Plectranthus: A Genus Chosen for New Plant Development Through Tissue Culture and Somaclonal Variation©

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INTRODUCTION

Plectranthus, an Old World genus, is a group of herbaceous plants belonging to the Lamiaceae family and consists of about 350 known species distributed throughout summer rainfall areas of Africa, Madagascar, India, Australia, and a few of the Pacific islands (Van Jaarsveld, 2006). *Plectranthus* are mostly soft, low-growing semi-succulent to succulent herbs or shrubs, some with unusually beautiful tubular flowers ranging in color from blue, violet, white, and pink (Brits et al., 2001).

The name *Plectranthus* literally means spurflower (*plectron* = spur and *anthos* = flower) and refers to the spur at the base of the corolla tube of *Plectranthus fruiticosus.* This species was the first plant in this genus to be described (Codd, 1975). This name is confusing because only a couple of the species in the genus have this spur. *Plectranthus* is a very diverse group of plants with some of the species converging into other genera. DNA studies are needed to clarify some of the taxonomic confusion within this genus.

Plectranthus has been referred to as a "horticulturally neglected" genus (Van Jaarsveld, 2006) and many species of the commercially grown *Plectranthus* have had very little or no improvement via plant breeding. A small number of the southern African *Plectranthus* has been known and grown in the U.S.A. and in Europe, with the most common being the "Swedish Ivy". These plants are mostly grown as window plants and in hanging baskets for their foliage. Very little attention has been given to the beautiful flowers some of these plants produce, or the potential that they have as garden plants. Recent introductions of two hybrid cultivars of *Plectranthus*, 'Mona-Lavender' and the pink-flowering 'Cape Angel' have brought more attention to this group of plants.

There is great potential for breeding and improvement of *Plectranthus,* especially as a novel, shade-loving annual. The potential to develop new forms and selections that perform well in shaded areas of the garden exists because there are species that occur natively as forest floor plants in the southeastern subtropical forests of South Africa (Van Jaarsveld, 2006). Plants within the genus *Plectranthus* are normally fast growing, easy to root and are mostly propagated asexually by stem cuttings. These are features, along with their ornamental foliage and beautiful flowers, make these plants very appealing.

Very little research has been conducted on the micropropagation of *Plectranthus*. Some work has been completed on the micropropagation of *P. vetiveroides* (Sivasubramanian et al., 2002) and *P. esculentus*, the Livingstone potato, (Allemann, 2002). However, there has been significant research published on related plants such as *Coleus, Salvia*, *Mentha*, and other members of the lamiaceae (Jullien et al., 1998; Bhattacharyya and Bhattacharya, 2001; Reddy et al., 2001; Goleniowski et al., 2003; Skala and Wysokinska, 2004; Misic et al., 2006; Rani et al., 2006).

Micropropagation protocols are being developed for four selected *Plectranthus* species: *P. ecklonii, P. hilliardiae, P. oertendahlii*, and *P. zuluensis*. The research includes the creation of somaclonal variants via different mutation techniques. In vitro chromosome doubling will also be investigated for possible restoration of fertility to sterile hybrids and/or to aid in the creation of seed sterile taxa. The tissue culture research will be used as an aid in a selective breeding program where inter- and intraspecific hybrids will be created via cross- and self-pollination techniques. These hybrids will then be screened for the use as new summer ornamentals in the garden and as potted plants. *Plectranthus* could be an alternative for coleus (*Solenostemon*) to add color and variation in the garden where shade-loving plants are needed.

The research that is being conducted will not only benefit the horticulture industry. *Plectranthus* is part of the mint family (*Lamiaceae*) which is known for the production of secondary metabolites and chemicals such as the diterpenoids. *Plectranthus* can be used as a medicine for various conditions, part of diet as an herb or a source of starch, and in some cases as animal fodder. Breeding and *in vitro* research of *Plectranthus* can also aid the pharmaceutical industry (Lukhoba et al., 2006).

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