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Application of Synthetic Growth Regulators for Vegetative Propagation of *Bougenvillea glabra* Choisy

Ligita Baležentienė

Ornamental plants, extension of their assortment and cultivation of planted material of new species and of cultivars play important role in creation of ergonomic, ecological and comfortable environment. *Bougenvillea glabra* Choisy can be successfully used for phyto-design of living interiors. This plant is worth attention for excellent ornamental features, durable blossom, resistance to pests and diseases, being not demanding for growing conditions. The influence of synthetic growth regulators on propagation of *Bougenvillea glabra* by semi hardwood cuttings was investigated in Kaunas Botanical Garden in 1998-1999. This way of propagation forms identical to initial planting material, what is especially important for multiplying hybrid cultivars. It has been determined, that ST-12 is the most effective stilts for propagation of *Bougenvillea glabra* by semi hardwood cuttings. This regulator has the strongest stimulating effect on callus forming and rhizogenesis as well as the biggest yield of rooted cuttings.

*Bougenvillea glabra*, vegetative propagation, stilts.

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Ivies for Winter Gardens

Valerija Baronienė

Means of vegetative propagation and drought resistance of two species and six cultivars of ivy (*Hedera colchica* (K. Koch)Hibb., *Hedera helix* L., have been *H. helix* ‘Ivalace’, *H. helix* ‘Maple Leave’, *H. helix* ‘Minor Marmorata’, *H. helix* ‘Parsley Crested’, *H. helix* ‘Sagittifolia’, *H. helix* ‘Shamrock’) studied. Layering and cuttings are the widely used types of vegetative propagation of ivy. All ivies are easily propagated by different types of stem cuttings (tip cuttings, one leaves, two - leaves and three - leaves node cuttings) in June and July and by layering in spring. The cuttings of *H. helix* ‘Maple Leave’ root the best, and the ones of *H. helix* ‘Minor Marmorata’ root the worst. All ivies, especially *Hedera helix* ‘Sagittifolia’ and *H. colchica*, are drought resistant enough and do not lose their vitality when not watered for a long time. The species and cultivars studied are easily propagated by cuttings and layering, drought, pests and disease resistant, highly decorative and may be widely grown outdoors and indoors.

*Ivy*, propagation, cuttings, layering, drought.
Effect of Medium on Asiatic Lily of Bulb Scale Segments’ Morphogenesis in vitro

Natalija Burbulis, Rita Marseliene, Ramune Kupriene, Judita Varkuleviciene

It has been determined, that morphogenesis of lily bulb scale segments in vitro depends on growth regulators in induction media. In the medium, supplemented by 3.0 mg l⁻¹ BAP + 0.3 mg l⁻¹ NAA, each explants formed in average 0.05 ('Nakotne') and 0.22 ('Destiny') more micro shoots in comparison with those in the medium supplemented by 1.0 mg l⁻¹ BA + 1.0 mg l⁻¹ 2.4D. Growth regulators combination 1.0 mg l⁻¹ BAP + 1.0 mg l⁻¹ 2.4D stimulated more intensive embryo formation, especially of cultivar 'Destiny'. Bulblets of 'Nakotne' cultivar formed explants in the medium supplemented by 3.0 mg l⁻¹ BAP + 0.3 mg l⁻¹ NAA only. Increasing content of sucrose from 30 g l⁻¹ to 60 g l⁻¹ promoted more intensive bulbs forming from micro shoots by 6.37 ('Nakotne') and 2.27 ('Destiny') units from explant. After cold treatment more extra bulbs were obtained from 'Nakotne' micro shoots in the medium supplemented by 60 g l⁻¹ sucrose. At higher content of sucrose the increase in size of the bulbs was observed. The bulblets with the diameter bigger than 4 mm, which had formed on 60 g l⁻¹ sucrose, better adapted when transplanted to soil.

Asiatic lily, growth regulators, content of sucrose, morphogenesis.

Natalija BURBULIS. Doctor of biomedical science, head of Genetic-Biotechnology laboratory, Department of Crop Science and Animal Husbandry, Agronomy faculty, Lithuanian University of Agriculture. Address: Studentu 11, LT-53361 Akademija, Kaunas distr. Tel. (8 37) 75 22 64, e-mail: natalija@nora.lzua.lt
Rita MARSELIENE. Head agronomist of Kaunas Botanical Garden of Vytautas Magnus University. Address: Z.E. Zilibero 6, LT-46324 Kaunas. Phone: (+370 37) 390033, e-mail: kore75@onet.lt
Ramune KUPRIENE. Ph.D student, Department of Crop Science and Animal Husbandry, Agronomy faculty, Lithuanian University of Agriculture. Address: Studentu 11, LT-53361 Akademija, Kaunas distr. Tel. (8 37) 75 22 64, e-mail: ramunek@info.lzua.lt
Judita VARKULEVICIENE. Doctor of biomedical sciences, Head of Exposition and Collection department at Kaunas Botanical Garden of Vytautas Magnus University. Address: Z. E. Zilibero 6, LT-46324 Kaunas. Phone: (+370 37) 390033, e-mail: j.varkuleviciene@bs.vdu.lt

Propagation of Caladiums in vitro

Simas Gliožeris, Egidija Venskutonienė, Alfonsas Tamošiūnas, Laimutė Štuopytė

The caladiums (Caladium Vent.), belongs to the Araceae family. The influence of growth regulators BAP, kinetin, NAA on direct regeneration of isolated caladium petioles, direct regeneration of microtubers in darkness and light have been investigated. Petioles were washed with distilled water, cleaned with sterile cotton moistened with 85% ethyl alcohol and again washed up three times with distilled water in glass cylinders of 200 ml capacity. Later in laminar the petioles were dried with sterile filter paper, cut to 0.4-0.5 cm pieces and laid on MS (1962) nutrient medium in flasks of 200 ml capacity. MS medium was supplemented with saccharose (30 g/l), agar (7 g/l), mesoizonit (100 mg/l), thiamine (1 mg/l), pyridoxine (1 mg/l), and nicotinic acid (1 mg/l). pH of the medium was 5.5. The medium was sterilized in autoclave for 20 min at the temperature of 120°C. Explants of caladium ‘Irene Virkau’ petioles were cultivated on MS medium with 0.01 mg/l of NAA and 0.01; 0.1 and 1.0 mg/l of BAP for two months. Due to the influence of low BAP and NAA (0.01 mg/l) formation of callus started on the surface of the explants. The most rapid growth of microtubers was observed when the MS medium contained 0.1-1.0 mg/l of BAP and 1.0 mg/l of NAA.

Caladium, micropropagation, BAP, NAA, kinetin.

Simas GLIOŽERIS. Lithuanian University of Agriculture, Faculty of Agronomy, Department of Botany, Assoc. Prof. Dr. Address: Studentu g. 11, LT-53361 Akademija, Kauno r. Tel. (8 37) 75 23 85, E-mail: bo@nora.lzua.lt.
Egidija VENSKUTONIENĖ. Lithuanian University of Agriculture, Faculty of Agronomy, Department of Crop Science and Animal Husbandry, Assoc. Prof.Dr. Address: Studentu g. 11, LT-53361 Akademija, Kauno r. Tel. (370) 37 75 22 93, E-mail: vega@info.lzuu.lt.
Alfonsas TAMOSIŪNAS. Lithuanian University of Agriculture, Faculty of Agronomy, Department of Botany, Assoc. Prof. Dr. Address: Studentu g. 11, LT-53361 Akademija, Kauno r. Tel. (8 37 ) 75 23 85, E-mail: aa@nora.lzua.lt.
Laimutė ŠTUOPYTĖ. Lithuanian University of Agriculture, Faculty of Horticulture, Assoc. Prof. Dr. Address: Studentu g. 11, LT-53361 Akademija, Kauno r. Tel. (8 37 ) 75 23 41, E-mail: ns@nora.lzua.lt
Theoretic and Applied Investigations of Tropical and Subtropical Plants in Conservatories of
the Donetsk Botanical Gardens of the National Academy of Sciences of Ukraine

Irene Gornitskaya

In assessment of introduction successfulness original scales have been used. Assessment of adaptive strate-
gies of plant species is proposed to be used taking in to account botanical-geographical regions (ranges) of the
Earth and geological history. The Mediterranean and the Western Pacific geosynclinal belt are regarded as
macroterritories. It has been determined that the ranges of the Western Pacific geosynclinal belt are predomi-
nant. Integral assessment must be conducted with regard for regional factor. Perspectives for mobilization are
the ranges from which at least 50% of plant species are successfully introduced. We observed convergent simi-
larities of plant species adaptive strategies in cases when the land was forming in similar geological epochs, pe-
riods under conditions of similar conjugacy of the basic environmental factors.

Introdution, geosynclinal belt, range, strategies.

Ирина ГОРНИЦКАЯ. Доктор биологических наук, ведущий научный сотрудник Донецкого ботанического сада НАН
Украины, заведующая фондовыми оранжерей. Адрес: пр. Ильича, 110, г. Донецк, Украина. Раб. тел. (0622) 94 70 58; дом. тел.
(0622) 97 76 65; адрес эл. почты herb@herb.dn.ua; ostapko@skif.net

ISSN 1648 – 116X LUA RESEARCH PAPERS. 2006. Nr. 69 (22),1

BIOMEDICAL SCIENCES

Biotrophic and Saprotrophic Fungi on Ornamental Plants in Closed Premises

Banga Grigaliūnaitė, Antanas Matelis, Sigutė Stakvilevičienė

For the first time a wood deteriorating fungus Antrodia sinusosa, ascribed to the Polyporaceae family, has
been determined as the primary infection agent of ornamental plants (Alocasia sp., Cyperus alternifolius, Fittonia
verschaffeltii, Nerium oleander, Platycerium bifurcatum, Saxifraga stolonifera, Strelitzia reginae) cultivated in
closed premises. The fungus was spread in soil from the damaged wooden boards. Micromycetes of 14 species
ascribed to 12 genera (Alternaria, Cladosporium, Fusarium, Mucor, Mycelia, Penicillium, Sporotrichum, Stem-
phyllium, Trichoderma, Trichosporium, Trichothecium, Verticillium) were isolated in vitro from withering, weak-
ened plants. Two viruses isolated from common oleander (Nerium oleander). Tomato spotted wilt tospovirus hav-
ing isometric pleomorphic particles 80 – 120 nm in diameter and another unidentified virus with isometric parti-
cles 30 nm in diameter.

However, many plants growing in the same flowerbed were healthy and flourishing. Wood deteriorating
fungus Antrodia sinusosa was not detected on them.

Leucocoprinus birnbaumii, a particularly rare fungi, was found in closed premises.

Ornamental plants, fungal diseases, closed premises.

Banga GRIGALIŪNAITĖ. Institute of Botany, senior researcher of Laboratory of Phytopathogenic Microorganisms, doctor of bi-
omedical sciences. Address: Žaliųjų ežerų str. 49, LT-08406, Vilnius, Lithuania. Phone (+370 5) 2697291, e-mail: bangas@botanika.lt

Sigutė STAKVILEVIČIENĖ. Institute of Botany, researcher of Laboratory of Phytopathogenic Microorganisms, doctor of biomedical
sciences. Address: Žaliųjų ežerų str. 49, LT-08406 Vilnius, Lithuania. Phone (+370 5) 2697291, e-mail: sigute@botanika.lt

Antanas MATELIS. Institute of Botany, head of Laboratory of Phytopathogenic Microorganisms, doctor of biomedical sciences. Ad-
dress: Žaliųjų ežerų str. 49, LT-08406, Vilnius, Lithuania. Phone (+370 5) 2697291, e-mail: matelis@botanika.lt
Collections of Tropical and Subtropical Plants in Vilnius Pedagogical University and their Use

Teresė Jokšiene

Tropical and subtropical plants collections have been accumulated in greenhouse of Vilnius Pedagogical University. Today it has plants of 603 taxes from 95 families, 264 genera. Plants belong to for 4 systematical divisions: Lycopodiophyta (make 0,3% of all greenhouse plants), Polypodiophyta (3.7%), Pinophyta (1,3%) ir Magnoliopsida (94.7%). The provenance of plants is as follows: South America – 164 species, Asia – 123, Africa – 97, North America – 89, Europe – 20 and from Australia – 17 species. According to morphological and ecological features the plants belong to the following groups: decorative leaves – 259 taxons, blooming – 75, succulents – 192, ampelics – 91, liana – 43, epiphytic – 39, plants with esculent fruits – 19 taxons.

The plants’ possibilities to adapt in various interiors were investigated in 1999-2004. The collections of plants are used for scientific and educational purposes. All plants from greenhouse of Vilnius Pedagogical University according to their morphological and ecological features could be grown in various interiors with different microclimatic conditions.

Tropical and subtropical plants, systematic, morphological features, provenance.

Teresė JOKŠIENĖ Assistant Department of Botany, Faculty of Natural Sciences, Vilnius Pedagogical University. Address: Studentų g. 39, LT – Vilnius. Tel 2 75 18 13, e-mail: oranzerija@vpu.lt

Pathogenesis of Imported Pot-Plants

Vidmantas Juronis, Vilija Snieškienė

Flowering pot-plants and cut plants imported from abroad (mainly from the Netherlands) have markedly filled up the assortment of decorative plants in Lithuania. Having been grown up under perfect conditions plants often poorly adapt and their physiological functions are interrupted. They plants become irressistant to pathogenic microorganisms. Diseases and pests found in 1997-2004 are described in the article. The state of 488 plant taxons was observed and 129 plant taxons were found to have several injuries and damages. The degree and intensity of injuries were determined. Just imported plants have no disease or injury symptoms. When plants are grown under unfavourable conditions (in stores, shops), the symptoms of non-infectious and infectious diseases show up after 2-4 weeks. Of the diseases caused by pathogenic microorganisms rot and wilt are the most dangerous and widely spread ones other widely spread diseases decrease plant decorativeness but are not very dangerous.

Pot-plants, pest, diseases, physiological injuries.

Vidmantas JURONIS. Doctor, Associated professor at Kaunas Botanical Garden of Vytautas Magnus University. Address: Z. E. Zilijbero 6, LT-46324, Kaunas. Tel (8-37) 39 00 33, E-mail: v.juronis@bs.vdu.lt
Vilija SNIĘŞKIENĖ Doctor at Kaunas Botanical Garden of Vytautas Magnus University. Address: Z. E. Zilijbero 6, LT-46324, Kaunas. Tel (8-37) 39 00 33, E-mail: v.sniekiene@bs.vdu.lt
Occurrence of Virus Infection on Some Greenhouse Plant Species Belonging to *Araceae* Juss. Family

Meletė Navalinskiene, Marija Samuitiene

Investigation of virus infection occurring on some plant species belonging to *Araceae* Juss. family: two species of anthurium (*Anthurium andreanum* Linden, *A. scherzenianum* Schott), dieffenbachia (*Dieffenbachia Schott*), epipremnum (*Epipremnum pinnatum* (L.) Engl.), scindapsus (*Scindapsus pictus* Hassk.) and callalily (*Zantedeschia aethiopica* (L.) Spreng.) was carried out at the Plant Virus Laboratory of Institute of Botany. Symptoms on host plants were described and shown in figures. Tobacco mosaic tobamovirus (TMV), Zantedeschia mosaic potyvirus (ZMV), Tomato spotted wilt tospovirus (TSWV) and Arabis mosaic nepovirus (ArMV) were isolated and identified by the methods of test-plant, electron microscopy and serological reactions.

*Araceae, tobamovirus, potyvirus, tospovirus, nepovirus.*

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Regulation of the Dark-Light Regime by the Plant Biopotential: Theoretical Grounding and Practical Appliance

Vladimir Petrouchenko, Vladimir Belov, Nelly Nikolayeva

The bio-potential of the best developed plant (leading plant) is used to synchronize the artificial lighting regime with the photo-energetic needs in plant tissues. The leading plant is selected from a massif of similar species by botanical indices (atypical and abnormal criteria) and by the bio-potential absolute value (*E*<sub>B</sub>) index.

The specific method applied to measure the bio-potential absolute value (*E*<sub>B</sub>) makes it possible to register the electrode potential system (E<sub>ELS</sub>) quantity by periodically turning on/off of the circuit between measuring electrodes. E<sub>E1</sub>S flowing magnitude is regarded as the starting point in the *E*<sub>B</sub> measurement which is carried out in 3 steps cycle: 1. The electromotive forces source (*E*<sub>EMF</sub>) – measurement; 2. E<sub>E1</sub>S – measurement; 3. Subtraction E<sub>E1S</sub> magnitude from E<sub>EMF</sub>.

The biomass accumulation increases up to 50 per cent, if the leading plant is used as the external artificial lighting regime self-regulator.

Bio-potential, leading plant, expert estimation.

Vladimir PETROUCHENKO. Candidate of biological science, senior staff scientist, head of Botanical Garden Plant Protection Department of Odessa National University by I.I. Mechnikov. Address: bul. Francuzsky, 48/50, Botanical garden ONU, Odessa, Ukraine. Tel. (8 0482) 63 97 91.

Vladimir BELOV. Candidate of geographical science, associate professor of the Hidroekology and Water Investigation Department of Odessa State Environmental University. Address: str. Lvovska, 15, Odessa, Ukraine. Tel. (8 0482) 42 71 20.

Cycadopsida Brogn. in Gewächshaus des Botanischen Gartens der Iwan Franko Universität in Lwiw

Andriy Prokopiv


Cycadopsida, Kollektion, Klassifikation.

Andriy PROKOPIV. Ivan Franko National University of Lviv, Department of Botany, Botanical Garden, doctor of biology sciences, docent. Address: Tscharemchny str., 44, 79014, Lviv, Ukraine. Tel (380) 322 76 83 69, e-mail aprokopiv@franko.lviv.ua

ISSN 1648 – 116X LUA RESEARCH PAPERS. 2006. Nr. 69 (22),1

BIOMEDICAL SCIENCES

Growth, Mycoflora and Fluorescence of Marantaceae Petersen Plants, Conditioned by Surroundings of Hothouse

Vytautas Šlapakauskas, Judita Varkulevičienė

Research of 24 taxa of Marantaceae plants was carried out at the botanical garden of Kaunas in the period of 1997-2004. Aim of the investigation was to establish the minimal cultivation conditions for plants of tropical climate as well to evaluate the phytosanitaric and physiological state of these plants. It has been established that the temperature necessary for Maranta L. and Ctenanthe Eichl. Plants is not less than 16-18°C and for Calathea Mey. and Stromanthe Sonder. - not less than 18-20°C, atmospheric moisture 70-80%. The biggest influence on plant growth is made by the temperature of surroundings. Saprophytic mycomycets dominate in the rhisosphere of Calathea; in the rhisosphere of other genera of Marantaceae pathogenic mycomycets are also detected. It has been established that the chlorophyll fluorescence parameters correlate with physiological state of Marantaceae plants.

Marantaceae, habitat, mycobiota, fluorescence.

Vytautas ŠLAPAUSKAS. Dr. of biomedicine sciences, professor at the Department of Botany, Lithuanian University of Agriculture. Address: Studentų g 11, Akademija, LT-53361 Kauno r. Tel. (8-37) 752385, e-mail boa@nora.lzua.lt

Judita VARKULEVIČIENĖ. Dr. of biomedicine sciences, Kaunas Botanical Garden of Vytautas Magnus University. Address: Ž.Žilibero g. 6, LT- 46324, Kaunas. Tel.(8-37) 420348, e-mail j.varkuleviciene@bs.vdu.lt
Ecological Aspects of Using Xerophyten in Interiors

Vilija Snieškienė, Vidmantas Juronis

In 1998-2004, was done in Kaunas Botanical Garden and city interiors the analysis of xerophyten plants suitability for various kinds of interiors. It was found out that 80% of 107 plants genera and 322 plants species belonging to 27 families were suitable for many interiors with a good illumination.

The only two factors, which limited the xerophyten plants growing were: 1) illumination (especially during autumn and winter time) and 2) the temperature of the room (especially during autumn and winter time).

The xerophyten plants are not demanding for caring, so they can make the big part the interiors plants and enrich them with their diversity.

Xerophyton, succulent, interior.

Vilija Snieškienė. Doctor, Kaunas Botanical Garden of Vytautas Magnus University. Address: Z. E. Žilibero 6, LT-46324 Kaunas. Tel (8-37) 39 00 33, E-mail: v.snieksiene@bs.vdu.lt

Vidmantas Juronis. Doctor, Associated professor Kaunas Botanical Garden of Vytautas Magnus University. Address: Z. E. Žilibero 6, LT-46324, Kaunas. Tel (8-37) 390033, E-mail: v.juronis@bs.vdu.lt

Diversity of Micromycetes in Rhizosphere of Tropical Plants Growing in the Greenhouse of Kaunas Botanical Garden

Antanina Stankevičienė, Albinas Lugauskas

The aim of the work was to isolate and identify the diversity of micromycetes from the rhizosphere of plants grown in tropical plant section of Kaunas botanical Garden greenhouse; to isolate fungi – causative agents of plant root rots.

112 fungal species belonging to 37 genera, 8 families, 5 ranges, 3 classes and 3 divisions have been identified. The Mitosporic fungi has the largest of number of taxons, (90 species belonging to 27 genera). In the rhizosphere of all plants micromycetes of the Penicillium genus (34 species) were predominant. In other 36 genus the number species differed: the biggest – 6-8 species in 5 genus (Aspergillus, Fusarium, Mucor, Mortierella ir Acremonium); the lowest – 1-2 species in 28 and medium – 3-4 species in 3 genus (Gliocladium, Verticillium ir Trichoderma). Mostly observed species were: Aspergillus fumigatus and A. niger, Mortierella alpina, Candida albicans (isolated from 55 % rhizosphere plants); rarely - Mortierella isabellina, M. hyalina, Acremonium charticola, Aureobasidium pullulans and Oidiodendron echinulatum (from 15 - 19% plants). In some of greenhouses sections within growing plants weren’t noticed visible differences between functional micromycetes complex in plants rhizosphere. The following micromycetes species were isolated causative agents of plants root rots: from genus Fusarium – 8 species, Verticillium – 3, Pythium – 2 and Sclerotinia – 1.

Diversity, mikromicetes, patogenic species, rhizosphere, tropical plants.

Antanina Stankevičienė. Doctor of biomedical sciences at Kaunas botanical Garden of Vytautas Magnus University. Address: Ž. E. Žilibero 6, LT – 46324 Kaunas. Phone +370 3739 0033, e-mail: a.stankeviciene@bs.vdu.lt

Albinas Lugauskas. Prof., habil. dr., Laboratory of Biodeterioration Research at the Institute of Botany. Address: Žaliųjų ežerų 47, LT - 08406 Vilnius. Phone +370 2579 6641, e-mail: lugauskas@botanika.lt
Micromycete Diversity in the Rhizosphere of the Clove Pink (*Dianthus caryophyllus* L.) Plants

Antanina Stankevičienė, Elena Survilienė, Alma Valiuškaitė

The aims of the work were to determine the diversity of micromycete species functioning in the rhizosphere of clove pink (*Dianthus caryophyllus* L.); to determine the dominating micromycetes in the rhizosphere; to investigate fluctuation of micromycetes in the course of clove pink vegetation; to establish the functioning of pathogenic species in the rhizosphere.

During the years of investigation (1993-2003) 138 species belonging to 43 genera of fungal species were ascertained in *Dianthus caryophyllus* L. rhizosphere. The micromycetes of *Penicillium*, *Aspergillus*, *Mucor*, *Trichoderma*, *Mortierella* genus and species of *Acremonium strictum*, *Gliocladium radicicola*, *Paecilomyces variotii* dominated in the substratum prepared for plants growing and in rhizosphere. Species variety of dominating genus decreased during the vegetation. *Fusarium* genus was an exception, of which dominating species variety increased. Detection frequency of micromycetes species during the vegetation increased. In the second half of *D. caryophyllus* vegetation (bloom — the end of vegetation) the dominance of pathogenic species gradually expanded: *Fusarium* (detection frequency (A%) 2.33 – 6.98% up to 5.88 – 47.06%), *Verticillium* (up 2.33 to 23.53%), *Sclerotinia* (10.37 – 23.26%) and *Botrytis cinerea* (up 3.51 – 11.76) species.

*Dianthus caryophyllus* L., rhizosphere, micromycetes, detection frequency, pathogenic species.

Antanina STANKEVIČIENĖ. Doctor of biomedical sciences, Kaunas Botanical Garden of VMU. Address: Ž. E. Žilibero str. 6, LT-46321, Kaunas distr. Phone: (8 37) 39 00 33, e-mail: a.stankeviciene@bs.vdu.lt

Elena SURVILIENĖ. Doctor of biomedical sciences, Lithuanian Institute of Horticulture. Address: Kauno str. 30, LT-54333 Babtai, Kauno distr., Lithuania. Phone: (8-37) 55 52 17, e-mail: e.surviliene@lsdi.lt

Alma VALIUŠKAITĖ. Doctor of biomedical sciences, Lithuanian Institute of Horticulture. Address: Kauno str. 30, LT-54333 Babtai, Kauno distr., Lithuania. Phone: (8-37) 55 52 17, e-mail: a.valiuskaite@lsdi.lt

Possibilities of Vegetative Reproduction of *Ficus benjamina* L. Affected by Synthetic Growth Regulators

Laimute Stuopyte, Vanda Lukoseviciute

During the last decade the increasing demand for ornamental plants has been noticed in Lithuania. Usually, new by introduced plants hardly adapt to our climatic conditions. It is important to investigate and to ground the vegetative reproduction methods for introduced plant species, to investigate the application of growth regulators for cutting rhizogenesis of these plants and for their growing under climatic conditions of our republic. The experiment was carried out in the greenhouse of Kaunas Botanical Garden of Vytautas Magnus University in 2000 - 2001. The object of the experiment – *Ficus benjamina* L. softwood cuttings. The aim of this work – to determine the efficacy of synthetic growth regulators ST-14, ST-85, VM-II-33 and VM-28-683 for rooting of *Ficus benjamina* L. softwood cuttings.

The data of *Ficus benjamina* L. softwood cuttings rhizogenesis, induced by synthetic growth regulators, is presented. The influence of synthetic growth regulators on the rhizogenesis of *F. benjamina* softwood cuttings was investigated and compared. Investigation of the influence of ST-14, ST-85, VM-II-33 and VM-28-683 solutions established that ST-14 and ST-85 solutions were the most effective ones for root mass enlargement, the biggest number of roots was formed in the cuttings induced by growth regulator VM-II-33.

ST-14 1.0 was identified as the most effective synthetic growth regulator for rooting of *Ficus benjamina* L. softwood cuttings.

*Ficus benjamina*, cuttings, regulator, rhizogenesis.

Laimute STUOPYTE. Doctor of biomedicine sciences, assoc. prof. at the department Household and Horticulture, Lithuanian University of Agriculture. Address: Studentu 11, LT – 53361 Akademija, Kaunas. Tel. (8 37) 75 23 4, e-mail: ns@nora.lzua.lt

Vanda LUKOSEVICIUTE. Agronomist of Kaunas Botanical Garden of Vytautas Magnus University. Address: Z.E.Zilibero - 2, LT - 46324 Kaunas. Tel. +370 610 31603, e-mail: v.lukoseviciute@bs.vdu.lt
Flora of Tropical and Subtropical Zones in Greenhouse of Kaunas Botanical Garden of Vytautas Magnus University

Judita Varkulevičienė, Ona Ragažinskinė, Antanina Stankevičienė

Since 1923 collections of ornamental plants have been saved up and increased in Kaunas Botanical Garden of Vytautas Magnus University. There collections make the constituent of the scientific investigative work and the object of the research. Plants are grown in six sections of the greenhouse by geographic-climatic principle.

The data of taxonomical analysis made in 2002-2004 estimated that 1234 species of ornamental plants belonging to 413 genera, 129 families, 14 subclasses, 8 classes, 62 ranges and to 4 divisions, were grown in the sections of the greenhouse. The division Magnoliophyta was the largest one by number of taxons: 2 classes, 10 subclasses, 58 ranges, 108 families, 393 genus and 1183 species; Lycopodiophyta – the lowest one. The number of plant taxons in families of ornamental plants differed: the biggest genus and species was in the families: Cactaceae (48 genus, 180 species), Araceae (16, 49), Arecaceae (15, 27), Crassulaceae (15, 67), Aizoaceae (14, 32), Bromeliaceae (15, 56), Agavaceae (13, 95), Acanthaceae (11, 19), the lowest (1-4 species) - in 108 families and average in 14 families (5-10 species).

Flora, tropical and subtropical zones, greenhouses.