How to cite: Souza LMV, Santos JL, Araújo SS, Marçal AC, Estevam CS. Physical exercise and medicinal plants: a promising source for health promotion? Rev Bras Fisiol Exerc 2020;19(4):270-274. https://doi.org/10.33233/rbfex.v19i4.4013

RBFEx
ISSN Online: 2675-1372
ISSN Printed: 1677-8510

Brazilian Journal of Exercise Physiology

Opinion

Physical exercise and medicinal plants: a promising source for health promotion?

Exercício físico e plantas medicinais: fonte promissora para a promoção da saúde?

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ABSTRACT

In view of the high consumption and phytotherapic medicines available on the market for use associated with exercise, from a nutritional point of view, it is extremely important to prove the safety of their use in order to avoid intoxication. In addition, the application of medicinal and phytotherapic plants associated with physical exercise presents another alternative resource to improve performance and attenuate the harmful effects caused by high-intensity exercise. Therefore, the adoption of physical exercises associated with the ingestion of supplements from plants with medicinal properties is suggested as important possibilities for health maintenance and promotion, both in pathology and in physical performance and in the mitigation of deleterious damages caused by physiological stress associated with chronic diseases.

Key-words: Physical exercise, Medicinal plants, Supplementation, Health promotion.

RESUMO

Diante do elevado consumo e dos diversificados fitoterápicos disponíveis no mercado para uso associado ao exercício, é extremamente importante, sob o ponto de vista nutricional, a comprovação de seu uso para que não ocorra intoxicação. Além disso, a aplicação das plantas medicinais e fitoterápicas associada ao exercício físico apresenta mais um recurso alternativo na melhora da performance e na atenuação de efeitos deletérios causados pelo exercício de alta intensidade. Portanto, sugerimos a adoção de exercícios físicos associados a ingestão de suplementos oriundos de plantas com propriedades medicinais como possibilidades importantes para a manutenção e promoção da saúde, tanto na patologia como no desempenho físico e na atenuação de danos deletérios causados pelo estresse fisiológico associados às doenças crônicas.

Palavras-chave: Exercício físico, Plantas medicinais, Suplementação, Promoção da saúde.

Received on: April 9, 2020; Accepted on: June 22, 2020.

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Currently, the world population has growing interest in the adoption of healthy habits that can improve quality of life and health. Among them, the practice of physical exercises and the use of plant supplements with medicinal properties stand out [1].

Merino *et al.* [2] emphasize that natural antioxidants, such as flavonoids, act directly and / or indirectly in the neutralization and / or scavenging of free radicals. In this context, flavonoids found in several medicinal plants have a variety of biological activities such as antioxidant and anti-inflammatory, suggesting that these compounds have beneficial effects on molecular pathways involved in the genesis and / or maintenance of oxidative stress in physiological conditions in physically active individuals, even in post-exercise and / or pathological conditions [1,3-5].

In addition to the use of medicinal plants for health maintenance, physical exercise is considered an important factor in promoting well-being and mitigating the incidence of comorbidities. However, it is widely discussed that the intensity and regularity of exercises may contribute to the appearance of extreme tiredness, oxidative stress, immunosuppression and muscle damage [6-12]. Muscle damage is partly due to increased oxygen uptake during physical exercises to maintain metabolism during cellular respiration. Therefore, exacerbated production of reactive oxygen species (ROS) may occur [13]. The imbalance caused by the increase in ROS production and the decreased and/or insufficient activity of the antioxidant system of cells is called oxidative stress, a condition that can lead to the oxidation of cellular and tissue components, involving some pathophysiological states such as aging, inflammatory processes, cancer, cardiovascular and neurodegenerative diseases [13-15].

Thus, new strategies have been developed in the field of physical exercise to minimize hormesis, among which the use of antioxidants such as vitamins C, E and phytochemicals, such as polyphenols present in fruits and vegetables and/or teas [6-16].

The use of supplements from some plant extracts can be beneficial when associated with physical exercise to reduce oxidative stress, muscle damage and type 1 diabetes mellitus. As an example, in a study carried out by our research group, it was observed that type 1 diabetic rats supplemented with *Coutoubea spicata* (known as Nicolao) and concomitantly submitted to resistance exercise during four weeks of resistance training (3 sessions per week) presented attenuation of blood glucose levels and oxidative stress induced by the disease [17]. These results suggest that this plant could be a potential alternative for the development of phytotherapic medicines and products for the treatment of diabetes mellitus concomitant with physical exercises.

Similar results were found by Baldissera *et al.* [18] with rats supplemented with *Syzygium cumini* extract (known as *Jambolão*); however, with 8-week aerobic training with diabetic rats, the extract of this medicinal plant showed hypoglycemic, hypolipidemic and protective properties against oxidative stress. In addition, in another study of our group using supplementation with Jambolão for 21 consecutive days in experimental models submitted to high-intensity interval physical exercise, reduction in oxidative stress caused by high-intensity physical training was observed [19].

In study carried out by our research group, rats submitted to acute resistance exercise session and supplemented with *Croton argyrophyllus* (popularly known as *Marmeleiro Branco*) showed significantly inhibition in the generation of free radicals and partial reduction of oxidative stress markers and muscle damage, suggesting that this supplement may be a possible adjuvant in the recovery process after extensive exhausting efforts [20]. Likewise, in another study by our research group that

performed 4-week high-intensity resistance training with rats supplemented with *Bowdichia virgilioides* (known as *Sucupira Preta*), reduction in the concentration of oxidative stress and muscle damage markers was observed when compared to control group (submitted to training only) [21]. Clinical trials have indicated that the practice of high-intensity physical exercise concomitant with acute or regular intake of some foods rich in polyphenols such as flavonoids, tannins and lignans can prevent or even reduce possible cellular damage such as oxidative stress caused by the increase in ROS production [22-24]. Other benefits of using phytotherapic medicines in physical exercise programs are gains in resistance in endurance and strength exercises [22].

Finally, despite the acute and chronic benefits from phytotherapic medicines associated with physical exercises presented here, they should be prescribed by qualified professionals. Such benefits can be superseded by the adverse reactions of self-ingestion without proper guidance, which may even cause intoxications. The idea is that physical exercise programs aimed at sportsmen could count on the participation of nutritionists with deep knowledge on the application of these phytotherapic medicines. Likewise, undergraduate and graduate courses in nutrition should include Exercise Physiology discipline for a deeper understanding of the effects of physical exercise on the physiology of different systems. This symbiosis, if well planned and executed, can benefit everyone involved with the practice of physical exercises.

Academic link
This article is part of the Thesis of Lúcio Marques Vieira Souza, supervised by Dr. Charles dos Santos Estevam, Federal University of Sergipe (UFS).

Potential conflict of interest
No conflicts of interest with potential potential for this article have been reported.

Financing source
There were no external sources of funding for this study.

Authors' Contributions
Study conception and design: Souza LMV. Writing of the manuscript: Souza LMV, Dos Santos JL, De Araújo SS. Critical review of the manuscript regarding the important intellectual content: Marçal AC, Estevam CS.

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