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Plants as medicinal stressors, the case of depurative practices in Chazuta valley (Peruvian Amazonia)

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ABSTRACT

Ethnopharmacological relevance: Depurative practices, based on taking emetic plants and the restriction of food intake, are very much used in the traditional medicine of Chazuta (Peruvian Amazon) not only to restore health but also to maintain it.

Aim of the study: To describe Chazuta's depurative practices, within a theoretical framework that involves the stress system and which defines the role played by the medicinal plants used as medicinal stressors. This biomedical model is more inclusive in relation to the variety of medicinal uses found for these practices.

Material and methods: The information was obtained in the valley of Chazuta from October 2004 to August 2005 through semi-structured interviews to the 6.3% of its rural adult population (i.e., 140 individuals, 75% belonging to the San Martin Quechua's ethnic group). Thereafter, results were analysed and confronted to the existing literature.

Results: Overall, 191 depurative practices were reported in Chazuta where 114 different plant species were recorded and identified. Depending on their level of severity and duration, depurative practices can be classified as mild or strict. The wide range of medicinal uses reported supports both the involvement of adaptive stress responses in depurative practices and the consideration of the plants employed in this practices as medicinal stressors.

Conclusions: By inducing moderate stress within safe levels, depurative practices in Chazuta could produce adaptive responses that would protect against the detrimental consequences of chronic stress and stress-related diseases. This hypothesis could help to understand the diversity of the medicinal uses recorded in the field. Thus, plant remedies used in these practices in Chazuta could be considered as "medicinal stressors" as through vomiting the necessary neuroendocrine stress activation would be produced. In addition, other bioactivities that plants may harbour could converge with the whole stress reactivity process.

1. Introduction

The use of medicinal plants in Chazuta (Peruvian Amazon) has been the study subject of recent publications of our group (Sanz-Biset and Cañigueral, 2011; Sanz-Biset et al., 2009). A particular aspect highlighted by these works has been the wide use of plant remedies in what we have described as depurative practices.

We use the term depurative to differentiate a group of practices in Chazuta that locals considered to be medicinal because it prompted a general cleansing effect. This cleansing effect was believed to be induced first by the ingestion of medicinal plants with emetic effects (sometimes also being purgative and often considered with other various medicinal effects) and second by reducing food intake. The local belief is that this depurative effect, whether induced by emetic medicinal plants and/or through calorie restriction, produces a "general cleansing" that enhances health broadly speaking.

It is not uncommon for depurative practices to be used for bodily purification or detoxification in complementary and alternative medicine (Kayne, 2009). Nowadays, in medicine the term depurative is mainly used in the clinical management of poisoning and around the concept of dialysis, the method that removes waste and excess water from the blood in renal failure. However, in ethnopharmacology, the term depurative is often used to indicate medicinal plants with effects such as diuretic, purgative, perspirative, choleretic, cholagogue or emmenagogue. These have been reported in regions across the world among different historical periods (Gurib-Fakim, 2006).

Some depurative practices that we reported in Chazuta were employed against different ailments prevalent in the region.

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For some of those, we found some correlation in between the medicinal uses reported and the available bibliographic data on plant bioactivity or active compounds (Sanz-Biset and Cañigueral, 2011). In part, those results may explain the use of plants in some depurative practices due to plant activities such as antinflammatory and antimicrobial. Indeed, besides the emetic effect, local informants also considered many other medicinal effects for the plants employed in these practices. However, in many occasions depurative practices in Chazuta were generally employed to tone and strengthen the body.

When we faced these more unspecific medicinal uses, we found ourselves limited with the conventional approach of targeting precise biological activities or active compounds, as there this relationship became less clear. Therefore, we were led to consider other biomedical models that could explain the broad spectrum of the physiological effects reported.

As a result, the explanation proposed here relates to the moderate activation of stress responses. The theoretical framework used to support these explanations is described in Appendix A (see the supplementary file). To sum up, it is known that both emesis and calorie restriction stimulate the neuroendocrine activation of the stress system (Eversmann et al., 1978, Masoro, 1998). As Chazuta's depurative practices mimic two very primitive and really stressful conditions that human beings can be encountered with, i.e., intoxication and starvation, it is feasible to consider the induction of moderate stress in a way that is medicinal. Considering models of beneficial exposure to stress is common in the study of physical exercise, diet restriction and other conditions (Jackson and Dishman, 2006; Sinclair, 2005; Tapia, 2006). Similarly to physical activity, depurative practices in Chazuta could elicit an adequate stimulation of the stress system, activating several centres such as the HPA axis, the autonomic nervous system and certain centres in the CNS. This activation could be within safe levels and could produce the corresponding adaptive responses conducive to beneficial stress resistance effects in different systems, e.g., gastrointestinal, endocrine, cardiovascular, respiratory or immune (Chrousos, 2006; Tsigos and Chrousos, 2002; Fig. 1).

Then, plant remedies used in depurative practices in Chazuta could be considered as "medicinal stressors" as through vomiting they could prompt the necessary stress to trigger adaptive stress responses. In addition, other bioactivities that plants are known to harbour could converge with the whole stress reactivity process.

The aim of this paper is to describe Chazuta's depurative practices within this more inclusive theoretical framework of adaptive stress responses that is able to indicate the biological processes that would explain the variety of medicinal uses found for these practices; and ultimately, to clarify the role that medicinal plants play in these practices as medicinal stressors. The present paper also brings data to the topic of plants and practices used for depuration, purification or detoxification. Even though this is a common subject in complementary and alternative medicine, papers rarely focus on it. Hence, ethnopharmacological data on this area is especially interesting and can prove to be useful in future studies.

2. Methods

The information collected in the field was obtained through semi-structured interviews to the 6.3% of the district's rural adult population (140 individuals, 60% men, 40% women, 75% of which was considered Quechua). The data presented in this paper is based in a wider fieldwork performed in the studied region from October 2004 to August 2005. In a previous published paper about the medicinal plants of Chazuta (Sanz-Biset et al., 2009), precise information was already given on the study site, its ethnicity, the demography, its socio cultural context, the historical background, the present medical system of Chazuta, how the selection of informants was done for the study, the type of interviews used, how plants were collected, which botanists participated in determining plant species, and how local consent for the investigation in Chazuta was obtained. Moreover, permit for the collection and exportation of voucher herbarium specimens was covered by official authorisations issued by the Agricultural Ministry of Peru's INRENA: Collection licence 087–2004-INRENA-IFFS-DCB and Exportation permit 005780-AG-INRENA.

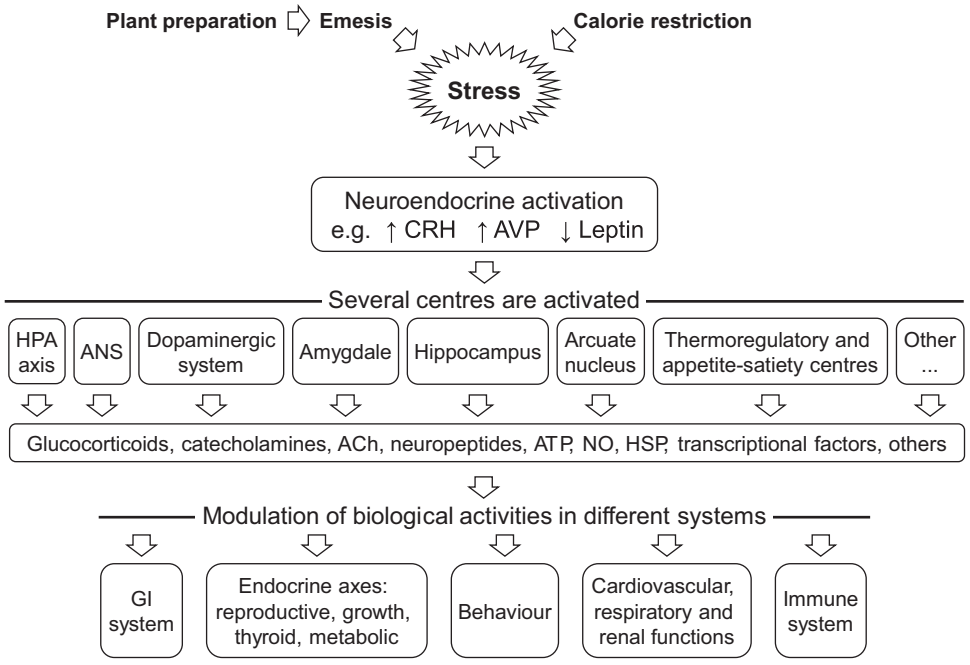

Fig. 1. Neuroendocrine infrastructure triggered by stress which could be activated by depurative practices in Chazuta valley. ACh: acetylcholine, ANS: autonomic nervous system, ATP: adenosine triphosphate, AVP: arginine vasopressin, CRH: corticotropin-releasing hormone, GI: gastrointestinal, HPA: hypothalamic–pituitary–adrenal, HSP: heat-shock proteins, NO: nitric oxide.