

Possibilities for using aromatic plants and plants with ornamental leaves for recreation

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Abstract

Plants are among the most important components of the environment in resort areas. In addition to the ornamental value and contribution to oxygen supply to the atmosphere, many of the plants have a pleasant aroma, emit phytoncides and have beautiful ornamental leaves with unusual shape, structure and color, attractive flowers and fruits which makes them a factor of influence, especially in the recreation areas. Moreover, the aroma released from the plant can be a substantial guidance for blind and poorly seeing people. In this study an assortment of aromatic plants and plants with double beneficial properties (ornamental leaves and known with their medicinal features) are suggested as suitable for recreation areas.

Keywords: aroma-aero-phytotherapy; ornamental leaves; medicinal plants; recreation

INTRODUCTION

Green spaces, as one of the main health and aesthetic factors, are the most important component of the resort areas. Many authors (Kolesnikov, 1974; Aksyonov & Aksyonova, 1997; Krizhanovskaya, 2005; Klimenko, 2014, and others) point out to the beneficial effects of plants on the physical and mental state of a person.

Many plants, in addition to decoration, have a pleasant aroma, emit phytoncides and have beautiful ornamental leaves. Together, all these, in combination with the shape, structure and color of the leaves, overall habit, flowering and fruits is a factor of influence. Considering that, as well as the type of terrain, plant associations, elements of improvement, landscape compositions and recreational areas of special purpose are created.

Landscapes have the ability to influence the mood of people to a greater extent than the individual trees (Bobrov, 1987). Contemplation of landscapes affects the emotions, enhances observation,

sharpens perception, simultaneously having a relaxing effect and affects the psychological state. The alternating landscapes have specific effect on the mood of the people – either beneficial (cheerful) or sad. According to doctors, the transition from minor to major improves the activity of the endocrine glands and increases the amount of adrenaline and vitamins in the blood (Symonds, 1965).

Any emotional impact is particularly amplified by the senses. Therefore, the presence of aromatic plants and plants with ornamental leaves creates an additional effect. This is especially important when creating recreational zones for blind and visually impaired people who do not have access to color and form, and pleasant aromas and tactile sensations in contact with ornamental leaves compensate for the emotional knowledge of the surrounding world, creating a favorable psychological atmosphere.

The beneficial effects of plant odors on humans has been known for a very long time, but, aromatherapy as an independent medical direction, has been well established at the turn from the 19th to 20th

century. Three possible mechanisms of aromatherapy are distinguished: pharmacological, physiological, and psychological (aroma-aero-phytotherapy), when the individual (conscious or subconscious) response of an organism to odor occurs as a result of inhalation of plant fragrance, and an emotional reaction, in turn, can cause mental or physiological changes.

The aim of our work was to select a range of plants and develop recommendations for the creation of specialized recreational zones of aroma-aero-phytotherapy.

MATERIAL AND METHODS

The objects of study were plants with fragrant flowers, growing in the territory of Abkhazia.

Phenological observations were carried out according to the standard technique - there were periods of the beginning of flowering and of mass flowering, the end of flowering, i.e. periods when plants produce odor.

The intensity of the smell was estimated on a 5-point scale, which included indicators such as the strength of the fragrance, the distance from the source of the smell, emotional impact. On this basis, it is possible to make recommendations on the placement of plants, taking into account their habits and aroma intensity.

In order to identify resource potential of aromatic plants, route surveys of all park zones of the coast of Abkhazia were conducted.

RESULTS AND DISCUSSION

We have studied a group of aromatic plants - 54 taxa, of which 36 are woody-shrub plants, 18 are herbaceous flower-ornamental plants (Table 1). Plants whose leaves have odor and plants that emit smell when touched are also identified (Table 2).

Based on phenological observations, a flowering calendar has been compiled, both by months and by seasons of the year, which makes it possible to select an assortment based on a continuous (year-

Table 1. Rating of aroma intensity of plants

№	Botanical name	Period of the greatest aroma effect	Aroma intensity, score
Trees and scrubs			
1	<i>Abelia grandiflora</i> Rehd.	summer-autumn	1
2	<i>Acacia dealbata</i> Link.	spring	2
3	<i>Akebia quinata</i> Decne	spring	1
4	<i>Albizia julibrissin</i> Durazz.	summer-autumn	3
5	<i>Buddleja davidii</i> Franch.	summer	3
6	<i>Citrus</i> sp.	spring	4
7	<i>Clematis armandii</i> Franch.	spring	2
8	<i>Daphne odora</i> Thunb.	winter-spring	5
9	<i>Eriobotria japonica</i> (Thunb.) Lindl.	autumn	1
10	<i>Eupatorium micranthum</i> Less.	summer	3
11	<i>Gardenia jasminoides</i> Ellis.	summer	3
12	<i>Hydrangea quercifolia</i> W. Bartram	summer	1
13	<i>Laurocerasus officinalis</i> Roem.	summer	5
14	<i>Ligustrum lucidum</i> Ait.	summer	3
15	<i>Lonicera caprifolium</i> L.	summer	3
16	<i>Lonicera fragrantissima</i> Lind. et Pax.	summer	5

17	<i>Magnolia grandiflora</i> L.	summer-autumn	1
18	<i>Magnolia soulangeana</i> Soul.-Bod.	spring	1
19	<i>Melia azedarach</i> L.	spring	2
20	<i>Meracia praecox</i> Rehd.	winter-spring	1
21	<i>Mihelia figo</i> Spreng.	spring	3
22	<i>Myrtus communis</i> L.	summer	5
23	<i>Nerium oleander</i> L.	summer-autumn	2
24	<i>Osmanthus fragrans</i> Lour.	autumn	5
25	<i>Paulownia tomentosa</i> (Thunb.) Steul.	spring	2
26	<i>Philadelphus caucasicus</i> Koehne.	spring	2
27	<i>Pittosporum tobira</i> Aiton	spring	4
28	<i>Rhododendron luteum</i> Sweet.	spring	1
29	<i>Robinia pseudoacacia</i> L.	summer-autumn	4
30	<i>Rosa</i> sp.	summer-autumn	5
31	<i>Rosmarinus officinalis</i> L.	summer	5
32	<i>Syringa</i> sp.	summer	2
33	<i>Tilia caucasica</i> Stev.	summer	5
34	<i>Trachelospermum jasminoides</i> Lem.	summer-autumn	5
35	<i>Viburnum carlesii</i> Hemsl.	summer-autumn	5
36	<i>Wisteria sinensis</i> (Sims.) DC.	spring	4

Herbaceous floral ornamental plants

37	<i>Allium odora</i> L.	spring	4
38	<i>Alyssum maritimum</i> Lam.	spring-summer	5
39	<i>Cheirantus cheiri</i> L.	summer	3
40	<i>Convollaria majalia</i> L.	spring	4
41	<i>Crinum x powellii</i> hort.ex Baker cv. Alba	summer	2
42	<i>Hyacinthus x hybrida</i> hort.	spring	4
43	<i>Lilium x hybrida</i> hort.	summer	4
44	<i>Matthiola bicornus</i> DC.	summer	4
45	<i>Narcissus x hybrida</i> hort.	spring	3
46	<i>Nicotiana affinis</i> T.Moore	summer	5
47	<i>Nicterinia capensis</i> Benth.	summer	4
48	<i>Paeonia hybrida</i> hort.	spring	2
49	<i>Petunia hybrida</i> hort.	spring-summer-autumn	2
50	<i>Polianthes tuberosa</i> L.	summer	5
51	<i>Reseda odoranta</i> L.	spring-summer-autumn	5
52	<i>Stephanotis floribunda</i> Brougn.	summer	4
53	<i>Tropaeolum x cultorum</i> hort.	summer	1
54	<i>Tulipa hybrida</i> hort.	spring	3

Table 2. Plants with aromatic leaves

Plants whose leaves have a smell	Plants that smell when touched
<i>Cercidiphyllum japonicum</i>	<i>Tagetes</i> sp
<i>Cinnamomum camphora</i>	<i>Lantana camara</i>
<i>Eucaliptus</i> sp	
<i>Lippia citriodora</i>	
<i>Acca sellowiana</i>	

round, rolling from one plant to another) aromatic effect (Table 3).

An assessment is made of the intensity of aromas of selected plants (in quantitative terms), taking into account the distance from the source of the smell (Fig. 1). Grouped by these parameters, plants allow the development of recreational areas with optimal placement of plants for obtaining the desired result. Figure 2 show aromatic plants by families.

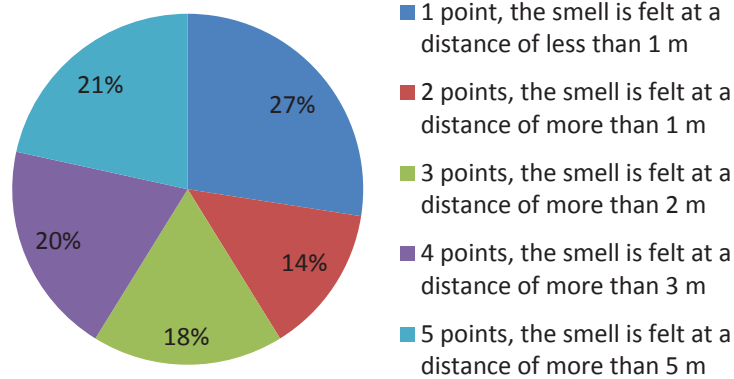


Figure 1. Estimation of the intensity of the aromas of the identified plants (by a 5-point scale) in quantitative terms

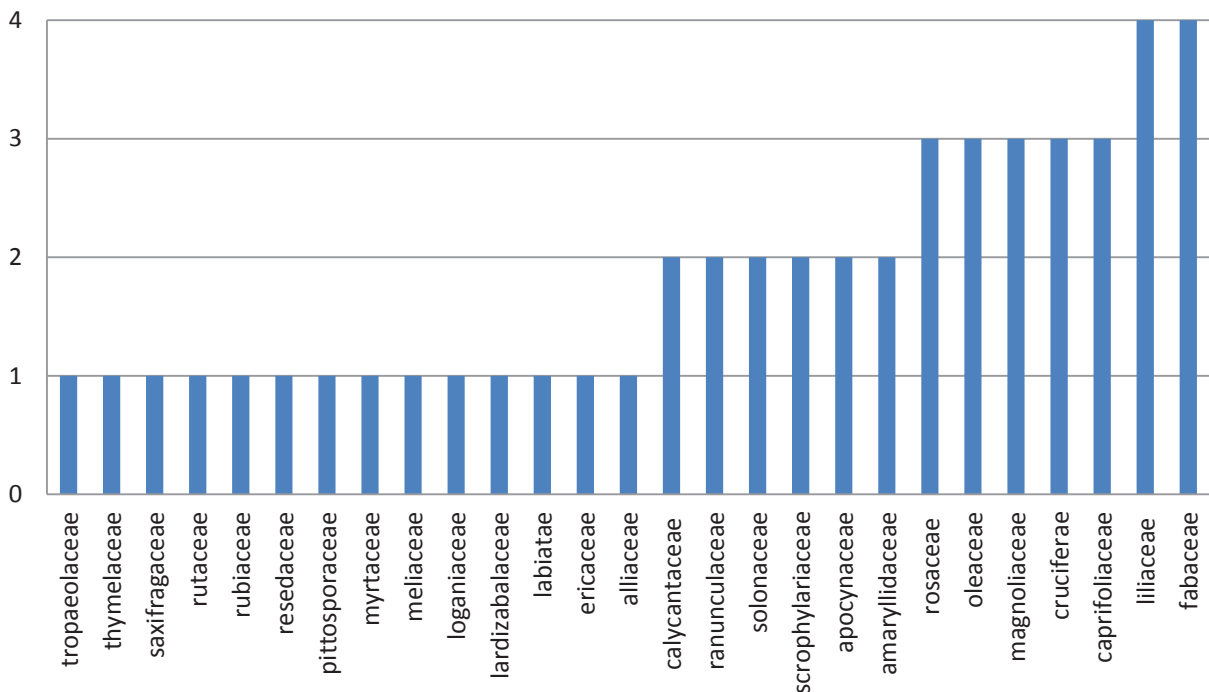


Figure 2. Aromatic plants by families

Table 3. Calendar of blooming of aromatic plants

Season of the year	Botanical name
autumn	<i>Eriobotria japonica</i> (Thunb.) Lindl.
autumn	<i>Osmanthus fragrans</i> Lour.
spring	<i>Acacia dealbata</i> Link.
spring	<i>Akebia quinata</i> Decne
spring	<i>Citrus</i> sp.
spring	<i>Clematis armandii</i> Franch.
spring	<i>Magnolia soulangeana</i> Soul.-Bod.
spring	<i>Melia azedarach</i> L.
spring	<i>Mihelia figo</i> Spreng.
spring	<i>Paulownia tomentosa</i> (Thunb.) Steul.
spring	<i>Philadelphus caucasicus</i> Koehne.
spring	<i>Pittosporum tobira</i> Aiton
spring	<i>Rhododendron luteum</i> Sweet.
spring	<i>Wisteria sinensis</i> (Sims.) DC.
spring	<i>Allium odora</i> L.
spring	<i>Convollaria majalia</i> L.
spring	<i>Hyacinthus x hybrida</i> hort.
spring	<i>Narcissus x hybrida</i> hort.
spring	<i>Paeonia hybrida</i> hort.
spring	<i>Tulipa hybrida</i> hort.
spring-summer	<i>Alyssum maritimum</i> Lam.
spring-summer-autumn	<i>Petunia hybrida</i> hort.
spring-summer-autumn	<i>Reseda odoranta</i> L.
summer	<i>Buddleja davidii</i> Franch.
summer	<i>Eupatorium micranthum</i> Less.
summer	<i>Gardenia jasminoides</i> Ellis.
summer	<i>Hydrangea quercifolia</i> W. Bartram
summer	<i>Laurocerasus officinalis</i> Roem.
summer	<i>Ligustrum lucidum</i> Ait.
summer	<i>Lonicera caprifolium</i> L.
summer	<i>Lonicera fragrantissima</i> Lind. et Pax.
summer	<i>Myrtus communis</i> L.
summer	<i>Rosmarinus officinalis</i> L.
summer	<i>Syringa</i> sp.
summer	<i>Tilia caucasica</i> Stev.
summer	<i>Cheirantus cheiri</i> L.
summer	<i>Crinum x powellii</i> hort.ex Baker cv. Alba
summer	<i>Lilium x hybrida</i> hort.
summer	<i>Matthiola bicornus</i> DC.
summer	<i>Nicotiana affinis</i> T.Moore
summer	<i>Nicterinia capensis</i> Benth.
summer	<i>Polianthes tuberosa</i> L.
summer	<i>Stephanotis floribunda</i> Brougn.
summer	<i>Tropaeolum x cultorum</i> hort.
summer-autumn	<i>Abelia grandiflora</i> Rehd.
summer-autumn	<i>Albizia julibrissin</i> Durazz.
summer-autumn	<i>Magnolia grandiflora</i> L.
summer-autumn	<i>Nerium oleander</i> L.
summer-autumn	<i>Robinia pseudoacacia</i> L.
summer-autumn	<i>Rosa</i> sp.
summer-autumn	<i>Trachelospermum jasminoides</i> Lem.
summer-autumn	<i>Viburnum carlesii</i> Hemsl.
winter-spring	<i>Daphne odora</i> Thunb.
winter-spring	<i>Meracia praecox</i> Rehd.

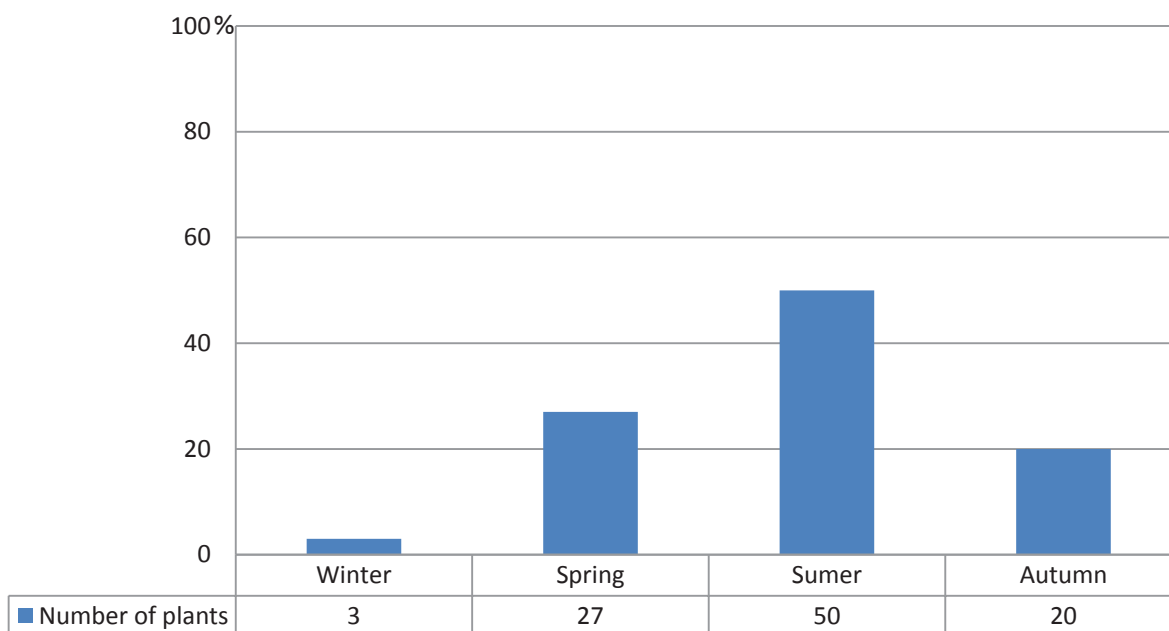


Figure 3. The distribution of the aromatic effect over the seasons

Table 4. Identified plants with ornamental leaves

Latin name of plant	
<i>Abutilon hybrida</i> hort.	<i>Ricinus communis</i> L.
<i>Acanthus mollis</i> L.	<i>Lavatera trimestris</i> L.
<i>Aquilegia x</i> hort.	<i>Malope trifida</i> Cav
<i>Aconitum napellus</i> L.	<i>Helleborus abchasicus</i> A.Braun
<i>Anemone japonica</i> Sieb. et Zucc.	<i>Pelargonium zonale</i> (L.) L'Herit.
<i>Arctotis stoechadifolia</i> Berg.	<i>Paeonia hybrida</i> hort.
<i>Astilbe x arendsii</i>	<i>Hedera helix</i> L.
<i>Tagetes hybrida</i> hort.	<i>Rodgersia pinnata</i> Franch.
<i>Brugmansia hybrid</i> hort.	<i>Tithonia rotundifolia</i> Blake
<i>Ligularia dentate</i> (A.Gray) Hara	<i>Trachystemon orientale</i> (L.) D.Don
<i>Ampelopsis aconitifolia</i> Bgl.	<i>Pharbitis rubro-caerulea</i> Hook.
<i>Thalictrum delavayi</i> Franch.	<i>Fatsia papyrifera</i> Thunb.
<i>Dahlia arborea</i> Regel	<i>Fatsia japonica</i> (Thunb.) Dec.et Pl.
<i>Geranium robertianum</i> L.	<i>Physalis alkekengi</i> L.
<i>Geum urbanum</i> L.	<i>Houttuynia cordata</i> Thunb.
<i>Hibiscus mutabilis</i> L.	<i>Corydalis hybrida</i> hort.
<i>Hibiscus syriacus</i> L.	<i>Chrysanthemum frutescens</i> L.
<i>Viburnum rhytidophyllum</i> Hemsl.	<i>Cineraria maritima</i> L.
<i>Zantedeschia aethiopica</i> Spreng.	<i>Cimicifuga cordifolia</i> Pursh.
<i>Kirengeshoma palmate</i> Yatabe	<i>Delphinium x hybridum</i>

The distribution of the aromatic effect over the seasons is shown on Figure 3.

Plants with double properties are also selected - decorative and, at the same time, medicinal (previously 27 taxa). It is no secret that in recent years, interest in herbal preparations has increased significantly. It cannot be said that herbal preparations completely replace synthetic medicines, but in our time, phytotherapy is experiencing a second birth. About 290 thousand medicinal plants are known, many of which are very beautiful and have attractive value as ornamental crops.

Enrichment of the existing range of ornamental plants is always an urgent problem for any region, and combining the involvement of medicinal plants, which are also highly decorative cultures, doubles the significance of such work.

An important place when creating recreational plots at sanatorium-resort complexes or urban recreation areas is given to plants with ornamental leaves, which in addition to purely aesthetic appearance are also of practical importance, creating opportunities for blind people to get additional information about the world around them.

We have identified a group of plants (40 taxa) with ornamental leaves, which have a clear contour, a pronounced texture of the leaves and give the plants additional attractiveness (Table 4).

Considering the above, we can offer a range of ornamental plants as an additional recreational factor, including for people with disabilities - blind or visually impaired.

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