A largescale semiautomated approach for assessing documenttype classification errors in bibliometric databases

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A large-scale semi-automated approach for assessing document-type classification errors in bibliometric databases

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Abstract

The accuracy of bibliometric databases in classifying *document types* (DTs)—such as *research articles*, *conference proceedings*, *reviews*, *short notes*, *letters*, *book chapters*, etc.—is crucial for the academic community, as bibliometric indicators may significantly influence research funding, decision-making, and academic reputation. This study presents a semi-automated methodology to assess the accuracy of DT classification in bibliometric databases, such as Scopus and Web of Science (WoS). The methodology can handle large document volumes and adapt to different DT categories without predefined correspondences. The first phase of the methodology automatically identifies discrepancies in DT classifications between Scopus and WoS, in order to find potentially misclassified documents; the second phase involves manually analyzing these documents to confirm and attribute classification errors. The methodology is applied to a sample of several tens of thousands of papers from the teaching staff of two major universities in Turin (Italy). The results show overall error rates of approximately 2.7% for Scopus and 2.3% for WoS. The paper also analyzes the most common types of errors found in both databases, providing an interpretation of these inaccuracies and some insights for possible improvements in the quality of these databases.

Keywords Bibliometric database · Document-type classification · Semi-automated methodology · Database accuracy · Misclassification · Scopus · Web of Science

Introduction

Scientific publications are classified into specific *document types* (DTs)—such as *research articles*, *conference proceedings*, *surveys*, *letters*, *book chapters*, etc.—which describe their nature and primary characteristics (Harzing, 2013; Yeung, 2021). Publishers and bibliometric databases use these categories to organize knowledge and facilitate efficient information retrieval for researchers (Donner, 2017). In addition, the classification into DTs plays a crucial role in research evaluation by differentiating scientific contributions for

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the construction of bibliometric indicators. For instance, DTs that are usually less substantial and relevant, such as *conference proceedings*, *notes* and *letters*, may be excluded from some evaluations. Furthermore, most bibliometric indicators for scientific journals, such as the widely known *impact factor*, are constructed considering the DT of indexed papers (García-Pérez, 2010).

Unfortunately, the DT classification is not always accurate, leading to misclassification of scientific contributions. For example, some common errors include *research articles* misclassified as *reviews*, or *notes*, and *letters* or *conference proceedings* misclassified as *research articles* (Mokhnacheva, 2023; Sigogneau, 2000; Yeung, 2019). These misclassifications often stem from the lack of standardized rules and subjectivity in distinguishing between DTs; the distinction between a *research article*, a *review*, or a *note*, for example, can sometimes be quite subtle. Furthermore, there are often discrepancies in the nomenclature and definitions of DTs between different publishers and databases. These discrepancies become apparent when comparing the official DT lists of the major bibliometric databases, such as Scopus and Web of Science (WoS) (Clarivate, 2024; Elsevier, 2024); see for example Tables 5 and 6 (in Appendix A.1).

The literature on DT-classification errors is relatively limited, forming part of the broader research on errors in bibliometric databases (Donner, 2023; Franceschini et al., 2013, 2015, 2016; García-Pérez, 2010; Moed, 2005; Olensky et al., 2016; Valderrama-Zurián et al., 2015). Some studies indicate that DT-classification errors in Scopus and WoS are relatively significant, amounting to a few percentage points (Yeung, 2021). Other studies explore specific types of DT-classification errors; for instance, Zhu et al. (2024) examine misclassifications of contributions from 160 journals belonging to ten review journal series. *Specialized* databases with smaller and more homogenous collections of indexed documents (e.g., PubMed) are generally associated with lower rates of DT-classification errors compared to *generalist* databases, such as Scopus and WoS, as highlighted by Yeung (2019). The few existing studies on DT misclassification unfortunately have (at least) a couple of limitations: (i) they generally limit the investigation to a few hundred or thousand documents and (ii) they require manual analysis of the entirety of the documents of interest.

This research aims to address the above gaps by proposing a novel methodology that enables the analysis of significantly larger datasets while reducing the reliance on manual review. The proposed approach introduces a novel semi-automated methodology to investigate DT-classification errors on a larger scale. The process begins with the automatic identification of a substantial *corpus* of publications indexed by both Scopus and WoS. A subset of publications with inconsistent DTs is then manually analyzed to identify classification errors and assign responsibility to the respective database. This "adaptive" methodology, which does not require any preliminary correspondence between the DTs used by each database, is hereafter demonstrated through a case study, based on a dataset of several tens of thousands of recently published documents by faculty members affiliated with the two main universities in Turin (Italy): *Politecnico di Torino* and *Università di Torino*. The choice of these two universities—the former being a technical university of engineering and architecture, and the latter being a generalist university—was made in order to have a relatively broad and diversified document base, in terms of variety of DTs, authors, disciplines, publishers, etc. In a nutshell, by comparing the DT classifications of competing databases, the proposed procedure directly identifies potentially misclassified documents for a targeted manual analysis. This approach accepts the "calculated risk" of overlooking the least "suspect" documents, concentrating efforts where discrepancies are most likely to reveal DT-classification errors.

The remainder of this article is divided into three sections. Sect. "Description of the semi-automated methodology" presents the semi-automated methodology, describing the process of selecting a sample of documents and the "adaptive" logic that matches the DTs of the two databases, in order to identify a subset of potentially misclassified documents for manual analysis. The second part of Sect. "Description of the semi-automated methodology" introduces various error statistics and provides an interpretation of the results of the empirical analysis. The concluding section summarises the main findings of the study, discussing the practical implications, limitations and offering suggestions for future research. Finally, the Appendix includes additional material and further insights into the analysis conducted.

Description of the semi-automated methodology

Basic steps

The following pseudo-code summarises the basic steps of the proposed methodology to identify DT-classification errors in a semi-automatic way.

Start

1. Identify a relatively large group of scientific publications. Use specific criteria to identify a relatively large group of source scientific publications (e.g., the scientific output of individual scientists, research groups, institutions, or scientific journals within a certain time window) on which to focus the analysis.
2. Query Scopus and WoS. Conduct separate queries in the Scopus and WoS databases, in accordance with the group of publications in *step (1)*.
3. Determine the "intersection" of publications indexed by both databases. Using suitable unique identifiers (e.g., DOI code, as illustrated later on), identify the subset of publications resulting from the queries in *step (2)*, indexed in both databases. This subset will represent the *corpus* of publications on which to focus the analysis.
4. Determine the DTs for each publication at step (3), according to both Scopus and WoS. For each publication in the *intersection* subset, identify the DTs classified by Scopus and WoS respectively.
5. Construct the "concordance matrix". Create a so-called *concordance matrix* (described later in this section) to compare the DTs assigned by the two databases of interest. Arrange the relevant DTs (in columns for Scopus and in rows for WoS), in order to maximize the amount of (concordant) publications in the diagonal.
6. Analyse publications with discordant DTs. Focus on the scientific publications outside the diagonal of the concordance matrix (cf. *step (5)*), since they include potential DT-classification errors. Proceed as described for the following sub-steps.

6.1 Manual analysis. Manually analyze each discordant publication and identify the most plausible DT for it (i.e., the "true" DT).
6.2 Determine a DT-classification error for Scopus or WoS. Determine which of the two databases is responsible for the (presumed) DT-classification error and record it.
6.3 Return to step (6.1). Continue the manual analysis until all publications with discordant DTs have been analyzed.

7. *Determine error statistics*. Process the results of the analysis and construct database-error statistics. Proceed as described for the following sub-steps.

7.1 Consider each specific database separately and *report the relevant DT-classification errors in a so-called "error table"* (described later in Sect. "Results and discussion").

7.2 Determine different kinds of error statistics, both from the general point of view of a database (*e*) and from the local point of view of a specific DT (covered by the database itself), i.e., calculate the rate of *missing assignments* (*a*) and the rate of *false classifications* (*b*) related to that DT.

7.3 Return to step (7.1). Repeat the calculation of the error statistics for the other database.

End

The rest of this section is organised into four subsections. The first one (2.2) describes the combined querying of the Scopus and WoS databases in order to identify (i) a relevant *corpus* of documents of interest, and then (ii) a relevant subset of potentially misclassified documents, due to possible DT-classification errors. This activity is *automated* and covers *steps (1)* to *(5)* of the pseudocode above. The second subsection (2.3) focuses on the individual analysis of potentially misclassified documents, so as to determine possible DT-classification errors for each of the two databases. This activity is *manual* and comprises *step (6)* and the respective sub-steps of the pseudo-code. The third subsection (2.4) shows and interprets the results obtained from the proposed analysis. The fourth subsection (2.5) concerns the construction and representation of the error statistics for the two databases; these activities, which are *automated*, cover *step (7)* and the respective sub-steps of the pseudo-code.

Data collection

First, it is necessary to identify a relatively large sample of scholarly publications (*step (1)*). For example, let us assume that the governing bodies of the two major universities in Turin (Italy)—i.e., *Politecnico di Torino* and *Università di Torino*—have decided to undertake a campaign to verify the accuracy of the data reported in the Scopus and WoS databases, in anticipation of a forthcoming national evaluation exercise of the scientific output produced from 2019 to 2023 (Franceschini & Maisano, 2017). To this end, this 5-year period by the more than two thousand researchers affiliated with the two universities are considered. Both Scopus and WoS databases are then queried (*step (2)*) to extract data on the publications of interest (e.g., co-author affiliation and issue years). This yields two sets of publications: one returned by Scopus (with about 34 thousand publications) and one returned by WoS (with about 38 thousand publications). The two sets are not identical in size because the corresponding databases differ in terms of source coverage (e.g., one database may index some *journals* or *conference proceedings* that are not necessarily indexed by the other) (Franceschini et al., 2016). The fact that one university (Politecnico di Torino) is *technical* and the other one (Università di Torino) is *generalist* ensures that the documents collected are relatively varied in terms of subjects, DTs, journals and publishers, thus representing a relatively comprehensive sample of recent scientific literature.

Unsurprisingly, over 90% of the collected documents belong to only three specific DTs for both databases (i.e., *articles*, *reviews*, and *proceedings/conference papers*). Besides, there are several other DTs with only a few dozen or at most hundreds of associated documents. Notably, the number of DTs in WoS is greater than those in Scopus, as will be shown below. This aspect is consistent with the official DT lists of the two databases (see Tables 5 and 6 in Appendix A.1). It is also noteworthy that, unlike Scopus—at least in relation to the group of documents considered—WoS permits multiple classifications for a significant portion of documents (approximately 25%), often applying two DT categories simultaneously (e.g., *article + data paper*, *review + book chapter*, etc.). For simplicity, DTs in WoS with multiple classifications were excluded from the analysis. Future research will return to these documents, focusing on the practical implications, *pros* and *cons* of this multiple-classification policy by WoS (Haupka et al., 2024).

The "intersection" (*step (3)*) of documents common to Scopus and WoS can then be determined using the relevant *digital object identifier* (or DOI code); therefore, documents without a DOI code are excluded from the analysis. Interestingly, some DTs in the official lists (cf. Tables 5 and 6, in Appendix A.1) do not appear among the DTs in the "intersection", probably due to their relatively high level of specialisation (e.g., *art and literature*, *meeting* DTs for WoS). To simplify the analysis and avoid potential ambiguities, *articles in press*, *monographs*, and *book chapters* were also excluded. The resulting intersection subset consists of 27,734 total documents, which were classified by each database into the corresponding DTs, as shown in Table 1.

The DT labels of the two databases often coincide, albeit with minor differences (e.g., *conference paper* for Scopus and *proceedings paper* for WoS, or *erratum* for Scopus and *correction* for WoS). Shifting the focus to other more specialised DTs, however, the differences between the two databases would be more pronounced. For example, one can observe DTs covered by one database but not the other, such as *biographical item*, *book review*, *expression of concern* and *meeting abstract* for WoS but not for Scopus (Clarivate, 2024; Elsevier, 2024).

The amounts of documents classified in the six most frequent DTs in the two databases (see Table 1) are generally close, although the differences indicate possible discrepancies in the classification of the DTs, as better evidenced in the so-called *concordance matrix*. This matrix (exemplified in Table 2) is nothing more than a contingency table showing in columns the DTs assigned by Scopus and in rows the DTs assigned by WoS for the *corpus* of publications of interest. The rows and columns are sorted in such a way that the relevant totals are both sorted in descending order. In this way the matrix is *diagonalized*, that is, with most of the documents placed on the main diagonal.[1] At the same time, this sort of diagonalization establishes an empirical correspondence between the DTs covered by one and the other database. This correspondence can be called "adaptive" in that it does not require any a priori link between Scopus and WoS DTs (Owen, 2001). In other words, among the possible permutations between Scopus and WoS DTs, the proposed diagonalization is the one that ensures the highest degree of concordance.

In order to simplify the concordance matrix, the least frequent DTs with reference to the dataset considered—i.e., conventionally defined as having fewer than 30 occurrences in Table 1—have been grouped into specific "*least frequent DTs*" macro-categories for both databases. Table 7 (in Appendix A.2) contains the *complete* concordance matrix, showing the detailed breakdown of the "*least frequent DTs*" for both databases.

[1] The authors are aware of the slight forcing in referring to the "main diagonal" of the matrix, in the sense of the "locus of elements with a row number equal to the column number", since the *concordance matrix* is not necessarily square but rectangular. E.g., in the present case, the number of columns is greater than the number of rows.

Table 1 Summary of DTs classified by Scopus and WoS with reference to the "intersection" of (27,734) publications and corresponding number of documents

DTs classified by Scopus		DTs classified by WoS	
Article	21,928	Article	21,868
Review	2,508	Review	2491
Conference paper	1,817	Proceedings paper	1812
Editorial	561	Editorial material	905
Letter	365	Letter	386
Erratum	236	Correction	233
Note	221	News item	24
Book chapter	60	Biographical item	6
Short survey	35	Retraction	3
Data paper	2	Book review	2
Retracted	1	Expression of concern	1
		Fiction, creative prose	1
		Meeting abstract	1
		Poetry	1
Total documents	27,734	Total documents	27,734

The DTs in each database are sorted in descending order according to the number of documents that they include

In general, off-diagonal elements of the concordance matrix indicate discordant classifications of DTs, denoting potential DT-classification errors by (at least) one database. For this reason, they can be classified as "discordant". The manual analysis described in Sect. "Manual analysis of potentially misclassified documents" focuses exclusively on these documents, based on the implicit assumption that concordant DT-classifications across competing databases are inherently correct. However, this assumption does not always hold true, particularly when DT-classifications are concordant but still incorrect in both databases. For instance, Zhu et al. (2024) observed cases where *reviews* were concurrently misclassified as research *articles* by both Scopus and WoS, under specific circumstances. To address this issue, confirming the relatively low occurrence of such misclassifications, a sample analysis of the concordant documents was conducted, as detailed in Sect. "Manual analysis of potentially misclassified documents".

Manual analysis of potentially misclassified documents

A manual analysis of each of the discordant publications (i.e., off-diagonal elements of the concordance matrix) is conducted using all available information, such as abstract, data on the publisher's website, full text, and more. The goal of this analysis is to identify the "true" DT and, consequently, to detect possible DT-classification errors within the databases. A sequential approach was adopted, whereby for each publication to be manually classified, a series of information sources were progressively examined based on the level of uncertainty. The following list outlines these sources in increasing depth of analysis:

1. Document's title and abstract.
2. Information and metadata available on the corresponding journal's and/or publisher's webpage.

Table 2 *Concordance matrix* related to data collected for the case study

DT classifications → ↓		by Scopus										
		Article	Review	Conf. paper	Editorial	Letter	Erratum	Note	Book chapter	Short survey	Least freq. DTs	Row total
by WoS	Article	(21,418)	297	71	14	14	–	39	5	7	3	**21,868**
	Review	323	(2,146)	2	–	1	–	1	–	18	–	**2491**
	Proceedings paper	19	–	(1,737)	1	–	–	–	55	–	–	**1812**
	Editorial material	124	62	6	(545)	8	1	149	–	10	–	**905**
	Letter	33	2	–	1	(342)	–	8	–	–	–	**386**
	Correction	2	–	–	–	–	(231)	–	–	–	–	**233**
	Least freq. DTs	9	1	1	–	–	4	24	–	–	–	**39**
	Column total	**21,928**	**2,508**	**1,817**	**561**	**365**	**236**	**221**	**60**	**35**	**3**	**27,734**

While the elements in the diagonal (in round brackets) denote DT classifications that are concordant between competing databases, those off-diagonal denote potential DT-classification errors. Documents corresponding to the latter elements will be manually analysed. In bold are column (Scopus) and row (WoS) totals

3. If applicable, querying other specialized databases (e.g., PubMed for medical research or IEEE Xplore for electrical and electronic engineering works).
4. Analyzing the formal structure of the document, which typically varies according to the DT.
5. Assessing the number of references in the document (e.g., *reviews* often have a high citation count, while *notes* or *letters* tend to have fewer citations).
6. Full text of the document.

In addition to discordant publications, a manual review was also conducted on a few dozen documents falling under Scopus and WoS's "*least frequent DTs*" macro-categories (see Table 2). Figure 1 exemplifies the heading of a document classified by Scopus as a *conference paper* and by WoS as an *article*. Manual analysis revealed that the "true" DT is *article*, since the document is a (complete) research contribution unrelated to any conference. The DT-classification error is therefore attributed to Scopus in this case.

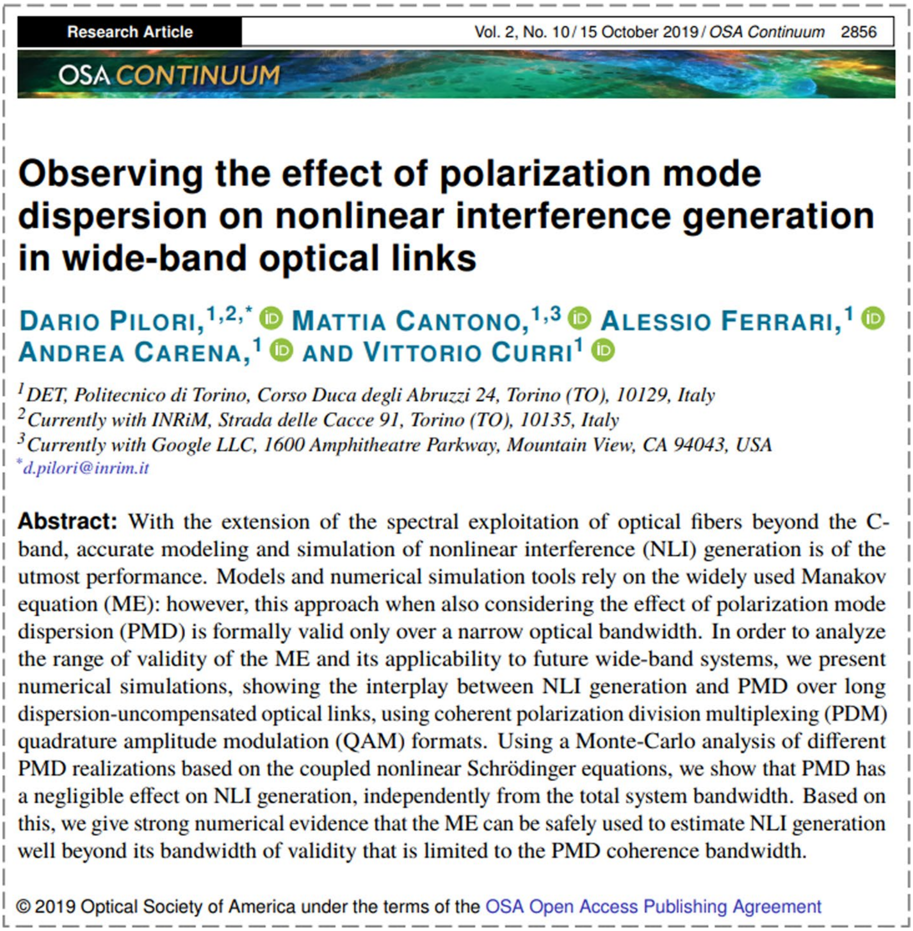
Very rarely, simultaneous errors of both databases can be observed. As an example, let us consider the document in Fig. 2, classified by Scopus as a *note* and by WoS as an *article*. Manual analysis found that this document is in fact a *letter*, resulting in an error for both databases. Probably the Scopus classification error (i.e., *note* instead of *letter*) stems from the fact that this *letter* has been considered as a discussion or commentary by the database. However, according to the official definitions (cf. Table 5 in Appendix A.1), it qualifies as a *letter* (to the editor) as its incipit is "*Dear Editor*, …". On the other hand, the document has not the structure and characteristics to be considered as an *article*, as the WoS classification mistakenly suggest (i.e., *article* instead of *letter*).

For the diagonal elements of the concordance matrix (in round brackets), the DT classifications in both databases are assumed to be correct, given the general agreement between the counterpart databases. To test the plausibility of this assumption, a sampling of 1% of these (concordant) documents (i.e., $1\% \cdot 26{,}419 \approx 264$ documents) was conducted, without detecting any DT-classification error. This confirms the validity of the hypothesis that concordant DT classifications are unlikely to be erroneous, in line with the concepts of *convergent validity* and *wisdom of crowds* (Franceschini et al., 2022).

From a statistical perspective, the probability of DT-classification errors for a certain concordant document can be conceptualized as a *conditional probability* (Ross, 2017): it requires that (i) both databases independently misclassify the same document and (ii) they both assign the same erroneous DT classification. This joint occurrence is inherently very unlikely, which (at least partially) explains the absence of DT-classification errors in the aforementioned sample check. Nevertheless, the authors acknowledge that the scientific literature reports cases where competing databases made simultaneous and coincident DT-classification errors (Zhu et al., 2024). For this reason, this aspect will be further investigated in future research through quantitative studies, to better understand its occurrence and implications.

Results and discussion

Having completed the manual analysis of the subset of potentially misclassified documents (cf. s*tep (6)* and relevant sub-steps), the DT-classification errors assigned to each database can be summarized in an *error table*, i.e., a contingency table reporting the DT classifications made by the database of interest, in the columns, and the "true" (or correct) DTs resulting from the manual analysis, in the rows. The main diagonal of the error table



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OSA CONTINUUM

Observing the effect of polarization mode dispersion on nonlinear interference generation in wide-band optical links

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Abstract: With the extension of the spectral exploitation of optical fibers beyond the C-band, accurate modeling and simulation of nonlinear interference (NLI) generation is of the utmost performance. Models and numerical simulation tools rely on the widely used Manakov equation (ME): however, this approach when also considering the effect of polarization mode dispersion (PMD) is formally valid only over a narrow optical bandwidth. In order to analyze the range of validity of the ME and its applicability to future wide-band systems, we present numerical simulations, showing the interplay between NLI generation and PMD over long dispersion-uncompensated optical links, using coherent polarization division multiplexing (PDM) quadrature amplitude modulation (QAM) formats. Using a Monte-Carlo analysis of different PMD realizations based on the coupled nonlinear Schrödinger equations, we show that PMD has a negligible effect on NLI generation, independently from the total system bandwidth. Based on this, we give strong numerical evidence that the ME can be safely used to estimate NLI generation well beyond its bandwidth of validity that is limited to the PMD coherence bandwidth.

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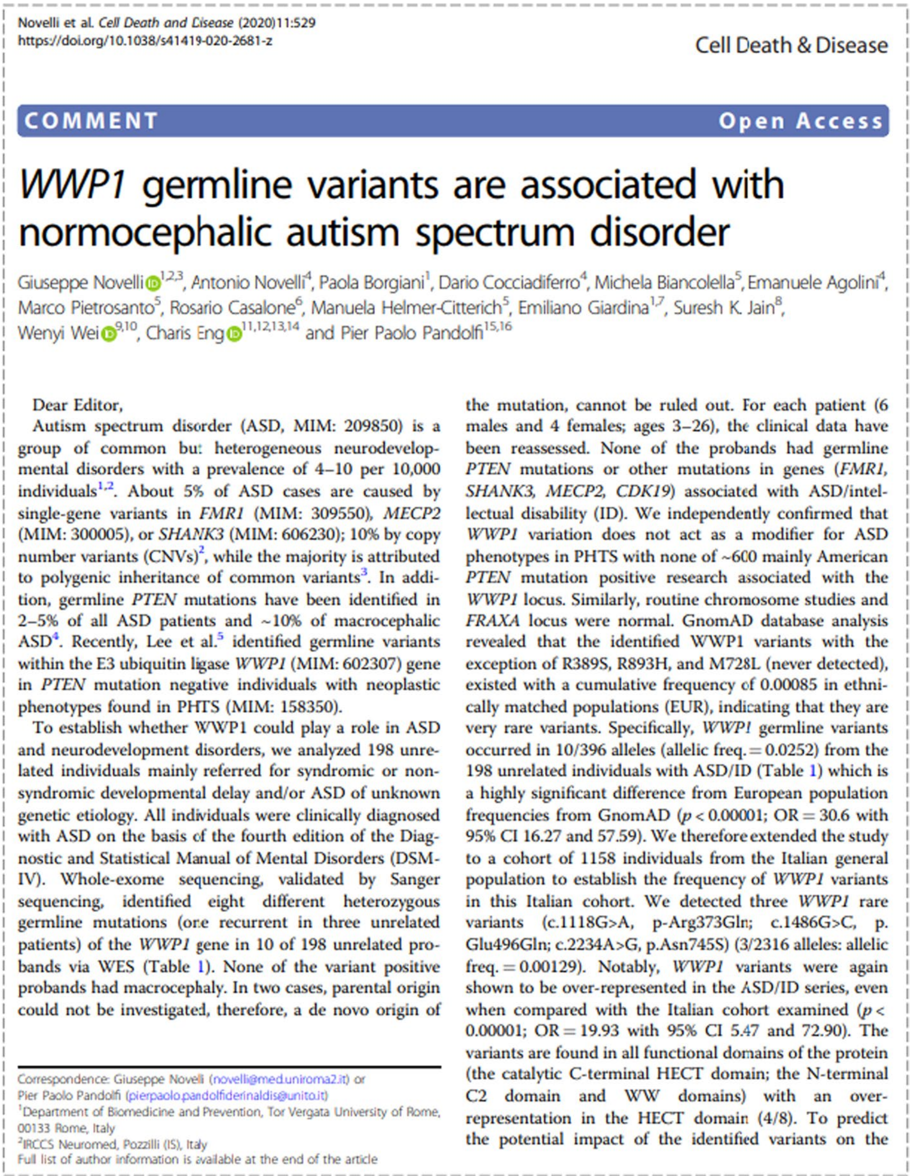
Fig. 1 Example of document misclassified by Scopus as a conference paper instead of an article (https://doi.org/10.1364/OSAC.2.002856)

contains the correct DT classifications while the off-diagonal elements correspond to the incorrect DT classifications. Tables 3 and 4 show the error tables related to Scopus and WoS, with reference to the case study. Consistent with what was done for the concordance matrix (cf. Sect. "Manual analysis of potentially misclassified documents"), the DTs with low occurrences were grouped into the macro-category "*least frequent DTs*" (for both Scopus and WoS in each error table).[2]

Keeping the focus on the Scopus error table, a significant number of documents mistakenly classified in the DTs *article* and *review*, can be immediately noticed: precisely,

[2] The *complete* error tables in Tables 8 and 9 (in Appendix A.2) provide a breakdown of these DTs. These tables contain more DTs than those listed in Table 2 because, during the manual analysis of each potentially misclassified document, the most likely correct DT was identified by selecting from the list of DTs considered by each database. As a result, in some cases, the correct DT may be a "new entry" compared to the initial ones inTable 2. For instance, this occurs with *books* misclassified as *reviews* by Scopus (see Table 8).



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Cell Death & Disease

COMMENT Open Access

WWP1 germline variants are associated with normocephalic autism spectrum disorder

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Dear Editor,

Autism spectrum disorder (ASD, MIM: 209850) is a group of common but heterogeneous neurodevelopmental disorders with a prevalence of 4–10 per 10,000 individuals[1,2]. About 5% of ASD cases are caused by single-gene variants in *FMR1* (MIM: 309550), *MECP2* (MIM: 300005), or *SHANK3* (MIM: 606230); 10% by copy number variants (CNVs)[2], while the majority is attributed to polygenic inheritance of common variants[3]. In addition, germline *PTEN* mutations have been identified in 2–5% of all ASD patients and ~10% of macrocephalic ASD[4]. Recently, Lee et al.[5] identified germline variants within the E3 ubiquitin ligase *WWP1* (MIM: 602307) gene in *PTEN* mutation negative individuals with neoplastic phenotypes found in PHTS (MIM: 158350).

To establish whether WWP1 could play a role in ASD and neurodevelopment disorders, we analyzed 198 unrelated individuals mainly referred for syndromic or non-syndromic developmental delay and/or ASD of unknown genetic etiology. All individuals were clinically diagnosed with ASD on the basis of the fourth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV). Whole-exome sequencing, validated by Sanger sequencing, identified eight different heterozygous germline mutations (one recurrent in three unrelated patients) of the *WWP1* gene in 10 of 198 unrelated probands via WES (Table 1). None of the variant positive probands had macrocephaly. In two cases, parental origin could not be investigated, therefore, a de novo origin of the mutation, cannot be ruled out. For each patient (6 males and 4 females; ages 3–26), the clinical data have been reassessed. None of the probands had germline *PTEN* mutations or other mutations in genes (*FMR1, SHANK3, MECP2, CDK19*) associated with ASD/intellectual disability (ID). We independently confirmed that *WWP1* variation does not act as a modifier for ASD phenotypes in PHTS with none of ~600 mainly American *PTEN* mutation positive research associated with the *WWP1* locus. Similarly, routine chromosome studies and *FRAXA* locus were normal. GnomAD database analysis revealed that the identified WWP1 variants with the exception of R389S, R893H, and M728L (never detected), existed with a cumulative frequency of 0.00085 in ethnically matched populations (EUR), indicating that they are very rare variants. Specifically, *WWP1* germline variants occurred in 10/396 alleles (allelic freq. = 0.0252) from the 198 unrelated individuals with ASD/ID (Table 1) which is a highly significant difference from European population frequencies from GnomAD ($p < 0.00001$; OR = 30.6 with 95% CI 16.27 and 57.59). We therefore extended the study to a cohort of 1158 individuals from the Italian general population to establish the frequency of *WWP1* variants in this Italian cohort. We detected three *WWP1* rare variants (c.1118G>A, p-Arg373Gln; c.1486G>C, p. Glu496Gln; c.2234A>G, p.Asn745S) (3/2316 alleles: allelic freq. = 0.00129). Notably, *WWP1* variants were again shown to be over-represented in the ASD/ID series, even when compared with the Italian cohort examined ($p < 0.00001$; OR = 19.93 with 95% CI 5.47 and 72.90). The variants are found in all functional domains of the protein (the catalytic C-terminal HECT domain; the N-terminal C2 domain and WW domains) with an over-representation in the HECT domain (4/8). To predict the potential impact of the identified variants on the

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Fig. 2 Example of a paper incorrectly classified by Scopus as a note and by WoS as an article, instead of a letter (https://doi.org/10.1038/s41419-020-2681-z)

217 documents erroneously classified as *articles* that were corrected to *reviews* and 102 documents erroneously classified as *reviews* that were corrected to *articles*. The prevalence of these DT-classification errors is unsurprising, given the sometimes relatively blurred boundary between the two DTs, confirming the findings of previous studies (Donner, 2023; Haupka et al., 2024). Additionally, over a hundred *editorial* documents were erroneously classified by Scopus as *articles* (55), *reviews* (56), *conference papers* (1), *letters* (3), *notes*

Table 3 Example of *error table* for Scopus. Error statistics (see Eqs. 1, 2, and 3) are bolded

		DT classification by Scopus										Row total	$\alpha_{Scopus,DT}$
		Article	Review	Conf. paper	Editorial	Letter	Erratum	Note	Book chapter	Short survey	Least freq. DTs		
"True" DT classifications	Article	(21,523)	102	53	1	–	–	7	5	2	–	21,693	**0.8%**
	Review	217	(2,335)	–	–	–	–	3	–	1	–	2,556	**8.7%**
	Conf. paper	22	5	(1,763)	1	–	–	–	47	–	–	1,838	**4.1%**
	Editorial	55	56	1	(557)	3	–	12	–	8	–	692	**19.5%**
	Letter	32	2	–	1	(362)	–	9	–	–	–	406	**10.8%**
	Erratum	2	–	–	–	–	(232)	–	–	–	–	234	**0.9%**
	Note	68	4	–	1	–	–	(188)	–	3	–	264	**28.8%**
	Book chapter	1	–	–	–	–	–	–	(8)	–	–	9	**11.1%**
	Short survey	2	–	–	–	–	–	–	–	(21)	–	23	**8.7%**
	Least freq. DTs	6	4	–	–	–	4	2	–	3	3	19	**–**
	Column total	21,928	2,508	1,817	561	365	236	221	60	35	3	27,734	
	$\beta_{Scopus,DT}$	**1.8%**	**6.9%**	**3.0%**	**0.7%**	**0.8%**	**1.7%**	**14.9%**	**86.7%**	**40.0%**	**–**		$\varepsilon_{\mathbf{Scopus}} \cong 2.7\%$

For DTs within the "*least frequent DTs*" family, error statistics were not calculated due to the small document base. The diagonal elements indicating correctly classified documents are marked with round brackets

Table 4 Example of *error table* for WoS. Error statistics (see Eqs. 1, 2, and 3) are bolded

		DT classification by WoS							Row total	$\alpha_{WoS,DT}$
		Article	Review	Proc. paper	Editorial material	Letter	Correction	Least freq. DTs		
"True" DT classifications	Article	(21,597)	74	–	17	3	–	2	21,693	**0.44%**
	Review	178	(2,371)	–	6	–	–	–	2555	**7.20%**
	Proc. paper	17	3	(1,804)	5	–	–	1	1830	**1.42%**
	Editorial material	18	1	–	(686)	–	–	–	705	**2.70%**
	Letter	16	1	–	7	(382)	–	–	406	**5.91%**
	Correction	–	–	–	1	–	(233)	–	234	**0.43%**
	Least freq. DTs	42	41	8	183	1	–	36	311	**–**
	Column total	21,868	2,491	1,812	905	386	233	39	27,734	
	$\beta_{WoS,DT}$	**1.2%**	**4.8%**	**0.4%**	**24.2%**	**1.0%**	**0.0%**	**–**		$\boldsymbol{\varepsilon}_{\mathbf{WoS}} \cong 2.3\%$

For DTs within the "*least frequent DTs*" family, error statistics were not calculated due to the small document base. The diagonal elements indicating correctly classified documents are marked with round brackets

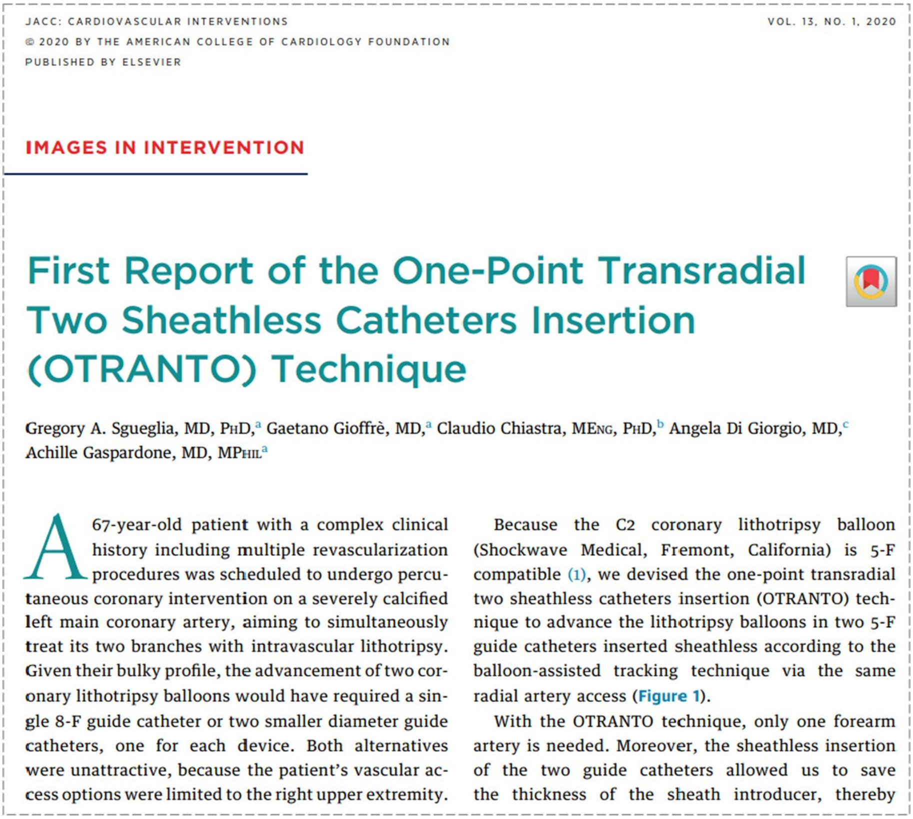
(12), and *short surveys* (8). The somewhat vague definition of *editorial* provided by Scopus (see Table 5) likely contributes to the ambiguities and inconsistencies in DT classification, especially when compared to similar classifications by journals and publishers. Furthermore, a certain number of *notes* were not recognized and mostly misclassified as *articles* (68). This could be favored, not only by the not very precise definition of a *note* according to Scopus, as a "catch-all" category (i.e., "*short items not readily suited to other item types*", cf. Table 5), but also by the diverse "sub-categories" which are listed under the *article* DT (e.g., *case reports*, *technical* and *research notes* and *short communication*, cf. definition in Table 5). These sub-categories are not always accurately reflected by the Scopus database, potentially leading to classification inaccuracies and inconsistencies (see detailed discussion in Appendix A.3.1).

Similar considerations apply to the WoS (complete) error table (see Table 4). Here, too, some new DTs compared to those initially recorded in Table 1 — such as *book* and *book chapter*—appear in the lower rows of the error table. Moreover, a significant number of *articles* erroneously classified as *reviews* (74) and vice versa (178) can be observed, although slightly less pronounced than in Scopus. Several documents were also mistakenly classified as *articles*, but were actually *proceedings papers* (17), *editorial materials* (18), *letters* (16), or other *least frequent DTs* (42). Looking at the complete error table by WoS (in Table 9, in Appendix A.2), the DT *note*, in the lowest row, immediately stands out in terms of the number of missing assignments, reporting several documents misclassified by WoS into other categories, such as *articles* (34), *reviews* (41), *proceedings papers* (8), *editorial materials* (181), and *news items* (23). For example, Fig. 3 exemplifies a publication in the field of surgery, containing a brief report of a clinical case with some images in intervention. This contribution certainly lacks the consistency to be considered a (research) *article* and is in fact classified by the journal as *images in intervention*. This publication is misclassified by Scopus as an *article* and by WoS as an *editorial material*, whereas manual analysis indicated that the most plausible DT would be *note*. As WoS does not include the *note* DT, despite its perceived relevance, its inclusion in the complete error table was "forced"[3] (Clarivate, 2024; Elsevier, 2024). Furthermore, it was noted that Scopus sometimes classifies *case reports* as *articles* (see also Appendix A.3.1), although this policy does not always comply with its own DT-classification rules (cf. Table 5). On the other hand, WoS sometimes classifies *case reports* as *reviews*, even though, according to the official definition, they should be *articles* (Clarivate, 2024), resulting in systematic misclassifications.

Again, the relatively large number of *editorial materials* misclassified by WoS is probably due to WoS's choice not to include the *notes* DT, despite the fact that it is recognized by journals, publishers, and other bibliometric databases. This omission results in the misclassification of many "true" *notes* as *editorial-materials*. It is plausible to assert that this error stems from an incomplete or ambiguous definition of DTs within the WoS database (see Table 6, in Appendix A.1).

Appendix A.3 contains further analysis, pointing out that the classification of certain DTs is more susceptible to errors and inconsistencies compared to others, and that questionable DT classifications are often triggered by incomplete or questionable DT definitions by the databases themselves.

[3] In fact, the DT *note* is not covered by the current official definitions by WoS (cf. Table 6), although it had been previously but later withdrawn (Clarivate, 2024).



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IMAGES IN INTERVENTION

First Report of the One-Point Transradial Two Sheathless Catheters Insertion (OTRANTO) Technique

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A 67-year-old patient with a complex clinical history including multiple revascularization procedures was scheduled to undergo percutaneous coronary intervention on a severely calcified left main coronary artery, aiming to simultaneously treat its two branches with intravascular lithotripsy. Given their bulky profile, the advancement of two coronary lithotripsy balloons would have required a single 8-F guide catheter or two smaller diameter guide catheters, one for each device. Both alternatives were unattractive, because the patient's vascular access options were limited to the right upper extremity.

Because the C2 coronary lithotripsy balloon (Shockwave Medical, Fremont, California) is 5-F compatible (1), we devised the one-point transradial two sheathless catheters insertion (OTRANTO) technique to advance the lithotripsy balloons in two 5-F guide catheters inserted sheathless according to the balloon-assisted tracking technique via the same radial artery access (Figure 1).

With the OTRANTO technique, only one forearm artery is needed. Moreover, the sheathless insertion of the two guide catheters allowed us to save the thickness of the sheath introducer, thereby

Fig. 3 Example of a document incorrectly classified by Scopus as an article and by WoS as an editorial material (https://doi.org/10.1016/j.jcin.2019.09.004). The document is actually defined by the publisher (Elsevier) as images in intervention. Manual analysis revealed that the most plausible DT for Scopus would be note and for WoS would be article or note (Clarivate, 2024; Elsevier, 2024)

Data-error statistics

This subsection introduces some quantitative indicators depicting database errors. An overall indicator of the DT-classification errors by a specific database (ε) can be expressed by the ratio of the total number of off-diagonal elements (i.e., depicting erroneous DT classifications resulting from the manual analysis) to all elements in the *error table* (i.e., the total number of DT classifications):

$$\varepsilon = \frac{\sum_{\forall(i,j)|i \neq j} d_{(i,j)}}{\sum_{\forall(i,j)} d_{(i,j)}}, \tag{1}$$

where $d_{(i,j)}$ is the number of documents reported in the i-th row and j-th column of the error table, for the database of interest. The ε values resulting from the analysis, also shown in the lower right vertex of the error tables, are 2.7% for Scopus and 2.3% for WoS.

Although aware that these results are difficult to generalize as they relate to a specific *corpus* of documents, it is interesting to note some general trends. First, the ε values are very close for the two databases, denoting a slightly higher error rate for Scopus with respect to WoS. In both cases, the most frequent DT-classification errors involve *reviews* misclassified as *articles* and vice versa. *Letters* misclassified as *articles* are also fairly frequent for both databases. In addition, while Scopus has erroneously categorized some *articles* as *conference papers*, WoS did not incur in this error.

Next, two other more detailed database-error statistics can be constructed from the perspective of a specific DT. In this regard, a *null hypothesis* (H_0) is defined as: "*The DT assigned by the database in use is correct*". Next, two DT-related error types are defined, as described below.

1. The *Type-I error* corresponds to the probability of wrongly rejecting H_0 when it is true, i.e. the probability of a document belonging to a specific DT being wrongly classified into another DT (i.e., *missing assignment to the DT of interest*):

$$\alpha_{DT} = \frac{\sum_{\forall(DT,j)|j\neq DT} d_{(DT,j)}}{\sum_{\forall(DT,j)} d_{(DT,j)}}. \tag{2}$$

DT being the DT of interest for the database in use. α_{DT} is calculated on a row-by-row basis by means of the ratio of misclassifications (i.e., missing assignment to the DT of interest) to the row total. This indicator can be interpreted—with reference to a specific row of the error table—as the ratio of the sum of the numerical values outside the parentheses to the row total (in the rightmost column); e.g., referring to the Scopus error table (in Table 3), $\alpha_{Article} = \frac{102+53+1+7+5+2}{21{,}693} \approx 0.8\%$.

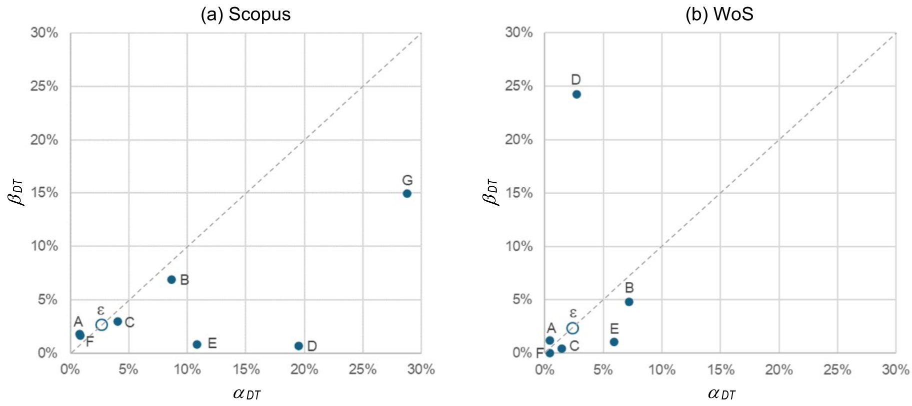
2. The *Type-II error* corresponds to the probability of failing to reject H_0 when it is false, i.e., the probability of misclassifying a document into a specific DT of interest (i.e., *false classification into the DT of interest*):

$$\beta_{DT} = \frac{\sum_{\forall(i,DT)|i\neq DT} d_{(i,DT)}}{\sum_{\forall(i,DT)} d_{(i,DT)}}, \tag{3}$$

$\beta_{db,DT}$ is calculated on a column-by-column basis by means of the ratio of misclassifications (i.e., false classifications into the DT of interest) to the column total. This indicator can be interpreted—with reference to a specific column—as the ratio of the sum of the numerical values outside the parentheses to the column total (in the bottom row); e.g., referring to the Scopus error table (in Table 3), $\beta_{Article} = \frac{217+22+55+32+2+68+1+2+6}{21{,}928} \approx 1.8\%$.

Interestingly, the same element ($d_{(i,j)}$) in the error table contributes to both types of error. With reference to the case study, the values of α_{DT} and β_{DT} are reported respectively in the right and lower parts of the corresponding error tables. To avoid misleading results due to very small sample sizes, the calculation of the α_{DT} and β_{DT} indicators was not performed for the DTs grouped into the macro-category "*least frequent DTs*" (by Scopus or WoS). Appendix A.4 provides further insights to better understand the meaning of the α_{DT} and β_{DT} indicators and introduces additional data-error statistics.

Returning to the Scopus error table (in Table 3), we note that among the DTs with the highest frequency of documents, there is simultaneously a relatively high β_{DT} rate of false classifications (6.9%) and α_{DT} rate of missing assignments (8.7%) for the *review* category. Furthermore, the errors/anomalies documented in Sect. "Results and discussion" significantly increase the indicators of some specific DTs. For example, let us consider (i) the α_{DT} values of 19.5% for *editorial*, 28.8% for *note*, and 11.1% for *book chapter*, and (ii) the β_{DT} values of 14.9% for *note*, 86.7% for *book chapter*, and 40.0% for *short survey*. These



Scopus DT	α_{DT}	β_{DT}
A - *Article*	0.8%	1.8%
B - *Review*	8.6%	6.9%
C - *Conf. paper*	4.1%	3.0%
D - *Editorial*	19.5%	0.7%
E - *Letter*	10.8%	0.8%
F - *Erratum*	0.9%	1.7%
G - *Note*	28.8%	14.9%
H - *Book chapter*	11.1%	86.7%
I - *Short survey*	8.7%	40.0%
ε = 2.7%		

WoS DT	α_{DT}	β_{DT}
A - *Article*	0.4%	1.2%
B - *Review*	7.2%	4.8%
C - *Proc. paper*	1.4%	0.4%
D - *Editorial material*	2.7%	24.2%
E - *Letter*	5.9%	1.0%
F - *Correction*	0.4%	0.0%
ε = 2.3%		

Fig. 4 Maps of the error statistics for **a** Scopus and **b** WoS

specific statistics should be considered with extreme caution, given the relatively small base of documents on which they are calculated (no more than a few hundred for each DT).

Regarding the WoS error table (in Table 4), similar considerations apply. The relatively high percentage of missing assignments to the *editorial* category stands out: $\beta_{Editorial} \approx 24.2\%$. Regarding the other WoS statistics, generally lower values are observed compared to Scopus. Considering the complete error table (see Table 9, in Appendix A.2), it can be seen that the *note* DT—introduced forcibly by the authors despite its recent removal from the DTs officially covered by WoS (Clarivate, 2024)—appears to be the most plausible DT for 288 misclassified elements, of which as many as 181 were misclassified as *editorial materials*, as shown in the last row of the WoS error table. The rationale for forcing the reintroduction of the *note* DT in our manual analysis is that (i) it was previously included and later withdrawn by WoS (Clarivate, 2024), (ii) it is still recognized by Scopus (Elsevier, 2024), and (iii) it is used by many journals/publishers to classify certain types of documents.

The two maps in Fig. 4 provide a graphical representation of the error statistics (ε, α_{DT}, and β_{DT}) described earlier. For each DT of each of the two databases, a point with coordinates (α_{DT}, β_{DT}) is plotted. To facilitate comparison between the maps of the two databases, the respective DTs have been labeled with letters (A, B, C, …), as shown in the tables in the lower part of Fig. 4. Despite differences in the DTs covered by the two databases, an effort was made to maintain consistency in the labeling (e.g., A corresponds to *article* for both, B corresponds to *review* for both, and so on). The ε value is also indicated on both axes with a hollow circle. For clarity, the scales of the two axes are kept equal and truncated at 30%. This choice resulted in the exclusion of some points, i.e., H and I for Scopus (see the table at the bottom of Fig. 4).

Beyond the numerical differences and considering the fact that the DTs of the two databases are not exactly coincident, there is a certain similarity in the positioning of the points for the two databases, particularly those marked by *e*, A (*article*), B (*review*), C (*conf./proc. paper*), and F (*erratum/correction*). The most significant differences concern the positioning of D (*editorial*) and E (*letter*), probably due to the different policies of the two databases in managing these DTs.

Conclusions

This paper proposed a new methodology for semi-automated analysis of a relatively large amount of scientific publications, which is useful in studying DT-classification errors in the Scopus and WoS databases. Taking advantage of the discordance in DT classification between the two databases, the proposed methodology directly targets a subset of potentially misclassified documents for manual analysis. In the case study, against a total *corpus* of 27,734 initial documents in both databases, only the 1315 off-diagonal documents in the concordance matrix – corresponding to about 4.7% – were manually analysed. It is emphasized that the size of this *corpus* is at least an order of magnitude larger than those characterizing previous research in the scientific literature (Donner, 2023). Additionally, 264 documents (i.e., 1% of the 26,419 diagonal ones) were analyzed randomly, finding no DT-classification error and confirming the plausibility of the working hypothesis that concordant DT classifications are unlikely to be erroneous. In light of these results, the decision to restrict the manual analysis to the subset of potentially misclassified documents appears to be a sort of "calculated risk", which—for the same amount of manual effort—enables a considerable extension of the *corpus* of analyzed documents than previously published studies. Nonetheless, the authors acknowledge that scientific literature documents cases of simultaneous and coincident misclassification by competing databases (Zhu et al., 2024). This aspect, which is inherently delicate for the implementation of the proposed methodology, will be investigated in greater detail and from a quantitative perspective in future research.

This study has shown that DT-classification errors are not negligible and generally hover around a few percentage points, with slightly higher *e* values for Scopus (2.7%) compared to WoS (2.3%). For both databases, most errors involve the misclassification of research *articles* as *reviews* and vice versa, confirming findings from other studies (Haupka et al., 2024); this is certainly due to the fact that these two DTs are the most frequent ones and that some documents often lie near the boundary between them. The analysis also highlighted some interesting differences between the two bibliometric databases. For example, Scopus shows a significant number of DT-classification errors regarding *editorial* documents and *notes*, which are not correctly classified as such. On the other hand, WoS shows a quite large number of (relatively short) documents misclassified into less plausible DTs, notably due to the absence of the *note* DT category. Data related to the discordant documents subjected to manual analysis are available to interested readers upon explicit request.

The proposed semi-automated approach presents several practical implications. It can be employed by individual scientists, institutions, and even publishers and database managers to efficiently detect (and correct) DT-classification errors. Database managers could also benefit from this analysis by identifying their own "weak points" in DT classification—at least in relative terms when compared to competing databases. Additionally, this analysis may support database managers when discussing or revising their DT definitions and classification rules, helping them to make decisions on the inclusion, exclusion or refinement of certain DTs, allowing for a more precise level of granularity. With access to both databases, the methodology can be easily implemented using simple tools such as spreadsheets and pivot tables, making it highly accessible and scalable.

This study has some limitations, including the fact that certain DTs were excluded from the analysis, such as *articles in press*, *monographs* and, more generally, scientific papers without DOIs. Furthermore, documents with a double DT classification in WoS were also excluded. Future research will aim to overcome some of the aforementioned limitations. In particular, it is planned to analyze the double DT classifications in WoS, evaluating the practical implications of this policy. Furthermore, the possibility of assisting the time-consuming manual analysis with AI-based techniques will be explored.

Appendix

A.1 DTs covered by Scopus and WoS

Tables 5 and 6 contain the DTs officially covered by the Scopus and WoS databases respectively.

A.2 Complete concordance matrix and error tables

Table 7 contains the complete concordance matrix, which—unlike the "simplified" version in Table 2—also includes a breakdown of the "*least frequent DTs*" (i.e. those with less than 30 occurrences, highlighted with an asterisk "*"). Tables 8 and 9 contain the complete error tables by Scopus and WoS respectively.

A.3 Further insights into analysis results

The analysis revealed several inconsistencies and gaps in the DT definitions within the reference databases, which are often at the root of numerous DT-classification errors. For example, the definition of *article* covers a wide range of DT sub-categories mentioned by both databases: for Scopus, it includes *case reports*, *technical notes*, *research notes*, and *short communications* (see the *article* definition in Table 5), while for WoS, it encompasses *research papers*, *brief communications*, *technical notes*, *chronologies*, *full papers*, and *case reports* (see the *article* definition in Table 6). The following subsections focus on some of these subcategories that are particularly prone to DT-classification errors and inconsistencies.

A.3.1 Case reports

Manual analysis of the off-diagonal elements of the concordance matrix (see Table 7) revealed 63 documents classified by the relevant publishers as *case reports*. Considering that the official DT definitions of the two databases do not include this DT, *case reports* should reasonably be classified under the *article* DT in both databases. However, the actual classifications are often inconsistent: Scopus classified most of these

Table 5 List of the DTs covered by Scopus and corresponding description. Adapted from (Elsevier, 2024)

DT	Description
Article	Original research or opinion. Articles in peer-reviewed journals are usually several pages in length, subdivided into sections: abstract, introduction, materials & methods, results, conclusions, discussion and references. Case reports, technical and research notes, and short communications may be as short as one page
Article in press	Accepted article made available online before the official publication
Book	A whole monograph or the entire book. Each chapter, along with a general item summarizing the book, is also indexed with the source type book
Chapter	A complete chapter in a book or book series volume, identified as a chapter by a heading or section indicator
Conference paper	An original article reporting data presented at a conference or symposium. Ranges in length from full papers to short items as brief as one page
Data paper	Searchable metadata documents describing an online accessible dataset or group of datasets. Focuses on data collection, distinguishing features, access, and potential reuse
Editorial	Summary of several articles or provides editorial opinions or news. Identified as editorial, introduction, leading article, preface or foreword, and usually listed at the beginning of the table of contents
Erratum	Report of an error, correction or retraction of a previously published paper. Short items citing errors in, corrections to, or retractions of a previously published article in the same journal
Letter	Letter to or correspondence with the editor. Individual letters or replies processed as single items
Note	Short items not readily suited to other item types. It includes discussions, commentaries, questions and answers, and comments on other articles. In trade journals, notes are generally shorter than half a page in length
Retracted article	Published articles that the author(s) or publisher has requested to retract. Indicated with the words retracted or retraction
Review	A significant review of original research, including conference papers, with an extensive bibliography. Educational items that review specific issues within the literature. As non-original articles, reviews lack typical sections of original articles such as materials & methods and results
Short survey	Short or mini-review of original research. Similar to reviews, but shorter (not more than a few pages) and with a less extensive bibliography

documents as *articles* (56), *notes* (6), and a *review* (1), while WoS classified them as *editorial materials* (32), *reviews* (28), *articles* (2), and a *letter* (1).

Case reports analyzed were primarily related to the medical field and healthcare in general, with a significant percentage (approximately 25%) including multimedia contributions such as videos, presentations, images in intervention, surgical techniques, clinical trial protocols, and practises. This extensive use of multimedia contributions—which is undoubtedly very effective in demonstrating surgical procedures and technical steps—highlighted the need of reshaping the DT-classification criteria.

Table 6 List of the DTs covered by WoS and corresponding description. Adapted from (Clarivate, 2024)

DT	Description
Article	Reports of research on new and original works that are considered citable. Includes research papers, brief communications, technical notes, chronologies, full papers, and case reports (presented like full papers) that were published in a journal and/or presented at a symposium or conference Articles usually include author abstract, graphs, tables, and lists of cited references
Art exhibit review	Reviews of gallery or museum showings of artworks, crafts, manuscripts, memorabilia, artifacts, or collections of sorts
Bibliography	A list, often with descriptive or critical notes, of writings relating to a particular subject
Biographical item	Obituaries or articles focusing on the life of an individual, and articles that are tributes to or commemorations of an individual
Book	A monograph or publication written on a specific topic
Book chapter	A monograph or publication written on a specific topic within a main division in a book
Book review	A critical appraisal of a book (often reflecting a reviewer's personal opinion or recommendation) that evaluates such aspects as organization and writing style, possible market appeal, and cultural, political, or literary significance. The book being reviewed is processed as the source title. The reviewer is processed as the author
Correction	Correction of errors found in articles that were previously published and which have been made known after that article was published. Includes additions and errata. Retraction items were processed as corrections prior to 2016. A correction title will include the citation to the article being corrected
Dance performance review	Reviews of solo dance recitals, complete dance productions, dance programs consisting of several works, and other types of performed dances
Data paper	A scholarly publication describing a particular dataset or collection of datasets and usually published in the form of a peer-reviewed article in a scholarly journal. The main purpose of a data paper is to provide facts about the data (metadata, such as data collection, access, features etc.) rather than analysis and research in support of the data, as found in a conventional research article. A data paper will have a dual document type: article; data paper
Database review	A critical appraisal of a database, often reflecting a reviewer's personal opinion or recommendation. Refers to a structured collection of records or data that is stored in a computer system
Early access	An article that has been electronically published by a journal before it has been assigned to a specific volume and issue. An early-access article will have a dual document type that will include the document type assigned and early access: article; early access. When the article is later indexed from the issue, it is updated with the volume, issue, date, page information and the early-access document type is removed. The processing of early-access articles began in December 2017. Only journals that have been onboarded for early access contain early-access articles
Editorial material	An article that gives the opinions of a person, group, or organization. Includes commentaries (depending on the content), editorials, interviews, discussions between individuals, post-paper discussions, round table symposia, conference summary, research highlights, introduction, preface and conclusion
Excerpt	A selection from or a fragment of a literary or musical work, which cannot stand as a separate work in its own right (that is not a short story from a collection of stories or a poem from a book of poems)

Table 6 (continued)

DT	Description
Expression of concern	A notification about the integrity of a published article that is typically written by an editor. The outcome may result in a future retraction notice or correction notice. The original article information is included in the title of the expression of concern and the original article is cited
Fiction, creative prose	Includes short stories and other works (non-poetry) classified as creative writing rather than objective reporting of events or a scholarly presentation of facts
Film review	A review of a motion picture
Hardware review	A critical appraisal of computer hardware, often reflecting a reviewer's personal opinion or recommendation. Refers to objects that you can actually touch, like disk drives, keyboards, printers
Item withdrawal	A published statement from the editor or author announcing the withdrawal of a manuscript and the reason for the withdrawal. The item-withdrawal notice must state that the item is being withdrawn. The original article information is included in the title of the withdrawal item and the original article is cited. Prior to 2021 item withdrawals were processed as a retraction
Letter	Brief contributions or correspondence from the readers to the journal editor concerning previously published material. Includes "readers write", "questions and answers", "letters to the editor" and "comments"
Meeting	A paper that covers meeting abstracts sections published in a journal. The article title will include the meeting title (if provided) followed by the word abstracts. If meeting abstracts are processed individually the page span will be a singular page. If the journal does not meet the criteria for processing the individual meeting abstracts the page span will include the entire set of meeting abstracts The "meeting" document type created in 2023 was applied retrospectively from 2019. The document type "article" was assigned prior to 2019
Meeting abstract	An abstract or extended abstract of completed papers that were or will be presented at a symposium or conference
Meeting summary	A paper that covers multiple meeting abstracts in a variety of subjects
Music performance review	Review of a live musical performance (recital, concert, and opera)
Music score	Transcript of the original and entire draft of a musical composition or an arrangement with the parts for the different instruments or voices written on staffs one above another
Music score review	Review of a bound musical composition or bound collection of musical compositions
News item	News, current events, and recent developments usually unauthored and less than a page long
Poetry	Compositions in verse; metrical writing
Proceedings paper	Full papers in a wide range of disciplines that were or will be presented at a symposium or meeting. The papers to be included must have been presented in full at a conference, meeting, symposium or similar gathering. Generally published in a book of conference proceedings Records covered in the two conference-proceedings indexes (CPCI-S and CPCI-SSH) are identified as proceedings paper. However, the same records covered in the three indexes (SCI-E, SSCI, and A&HCI) are identified as article when published in a journal. These proceedings papers will have a dual document type: article; proceedings paper

Table 6 (continued)

DT	Description
Expression of concern	An original publication that has an expression of concern published about it. A publication with expression of concern will have a dual document type: e.g., article; publication with expression of concern. A publication with "expression of concern dual document type will only be assigned if an expression of concern notice is published
Record review	Reviews of recorded music or speech
Reprint	An article that was previously published. Reprinted information is included in the source title and the original article is cited
Retracted publication	An article that has been retracted by an author, institution, editor, or a publisher. A retracted article will have a dual document type: e.g., article; retracted publication. A retracted publication dual document type was created in 2016 and is only assigned if a retraction notice is published
Retraction	A published statement from the editor or author announcing the retraction of a manuscript and the reason for the retraction. The retraction notice must state that the item is being retracted. The original article information is included in the title of the retraction and the original article is cited. Prior to 2016, retractions were processed as corrections. The original article information is included in the title of the retraction and the original article is cited
Review	Detailed, critical surveys of published research. A review article may summarize previously published studies and draw some conclusions but will not present new information on the subject. Includes reviews, reviews of literature, mini-reviews, and systematic reviews. If an article is listed under the review section in a journal and/or review of literature appears in the title it will be assigned a review If an article is not assigned a review by the journal but "review", "systematic review" or "mini-review" appears in the title, it must also appear someplace else in the article (abstract/summary or introduction) in order to be assigned the document type review. If the article(s) meet the above criteria—they must have references in order to be tagged as a review item Review articles that were presented at a symposium or conference will be processed as proceedings papers
Script	Includes film scripts, plays, TV, and radio scripts
Software review	A critical appraisal of computer software, often reflecting a reviewer's personal opinion or recommendation. Refers to programs, procedures, and rules, along with associated documentation pertaining to the operation of a computer system
Theatre review	Review of a performed play
TV review, radio review	Reviews of television, videos, and radio broadcasts
Withdrawn publication	An article that has been withdrawn by an author, institution, editor, or a publisher. A withdrawn publication will have a dual document type, e.g., article; withdrawn publication. A withdrawn publication dual document type was created in 2021 and will only be assigned if an item withdrawal notice is published

A.3.2 Research notes and technical notes

Another example of inconsistency arises with two documents classified by the relevant publishers (Taylor & Francis and Elsevier, respectively) as *research notes* (see Table 10).According to the official DT definitions provided by Scopus, these documents should reasonably be classified under the *article* DT, given their significant

Table 7 Complete *concordance matrix*, also including breakdown of the "*least frequent DTs*" (i.e. those with less than 30 occurrences, highlighted with "*"), which are instead grouped into the concordance matrix in Table 2. In bold are column (Scopus) and row (WoS) totals

DT classifications → ↓		By Scopus											
		Article	Review	Conf. paper	Editorial	Letter	Erratum	Note	Book chapter	Short survey	Data paper (*)	Retracted (*)	Row total
By WoS	Article	(21,418)	297	71	14	14	–	39	5	7	2	1	**21,868**
	Review	323	(2,146)	2	–	1	–	1	–	18	–	–	**2491**
	Proceedings paper	19	–	(1,737)	1	–	–	–	55	–	–	–	**1812**
	Editorial material	124	62	6	(545)	8	1	149	–	10	–	–	**905**
	Letter	33	2	–	1	(342)	–	8	–	–	–	–	**386**
	Correction	2	–	–	–	–	(231)	–	–	–	–	–	**233**
	News item (*)	2	–	–	–	–	–	22	–	–	–	–	**24**
	Biographical item (*)	4	–	–	–	–	–	2	–	–	–	–	**6**
	Retraction (*)	–	–	–	–	–	3	–	–	–	–	–	**3**
	Book review (*)	1	1	–	–	–	–	–	–	–	–	–	**2**
	Expression of concern (*)	–	–	–	–	–	1	–	–	–	–	–	**1**
	Fiction, creative prose (*)	1	–	–	–	–	–	–	–	–	–	–	**1**
	Meeting abstract (*)	–	–	1	–	–	–	–	–	–	–	–	**1**
	Poetry (*)	1	–	–	–	–	–	–	–	–	–	–	**1**
	Column total	**21,928**	**2,508**	**1,817**	**561**	**365**	**236**	**221**	**60**	**35**	**2**	**1**	**27,734**

Table 8 Complete *error table* for Scopus. Error statistics (cf. Equations 1, 2, and 3) are bolded

		DT classification by Scopus												
		Article	Review	Conf. paper	Editorial	Letter	Erratum	Note	Book chapter	Short survey	Data paper (*)	Retracted (*)	Row total	$\alpha_{Scopus,DT}$
"True" DT classifi-cations	Article	(21,523)	102	53	1	–	–	7	5	2	–	–	21,693	**0.8%**
	Review	217	(2,335)	–	–	–	–	3	–	1	–	–	2,556	**8.7%**
	Conf. paper	22	5	(1,763)	1	–	–	–	47	–	–	–	1,838	**4.1%**
	Editorial	55	56	1	(557)	3	–	12	–	8	–	–	692	**19.5%**
	Letter	32	2	–	1	(362)	–	9	–	–	–	–	406	**10.8%**
	Erratum	2	–	–	–	–	(232)	–	–	–	–	–	234	**0.9%**
	Note	68	4	–	1	–	–	(188)	–	3	–	–	264	**28.8%**
	Book chapter	1	–	–	–	–	–	–	(8)	–	–	–	9	**11.1%**
	Short survey	2	–	–	–	–	–	–	–	(21)	–	–	23	**8.7%**
	Data paper (*)	–	–	–	–	–	–	–	–	–	(2)	–	2	**-**
	Retracted (*)	–	–	–	–	–	3	–	–	–	–	(1)	4	**-**
	Book	–	1	–	–	–	–	–	–	–	–	–	1	**-**
	Other	6	3	–	–	–	1	2	–	–	–	–	12	**-**
	Column total	21,928	2,508	1,817	561	365	236	221	60	35	2	1	27,734	
	$\beta_{Scopus,DT}$	**1.8%**	**6.9%**	**3.0%**	**0.7%**	**0.8%**	**1.7%**	**14.9%**	**86.7%**	**40.0%**	**–**	**–**		$\boldsymbol{\varepsilon}_{\mathbf{Scopus}} \cong 2.7\%$

Other is an auxiliary DT introduced by the authors to compensate for the absence of DTs fitting for some specific documents analysed, within the current Scopus classification system

Table 9 Complete *error table* for WoS. Error statistics (see Eqs. 1, 2, and 3) are bolded

		DT classification by WoS															
		Article	Review	Proc. paper	Editorial material	Letter	Correction	News item (*)	Biographical item (*)	Retraction (*)	Poetry (*)	Expression of concern (*)	Fiction, Creative prose (*)	Meeting abstract (*)	Poetry (*)	Row total	$\alpha_{WoS,DT}$
"True" DT classifications	Article	(21,597)	74	–	17	3	–	1	–	–	–	–	1	–	–	21,693	**0.44%**
	Review	178	(2,371)	–	6	–	–	–	–	–	–	–	–	–	–	2,555	**7.20%**
	Proc. paper	17	3	(1,804)	5	–	–	–	–	–	–	–	–	1	–	1,830	**1.42%**
	Editorial material	18	1	–	(686)	–	–	–	–	–	–	–	–	–	–	705	**2.70%**
	Letter	16	1	–	7	(382)	–	–	–	–	–	–	–	–	–	406	**5.91%**
	Correction	–	–	–	1	–	(233)	–	–	–	–	–	–	–	–	234	**0.43%**
	News item (*)	5	–	–	–	–	–	–	–	–	–	–	–	–	–	5	**–**
	Biographical item (*)	–	–	–	1	–	–	–	(6)	–	–	–	–	–	–	7	**–**
	Retraction (*)	1	–	–	–	–	–	–	–	(3)	–	–	–	–	–	4	**–**
	Book review (*)	1	–	–	–	–	–	–	–	–	(2)	–	–	–	–	3	**–**

Table 9 (continued)

	DT classification by WoS															
	Article	Review	Proc. paper	Editorial material	Letter	Correction	News item (*)	Biographical item (*)	Retraction (*)	Poetry (*)	Expression of concern (*)	Fiction, Creative prose (*)	Meeting abstract (*)	Poetry (*)	Row total	$\alpha_{WoS,DT}$
Expression of concern (*)	–	–	–	–	–	–	–	–	–	–	(1)	–	–	–	1	**–**
Fiction, creative prose (*)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	**–**
Meeting abstract (*)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	**–**
Poetry (*)	–	–	–	–	–	–	–	–	–	–	–	–	–	(1)	1	**–**
Book	1	–	–	–	–	–	–	–	–	–	–	–	–	–	1	**–**
Book chapter	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	**–**
Note (**)	34	41	8	181	1		23	–	–	–	–	–	–	–	288	**–**
Column total	21,868	2,491	1,812	905	386	233	24	6	3	2	1	1	1	1	27,734	
$\beta_{WoS,DT}$	**1.2%**	**4.8%**	**0.4%**	**24.2%**	**1.0%**	**0.0%**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**		$\boldsymbol{\varepsilon}_{\mathbf{WoS}} \cong 2.3\%$

DTs grouped into the macro-category *least frequent DTs* (i.e., those with fewer than 30 occurrences) are marked with an asterisk "*". The *note* DT, marked with a double asterisk "**", was forcibly included in the table despite its exclusion from WoS, due to its perceived relevance

Table 10 Example of two documents classified by the relevant publishers as *research notes* and (mis)classified by the databases of interest

DOI	Journal name	DT by Scopus	DT by WoS
10.1080/10871209.2020.1825878	Human dimensions of wildlife—An International Journal (Elsevier)	Note	Article
10.4315/0362-028X.JFP-18-228	Journal of food protection (Taylor & Francis)	Note	Article

length (5 and 11 pages, respectively). However, both were classified by Scopus as *notes* (cf. "*Case reports, technical and research notes, and short communications may be as short as one page*" and "*notes are generally shorter than half a page in length*" in Table 5). Conversely, WoS, which does not include *research notes* in its DT definitions (only *technical notes*, which are incorporated into the *article* DT), classified them as *articles*. In this case, one could argue that Scopus' classification, though seemingly correct, is inconsistent with its own DT definitions. WoS, on the other hand, maintains consistency with its perhaps (partly) incomplete DT definitions.

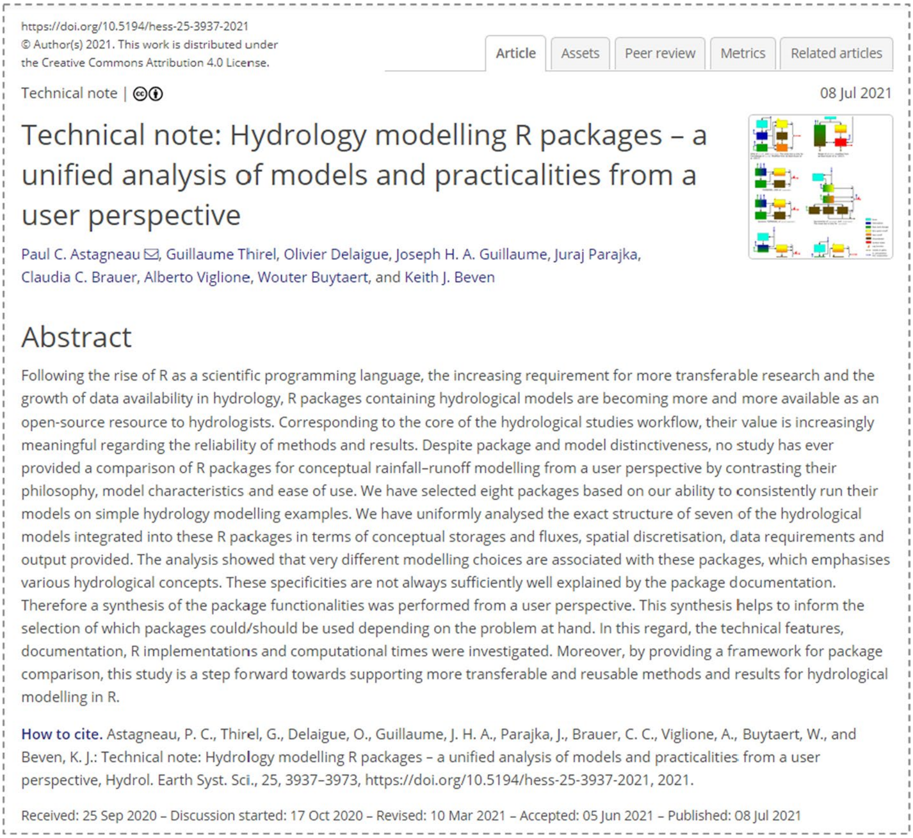
A similar inconsistency emerged with some documents classified as *technical notes* by the relevant publishers (see Table 11). According to the official DT definitions, *technical notes* should reasonably be categorized as *articles* by both databases (cf. "*Includes research papers, brief communications, technical notes, chronologies, full papers, and case reports (presented like full papers) that were published in a journal and/or presented at a symposium or conference*" in Table 6). However, Scopus classified the first five as *notes*, likely because these contributions lack the substance to be considered (research) *articles*. In contrast, WoS classified them as *articles*. According to the authors, the most pertinent DT classification could be *notes*, as these contributions do not have the characteristics of complete (research) *articles*. Focusing on the sixth document in Table 11 (see also Fig. 5), we observe that Scopus classified it as a *review*, although our manual analysis revealed that it has the characteristics of an *article*, according to the relevant DT definitions. This misclassification by Scopus likely stems from the extensive bibliography of the paper, which includes over 50 references.

A.3.3 Short/brief communications

Another *article* "sub-category" that is not covered by the two databases is *short/brief communication*. Manual analysis identified nine *short communications* which, according to the DT definitions of both databases, should be included in the *article* DT (see Table 12). Unfortunately, WoS misclassified these documents as *editorial material* in eight out of nine cases (as shown in Table 12). It is also interesting to note the internal inconsistency of Scopus in handling the last four documents, which share a similar structure and even belong to the same open-access journal (i.e., *Acta Dermato-Venereologica*). While two of them were classified as *notes* (see also the example in Fig. 6), the other two were classified as *articles* (see also the example in Fig. 7).

Table 11 Example of documents classified by the relevant publishers as *technical notes* and misclassified by (at least one of) the databases of interest

DOI	Journal name	DT by Scopus	DT by WoS
10.1080/00221686.2019.1671508	Journal of hydraulic research (Taylor & Francis)	Note	Article
10.1080/1064119X.2018.1469699	Marine georesources & geotechnology (Taylor & Francis)	Note	Article
10.1080/10889868.2018.1476454	Bioremediation journal (Taylor & Francis)	Note	Article
10.3390/aerospace7040038	Aerospace (MDPI)	Note	Article
10.3390/f13111839	Forests (MDPI)	Note	Article
10.5194/hess-25-3937-2021	Hydrology and earth system sciences (Copernicus Publications)	Review	Article



https://doi.org/10.5194/hess-25-3937-2021
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Technical note | 08 Jul 2021

Technical note: Hydrology modelling R packages – a unified analysis of models and practicalities from a user perspective

Paul C. Astagneau, Guillaume Thirel, Olivier Delaigue, Joseph H. A. Guillaume, Juraj Parajka, Claudia C. Brauer, Alberto Viglione, Wouter Buytaert, and Keith J. Beven

Abstract

Following the rise of R as a scientific programming language, the increasing requirement for more transferable research and the growth of data availability in hydrology, R packages containing hydrological models are becoming more and more available as an open-source resource to hydrologists. Corresponding to the core of the hydrological studies workflow, their value is increasingly meaningful regarding the reliability of methods and results. Despite package and model distinctiveness, no study has ever provided a comparison of R packages for conceptual rainfall–runoff modelling from a user perspective by contrasting their philosophy, model characteristics and ease of use. We have selected eight packages based on our ability to consistently run their models on simple hydrology modelling examples. We have uniformly analysed the exact structure of seven of the hydrological models integrated into these R packages in terms of conceptual storages and fluxes, spatial discretisation, data requirements and output provided. The analysis showed that very different modelling choices are associated with these packages, which emphasises various hydrological concepts. These specificities are not always sufficiently well explained by the package documentation. Therefore a synthesis of the package functionalities was performed from a user perspective. This synthesis helps to inform the selection of which packages could/should be used depending on the problem at hand. In this regard, the technical features, documentation, R implementations and computational times were investigated. Moreover, by providing a framework for package comparison, this study is a step forward towards supporting more transferable and reusable methods and results for hydrological modelling in R.

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Fig. 5 Example of a document classified by the publisher as a *technical note*, misclassified by Scopus as a *review* and by WoS as an *article* (https://doi.org/10.5194/hess-25-3937-2021)

A.3.4 Disease notes

Another "niche case" concerns 71 manually analyzed documents that are indexed by the relevant publishers as *disease notes*, i.e., papers in the field of botany, typically less than one page long and often consisting of just a few lines. These documents report outbreaks or significant changes in the geographic distribution of plant diseases and primarily provide updates on the "health status" of specific plants.[4] The *disease note* is not a DT recognized by either Scopus or WoS, nor is mentioned as a sub-category of any other DT. Although all 71 documents share a similar structure, Scopus classifies them inconsistently: as *notes* (63 documents), *articles* (7 documents), and a *short survey* (a single document). In contrast, WoS classifies them as *editorial materials* (49 documents) and *news items* (22 documents).

[4] According to the definition provided by the botanical journal *Plant Disease International Journal*, a *disease note* is a "*short research paper intended to encourage early reporting of outbreaks or significant changes in geographic location of diseases, new or expanded host ranges, or new physiological races of pathogens. A geographic location usually refers to a country, but may also refer to a region (e.g., state, province) within that country*" (https://apsjournals.apsnet.org/page/pdis/notes).

Table 12 Example of documents classified by the relevant publishers as *short communications* and misclassified by (at least one of) the databases of interest

DOI	Journal name	DT by Scopus	DT by WoS
10.1016/j.ctro.2021.03.011	Clinical and translational radiation oncology (Elsevier)	Article	Editorial material
10.1088/1681-7575/ab065f	Metrologia (IOP science)	Short survey	Article
10.1111/age.12647	Animal Genetics (Wiley)	Article	Editorial material
10.2340/00015555-3061	Acta Dermato-Venereologica (Medical Journals Sweden AB)	Article	Editorial material
10.2340/00015555-3798	Acta Dermato-Venereologica (Medical Journals Sweden AB)	Article	Editorial material
10.2340/actadv.v102.2926	Acta Dermato-Venereologica (Medical Journals Sweden AB)	Article	Editorial material
10.2340/actadv.v102.319	Acta Dermato-Venereologica (Medical Journals Sweden AB)	Article	Editorial material
10.2340/actadv.v103.4526	Acta Dermato-Venereologica (Medical Journals Sweden AB)	Note	Editorial material
10.2340/actadv.v103.5278	Acta Dermato-Venereologica (Medical Journals Sweden AB)	Note	Editorial material

SHORT COMMUNICATION

Dimethyl Fumarate Treatment in Patients with Moderate-to-Severe Psoriasis: A 52-week Real-life Study

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INTRODUCTION

Psoriasis is a chronic inflammatory immune-mediated disease, with an estimated prevalence of 2–4% in Europe. Recently, a new oral formulation of dimethyl fumarate (DMF) has been approved for treating adults with moderate-to-severe chronic plaque psoriasis (1). The aim of this multicentre retrospective study was to evaluate the effectiveness and safety of DMF in a real-life setting, through collecting and analysing data from DMF-treated patients with moderate-to-severe psoriasis.

MATERIALS AND METHODS

The study retrospectively collected data from DMF-treated adult patients with moderate-to-severe psoriasis presenting to 10 dermatological referral centres located in the central parts of Northern Italy (Bologna, Ferrara, Genova, Modena, Padova, Parma, Reggio-Emilia, Torino, Verona, Vicenza) from January 2019 to March 2021.

Psoriasis Area and Severity Index (PASI) was evaluated at weeks 0, 12, 24, and 52. The study protocol was approved by the local ethics committee (protocol 0053012/ 2022) and informed consent was obtained by the participating subjects. The following data were extracted from electronic medical records: demographics (sex and age), body mass index (BMI), comorbidities, psoriasis duration, psoriatic arthritis (PsA), clinical or laboratory side-effects.

Statistical analysis

PASI reduction ≥ 50% and ≥ 75% from baseline (PASI 50 and PASI 75, respectively) were assessed using both intention-to-treat (ITT) and per-protocol analysis (PP). In the ITT analysis, patients who withdrew from the study for any reason were defined as non-responders. Differences between psoriasis patients at baseline and at short-term or intermediate-term therapy were analysed using repeated measures of 1-way analysis of variance (ANOVA). Analyses were performed using IBM-SPSS software v.25 (Chicago, IL, USA). A *p*-value <0.05 was considered statistically significant.

Fig. 6 Example of a document classified by the publisher as a *short communication*, (mis)classified by Scopus as a *note* and by WoS as *editorial material* (https://doi.org/10.2340/actadv.v103.4526, which is the eighth document in Table 12)

ActaDV Acta Dermato-Venereologica ActaDV Advances in dermatology and venereology

1/2

SHORT COMMUNICATION

Association between Primary Cutaneous B-cell Lymphomas and Other Skin Cancers: A Multicentre Cohort Study

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Primary cutaneous lymphomas (PCLs) are defined as non-Hodgkin lymphomas (NHLs) of the skin without evidence of extracutaneous disease at diagnosis. They are subdivided into primary cutaneous T-cell lymphomas (CTCLs) and primary cutaneous B-cell lymphomas (PCBCLs). The latter account for 25% of all PCLs and have been further categorized into 3 main groups according to the last World Health Organization – European Organization of Research and Treatment of Cancer (WHO-EORTC) classification: primary cutaneous marginal zone lymphomas (PCMZLs), primary cutaneous follicle-centre cell lymphomas (PCFCLs), and diffuse large B-cell lymphomas, leg-type (PCDLBCL, LT) (1). Recently, increasing attention on the increased risk of other primary malignancies in patients with PCL has been focused on CTCL; however, data regarding second malignancies in PCBCL are lacking (2). Rates of 16% and 25% of patients with PCBCL developing other primary cancers have been reported in the only 2 studies conducted to date, suggesting a potential association (3, 4). It is not known whether a dysfunction of cancer surveillance or immunosuppressive drugs is the basis for this association in these patients. It is notable that immunosuppressive therapy is sometimes unnecessary in PCMZL and PCFCL (4). Further clarification of this association might be of considerable importance for the management of PCBCL, as well as for the improvement of cancer screening.

MATERIALS AND METHODS

In order to shed light on this issue, we conducted a retrospective multicentre cohort study on PCBCLs from 2 tertiary referral centres for cutaneous lymphomas: the Dermatology Clinic of the University of Turin, Italy, and the Dermatology Department of La Fe University Hospital of Valencia, Spain. All histopathological diagnoses were made on the agreement of 2 independent dermatopathologists specialized in PCL. PCBCL staging was performed according to EORTC guidelines (5). Demographics, PCBCL subtype, site of lesions, stage at diagnosis and progression have all been assessed and summarized (**Table I**). A total of 144 patients with PCBCL were collected (78 PCFCLs, 49 PCMZLs, 15 PCDLBCLs, 1 intravascular B-cell lymphoma, 1 PCFCL and 1 PCMZL). Forty patients out of 144 (27.8%) developed at least 1 malignant neoplasm (Table SI), 67.5% were men and 32.5%

Table I. Patients' demographics and characteristics

Characteristic	Patients (n = 144)
Sex, male, n (%)	91 (63,0)
Age at diagnosis, years, median (range)	55 (23–84)
Primary cutaneous B-cell lymphoma subtype, n (%)	
PCFCL	78 (54.2)
PCMZL	49 (34.0)
PCDLBL	15 (10.4)
Intravascular B-cell lymphoma	1 (0.7)
PCFCL and PCMZL	1 (0.7)
Staging at diagnosis, n (%)	
T1N0M0	81 (56.2)
T2N0M0	31 (21.5)
T3N0M0	16 (11.1)
Any N+	6 (4.2)
Any M+	2 (1.4)
Unknown	8 (5.6)
Site of lesions[a], n (%)	
Head and neck	42 (29.2)
Trunk	84 (56.3)
Upper limbs	31 (21.5)
Lower limbs	24 (16.7)
Unknown	9 (6.3)
Progression[b], n (%)	30 (20.8)
PCFCL	18 (12.5)
PCMZL	7 (4.9)
PCDLBL	5 (3.5)
High-grade transformation[c], n (%)	2 (1.4)
PCFCL	1 (0.7)
PCMZL	1 (0.7)

[a]Some patients had more than 1 localization of disease. [b]Progression is defined as increase in tumour node metastasis (TNM) staging system. [c]Trasformation of a low-grade B-cell non-Hodgkin lymphoma (NHL), such as primary cutaneous follicle-centre cell lymphoma (PCFCL) and primary cutaneous marginal zone lymphoma (PCMZL), into a high-grade NHL, such as primary cutaneous diffuse large B-cell lymphoma (PCDLBL).

women. Twenty-seven patients (18.8%) reported at least 1 non-lymphoma skin cancer and 15 (10.4%) patients were diagnosed with other non-skin related malignancy. In 2 patients both neoplastic conditions were observed. As for the non-lymphoma skin cancers, 23 were metachronous, 5 synchronous and 3 previous, whereas in the non-skin-related malignant group, 8 diagnoses were metachronous, 1 synchronous and 8 previous to the diagnosis of PCBCLs. Two patients presented more than 1 type of non-lymphoma skin cancer (i.e. both basal cell carcinoma and squamous cell carcinoma). Mean and median times of second malignancies onset (considering both metachronous and synchronous diagnoses) were, respectively, 71.5 and 48 months (range 1–264), whereas the mean and median times of having previous neoplasia were 130.2 and 138 months (range 4–264). Patients diagnosed with other primary cancers following PCBCL who had undergone radiotherapy (RT), immunosuppressive treatment, or a combination of both, accounted for 37.1% (n = 13), 20% (n = 7) and

Fig. 7 Example of a document classified by the publisher as a *short communication*, (mis)classified by Scopus as an *article* and by WoS as *editorial material* (https://doi.org/10.2340/actadv.v102.319, which is the seventh document in Table 12)

This discrepancy is an indication of some uncertainty that this DT can cause in DT-classification by bibliometric databases.

Table 13 exemplifies four of the analyzed *disease notes*, although the first two are even published by the same journal (*Journal of Plant Pathology*), Scopus classified them differently: the first as a *note* (see also Fig. 8), while the second as an *article* (see also Fig. 9).

Table 13 Example of documents classified by the relevant publishers as *disease notes* and misclassified by (at least one of) the databases of interest

DOI	Journal name	DT by Scopus	DT by WoS
10.1007/s42161-020-00508-3	Journal of plant pathology (Springer)	Note	Editorial material
10.1007/s42161-022-01187-y	Journal of plant pathology (Springer)	Article	Editorial material
10.1094/PDIS-01-18-0064-PDN	Plant disease (APS Publications)	Note	News item
10.1094/PDIS-07-21-1547-PDN	Plant disease (APS Publications)	Note	Editorial material

On the other hand, WoS classified both as *editorial material*. Why does this classification difference occur in Scopus?

Considering the last two documents in Table 13, which share a similar structure and are published by the same journal (*Plant Disease International Journal*), the situation is reversed. Although Scopus classified both documents as *notes*, WoS classified one as a *news item* and the other as *editorial material*. Why does this classification difference occur in WoS? According to the authors, the most appropriate category for *disease notes* in general should be *note*. However, since WoS does not recognize this DT, we believe that these documents should be classified either as *articles* or under the auxiliary DT of *note*,[5] based on their content.

On the other hand, although Scopus does recognize the *note* DT, it assigned one of the documents (which is entirely similar to the other three) to the *article* DT. This example demonstrates that databases do not always align their actual classification practices, leading to sometimes inconsistent and heterogeneous classifications.

A.4 In-depth analysis of data-error statistics

This section provides a detailed examination of the data-error statistics, a_{DT} and b_{DT}, described in Sect. "Data-error statistics", offering a new practical interpretation and introducing an additional data-error statistic. Referring to the error table of a given bibliometric database, the following four "intermediate" indicators, related to a specific DT, are defined (see also the pedagogical scheme in Fig. 10):

True positives (*tp*): The number of documents classified by the database under the specific DT of interest, which aligns with the results of the manual analysis (i.e., the "true" classifications specified in the first column of the error table). In formula:

$$tp_{DT} = d_{(DT,DT)}, \tag{4}$$

where the term on the right-hand side represents the number of documents listed in the specific row and column of the error table corresponding to the DT of interest (i.e., *DT*).

True negatives (*tn*): The number of classifications in DTs different from the reference DT, which were not contradicted by the manual analysis. In formula:

$$tn_{DT} = \sum_{\forall(i,j)|i\neq DT,j\neq DT} d_{(i,j)}. \tag{5}$$

[5] The *note* is an auxiliary DT introduced by the authors to compensate for the fact that there is no such DT in the current WoS classification system.


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DISEASE NOTE

Check for updates

First report of powdery mildew caused by *Golovinomyces neosalviae* on *Lavandula stoechas* in Italy

Angelo Garibaldi[1] · Domenico Bertetti[1] · Slavica Matić[1] · Patrizia Martini[2] · Maria Lodovica Gullino[1]

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Keywords French lavender · Ornamental plants · Powdery mildew

During winter and spring of 2019, several plants of *Lavandula stoechas* cv. Ruflex growing in a farm located in Albenga (Savona province, northern Italy) showed a whitish to greyish mycelium colonizing stems and leaves within the canopy. Conidiophores measured 124–236 × 8–15 (average: 163 × 11) µm and they were variable in size and arrangement of cells. Foot-cells were erect or curved at the base, with a basal septum raising above the mother cell and measured 28–146 × 8–13 (average: 67 × 11) µm. The foot-cells were followed by 2–5 cells measuring 14–95 × 8–15 (average: 32 × 11) µm. Conidia were lacking of fibrosin bodies, they were doliiform to limoniform, formed chains (up to 5 conidia) and measured 28–40 × 17–24 (average: 34 × 20) µm, with length/width (l/w) ratio between 1.3 and 2.2. Chasmothecia were not observed. The DNA of the fungal pathogen was extracted from mycelium collected from affected tissues. The primers ITS1/PM6 (White et al. 1990) and PM5/NLP2 (Takamatsu and Kano 2001) were used for a PCR reaction to amplify the Internal Transcribed Spacer (ITS) region and the 28S rRNA gene. Two sequences with 515 and 618 bp respectively (GenBank accession numbers MN053030 and MN749535) were obtained. The NCBI blast analysis of these sequences showed 99.22% (511/515) and 99.68% (616/618) homology respectively, with *Golovinomyces neosalviae* M. Scholler, U. Braun & Anke Schmidt (MG386701 from *Salvia officinalis*). Therefore, the causal agent of the powdery mildew on *L. stoechas* was identified as *G. neosalviae*, accordingly with the features described for this pathogen (Scholler et al. 2016). A pathogenicity test was performed by gently pressing the leaves of three plants of *L. stoechas* cv. Ruflex onto leaves of the same host affected by *G. neosalviae*. Three non-inoculated plants were used as control. About 20 days later, first symptoms and signs of powdery mildew were observed on the inoculated plant, while controls remained symptomless. *G. neosalviae* was reported on *Salvia officinalis*, *S. fruticosa* and *S. lavandulifolia* (Scholler et al. 2016). To our knowledge this is the first report of *G. neosalviae* on *L. stoechas* in Italy, as well as worldwide.

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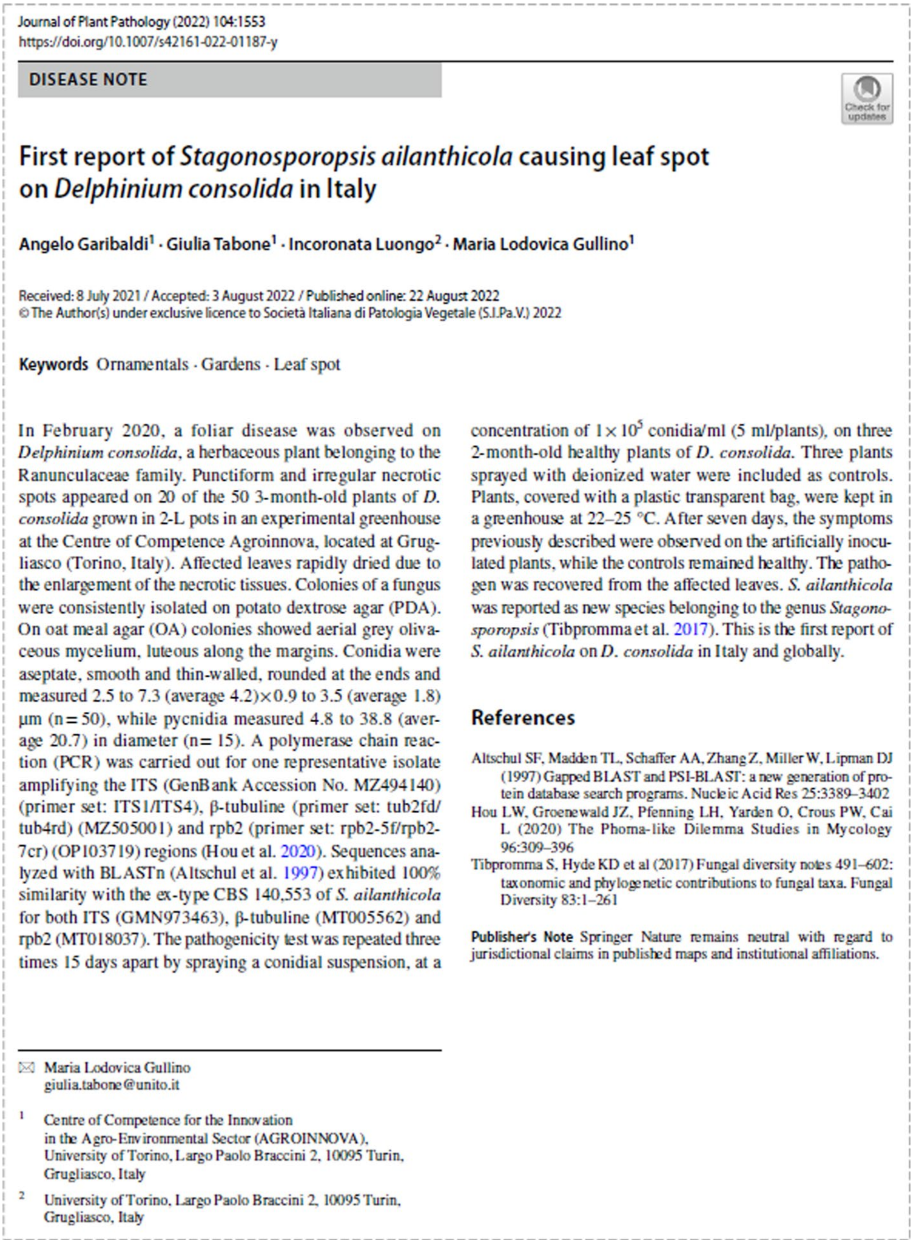
Fig. 8 Example of a document classified by the publisher as a *disease note*, classified by Scopus as a *note* and by WoS as *editorial material* (https://doi.org/10.1007/s42161-020-00508-3), which is also the first document in Table 13)

False positives (*fp*): The number of classifications in DTs different from the one of interest, which were contradicted by the manual analysis. In formula:



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DISEASE NOTE

First report of *Stagonosporopsis ailanthicola* causing leaf spot on *Delphinium consolida* in Italy

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Keywords Ornamentals · Gardens · Leaf spot

In February 2020, a foliar disease was observed on *Delphinium consolida*, a herbaceous plant belonging to the Ranunculaceae family. Punctiform and irregular necrotic spots appeared on 20 of the 50 3-month-old plants of *D. consolida* grown in 2-L pots in an experimental greenhouse at the Centre of Competence Agroinnova, located at Grugliasco (Torino, Italy). Affected leaves rapidly dried due to the enlargement of the necrotic tissues. Colonies of a fungus were consistently isolated on potato dextrose agar (PDA). On oat meal agar (OA) colonies showed aerial grey olivaceous mycelium, luteous along the margins. Conidia were aseptate, smooth and thin-walled, rounded at the ends and measured 2.5 to 7.3 (average 4.2)×0.9 to 3.5 (average 1.8) µm (n = 50), while pycnidia measured 4.8 to 38.8 (average 20.7) in diameter (n = 15). A polymerase chain reaction (PCR) was carried out for one representative isolate amplifying the ITS (GenBank Accession No. MZ494140) (primer set: ITS1/ITS4), β-tubuline (primer set: tub2fd/tub4rd) (MZ505001) and rpb2 (primer set: rpb2-5f/rpb2-7cr) (OP103719) regions (Hou et al. 2020). Sequences analyzed with BLASTn (Altschul et al. 1997) exhibited 100% similarity with the ex-type CBS 140,553 of *S. ailanthicola* for both ITS (GMN973463), β-tubuline (MT005562) and rpb2 (MT018037). The pathogenicity test was repeated three times 15 days apart by spraying a conidial suspension, at a concentration of 1×10^5 conidia/ml (5 ml/plants), on three 2-month-old healthy plants of *D. consolida*. Three plants sprayed with deionized water were included as controls. Plants, covered with a plastic transparent bag, were kept in a greenhouse at 22–25 °C. After seven days, the symptoms previously described were observed on the artificially inoculated plants, while the controls remained healthy. The pathogen was recovered from the affected leaves. *S. ailanthicola* was reported as new species belonging to the genus *Stagonosporopsis* (Tibpromma et al. 2017). This is the first report of *S. ailanthicola* on *D. consolida* in Italy and globally.

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Fig. 9 Example of a document classified by the publisher as a *disease note*, (mis)classified by Scopus as an *article* and by WoS as *editorial material* (https://doi.org/10.1007/s42161-022-01187-y), which is also the second document in Table 13)

$$fp_{DT} = \sum_{\forall (DT,j) | j \neq DT} d_{(DT,j)} \quad (6)$$

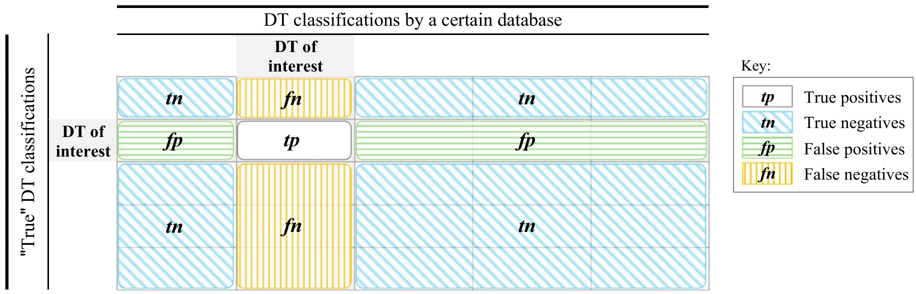

Fig. 10 Spatial positioning of the intermediate indicators—*tp*, *tn*, *fp* and *fn*—in the error table of a specific database

False negatives (*fn*): The number of documents classified under the DT of interest, but in contrast with the manual analysis that assigned them to different DTs. In formula:

$$fp_{DT} = \sum_{\forall (DT,j)|j \neq DT} d_{(DT,j)}. \tag{7}$$

It is straightforward to demonstrate that these four intermediate indicators sum to the total number of analyzed documents (e.g., 27,734 in our case).

Referring back to the statistics α_{DT} and β_{DT} defined in Sect. "Data-error statistics" (cf. Eqs. 2 and 3), these can be reformulated using some of the aforementioned intermediate indicators as follows:

$$\begin{aligned} \alpha_{DT} &= \frac{\sum_{\forall (DT,j)|j \neq DT} d_{(DT,j)}}{\sum_{\forall (DT,j)} d_{(DT,j)}} = \frac{fp_{DT}}{tp_{DT} + fp_{DT}}, \\ \beta_{DT} &= \frac{\sum_{\forall (i,DT)|i \neq DT} d_{(i,DT)}}{\sum_{\forall (i,DT)} d_{(i,DT)}} = \frac{fn_{DT}}{tp_{DT} + fn_{DT}} \end{aligned} \tag{8}$$

To enrich the analysis, an additional data-error statistic is introduced, which qualifies DT classifications from the perspective of a specific DT. Specifically, *accuracy* corresponds to the percentage of correct classifications and is defined as the ratio of classifications or exclusions made by the database that were not contradicted by the manual analysis. It is calculated as follows:

$$Accuracy_{DT} = \frac{tp_{DT} + tn_{DT}}{tp_{DT} + tn_{DT} + fp_{DT} + fn_{DT}}. \tag{9}$$

In simple terms, *accuracy* can be considered more general than α_{DT} and β_{DT}, as it provides an overall indication of the effectiveness of the database in managing a certain DT, both in terms of correct classifications and correct exclusions.

Although the scientific literature includes further statistics based on combinations of the four intermediate indicators (e.g., *negative predictive value*, *fall-out*, *specificity*, *miss rate*, etc.), we do not cover them here to avoid overcomplicating the discussion (Barravecchia et al., 2022). However, the four intermediate indicators and the *accuracy* values were determined for both databases from the perspective of the main DTs they cover (excluding those grouped into the "*least frequent DTs*" families), as reported in Table 14 and Table 15. As can be observed for both databases, the DTs with the lowest *accuracy* values are *articles* and *reviews*, confirming many of the considerations made

Table 14 Data-error statistics for the main DTs covered by the Scopus database. The intermediate indicators *tp*, *tn*, *fp*, and *fn* sum to the total number of analyzed documents (S = 27,734)

DT	*tp*	*tn*	*fp*	*fn*	S	*a*	*b*	*Accuracy*
Article	21,523	5,636	170	405	27,734	0.78%	1.85%	97.93%
Review	2,335	25,005	221	173	27,734	8.65%	6.90%	98.58%
Conference paper	1,763	25,842	75	54	27,734	4.08%	2.97%	99.53%
Editorial	557	27,038	135	4	27,734	19.51%	0.71%	99.50%
Letter	362	27,325	44	3	27,734	10.84%	0.82%	99.83%
Erratum	232	27,496	2	4	27,734	0.85%	1.69%	99.98%
Note	188	27,437	76	33	27,734	28.79%	14.93%	99.61%
Book chapter	8	27,673	1	52	27,734	11.11%	86.67%	99.81%
Short survey	21	27,697	2	14	27,734	8.70%	40.00%	99.94%
Data paper	2	27,732	0	0	27,734	0.00%	0.00%	100.00%
Retracted	1	27,730	3	0	27,734	75.00%	0.00%	99.99%

Table 15 Data-error statistics for the main DTs covered by the WoS database. The intermediate indicators *tp*, *tn*, *fp*, and *fn* sum to the total number of analyzed documents (S = 27,734)

DT	*tp*	*tn*	*fp*	*fn*	S	*a*	*b*	Accuracy
Article	21,597	5,770	96	271	27,734	0.44%	1.24%	98.68%
Review	2,371	25,059	184	120	27,734	7.20%	4.82%	98.90%
Proceedings paper	1,804	25,896	26	8	27,734	1.42%	0.44%	99.88%
Editorial material	686	26,810	19	219	27,734	2.70%	24.20%	99.14%
Letter	382	27,324	24	4	27,734	5.91%	1.04%	99.90%
Correction	233	27,500	1	0	27,734	0.43%	0.00%	100.00%

in Sect. "Results and discussion". Other problematic DTs in terms of *accuracy* are *editorials* (99.50%), *conference papers* (99.53%), and *notes* (99.61%) for Scopus, while for WoS, they include *editorial materials* (99.14%). Interestingly, the *accuracy* statistic somewhat combines the more specific information provided by *a* and *b*.

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