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Applications of Peru Balsam.

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Pharmaceutical Applications.

1. Biocidal applications. Peru balsam has a long history of use in Europe as an anti-parasitic agent, especially against the burrowing mite that causes scabies *Sarcoptes scabiei* (Anon 1986), & for rashes, especially diaper rash, & for ringworm, particularly of the scalp (Wren 1988). Alcoholic extracts of both tolu & Peru balsams have been said to inhibit *Mycobacterium tuberculosis* (Duke 1981). An anti-*Helicobacter pylori* isoflavone compound, cabreuvin, was more recently identified by Ohsaki *et al.* (1999). According to older texts, Peru balsam was also used to cure chilblains, and for the treatment of sore nipples & pruritis vulvae (Felter & Lloyd 1898). A moderate degree of anti-microbial activity was shown by Peru balsam oil against a number of micro-organisms, especially against two strains of *Listeria monocytogenes* (Friedman *et al.* 2002).

2. Peru balsam has a similar traditional history of use in topical applications to combat skin diseases e.g. in pruritis & purigo, as a medicating agent in lotions & shampoos to treat dandruff; in the later stages of eczema, and for the treatment of obstinate skin ulcers & bedsores. Peru balsam is also a component of Compound Tincture of Benzoin.

3. Peru balsam has been, and still is, used extensively for topical preparations for treatment of wounds (Leung & Foster 1996), and in wound dressings. Peru balsam's properties to promote granulation and as a mild wound disinfectant and epithelial cell growth stimulant are utilized in combinations of Peru balsam, trypsin & castor oil are marketed under various trade names (Granulex™, Granul™, Balsa-Derm™, Xenaderm™ etc.), Recent published studies (Noble *et al.* 1989, Narayanan *et al.* 2005, McDougall *et al.* 2005, Gray & Jones 2004 etc.) demonstrate considerable its success in difficult wound care situations, in skin graft healing (Carson *et al.* 2003), in pressure ulcers (Maas-Irslinger *et al.* 2003) and in partial thickness wounds. For a review of Peru balsam's considerable beneficial role in wound healing see Hammond (1999).

4. Peru balsam has also been used in Western medicine in profuse bleeding and in plastic surgery (Lewis & Lewis 2003). It is also used frequently in haemorrhoidal preparations and rectal ointments.

5. The mildly expectorant & mucolytic properties of Peru balsam have led to some limited use in the treatment of colds, coughs, sore throats, catarrh & bronchitis, especially in vapour baths for respiratory ailments. Conversely, other authorities point to a cough suppressant action which has promoted its use in cough syrups and cough pastilles & sweets. There is also a history of traditional use to combat the symptoms of asthma in many countries.

Cosmetic Applications.

The mild antiseptic and skin soothing properties of Peru balsam have led to the use to its use as an ingredient in soaps & detergents, where it also has some influence on the skin-feel of the lather produced. It has been used in hair preparations (tonics, shampoos) and as a fragrance ingredient in perfumed creams, lotions, sunscreens, suntan lotions, feminine sprays etc. In oral care, Peru balsam has been used in toothpaste flavourings & mouthwashes.

Fragrances

Peru balsam is a amber-brown to brown-black gleaming treacle-like semi-mobile liquid, sometimes containing crystals. It has a rich creamy-smooth vanillic-chocolate balsamic type odour, with a dry-out which is: sweet & chocolately-balsamic, and which will persist for a number of days on a perfumers' strip. Although its dark colour could be a disadvantage, it was extensively used for its fixative & fragrant qualities in early perfumery, especially in heavy floral perfumes (such as ylang-ylang & narcissus) & other compounded bases, such as patchouli, ambergris, labdanum & sandalwood. Furthermore it blends excellently with a large range of perfumery ingredients, including ionones, linalool, petitgrain oil, floral bases etc.

The balsam/balsam oil/tincture has been traditionally used to impart "warmth" and sweetness in perfume compositions, particularly as part of oriental themes. It was noted for its fixative properties & had significant uses in incense perfumes, being blended with musks, coumarin and animal notes. It is particularly useful in incense and formerly also in soap perfumes, and also in shampoos, conditioners & lotions where it was additionally employed for its alleged antiseptic properties.

Peru Balsam has featured in the base notes of the following female fragrances:

Fragrance Type	Fragrance
Oriental-Spicy	Youth Dew (Lauder 1952),
Oriental-Sweet	Vol de Nuit (Guerlain 1945) Shalimar (Guerlain 1925)
Floral-Aldehydic	Chamade (Guerlain 1970)
	Le Dix (Balenciaga 1947)
	Nahéma (Guerlain 1979)
	Nishiki (Shiseido 1973)
Chypre/Floral-Animalic:	Parure (Guerlain 1975)
Woody-Oriental	Prada by Prada (EDP only)
	Prada for Women (Prada)

Table 1. Female Fine Fragrances featuring Peru Balsam as an Ingredient.

Following the prohibition of Peru balsam exudates by IFRA, Peru balsam usage in fragrances is mainly employed in perfumery via the prepared absolute, anhydrol or the essential oil (the latter obtained by molecular or high-vacuum dry distillation from Peru balsam exudate). According to the current IFRA Standard for Peru extractives & distillates (last amended 16th May 2007), the QRA indicates the following usage restrictions for Peru balsam exudates & distillates across the eleven QRA categories:

Category	Product (for updated information see the IFRA QRA Information Booklet)	Limit in Finished Product
1	Lip Products, Toys, Insect Repellents	0.03 % - see note 1
2	Deodorants/Antiperspirants	0.04 %
3	Hydroalcoholic Products for Shaved Skin, Eye Products, Men's Facial Cream & Balms, Tampons	0.1 %
4	Hydroalcoholic Products for Unshaved Skin, Hair Styling Aids & Sprays, Body Creams	0.4 %
5	Women's Facial Cream/Facial Make-Up, Hand Cream, Facial masks	0.2 %
6	Mouthwash, Toothpaste	0.7 % -see note 1
7	Intimate Wipes, Baby Wipes	0.07 %
8	Make-up Remover, Hair Styling Aids Non-Spray, Nail Care	0.4 %
9	Shampoo, Rinse-off Conditioners, Bar Soap, Feminine Hygiene Pads & Liners	0.4 %
10	Detergents, Hard Surface Cleaners, Diapers	0.4 %
11	All Non-Skin or Incidental Skin Contact Products	No restriction – but see note 2

Table 2. Restrictions on Peru Distillates & Exudates in Finished Products according to IFRA (downloaded 03.03.2009).

Note 1: any material used to impart perfume or flavour in products intended for human ingestion should consist of ingredients that are in compliance with appropriate regulations for foods and food flavourings in the countries of planned distribution and, where these are lacking, with the recommendations laid down in the Code of Practice of IOFI (International Organisation of the Flavor Industry).

Note 2 - Category 11 includes all non-skin contact or incidental skin contact products. Due to negligible skin contact, the concentration of a fragrance ingredient should not exceed the usual concentration of the fragrance compound in the finished product. For example, hypothetically if the usual concentration of a fragrance compound in the final product, for example a candle, is at 5%, then any individual fragrance ingredient (in this case Peru balsam oil) must not exceed 5% in the candle.

However, the European Commission have adopted the previous IFRA standard for Peru balsam oil, anhydrol or absolute under Council Directive 2008/42/EC of

03.04.2008 [amending Council Directive 76/768/EEC, concerning cosmetic products, for the purpose of adapting Annexes II and III thereto to technical progress]. This limits the concentration of Peru extracts & distillates to 0.4% in the final cosmetic product.

Peru balsam oil is obtained in over 50% yield from the balsam, & is a yellow-brown viscous liquid, often containing a large proportion of crystals and having a smooth creamy, sweet, slightly chocolately odour, but being less sweet, less rich and less vanillic than the balsam. Dry-out is sweet, balsamic, being thinner and not as sweet as the balsam, and with a benzyl benzoate/cinnamate presence. The oil has largely replaced the balsam in skin fragrances, and it finds its main application in oriental accords, and sweet sensual blends. Peru balsam extracts (absolute etc) are produced by solvent extraction of the balsam and find minor application in oriental fragrances.

Food flavourings.

Peru balsam at 40 ppm gives a somewhat bitter, woody & vanillic initial impression, which can be burning to the throat for some individuals, & leave a somewhat persistent after-taste. It enjoys extensive use in flavorings (according to the EMEA (1998), this extends to baked goods, frozen dairy products, softy confectionery & chocolate, gelatin puddings, non-alcoholic beverages – especially cola types, alcoholic beverages – such as vermouth & bitters, hard confectionery. The range of employment for all products is from 6-27mg/Kg, and in chewing gum at up to 172mg/Kg. etc.). Peru balsam oil is said to be employed at 1 to 13mg/Kg, and in chewing gum at 10mg/Kg.

Peru balsam was approved by the FDA, and has GRAS status on its 1993 listing i.e. FDA: §182.20 GRAS. It was also formerly official in the FCC, but under FCC IV & FCC V, only Peru balsam oil is now official. .

Aromatherapy.

Taking care to exclude the possibility of sensitization, Peru balsam oil has some potential applications in aromatherapy. According to Lawless (1995), these include bronchitis, chapped skin, colds, coughing, eczema, flu, poor circulation, rashes, sensitive skin & stress. Lis-Balchin (2005) advises against skin application, but approves use for non-skin fragrancing purposes.

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