

The Versatility of Essential Oils

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What are ESSENTIAL OILS ?

- Volatile or ethereal oils that are either secreted or excreted as odiferous by-products of the plants
- They represent the "essential aroma" or the fragrance of the plant from which they are obtained
- Hydrophobic liquid containing volatile aroma compounds from plants
- Distilled volatile oils of plants materials that have strong aromatic components
- Hormones or life-force of a plant
- Aromatic compounds from plants



What are ESSENTIAL OILS ?

- Highly concentrated essences of aromatic plants
- 'The chemical weapons' of the plant world
- 'Plant pheromones'
- The essence of the plant's soul, their ethereal nature, concentrated as scent, through which plants communicate with their surrounding world
- Chemically they belong to the huge family of terpenes



What are ESSENTIAL OILS ?

- The essential oil of a plant consists of many compounds which generally boil between 150° to 300°C. However, the compounds are steam volatile and can be distilled out of the at around 100°C.
- Essential oils occur in many different parts of plants, e.g. roots (vetiver), bark (cinnamon), heartwood (sandalwood), leaves (bay), herb (peppermint), seeds (nutmeg), flowers (cananga and jasmine).
- Found in specialized secretory substance structures known as glandular hairs, modified parenchymal cells, oil tubes or ducts of the different parts of a plant



Plant materials used for essential oil extraction



Patchouli leaves (*Pogostemon cablin*)



Lemongrass leaves (*Cymbopogon citratus*)



Ilang-ilang flowers (*Cananga odorata*)

700 plants are considered aromatic which are all significant for the production of essential oils

How Essential Oil Works

Essential oil



Sense of smell “olfaction”



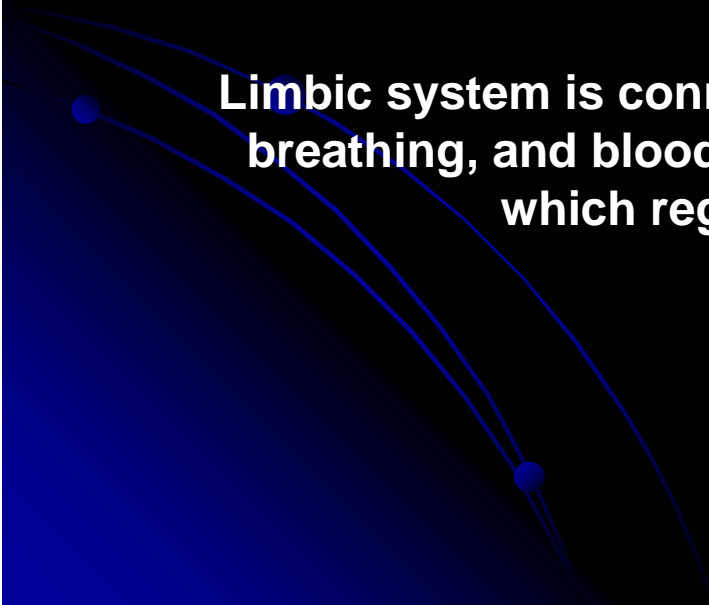
Olfactory receptor cells stimulated



Impulse transmitted to limbic system or
the emotional center of the brain



Limbic system is connected to areas of the brain linked to memory,
breathing, and blood circulation, as well as the endocrine glands
which regulate hormone levels in the body



How Essential Oil Works

- The properties of the oil, the fragrance and its effects, determine stimulation of the limbic system
- During massage, essential oils are not only inhaled, but absorbed through the skin as well
- Essential oils have differing rates of absorption, generally between 20 minutes and 2 hours
- The olfactory centre is part of the oldest section of the brain, which is located in close proximity to the area which stores emotional memories and instincts.
 - Reactions to scents are rather irrational - they communicate with our mind at a sub-lingual level and appeal directly to our instincts
 - Explains why perfumes can be so effective in attracting the opposite sex, or why certain smells conjure up intense emotions or memories

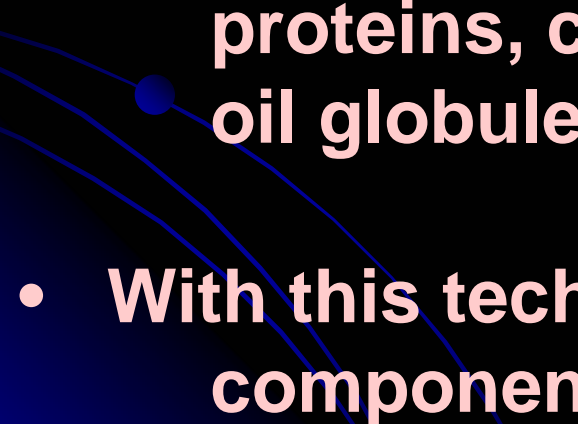
Methods of Essential Oil Extraction

- **Expression/cold pressing**
- **Distillation** - water or "hydrodistillation" , water and steam or "wet steam" and steam or "dry steam"
- **Solvent extraction**- hydrocarbon solvent, Liquid CO2 extraction
- **Enzymatic extraction**

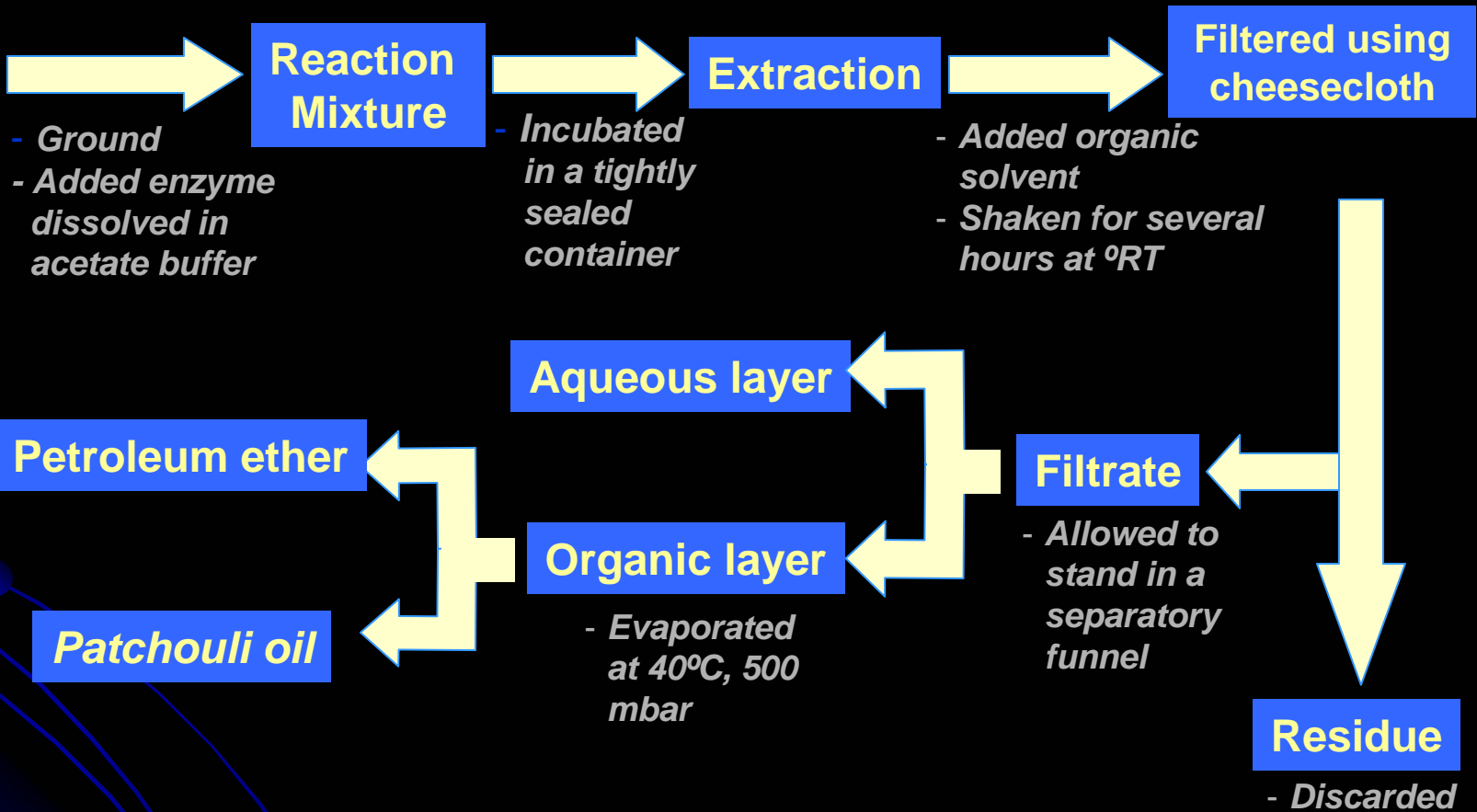
The choice of technique for the extraction of essential oils depends upon the sensitivity of essential oils to the action of heat and water, its volatility and solubility (Wijesekera, 1975).

Enzymatic Extraction of Essential Oils

- Based on the mechanical and enzymatic degradation of the cell wall of plants
- MICROBIAL ENZYMES are used in the processing of oil-bearing materials to recover oil and non-oil constituents
- Enzyme activities release oil globules readily by the action on proteins, cellulose and hemicellulose in a controlled manner

- **Enzyme extraction uses NO HEAT**
 - **Fresh materials are chopped or cut into smaller pieces and enzyme is added**
 - **Specific enzymes hydrolyze complex molecules e.g. pectic substances, proteins, celluloses, etc. thus releasing oil globules**
 - **With this technology, the important active components of the oils are retained**
- 

Schematic diagram for the extraction of essential oil using enzyme biotechnology



Comparative Essential Oil Yield

Comparatively higher oil yield and quality than competing technologies

% Yield	Extraction process		% increase
	Enzymatic	Steam distillation	
Citronella	1.68	0.55	205
Lemongrass	1.94	0.18	977
Patchouli	1.60	0.31	416
Ilang-ilang	1.44	0.62	132

The "Notes" of Essential Oils

Top Notes are the most stimulating and uplifting oils. They are strongly scented, but the perfume lasts only for approximately 3 - 24 hours

Examples: *Basil, bergamot, clary, sage, coriander, eucalyptus, lemongrass, neroli, peppermint, sage, thyme.*

Middle Notes are the next longest lasting, at about 2 - 3 days, and affect the metabolic and body functions. The perfume is less potent than that of top note oils

Examples: *Balm, chamomile, fennel, geranium, hyssop, juniper, lavender, rosemary*

Base Notes are the slowest oils to evaporate, lasting up to one week. They have a sweet, soothing scent and a relaxing, comforting effect on the body

Examples: *Cedarwood, clove, frankincense, ginger, jasmine, rose, sandalwood*

Creating Aromatherapy Blends

- ✚ **Best balanced perfume - a combination of all three notes**
- ✚ **There are no fixed rules when making aromatherapy blends**
- ✚ **The more familiar you become with the fragrances and their effects, the easier it will be to create combinations that are right for you!**

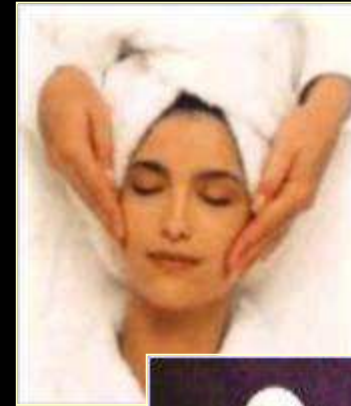
Carrier Oils

Almond oil
Apricot kernel oil
Avocado oil
Evening primrose oil
Grapeseed oil
Hazelnut oil
Jojoba oil
Olive oil
Peach kernel oil
Soya oil
Sunflower oil
Wheatgerm oil
Coconut oil

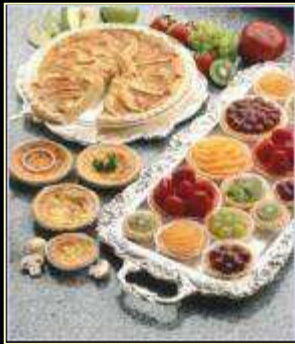
Mineral oil is not used in aromatherapy

Essential Oil Market

- The Philippines ranks 8th among the primary importer and spends millions annually for essential oils
- Around US\$226M (PhP 225,681,068) was spent for essential oils (2001), of which 90% came from Europe and the US
- No local essential oil manufacturing company is yet known to exist except for small-scale producers (traditional method of essential oil extraction)
- Wide industrial uses



Uses of Essential Oils



Confectioneries



Beverages



Cosmetics



Soaps and Detergents



Aromatherapy



Scented candles



Pharmaceuticals



Perfumery

Aromatherapy

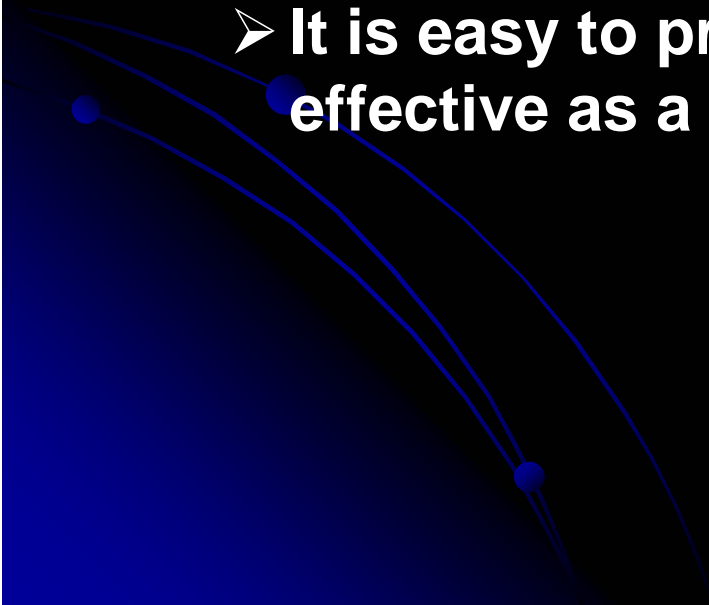
- ✚ Aromatherapy is the art of using essential oils to promote healing of the body and the mind
- ✚ Aromatherapy provides a very holistic approach as it affects both, the mental/emotional as well as the physical plane

History of Aromatherapy



- **Oldest methods of holistic healing origin dating back 5000 years**
- **Began with the Egyptians for medicinal, cosmetics and embalming**
- **Ancient Chinese civilization used aromatics in religious ceremonies and other ancient therapies such as massage and acupressure**
- **India used aromatherapy for many centuries in their traditional medical system called Ayurveda**
- **The Greeks acquired most of their medical knowledge from the Egyptians**
- **The Romans learned from the Greeks and became well known for scented baths followed by massage with aromatic oils.**
- **the Romans to import "exotic" oils and spices from distant lands such as India and Arabia.**
- **With the decline of the Roman Empire, the use of aromatics faded and the knowledge of their use was virtually lost in Europe during the dark ages.**

Aromatherapy Today

- **Very popular today**
 - **Return to a holistic lifestyle, recognizing the importance of combining the mind, body and spirit to achieve optimum health and wellness.**
 - **It is easy to practice, readily available, and effective as a therapy.**
- 

Aromatherapy Oils

Essential Oils for the Mind

Essential Oils are capable of not only treating our physical bodies, but also in enhancing our state of mind.

Anxiety, Apathy, Depression, Grief, Insecurity, Irritability,
Loneliness, Low self-esteem, Mental fatigue, Panic attacks, Poor
Memory , Postnatal depression, Sadness, Stress



Aromatherapy Oils

Essential Oils for the Body

The healing properties of essential oils extend into the effective treatment of a variety of physical ailments

Acne, Aging Skin, Allergies, Alopecia, Arthritis, Asthma, Athletes Foot, Blackheads, Boils, Bronchitis, Bruises, Burns, Cellulite, Childbirth, Circulation, Colds & Flu, Cold Sores, Constipation, Corns, Dandruff, Dry Skin, Dyspepsia, Earache, Eczema, Exhaustion, Feet (aching), Flatulence, Gingivitis, Haemorrhoids, Hay Fever, Headaches, Immune System problems, Indigestion, Influenza, Insect Bites, Insomnia, Irritable Bowel, Mature Skin, Menopause, Migraine, Mouth Ulcers, Muscle Aches, Nausea, Neuralgia, Oily Skin, Palpitations, Heavy Periods, Irregular Periods, Painful Periods, Scant Periods, Psoriasis, PMS, Postnatal Depression, Rheumatism, Scarring, Sciatica, Sensitive Skin, Shingles, Sinusitis, Sore Throat, Sprains, Stress, Stretch Marks, Sunburn, Toothache, Vaginal Thrush, Varicose Veins, Warts, Wrinkles

Aromatherapy Oils

Aromatherapy in the bath

Relaxing and calming bath , relieve nervousness, insomnia, energizing bath, soothing foot bath, aching feet

Massage

Massage combined with essential oils can have a powerful calming or energizing effect

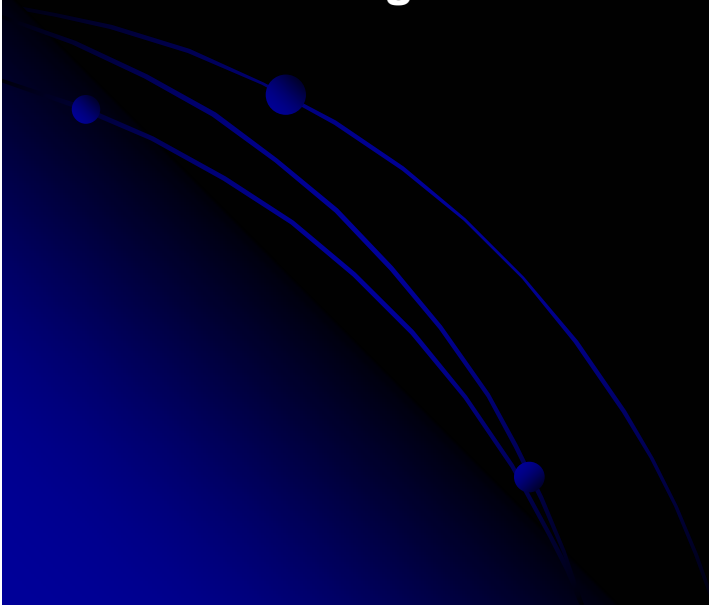
When using essential oils in massage, always dilute the oils in a carrier oil prior to application to the skin

Aromatherapy Oils

Aromatherapy in the air

EOs can be added to humidifiers, vaporizers, the molten wax of a candle, the dish of a diffuser (mixed with water), or even combined with water in a spray bottle.

**Recipe for a fresh, clean smell in the air , Recipe to induce sleep
Recipe for a spicy aroma , Romance is in the air, Recipe for cold & flu using steam inhalation**



Storage and Packaging of EOs

- Most essential oils can be stored for long periods under suitable conditions: they should be dry, not in contact with the air or direct sunlight and kept cool.
- It is important that essential oils do not come into contact with materials with which they might react, e.g. rubber or plastic bungs.
- Glass containers are often used for smaller amounts of oil but larger quantities are invariably stored mild steel drums lined with epoxy resin.
- Plastic containers, e.g. polythene, should not be used because the oil may be absorbed by the plastic and contamination may occur.
- To ensure that the oil is not wet it should be left to stand for some time before being filtered into its container.
- Oils generally show no cloudiness when thoroughly dry.
- Freshly distilled oils often possess some "still odours" which are unpleasant. These generally disappear after several weeks storage.

DANGERS

- Some EO's including many of the citrus peel oils, are photosensitizers, increasing the skin's reaction to sunlight and making it more likely to burn.
- Because of their concentrated nature, EO's generally should not be applied directly to the skin in their undiluted or "neat" form. Some can cause severe irritation or provoke an allergic reaction.
- Gynaecomastia. Some essential oils, particularly lavender, have been implicated in causing abnormal breast tissue growth in prepubescent boys.
- Pesticide residues. There is some concern about pesticide residues in EOs, particularly those used therapeutically. For this reason, many practitioners of aromatherapy choose to buy organically produced oils.

DANGERS

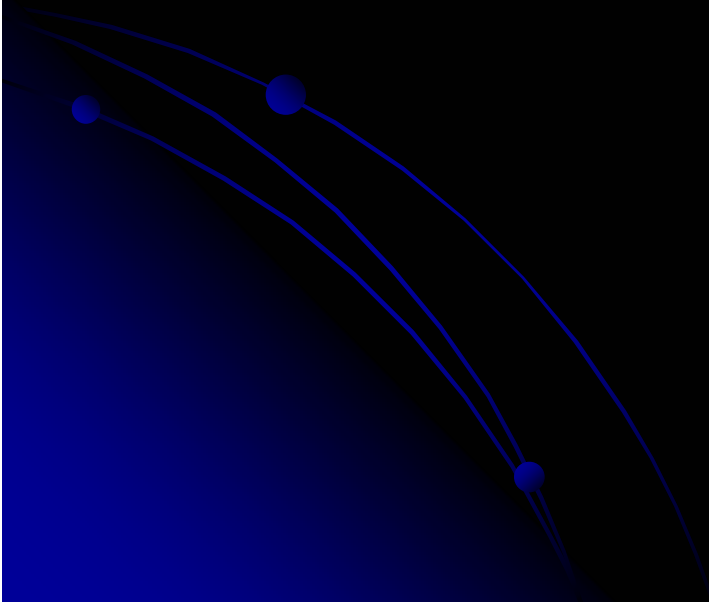
- Ingestion. Some very common EO's such as Eucalyptus are extremely toxic internally.
- Smoke. The smoke from burning essential oils may contain potential carcinogens, such as polycyclic aromatic hydrocarbons (PAHs).
- The internal use of essential oils should be fully avoided during pregnancy without consulting with a licensed professional, as some can be abortifacients in dose 0.5–10 ml.

Problems that beset the essential oils industry

- poor technology on essential oils extraction and outdated equipment.
- low production of crops with essential oils (e.g. ylang-ylang, patchouli, citronella, lemongrass, sampaguita),
- poor financing strategy
- marketing and other related issues such as tax incentive for essential oils producers, prioritization of R&D on essential oils, legislative support for essential oils industry, and the establishment of a web site solely for essential oils industry.

Successful Marketing of Essential Oils

- uniform good quality
- stable price
- continuity of supply





Thank you.....

Acknowledgment:

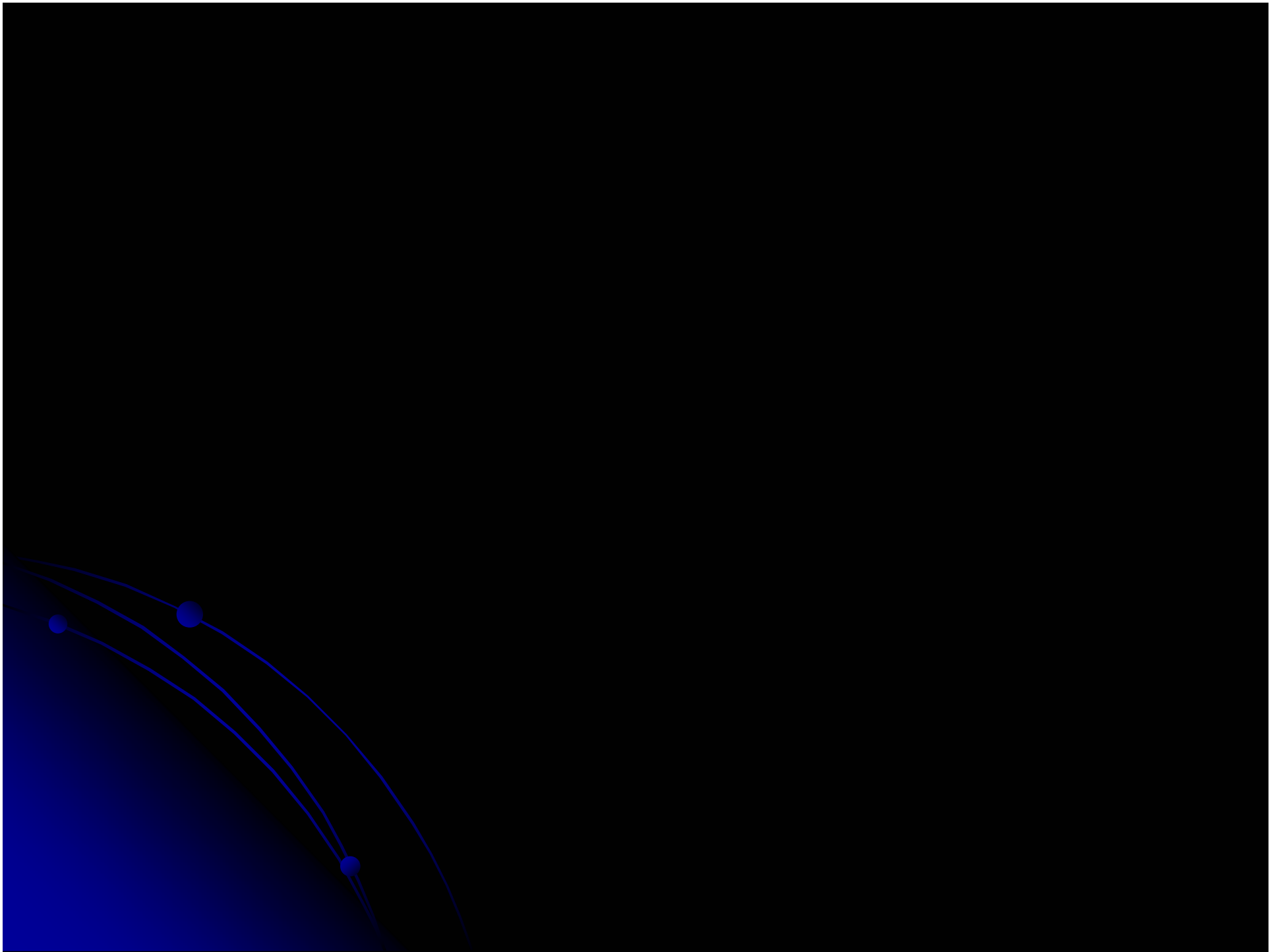
Dr. T. M. Espino, Roshena E. Arevalo

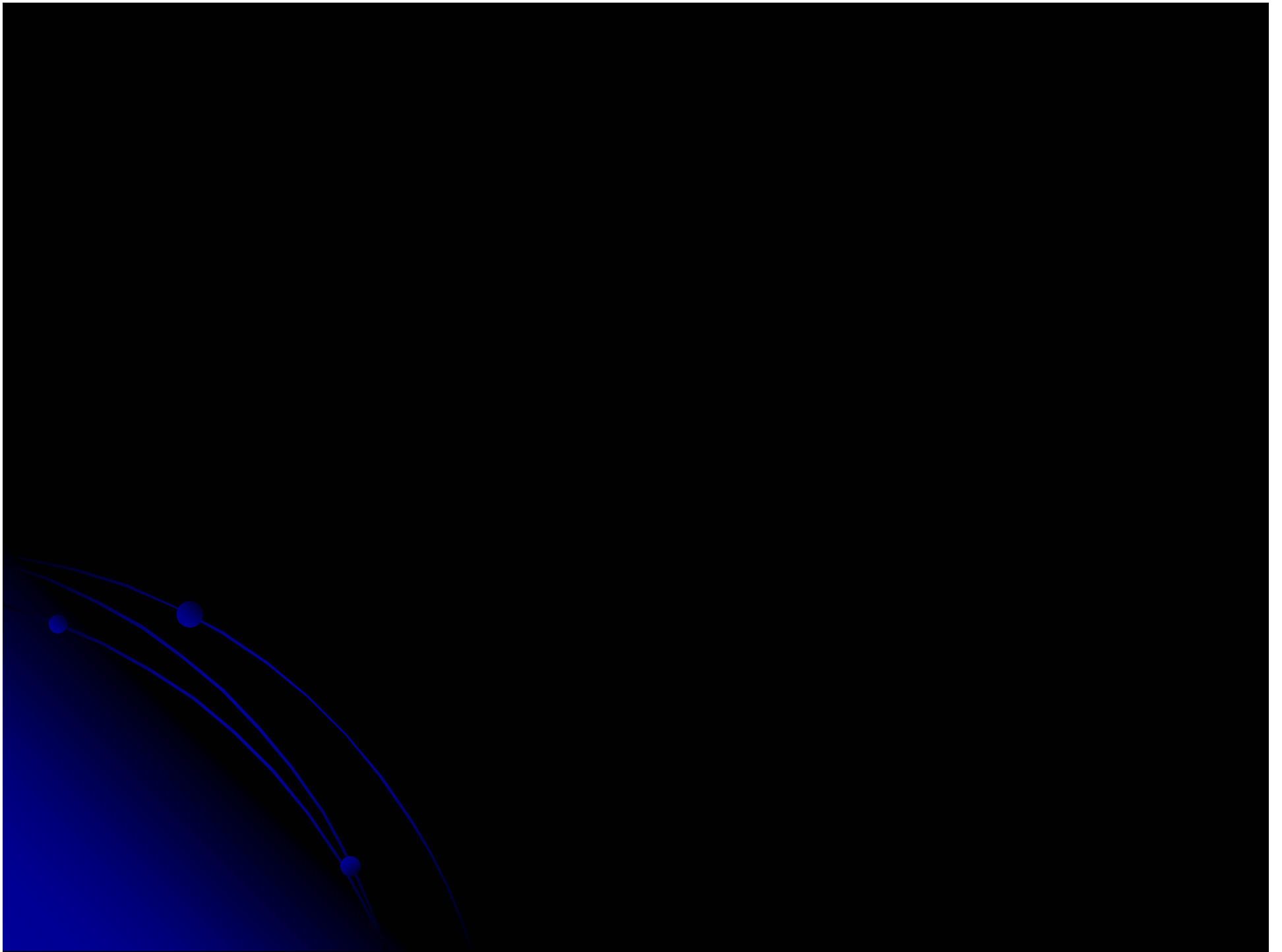
Contact Persons:

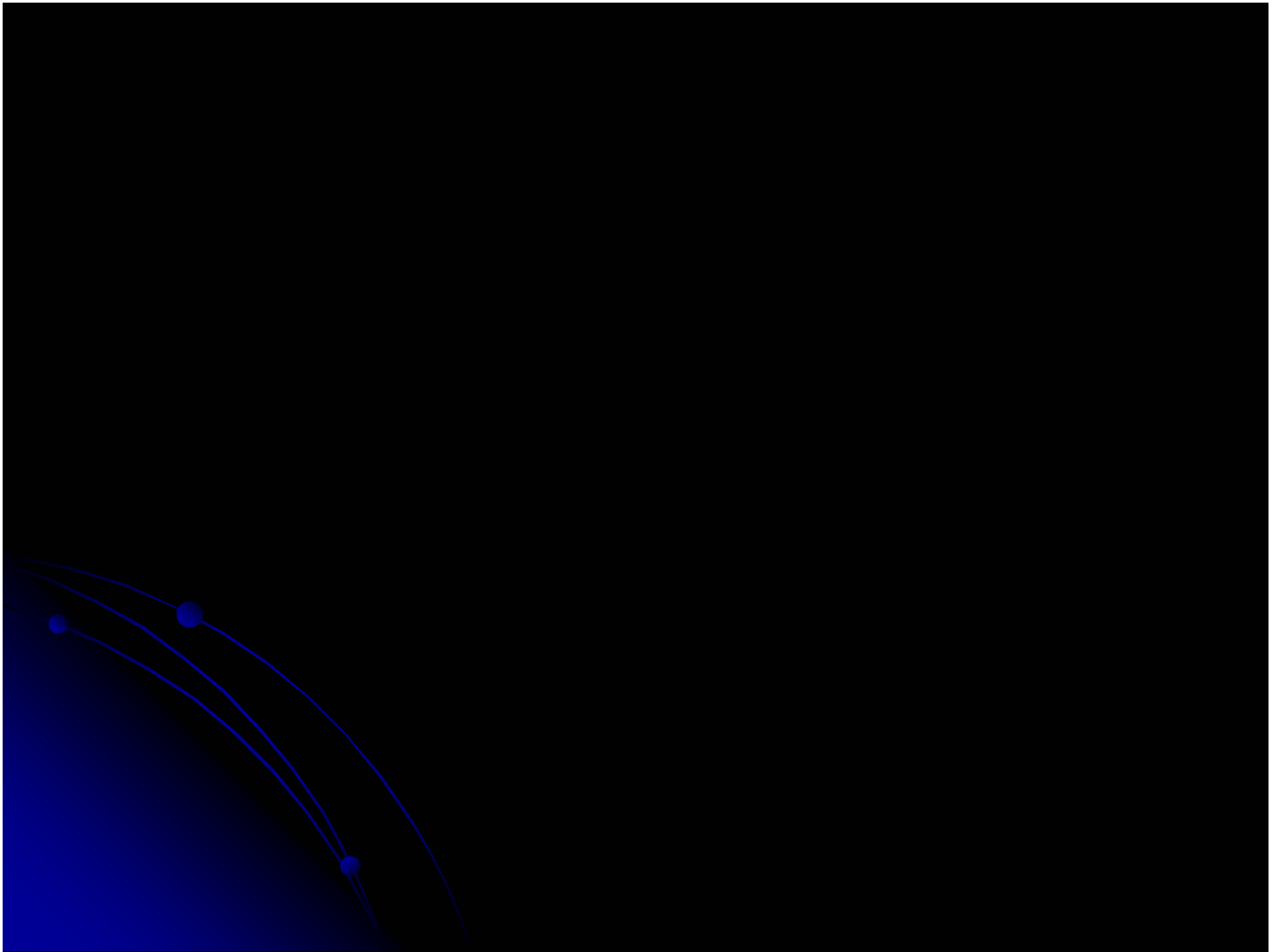
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Dangers

Ingestion

While some advocate the ingestion of essential oils for therapeutic purposes, this should never be done except under the supervision of a professional who is licensed to prescribe such treatment. Some very common EO's such as Eucalyptus are extremely toxic internally. Pharmacopoeia standards for medicinal oils should be heeded. EO's should always be kept out of the reach of children. Some oils can be toxic to some domestic animals, cats in particular. Owners must ensure that their pets do not come into contact with potentially harmful essential oils.[7]

Smoke

The smoke from burning essential oils may contain potential carcinogens, such as polycyclic aromatic hydrocarbons (PAHs). Essential oils are naturally high in volatile organic compounds (VOCs). The internal use of essential oils should be fully avoided during pregnancy without consulting with a licensed professional, as some can be abortifacients in dose 0.5–10 ml.

Toxicology

LD50 of most EO's or their main components are 0.5-10 g/kg (orally or skin test).[citation needed]

Quality control parameters for essential oils

ISO – International Organization for Standardization

relative density

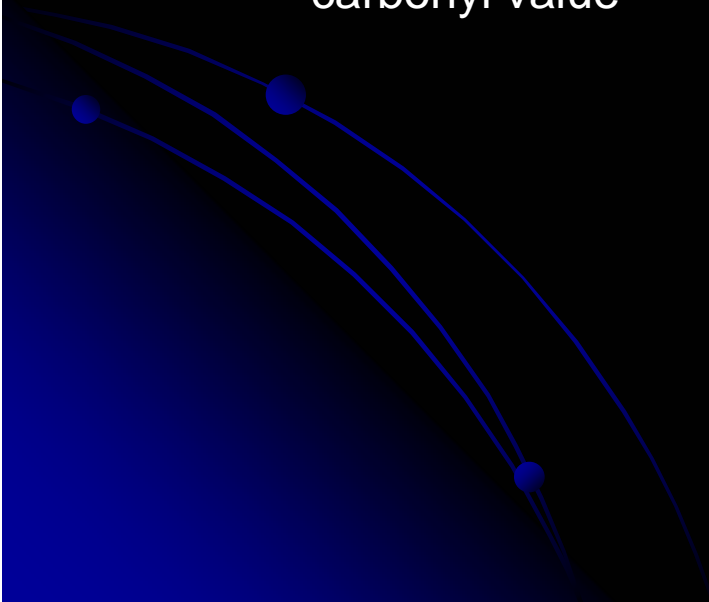
refractive index

optical rotation

miscibility in ethanol

ester values – before and after acetylation

carbonyl value



Medical professionals are more interested in the medicinal properties of essential oils - many oils show antibacterial, fungicidal, relaxant, stimulating, antidepressant etc effects, and can be very effective therapeutic agents indeed.

Aromatherapy, has evolved, which is solely concerned with the therapeutic actions of essential oils. Aromatherapy provides a very holistic approach as it affects both, the mental/emotional as well as the physical plane and a skilled aromatherapist will take both into consideration when blending their oils. The therapy usually consists of massaging the patient with a particular oil blend, but they may also be instructed to use a particular oil in a diffuser or other applications. Some aromatherapists may even blend special cosmetic ranges, such as facial crèmes and body lotions with particular essential oils to maximize their therapeutic effect. (This practice has become a bone of contention with regulators since fragrance components may be regulated under different rules than therapeutic agents, even if they are the same oils and used in the same concentrations.

Aromatherapy is the art of using these oils to promote healing of the body and the mind

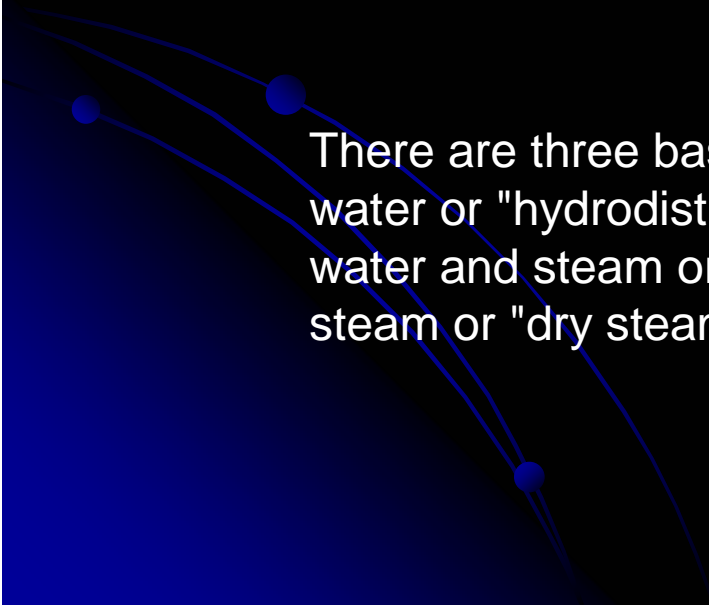
The art of aromatherapy is really not as new as some might make us believe. In fact, it dates back thousands of years and was already practiced in ancient Greece, Egypt and India. Archaeological finds of ancient stills as well as perfume vials found in Egyptian graves verify the fact, although their purposes may have differed somewhat to those of modern practitioners. In the ancient world fragrance was very important, and long before people figured out how to capture the ethereal scents of plants, they burnt fragrant plants to perfume themselves or to make fragrant offerings to the Gods. The Gods were believed to sustain themselves on scents sent to heaven. Neglecting to burn incense would have meant abandonment of the Gods, while burning incense was to honour the Gods and to invite their benevolence and protective powers into one's life.

Likewise, when essential oils were discovered, then essential oils were discovered, they were primarily used as perfume to delight the Gods, who love to walk with those who sojourn in their bodily temples. The ancient Egyptians were masters of the art of perfumery.



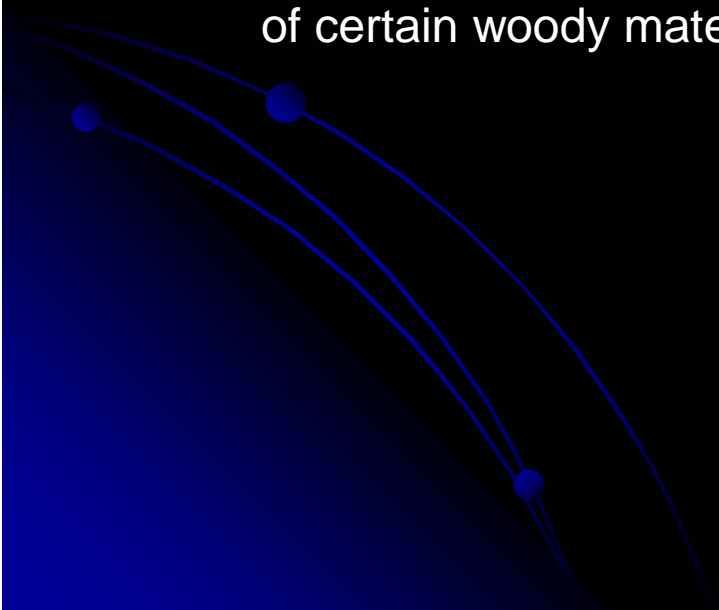
Distillation

Preparation of material for distillation varies with the material to be distilled. Some material must be distilled immediately after harvesting, whereas others can be (and are best) stored for a day or two before distilling and finally there are materials which can be stored indefinitely before distillation. In general, flowers should be distilled immediately, whereas herbaceous material often benefits from wilting for one or two days before distillation. Woody materials may need to be ground and/or soaked before distillation.



There are three basic types of essential oil distillation:
water or "hydrodistillation"
water and steam or "wet steam"
steam or "dry steam"

Hydrodistillation-The disadvantages are that the heat is difficult to control and hence the rate of distillation is variable. Also the possibility exists for local overheating and "burning" of the charge which can lead to a poorer quality oil. Improved distillation control can be obtained by using steam from a separate boiler, which is passed into a jacket around the still or through a closed coil in the bottom of the still, to heat the contents of the still. A further disadvantage of this system is that it requires the heating of a large quantity of water adding to costs and time needed for each distillation. However, it is necessary for certain flower distillations e.g. rose and ylang. It is also necessary for the efficient distillation of certain woody materials e.g. sandalwood and cinnamon bark.



Water/steam distillation this is an improved method, the still contains a grid which keeps the plant material above the water level (Fig. 2. Water/Steam still) The water is boiled below the charge and "wet" steam passes through the plant material. Consequently, if an open fire is used the plant material is protected from direct heat. In Fig. 2 the still is heated by a steam jacket. It is important in both water/steam and steam distillation that the still is packed evenly and not too tightly so that steam can extract from the complete charge efficiently. Over packing of the still can cause the steam to force "rat holes" through the charge and leave other parts of the charge unextracted.

• Steam Distillation - the most advanced type of distillation is by direct steam provided from a separate boiler. The still contains a grid plate under which an open steam pipe is fitted (see Fig. 3. Steam distillation unit).

The advantages of this type of "dry" steam distillation are that it is relatively rapid, therefore charging and emptying the still is much faster and energy consumption is lower. The rapid distillation is also less likely to damage those oils which contain reactive compounds, e.g. esters