Honeysuckle in Perfumery and Cosmetics

By Danute Pajaujis Anonis, Consulting Chemist Perfumer, Rego Park, New York

Honeysuckle belongs to the family of floral odors like lilac and lily of the valley for which there are no natural material available and are considered important in perfumery. In the past, honeysuckle absolute produced commercially in small quantities was used in deluxe fragrances. The advent of aromatic chemicals enabled the perfumer to develop synthetic compounds, which are now used in perfumery.

Origin, Production and Composition

Honeysuckle, *Lonicera caprifolium* L., originated in Asia Minor.[1] Another species of honeysuckle is *Lonicera gigantea* L. (family Caprifoliaceae). A number of different species of Lonicera are growing wild or are cultivated in many countries of the world.[2]

Lonicera caprifolium L. and *Lonicera gigantea* L. were used in the past to obtain the flower oil. The latter was extracted in South France with petroleum ether and yielded 0.33 percent of a concrete which on treatment with alcohol gave 23.8 percent of a viscous olive-green absolute. The steam distilled oil of this absolute was a yellowish liquid and its yield was nine percent.[3]

Little is known of the honeysuckle flower oil composition. In a steam distilled *Lonicera gigantea* L. oil, neither aldehydes, ketones, nor nitrogenous compounds were found.[4]

Synthetic Compounds

Early synthetic honeysuckle compounds were based on mimosa absolute and other flower absolutes, as the following formulas illustrate:[5]

Honeysuckle I

Mimosa absolute, 250 cm³	Phenyl ethyl alcohol, 75 cm³
Mimosa synthetic, 50 cm³	Linalool, 25 cm³
Jasmin absolute, 150 cm³	Vanillin, 25 gr
Neroli oil natural, 75 cm³	Benzoin resinoid, 100 gr
Narcissus absolute, 50 cm³	Phenylacetaldehyde, 10 gr
Terpineol, 125 cm³	Aldehyde C-9, 10 gr
Hydroxycitronellal, 25 cm³	Alcohol C-9, 5 gr

The next formula illustrates a bolder use of the early available aromatic chemicals.

Honeysuckle II

Mimosa absolute, 125 cm³	Methyl para-cresol, 50 gr
Benzyl isoamyl ether, 500 gr	Terpineol, 50 cm³
Phenyl ethyl alcohol, 75 cm³	Hydroxycitronellal, 10 cm³
Benzyl isoeugenol, 50 cm³	Tolu and benzoin resinoids, 90 gr
Vanillin, 50 gr	

In later synthetic honeysuckle compounds, aromatic chemicals formed the base, and the absolute flower oils were used in smaller amounts, as illustrated below:[6]

Honeysuckle No. 11

Hydroxycitronellal	10.0
Jasmin synthetic with indol	70.0
Alpha amyl cinnamic aldehyde	10.0
Dimethyl benzyl carbinyl acetate	2.0
Dimethyl octanyl phenyl acetate	2.0
Jasmin absolute	1.0
Ylang ylang	1.0
Rose absolute	1.0
Hydrodor fleurs d'oranger	1.0
Neroli Bigarade	1.0
Aldehyde C-8, 10%	0.5
Aldehyde C-10, 10%	0.5
	100.0

 0272-2666/89/0005-1901$04.00/00

Honeysuckle No. 12

Hydroxycitronellal	20
Phenyl ethyl alcohol	20
Linalool	26
Alpha ionone white	10
Citronellol	5
Dimethyl benzyl carbinyl acetate	5
Jasmin absolute	3
Benzyl Acetate	2
Hydrarome fleurs d'oranger decolorized	2
Methyl naphtyl ketone	2
Rosacetol	2
Rose absolute	1
Anisic aldehyde	1
Musk verduré No. 2 (R. Cerb.)*	1
	100

Musk Verduré No. 2*

Musk ambrette	71.50
Phenyl acetic acid	14.25
Coumarin	14.25
	100.00

In general, honeysuckle is considered to belong to the jasmin family of odors, but some perfumers include honeysuckle in the narcissus family, as reflected by the following formula:[7]

Honeysuckle I

Isobutyl phenyl acetate	200
Cinnamic alcohol	185
Ionone	160
Neroli synthetic	80
Jasmin synthetic	65
Rhodinol	60
Heliotropin	45
Isoeugenol	25
Jasmin absolute	10
Fleurs d'oranger absolute	10
Vanillin	10
Aldehyde C-12, 10%	10
	860

Gradually, less expensive honeysuckle compounds have been developed, containing more aromatic chemicals.

The following conventional illustrative formulas may serve as examples.

Honeysuckle No. 1

150	Phenyl ethyl alcohol
150	Hydroxycitronellal
150	Jasmin synthetic
80	Amyl salicylate
50	Bergamot
50	Alpha ionone
50	Citronellol
40	Linalool
40	Isobutyl benzoate
40	Aldehyde C-9, 10%
30	Methyl anthranilate
30	Phenyl ethyl acetate
30	Coumarin
25	Para-cresyl phenyl acetate, 25%
25	Para-cresyl acetate, 10%
20	Methyl phenyl acetate
20	Vanillin
15	Petitgrain
3	Aurantiol
998	

Honeysuckle No. 2

250	Dimethyl benzyl carbinol
150	Hydroxycitronellal
150	Terpineol
125	Alpha-amyl cinnamic aldehyde
85	Phenyl ethyl alcohol
50	Methyl ionone
50	Benzyl acetate
50	Cinnamic alcohol
30	Guaiacwood acetate
25	Phenyl ethyl isobutyrate
8	Methyl octine carbonate
8	Phenyl ethyl acetate
4	Alcohol C-11, 10%
985	

Honeysuckle No. 3

300	Hydroxycitronellal
300	Phenyl ethyl alcohol
100	Jasmin synthetic
100	Dimethyl octanol
100	Neroli synthetic
100	Bergamot
100	Amyl benzoate
80	Alpha-ionone
80	Coumarin
80	Aurantiol
60	Isobutyl benzoate
60	Vanillin
40	Isoeugenol
40	Methyl anthranilate
40	Methyl phenyl acetate
40	Methyl salicylate, 10%
40	Aldehyde C-9, 10%
30	Para-cresyl phenyl acetate, 25%
30	Para-cresyl acetate, 10%
20	Phenyl ethyl acetate
1740	

Honeysuckle No. 4

200	Jasmin synthetic
100	Hydroxycitronellal
60	Phenyl ethyl alcohol
60	Citronellol
60	Aurantiol
30	Linalool
30	Musk ketone
20	Linalyl acetate
20	Ylang
580	

The following formula illustrates a conventional honeysuckle floral bouquet:

Honeysuckle No. 5

200	Terpineol
150	Amyl salicylate
125	Jasmin synthetic
70	Hydroxycitronellal
50	Heliotropin
25	Cinnamic alcohol
25	Phenyl ethyl alcohol
20	Vanillin
20	Phenylacetaldehyde 50% in phenyl ethyl alcohol
20	Citronellol
15	Ylang
10	Musk ketone
10	Linalyl acetate
4	Aldehyde C-12 (L)
2	Methyl ionone
2	Orange oil sweet
2	Coumarin
750	

Basically, honeysuckle compounds are built on lily of the valley or its components, combined with jasmin or its constituents, and rose or its alcohols. Ionones have been used in the past. Among addi-

tional components are neroli or orange flower, or their constituents, cinnamic alcohol, isoeugenol or eugenol, ylang, aromatic carbinols and their acetates, phenyl ethyl acetate and other derivatives, and p-cresol esters. For the top note, linalyl acetate, bergamot or other citrus oil, and aldehydes C-9 to C-12, supported by corresponding alcohols.

In earlier honeysuckle compounds natural musk was used as fixative, later crystalline aromatics, i.e. musk ketone, musk ambrette, heliotropin, and vanillin appeared in such formulas. When macrocyclic musks became available, they replaced the natural musk. Among other fixatives are resinoids tolu, styrax, and olibanum. Jasmin, mimosa, rose, tuberose, and violet leaves absolute were used in small amounts.

In more modern honeysuckle compounds, new aromatics discovered in jasmin, rose, and tuberose, i.e. methyl dihydro jasmonate (hedione), pentyl-cyclopentenone (delphone), cis-jasmone lactone, damascenones, especially beta damascenone (2,6,6-trimethyl-trans-crotonyl-cyclo hexadiene,1,3), rose oxides, nerol oxide, and docediene-4-olide ketone (tuberolactone) may be used to advantage.

The use of hydroxycitronellal in honeysuckle compounds made it unsuitable for creams and soaps. Cyclamen aldehyde, lilial, and lyral became hydroxycitronellal replacements. Among newer aromatics are cis-dihydro shiseol (Mayol-Firm.) dupical (Naarden), and bourgeonal (Naarden).

Among newer aldehydes, cis-4-decenal (Bedoukian), trimethyl decadienal (Trimenal—Firm.), and trimethyl undecadienal (Oncidal-Dragoco) may be mentioned. Hexenol and its esters, 2-trans-6-cis nonadien-1-al, and 2-nonyl-1-al dimethyl acetal brought new possibilities in the green-folial-fruity notes. Nitriles, among them nonyl nitrile of an orange-aldehyde odor, are stable replacements for the citrus oil.

Among newer aromatics in the coumarin odor tonality are: 3-oxa-10-ethylidene-tricyclo (6,2,1,0) undecan-4-one (Florex-Firmenich), and 6-amyl alpha pyrone.[8] Among the more recently used aromatics, furan derivatives and diverse pyrazines, especially isohexenyl methoxy pyrazine and isobutyl methoxy pyrazine, may be mentioned.

In modernizing conventional honeysuckle compounds, today's perfumer has to eliminate some of the previously used perfume materials because of dermatological considerations. Some of these materials are coumarin, musk ambrette, heliotropin, methyl heptine carbonate and phenyl acetic acid. Other aromatics still can be used in limited amounts, i.e. cinnamic alcohol, dimethyl anthranilate, hydroxycitronellal and isoeugenol, or in purified form, i.e. bergamot and styrax resinoid, farnesol 96%; with quenchers—phenylacetaldehyde.

Application

Honeysuckle is very seldom found as a fragrance per se. One example was its use among other florals in innovative single flower perfumes without alcohol, developed in Germany during World War II. Such honeysuckle fragrances usually contained a large amount of terpineol and were fixed with synthetic civet.[9] Among later attempts, Honeysuckle fragrance by Avon in the sixties may be cited.

Honeysuckle serves mostly as a valuable component of past and present fragrances. Among the former, Quelques Fleurs, and Coeur de Jeanette may be mentioned; among more recent fragrances are Tatiana, Sikkim, Christian Aujart, Première and Crystalle, to cite a few. The return to romantic fragrances during the later 1970s saw the increased use of honeysuckle.

In cosmetics, honeysuckle has been used as a cream fragrance. It also was an important soap fragrance, and is still used in today's scented soaps, such as Puig or Belgian Chèvrefeuille (Honeysuckle) soaps.

In our modern times, honeysuckle fragrances are used in air fresheners.

References

Address correspondence to Danute Pajaujis Anonis, Consulting Chemist Perfumer, 98-41—64th Road, Rego Park, NY 11374, USA.

1. O Gerhardt, Das Komponieren in der Parfumerie, Akademische Verlagsgesselschaft, MBH, Leipzig, p 60 (1931)
2. E Guenther, The Essential Oils, Vol 5, New York: D Van Nostrand Co, p 387 (1952)
3. Igolen, Parfums de France, **15**, 299 (1937)
4. Ibid, 229
5. H Fouquet, La Technique Moderne et les Formules de la Parfumerie, Librairie Polytechnique, Paris: Ch. Béranger, 101 (1951)
6. R Cerbelaud, Formulaire de Parfumerie, Paris: Edition Opera, p 48 (1951)
7. R M Gattefossé, Formulaire de Parfumerie et de Cosmétologie, Paris: Girardot & Cie, p 59 (1950)
8. A Boix Camps, Perf & Flav, **10**(4), 15-37 (1985)
9. Fouquet, ibid, 137