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We are silently paving the way toward human-wildlife coexistence: The role of women in the rural landscapes of southern Andes

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Gender plays an important role in human-wildlife coexistence. Women have their own distinct form of environmental knowledge; women shape attitudes and perceptions related to wildlife and influence the use of natural spaces and the nature of human-wildlife interactions. Being a female farmer or practitioner involved in human-wildlife conflict mitigation poses a variety of obstacles and benefits. The way conservation conflicts are perceived and managed is gendered, and this needs to be taken into account when working with local communities to achieve effective and fluent dialogue, planning, implementation, and evaluation. The existing body of evidence is focused mainly in Africa and Asia and suggests that the sharing of landscapes between humans and wildlife has different implications for men and women with respect to their attitudes toward wildlife and how they are impacted by it. Although extensive research has been done in relation to gender, conservation, and natural resource management, the gender perspective of human-wildlife coexistence is underreported. Feminist political ecology emphasizes that gender differences originate in the need to overcome existing social and political barriers and is highlighting the importance of en-gendering research. In Chile, work in the rural sector poses various challenges, especially for women. Rural landscapes are, in general, dominated by men, with low female participation in decision-making spaces. Nonetheless, this appears to be silently changing. In this perspective, we contrast three undocumented experiences of our work as female researchers and facilitators of human-wildlife coexistence (northern case, central case, and southern case). The aim of this perspective piece is to expose current

findings for the role of women in human–wildlife coexistence, contrast these with our reports, and propose future directions.

KEYWORDS

conflict, rural landscapes, *campesinas*, gender perspective, traditional local knowledge, Chile

Introduction

Social–ecological systems in rural settlements are dynamic cultural landscapes that are created and shaped by human stewardship and the richness of human–wildlife interactions (Plieninger and Bieling 2012; Huntsinger and Oviedo, 2014; Fernández-Giménez et al., 2022). Within these systems, humans and other-than-human beings establish biotic and cultural communities as cohabitants of a shared landscape (Rozzi, 2012; Carter and Linnell, 2016; Morehouse and Boyce, 2017). In rural landscapes, interactions between these cohabitants can cause some friction due to competition over resources and habitat use. Management of human–wildlife conflicts (HWC) has received increasing attention from researchers because it negatively impacts both wildlife and local communities that have traditionally dwelled on the land (Treves et al., 2006; Nyphus, 2016; Crespin and Simonetti, 2019; Araneda et al., 2021; Canney et al., 2021). Most of the studies addressing this topic have failed to acknowledge how the impact of HWC on humans differs between genders and is often asymmetrically adverse for women (Barua et al., 2013; Khumalo and Yung, 2015; Banerjee and Sharma, 2021). Although extensive research has been done in relation to gender, conservation and natural resource management (Espinosa, 2010), the gender perspective of HWC is rarely considered (Barua et al., 2013; Khumalo and Yung, 2015; Alexander et al., 2022; Herzog, 2007) and research on it has hitherto mostly focused on Africa and Asia.

The existing body of evidence suggests that the sharing of landscapes between humans and wildlife has different implications for men and women with respect to their attitudes toward wildlife and how they are impacted by it. Feminist political ecology is highlighting the importance of overcoming “gender blindness” by en-gendering research (Kellert and Berry, 1987; Ogra, 2008; Espinosa, 2010; Carter and Allendorf, 2016; Banerjee and Sharma, 2021). Some studies acknowledge that women play a major role in the sustainability and resilience of social-ecological systems, and their influence is critical when it comes to human–wildlife coexistence and harmonic cohabitation of space (Alexander et al., 2022; Carter et al., 2016; Kellert and Berry, 1987; Anthony et al., 2004; Espinosa, 2010). Women have their own distinct form of traditional environmental knowledge (Eyzaguirre and Linares,

2010) and shape attitudes to and perceptions of wildlife, as well as influencing the use of natural spaces (Westermann et al., 2005; Alexander et al., 2022). They preside over environmental activist groups and therefore influence management decisions and the conservation of biological resources (Herzog, 2007; Agarwal, 1997; Anthony et al., 2004). Addressing the gender dimension of human–wildlife interactions could help us identify new drivers of coexistence connected to perceptions, values, and behaviors and, therefore, new effective strategies for coexistence.

To this date, we have almost no information on this topic for Latin America. Particularly in Chile, being a woman involved in HWC poses a variety of obstacles, especially for *campesinas*¹ that subsist in a context of poverty, isolation, and lack of resources (Bahamondes and Herrera, 2009). In this perspective article, we will briefly communicate the need to address the lack of a gender perspective in human–wildlife coexistence research, and how doing so could contribute to alleviating the challenges faced by women involved in HWC (Westermann et al., 2005; Agarwal, 2009; Sodhi et al., 2010). We refer to two categories of female stakeholders that play different roles: *campesinas* (female farmers) and female practitioners (professionals and researchers), although focusing mainly on the first group as traditional dwellers of landscapes and carriers of essential traditional local knowledge (TLK) (Barreau and Ibarra, 2019; Guerrero-Gatica et al., 2020). For our purposes, *campesinas* are teachers and traditional keepers and carers of the land, whereas practitioners are observers, facilitators, and apprentices (Liamputtong, 2008). Each group contributes to coexistence with their own knowledge and resources. We present three undocumented

¹ *Campesinado* is a concept used to refer to the social group of *campesinos* and *campesinas*. Close translations for these terms are “smallholder farmers” or “family farmers”, although they lack the richness, historical perspective, and significance of the Spanish term. The word *campesina/o* includes “millions of small- and medium-size farmers, marginalized landless people, women farmers, indigenous people, migrants, and agricultural workers from all around the world” (Woods, 2012). For the purpose of this perspective article and to use terminology that implies social justice, we will only speak of *campesinas* for women and *campesinos* for men farmers.

experiences of our work as female practitioners and facilitators of human–wildlife coexistence in three distinct rural areas in the Andes of Chile: north, central, and south (Table 1). From these experiences, we identify certain gender traits that we believe merit rigorous exploration in future scientific studies worldwide. We discuss what the gender-related variables are that should be looked at in future research with the aim of adding a gender perspective to the field of coexistence. We contrast our experiences with the existing literature that has treated this topic.

The need for a gender perspective in the field of human–wildlife coexistence

Diversifying knowledge and including new perspectives means moving away from male-oriented management measures. The limited amount of information about the relevance of women in HWC management and decision-making within the field might affect their potential to contribute and create change (Anthony et al., 2004; Anderson, 2020; Alexander et al., 2022). Collaborations between different female stakeholders for environmental management provide different results than male-led experiences (Fortmann, 1990)

and lead to more democratic and creative management decisions (Gore and Kahler, 2012).

Many female practitioners and political ecologists are currently encouraging their audience to understand and challenge gender essentialist assumptions from ecofeminism that state that women are naturally more sensitive and connected to the environment (Banerjee and Sharma, 2021). These assumptions are originated in the historical accumulation of management forms and, therefore, are considered endogenous results of women–wildlife coevolution (Haraway, 2014). Women do have different priorities for conservation and resource management and different drivers for valuing wildlife (Kellert and Berry, 1987). However, the particularities of the woman–nature relationship have a more complex and socio-political origin and are the result of a historical, contextual, situated, and embodied conceptions (Montecinos et al., 2003). Feminist political ecology emphasizes that gender differences originate in the need to overcome existing social and political barriers (Agarwal, 1997; Ogra, 2008; Gore and Kahler, 2012).

In rural livelihoods, there are often roles for women and roles for men, and, through this article, we are not seeking to criticize the existence of these differentiated roles. The division of tasks, knowledge and responsibilities according to gender can generate complementarity and overlap (Rocheleau, 1989). Gender relations are multiple and related to social entities,

TABLE 1 General description of the three cases where the authors have done work in human–wildlife coexistence (¹Vargas, 2021; ²Vargas et al., 2021; ³Vargas et al., 2022; ⁴Almuna et al., 2020), including information on women and indigenous participation in the studies. We also present a list of the gender traits identified from our perspective that would be relevant to assess for future research.

	Northern case ¹	Central case ^{2,3}	Southern case ⁴
Location	Coquimbo region	Valparaiso region	La Araucania region
Coordinates	29° 59'S–71° 9'W	32°21'S–70°47'W	38°47'S–71°31'W
Industry	Goat	Cattle	Poultry
Species in conflict	Puma (<i>Puma concolor</i>)	Guanaco (<i>Lama guanicoe</i>)	Diurnal raptors (<i>Parabuteo unicinctus</i> , <i>Accipiter chilensis</i> , <i>Geranoeatus polyosoma</i>)
Habitat	High Andes wetlands and shrubland	High Andes wetlands and shrubland	Andean temperate rainforest
Method	Workshops and semi-structured questionnaires	Workshops and semi-structured questionnaires	Semi-structured questionnaires
Female participation in study	60%	<10%	76%
Indigenous communities' participation in study	None	None	Mapuche, 49%
Female participation in animal management	High	Low	High
Gender traits	<ul style="list-style-type: none"> - High participation in animal caring duties - High participation in decision-making and organizational spaces - Mixed networks with female leaders - Strong women-to-women bonds - Deep connection to nature and intangible value for biodiversity 	<ul style="list-style-type: none"> - Low participation in animal caring duties - Traditional practices negatively affected women's participation in decision-making and organizational spaces - Exclusive men networks - Tangible value for natural resources 	<ul style="list-style-type: none"> - High participation in animal caring duties - Animal care related to home garden and household care - Mixed networks with female leaders - Strong women-to-women bonds - Deep connection to nature and intangible value for biodiversity - Creative conflict management measures

where factors like power, social class, generation and ethnicity are articulated. Hence, in some human communities, we will find gender relations where women are subordinate; in others, we find complementarity; and in others, we still find more protagonism. The problem arises when women's labor is less visible, recognized, and validated (UN Women, 2001; Lamas, 2013). When women decide to work in sectors dominated by men, they can suffer from discrimination and have to overcome a number of barriers to achieve validation or be heard (Banerjee and Sharma, 2021). Extreme situations can even feature sexual or emotional abuse (Tinkler and Zhao, 2020). This is specially the case for when women try to be part of decision-making spaces (Reygadas et al., 2007; Anderson, 2020; UN Women, 2001).

Women tend to create their own informal networks that are often powerful and highly influential (Agarwal, 1997; FAO, 2012; Gitungwa et al., 2021). Studies show that women's participation and leadership in organizations dedicated to natural resource management helps achieve a more creative and productive task force (Anderson, 2020). Women TLK has different sources to its male counterpart, and women's interactions with nature have their own unique and distinctive motivations (Painemal and Álvarez, 2016; Banerjee and Sharma, 2021).

Three experiences in Chile that illustrate a global concern

Within rural landscapes of South America, the *campesinado* has been defined as a rural producer who works relatively small patches of land, with the family being in charge of most or often all of the labor. *Campesinos* often do not own the land which they work (Woods, 2012). In Chile, the *campesinado* mostly fits with this definition, especially when referring to family farming, but it is relevant to add that total household income from livestock and agricultural exploitation is often very low, which leads to low employment and drives families toward multi-activity performing paid employment (Bahamondes and Herrera, 2009; Cid et al., 2017). Rurality is changing, with more activities being performed outside the farm, with women taking more part in rural work, and with urban and rural areas increasingly interacting (Cid et al., 2017). With these changes, new gender relationships are appearing that have not yet been analyzed. The relevance of women's paid and unpaid work is only starting to be recognized, and there is no notion of how this is impacting vulnerability and gender gaps in rural families.

How rural women and men are differentially adapting to these social changes, along with other changes in the landscape of climatic and structural nature, including variations in biodiversity and ecosystem resources, is unknown. This includes adaptation to changes in human-wildlife dynamics. As female practitioners addressing HWC in different areas of Chile, we have had widely different experiences but very similar

concerns about how little we know about the role of women in this field worldwide. Through our work, we were able to recognize gender traits that, although they are only experiential and have not yet been evidenced by science, they provide a valuable preliminary insight in relation to gendered roles in human-wildlife dynamics. In 1987, Kellert and Berry (1987) recognized a lack of reliable data on the differences between men- and women-wildlife dynamics and how they were purely based on speculation and biases. After exploring the current literature, we were surprised by the fact that, 35 years later, there is still a major knowledge gap (Barua et al., 2013; Khumalo and Yung, 2015; Alexander et al., 2022; Herzog, 2007). The traits that we have identified and their implications are not sufficiently supported by our scientific field, and we believe that this is not because they are not happening elsewhere but because they are rarely studied.

Here, we present three cases of our own experience as female practitioners addressing HWC and coexistence in different rural areas of Chile (Table 1). The main results from these research initiatives have been published (Almuna et al., 2020; Vargas, 2021; Vargas et al., 2021; Vargas et al., 2022), and, based on these experiences, numerous questions arose regarding the distinct role played by women, particularly *campesinas* and indigenous women, in human-wildlife coexistence initiatives. After realizing how underrepresented this topic was in the scientific literature, we decided to write this perspective article, with the aim of proposing future directions based on personal experience and available scientific literature. We also represent and communicate the key elements of the role of women through a naturalistic illustration based on and inspired by these experiences to add breadth, clarity, and robustness to the message that we are attempting to convey (Figure 1).

The northern case involves goat farming by *campesinos*, who are also known as "*crianceros*", that practice this subsistence activity mainly in central and north-central Chile. It is characterized by nomadic pastoralism in search of fresh pastures, in which displacement is joined by the family group. Livestock activities are a men-dominated practice, but with high dependence on the support and cohesion of the family (including women and children) (Baeza, 1970). In this context, mothers and daughters take responsibility from an early age and play relevant roles in caring for the animals and manufacturing goats' cheese (Baeza, 1970). Working here, it was not uncommon to find women leading and representing the *crianceros* guild, and their work appeared to open spaces of trust and dialogue, where women had strong, long-lasting bonds and high networking capacities. This raises the question of whether this high female presence can allow us a better understanding of the dynamics and traditions behind their interactions with wildlife. The puma is the main predator present in the high Andes wetlands and shrublands that can eat their livestock. In this ecosystem, the *crianceras* freely grazed their goats, often accompanying the animals so that they did not

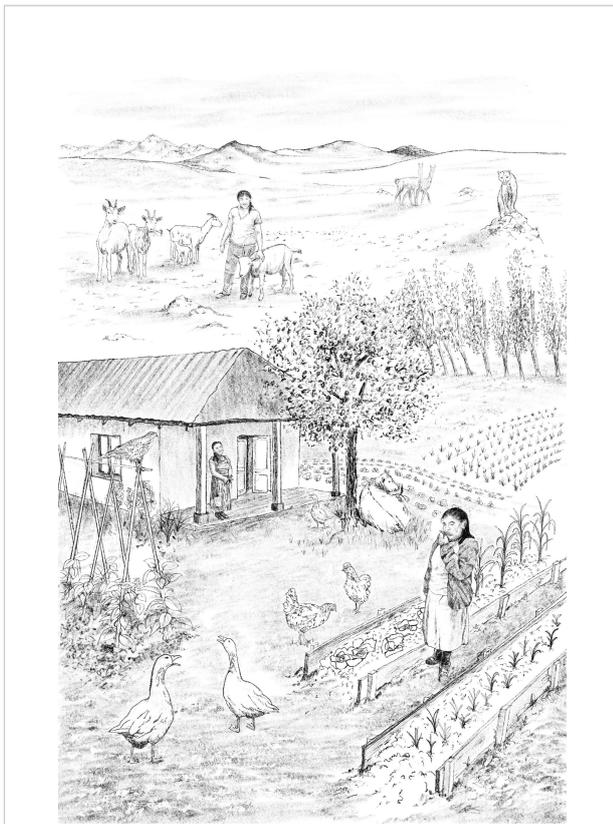


FIGURE 1
 “Private life of feminine rurality”, illustration by María de los Ángeles Medina inspired by the spaces of intimacy between women and their animals, and between women and the social-ecological landscape. This naturalistic illustration shows how women dwelling on their spaces of silence and privacy develop traditional and local knowledge. From contemplation and action, they learn about animals and plants. They do this on their own and with their neighbors. This constant horizontal and intimate interaction makes them empathetic and sensible observers and guardians of our relationship with biodiversity and its life forms.

get lost or predated by the puma (Figure 1). This mobile grazing allowed the women to have close contact with nature and built a connection and sense of place. The time investment by the *crianceras* destined to care for the goats was also important, and the concern that they showed for the health and safety of the animals was evident. From our perspective, there could be a connection between these previous elements and the human-wildlife dynamics, associated with greater knowledge of the natural landscape or willingness to care for it.

The central case describes working with *campesinos* from the cattle sector of central Chile, who are mostly constituted by men, with only a few cases involving a female presence. Here, livestock management is carried out collaboratively as a community, through male associations. Women, in this case, can have an important role in the family economy, but by performing other activities such as agriculture, maintenance of home gardens, feeding livestock that remains near the house, and housekeeping (Fawaz and Soto, 2012; Menegoz and Covarrubias, 2019). Unlike

the previous case, here, *campesinas* did not go to the mountains nor did they co-inhabit spaces with the guanaco. During the summer seasons, when cows and guanacos graze in a shared territory, the women would stay at their homes away from mountain life (Figure 1). They did not participate in the care of the cattle on the mountains. Their perception of the dynamics between livestock and wildlife was closely associated with what their husbands or children passed on to them. Our work in this context was challenged by cultural views and characterized by limited women’s influence and participation. Here, statements such as “women bring bad luck” and “the mountain is a place only for men” created a tense and challenging atmosphere, especially because the main researcher was a professional and postpartum woman who arrived at the meetings with a month-old baby in her arms. This context was particularly challenging, with a marked masculinization of the space and numerous obstacles that made it even more difficult to move forward with the already complex work of HWC management.

The southern case presented here was located in the Andean temperate forest of south-central Chile. In the area, homegardens and poultry family farming are integrated into a broader agroforestry system (Galluzzi et al., 2010; Ibarra et al., 2021). The work here was carried out mainly with *campesinas* and a mixture of Mapuche indigenous and non-indigenous families, which helped create a space for cross-cultural knowledge exchange. In this opportunity, non-lethal methods for managing human-raptor conflict were assessed. Here, it was normal for women to take care of the poultry, whereas men took care of the livestock (Coña and de Moesbach, 2010). The reason for this probably is because, in almost every case, the chickens stay near to the house and the home garden, which is usually women’s business (Figure 1) (Barreau and Ibarra, 2019). As in the northern case, here, we witnessed close contact between women and nature. There was creativity and efficiency in the management measures the participants came up with (Almuna et al., 2020); they recognized the intangible value of nature and showed great knowledge of wildlife behavior and their role within the ecosystem. Moreover, it was very interesting to see the significance that they gave to symbols and ancestral stories and how this impacted their attitudes toward raptors. This significance might be influenced by indigenous values immersed in the cultural mosaic present in the area.

In the cases presented here, we identified gender traits that vary together with the level of female participation. In the examples with more female participation, we observed greater networking capacities with strong women-to-women bonds, intangible valuation of nature, and a conspicuous difference in the fluidity of the work and communication between practitioners and participants. Women hold unique values and knowledge and carry out fundamental practices for coexistence, identifying that these practices could be a relevant breakthrough for this scientific field. Values and traditions played an important role in the three cases. In the central case, cattle rearing was men’s business, and

the presence of women was even considered to be a nuisance. On the contrary, in the northern and southern cases, women played a notorious role in animal care that suggests that the practice of nurturing (their children, plants, and animals) could be highly significant for fulfilling an essential role in domestication, conservation, and human–wildlife coexistence in the rural landscape of Chile (Eyzaguirre and Linares, 2010; Barreau and Ibarra, 2019). In addition, in the southern case, shared landscapes with the Mapuche community that have extensive knowledge of the natural world and that consider biodiversity as an important part of their worldview could promote coexistence and intangible value of nature and its cohabitants within the non-Mapuche community (Rozzi, 2012; Ibarra et al., 2020).

The gender traits that we identify in these case studies make us wonder whether gendered roles, responsibilities and use of space may produce gendered risks. Risk may be more perceived by women; nonetheless, management of conflict has been reported to be predominantly male-oriented (Banerjee and Sharma, 2021). This is why the specific impact of HWC on women should also be determined. Some studies have reported that the negative impacts of human–wildlife interactions can often be long-term and uncompensated for women, which could certainly have an effect on women–wildlife dynamics (Ogra, 2008; Barua et al., 2013; Banerjee and Sharma, 2021).

Discussion

Here, we presented three different socio-cultural and ecological contexts, where the role of women varied from case to case. Our objective is to raise our concerns about the scarce amount of scientific evidence about the role of women in human–wildlife coexistence because, from our experience as practitioners, we have observed gender traits that suggest that the role of women is unique and fundamental in the pursuit of coexistence (Figure 1).

To consider gender itself as an explanatory variable to different perceptions and attitudes toward wildlife is to overly simplify the relevance of gendered human–wildlife interactions (Gore and Kahler, 2012). Some studies have reported gender differences in attitudes toward wildlife (Kellert and Berry, 1987; Gore and Kahler, 2012; Khumalo and Yung, 2015; Carter and Allendorf, 2016; Banerjee and Sharma, 2021). Some say that women, in general, show more positive attitudes toward animals, being involved in more conservation initiatives than men (Kellert and Berry, 1987; Herzog, 2015; Carter and Allendorf, 2016). Others say that women, in relation to carnivores, tend to show more fear and hold more negative perceptions (Dickman et al., 2013; Bhatia et al., 2017; Alexander et al., 2022). However, there is still not enough information to identify tendencies and associated factors. Acknowledging that these findings are valuable insights contributing to gender perspective, we consider that it is important to explore beyond the gendered and cultural differences in attitudes toward wildlife.

Future studies should also include other variables for a better understanding of the complexity and relevance of the role of women in human–wildlife dynamics in rural settlements. Feminist political ecology and cross-cultural research could be key frameworks to explore these other variables and address this complexity (Banerjee and Sharma, 2021). On the basis of the gender traits, we identified from our experiences, and we consider social identity is a relevant variable to include. Whether women identify themselves as *campesinas*, indigenous, conservationists, hunters, urban dwellers, or others could impact their exposure to HWC and engagement in managing it (van Eeden et al., 2019). From our personal experience, we suggest additionally that time spent with livestock in nature and women's networking capacities as possible variables that could have an impact in their strategies to manage conflict.

Other authors recommend that household responsibilities, economic status, marital status, and number of dependents are also variables to consider because these may impact women's exposure and vulnerability to gender barriers and wildlife impacts (Khumalo and Yung, 2015; Banerjee and Sharma, 2021). As stated by Reygadas et al. (2007) and Agarwal (1997), we also believe that it is relevant to study women's unequal access to land ownership and the consequent low participation of women in decision-making spaces. This is one of the main reasons behind the division of labor, where women tend to dedicate their time to care duties (ECLAC, 2021). These care duties are basically productive and reproductive unpaid work that make male work available, together with others taking care of other alternative sources of income (looms, crafts) and supporting food production through home gardens, which reduces the monetary cost of feeding (Agarwal, 1997).

Human–nature relations are shaped by how the land is perceived or attributed meaning, which is why landscapes are a continuous work in progress (Skogen et al., 2019). We also believe that using a feminist political ecology framework when addressing gender differences is very important to challenge the notion that women are inherently closer to nature. It is our responsibility as female scientists to acknowledge that human gendered interactions have their roots in political issues such as unequal access and control over resources, unequal rights, and reduced access to decision-making spaces (Agarwal, 1997; Banerjee and Sharma, 2021). When gender-disaggregating data, research should focus on TLK including the voices of women, men, and children through community-based, participatory and interdisciplinary approaches to achieve effective and fluent dialogue (Gore and Kahler, 2012; Biskupovic and Canteros, 2019). Doing this not only supports inclusiveness and equity but also creates a space for women's knowledge to contribute to conservation (Sandberg, 2013; Alexander et al., 2022). This could make a difference in terms of feminist environmental justice by helping women to overcome existing social and political barriers (Agarwal, 1997).

and make coexistence initiatives more successful and expeditious (Banerjee and Sharma, 2021).

Author contributions

RA: Conceptualization, methodology, investigation, and writing. SV: Conceptualization, methodology, investigation, and writing. JC: Conceptualization and writing. MM: Conceptualization and illustration. All authors contributed to the article and approved the submitted version.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Supplementary material

The Supplementary Material for this article can be found online at: <https://www.frontiersin.org/articles/10.3389/fcosc.2022.1006006/full#supplementary-material>

DATASHEET 1

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