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This study was aimed primarily to determine the anatomical structure of the graft-union in two graft combinations of *Leucospermum* (Proteaceae). It was conducted during five periods following grafting, with two different combinations: *L.* ´Succession I´ / *L. patersonii* and *L.* ´Succession I´ / *L.* ´Spider´, using unrooted cuttings as stocks. Samples were taken from graft-unions, fixed in FAA, embedded in Paraplast Plus and then stained with Safranin-Fast Green (Johansen 1940). It was noted that cells neighbouring the wound were capable of de-differentiation where the two sides come into contact, developing meristematic characteristics and subsequent proliferation. The vascular cambium showed an essential role in engraftment. The cambial bridge was established at 4 months after grafting, and new vascular cambium, phloem and xylem were formed. Cellular activity of both components was necessary to establish the cambial bridge. Xylem tissue was developed regularly in both types of graft, with both *L. patersonii* and *L.* ´Spider´ as stocks, indicating that the conductive elements transported water, essential to keep the grafts alive. Some of the sections of both combinations showed cells with a 'necrosed' appearance in cortical tissues at 5 and 6 months, without negatively affecting compatibility. The combination *L.* ´Succession I´ / L. *patersonii* and *L.* ´Succession I´ / *L.* ´Spider´ belongs to the compatibility group 'a' (Mosse and Herrero 1951).

P0611 – Poster

Variations in leaf and stem anatomy of two micropropagated *Leucospermum* (Proteaceae) cultivars

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A histological study of leaves and stems of two *Leucospermum* (Proteaceae) cultivars ('Flame Spike' and 'Tango') has been made from micropropagated (70 days old microplantlets) and field plants, using light and transmission electron microscopy. Both cultivars showed a similar tissue distribution and development. Leaves from in vitro and field plants presented a simple epidermis with isodiametric cells covers by a cuticle. This layer was much thinner in leaves from in vitro plantlets than from field. Trichomes were unicellular, simples and elongated. Leaves were anphistomatic, and presented reniform and paracytic stomata in both surfaces. The mesophyll presented a parenchyma poorly organized and vascular bundles with a limited development and a poor presence of sclerenchyma in leaves grown in vitro, while field leaves showed an organized palisade and spongy parenchyma with intercellular spaces. Ultrastructural observations showed scattered droplets of phenolic compounds in parenchyma and bundles sheath cells from in vitro plantlets leaves. The palisade parenchyma cells from field leaves containing phenolic deposits presented as fine-granular and occupy the entire vacuolar volume. Stems transversal section showed a concentric tissue organization both in vitro and field plants. The in vitro stems showed a simple epidermis covered by a thin cuticle compared to the field ones. Cortical parenchyma presented a variable cells layer (8-10 from in vitro plantlets and 6-8 from field plants) and collateral vascular bundles were surrounding a large pith in both. In vitro stems showed poorly developed vascular bundles with a small number of sclenchyma fibers outside them. Ultrastructural observations showed cortical cells containing phenolic deposits presented as scattered droplets in vitro stems, these deposits were lower than in field stems. 'Flamespike' showed scattered droplets, while `Tango´ phenols are presented both scattered droplets and fine-granular. 'Flame Spike' and `Tango´ in vitro plantlets showed certain characteristic features due to the microenvironment where they have grown. These features render them vulnerable to the transplantation shock when directly placed in a greenhouse or field. This work gives us guidelines for developing an optimal acclimatization protocol that increase survival rates in greenhouse and field.

P0612 – ePoster

Xplo: a software for plant architecture exploration

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Improving our knowledge on plant architecture and development will help to answer remaining questions in ecology, agronomy and forestry, i.e. regarding plant acclimation and adaptation to changing environments or optimization of plant products. For this purpose, computational plants are becoming more and more popular and a lot of effort is made to build structural and functional models at the organ level in order to simulate plant growth and structure [1]. In this context, scientists need software to measure, analyse and model plant architectures. The Xplo project has been developed in UMR AMAP since 2008 aiming at edition, visualization, exploration and simulation of plant architecture in a user-friendly manner. The software gives interactive tools to handle the plant structure topology (i.e. organ addition/ deletion), geometry (i.e. 3D selection, edition, rotation) and dynamic (i.e. time line, scenarios). It has been used for various types of plant architecture studies (i.e Sunflower [2], Fir Sapling[3], Cecropia, Palm trees [4]). Xplo is fully compatible with the multi-scale tree graphs (MTGs) data structure, which is commonly used to represent plant topology [5]. Users can explore this data structure to find or to improve hypotheses on plant development. Specific data can be extracted with combination of criteria and be visualised in tables and graphs. Simple analysies functions can be launched or data can be exported to external tools, i.e. AMAPMod, R or any other statistical computing environment, for more specific analyses. Once the model is designed, modellers can integrate their own plant simulation model to the platform and get benefit of its functionalities to test their hypothesis. Different scenarios can be computed for a growth model by interactively modifying model parameters or plant structure (i.e. by pruning) at defined time steps. A plant geometry builder is integrated to Xplo. It allows a 3D plant mockup to be computed according to available geometrical data in the tree graph. If geometrical information is missing, standard default algorithms are provided to compute the missing data and to make 3D rendering available. Xplo is an expandable software built around the stable Capsis kernel [6]. Independent simulation models are integrated in Xplo under the form of separated modules, and various tools can be plugged at any time using flexible extensions. This generic software can be run either in an interactive context with a multi-language graphical user interface or in script mode (Groovy/Python). Xplo is a free open-source software (LGPL) and is available on almost every OS.

P0613 – ePoster

Ecological trends in wood anatomy: is it possible to define patterns in species of Atlantic rain forest domain?

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The Atlantic rain forest (ARF), one of the 25 biodiversity hotspots for conservation priority, is a mosaic of different physiognomies. The biome that once covered most of the Brazilian east coast is now reduced to 7%. Despite its impressive biodiversity, little is known about the wood anatomy of ARF species and understand the variation of the wood anatomy is a key role to evaluating environmental and biotic influences in ecosystems. To gain more insight into the ecological trends in wood anatomy, qualitative and quantitative wood anatomy parameters of species from three remnant in ARF domain were compared (256 tree specimens, belonging to 82 species and 25 families) and the results were compared with literature data of 187 species from 9 different forest remnants around the world: one in Amazon forest (Fedalto et al. 1989), two in Mexico (Barajas-Morales 1985), one in Venezuela (Lindorf 1994) and five in Southwestern Australia (Carlquist 1977), to answer the following questions: (1) can wood anatomy parameters be used to characterize different physiognomies of the ARF?; (2) can an ecological trend for the remnants of the ARF be identified? and, if so, (3) is it comparable to results from other biomes? The samples were collected in Rio de Janeiro State in two Montane forest patch at the Parque Nacional do Itatiaia (PNI) (22º15'– 22º30'S and 44º30'– 44º45'W) and Reserva Ecológica de Macaé de Cima (REMC) (22º21'– 22º28'S; 42º27'– 42º35'W) and one Lowland forest sampled in Reserva Biológica de Poço das Antas (RBPA) (220 30'– 220 33'S; 420 15'– 420 19'W). Our results showed that the ARF species have privileged the efficiency of the conduction investing in low frequency (average of 20) of vessels wider than 80 µm with simple perforation plates. The principal component analysis separates the three remnants in different groups, which allows us to detect features for each physiognomy: the Montane forests are characterized by vessel elements longer than 500 µm and narrower than 100 µm and septate fibres (52% PNI and 71% REMC). The PNI species are separated from REMC by the incidence of distinct growth rings boundaries (86% in PNI and 57% in REMC). The RBPA species presented distinct growth rings boundaries (82%), vessel frequency lesser than 10 and vessels wider than 100 µm. The comparison of ARF remnants and the literature data, although applied to only a few vessel element characters, demonstrate in a statistical approach that the wood anatomical features can characterize different forest remnants. The more xenomorphic remnants from Australia remain grouped. The dry forest in Venezuela and the tropical deciduous forest from Mexico integrate another group, as well as the tropical Lowland forests from Mexico, Amazon and ARF (RBPA) and the Montane forests of ARF.

P0614 – ePoser

Leaf anatomy of invasive and non-invasive climbers: does it correspond with ecophysiological performance?

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An aspect of invasion biology is the identification of common traits of invasive species that may contribute to their invasiveness. A previous study that compared resource-use efficiency and phenotypic plasticity of invasive and non-invasive climbing plants in South-eastern Queensland under different light conditions indicated that invasive species tend to have a more efficient use of light and carbon compared with non-invasive counterparts, while non-invasive species have a greater water-use efficiency. Furthermore, the invasive species were shown to have a lower leaf construction cost and greater plasticity in such structural traits as leaf thickness and density. This set of characteristics may contribute to the fitness of the invasive species. The present study compares leaf anatomical and morphological traits associated with relevant ecophysiological traits of the same species grown under different light conditions. These anatomical traits were examined primarily by light microscopy of stained leaf sections and impressions of the epidermis. Specifically, it was hypothesised that invasive species have anatomical traits consistent with a high light-use efficiency (e.g. fewer trichomes), low water-use efficiency (e.g. thinner epidermis) and low construction cost (e.g. less lignin) than non-invasive counterparts, and that they have a greater ability to adjust their anatomy to different light levels. A possible exception to this generalisation may be given to one non-invasive species (Parsonsia straminea), which has an ecological performance closer to that of invasive ones.