

## FLAVOURING AGENTS IN PHARMACEUTICAL FORMULATIONS

A. V. SHARMA & P. V. SHARMA

*Dept. of Pharmaceutical Sciences, Kashmir University, Srinagar,  
Jammu & Kashmir, India.*

---

**Received: 19 April 1987**

**Accepted: 28 December 1987**

---

**ABSTRACT:** This paper deals with the various aspects of commonly used flavouring agents for the preparation of medicaments.

Flavour refers to a mixed sensation of taste, touch, smell, sight and sound, all of which involve a combination of physio-chemical and physiological actions that influence the perception of substances. With the expansion of technology in the flavour industry, many artificial or imitation flavours have been created. Cough syrups, laxatives, sedatives, antihistamines, antibiotics, vitamins and pediatric and geriatric formulations now are available in a variety of flavours which successfully mask unpleasant tastes without affecting physical and chemical stability. The suitable flavours are selected through the results of elaborate taste – panel studies. Formulators have found that unpleasant taste masking problem can best be resolved by use of blends of distinctive flavours. Now since many flavours are odorous, the brain receives some additional impulses from the oil factory receptors in the nose which coordinate with the gustatory stimuli to produce the mingled sensation that is recognized as the flavour of a substance.

The specific therapeutic agents and associated flavours with unique names individuals certain formulations.. For example, an orange-mint flavour is especially effective in disguising diphenhydramine in an expectorant formulation. The use of a spice vanilla

flavour for phenylephrine and chloropheniramine maleate preparation has been proposed. Strawberry is well suited to tranquilliser formulations. Maple combined with butterscotch is well suited to improve the taste of adsorbents such as kaolin and pectin. Also this same flavour is recommended for aminophylline and theophylline. Mint is preferred in antacid preparation.

Now, some of the well suited flavours for a particular class of drug is shown in the following table I:

The taste buds are sensitive to a number of basic tastes i.e. sweet, sour, bitter, salt and possibly, metallic and alkaline, but their response is modified by some additional factors such as temperature, physical nature and some special characteristics like astringency and pungency of the flavoured material.

Flavour acceptance is also affected by age. In general, children like fruit flavoured syrup, adults prefer a more acid taste, while many old people find mint or wine flavours more agreeable. Response to the flavour may not be the same in health and disease while a flavour acceptable for a short time may become objectionable if the treatment is prolonged.

**TABLE - I**

Drug	Preferred flavour
1. Antibiotics	-- Cherry, maple, pineapple, orange, raspberry, banana-vanilla, butterscotch, coconut-custard, fruit-cinnamon, strawberry, vanilla
2 Antihistamines	-- Apricot, cherry, cinnamon, grape, honey, lime, peach-orange, peach-rum, raspberry, wild cherry.
3. Barbiturates	-- Banana-pineapple, banana-vanilla, cinnamon-peppermint, orange, peach-orange, grenadine-strawberry.
4. Decongestants& Expectorants	-- Anise, apricot, butterscotch, chery, coconut-custard, custard-mint-strawberry, grenadine-peach, strawberry-lemon, gooseberry, orange-lemon, coriander, pineapple, raspberry.
5. Electrolyte-solutions geriatrics	Cherry, grape, lemon-lime, raspberry, wild cherry syrup, grenadine-strawberry, lime, portwine, cherrywine, wild-strawberry.

Flavourants are also selected on the basis of the taste of the drug to be incorporated. The following table – II gives guideline with respect to this:

**TABLE – II**

Taste	Masking flavour
Salt	- Butterscotch, maple
Bitter	- Wild cherry, walnut, chocolate-mint, licorice
Sweet	- Fruit, berry, vanilla
Acid	- Citrus

Flovours used in he formulation must be non-toxic, soluble (if for a clear product like syrup elixir) and stable and compatible with the preparation. Masking of few flavours in very difficult due to their complexity like male fern extract which is initially sweet, then astringent and finally bitter. Also sweetening agents that raise the blood sugar or increase caloric intake cannot be included in formulations for diabetics or patients or reducing diet respectively.

The creation of an acceptable flavour is more of an art than a science. Mostly the flavour is built upon a sweetened base which is usually a syrup but may be a mucilage prepared from a cellulose ester or alginate and containing a synthetic sweetener. Apart from sweetness these viscous materials give a better feel in mouth.

From the practical experience it has been found that blending of tastes is generally moe effective than adding a large excess of a powerful but unrelated flavour. Among the various tastes, bitterness is the hardest basic taste to mask; some bitter drugs leave a persistent and unpleasant after taste which occasionally can overcome by a lingering flavour such as chocolate or/apricot, or by including adjuvants such as glycine and monosodium glutamate, that have een found to reduce this effect.

Some specialized methods of obscuring an unpleasant taste are:

(1) **Formulation of the medicamen as a sweet:** Sometimes local anaesthetics like amehocaine are

included in the reparation for their action on taste buds.

(2) Use of a virtually insoluble and, therefore, comparatively tasteless derivative of a drug like Chloamphenicol cinnamate or palmitate instead of using the very bitter parent compound.

(3) **Use of effervescent powders, granules or tablets:** These contain medicament, sweetner, sodium or potassium bicarbonate and citric acid or tartaric acid. When the preparation is dissolved in water the carbonated, sweetened solution obscures the taste of saliness such as potassium citrate.

The types of flavouring agent used in the preparation are:

1. **Sweetening agents:** These include sucrose, invert syrup, treacle (used in chlorodyne i.e. chloroform and morphine tincture BPC), sorbitol, saccharine sodium etc.
2. **Flavoured syrup:** These include fruit flavoured syrup, syrups with weak therapeutic activity for example the pleasantly aromatic odour and pungent taste of Ginger syrup make it a satisfactory flavour for laxative mixtures containing rhubarb while its carminative action (ability to relieve flatulence) is helpful in this type of preparation, and cocoa syrup.
3. **Aromatic Oils:** Like caraway, clove, dill, lemon, orange, pepper-mint etc.
4. **Synthetic flavours:** These include synthetic sweeteners, chloroform, vanillin, benzaldehyde etc. and variety of organic compounds like alcohols, aldehydes, esters, ketones, fatty acids and lactones are used

alone or combined with essential oils.

### Evaluation of Flavours

For the assessment of flavours volunteers are used and they are subjected to taste tests. Each volunteer tastes three samples, two of which are the same while the other is slightly different. An acceptable volunteer must detect the odd one. Only few samples should be examined are each session because repeated testing numbs the taste buds and so raises the taste threshold. The full dose of the preparations must be taken and the experiment should be designed to minimize the effects of personal variation and other factors such as temperature, age, environment and time of the day.

Finally, the stability test must be performed for the flavours used in the preparation. It should be confirmed that the flavour used is stable in the preparation and is unaffected by the container. Deterioration of flavours may be accelerated by certain factors like,

- i) alkaline pH (except cinnamon oil)
- ii) hydrolysis except esters
- iii) oxidation except citrus oils
- iv) loss may occur through volatilization from an imperfect closure or by absorption on a certain plastics.

The preparations must be subjected to an accelerated storage test to show that none of these problems exists.

### REFERENCE:

1. Remington's Practice of Pharmacy 16<sup>th</sup> edition, Mack Publishing Co., Easton Penn, U.S.A. (1980).
2. C. Gunn and S. J. Carter, Cooper and Gunn's Dispensing for Pharmaceutical

Students, Indian editions, Kothari Book

Depot,

Bombay

(1973).