

ABSTRACT - STRESS IN POPULATIONS, FUNGAL COMMUNITIES, AND
SYMBIOTIC INTERACTIONS

**A COMMON MYCORRHIZAL NETWORK MAINTAINS THE SOIL FERTILITY
OF A SITE OF CAMPO RUSPESTRE OVER A QUARTZITE SUBSTRATE IN
THE “SERRA DA CALÇADA” REGION (NOVA LIMA – MG)**

Gabrielle Marques Inácio (gabrielle.minacio@gmail.com)

Antonio Henrique Dos Santos (ahsantos010@gmail.com)

Julio Cezar Barroso Lima (julioczlma@hotmail.com)

André Felipe De Souza Reis (afsr11@hotmail.com)

Maria Rita Scotti (mrsm.ufmg@gmail.com)

The “Serra da Calçada” , located in the municipality of Nova Lima in Minas Gerais State/Brazil (20°06'09.8"S S, 43°59'23.3"W), is formed by a rocky quartzitic outcrop belonging to the “Espinhaço” mountain range which is situated between 1462 and 1478 m above the sea level. This region hosts several headwaters and a native vegetation with high degree of biodiversity and endemism. However, these sites have been degraded by radical sports such as motocross and off-road racings, damaging the vegetation, the rocky outcrop and the headwaters that supply neighboring cities. Aiming at subsidize the restoration of one of these degraded sites, we proposed to study a preserved site located nearby in order to understand the natural patterns of plant distribution, soil fertility and their inter-relations. For that, we assessed the occupancy and abundance of plant families, soil chemical fertility, root mycorrhizal colonization and leaf N content across three blocks sizing 50m x

10m each. The most prevalent plant families were: Asteraceae, Fabaceae, Malpighiaceae, Melastomataceae, Orchidaceae and Poaceae. Soil was predominantly sandy with high levels of organic matter, P, N-NH₄ and the latter showed a homogenous distribution across the site. In contrast, N-NO₃ was found low and associated with organic matter pools. The leaf N content showed also an equitable distribution across plant families, except for the Fabaceae plants that presented a higher leaf N content likely due to their N-fixing ability. Such homogenous distribution of both soil and leaf N may be explained by the harmonious arbuscular mycorrhizal fungi (AMF) root colonization (30-40%) found in all the studied plant families since AMF are able to transfer N among plants and organic matter patches via their extra-radicular mycelium. Besides, plants from Orchidaceae family were also found colonized by Orchid Mycorrhizal Fungi (OMF) belonging to the Basidiomycota phylum, which are known as greater organic matter decomposers. Therefore, the presence of the double infection by AMF and OMF in Orchidaceae suggests that this family plays a key role in the establishment of a common mycorrhizal network (CMN) likely involved in N transfer among organic matter, OMF, AMF and all the plants. In this way, this study suggests that such a CMN formed among mycorrhizal and plant species in the Campo rupestre of the Serra da Calçada plays a major role for the harmonious N fertility found in this site. Thus, we recommend the maintenance of arbuscular mycorrhizal associations in future rehabilitation efforts of degraded campo rupestre sites.