v. 0.9.0 (51). For these regressions, PP ran three chains, each with 5,000
408 iterations plus another 5,000 burn-in iterations, adopting Stan's standard uninformative priors and
409 setting the adaptive delta to 0.9. PP then computed the predictions and trends of such regressions
410 using the package *marginaleffects* v. 0.31.0 (52).

411

412 **Code and data accessibility**

413 All data and code used in this study are available at <https://zenodo.org/records/19451113>.

414

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417 Research Technology Services at UNSW Sydney. Some of the data in this research was sourced
418 from Altmetric (<https://www.altmetric.com>).

419

420 **Author contributions**

421 PP: conceptualisation, methodology, formal analysis, investigation, data curation, writing -
422 original draft, writing - review & editing, visualisation, project administration.

423 MK: conceptualisation, writing - review & editing.

424

425 **Competing interests**

426 The authors declare no conflicts of interest.

427

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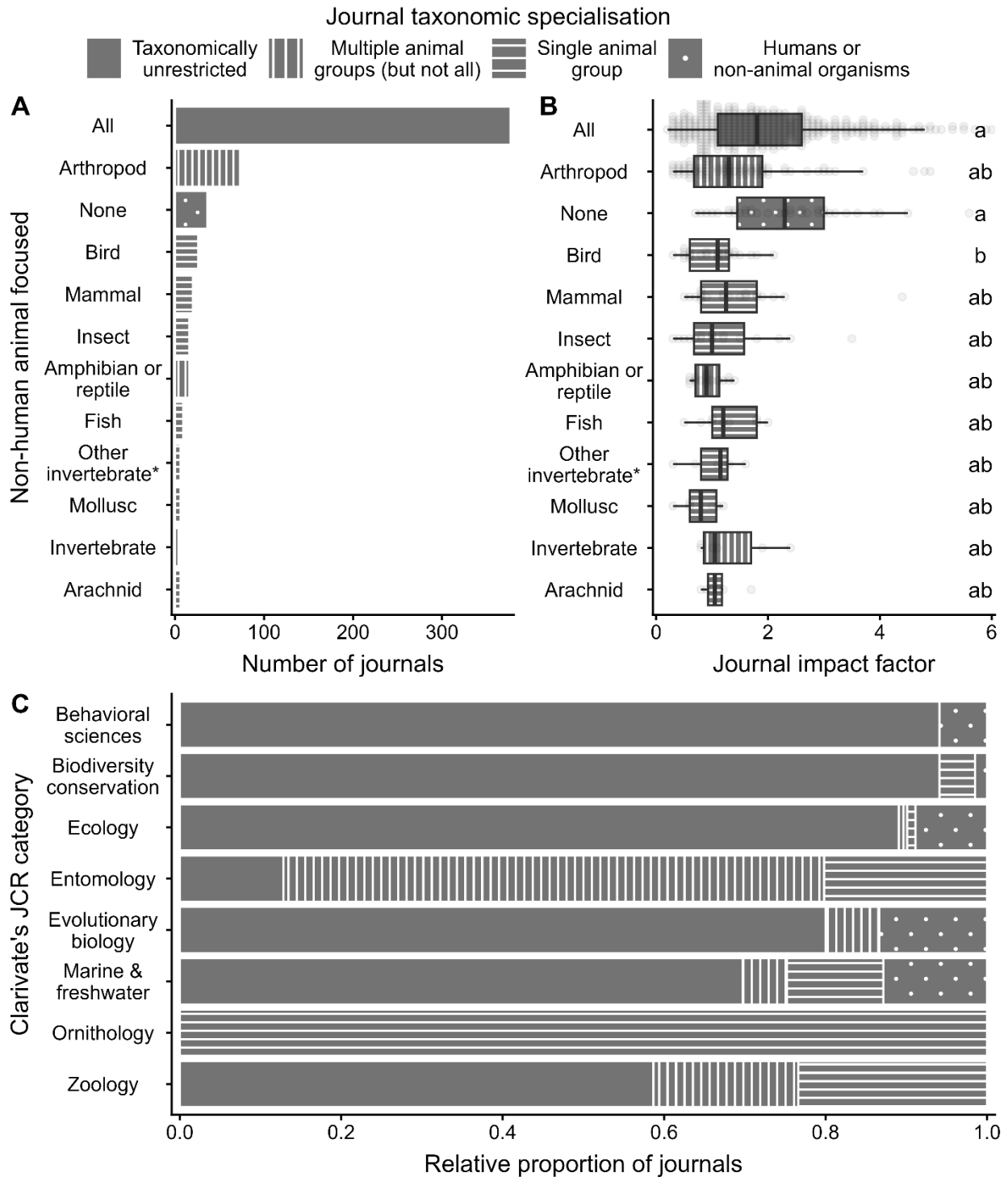
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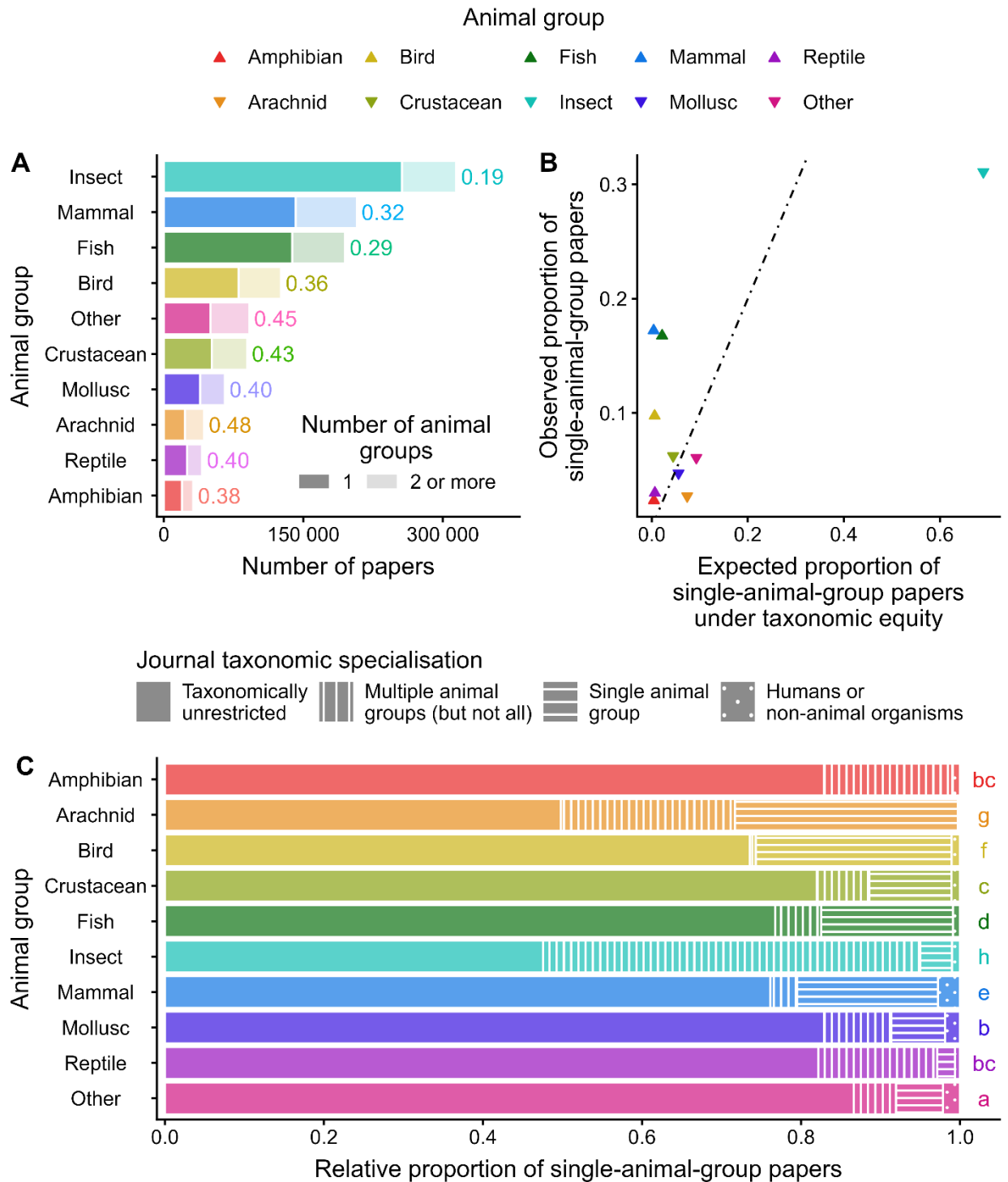
589

590 **Figure 1. Taxonomic specialisation of ecology and evolution journals.** Panel A shows the

591 number of journals focusing on each non-human animal taxon, with panel B showing the impact

592 factor of these journals (curtailed x -axis with 6 as maximum value; only taxa focused by at least
593 five journals are shown). Panel C shows the taxonomic specialisation of journals within each
594 Journal Citation Report (JCR) category. In panels A and B, “Other invertebrate*” refers to
595 invertebrates other than arachnids, crustaceans, insects, and molluscs. In panel B, dots represent
596 individual journals, boxes enclose 50% of the data (interquartile range), the whiskers contain
597 values up to 1.5 times the interquartile range, the solid line within the boxes represents the median,
598 and distinct letters represent statistical differences between groups of journals with different
599 focused taxa (z-values with $p < 0.05$ for all pairwise comparisons).

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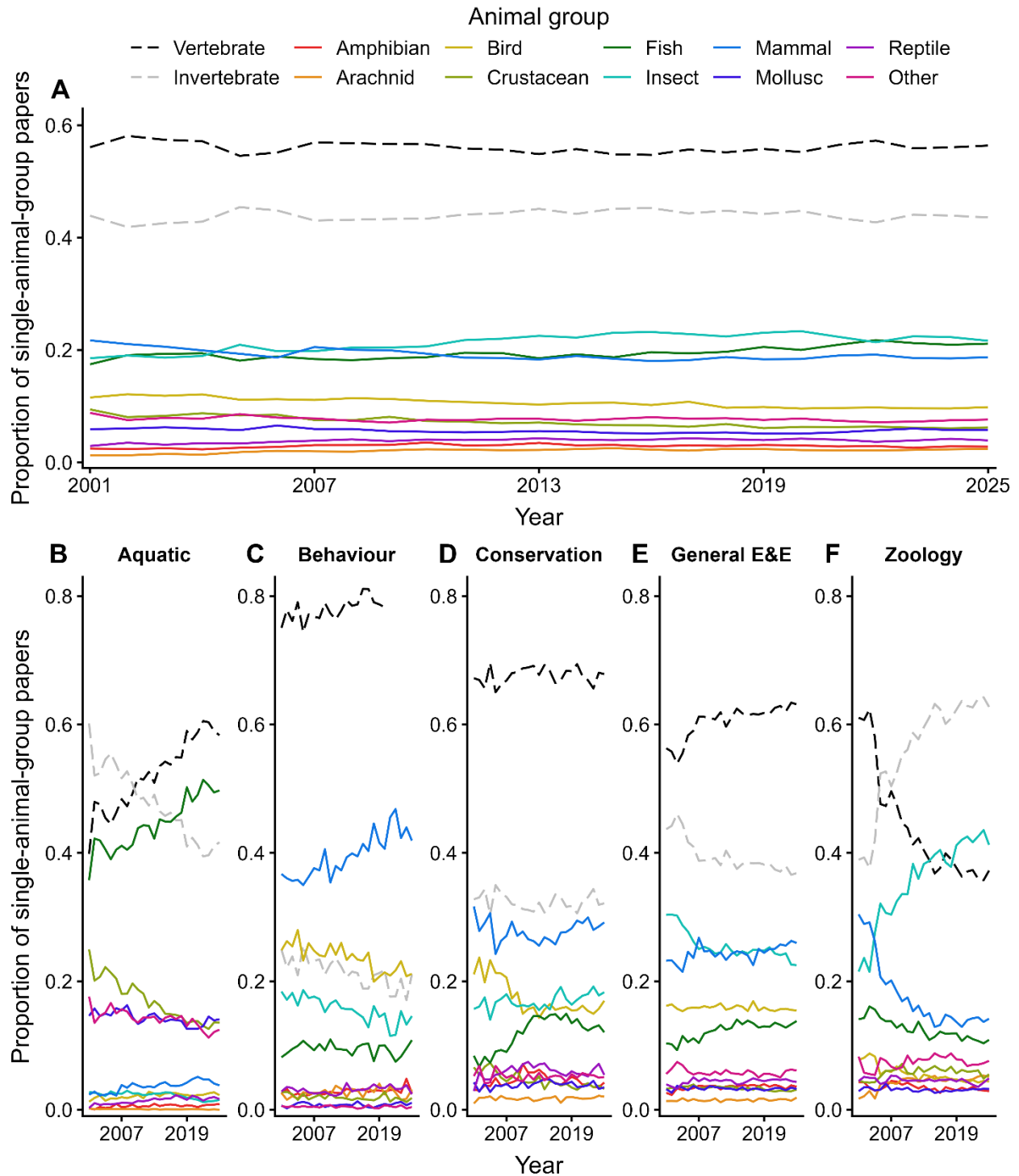
602 **Figure 2. Taxonomic patterns across all papers mentioning at least one animal group.** In

603 panel A, dark-coloured bars represent the number of papers solely on that animal group, light-

604 coloured bars represent the number of papers examining that animal group in conjunction with

605 other animals, and numbers beside these bars represent its proportion in relation to all papers on
606 that animal group. Panel B shows the relationship between the expected proportion of single-
607 animal-group papers under taxonomic equity (i.e. proportional to the species richness of animal
608 groups) and the observed corresponding proportion, where the dot-dashed line highlights a perfect
609 relationship; points above the line signify overrepresentation, while points below the line signify
610 underrepresentation. Panel C shows the relative proportion of single-animal-group papers on each
611 animal taxon published in each type of journal taxonomic specialisation, in which distinct letters
612 represent statistical differences between animal groups regarding their proportion of such papers
613 in taxonomically unrestricted journals (z-values with $p < 0.05$ for all pairwise comparisons).

614

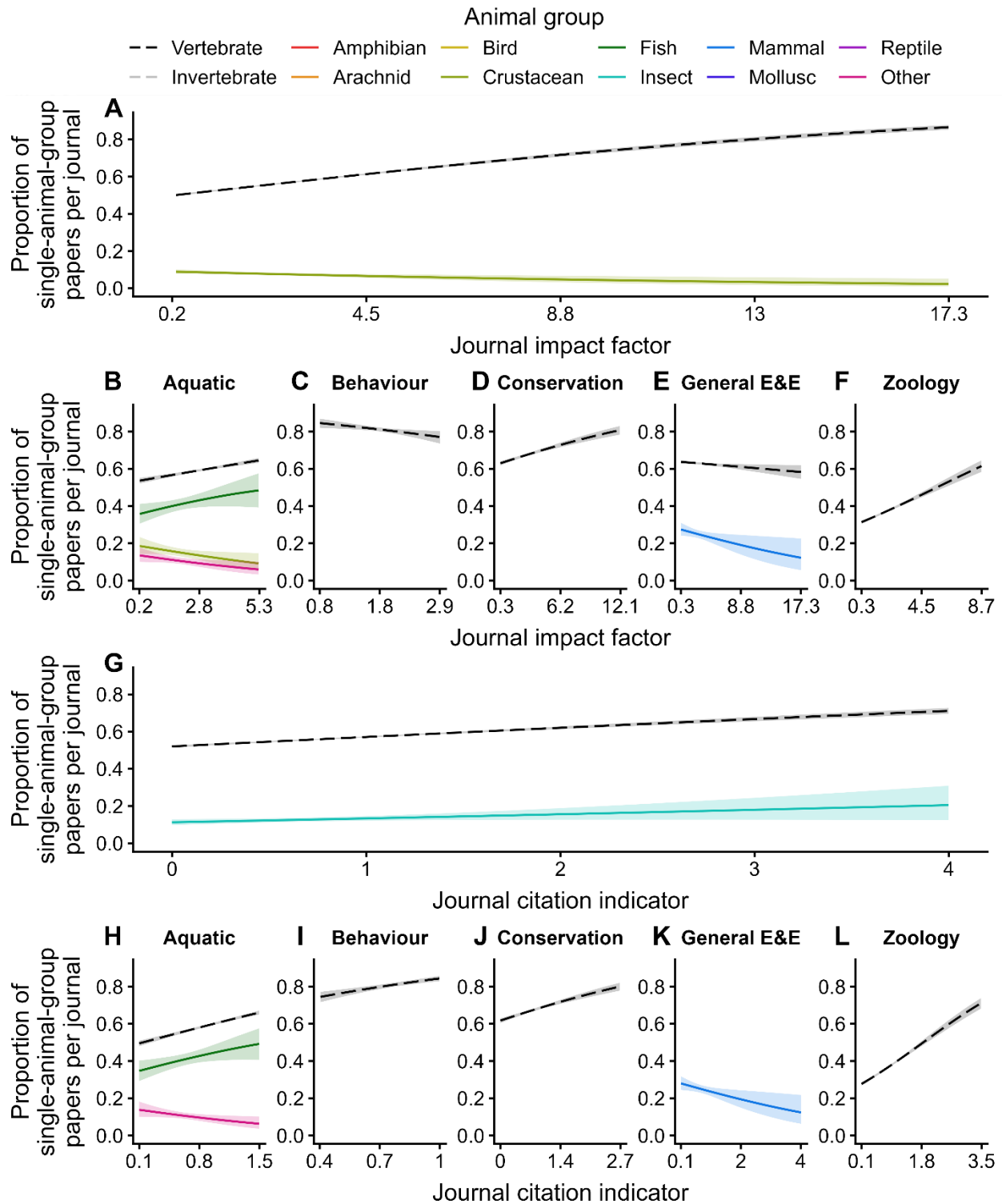


615

616 **Figure 3. Proportion of single-animal-group papers investigating each animal group over**

617 **time.** While panel A shows estimates for all journals together, panels B-F show journals divided

618 into five separate sets. See also the Supplementary file S1.



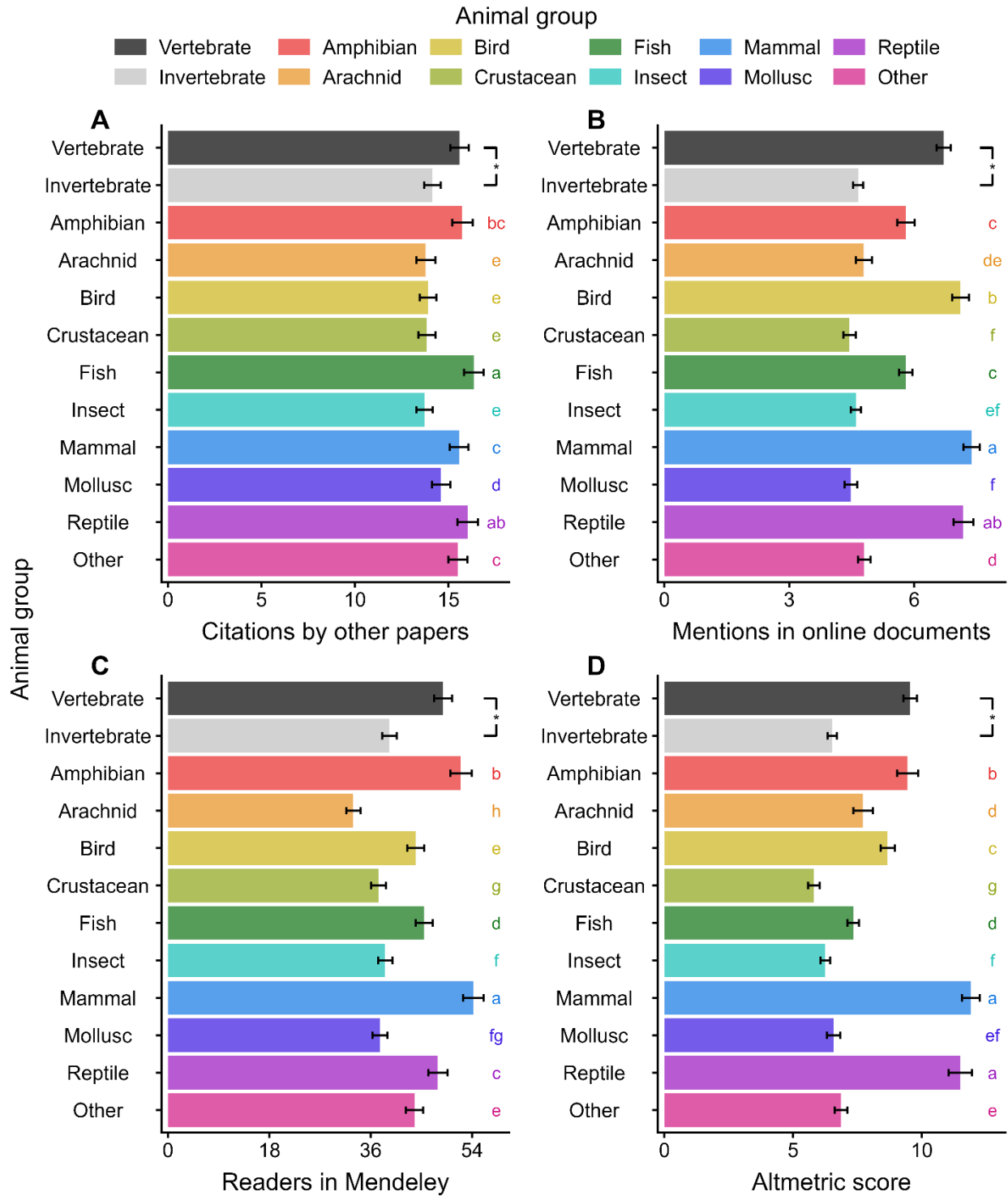
619

620 **Figure 4. Proportion of single-animal-group papers investigating each animal group in**

621 **relation to journal impact metrics.** The journal impact metric explored in panels A-F is journal

622 impact factor, while journal citation indicator is explored in panels G-L. Panels A and G show
623 trends for all journals in ecology and evolution together, while panels B-F and H-L do so within
624 journal sets. Note that only positive or negative relationships are shown.

625



626

627 **Figure 5. Attention metrics for papers on distinct animal groups.** Distinct letters represent

628 statistical differences among papers on specific animal groups within each panel (z-values with p

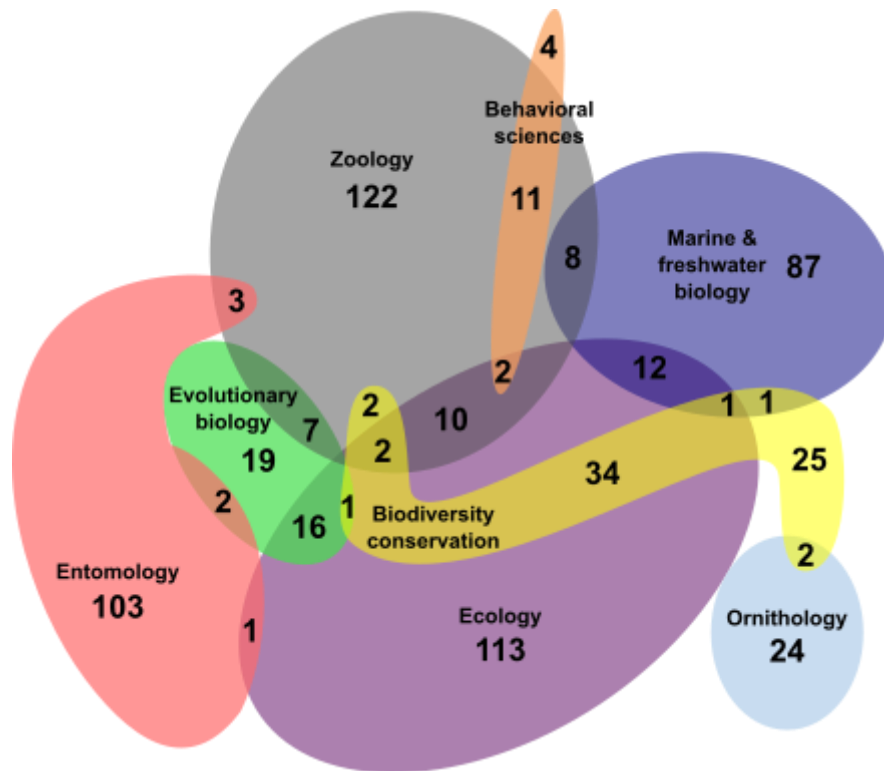
629 < 0.05 for all pairwise comparisons), while differences between papers on vertebrates vs.
630 invertebrates are shown with a star.

631

632

633 **Supplementary material**

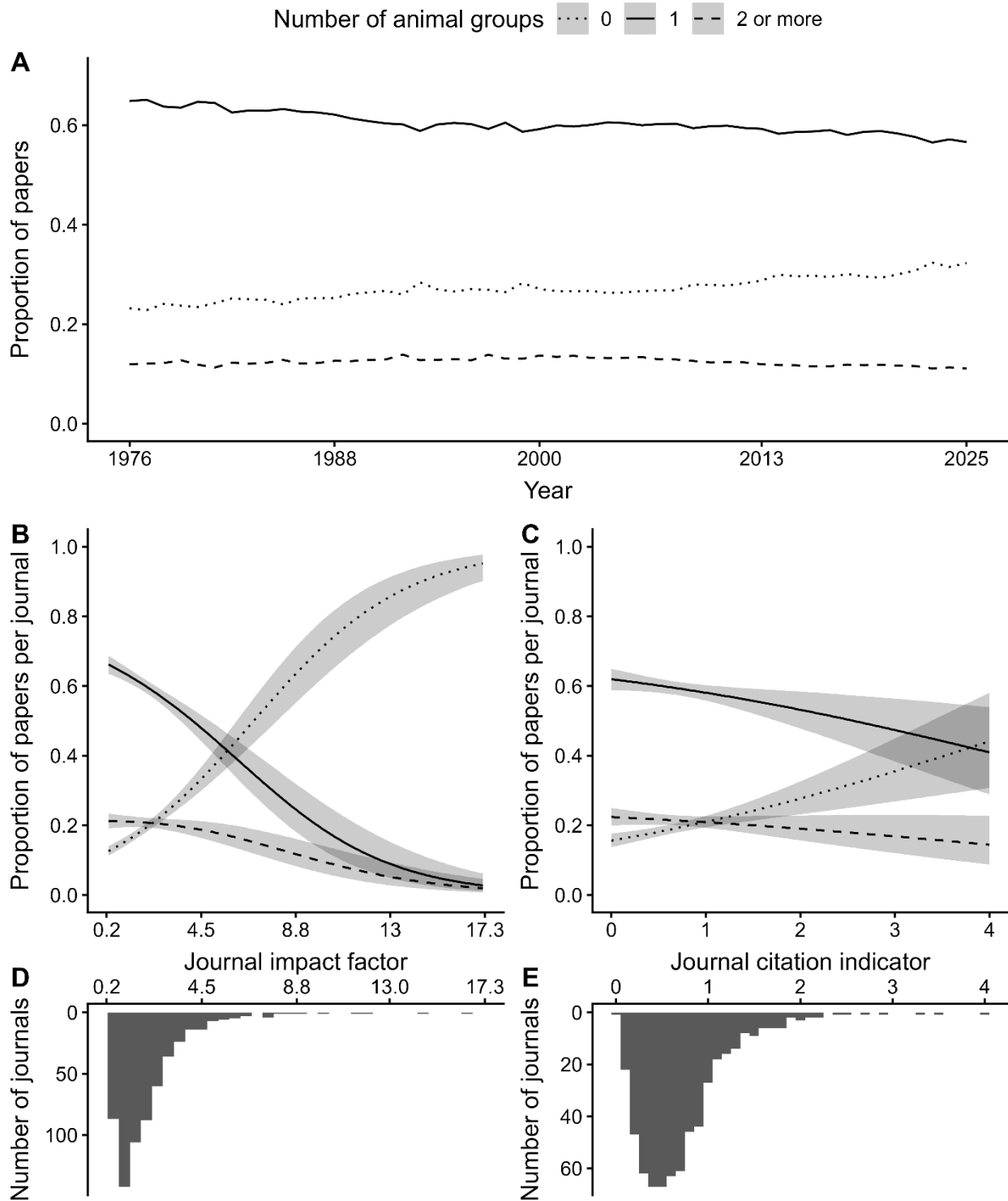
634 *Supplementary figures*



635

636 **Figure S1. Clarivate's Journal Citation Report (JCR) classification of assessed journals.**

637 Numbers represent the number of journals within each set combination.



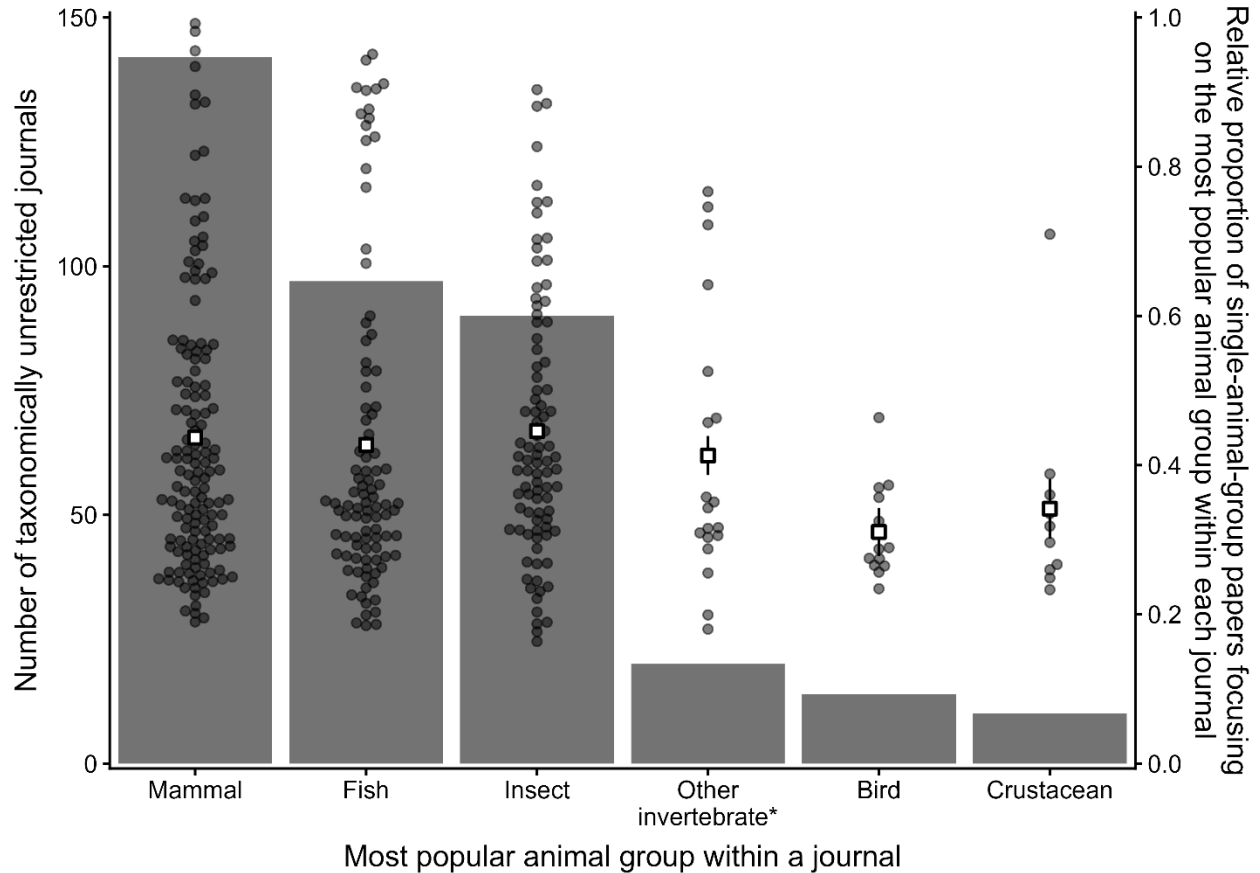
638

639 **Figure S2. Number of animal groups examined in papers in ecology and evolution.** Panel A

640 shows the proportion of papers on distinct numbers of animal taxa investigated from over the last

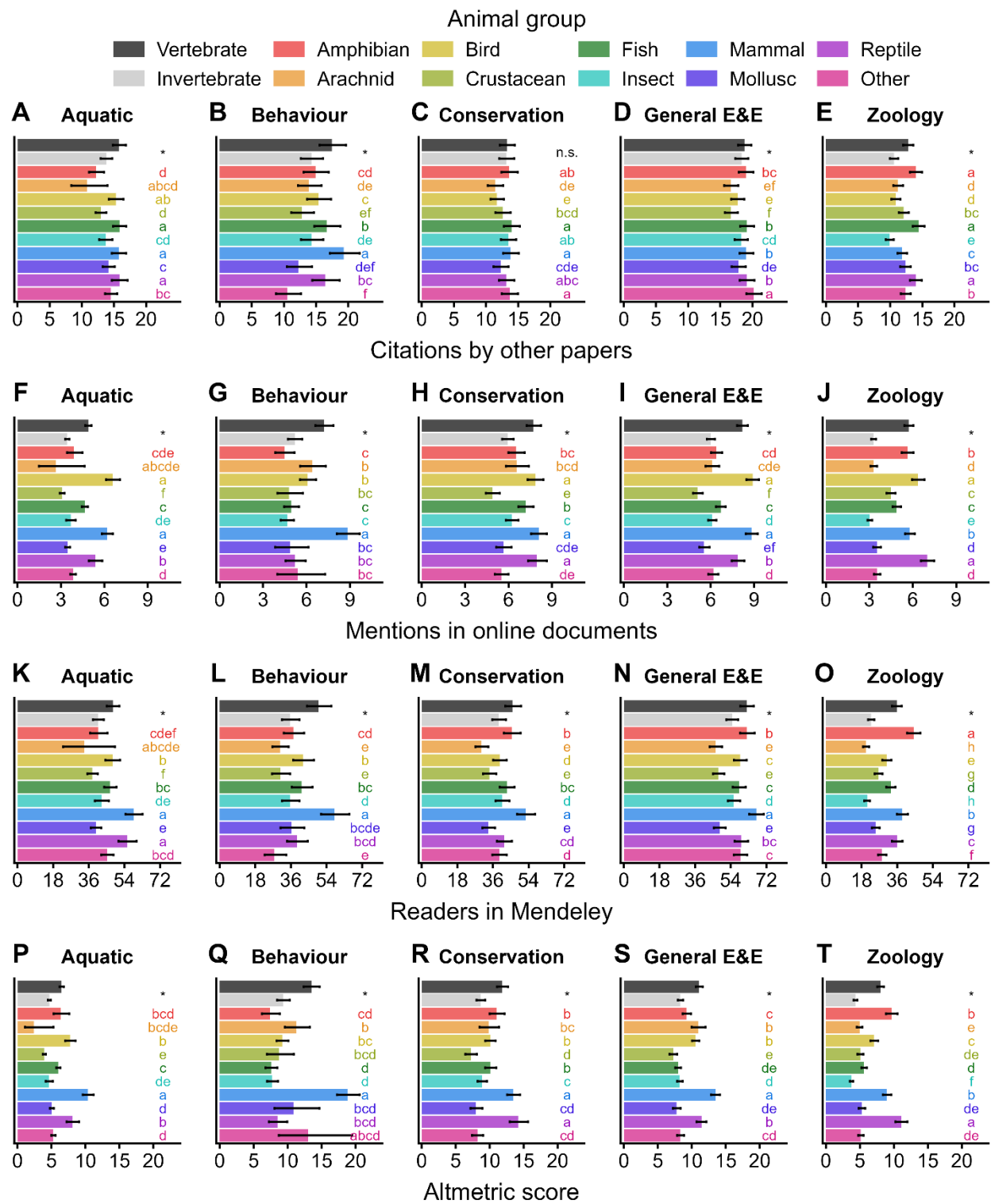
641 50 years (1976-2025). Panels B and C show the mean proportion of papers per journal on distinct

642 numbers of animal taxa investigated collectively over the last five years (2021-2025) by journal
643 impact factor and journal citation indicator, respectively. Panels D and E show the distribution of
644 journal impact factor and journal citation indicator in 2024, respectively.



646

647 **Figure S3. Most popular animal groups within journals.** Bars represent the number of
 648 taxonomically unrestricted journals for which an animal group was the most frequently
 649 investigated. Dots represent the proportion of single-animal-group papers focusing on the most
 650 popular animal group in each journal, while squares represent the mean of these estimates per most
 651 popular animal group, with whiskers encompassing its 95% confidence interval. “Other
 652 invertebrate*” refers to invertebrates other than arachnids, crustaceans, insects, and molluscs.



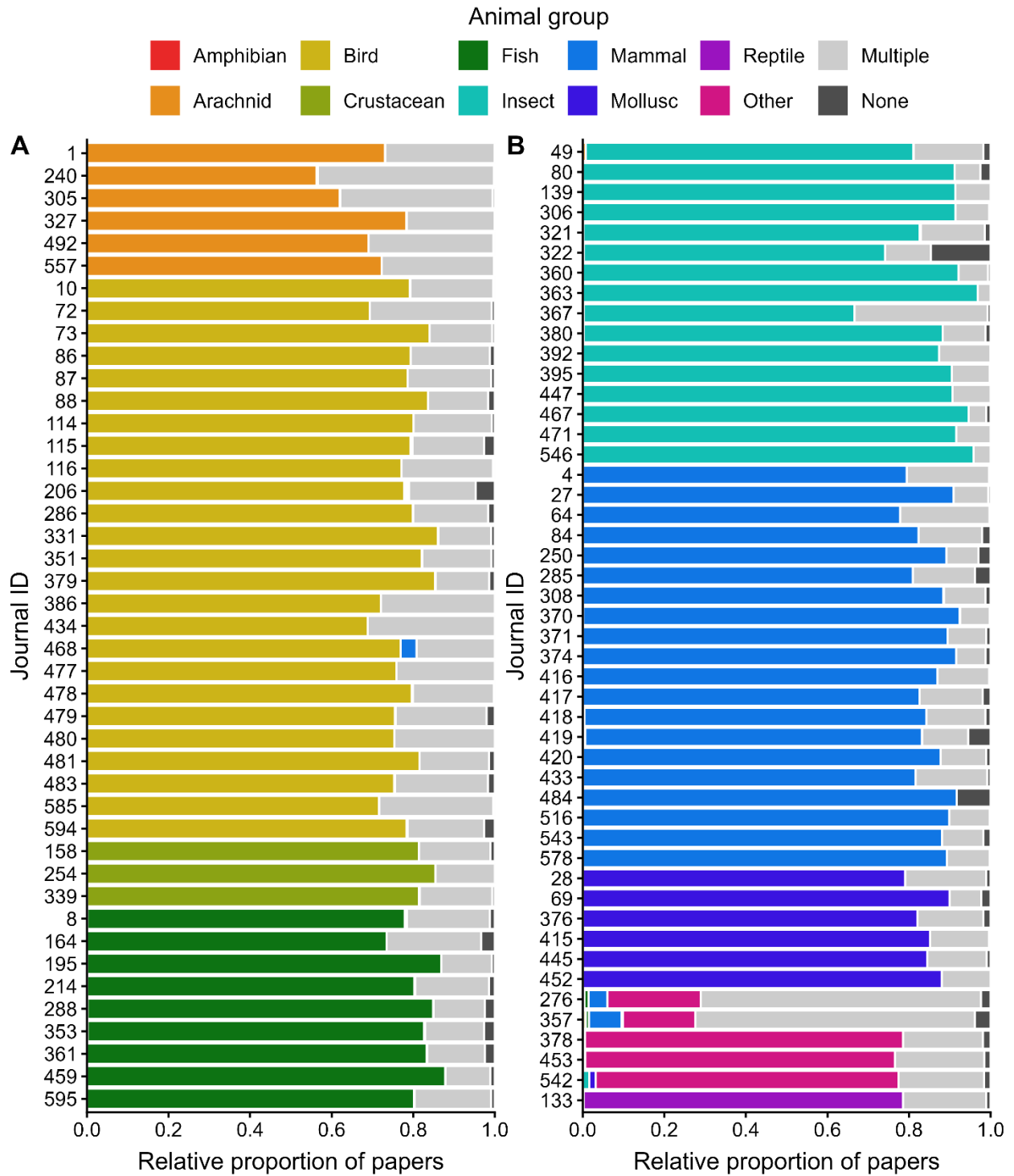
653

654 **Figure S4. Attention metrics for papers on distinct animal groups within journal sets. Distinct**

655 letters represent statistical differences among papers on specific animal groups within each panel

656 (z-values with $p < 0.05$ for all pairwise comparisons), while differences between papers on
657 vertebrates vs. invertebrates are shown with a star.

658

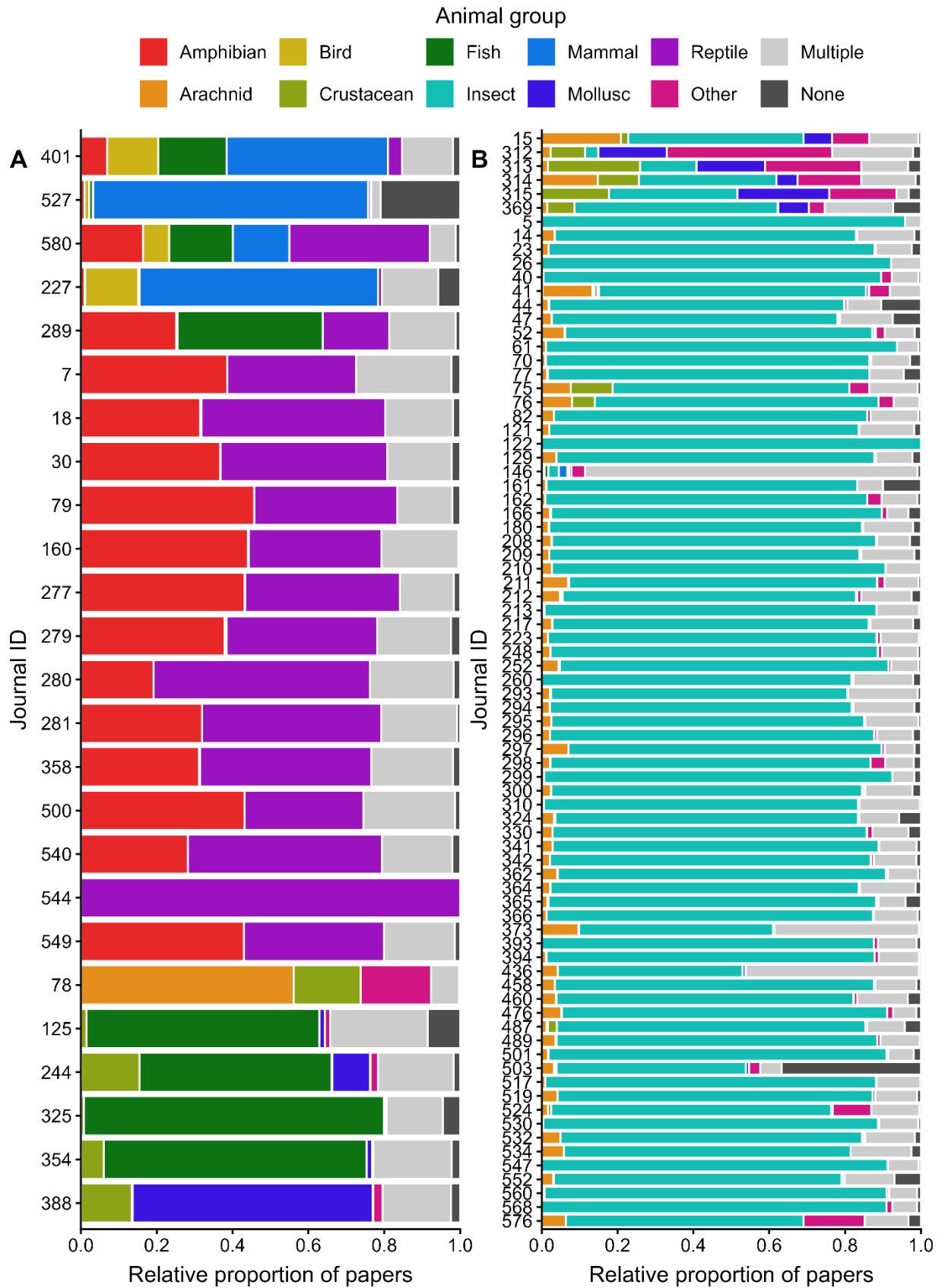


659

660 **Figure S5. Taxonomic focus of papers published in journals specialised in one animal group.**

661 Panel A shows journals specialised in arachnids, birds, crustaceans, or fish, while panel B shows

662 remaining journals.



664 **Figure S6. Taxonomic focus of papers published in journals specialised in multiple animal**

665 **groups.** Panel A shows journals that do not publish research on insects, while panel B shows

666 journals that publish research on insects.

667

668 *Supplementary tables*

669 **Table S1. Examples of how papers were manually classified regarding their taxonomic focus.**

670 Terms in red highlight organisms mentioned in papers.

| Details of specific papers | Focused animal taxa | Number of animal groups identified |
|---|--------------------------|------------------------------------|
| Buchsbaum & Morse (53) compared the behaviour of spiderlings released in the field with those fed in the laboratory with fruit flies. | Arachnids, insects | Two or more |
| Bochkov & O'Connor (54) analysed the phylogeny and host associations of certain mites and murines. | Arachnids, mammals | Two or more |
| Eraud et al. (55) injected sheep red blood cells (SRBC, a common method to represent an immunological challenge) to understand the cost of immune responses on collared doves (<i>Streptopelia decaocto</i>). | Birds, mammals | Two or more |
| Suzuki (56) investigated the production of alarm calls in great tits (<i>Parus major</i>) by exposing their nests to three predator species (snakes, crows, and martens). | Birds, mammals, reptiles | Two or more |
| Tchana et al. (57) assessed the effects of <i>Protocalliphora</i> larvae on the plumage colours of blue tits (<i>Cyanistes caeruleus</i>). | Birds, insects | Two or more |
| Milinski (58) showed that three-spined sticklebacks prefer prey of familiar size by conducting experiments with water fleas (<i>Daphnia magna</i>) of various sizes as prey items. | Crustaceans, Fish | Two or more |
| Coop et al. (59) observed that black bears (<i>Ursus americanus</i>) forage on aggregations of cutworm moths (<i>Euxoa axiliaris</i>). | Insects, mammals | Two or more |
| Cross & Jackson (60) tested problem-solving skills of nine species of jumping spiders, mentioning that one of these species specialises on preying mosquitoes. | Arachnid | One |
| Latta et al. (61) presented evidence of ivory-billed woodpeckers (<i>Campephilus principalis</i>) in Louisiana despite the US Fish and Wildlife Service suggesting that this species was extinct. | Birds | One |
| Mercado et al. (62) explored song copying in humpback whales, mentioning in that song learning in birds is well understood. | Mammals | One |
| Iriarte et al. (63) investigated the diet and behaviours of pumas (<i>Felis concolor</i>), finding that these animals feed from ungulates and compete with jaguars (<i>Panthera onca</i>). | Mammals | One |
| Olson et al. (64) investigated patterns in the transcriptome of a tapeworm species (<i>Hymenolepis microstoma</i>). | Other invertebrate | One |
| García et al. (65) assessed manure (of unmentioned animals) for management strategies. | - | Zero |

671

672

673 **Table S2. Evaluation metrics for the algorithm used in our study to classify the taxonomic**
674 **focus of studies in ecology and evolution.** TP, TN, FP, and FN stand for true positives, true
675 negatives, false positives, and false negatives, respectively.

| Animal group | TP | TN | FP | FN | Total | Accuracy | Precision | Sensitivity | Specificity | F1 score |
|---------------------|-----------|-----------|-----------|-----------|--------------|-----------------|------------------|--------------------|--------------------|-----------------|
| Amphibian | 49 | 1760 | 6 | 0 | 1815 | 0.997 | 0.891 | 1.000 | 0.997 | 0.942 |
| Arachnid | 55 | 1758 | 2 | 0 | 1815 | 0.999 | 0.965 | 1.000 | 0.999 | 0.982 |
| Bird | 194 | 1600 | 21 | 0 | 1815 | 0.988 | 0.902 | 1.000 | 0.987 | 0.949 |
| Crustacean | 107 | 1702 | 4 | 2 | 1815 | 0.997 | 0.964 | 0.982 | 0.998 | 0.973 |
| Fish | 204 | 1583 | 23 | 5 | 1815 | 0.985 | 0.899 | 0.976 | 0.986 | 0.936 |
| Insect | 407 | 1390 | 16 | 2 | 1815 | 0.990 | 0.962 | 0.995 | 0.989 | 0.978 |
| Mammal | 260 | 1505 | 48 | 2 | 1815 | 0.972 | 0.844 | 0.992 | 0.969 | 0.912 |
| Mollusc | 82 | 1730 | 3 | 0 | 1815 | 0.998 | 0.965 | 1.000 | 0.998 | 0.982 |
| Reptile | 62 | 1742 | 8 | 3 | 1815 | 0.994 | 0.886 | 0.954 | 0.995 | 0.919 |
| Other | 126 | 1681 | 6 | 2 | 1815 | 0.996 | 0.955 | 0.984 | 0.996 | 0.969 |

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