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Genomics, Bio-prospecting, Indigeneity[1].

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Abstract

Scientific contributions and their impact on the lives of Indigenous Peoples endure historical fallouts. In this article the intersection between genomics, bioprospecting, and the 'genetic ancestry' of *low-level* mixture of 'founding populations' is discussed. By historicizing the materiality of Quinoa (chenopodium sp.) and Ayahuasca, plants (banisteriopsis caapi sp) nurtured by native peoples of the Andes and the Amazon area for millennia, it critiques the too often tilted and exclusionary practices behind genomics, bioprospecting, property rights regimes, and patenting. It is suggested that the scientific community at large, works responsibly at implementing transparency on critical issues pertaining legibility of the law that, rather than hindering, hopefully, assists in better informing impacted Indigenous Peoples about their rights to litigate, consent, grant, or become beneficiaries of practices concerning bioethics, conservation, reproduction and biodiversity's regeneration.

The purpose of this paper is to answer the following question: "How does idealization and typology in genomic research reverberate through the Latin American indigenous and non-indigenous communities? Understanding that this question is general it leads us to specify and focus on the ways Indigenous Peoples engaged in debates and contestations about intellectual property rights and bio-prospecting in Latin America. Genomic related research prompts a relatively new twist as it pertains to Indigenous Peoples (IPs hereafter). The terms "founding populations," or "genetic ancestry," often attached to classificatory ('scientific') views, privilege molecular sequences tracked across continents, as Kim TallBear's studies (2013) remind us of. Once on the ground these concepts press interested and impacted parties, mostly IPs but also others concerned with this issue in the scientific community, to think about further implications behind what the terms "founding populations" or "genetic ancestry" might mean for IPs specifically. The article thus raises the question of inter-communication,

[1] This paper formed part of the Genomics and Philosophy of Race Conference, April 12-13. 2014. IHR, UCSC. I would like to acknowledge Rasmus Grønfeldt Winther, John Brown Childs, Stefano Varese, Frédérique Apffel-Marglin, Joanne Barker, Kimberly TallBear, Karen Barad and Nancy Chen, for their path-breaking work on these matters. I also appreciate dialogues with members of the Indigenous Research Cluster at UCSC. Norma Klahn offered several editorial suggestions.

mis/understandings, *co/laboration*, and scientific objectives that affect concrete lives of peoples not always direct beneficiaries of, in this case, genetic extractivism. As it has been stressed several times, science has been utilized to deliberately undermine, also, the survival of IPs —very much reminding us of earlier Western perceptions of the newly "empty," "uncovered" Americas.

It is assumed here that genomic research has become a buzzword because of economic implications. Genomic research, or at least an aspect of it, affects Indigenous peoples because such populations are targeted due to their *low level* of genetic mixture. The situation calls for research protocols that are transparent, an issue that is not always obvious regarding the relation scientific community and IPs (Träger, 2008). Of course, as we enter the twenty first century, contemporary work shows that some progress has been made and that *consent* appears in agreements relevant to the collection of biomatter by scientists and informed IPs. So, things are much better, but as we know, there are always exceptions.

My intention here is to historicize and reflect on concrete situations that have emerged and remain to date as learning experiences for Indigenous Peoples (IPs, hereafter) regarding genomics, property rights, legibility of the law, informed consent, bioethics, and *transcommunal* solidarity. This last concept coined by John Brown Childs makes reference to mutual support and '*co/laboration*:' "Transcommunality is a method that incorporates fusion and fission, structure and fluidity. It allows for a higher degree of diversity, autonomy, *and* coordination of its participants" (Childs, 2003).

Conceptual clarifications

Briefly, before we continue, there are some concepts made reference to herein, in need of brief summaries. *IPR, or Intellectual Property Rights* embodied in a group of laws generate or grant legal protection to those who create ideas or knowledge. Debates concerning these issues are kept for the most part within closed, often academic, policy or governmental circles, but the neologisms "bioprospecting," or "gene editing" and the meanings they entail can summarize for us the intentionality and forthcoming impact, as it has, on Indigenous individuals and our communities.

'Bioprospecting' itself is a concept related to mining, and in this case the mining of gene pools, genetic materials, or civilizational knowledge. As the anthropologist Cori Hayden specifies: "Bioprospecting is the new name for an old practice: it refers to corporate drug development based on medicinal plants, traditional knowledge, and microbes culled from the "biodiversity-rich" regions of the globe —most of which reside in the so-called

developing nations." (2003) Less clear is how this bioextractivist economy could benefit indigenous populations that nurtured medicinal plants, and even worse, to those submitting DNA samples, assuming that "consent" and "prior information" are, in purpose or intent, transparent. The question of co-evalness remains to be seen since, generally speaking, IPs, the precise 'objects' or 'targets' of bioprospecting[2] do not always have *mutatis mutandis* access to the legibility of the juridical process that is found, surely, at the base of historical dispossession schemes. So, what is perceived about DNA collection and bioprospecting from an Indigenous positionality is a recalling of previous exploitative, never reciprocal or generous experiences, uninvited relations established with the non-Indigenous world, to say the least[3]. Kim TallBear illustrates this sentiment: "[Critics] felt Indigenous Peoples had been duped before into supposedly health-related genetic research that ultimately did not, or that never intended to, address their pressing health issues" (TallBear, 2013).

Let me foreground here a Latin American perspective illustrating two cases I followed concerning the blurred emergence of genomic research impact, and intellectual property rights usury that affect the lives of IPs. In this case, my interest is to branch out and bring up, for elucidatory purposes, examples that go beyond the earlier collection, in themselves problematic, of hair, nails, saliva, blood samples (e.g. cells, seeds) linked to the concepts of 'founder populations, and/or 'typologies.' And, just for comparative intentions, it is my aim to point out also, for illustrative purposes, examples to complement the cases I discuss.

Before I continue I must clarify for the benefit of the reader, that Latin America's indigenous population of pre-Columbian heritage adds nowadays to about fifty million. Five hundred years ago, the demographic mortality drop of this population, provoked by the European invasion that introduced unknown pathogens to this area of the world, reached about ninety percent. This demographic demise was so terrifying that only ten percent of such population survived the sixteenth century European incursion (Crosby, 1996; Denevan, 1992). It has taken five hundred years for IPs to demographically rebound to reach its initial number today. Native languages survived in large numbers:

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[2] See the seminal contributions of anthropologist Cori Hayden on bioprospecting and bioscience.

[3] "Like the Diversity Project, the Genographic Project consist of teams of scientists from around the world who collect DNA samples, mostly of indigenous peoples, to build a large DNA database —up to one hundred thousand samples, in Genographic's case. Genographic's ultimate goals is synonymous with that of the Diversity Project to greatly increase the size of the existing database in order to produce a more detail narrative of human migratory history and deep historical genetic relationships between different peoples of the world. In addition, both projects have employed the "vanishing indigene" narrative to give sense of urgency to the drive to collect blood, especially from those who are isolated both generically and culturally." (TallBear, 2013)

about sixty in Mexico alone; the Mayan language with about twenty six varieties; around three hundred in the Amazon, plus about ten million speakers of Quechua in the Andean area of South America, the largest native language that, structurally, remains not-fully affected by the presence of Spanish and Portuguese. Instead, Quechua, for example, an agglutinative, unwritten language with a rich *oraliture*, has integrated Spanish words by *Quechuaizing* them while adopting the Spanish language phonetics in order to write it down.

Given the previous reminder, let's now continue on depicting the case known as bioprospecting *vis-à-vis* the Indigenous population that has been targeted as repository of desired biomatter, largely the collection of cell samples. To clarify, a *Human Cell line* constitutes a sample of cells removed from the human body that can sustain continuous, long-term growth in an artificial culture. It is understood that human cell collection is at the center of the discussion, since it has been conducted without clear consent of IPs affected by this process. In this case, a similar situation developed regarding the unauthorized collection of seeds, plants, and TEKs (traditional ecological knowledge) not always acknowledged by previous forms of property rights and patents regimes (e.g. patent judges in the U.S. can make billion dollar decisions by validating or invalidating them) largely dominated by Western institutions that very often contradict the more collectivized or communal notion of local knowledge privileged by IPs.

For the sake of historicizing the issue, these aspects of unknown or unauthorized collection of samples raised troubling reactions that triggered early shudders in IPs' communities that were, and are, to be potentially affected by this type of research involving genetic materials. The issue was not clearly transparent initially, and terms utilized by interested parties such as scientists were unknown to IPs or, flatly, required intermediaries to translate or interpret their legal, genomic, or medical meanings.

It is fairly obvious that the scientific community is interested in collecting and commoditizing genetic material (s) for profit first, and maybe later or eventually, for humanitarian or medical purposes[4]. Once the Indigenous communities learned more about the implications of this type of research, several activists as well as concerned researchers, tried to identify legal implications. Suddenly, new terms were floating in the air: 'founding populations' 'typology' 'genome,' 'human cells' and IPs begun to question and struggled to understand the text and subtext of scientific deliberate intentions to change the human genome. The questions raised by these communities of IPs were: what

[4] An early contribution by Cultural Survival in 1996, issued one of the first reports on Genes, People and Property "Furor Erupts over Genetic Research on Indigenous Groups" (Volume 20 (2), must be acknowledged.

does it mean that "scientists" are collecting blood, saliva, tissue, nails, fluids, and hair samples, or for that matter, unknown or little known plants, *without the consent* or *prior informed concerns* of IPs? In a sense, raising these questions troubles an earlier period of detection and enquiry for clarification purposes, when collections were already conducted. The previous instance is what prompted systematic enquiry from the part of IPs. How to proceed in such cases? What does it mean the 'genomic project?' Who sponsors it? What is the purpose of this genomic project and is it, once again, a kind of bio-colonialism? In the process, a methodological and epistemic problem is detected because there are three elements that need to be discussed; one, the positionality of the analyst or researcher; two, the participant or participants' ethics and voices; and three, the genomic nature of shifting temporality and materiality.

The Scientific Community and Indigenous Peoples

In the next parts of this contribution my intention will then be, to exemplify the interaction between the scientific community and IPs, by foregrounding cases or situations that help us rethink procedures and standards relevant to scientific research that need to actively engage IPs as direct contributors to the re-generation and healing of the *Pachamama*, "E**ART**h."

Some Cases in Latin America

The contemporary story related to genomic research and commoditization of cells, human and non-human (plants) has become, once again, a narrative of misunderstandings and mistranslations regarding, in this current case, biomedical research and property rights[5] that affect IPs *collectively*, not only in Latin America but around the world where 350 million IPs are found. 'Misunderstandings' because the information behind research that alters (complex multi-gene traits) the human genome (can we predictably edit it?), is not easily accessible to IPs, it requires 'translation' and translations very often are misleading —not mistakenly the Italian saying 'traduttore traditore' stands with accuracy.

[5] A case is described by TallBear: "Science Insider, a publication of the American Assoc for the Advancement of Science, reported that indigenous leaders in the Cusco region of Peru were charging Genographic scientists with planning to "collect DNA samples without following local regulations and obtaining proper consents," that is, of not getting community input into research plans ahead of time, and of notifying the community only very shortly before planned DNA collection with a patronizing one-page flyer announcing their plans and a PowerPoints presentation *immediately* prior to DNA collection. ANDES writes that Genographic promised in a letter sent to the community: "a 'fun' presentation with pretty pictures' to induce attendees to offer DNA samples." Carlos Andres Barragán owns a translation of this document and shared with Kim TallBear. (2013)

‘Mistranslations’ are not always easy to convey because relaying ‘scientific’ information demands specific inter-lingual conventions. The issue is not new as the case I convey next. We must remember that the sixteenth century legal Latin term “Terra Nullius” expressed this Tabula Rasa imagining of the Abiayala’s chorography (the Kuna name meaning *Land of Life* that Europeans called Americas) as being a vacuum: “—It is empty,” they said. The late Guaraní leader of the Gran Chaco, Mateo Chumiray once told me: —“I went to the city. And there, I heard city people talk about the Gran Chaco where we the Guaraní inhabited and continue to do so, for centuries. They said: ‘—It is empty, only animals live there.’ So, I thought, they looked at us as animals. To city people we, the Guaraní, are animals on an *empty* space.” (Delgado-P., 1992) It is as if the concept of “Terra Nullius” has intentionally become an integral part of non-Indigenous DNA.

This latter example talks about perceptible invisibility, a recurrent theme that marginalizes IPs, —the Zapatista Mayan insurgents in 1994, revolting against the enacting of NAFTA (the North American Free Trade Agreement), foresaw a take over of their resources via privatization. When asked why they wore black masks hiding their faces, they answered: “so that the government sees us.” That is, the Zapatista Maya rebels hid behind a mask in order to-be-visible to the powers that be.

If you allow me, again, here is another example of a similar situation, pertinent to the case being discussed. The Zapatistas remind me of the Yuchi People of Sapulca, Oklahoma, in the United States, and some (actual descendants) Yuchi people attending a lecture titled: “Who Were the Yuchi? —“The speech was delivered as if there was no one from the on-going community to answer the question in the present tense.” In the audience, “Yuchi attendees discussed among themselves in the Yuchi language this strange circumstances of being a Yuchi person listening what appeared to be their own community’s obituary. Two married Yuchi elders raised the philosophical question: “How come we exist for them to write about us, but we do not exist for ourselves?” Later, the Yuchi artist Richard Ray Whitman produced a collage on canvas about this specific encounter or rather, dis-encounter. He answered the ontological question: “Who were the Yuchi?” by posing the counter-question, “Who ARE the Yuchi?” (Grounds, 1996).

Disregarding distance within the Americas or Abiayala, the late Guaraní leader Mateo Chumiray and the Yuchi artist Richard Ray Whitman both remind us about colonialist erasure and invisibility, to be in and inhabit one’s ancestral place but without purposely being noticed. In the case of the Guaraní, they remained invisible to the colonialist’s gaze that imagined them as animals, roaming on ‘empty’ nature; in the case of the Yuchi, a scholar that “studies the Yuchi” opts to wipe them out from memory altogether,

registering in this erasure, the enacting of academic colonial privilege. Both acts remind us about scholar's (bio) ethic responsibilities on the fate of IPs, very often marveled at, as long as they are fixed in the clear obscurity of the archaeological past that continues to be theorized upon throughout old kinds of artifacts, and contemporary outmoded studies of 'native art' all over the world, but without ulterior ethical concern, or responsibility for the survivors that remain somehow *invisible*. Even Indigenous languages, such as Guaraní, have been appropriated by non-indigenous speakers in Paraguay while the Guaraní themselves fade away, very often expelled from their ancestral lands, diminished or annihilated, an historical obstacle that hinders economic development schemes, material "progress" that seldom reaches them but whose language survives on its own, uttered by non-Guaraní people. It is a case of a slowly fading Guaraní whose language, without them, endures as an unintended deference.

Founder Populations

Since I am historicizing this recent period, I should state that this push and pull between scientists and IPs coincided with the 500 years Commemoration or Celebration (depending on how you situate yourself in the background of history) of 1992. The contentions that emerged during the decade of the 90s were stirred-up by the Human Genome Diversity Project's (HGDP) lack of legibility. Between 1992 and 1995 about 25 world organizations of IPs opposed the abstruse aims of the Human Genome Diversity Project. This was largely triggered because scientists and bio-prospectors had the upper hand and the colonial privilege to enter Indigenous communities and collect samples *ad voluntatem*, as said earlier, *without* the consent or knowledge of the affected IPs. As the anthropologist Harry Sanabria pointed out years later: "There is a long history of bioprospecting in indigenous communities that involves extracting information from indigenous bodies themselves. This has included the collection of skeletal remains for tests in the early twentieth century that served the interests of racist scientific experimentation, the collection of blood samples for a range of experiments that still continue today, and the collection of DNA samples for the on-going Human Genome Project and its offshoot, the Human Genome Diversity Project" (2007).

In 1993 and 1994, two legally binding international agreements came into play effectively serving to globalize intellectual property laws. The first, the Convention on Biological Diversity, was adopted at the Earth Summit" in Rio de Janeiro in 1992 and came into effect in December 1993. The second, the GATT-TRIP's (General Agreement on Trade and Tariffs/Trade Related Intellectual Property) agreement, was signed in June

1994. For the first time in history, it obligates all signatories of a global trade accord to adopt legislation for intellectual property —including that over life forms. As you noticed, both agreements strengthen life patenting specifically and coincide with establishing a process of privatization, the backbone of unregulated neo-liberalism. Briefly: a patent is a form of intellectual property that covers a wide range of products and processes, including life forms. To be patentable, inventions must be novel, non-obvious and useful. Here, one sees the sticky fingerprints of the industrial biotech giants lobbing for life patenting. The issue, generally speaking, is of concern: as recently the U.S. government signed an executive memo "asking the United States Trade Representative to determine whether to investigate state backed theft by China of intellectual property from American technology and defense companies" (TNYT, 13, Aug, 2017, p. 17). But such state power is not a sword so easily available for IPs to brandish it (Träger, 2008).

As the above information states, the issue of intellectual property rights, already established as Trade Act in 1974, is not a solved issue. Time could not perfect it and it remains a contentious fact, as we see it, takes missteps, deletion, rejection (e.g. Transpacific Trade Agreement) or/and announced revisions or rewritings (e.g. NAFTA, North American Trade Agreement known today as USMCA). Governments and companies continue to bicker over unfair gains or once in hold of a given patent they may capriciously decide to freeze it if they foresee, detect or know a-priori about potential benefits, or face contestations by others. (Gabriel, 2014; Zermeño, 2005) To reiterate, this is the context of the cases I would like to bring to your attention, re-visiting an historical event that foregrounds problems of legibility, bioethics, disinformation, information inaccessibility, or even terms such as 'compensation' or 'benefit-sharing,' all related to the reception side pertaining to the interests of IPs.

Let me attempt to exemplify the notion 'founder populations.' DNA researchers, in trying to draw a chart of human origins search for limited biological human mixtures or variants. It is assumed that today's world population experienced increased genetic change due large demographic dis/placements. However, in trying to understand populations with *lower* degrees or rates of mixtures, researchers search for isolated populations in the belief that such populations experienced lower mixing rates or degrees. At this point, something that was barely understood by IPs in general, especially those ones living in voluntary isolation (IPLVI), suddenly acquired a new life, they became visible and strategic only because DNA variability could be found in isolated populations such as the Guaymí of Panama. Isidro Acosta, a lawyer and President of the Guaymí Congress (Panama), requested an appointment with Adrian Otten, senior GATT official responsible for GATT=TRIP's protocols, and asked: "Was there anything in the proposed

TRIP's agreement that would exclude human genetic material from patenting? The answer was NO. Why did Isidro Acosta (SAIIC, 1997) ask for this meeting? It was because only weeks before, Isidro learned that the U.S. Government via its Secretary of Commerce, the late Ron Brown, had laid a patent claim to "a cell line" from a 26 years old Guaymí mother of two. If granted, it would give the US Government the exclusive right to decide who could use the cell line, and at what cost," and for that matter, purpose, aim, or hidden profiting.

The Guaymí are an organized society and they convey themselves through el Congreso General Guaymí (the Guaymí, General Congress) that, after learning about the case of the Guaymí woman, requested the US government to drop its claim. "The US government finally revoked the patent application thanks primarily to pressure from numerous NGOs and the Guaymí General Congress." (SAIIC, Ibid) According to Jean Christie, in her article "Whose Property, Whose Rights:" "Virtually overnight, Acosta and the Guaymí People, otherwise a forgotten population from a remote corner of Panama, found themselves in the middle of a controversial international debate about "life patenting," their own life patenting" (1996).

The case raised bioethical questions about property, private ownership (of human life, in this case), the meaning of "prior informed consent" and the fast-growing business of pharmaceutical "bio-prospecting" for commercial useful genes (Cobb, 2017). As the Guaymí case, two other ones foreground the persistence and insistence of scientists about these issues. Around the same time, and just to point out the widespread relevance over 'useful genes:' "On March 14, 1995, an indigenous man of the Hagahai people (population of 260 persons, contacted only in 1984) from Papua New Guinea's remote highlands ceased to own his genetic material. In an unprecedented move the U.S. government has issued itself a patent on a foreign citizen; the case was later withdrawn" (RAFI, 1996; SAIIC, 1997; Alpers, 1996). And yet in another situation: "In 2002, another indigenous group, the Nuu-chah-nulth First Nation or tribe of British Columbia, Canada, discovered that 883 blood samples taken between 1982 and 1985 by a University of British Columbia geneticist —originally for research on a severely debilitating form of rheumatoid arthritis that occurs at a high rate among them— had been shipped to researchers all over the world" (TallBear, 2013).

The scientists' interests do not stop with attempts at appropriating or patenting genetic materials but think less of unseen consequences. The issue affects also other aspects of Indigenous knowledges. Let me bring up the case of Kuna textiles, although not related to 'founding populations' it parallels the commercial interests of non-Indigenous persons, materialities, knowledges, and institutions regarding the concept 'property rights.' My

Kuna friends of Panama and Colombia, Ascario Morales and Marcial Arias of Kuna Yala and Napguana, shared with me the news of another foreign attempt, this time from China's textile industrialists, to patent their traditional *Molas* of San Blas, colorful and intricate textile designs, patched art work based on reversed appliqué technique that has been a signature of Kuna culture. As in the case of the Guaymí woman line cell, in this case, an international mobilization forced the culprits to drop all attempts at appropriating Kuna textile artwork. (Léger, 1994)

Ayahuasca and Quinoa

What we have so far is a broad front of cases that, similar to the issue of 'founder populations,' spill on to other aspects of Indigenous knowledge and creativity, all mediated by specific 'extractivist' purposes. The same could be stated regarding the topics of 'typology in genomics,' its obscure stand is blurry to the eyes of IPs. Yet, IPs trying to defend their interests needed to decipher legal lingo. In concrete, only because of the interceding of extended solidarity, legal issues were solved, not always, in favor of just claims submitted by IPs.

At the time of these previous disputes I revisited, similar cases were documented: the attempt to claim a patent on Ayahuasca (banisteriopsis cäapi) —its Quechua name is translated as "liana of the dead"— by a scientist named Loren Miller and a U.S. based International Plant Medicine Corporation, is but one example of further contentions where IPs knowledges and patent regimes collide. In this case, however, as we entered onto the space of laws and legibility, "on November 3, 1999, the United States Patent and Trademark Office (PTO) ultimately rejected Miller's patent 108" (Fecteau, 2001; Wiser, 1999). This Amazonian vine has a monoamine oxidase (MAO) inhibitor, utilized in ritual-magical and psychic curing (metadeath, wrongly called "shamanic") by native peoples, attracted the attention of patent hunters. Anthropologist Stefano Varese working for more than forty years with the Ashéninka of the Peruvian Amazon complains about the fact that, due to Western tourism and excessive consumption of this entheogenic vine, unscrupulous 'healers' sprout to satisfy questionable demands for Ayahuasca's without identifying properly *landraces* (the term *landraces* illustrates the variations of a species nurtured in the same eco-niche or biome), causing, as consequence, rapid deforestation and extinction of varieties nurtured and protected by the Ashéninka. Not knowing how to 'talk to the plants,' self appointed 'shamans' end up carelessly mowing the landraces

down to the roots, unaware of this botanical detail they damaged the plants killing them altogether. As a consequence, unknown varieties of Ayahuasca have entered the space of inevitable deforestation and extinction. (Varese, personal communication, 2015, 2017) As we see, this whimsical, Western Ayahuasca gluttony is often irresponsible and dangerous. Dr. Charles Grob, quoted in the journalist Bob Morris's recent article states the following: "When used with antidepressants [Ayahuasca] creates an excess of serotonin in the Central Nervous system, which can cause confusion and tremulousness (…) and because it is a stimulant, it can affect cardiovascular function when people have heart issues" (Morris, 2014). Similar warnings regarding this issue became the life endeavor of the late anthropologist Marlene Dobkins de Rios (2008, 2006) when she warned us all about overconsumption and overharvesting of this plant.

In this case, driven by insatiable appetite for Ayahuasca, several 'scientists' have tried to patent it for their own benefit (Fullilove 2017; Witt 2020). The case is very much out of hand, and consumption is detected in several areas of urban Brazil, New York, San Francisco, and a few other cities around the world, where it is called 'a tea' and it is utilized by self-described 'shamans.' The term 'shaman' itself, one of those examples of misplaced terms and ideas, thanks to early modern ethnographers who adopted it from Mircea Eliade's work, originates in the Tungus of Siberia; it is deceiving and misleading since IPs have a proper name for their own specialists of the sacred throughout the Americas. 'Shaman' is a heritage of colonialism, spread by Western ethnographers, cognitively colonized by Cartesian dualisms, adopted it to homogenize and describe the multiple curative practices and botanical bioknowledges nurtured by IPs such as the Ashéninka *Shiripiari* healers. (Apffel-Marglin and Varese, 2020; Delgado-P., 2016).

Likewise, Ayahuasca exporting and consumption has entered the juridical and regulatory system in the Western world (Mabit 2020; Witt 2020). Catherine Walsh has gone a bit further documenting the issue and has written about the:

> "(…) The hazy status of Ayahuasca in the English legal system through a consideration of relevant international provisions, domestic legislation, and case law, and focusing in particular on the prosecution of self-proclaimed shamanic practitioner Peter Aziz. The core ambiguity is that, while the psychoactive components of Ayahuasca, N, N-dimethyltryptamine (DMT), is scheduled as a Class A drug under the Misuse of Drugs Act 1971 (MDA), neither Ayahuasca itself, nor the plants that are typically combined to constitute it, are listed. (…) The confusion this generates renders prosecution for activities involving Ayahuasca an abuse of process, conflicting with the requirement for legal certainty, enshrined within Article 7 of the European Convention on HR (ECHR)"

(Walsh, 2016; Wiser, 1999).

The questions brought up by the Ayahuasca case taught IPs to rely on a network of pro bono solidarity that entailed translating legal understandings and defense of cases in a context of legal illiteracy. To be successful, IPs approached people with clear understanding of legal cultures (e.g. understanding the function of Patent Trial and Appeal Boards), both native as well as non-native, largely anthropologists, geographers, biologists, who could lend a hand in making legible convoluted and intricate legal codes. Several of the previous cases rely on dialogue, empathy, detailed understanding of legal procedures, as well as biochemical knowledge, and pertain the work of IPs and bioethic practitioners.

The same could be stated about the next example, an issue that continues to have larger repercussions in the world of property rights, since food production and native seeds prompt dragging legal bickering. Here, the cases are comparable in their substance, while Ayahuasca grows in the Amazon, Quinoa is a highland grain consumed by IPs in the Andes for millennia, both are in the scope of privatization. The need to diversify food consumption, especially in the Western world, has pushed the harvesting of Quinoa to dangerous levels when, due to higher demands in the international market, visible soil erosion curtailed its harvesting. Not only that, exporting countries like Peru and Bolivia play the issue on different levels. While Peru is a signatory of a Free Trade Agreement with the United States, Bolivia has been partially sidelined. This little detail of supply and demand transactions triggered the emergence of a 'black market of Quinoa production' since, due to high demand now Quinoa middlemen from Peru enter the productive regions in Bolivia to purchase Bolivian Quinoa that is later exported as 'Peruvian Quinoa.'

Let me leap then, to discuss this important situation in the high Andes. Just like the Ayahuasca case, the attempt to patent Quinoa seeds, the rich grain that has been staple to Andean peoples for millennia can be considered another example of indigenous knowledge being appropriated by giant seed corporations in a process that could easily be called "Monsantization," "Bayerization," or "Dupontization." As early as 1998, the activist and physicist Vandana Shiva stated that:

> (…) "The USDA and the Delta and Pine Land Company announced the joint development and patent on new agricultural biotechnology benignly called "Control of Plant Gene Expression." The new patent permits its owners and licenses to create sterile seeds by selectively programming the plant's DNA to kill its own embryos. The patent, which has been applied for in at least 78 countries,

applies to plants and seeds of all species. The USDA, a government agency, receives a 5 percent profit from the sales of these seeds, which it considers a built-in "gene police." (Shiva, 2000; Gabriel, 2014).

The issue seems to respond to a capitalist interest by obtaining patents of anything that is edible and that could have potential commercial value in the international food market (Oliveira and Hecht 2016; Urioste 2012, 2013). As King and Duddley already writing in the early 1990s, suggested: "Revitalizing forgotten crops of the New World could expand the diversity and stability of agriculture around the globe (NRC, 1989). Respect for Indigenous knowledge could be a potent force in farming in the future, where creative approaches and productive, nonpolluting methods are required" (King and Duddley, 1991). Of course, to an anonymous consumer, unconcerned about the conditions in which a staple arrives to a given table, these convoluted discussions, further endangered by climate change, are irrelevant[6].

So, it seems that these researchers writing almost thirty years ago, are talking about sustainable systems found in areas of high biodiversity where, coincidentally, IPs kept and keep toying around with germoplasm, improving seeds not so easily available elsewhere. In this way, other "unknown" food crops remain as candidates for patenting (see recent availability of 'exotic' foods such as the antioxidant Açaí berries). Of course, by placing the genetic base of our food supply under corporate control, we undermine the higher rates of biodiversity, inadvertently found on territories inhabited by IPs around the world (Hippert, 2013). The same could be said about DNA sample collection. And yet, those who have direct TEK knowledge (the term Traditional Ecological Knowledge, has been coined to describe this fact), of multi-cropping strategies or pluricultures are not to be acknowledged as 'owners' of the genetic base we are discussing about.

As a matter of fact, Mexico, a place where beans, squash and corn have originally been domesticated are no longer in control of their seed varieties, today they must acquire them from large corporations that became patent owners. To our dismay, such corporations could potentially criminalize Indigenous peasants who insist to breed and nurture organic seeds. Surely, Western law is predisposed since it only recognizes individuals, but not the collective effort of the commons such as the *Ayllu* (a *socionature* system of Andean origin that entails people, non-people and other than people, that is, a socionature or a communal pluriverse) in nurturing seeds. Surendra J. Patel wisely

[6] It reminds me of a student who thought that potatoes originated in Ireland. When I pointed out that Andean peoples domesticated potatoes way before the arrival of Columbus to the Americas, he could not believe it. The same goes for corn, squash, peanuts, beans. (Hobhouse, 1985, 2005; Dillehay, Rossen et al., 2007; Wilford, 2007).

observed this long ago: “And yet, the existing intellectual property rights system wholly ignores these contributions and legalizes only the rights of the inventors and innovators of modern technology” (1996). Patel is illustrating the fact that ‘individuals’ and not ‘collectivities’ are entitled to claim patents rights. This requirement makes illegitimate the collective aspect of a given Indigenous entity such as the communal Andean Ayllu system. Moreover, the filing fee is expensive and prohibited, sums that IPs could hardly afford, anyway.

Let me get back to the Quinoa case. In 1998, RAFI, (Rural Advancement Foundation International) issued a brief report titled “Quinoa Patent Dropped. Andean Farmers Defeat U.S. University.” It states: “Andean farmers have forced Colorado State University (CSU) to surrender U.S. Patent #5,304, 718 on “Apelawa” quinoa and its 43 sister varieties. The Anti-patent campaign that began 14 months ago ended on May 1st when one of the quinoa “inventors” admitted that the patent had been abandoned.” Let’s assume that, indeed, twenty years later, due to serious international and global concern for Quinoa, today on the shelves of European, Asian and North American supermarkets, Indigenous Quinoa growers in the Andes, have received some benefits of their collective work and their knowledge on Quinoa production and exports. Some in the City of La Paz, Bolivia, talk about a new class of Quinoa nouveau riche, several of them are producers of Aymara heritage, the very people that historically speaking, are associated with domestication of this Andean grain.

So much has the novelty of Quinoa affected high end ‘organic food’ consumption in the Western world that we forgot about its ecological side-effect, largely impacted by recent climate change menace. Simply, overharvested Quinoa provokes the fast depletion and erosion of topsoil an issue that is complicated by hydric stress and Aeolian dust (Marca, 2015). These ecological phenomena further intensified by the impact of global warming on high altitude settlements where snowcap receding lines are visible, account for serious water shortages. As recently, Lake Poopó in the Bolivian plateau dried up in 2016, and as of late, recovered by unexpected flood (2020-21). The other side effect of Western urban high Quinoa demand has determined the visible fading of Quinoa’s local Andean consumption, because it now became a delicatessen. Once more, a sort of Quinoa boom and burst has happened in the Andes, pushing Indigenous producers and merchants to fight over exports and high demand in core countries’ supermarkets, but at a very high environmental cost (Pak, 2012). In this case, to satisfy such high demand, Marca, for example, suggests: “the production of certified seeds must be in charge of expert producers,” and extending producing areas to the Peruvian coastal region. (2015) However, there is no mention of Quinoa property rights over seeds or about the varieties nurtured by Andean farmers. Instead, Quinoa mono-crop seems to be the insisting

recommendation, largely because of global demand, without considering stresses on agricultural systems that are affecting soil's carrying capacity that inevitably entered a cycle of desertification due to increasing production demands and global warming. It is known that, the Peruvian Coastal city of Ica on the Peruvian desert has exhausted its underground water table due to the overproduction of asparagus for export. It is ironic, that the desert is earmarked as a green oasis, asparagus requiring a lot of watering.

On the Peruvian-Bolivian plateau, a hidden regime of smuggling is at the center of who profits from Quinoa exports. *It is said*, that Bolivian Quinoa is smuggled into Peru raising their export rates under the rubric "Peruvian Quinoa." But here is another sad irony: very much until the early 1990s, Quinoa, considered to be "the food staple of Indians" by Europeans and urban Latin Americans alike, became inaccessible and forbidden for the very population that domesticated, improved and consumed it for millennia. When I was in La Paz in 2012, I went looking for "Café Marbella" on the Prado walk, the long central downtown stretch, where every time I visited it, ordered my Sopa Andina (basically a Quinoa stew). In 2015, I went back but the owner told me: —"Ya no hay quinua, está muy cara" (We no longer have Quinoa, it became very expensive). The most recent times, in 2016 and 2018, "La Marbella" closed and La Paz experienced serious drinking water shortages, drought affecting the Andean biome and, of course, the production of Quinoa. In the United States, a pound of Quinoa is sold at $6.00 or even $9.00 dollars and yet, I noticed that people do not always follow directions on how to cook it, thus, intact Quinoa packages are trashed without concern, largely because Quinoa requires an acquired new taste that is not there, necessarily. As recently Quinoa is sold mixed with breakfast cereals such as oats, bran, or corn flakes.

Hopefully, and this is constantly fought over, Quinoa seeds must remain under Andean control of property right's regimes because, in genetic variation research, new terms and strategies emerge, to create mutual agreements over issues of genetic property. Here we must remember that, in Indigenous societies of the Americas, the modern, Cartesian separation of nature and culture is disavowed, repositioning instead the *cosmicentric* holistic perspective, also called the *socionature* or the *pluriverse*, rather than an anthropocentric one (Varese, 2018; Apffel-Marglin, 2011). Protecting biodiversity has become a global issue. Understanding that other communities, such as those of IPs, insist in acknowledging different temporalities, the larger world concurs in supporting IPs efforts. Rather than biocolonizing, further recognition of Western provincialism is detected as we realized that 'progress' is not infinite and that its telos became, instead, high risk and uncertainty. In the several cases foreground in this contribution, we noticed the relevance of cooperation, fairness, and empathy translated in the concept of "meaningful control over the initiation and conduct of research" on IPs. For example, the

term:

> "Community Engagement," according to Eric T. Juengest, "has recently become an ethical watchword for population-based studies on human genetic variation. The theoretical aims of community engagement are to allow human populations who are the subjects of genetic variation research some meaningful control over the initiation and conduct of that research. This goal echoes the clear obligation to secure informed consent from any human individuals being recruited for research —much as 'slow code" in dying patients echoed the clear life-saving aim of cardio-pulmonary resuscitation in other rescue situations. Conducting community engagements for genetic variation research is a delicate and hazardous business: issues of representativeness, social identity internal politics, and cross-cultural differences abound." (Juengst, 2003)[7]

So, let's say that, some positive advances due to the availability of international instruments are tangible, assisting in offering transparency and regulation in areas that, before the existence of such instruments, looked as an updated version of Terra Nullius. In general, as Juengst suggests, it seems that we are observing better systems of mutual understanding that reject unscrupulous attitudes or practices of both, researchers but also of those individuals and communities that are now better informed on the (commercial and sustainable) value of their own TEKs, traditional ecological knowledges as is the case of Ayahuasca or Quinoa.

Some lessons

In this article my purpose is to critique cases that triggered an early realization about 'extractivist' research intended to exploit IPs cells and knowledges, especially those regarding genetic materials. To contest, it required a broad and agile participation of both affected IPs and supporters, capable of discerning the legal implications behind gene harvesting. The cases I brought up pertain: genetic collection of saliva, nails, blood and human tissue belonging to a Guaymí woman, a Hagahai man (from Indonesia), the Kuna intricate appliqué called Mola, as well as Ayahuasca, and Quinoa seeds. A while back, the anthropologist Eduardo Kohn wrote that: "Making sense of how we live in these kinds of changing contexts that we both make and that makes us has long been an important goal of anthropology." (2013) Early mobilization, solidarity of international

[7] See also: Towards an Alternative Development Paradigm: Indigenous Peoples' Self-Determined Development (2010). V. Tauli-Corpuz, L. Enkiwe-Abayao, and R. de Chavez. Baguio City, Philippines: Tebtebba Foundation.

characteristics and reach, persistent interest in understanding the effects of unethical research and funding by agencies, the participation of students and scholars, the circulation of critical information and analysis, popularizing, disseminating, and socializing knowledge that is only accessible to the *cognoscenti*, organizing new courses and new research institutes, and above all inviting IPs voices and thinking on the matter, all helped in pressing for consensus, transparency and regulation, to make legible the proceedings of available international instruments, to lend strong meaning to the words "prior informed consent."

And yet, already in the late 1990s my friend, the Quechua biologist Alejandro Argumedo, coordinator of the Indigenous People's Biodiversity Network, was aware on the fact that bio-piracy of IPs *knowledges* had escalated, indeed, Western "inventors" submitted more than one hundred claims related to crop varieties, medicinal plants and ornamentals, not consumed or known in the Western world. But twenty years ago, David Bracket, chairman of the World Conservation Union's Species Survival Commission in Ottawa stated that: "270.000 known species of plants, the 12.5 percent found to be at risk is a huge proportion" (Stevens, 1998). Indeed, the Sixth Extinction is here.

The fact is that intellectual property concepts and laws protected the emergent mechanical, individualist inventions of the Industrial Revolution, and nowadays similar legal apparatuses enticing the market to commoditize and dispute ownership over life processes and living entities, plants, animal, microbes and their genetic parts, are being used (Cobb, 2017; Gabriel, 2014): all of these —by a legal twist pertaining legibility— are dubbed "creation of human genius and have become patentable." But, usually, "human genius" is an individualist concept only credited in the Western world, the term is not applicable to the communal approach IPs have regarding collaboratively input, the case of 'nurturing' seeds.

Legibility falls usually on the domains of states, governments, and international juridical institutions. Presumably laws exist to regulate conviviality in the human, non human and other that human community and yet, such instruments require access to languaging, coding, legal dispute and hermeneutics that are not easily accessible to native peoples who, to our amazement, compared to other societal cohorts that face problems of literacy continue to lag behind in educational systems, in this case, the lack of legal literacy. And very often, the terms 'regulation' or 'transparency' are seen by corporations as bumps on the road, in need to deregulate as much as possible. As stated before, deregulation and displacement are the main subtexts of neoliberal policies. Each case documented in this contribution has at its source the issue of il/ legality, in/accessibility, mis/understanding, and hindrance. While the State and/or international legal agencies in their regulatory

functions display and exercise their rights, the recipients or beneficiaries of the law, such as IPs, very often carry a distrustful perception of State or international agencies' roles. Very rarely, the discriminated against, in the eyes of IPs, are favored by the law. In the cases discussed herein one could state that beneficial outcomes are tangible but only when issues acquired (rarely) consensus between parts, so much that broad solidarity with IPs claims, required the participation of a larger community familiarized with bioethics, and fair legal procedures.

As an observer of academic matters and Indigenous societies, I must admit that, despite all obstacles that try to undermine education budgets, access to educational progress, although still limited, IPs are seriously capacitated to fully participate in their societies by defending common or collective interests. This is much more visible in Northern scholarly institutions than in the South, and yet nevertheless, tangible progress is made against constant erection of obstacles. In a way, it continues to be a non-ending struggle.

Conclusion

As we see it, the cases and disputes I brought up, have entered the labyrinth of legalistic lingo, and is an on-going situation. At this point we can remember, as ways of summary, that the first sequencing of the human genome has taken about 15 years of work at a total cost of three billion dollars. In most communities of Latin American, Indigenous or not, it is very hard to see the benefits of such research. While in the developed world science and profit enter into Faustian bargains, in the developing world scarce benefits are hard to see. As recently, it has been noted, for example, that: "Many scientists are calling for a moratorium on all germline modification experimentation: research on human germlines is currently banned in 40 countries." (Smart and Smart, 2017; Cobb 2017) So, while some talk about heritable gene editing, since its consequences will not utter any time soon, others are still concerned with daily survival as the rates of biodiversity are alarmingly decreasing, endangered by undeniable global warming and the disappearance of TEKs and actual biodiversity. For the sake of comparison, twenty years ago, it was affirmed that:

> "Since the first Europeans set foot in North America, an estimated 200 species of plants and 71 species and subspecies of vertebrates have become extinct (…) The current rate of extinction is thought to be 400 times greater than that recorded over recent geological time. On a global scale, scientists estimate that 27,000 species are being lost each year in the rainforests alone… the loss of species through extinction is only one aspect of the biological impairment that has

resulted from human destruction of wildlife habitat" (Heisel,1998).

Still, what is the most current news? As recently (2014), a multi-stakeholder group open to participants met for the first Geneva Dialogue on Traditional Knowledge, to informally discuss negotiations at the World Intellectual Property Organization scheduled to resume on yearly bases[8]. As an on-going issue, this group amidst whose members are the following organizations: The International Centre for Trade and Sustainable Development (ICTSD), the Australian Centre for Intellectual Property in Agriculture (ACIPA) and the Institute for Sustainable Development and International Relations (IDDRI), will hopefully continue to hold future dialogues. And, again, it is not always certain that they would invite IPs representatives. Several of the participants stated that: "The objective of this dialogue is to provide an informal space to debate key issues relevant for the effective development and implementation of an international regime for the protection of TK, with a primary focus on the ongoing process at the IGC." Let's hope that IPs will be invited to the table since dialoguing, as Kimberly TallBear in her evaluation about reconfiguring genome research and policy suggested, clears the waters:

> "For years, indigenous critics have pressed for the reform of physical anthropological and genome-research practices. We now see the fruits of agitation: innovative ethical thinking about how to conduct research in ways that attempt to democratize scientific knowledge production, and an increasing co-constitution of indigenous governance with genome science. In this instance, "democratization" means two things. First, the rights and research priorities of potential subjects are privileged along with the needs and priorities of scientists—or more so when the stakes for subjects are high. These rights include indigenous jurisdiction, or "sovereignty," over research on their lands and knowledges. Second, giving due attention to subject rights and priorities can lead to greater "distributive justice," in which a wider variety of people access a fairer share of the benefits of scientific knowledge production than in the traditional model." (TallBear, 2013)

At the end, despite the overwhelming availability of data on the Internet, the problem is related to accessing and processing reliable information *vis-á-vis* the educational status of those participating and affected. Several areas settled by IPs are simply removed from Internet *e-benefits* because the market does not consider their ancestral lands to be of engaged, high-end *e-consumers*. In 2017, what we observed in Latin American

[8] The IGC [Inter-governmental Commission] is the WIPO [World Intellect Property Org] Intergovernmental Committee on Genetic Resources, Traditional Knowledge and Folklore, and meets periodically. It is not always certain that Indigenous Peoples representatives are in attendance.

Indigenous communities are factors that stress the survival of such communities (Hippert, 2013). Rates of poverty remained constant or in some areas such as the marginalized urban periphery, increased consumption of cheap, junk processed food ('comida chatarra') and high sugar content beverages courtesy of Nestlé, Coca-Cola, PepsiCo, that trigger obesity (Nestle, 2015), are placing an extra stress on health services, already overwhelmed. Parallel to the cases I revisited, there is recognition from the part of the academic community about progress but also uncertainty, and risk. IPs initial complaints regarding genetic related research, opened stronger forms of dialogue between those affected and those scientists willing to drive for social justice and equity. Omer Gokcumen in a recent article states the following:

> "Indeed, multiple studies in 2017 have dramatically expanded our knowledge of genomic variation involving hundreds of ancient and present-day peoples from across the globe. Maybe not surprisingly, the results of these studies have empirically confirmed that our understanding of human genetic variation was incomplete, flawed, and biased" (Gokcumen, 2018).

Lastly, genetic anthropology has become a new academic specialty in itself. It is helping the public to understand its relevance, this time by a clear consensual inclusion and consultation with non-European peoples that are invited to grasp and problematize emergent genomic studies (Cobb, 2017). At the end, the cases discussed in this contribution prompted the building of a new *co-laborative* relation between the affected, usually IPs, and the scientific community. Amidst the lessons learned that advance a consensual relation between these two social actors there is clear recognition of rights and dues to avoid insidious forms of bio-colonialism. However, since new questions are posed in immediate relation to the very issues we discussed in this contribution, dialogue, information socialization and democratization are at the base of continuous *'co-laboration,'* that is, the labor that acknowledges a post-human relational web of equals.

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