1. **NAME OF THE MEDICINAL PRODUCT**

   EBECOF SYRUP

2. **QUALITATIVE & QUANTITATIVE COMPOSITION**

   COMPOSITION:

   Each 10 ml contains:

   Dextromethorphan Hydrobromide BP……10.0mg

   Ammonium Chloride BP…….100.0mg

   Bromhexine Hydrochloride BP……8.00mg

   Menthol BP……5.00mg

   Syrup base……....q.s.

   Colour: Sunset Yellow

QUALITATIVE & QUANTITATIVE

Sr. No.	Ingredients	Specifi-cation	Label Claim/ 10ml (in mg)	% OA	Qty./bottle (mg)	Reason for Inclusion
1.	Dextromethorphan HBr	BP	10.00	-	10.00	Cough suppressant
2.	Ammonium Chloride	BP	100.00	-	100.00	Urine and to correct metabolic alkalosis
3.	Bromhexine HCl	BP	8.000	-	8.00	Expectorant
4.	Menthol	BP	5.00	-	5.00	Expectorant
5.	Sucrose	BP	-	-	5.000 gm	Sweetening agent
6.	Sod. Methyl paraben	BP	-	-	0.025	Preservative
7.	Sod. Propyl paraben	BP	-	-	0.003	Preservative
8.	Sod. Benzoate	BP	-	-	0.20	Preservative
9.	Bronopol	USP	-	-	0.003	Preservative
10.	Sorbitol	BP	-	-	1.000 gm	Sweetener
11.	Propylene Glycol	BP	-	-	2.000 gm	Solvant
12.	Orange Flavour	IHS	-	-	10l	Flavouring agent
13.	Honey Flavour	IHS	-	-	10	Flavouring agent
14.	Anhydrous Citric Acid	BP	-	-	0.004	Mild Flavouring
15.	Colour Sunset Yellow supra	IHS	-	-	0.0075	Colouring agent
16.	Purified Water	BP	-	-	Q.s.	Vehicle

Where,
BP; British Pharmacopoeia
USP; United State Pharmacopoeia
IHs; In-House

3. PHARMACEUTICAL FORM

Oral Liquid Syrup

4. CLINICAL PARTICULARS

4.1 Therapeutic indications

EBECOF SYRUP is a combination of active ingredients to give a 4 – way relief in cough, cold and symptoms associated with Bronchitis and Sinusitis.

Dextromethorphan as a cough suppressant, gives relief from cough.

Bromhexine, a mucolytic agent helps to losen mucus while Ammonium Chloride as an expectorant works to expel the mucus.

Menthol provides relieve in symptoms of Bronchitis and Sinusitis.

4.2 Posology and method of administration

Adults: To be taken 10 ml, 3 – 4 times daily.

Children: 6 – 12 Years: - 5 ml, 3 – 4 times daily.

Or as directed by the physician.

Method of Administration: Oral

4.3 Contraindications

EBECOF SYRUP is contraindicated for use in patient with known hypersensitivity to any ingredient of this drug.

4.4 Special warnings and precautions for use

Do not take this product for persistent or chronic cough such as occurs with smoking, emphysema, asthma or where cough is accompanied by excessive secretion except under advice of physician. Sympathomimetic amines should be used with caution in patient with hypertension, diabetes mellitus, heart disease, peripheral vascular disease, increased intraocular pressure, hyperthyroidism or prostatic hypertrophy. Do not exceed recommended dose.

Since mucolytic may disrupt the gastric mucosal barrier, EBECOF SYRUP should be used with caution in patient with history of gastric ulceration. Clearance of Bromhexine or its metabolites may be reduced in patient with severe hepatic or renal impairment.

This medication should be used only if clearly needed during pregnancy. Discus the risk and benefits with your doctor. Since small amount of this medication are found in breast milk, consult your doctor before breast- feeding.

4.5 Interaction with other medicinal products and other forms of interaction

When given in combination with Bromhexine, the concentration of chloramphenicol, tetracyclines or spiyramycin in the bronchial secretion are increased.

Coadministration of theophylline and cetirizine may cause decreased cetirizine clearance resulting in elevated cetirizine serum concentration and possibly cetirizine.

4.6 Fertility, pregnancy and lactation

This medication should be used only if clearly needed during pregnancy. Discus the risk and benefits with your doctor. Since small amount of this medication are found in breast milk, consult your doctor before breast- feeding.

4.7 Effects on ability to drive and use machines

Avoid driving and using machinery upon usage of medication.

4.8 Undesirable effects

Nausea, vomiting, skin rashes, headache, dizziness may rarely occur.

4.9 Overdose

Symptoms of an overdose may include feeling restless or nervous, nausea, vomiting, stomach pain, dizziness, drowsiness, dry mouth, warmth or tingly feeling, or seizure (convulsion).

The treatment of over dosage may provide symptomatic and supportive care. If the amount ingested is considered dangerous or excessive, include vomiting with ipecac syrup unless the patient is convulsing, comatose or has the gag reflux, in which case perform gastric lavage using a large bore tube. If indicated follow with activated charcoal and a saline cathartic.

5. Pharmacological properties

5.1 Pharmacodynamic properties

Pharmacotherapeutic group & ATC code:

Dextromethorphan Hydrobromide: R05DA09, Antitussives

Ammonium Chloride: B05XA04, Mineral supplements.

Bromhexine Hydrochloride: R05CB02, Expectorants and Mucolytic.

Menthol: R05CA03, Cough and Cold Preparations, Expectorants

Dextromethorphan Hydrobromide:

Dextromethorphan acts centrally to elevate the threshold for coughing, and has no significant analgesic or sedative properties at antitussive doses.

It is proposed that dextromethorphan is a glutamate and NMDA antagonist, and blocks the dopamine reuptake site. It may also increase 5HT 1A activity possibly via NMDA antagonism.

Ammonium Chloride:

Into the body, part of the ammonium ion is rapidly metabolized by the liver with formation of urea, excreted in the urine. Ammonium chloride has an irritant effect on mucous membranes and are considered to have expectorant properties.

Bromhexine Hydrochloride:

Bromhexine is an expectorant/mucolytic agent. The drug is a benzyl amine derivative (2-amino-3,5-dibromo-N-cyclohexyl N-methylbenzylamine hydrochloride) and also a derivative of vasicine and adhatodic acid, alkaloids obtained from the plant Adhatoda vasica.

Following oral administration, Bromhexine has increased sputum volume and reduced the viscosity of bronchial secretions in chronic bronchitis patients. The drug has been reported to induce hydrolytic depolymerization of mucoprotein fibres and stimulate activity of the ciliated epithelium. An increase in lysosomal activity facilitated by Bromhexine has been postulated.

Improvements in pulmonary function in bronchitis patients appear secondary to easier expectoration.

An effect of Bromhexine on increasing sputum concentrations of various antibiotics (e.g. oxtetracycline, erythromycin, ampicillin, amoxicillin) has also been reported. However, some of these effects (exocrine stimulation, increased sputum concentrations) have not been confirmed in some studies.

It has been suggested that a metabolite of Bromhexine, ambroxol, may contribute to enhanced secretion from exocrine glands during Bromhexine administration.

Menthol: It relieves irritation, diminishes congestion and checks excessive secretion of mucous membranes in the upper respiratory tract and is used for the treatment of the symptoms of bronchitis.

5.2 Pharmacokinetic properties

Dextromethorphan Hydrobromide:

Dextromethorphan is rapidly absorbed from the gastrointestinal tract and peak plasma concentrations are reached in approximately 2.5 hours. Dextromethorphan is widely distributed, and is rapidly and extensively metabolized by the liver. Dextromethorphan is demethylated to dextrorphan, an active metabolite, and to 3-methoxymorphinan and 3-hydroxymorphinan. It is primarily excreted as unchanged parent drug and dextrorphan.

Ammonium Chloride:

Absorption: IV administration results in complete bioavailability; completely absorbed after oral administration.

Distribution: Widely distributed.

Metabolism and Excretion: Ammonium ion is converted to urea in the liver, liberating hydrogen and chloride.

Half-life: Unknown.

Bromhexine Hydrochloride:

Absorption: Oral, well absorbed

Rapidly absorbed from the gastrointestinal tract Peak plasma concentrations occur after about 1 hour following oral administration

Distribution: It is widely distributed to body tissues Bromhexine is highly bound to plasma proteins Bromhexine crosses the blood-brain barrier and small amounts cross the placenta

Metabolism: Bromhexine undergoes extensive first-pass metabolism in the liver: Ambroxol is a metabolite of Bromhexine

Excretion: Bromhexine is excreted primarily in the urine as metabolites. Only small amounts appear as unchanged drug.

About 85 to 90% of a dose is excreted in the urine mainly as metabolites. Approximately 70% of an oral dose of Bromhexine has been recovered in the urine within 24 hours

Other excretion: faeces, 4%

Elimination Half-life: It has a terminal elimination half-life of 13 to 40 hours

Menthol: After absorption menthol is excreted in the urine and bile as a glucuronide.

5.3 Preclinical safety data

None known.

6. Pharmaceutical particulars

6.1 List of excipients

- Sucrose
- Sodium Methyl paraben
- Sodium Propyl paraben
- Sodium Benzoate
- Bronopol
- Sorbitol
- Propylene Glycol
- Orange Flavour