

Research Article

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The diversity, distribution, and taxonomic history of the Brazilian Tanaidacea (Crustacea)

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Abstract

Tanaidaceans have a worldwide distribution, with 36 families, 316 genera, and 1575 extant species described. This study aimed to compile the resulting taxonomic information for Brazilian waters obtained to produce the available online catalogue Taxonomic Catalogue of the Brazilian Fauna. Results show 63 species described for Brazilian waters: 30 Apseudomorpha and 33 Tanaidomorpha, distributed in 46 genera and 18 families. For apseudomorphan, Kalliapseudidae is the most diverse family (12.7%), followed by Apseudidae and Parapseudidae (9.5% each). For tanaidomorphan, Typhlotanaidae is the most diverse (15.9%) followed by Leptocheliidae (9.5%) and Tanaididae (7.9%). In Brazilian waters, more than 60% of Tanaidacea species are distributed in shallow waters (42 species; 63.6%), including continental areas, and about 1/3 are recorded from deep-sea (24 species; 36.4%). Southeast Region of Brazil holds most records with 46 occurrences, followed by the Northeast Region with 19 occurrences. Our results highlight the increasing number of publications and new Brazilian tanaid species in the last 15 years, and this is directly correlated to where specialists in alpha-taxonomy, systematics/phylogeny, and ecology are based in. Our current dataset also indicates an important aspect regarding the lack of taxonomic experts of Tanaidacea worldwide, but especially in Brazil. This study gives an overview of all the information that may help elucidate future research on the taxonomic diversity of tanaidaceans in Brazil, thus it is expected that this may encourage further studies and specialists for the group.

Introduction

The superorder Peracarida Calman, 1904 is considered one of the most widespread and adaptable groups among crustaceans. Characterized by direct development, where larvae transition directly into adults without free-swimming *nauplius* stages, peracarids currently encompass 11 recent orders (Lowry and Myers, 2013; WoRMS, 2024a), including Tanaidacea Dana, 1849. Tanaidaceans exhibit extensive morphological variety, with their body plan typically dorso-ventrally flattened, cylindrical, semi-cylindrical, or occasionally discoidal (Figure 1). Tanaidaceans have a global distribution, being found in all marine habitats and depths, including estuaries, albeit rarely in freshwater (Larsen, 2005; Błażewicz-Paszkowycz *et al.*, 2012, 2015; Pabis *et al.*, 2015). Due to their limited dispersal capabilities, species with wide distribution are uncommon and questionable, but still registered in few groups (e.g., *Chondrochelia dubia* (Krøyer, 1842), *Neotanais* spp., *Sinelobus stanfordi* Richardson, 1901, *Agathotanaia ingolfti* Hansen, 1913) (Gardiner, 1975; Sieg, 1986; Larsen, 2005 [Table IV, V, p. 291], 2013; Brandt *et al.*, 2012; Larsen *et al.*, 2015).

According to Anderson (2020) and the World Register of Marine Species website (2024b), there are currently 36 families, 316 genera, and 1575 species of recent Tanaidacea. In terms of biodiversity, is estimated that Tanaidacea could surpass 3000 species (Larsen, 2005) and the number of tanaids species might significantly increase in the coming years, mainly due to the expansion of material collected from numerous deep-sea (>200 m depth) expeditions, combined with the increasing interest in studying the group and advancements in taxonomy technology.

The deep-sea environment encompasses over 90% of the entire ocean, yet its extreme conditions make exploration significantly more expensive and challenging (Brandt *et al.*, 2004) compared to shallower waters, requiring specialized sampling tools (e.g. box-corers, epibenthic sledges, grabs, multicorers). As a result, collecting abiotic and biotic data is often linked to deep-sea expedition efforts conducted by political incentives to survey economic exclusive zones (EEZ), or by oil companies seeking baseline studies for environmental impact assessments.

Brazil is a country of continental dimensions (8516,000 km²) (Machado *et al.*, 2023), and has an extensive coastal zone, spanning the political regions North, Northeast, Southeast, and South. In the North Region littoral (Amapá and Pará), the coastline is characterized by the vast Amazon River delta, where the river meets the Atlantic Ocean, creating a blend of freshwater and saltwater habitats (Goes and Ferreira Jr, 2017); the Northeast Region (Maranhão, Piauí, Ceará, Rio Grande do Norte, Paraíba, Pernambuco, Alagoas, Sergipe, and Bahia) encompass an extensive coastline, with oligotrophic waters and a narrow and shallow continental shelf (40–80 m) (Knoppers *et al.*, 1999; Goes and Ferreira Jr, 2017; Guimarães *et al.*, 2020); the



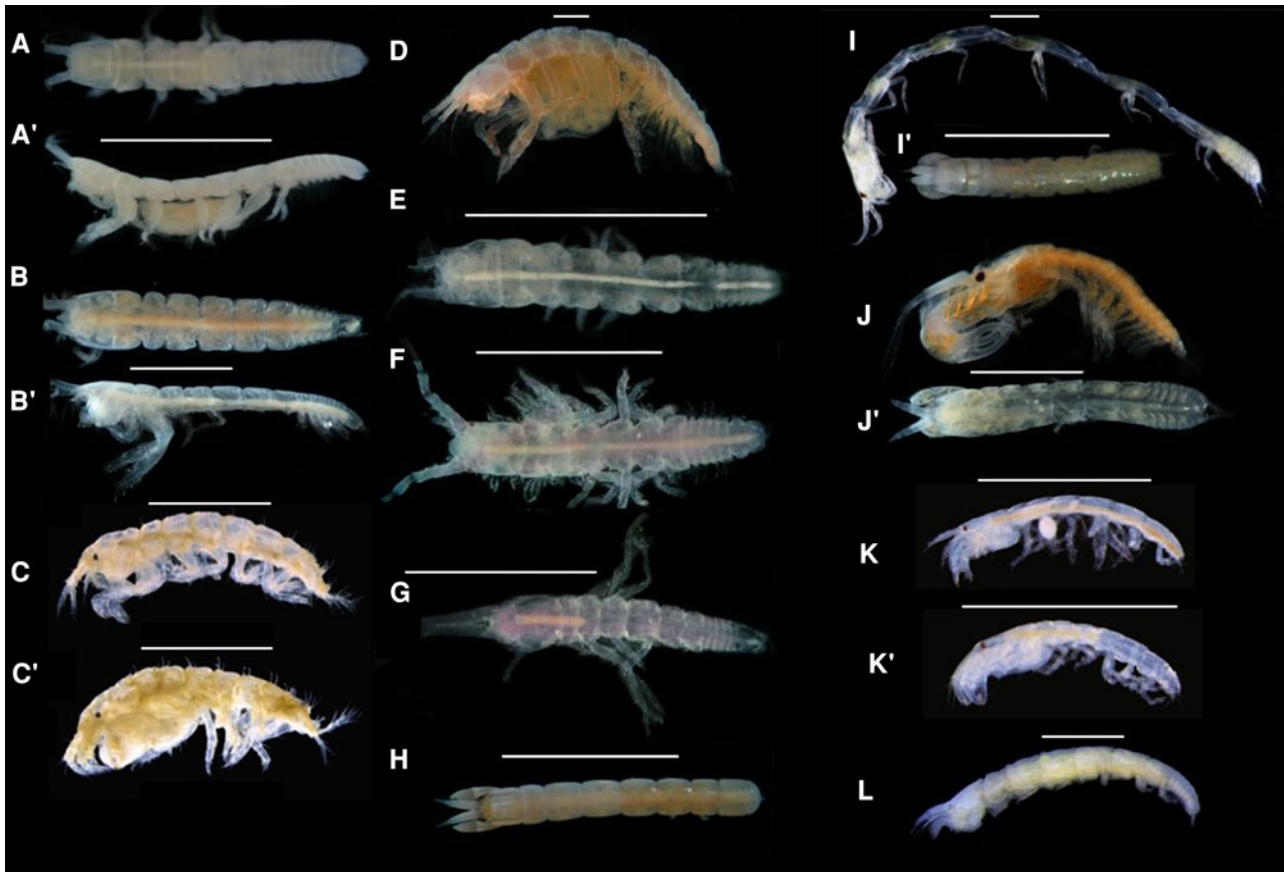


Figure 1. Morphological variety of Tanaidacea representatives of the Brazilian fauna. A, *Psammokalliapseudes granulosa* ovigerous female, dorsal (A) and lateral views (A'); B, *Bunakenia sudvestlantica* adult female, dorsal (B) and lateral views (B'); C, lateral view of *Apseudomorpha brasiliensis*, adult female (C) and male (C'); D, ovigerous female, lateral view of *Aapseudes noronhensis*; E, adult female, dorsal view of *Paraleiopus macrochelis*; F, adult female, dorsal view of *Calozodion bacescui*; G, adult female, dorsal view of *Parapagurapseudopsis carinatus*; H, adult female, dorsal view of *Paratanais coelhoi*; I, *Makraleptochelia potiguara*, adult male (lateral view; I) and female (dorsal view; I'); J, *Chondrochelia dubia*, adult male (lateral view; J) and female (dorsal view; J'); K, lateral view of *Pseudozeuxo fischeri*, adult female (K) and male (K'); L, adult female, lateral view of *Aremus brasiliica*. Scale bars A, B, D – J: 2 mm; C, K, L: 1 mm. Photos: Catarina Araújo-Silva (A, B, D – J); Juliana Segadilha (C, K, L). For taxon authority see suppl. Table.

Southeast Region littoral (Espírito Santo, Rio de Janeiro and São Paulo) presents the upwelling occurring along the coast of the Rio de Janeiro State, where the cold, nutrient-rich deep water is brought to the surface, influencing the benthic assemblages diversity (Bernardino *et al.*, 2016); and the South Region (Paraná, Santa Catarina and Rio Grande do Sul) has a series of coastal ranges with long stretches of beach and very few rocky shores, enclosed lagoons and lagoons connected to the sea (Goes and Ferreira Jr, 2017).

Despite Brazil ranks among the 17 most biodiverse countries on the planet, earning the distinction of 'megadiversity' (UNEP-WCMC, 2016) and Arthropods represents the group with the highest number of species (Machado *et al.*, 2023), significant knowledge gaps remain for a substantial part of taxa (Guțu, 1996). For example, in the Brazilian EEZ, covering a vast area of 3.6 million km², ranking 11th globally in terms of size (De Leo *et al.*, 2020), only 63 Tanaidacea species have been described to date (Segadilha, 2024). Moreover, there are Brazilian areas where knowledge and sampling efforts are lacking, as well as unexplored marine ecosystems such as canyons and slope (Marques and Lamas, 2006).

This paper is a compilation resulting from the 'Catálogo Taxonômico da Fauna do Brasil – CTFB' (Taxonomic Catalogue of the Brazilian Fauna), an online catalogue exclusive on the Brazilian fauna, a project that started in 2015. The CTFB database is constantly updated by over 500 zoological experts in their respective group (Santos *et al.*, 2020; Machado and Martins, 2022). There are over 130,000 valid animal species

represented in the CTFB, and almost 3500 crustaceans (from marine, freshwater and terrestrial environments, excluding fossils) are recorded to Brazilian territory. Currently, a list containing all valid species of Brazilian tanaidaceans is presented online. Detailed information about each taxon such as the hierarchy classification of species, year of publication, author's name, taxonomic status of the name, geographic distribution to Brazilian states and ecoregions, and bibliographic references can be freely accessed on the website <http://fauna.jbrj.gov.br>.

As for the present study, the authors give all information that will facilitate research on the taxonomic diversity of tanaidaceans in Brazil, presenting a comprehensive overview, and highlighting its historical taxonomic advancements. The database is also relevant since it shows Brazilian areas on which collection and research efforts should be concentrated.

Material and methods

Taxonomic information available in the CTFB website (<http://fauna.jbrj.gov.br>) was obtained from published papers with original descriptions, taxonomic revisions or checklists with species level identification provided. The CTFB database has been constantly updated (lastly updated in February 2024) and the higher-level classification for Tanaidacea adopted in the CTFB follows WoRMS (2024b). Data were extracted and compiled in an Excel spreadsheet, which was the basis for all analyses conducted in this study. Our dataset is organized first by family and then contains a list of species for each of these taxa.

Detailed information was obtained for each tanaidacean species described or reported for Brazil: author's name, year of description, complete literature, year of first record in Brazil, if endemic to Brazil, and the distribution in biogeographic regions (ecoregions), and Brazilian states (political subdivision).

Accumulation curve was generated based on the year of descriptions or the year that the species was first reported from Brazil, if this occurred only in subsequent papers. Graphics were generated in Excel and maps in Quantum GIS v. 2.16.3, then edited in Adobe Photoshop 2024.

Results and discussion

Historical Tanaidacea data

The first reference of Tanaidacea from Brazil was *Chondrochelia dubia*, made by Krøyer as *Tanais dubius*, representative of the suborder Tanaidomorpha Sieg, 1980, collected on the coast of Bahia (Krøyer, 1842; Brum, 1973, 1977). Guțu (1998), catalogued 29 species off Brazilian coast, comprising 17 of the suborder Apeudomorpha Sieg, 1980 and 12 of the suborder Tanaidomorpha. Larsen *et al.* (2009) updated this list up to 41 species, with 26 of Apeudomorpha and 15 of Tanaidomorpha.

Currently, a total of 63 tanaidacean species are registered from Brazil (suppl. Table; Segadilha, 2024): 30 Apeudomorpha species in 23 genera and six families and 33 Tanaidomorpha species in 23 genera and 12 families (Table 1). All three Tanaidomorphan superfamilies are represented: Neotanaoidea Sieg, 1980, Paratanaoidea Lang, 1949, and Tanaidoidea Nobili, 1906. Despite having nearly the same number of species described as the Apeudomorpha (30 spp.), the Tanaidomorpha (33 spp.) is the suborder with the highest number of families (12 compared to 6; Table 1).

Among the Brazilian apeudomorphan, Kalliapseudidae Lang, 1956 is the most diverse family with eight species (12.7%) divided into six genera, followed by Apeudidae Leach, 1814 and Parapseudidae Guțu, 1981 (six species each, 9.5%, divided into five genera each; Table 2). Among the tanaidomorphan, Typhlotanaididae Sieg, 1984 appears as the most diverse family with ten species (15.9%) divided into four genera, followed by Leptocheliidae Lang, 1973 with six species (9.5%) divided into four genera, and Tanaididae Nobili, 1906 with five species (7.9%) in five genera (Table 2).

Many authors, even foreigners, have been worked with Brazilian material describing new species. Until 2023, the author with more articles published of valid species of Tanaidacea described from Brazil was Juliana Segadilha (16), followed by Kim Larsen (9), Catarina Araújo-Silva, Modest Guțu and Cristiana Serejo (8 each), and Magdalena Błażewicz, Iva Nilce da Silva Brum and Kátia Christol dos Santos (5 each) (Figure 2).

Since the two first species described in Brazil in 1842 and later in 1849 by Dana (*Leptochelia brasiliensis* Dana, 1849), there was a gap of 100 years until the following species described by Mané-Garzón in 1949 (*Monokalliapseudes schubarti* Mané-Garzón, 1949) followed by Lang (1956) (*Psammokalliapseudes mirabilis*

Lang, 1956 and *Teleotanais gerlachi* Lang, 1956). During the second half of 19th century (1842–1900), six species were recorded from Brazil (Figure 3). Although *Tanais dulongii* (Audouin, 1826), *Hexapleomera robusta* (Moore, 1894), *Paradoxapseudes intermedius* (Hansen, 1895) and *Leptochelia forresti* (Stebbing, 1896) were first described offshore Brazilian waters, these species were reported to Brazilian coast in the second half of the following century (Brum, 1969, 1973; Sieg, 1980; Guțu, 1998) (see suppl. Table).

During the 20th century, a total of 33 species were recorded in Brazil. There was a slow growth on the cumulative number of tanaidacean species described from Brazil per year until the 1970s, with the Brazilian author Brum's works describing four species (Brum, 1971, 1973), among other authors (Figure 3; 1971–1975). After that, the second major increase occurred at the end of the 20th century, when Guțu (1996) published the major work about Brazilian Tanaidacea describing eight new species (Figure 3; 1996–2000). The growth has reached the average of 3.0 species described per 5 years in the last 20 years.

By the beginning of the 21st century (2001–present), 30 species have already been described, totalling 63 species reported to Brazil. The third major increase in the cumulative number of tanaidacean species was due mainly to two Brazilian authors: Santos, with four new species described (Santos, 2007; Santos & Hansknecht, 2007) and Araújo-Silva, with three new species described (Larsen *et al.*, 2009; Araújo-Silva and Larsen, 2010) (Figure 3; 2006–2010). At this point until nowadays, the growth has reached the higher average, with 7.25 species described per 5 years: six new species described until 2015 (five by Araújo-Silva and Larsen, 2012b; and Araújo-Silva *et al.*, 2013) (Figure 3; 2011–2015), seven described until 2020 (Segadilha *et al.*, 2018, 2019; Segadilha and Serejo, 2020) (Figure 3; 2016–2020), and nine described until the present moment (Iwasa-Arai *et al.*, 2021; Segadilha and Serejo, 2022; Segadilha *et al.*, 2023) (Figure 3; 2021–2023). This steep increase suggests that the total number of Tanaidacea species in Brazil is much greater than what was recorded in previous centuries, with less than a quarter of the 21st century almost 50% of the total species (30 species from 63) have been described.

It is relevant to emphasize that among these six points of great increase in the accumulation curve, five were due to four Brazilian authors, all of them women who were without permanent positions (such as professors in institutions), meaning that they were early-career researchers who received only temporary research scholarships, but who were essential for the tanaidaceans studies in Brazil. This highlights the importance of government investment in science, promoting equal opportunities between genders in academic careers and the need to encourage women in the field of taxonomy.

Tanaidacea distribution across Brazil

From the 63 species currently registered in Brazilian waters, only one species occurred in freshwater (*Halmyrapseudes spaansi* Băcescu & Guțu, 1975; 1.6%, suppl. Table) and four species

Table 1. Number of families, genera, and total species of Tanaidacea suborders occurring in Brazil.

Suborder	Superfamily	Family	Genus	Species
Apeudomorpha	-	6	23	30
Tanaidomorpha	Neotanaoidea	1	1	1
	Paratanaoidea	10	17	27
	Tanaidoidea	1	5	5
TOTAL		18	46	63

Table 2. Species diversity of each Tanaidacea genus occurring in Brazil. For taxon authority see suppl. Table.

Suborder	Family	Genus	Number of Species
Apseudomorpha	Apseudidae	<i>Apseudes</i>	2
		<i>Atlantapseudes</i>	1
		<i>Bunakenia</i>	1
		<i>Paradoxapseudes</i>	1
		<i>Carpoapseudes</i>	1
	Kalliapseudidae	<i>Acutihumerus</i>	2
		<i>Paraleiopus</i>	1
		<i>Postispinatus</i>	1
		<i>Mesokalliapseudes</i>	1
		<i>Monokalliapseudes</i>	1
		<i>Psammokalliapseudes</i>	2
	Metapseudidae	<i>Calozodion</i>	1
		<i>Vestigiramus</i>	1
		<i>Apseudomorpha</i>	1
		<i>Synapseudes</i>	2
	Pagurapseudidae	<i>Parapagurapseudopsis</i>	1
		<i>Pagurotanais</i>	1
	Parapseudidae	<i>Leptolicoa</i>	1
		<i>Pakistanapseudes</i>	1
		<i>Halmyrapseudes</i>	1
<i>Parapseudes</i>		1	
<i>Saltipedis</i>		2	
Sphyrapodidae	<i>Kudinopasternakia</i>	3	
Tanaidomorpha	Neotanaidae	<i>Neotanais</i>	1
	Akanthophoreidae	<i>Stenotanais</i>	2
		Leptocheliidae	<i>Chondrochelia</i>
	<i>Intermedichelia</i>		2
	<i>Leptochelia</i>		2
	<i>Makraleptochelia</i>		1
	Hamatipedidae	<i>Hamatipeda</i>	1
	Nototanaidae	<i>Nototanoides</i>	1
	Paratanaidae	<i>Paratanais</i>	2
	Pseudozeuxidae	<i>Pseudozeuxo</i>	1
	Tanaellidae	<i>Araphura</i>	1
		<i>Tanaella</i>	1
	Tanaissuidae	<i>Molotanaissus</i>	1
	Teleotanaidae	<i>Teleotanais</i>	1
	Typhlotanaidae	<i>Aremus</i>	1
		<i>Meromonakantha</i>	1
		<i>Paratyphlotanais</i>	2
		<i>Typhlotanais</i>	6
		<i>Zeuxo</i>	1
	Tanaididae	<i>Zeuxoides</i>	1
<i>Hexapleomera</i>		1	
<i>Sinelobus</i>		1	
<i>Tanais</i>		1	
TOTAL			63

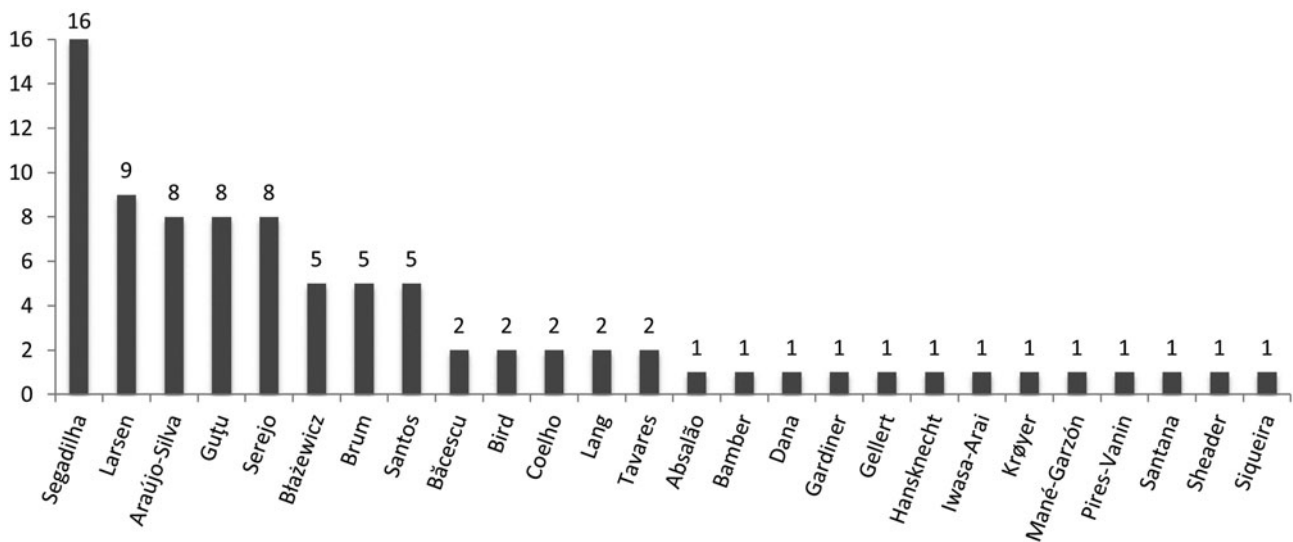


Figure 2. Number of valid species of Tanaidacea described from Brazil by authors until 2023.

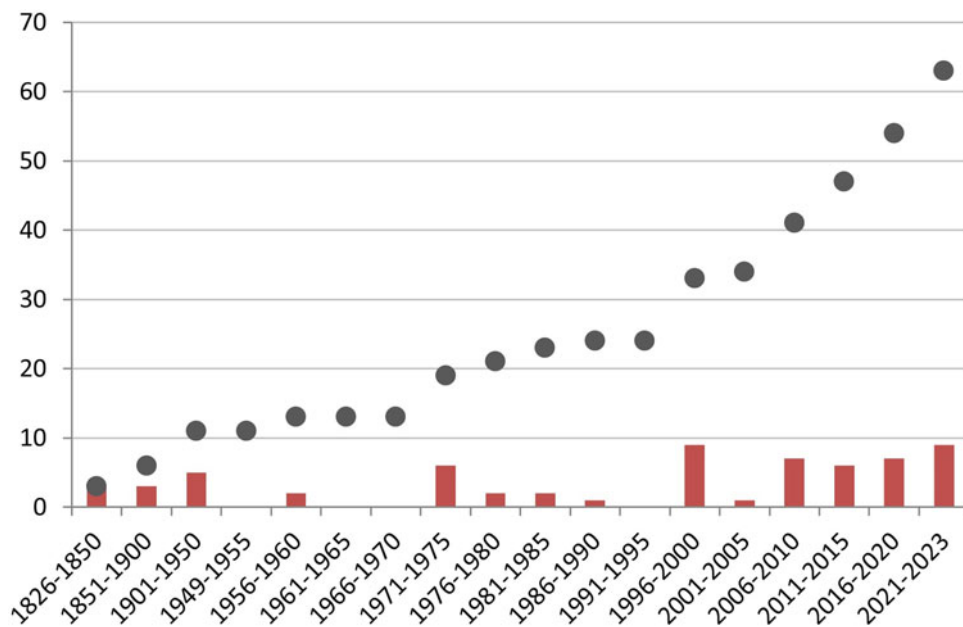


Figure 3. Accumulation curve of tanaidacean species described or reported from Brazil by year (histogram bars illustrate the number of species published per five years).

were recorded from brackish waters (estuary and mangroves; 6.3%, suppl. Table). According to Larsen & Hansknecht (2004) and Błażewicz-Paszkowycz *et al.* (2012), while 188 Tanaidaceans are predominantly found in the marine habitats, there are also some records from 189 brackish and freshwater habitats. The limited presence of brackish water species and the 190 specific conditions regarding the freshwater species indicate that tanaidaceans have not been 191 successful in colonizing inland waters (Larsen, 2005; Larsen *et al.*, 2015).

Regarding the marine environment, 38 species were recorded to shallow waters (coastal waters) and continental shelf (suppl. Table), whereas about 1/3 was registered to the deep-sea (24 species; suppl. Table), with five occurring in both shallow and deep waters: *Intermedichelia gracilis* Guțu, 1996; *I. jesseri* Araújo-Silva & Larsen, 2012; *Hamatipeda prolata* Segadilha *et al.*, 2019; *Makraleptochelia potiguara* Araújo-Silva & Larsen, 2012 and *Typhlotanais ischnochela* Segadilha and Serejo, 2022.

However, these results may be subject to bias as deep-sea studies have only begun to increase more recently. The first paper on tanaidacean found on the Brazilian slope was published by Guțu (1996), followed by samples collected from abyssal plains 13 years later by Larsen *et al.* (2009). This suggests that in the near future this difference may reduce or even the number of Brazilian deep-sea tanaidaceans may be greater than those from shallow areas.

Apeudomorphan species are predominantly shallow-waters taxa, with few groups extending their distribution to slope depths (Błażewicz-Paszkowycz *et al.*, 2012). In Brazil, from the 30 species registered, most occurred between 0 and 100 m depth (24 spp.; Figure 4), being from family Kalliapseudidae the most representative with nine species, followed by Metapseudidae with five species, Apeudidae and Parapseudidae with four species each and Pagurapseudidae with two. Only six species occurred below 200 m depth: three species of Sphyrapodidae Guțu, 1980

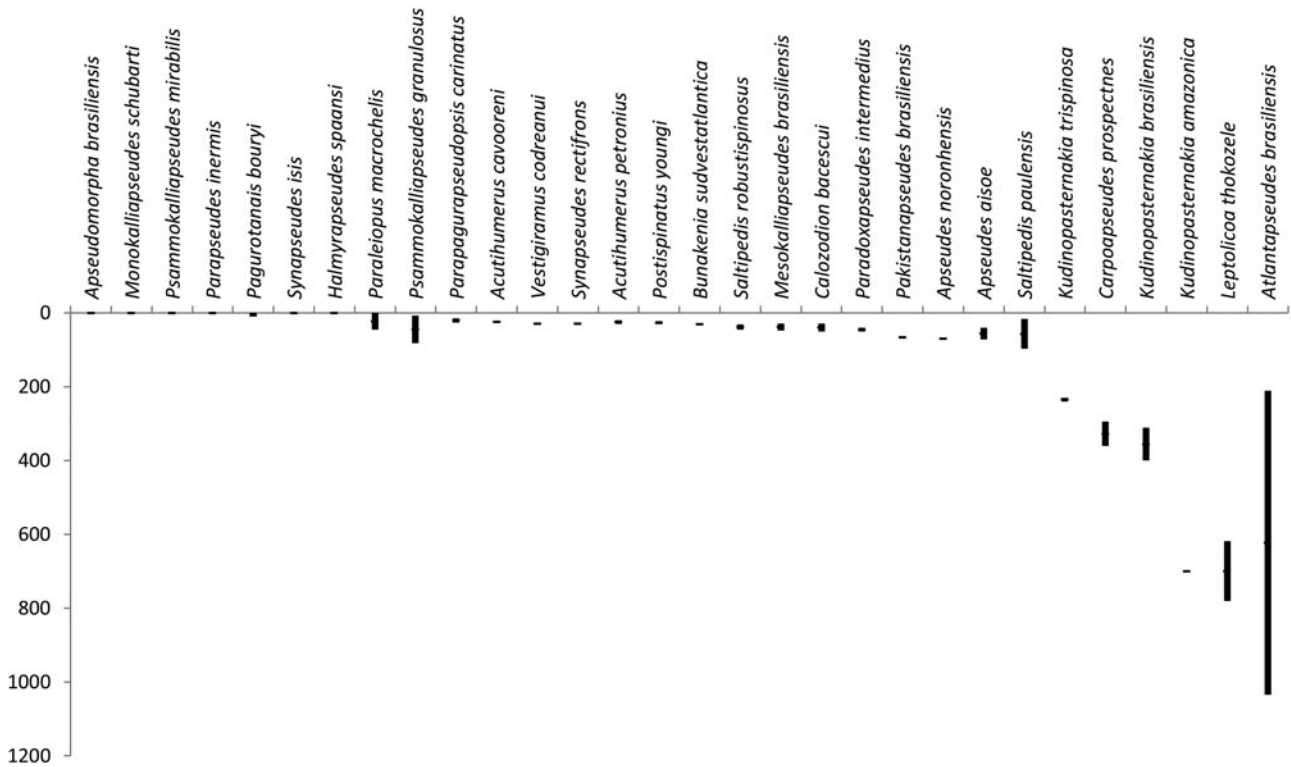


Figure 4. Bathymetric range of Brazilian species of suborder Apeudomorpha.

(*Kudinopasternakia amazonica*; *K. brasiliensis* and *K. trispinosa*), two Apeudidae (*Carpoapseudes prospectnes* and *Atlantapseudes brasiliensis*) and one Parapseudidae (*Leptolicoa thokozele*) (Figure 4) - for taxon authority see suppl. Table.

According to Błażewicz-Paszkowycz *et al.* (2012), within Tanaidomorpha, four families are predominantly shallow-water:

Tanaididae, Leptocheliidae, Mirandotanaidae Błażewicz-Paszkowycz and Bamber, 2009 and Paratanaidae Lang, 1949. In the Brazilian coast, 22 species were registered until 100 m depth, being Leptocheliidae the most representative (6 spp.), followed by Tanaididae (5 spp.), and Paratanaidae (2 spp.). Families represented in deep-sea in Brazil are: Typhlotanaidae, Tanaellidae,

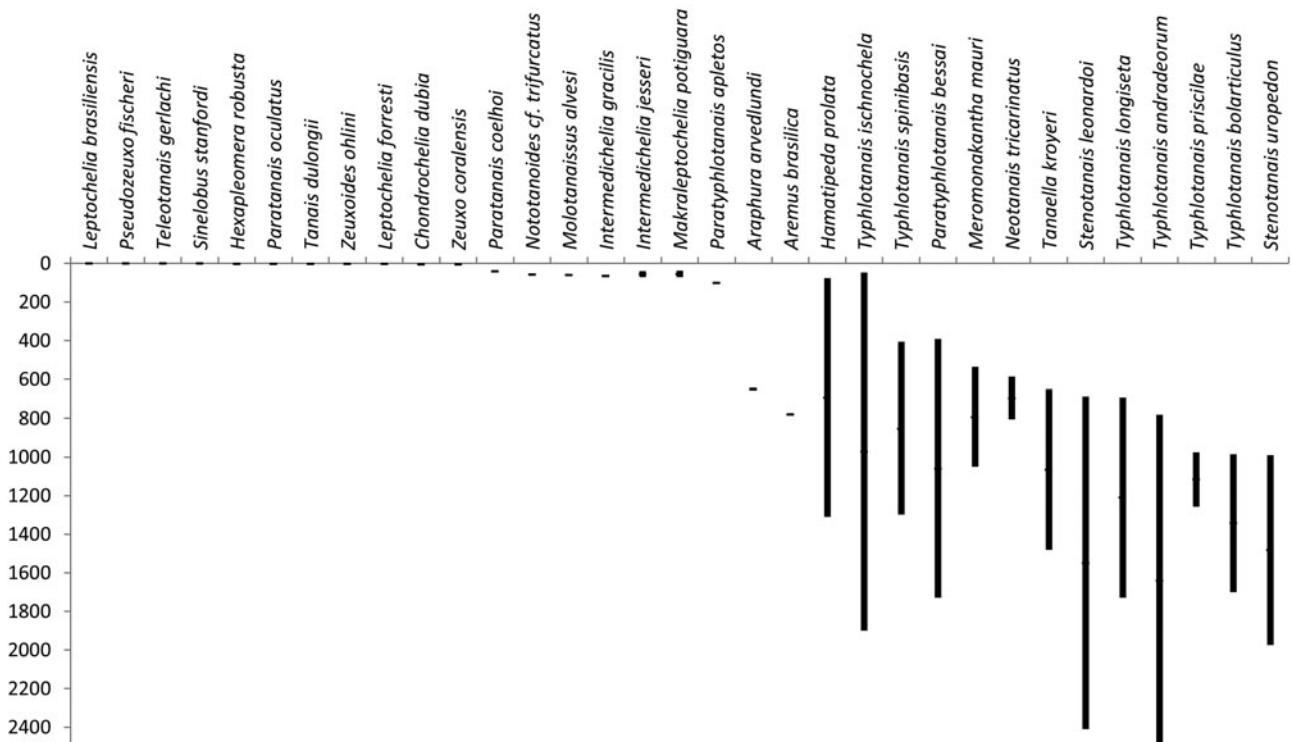


Figure 5. Bathymetric range of Brazilian species of suborder Tanaidomorpha.

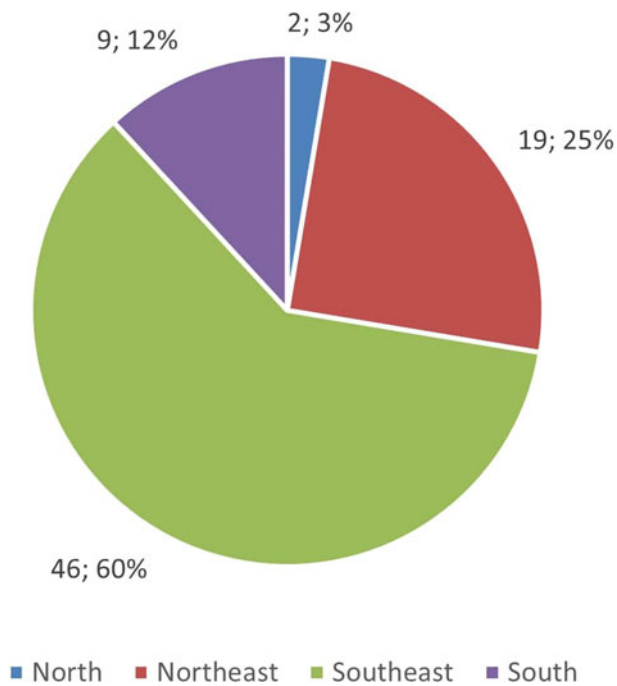


Figure 6. Number of Tanaidacea species records by regions of Brazil.

Neotanaididae, Akanthophoreidae, and Hamatipedidae (Figure 5). The species *Typhlotanais ischnochela* and *Hamatipeda prolata* had a wider range of depth occurring from continental shelf to lower slope (46–1898.7 m and 77–1310 m, respectively).

With this compile, it was possible to carry out a regional analysis of the diversity of Brazilian tanaids and track the under-sampling in some Brazilian areas. According to the present literature revision, the Southeast Region of Brazil holds the majority of Tanaidacea records with 46 occurrences (with 7 species occurring concomitantly in the South and 6 in the Northeast Region), followed by the Northeast Region with 19 occurrences. Poorly known Brazilian regions are the South with nine and the North with only two registers so far (Figure 6), though no region is considered adequately known. Moreover, the number of tanaidacean specialists seems to be directly related to the number of species records per region. The highest numbers of records are mainly due to localities in Brazil where taxonomists are based: Santos, Segadilha and Brum for Southeast Region, and Araújo-Silva for Northeast Region of Brazil (e.g. Brum, 1971, 1978; Santos, 2007, 2014; Araújo-Silva and Larsen, 2010, 2012a, 2012b; Araújo-Silva *et al.*, 2013; Segadilha *et al.*, 2019, 2023; Segadilha and Serejo, 2020, 2022).

The locations of oil prospecting sites where energy companies worked in Brazilian offshore certainly influenced the distribution of species records within the country. The states of Espírito Santo (12 spp.), Rio de Janeiro (35 spp.) and São Paulo (13 spp.) were the three most speciose states in Brazil (Figure 7), corresponding to the areas where the Petrobras Company oil conducted big deep-sea fauna projects in the last two decades (Falcão *et al.*, 2017; Segadilha and Serejo, 2022). Among the Brazilian coastline states, only Amapá, Maranhão, and Piauí have no records of Tanaidacea until now. In general, the North Region in Brazil is the least explored area in the country, with only two species registered to Pará state (Figure 7). This disparity is certainly the result of a lack of studies targeting local biodiversity, but it is also due to the Amazon river plume, which might have influence on the local fauna, changing the composition of species (Sumida *et al.*, 2020; Targino and Gomes, 2020). Nevertheless, further studies need to be conducted in these areas to confirm this influence on the number and the composition of tanaidacean species in the Brazilian North Region.

For instance, in Brazil, there is a significant amount of material from both deep-sea and shallow waters in zoological collections that remain unpublished (e.g. MNRJ, MZUSP, UFPE; C. Serejo, M. Tavares and J. Souza-Filho – pers. comm., respectively). This highlights that the lack of specialists remains an obstacle to the knowledge of the group, failures in sampling and/or treatment, and, most critical, funding for the development of pure science (Błażewicz-Paszkowycz *et al.*, 2012).

Conclusions

Our results highlight the increasing number of publications and new Brazilian species of Tanaidacea in the past 15 years, and this is directly correlated to where the specialists in alpha-taxonomy, systematics/phylogeny, and ecology are based. There is a vast sum of deep-sea and shallow-water material in the Brazilian zoological collections, however, remains unpublished.

Knowing about the current status of Brazilian taxonomy is a required step to establish future strategies to develop unfilled areas and overlooked groups (Marques and Lamas, 2006). An important key to understanding the biodiversity of a country is the ability to form taxonomists, as well as investment in science and technology. However, the taxonomy is currently maintained in a weak appreciation (Giangrande, 2003), reflecting the world's lack of interest in the area. As indicated by our current dataset, one important aspect that must be addressed in future studies is the lack of taxonomic experts of Tanaidacea, especially in Brazil.

None of the Brazilian specialists in the order Tanaidacea had permanent positions. All previous studies were carried out by students and researchers whose publications were funded by their own scholarships, one of the greatest problems faced by taxonomists in Brazil. And that is the Brazilian biodiversity challenge: an impasse between the lack of taxonomists and the urgent need for knowledge of our biodiversity, especially because many wild habitats are rapidly disappearing.

We conclude that the lack of specialists is still an obstacle to the future knowledge of the order, as well as failures in sampling and/or treatment and, most critical, funding for the development of alpha-taxonomy and pure science in Brazil. Currently, there is no research group in Brazil for order Tanaidacea and this must be changed soon. Authors hope that this paper will stimulate further studies on this group in the country, which is in urgent need of experts.

Finally, the overall knowledge on the Brazilian tanaidaceans still contains gaps that should be addressed in future studies. One great issue is the under sampled regions in the country. Future research efforts should focus on areas such as the North and South regions, although Southeast and Northeast regions should not be left out, as it is unlikely that the local fauna is not even close to being cataloged.

Supplementary material. The supplementary material for this article can be found at <https://doi.org/10.1017/S0025315424000808>.

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Data. Data supporting the conclusions of this article are available in full from the references listed below.

Author contributions. JLS concept of the manuscript, data analysis, manuscript writing, and discussion. CLAS concept of the manuscript, data analysis, manuscript writing, and discussion. All authors contributed to the draft provided critical feedback and helped shape the research. All authors read and approved the final manuscript.

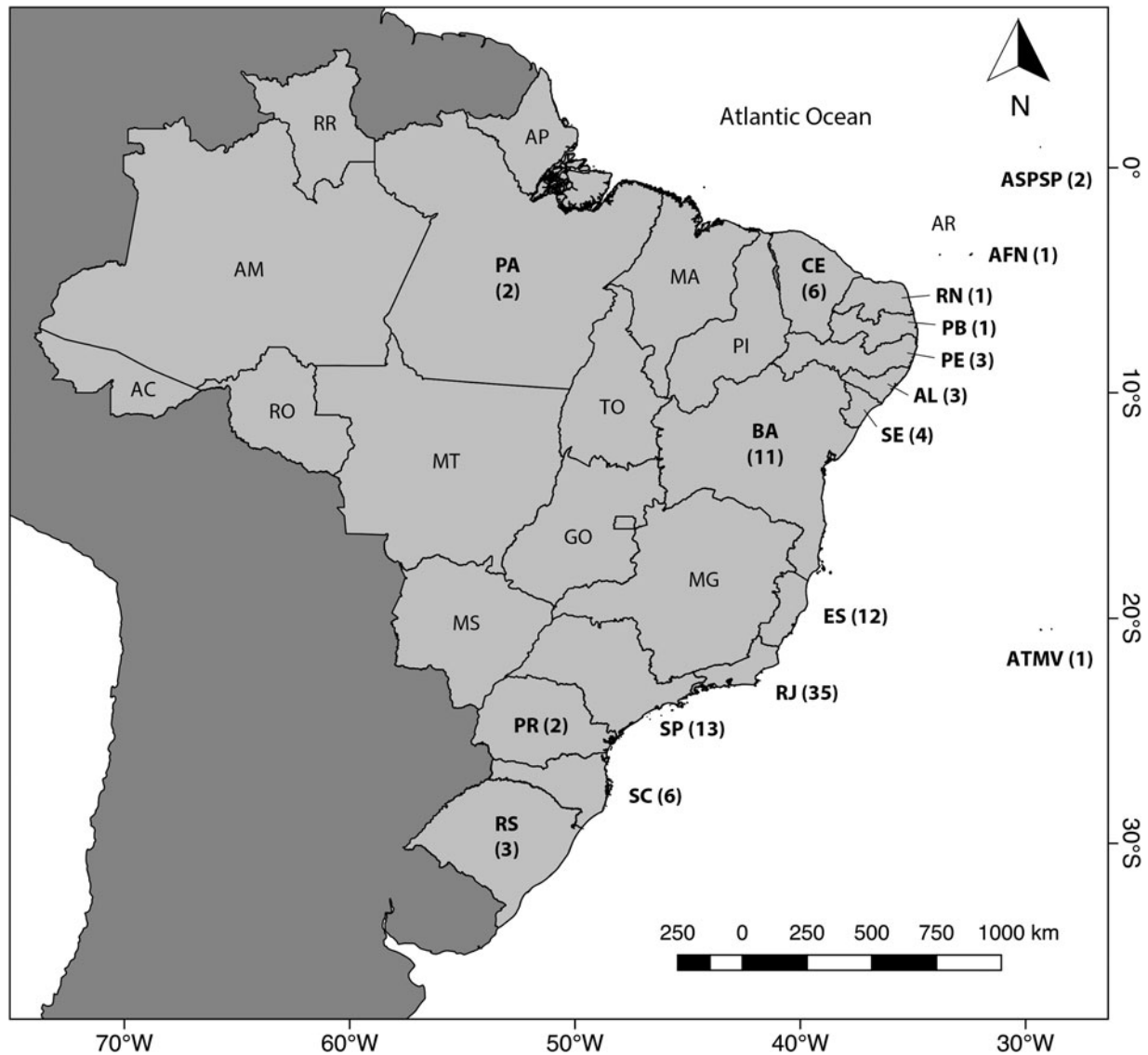


Figure 7. Map of Brazil showing the number of Tanaidacea species recorded for each one of the states and oceanic islands. States and Oceanic Islands abbreviations: AC, Acre; AL, Alagoas; AM, Amazonas; AP, Amapá; BA, Bahia; CE, Ceará; ES, Espírito Santo; FNA, Fernando de Noronha Archipelago; GO, Goiás; MA, Maranhão; MG, Minas Gerais; MS, Mato Grosso do Sul; MT, Mato Grosso; PA, Pará; PB, Paraíba; PE, Pernambuco; PI, Piauí; PR, Paraná; RA, Rocas Atoll; RJ, Rio de Janeiro; RN, Rio Grande do Norte; RO, Rondônia; RR, Roraima; RS, Rio Grande do Sul; SC, Santa Catarina; SE, Sergipe; SP, São Paulo; SPSA, São Pedro and São Paulo Archipelago; TO, Tocantins; TMVA, Trindade and Martim Vaz Archipelago.

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