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## THE BRAZILIAN BIBLIOGRAPHY ON CHAGAS DISEASE: SOME CONSIDERATIONS

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### ABSTRACT

This article presents data regarding bibliometrics on Chagas Disease. It also highlights the impressive number of publications by Carlos Chagas, one of the greatest Brazilian researchers of all time. The data showed that the number of published papers on Chagas disease did not decrease after the quarrel between Chagas and his opponents at the National Academy of Medicine.

KEY WORDS: Carlos Chagas; Chagas disease; bibliometrics.

### RESUMO

A bibliografia brasileira sobre a doença de Chagas: algumas considerações

Neste artigo, são apresentados dados bibliométricos sobre a doença de Chagas. Além de destacar o expressivo número de publicações por Carlos Chagas, um dos maiores pesquisadores brasileiros de todos os tempos, os dados mostram que o número de artigos publicados sobre a doença de Chagas não diminuiu após os desentendimentos entre Chagas e seus oponentes na Academia Nacional de Medicina.

DESCRITORES: Carlos Chagas; doença de Chagas; bibliometria.

In 1999, on the 90<sup>th</sup> anniversary of the discovery of Chagas Disease, at the request of the National Health Foundation in the Brazilian Ministry of Health, Aluizio Prata, eminent professor and researcher in the area of Tropical Medicine, published an extensive survey on the Brazilian scientific production regarding Chagas Disease. In 3 volumes, 18,615 publications were cited, including 10,048 full papers and 8,567 summaries (Prata, 1999). Works published by Brazilian researchers working abroad and by foreign researchers in Brazil can be found in this Brazilian bibliography and, although some articles on bibliometrics on Chagas Disease have been published in Brazil,

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much remains to be done. A critical inquiry into this bibliographic list will certainly bring some changes to certain statements which have been made about the acceptance or denial of the disease, since its description in 1909.

The first work published by Carlos Chagas on this matter was named “Nova tripanosomiase humana” (New human trypanosomiasis) (Chagas, 1909a). In the same year, Chagas published in Germany (Chagas, 1909b), and Oswaldo Cruz presented an author’s note in the National Academy of Medicine, dated November 22<sup>nd</sup> (Chagas, 1909c). In the previous year, 1908, Chagas had described a new species of *Trypanosoma* found in monkeys in Lassance, State of Minas Gerais. He named this species *Trypanosoma minasense* (Chagas, 1908).

In 1909, Chagas published 13 works related to his discovery, five of which were published in scientific journals abroad. In the next year, Chagas was invited to join the National Academy of Medicine, where he was awarded a special seat. He gave a much applauded lecture on October 26<sup>th</sup> 1910, that is to be found in the Annals of the Academy. In the same year nine articles were published in Brazil. It must be highlighted that these publications do not relate specifically to the human disease, but also to the ethiological agent and triatomines. In 1910 Arthur Neiva published his first work on the vector *Conorhinus megistus* (Neiva, 1910), and thereafter contributed greatly to the field of entomology. Curiously, Arthur Neiva never published with Carlos Chagas, although they were both from the Oswaldo Cruz Institute.

From the first publication on *Trypanosoma* in 1908, until 1935, when his last work appeared (Carlos Chagas died in 1934), there were 100 publications, and only 8 of these works were written in partnership. The first of these is a publication with Hartmann in 1911 on flagellates (Hartmann & Chagas, 1919), and later on, Chagas had as co-author Eurico Villela, his admired colleague for many years, (Chagas & Vilela, 1922a, 1922b). Later, together with H. Rocha Lima, a chapter in a book on Tropical Diseases was published in Germany (Chagas et. al, 1929). 3 other works were published in 1930 on electrocardiography (Chagas & Vilela, 1930a, 1930b, 1930c) and finally, Chagas and his son Evandro Chagas were co-authors in 1935, of the book “Manual de Doenças Tropicais e Infecciosas” (Manual of Tropical and Infectious Diseases) (Chagas & Chagas, 1935).

It must be noted that at that time solo publication were the norm. Perhaps, in order to reinforce this idea, it must be remembered that Belizário Penna, who came to Lassance with Chagas from the beginning in order to fight malaria, was already Chagas’ friend, at least since 1905, when Penna stated he visited Chagas at his home with Oswaldo Cruz, who was both their superior. Penna was also with Chagas, when the engineer Cantarino Motta told them about the presence of insects in the homes. Penna helped Chagas to capture these insects in the huts. He was present when Chagas performed the

two autopsies at Lassance (Katz, 2010a), yet never claimed co-authorship on any subject relating to Chagas' publications. It must be remembered that some years later Belizário Penna would write "Saneamento no Brasil" (Sanitation in Brazil) which would also become a classic on this topic (Penna, 1918).

Although, only 8% of Chagas' publications present co-authorship, his support, invitation and encouragement to many researchers to produce studies on this new disease is well known. Examples of this are Emmanuel Dias (his godson), Arthur Neiva, Evandro Chagas (son), Hermann Lent and Astrogildo Machado, among others.

Other authors published immediately after the discovery of Chagas Disease. In 1909, there is only one publication, which is a comment made by Horta during a meeting of the Medical and Surgical Society, in Juiz de Fora, Minas Gerais (Horta, 1909), but in the following year the aforementioned work by Neiva (Martins & Tupynamba, 1940) appears as well as one by Vital Brazil (Vital, 1910). In 1911, there are 13 articles, and the publications will increase from there. In Table the number of papers published annually by Chagas and the total work appearing in Brazil from 1909 to 1935 may be appreciated. There were a total of 470 articles, 370 of these by other authors, and 100 articles by Carlos Chagas. It is noteworthy that soon after the discovery of Chagas Disease in Minas Gerais, studies carried out in other Brazilian states confirmed Chagas' work. Among these is the State of Bahia, where the great French parasitologist E. Brumpt, together with Pirajá da Silva, who discovered Schistosomiasis in Brazil, published a paper on the presence of the infected vector (Brumpt & Pirajá da Silva, 1912, 1913). Moreover, in 1912, Brumpt published 3 other articles about this parasite in the same French journal, as a result of his sojourn in Brazil. The following year he found *Rhodnius prolixus* in Venezuela (Brumpt & Gonzales, 1913). From 1911 to 1919, Brumpt published 16 papers on Chagas Disease, its vector and also created the xenodiagnosis method, which was applied for decades. Then came the works from the State of Mato Grosso, and by the same author studies from Rio de Janeiro to Cuiabá (Campos, 1913a, 1913b). Carini & Maciel (Carini & Maciel, 1914) found Chagas Disease in São Paulo and also studied the distribution of triatomines in the State; successively in the State of Paraná (Araujo, 1919); Rio Grande do Sul (Oliveira, 1920); Pará (Araujo, 1922); Ceará (Dias, 1923), and so on. When Mazza (1934) and collaborators (Mazza & Cornejo, 1934) published their work in Argentina, which was considered by many as a new milestone in Chagas Disease, some Argentinian scientists suggested it should be called Chagas-Mazza Disease although over 400 articles had already been published in Brazil. This number may, however, be considered excessive for the period. Concomitantly, entomological surveys showed the wide distribution of triatomines in Brazil and in other countries in the American continent.

*Table.* Number of papers published by Carlos Chagas and the total number in Brazil on American trypanosomiasis from 1908 to 1935.

YEAR	PAPERS PUBLISHED	
	BY CARLOS CHAGAS	IN BRAZIL
1908	1	1
1909	13	14
1910	10	12
1911	11	24
1912	6	21
1913	3	24
1914	0	25
1915	0	13
1916	7	11
1917	0	3
1918	7	13
1919	0	20
1920	5	11
1921	2	4
1922	4	11
1923	2	28
1924	4	16
1925	5	21
1926	3	12
1927	3	21
1928	5	18
1929	2	17
1930	5	28
1931	0	13
1932	1	18
1933	0	7
1934	0	34
1935	2	28
<b>TOTAL</b>	<b>100</b>	<b>470</b>

The significant number of papers published before Chagas died, seems to belie the idea that his discovery was not considered relevant at the time. In 1940, Martins & Tupynambá wrote that the lack of publications on schizotrypanosis outside Lassance was due to discredit regarding the disease, on the one hand owing to the initial exaggeration about the disease, placing together ethiologically different syndromes and, on the other hand, “the intense demoralizing campaign headed by personal enemies of the great master” (Martins & Tupynamba, 1940).

In fact, this affirmation, which has since been repeated by several authors, was questioned by Leal in 1946. With the interesting title: “Oportuno, expressivo e convincente balanço das atividades científicas à cerca da Moléstia de Chagas no período de 1920 a 1930” (An opportune, expressive and convincing statement of scientific activities on Chagas Disease, from 1920 to 1930), one can read “it has been said that since 1920 there had been, I will not say a pause, but intermittence in the application rate of studies on that parasitosis” (Leal, 1946). Leal quoted several important works published in that decade, namely: In 1920, the observations by Gastão de Macedo in Rio Grande do Sul; in 1921, Periassú, on vectors, especially the triatomine insects; also Neiva & Pinto, with important investigations on the systematics and biology of sucking *Reduvidae* and, also works by Ezequiel Dias, Marques Lisboa, Samuel Libanio, Eurico Villela, Marques da Cunha, Margarinos Torres and many other authors (Leal, 1946). More recently, Coutinho & Dias (1999) suggested again that due to “Carlos Chagas’ enemies” such as Afranio Peixoto, the disease was excluded from the medical curricula.

It is possible that the 20s were chosen, since it was in the early years of this decade that the famous and exhausting debates in the National Academy of Medicine occurred. Afranio Peixoto, Figueiredo Vasconcelos and Parreiras Horta tried unsuccessfully to question Carlos Chagas’ discovery and the importance of the disease that has his name. It is well known that in the end the committee formed by the Academy was completely favorable to Carlos Chagas (Katz, 2010b).

As can be seen in Figures 1 and 2 and Table 1, the number of papers published increases from 1911 to the 1970s, when there is an exponential increase of Brazilian publications on Chagas Disease. In the 1920s there were 70 papers published from 1920 to 1924, and 89 papers from 1925 to 1929 on Chagas Disease. From 1930 to 1939, 203 papers were published (Figure 3). There is always an increase and never a decrease in the number of scientific papers published.

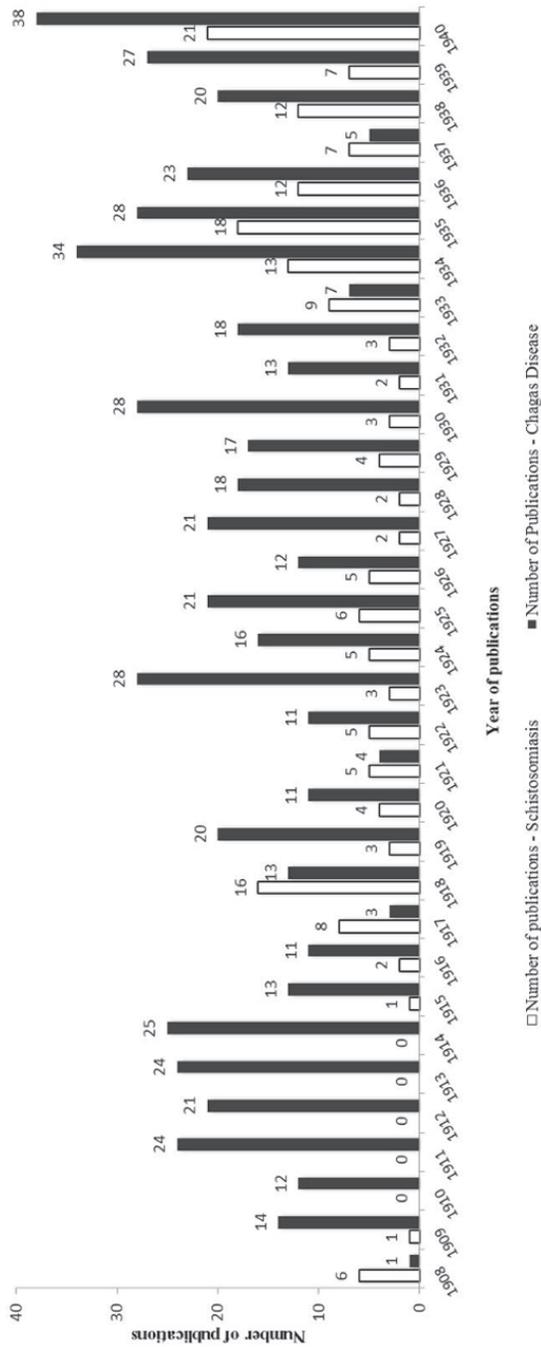


Figure 1. Number of publications on Schistosomiasis and Chagas Disease in Brazilian scientific Journals over the years (1908 – 1940).

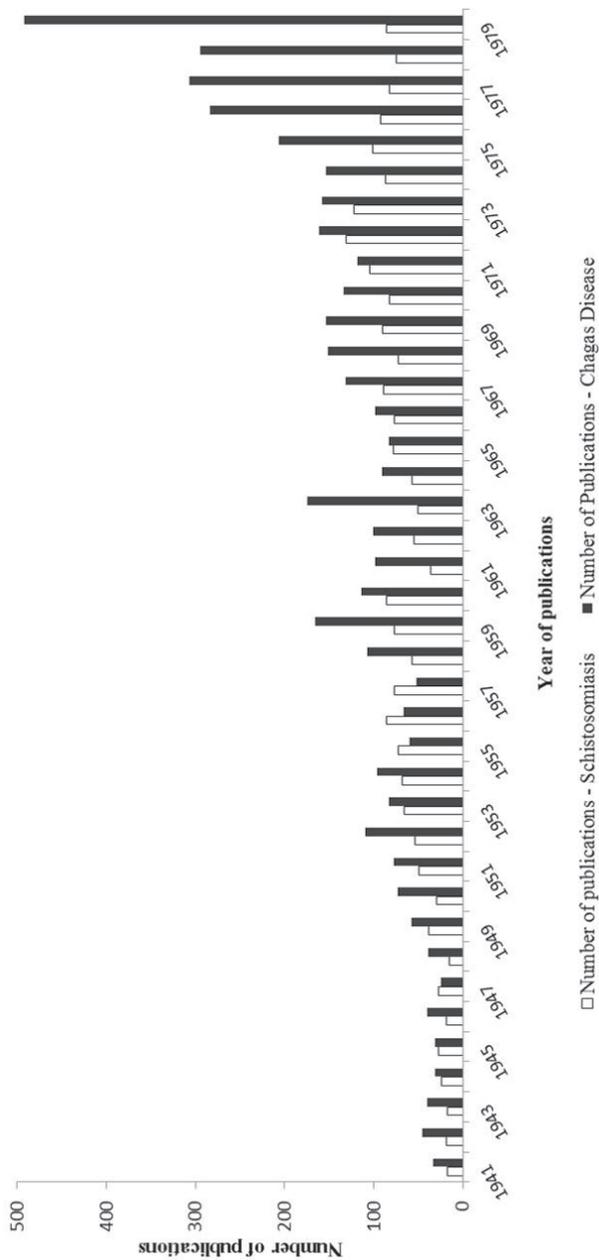


Figure 2. Number of publications on Schistosomiasis and Chagas Disease in Brazilian scientific Journals over the years (1941 – 1979).

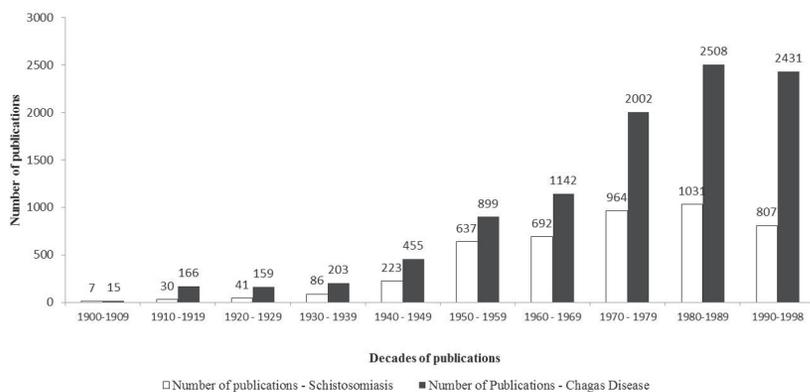


Figure 3. Number of publications on Schistosomiasis and Chagas Disease in Brazilian scientific Journals over the decades (1900 – 1998).

A similar pattern may be noted regarding the Brazilian bibliography on Schistosomiasis, although there has always been a greater number of publications on Chagas Disease.

Schistosomiasis was discovered in Brazil in 1908, by Pirajá da Silva, in the State of Bahia. It is worth remembering that *Schistosoma mansoni* was considered a new species, in relation to *Schistosoma haematobium*, discovered by Bilharz, in 1853, after the description by Sambon, 1907 (Sambon, 1907). Pirajá da Silva described the morphology of the worms, eggs, eclosion of miracidia, including the discovery of snails shedding cercariae (Katz, 2008; Piraja da Silva, 1908a, 1908b, 1908c). Pirajá da Silva published only 6 articles on Schistosomiasis in Brazil, differently from Chagas, who published a great number of scientific works on different aspects of the disease that has his name. In the 1990s, a survey was carried out on Brazilian literature dealing with Schistosomiasis and presented as an on-line edition (Katz et al., 1994). This bibliographic survey was updated in 2008, the year of the centennial of the discovery of Schistosomiasis in Brazil (Carvalho & Katz, 2008), and later another edition appeared in print (Carvalho et al., 2009). In this last edition, 4,971 full articles were recorded published from 1908 to 2007 in Brazil. Data from these bibliographies (Carvalho & Katz, 2008; Carvalho et al., 2009; Katz et al., 1994) and Prata’s bibliography (Prata, 1999) are recorded in Figure 1, 2 and 3. As can be seen, publications on Schistosomiasis were also few up to 1950, when an expansion starts, which will also grow significantly from 1970 onwards. Therefore, we can conclude that the number of papers published on

Chagas Disease did not decrease after the quarrel that happened between Chagas and his opponents Afrânio Peixoto, Figueiredo Vasconcelos and Parreiras Horta in the National Academy of Medicine, and the number of publications varied according to the scientific development situation in the country.

In conclusion, the data on bibliometrics here presented allow new conclusions and opens a perspective for investigation of the Brazilian scientific production on Chagas Disease, as well as highlighting the remarkable number of publications by Carlos Chagas, one of the greatest Brazilian researchers of all time.

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