

**150**

**Annales  
Universitatis  
Paedagogicae  
Cracoviensis**

**Studia ad Didacticam  
Biologiae Pertinentia III**

**Editor-In-Chief**

dr hab. Katarzyna Potyrała, prof. UP, Pedagogical University of Cracow, Poland

**Assistant Editor**

dr Karolina Czerwiec, Pedagogical University of Cracow, Poland

**Editorial Board**

dr hab. Kazimierz Karolczak, prof. UP, Pedagogical University of Cracow, Poland

dr hab. Ali Gunay Balim, Dokuz Eylül University, Izmir, Turkey

dr hab. Natalia Demeshkant, prof. National University of Life and Environmental Sciences of Ukraine, Ukraine

prof. dr Sibel Erduran, University of Limerick, Ireland

dr Emmanuella Fouchereau, University of Burgundy, Dijon, France

prof. dr André Giordan, University of Geneva, Switzerland

prof. dr John R. Jungck, University of Delaware, USA

prof. dr hab. Elżbieta Lonc, University of Wrocław, Poland

dr hab. Małgorzata Nodzyńska, Pedagogical University of Cracow, Poland

dr hab. Andrzej Rzepka, prof. UP, Pedagogical University of Cracow, Poland

dr hab. Robert Stawarz, prof. UP, Pedagogical University of Cracow, Poland

doc. dr hab. Milada Švecová, Charles University in Prague, Czech Republic

dr hab. Bożena Witek, prof. UJK, Jan Kochanowski University in Kielce, Poland

**Reviewers**

prof. dr Halil Aydin, Dokuz Eylül University, Izmir, Turkey

prof. dr Dany Azar, University of Lebanon in Beirut, Lebanon

dr hab. Jacek Bielecki, prof. University of Warsaw, Poland

prof. dr hab. Martin Bílek, University of Hradec Králové, Czech Republic

dr hab. Małgorzata Grodzińska-Jurczak, Jagiellonian University, Poland

dr Olivier Galibert, University of Burgundy, France

prof. dr hab. Adam Kołataj, Institute of Genetics and Animal Breeding PAS, Jastrzębiec, Poland

prof. dr Daniel Raichvarg, University of Burgundy, France

dr hab. Ligia Tuszyńska, prof. University of Warsaw, Poland

dr hab. Ilona Żeber-Dzikowska, Jan Kochanowski University in Kielce, Poland

© Copyright Wydawnictwo Naukowe UP, Kraków 2013

ISSN 2083-7267

Journal website:

[www.bioannales.up.krakow.pl](http://www.bioannales.up.krakow.pl)

**Wydawca**

Wydawnictwo Naukowe UP

30-084 Kraków, ul. Podchorążych 2

tel./fax (12) 662-63-83, tel. (12) 662-67-56

e-mail: [wydawnictwo@up.krakow.pl](mailto:wydawnictwo@up.krakow.pl)

Zapraszamy na stronę internetową:

<http://www.wydawnictwoup.pl>

druk i oprawa Zespół Poligraficzny UP, zam. 11/14

*Mariana Sanmartino*

## **Incorporating sub-universes to address the issue of chagas in different educational contexts**

### **Introduction**

Chagas has been traditionally addressed just from a biomedical point of view; however, its multiple factors, the diverse actors involved and the distinctive features of current scenarios make it necessary to regard it as a really complex problem (Sanmartino 2006, 2009). The perspective we present aims at going beyond the reductionist and stereotyped viewpoints that consider it “a disease of the poor”, restricted to rural areas and to the biomedical concern. Therefore, to adopt an integral approach, we define four large dimensions, whose dynamic combination of elements conveys the complexity of the problem (Sanmartino et al. 2012a). Basically, these four dimensions are defined as follows:

The biomedical dimension includes features ranging from the biology of the causal agent and vectors, to medical issues regarding the disease manifestation, its diagnosis, its treatment and its transmission.

The epidemiologic dimension concerns the aspects that characterize the situation from a population point of view, using parameters – such as prevalence and incidence, distribution and infestation rates. The phenomenon of the growing immigration that influences the configurations of the problem is also considered in this dimension.

The sociocultural dimension is related to home conditions, cultural patterns, environmental management, the distinctive features of both rural and urban contexts, and social representations, conceptions and assessments (among others, discrimination or prejudice,).

The political-economic dimension regards, apart from the economic and macroeconomic conditions that affect the problem, the features related to public management and health, educational, legislative and economic decisions, at local, regional and global levels.

This viewpoint requires a careful analysis both of the actions taken until now and of the current situation, in order to develop contextualized, effective and long-term solutions concerning health, politics, research, education and communication.

To this end, the inclusion of representatives of other sub-universes different from the scientific and medical care ones is essential and is certainly a challenge. We agree with the anthropologist Byron Good (1994) who, from a critical view on the scientific work, defines the “scientific world” as *one of several worlds or “sub-universes” in which we live, worlds which include those of religious experience, of dreams and fantasies, or music and art, and of the “common-sense” reality.*

In this sense, art, science and popular knowledge are dynamically combined in a series of proposals that consider the Chagas problem beyond dichotomies and traditional approaches. Aranda Zamudio (2011) states that *science explains; art conveys*, and considers that *both science and art are part of a community where results are judged, integrated, assessed and contextualized* (Zamudio 2011). For this reason, since art affects and touches people in a way that science could never do, artistic expressions that somehow talk about Chagas are powerful, since they provide a sensitive and deep interpretation of issues of the sort (Sanmartino 2011a).

With our proposals, we attempt to encourage those who address this problem –from any area and discipline – to do so in a different way, respecting all voices and views (Sanmartino et al. 2012b, Sanmartino 2011a).

### **Education, communication and Chagas**

During the last decades, the knowledge about the problem of Chagas has increased significantly, both in the scientific field and among health authorities in general (*Organización Mundial...*, 2007). Nevertheless, irrespective of this progress, a continuous adaptation to new rural and urban realities and to globalization is required (Briceño-León, Galvan 2007). This *continuous adaptation* needs the inclusion of new points of view and, according to Morel (1999), *we have no choice but to be imaginative, flexible and devoid of prejudices in the selection of the new priorities that will shape our next research agenda.* We consider these words to be valid even beyond research agendas. Therefore, in the light of this, we also believe we have no other choice but to contemplate and add all the useful elements that enable the analysis of this issue from the greatest possible number of sub-universes (Sanmartino 2006, 2009, 2011a, 2011b).

We consider that an integral approach directed not only to preventing the disease, but also to promoting health in affected populations is substantial. As Briceño León and Galván (2007) assert, the solution to Chagas disease given at the beginning of the 21<sup>st</sup> century cannot be developed exclusively through an entomologic or medical perspective, but in a broader social and health context, and taking into consideration the different government levels and society in general. Besides, since a serious and responsible debate on the issues presented here is needed, communication and education are essential tools. However, not only are they essential for the people directly affected by the disease, but also for those who discriminate, who look the other way, who take decisions, who investigate, diagnose and prescribe medicines,

and who communicate and educate. Therefore, communication and education are needed not only to inform, but also to raise awareness, challenge and engage.

By considering the role that education plays in issues like Chagas, we make reference mainly to scientific, environmental and health education. Generally, these areas refer to the curricula of the compulsory education that starts in kindergarten, where given knowledge and different types of approach have been criticized. Criticism refers to content and resource fragmentation, decontextualization and lack of update, the predominance of traditional teaching approaches (based on the transmission/reception model), and the incoherence between the science taught and the students' educational demands (Díaz 2004; Pozo, Crespo 1998). These aspects frequently lead to a lack of interest in and motivation for studying (Giordan et al. 2001). There are other places that simultaneously address issues related to natural sciences, environment and health, such as science clubs, museums, zoos and social organizations. Many of the proposals presented at these places and those developed at schools are an attempt to improve the previously mentioned aspects, through innovations in education.

In this sense, we state that by understanding the various elements that are involved in the production of non-conventional<sup>1</sup> didactic environments<sup>2</sup> when referring to Chagas, it is possible to reinforce the role of communication and education in the struggle against the disease, through *the modification of the huge distance separating labs, congresses and publications from the affected populations* (Pintos Dias, Borges Dias 1993).

On the other hand, as Aranda Zamudio (2011) explains, *spectators external to science and art also incorporate their own criteria coming from the personal experience, from multiculturalism*. Thus, this challenge of combining different "sub-universes" to address an issue like Chagas motivates the participants' creativity, encouraging them to develop a critical stance, to judge, to argue, to explain phenomena, to create objects, or to solve problems (Zamudio 2011).

From these observations, we promote the use and development of non-conventional strategies and resources referring to Chagas as good "excuses" to address it and to encourage its treatment in different educational contexts. This is valid not only for those who live with the problem, but also for those who, being out of risk, are indifferent to this really important regional reality.

---

<sup>1</sup> We understand that a **non-conventional** educational experience or approach referred to Chagas is the one that introduces innovative elements (new communication technologies, artistic expressions, games, etc.) or that involves actors/scenarios other than traditionally biomedical or institutional ones (social organizations, patients groups, artists from various disciplines, etc.).

<sup>2</sup> The concept of **didactic environment** has been developed by Giordan et al. (2001) and can be defined as a group of *didactic resources and strategies*. By *didactic resource*, we understand the group of educational elements available for the teacher or entertainer to make the learning process easier for the student, and by *didactic strategy*, the organization of a classroom, an entertaining event, a club or a theatrical museum that can involve different situations, activities and types of intervention.

## Resources and strategies

Next, a number of concrete examples arising from non-conventional proposals and approaches referring to Chagas are mentioned. We think they are interesting tools that can be used to deal with the issue in different educational contexts (Sanmartino 2011b).

### Paintings

- the series of paintings called *CHAGAS* of the Argentinian plastic artist Néstor Favre-Mossier, which includes 14 oils made between 2007 and 2008 as a result of an interesting personal journey. These paintings talk about different aspects of the issue (vectors, parasites, vectorial transmission, reservoirs, disease, original context) and, at the same time, make us reflect on the particular way of addressing the issue by the artist.



“DONDE COMO” (WHERE I EAT)  
Óil on canvas, 80 x 100 cm. 2007.



“MALA SANGRE” (BOILING BLOOD)  
Óil on canvas, 80 x 100 cm. 2007.

Both paintings belong to the World Health Organisation

### Songs

- *Vinchuca* (*Kissing Bug*) is a reggae song composed and performed by Renée Asteria<sup>3</sup>. The song makes reference to different types of kissing bugs, their blood-sucking habit and some risk factors.

#### *Vinchuca*<sup>4</sup>

Han Visto Vinchuca?  
La Negra, La Rubita ...  
Han visto Vinchuca?  
Que chupan la sangre...

<sup>3</sup> Independent music producer who mixes Latin styles and Caribbean rhythms and deals with issues about public health. Renée Asteria is Magister in Public Health (University of California, Berkeley, USA) and currently, apart from producing music, she works as a teacher in high schools and as a research assistant in the University of California.

<sup>4</sup> <http://www.myspace.com/music/912988/songs/48419455>

Asesino escondido...  
 De qué está hecho tu techo?  
 Afata Poleo Afata Poleo...  
 Refugio para el asesino...  
 Gallinas Cerdos Cabras Caballos  
 Dónde dónde dónde duermen tus caballos  
 Sangre para el Asesino  
 (Renée Asteria 2007)

- *La Vinchuca* (*The Kissing Bug*) is a *milonga*<sup>5</sup> composed by José Luis Serrano and performed by Doña Jovita<sup>6</sup>. The lyrics refer to aspects related to the vectorial transmission of Chagas, the vectors' habits and some consequences of the disease.

***La Vinchuca***

Para el año del terremoto  
 tuve en el rancho un cimbrón  
 se descolgó un chaparrón  
 de cien vinchucas golosas  
 y me picaron las mozas  
 desde la nunca al garrón.  
 Chuparon toda la noche  
 dejándome el cuero seco  
 cagaron al lado del hueco  
 y yo me empecé a rascar  
 me rasguñé hasta el ojal  
 que hasta me salieron flecos.  
 Para qué me habré rascado  
 de esa manera imposible  
 el parásito temible  
 estaba en la caca del bicho  
 y sentí un frío de nicho  
 en mi destino terrible.  
 De vez en cuando me viene  
 un sacudón en el pecho  
 no son gases ni es afrocho  
 es que tengo mal de Chagas  
 es la muerte que me amaga  
 y que cayó de los techos.

(José Luis Serrano 1994)

---

<sup>5</sup> Translator's note: *milonga* is a folk music style of Argentina.

<sup>6</sup> The character "Doña Jovita" has been played by José Luis Serrano, an actor from Córdoba, Argentina, for more than 20 years. Regarding this lovable character, Serrano explains that "Jovita is completely imperfect and has all the disadvantages: she is old, she is a woman, she is from the countryside and she is poor. Thus, she has things to say" (<http://www.donajovita.com.ar/>).

### Graphic humour

- *Desde la paja del rancho* (*From the Straw of the Ranch*) is a comic about Inodoro Pereyra<sup>7</sup> created by Roberto Fontanarrosa<sup>8</sup>. With lots of drawings and few words, Fontanarrosa's characters (Inodoro Pereyra, Mendieta and Eulogia) address some generalities concerning Chagas, aspects related to the vectorial transmission, certain risk factors and some prevention measures (the following is an extract of the comic<sup>9</sup>).

#### Desde la paja del rancho...



- *Nacionalista* (*Nationalist*) by Cristóbal Reinoso (Crist). This piece can serve as a brief and forceful trigger for thinking and discussing the characters' sayings and, from there, for characterizing the problem in its complexity.



CLARÍN Newspaper (25/07/2005)

<sup>7</sup> "Inodoro Pereyra is a solitary gaucho from the Argentine Pampa, a man with bad temper and lots of creole mischief. It is known that once this gaucho who is "macho" and bears it, wears a headband, rides horses and is good at improvising presented himself saying: "I'm Pereyra because of my mother and Inodoro because of my tata, who was a plumber." (Source: [www.todohistorietas.com.ar](http://www.todohistorietas.com.ar))

<sup>8</sup> Roberto El Negro Fontanarrosa (Rosario, 1944–2007) was a well-known Argentinian graphic humorist and writer.

<sup>9</sup> To see the complete comic go to the book N°. 7 of *Inodoro Pereyra* (Ediciones de la Flor) or to Sanmartino (2011b).



### Combining resources and strategies

During these years of work we have generated and used these (and many other) resources as a complement of educational and communicative strategies in many opportunities through activities addressed to students of different levels, teachers, specialists of various disciplines and public in general (Ceccarelli et al. 2013; Medone et al. 2013; Sanmartino et al. 2012a, 2012b; Sanmartino 2011a). These ideas have been expressed in proposals developed in scientific dissemination, educational institutions and scientific events. Some examples include the “Art, Science and Chagas” conferences (Santa Fe 2009, Paraná 2009, La Plata 2010), “The Chagas Week in La Plata Museum” (2011) and “The Chagas Month in La Plata” (2012), as well as a huge number of workshops and seminars with students and teachers of different levels, among others.

### Closure

The resources previously mentioned are tools of great potential and, due to their particular features, can be used in diverse situations (this fact is demonstrated through the enumerated activities, which are just a sample of the many possible options). The range of possibilities is wide, but the idea of this text is to briefly show some of the resources that can be found and the strategies that can be adopted if we want to be *flexible, imaginative and devoid of prejudice* when undertaking educational and communicative activities about Chagas.

The examples presented can be appropriate both to raise interest among students and to function as triggers for addressing aspects related to the issue, gathering information and creating other tools. We hope this paper arouses curiosity and encourages the employment of these and other “non-scientific” expressions with creativity, with the purpose of developing particular and contextualized didactic environments.

We believe that this type of activities, where diverse actors and knowledge interact, contribute to what Alderoqui and Pedersoli (2011) define as a *kaleidoscopic view* – within the “instrumental views” that should be favoured in science museums. According to the authors, *the internal mirrors of kaleidoscopes make it possible to see the colourful and multiform beads multiplying, creating different images each time we twirl it. Similarly, by constructing kaleidoscopic views, we encourage the observation of the same thing, but from different points of view, in a way that the superposition of different partial images enables us to build a more complex and richer image of the issue.* The metaphor sums up correctly the ultimate end of the educational actions referring to Chagas that we try to encourage (Sanmartino et al. 2012b).

This purpose poses important challenges, including the necessity to remember that the real characters of this story are those who suffer any consequence of Chagas. Remembering this implies considering them as active subjects of the decisions and solutions, and not as passive receptors of actions that are sometimes

thought of at hundreds of (geographical or cultural) kilometres away. In this sense, what is presented in this text also implies the questioning of the development of educational and communicative resources and strategies with receivers that are regarded as passive “beneficiaries”. We aim at encouraging spaces for research, debates and learning, where every actor involved actively participates in the different moments and where the medical or “scientific” voice is not the only one authorized to talk about the problem (Sanmartino et al. 2012b; Sanmartino 2011b).

In a more general level of analysis that goes beyond the specific problem of Chagas, and considering the “sub-universes” involved in this text, we agree with Aranda Zamudio (2011) when he states that *while science and technology provide us with the possibility of understanding and transforming the world, showing us their limits, art enables us to break and recreate them, challenging reality and ourselves.*

Finally, we observe that traditionally *education* has been regarded as one of the foundations for “the struggle” against Chagas (as well as the fight against vectors, the improvement of homes and the detection/assistance of the affected people). However, concerns about the role played by education are usually restricted to the discursive level or limited to the areas surrounding rural schools. From our approach, we think it is necessary to reduce the distance between biomedical and scientific knowledge, and the knowledge promoted from educational areas. Therefore, a combined work between researchers, teachers and young people is needed at all educational levels (both at school and at technical and professional formation) and at all possible contexts (rural/urban, formal/non-formal, with kissing bugs/without kissing bugs, etc.) in order to achieve the solid purpose of increasing the number of voices that, from diverse views, talk about Chagas.

**Acknowledgements:** Néstor Favre-Mossier, José Luís Serrano, Renée Asteria, Gabriela María Mahy, Crist and Néstor Giunta (responsible for [www.todohistorietas.com.ar](http://www.todohistorietas.com.ar)).

## Literature

- Acevedo Díaz JA., 2004, Reflexiones sobre las finalidades de la enseñanza de las ciencias: educación científica para la ciudadanía. *Revista Eureka sobre Enseñanza y Divulgación de las Ciencias*. 1: 3–16.
- Alderoqui, S., Pedersoli, C., 2011, *La educación en los museos. De los objetos a los visitantes*. Buenos Aires, Editorial Paidós.
- Aranda Zamudio MR., Ciencia, arte y creatividad: crenado vínculos a través de experiencias educativas. *Boletín de la Comunidad de Educadores para la Cultura Científica, OEI*. Noviembre 2011 (<http://www.oei.es/divulgacioncientifica/spip.php?article217> – Consultado el 01/02/2012).
- Borges Dias R., 1998, “*Eu? Eu estou aí, comendo o mundo.*” *Uma experiência de controle de endemia, pesquisa e participação popular vivida em Cansanção*, Minas Gerais, Brasil. *Cad Saúde Pública*. 14(Sup.2): 149–157.
- Briceño-León R, Galván JM., 2007, The social determinants of Chagas disease and the transformation of Latin America. *Mem. Inst. Oswaldo Cruz*. 102 (Suppl. 1): 109–112.

- Ceccarelli S, Balsalobre A, Scazzola MS, Reche VA, Marti GA, Mordeglia C, Sanmartino M., 2013, *¿De qué hablamos en la sala de entomología? Actividades del mes de Chagas en el Museo de La Plata*. Anais do I Simposio Brasileiro de Entomologia Cultural. UEFS, Feira de Santana.
- Favre-Mossier N., 2011, La mirada del pintor. En: Sanmartino M, Ale ME (editoras): "Arte, Ciencia y Chagas: miradas posibles, diálogos necesarios. Memorias de un comienzo..." *Edición Especial Coleccionable N° 1, marzo 2011. El latir de los equipos*. Plan Nacer Entre Ríos.
- Giordan A, Guichard F, Guichard J., 2001, *Des idées pour apprendre*. Z'éditions-Delagrave, Nice.
- Good BJ., 1994, The body, illness experience, and the lifeworld: a phenomenological account of chronic pain. Cap. 5. En: *Medicine, rationality, and experience. An anthropological perspective*. Cambridge University Press, Cambridge.
- Medone P, Susevich ML, Amieva C, Gaddi A, Marti GA, Mordeglia C, Sanmartino M., 2013, *Los Jóvenes y el Chagas: nuevas miradas posibles. Experiencias educativas en el Museo de La Plata*. Anais do I Simposio Brasileiro de Entomologia Cultural. UEFS, Feira de Santana.
- Morel C., 1999, Chagas Disease, from Discovery to Control – and Beyond: History, Myths and Lessons to Take Home. *Mem. Inst. Oswaldo Cruz*. 94 (Suppl. 1): 3–16.
- Organización Mundial De La Salud., 2007, *Reporte sobre la enfermedad de Chagas*. Grupo de trabajo científico. OMS-TDR/GTC/09. Organización Mundial de la Salud, Ginebra.
- Pintos Dias JC, Borges Dias R., 1993, La necesidad de investigación social y económica para las acciones de control de las enfermedades tropicales. En: Briceño-León R y Pinto Dias JC, compiladores: *Las Enfermedades Tropicales en las Sociedad Contemporánea*. Caracas: Fondo Editorial Acta Científica Venezolana y Consorcio de Ediciones Capriles.
- Pozo JI, Gómez Crespo MA., 1998, *Aprender y enseñar ciencia. Del conocimiento cotidiano al conocimiento científico*. Morata, Madrid.
- Sanmartino M., 2006, *Faire face à la maladie de Chagas en partant des conceptions des populations concernées*. (Thèse doctorale). Genève: Université de Genève, Faculté de Psychologie et Sciences de l'Education.
- Sanmartino M. 2009, Chagas, educación y perspectiva CTS. Tema 13. En: Arrivillaga JC, El Souki M, Herrera B, editoras: *Enfoques y temáticas en entomología*. Sociedad Venezolana de Entomología, Caracas. Ediciones Astro Data S.A., Maracaibo, Venezuela.
- Sanmartino M., 2011a, Arte y Chagas: miradas necesarias, ¿diálogos posibles? En: Sanmartino M. Ale ME (editoras): "Arte, Ciencia y Chagas: miradas posibles, diálogos necesarios. Memorias de un comienzo..." *Edición Especial Coleccionable N° 1, marzo 2011. El latir de los equipos*. Plan Nacer Entre Ríos.
- Sanmartino M., 2011b, Recursos no convencionales para hablar de Chagas en contextos educativos formales y no formales. Capítulo 12. En: Crocco L (ed.) *CHAGAS, EDUCACIÓN Y PROMOCIÓN DE LA SALUD. Estrategias para abordar la problemática en diferentes contextos*. Facultad de Cs. Exactas, Físicas y Naturales, UNC. Ministerio de Ciencia y Tecnología, Gobierno de la Pcia. de Córdoba.
- Sanmartino M, Menegaz A, Mordeglia C, Mengascini A, Amieva C, Ceccarelli S, Bravo Almonacid G., 2012a, La problemática del Chagas en 4D: representaciones de docentes de Nivel Inicial y Primario de La Plata. *Actas de las III Jornadas de Enseñanza e Investigación Educativa en el campo de las Ciencias Exactas y Naturales*. Facultad de Humanidades y Ciencias de la Educación. Universidad Nacional de La Plata.
- Sanmartino M, Mengascini A, Menegaz A, Mordeglia C, Ceccarelli S., 2012b, Miradas Caleidoscópicas sobre el Chagas Una experiencia educativa en el Museo de La Plata. *Revista Eureka sobre Enseñanza y Divulgación de las Ciencias*. 9 (2): 265–273.

## **Incorporating sub-universes to address the issue of Chagas in different educational contexts**

### **Abstract**

Although Chagas has been traditionally addressed just from a biomedical point of view, due to its multiple factors and the diverse actors involved, it is necessary to consider it as a really complex problem characterized by four large dimensions: biomedical, epidemiological, sociocultural, and political-economic. A comprehensive analysis of the problem is thus needed, in order to obtain effective and long-term solutions, appropriate to the different contexts where Chagas exists. In this text we share our ideas and experiences that we have applied to activities, didactic materials and resources that aim at creating a comprehensive view of this environmental and health issue, by providing elements and actors that are usually disregarded. Art, science and popular knowledge get dynamically combined in a group of proposals developed to provide all of us with the opportunity to observe and feel beyond dichotomies and traditional approaches.

**Key words:** Chagas disease, communication, education

### **Mariana Sanmartino**

National University of Cordoba, Latin American School of Social Sciences, Educational Sciences (University of Geneva, National Scientific and Technical Research Council of Argentina

La Plata (Buenos Aires), Argentina.

mariana.sanmartino@conicet.gov.ar