[DESCRIPTION]

[Invention Title]

FAST-DISSOLVING ORAL FILM FOR EFFECTIVELY CONCEALING UNPLEASANT TASTES

[Technical Field]

The present invention relates to a quickly soluble oral film dosage for effectively masking a unpleasant taste and, more particularly, to a quickly soluble oral film dosage comprising a stevioside based sweetener and a high potency sweetener in a ratio by weight (w/w) of 1:3 to 3:1, which may efficiently mask a bitter or nasty taste of a medicine and may be quickly dissolved in a mouth without water, thereby improving an aftertaste thereof thus enhancing dosage acceptability of a patient.

[Background Art]

A social distribution ratio of aged population has currently increased owing to an extended span of human life. Old people generally show degenerated abilities including eyesight, hearing, memory, physical strength, etc. as well as pharmacokinetic variation, thus requiring suitable medical therapy. Especially, since they have difficulties in swallowing typical tablets or capsules, an alternative

oral dosage formulation for aged persons may be required.

A quickly soluble film easily disintegrated or dissolved in a mouth can be taken without water, thus being useful for aged persons who have difficulties in swallowing tablets or capsules, handicapped children, patients in bed, and the modern people living a busy life, and so forth. For aged persons and children, a liquid type formulation may be prescribed instead of tablets and/or capsules. However, such liquid formulation has disadvantages such as deteriorated stability and incorrect dosage.

In particular, when a drug is absorbed in an oral mucosa, it may avoid passage of the drug through the liver. Therefore, the quickly soluble film dosage is preferably used for some medicines subjected to liver metabolism.

However, a film formulation easily dissolved in an oral cavity enables a drug to be absorbed in the oral mucosa, causing a bitter or nasty taste of the drug during absorption. Accordingly, ideas for blocking or masking such bad taste may be required.

In view of the foregoing circumstances, International Patent Publication No. WO 2001/70194 describes preparation of a quickly soluble oral film dosage as a taste masking agent by adsorbing active ingredients to an ion-exchange resin. However, the ion-exchange resin contained in a water-soluble polymer may cause scratches during forming and

require a complicated processing.

International Patent Publication No. WO 2003/070227 describes use of a chemical compound such as sodium hydrocarbonate generating carbon dioxide so as to mask taste. However, sodium hydrocarbonate has limitations in masking a strong bitter taste.

International Patent Publication No. WO 2008/040534 describes a film formulation disintegrated and entered into the stomach without adhesion to the oral mucosa. However, the foregoing film formulation is prepared by a complicated method for considerably preventing absorption of the formulation to the oral mucosa and may not provide beneficial effects for protection of the stomach and bowels.

U.S. Patent Laid-Open No. US 2008/0044454 describes a preparation method of a uniform film comprising coating of an active material by a variety of coating techniques then introducing the coated active material into a film forming agent. Such coating process may complicate the preparation of film.

[Disclosure of Invention]

[Technical Problem]

The present inventors have made efforts to overcome the foregoing shortcomings and found that use of at least one selected from a group consisting of aspartame,

acesulfame potassium, sucralose and neotame together with stevioside and/or its derivative can mask a bitter and/or nasty taste even without substantially altering a process of preparing an oral film dosage.

In other words, in order to solve conventional problems and to develop an improved quickly soluble oral film dosage containing active ingredients as the most preferable formulation, a great deal of studies and investigation have been conducted by the present inventors. As a result, they found that the bitter and/or nasty taste may be efficiently masked without additional coating processes if stevioside and/or derivatives thereof having a strong sweet aftertaste among high potency sweeteners are used together with any typical high potency sweetener, and then, completed the present invention.

Accordingly, it is an object of the present invention to provide a quickly soluble oral film dosage including a therapeutically effective amount of active pharmaceutical ingredient, stevioside and/or its derivative, at least one high potency sweetener, a film forming agent, and at least one of pharmaceutically available additives.

Another object of the present invention is to provide a quickly soluble oral film dosage capable of efficiently masking a nasty taste caused by a therapeutically effective amount of active pharmaceutical ingredient and, in addition,

being promptly dissolved in an oral cavity.

[Technical Solution]

In order to achieve the above objects, the present invention provides a quickly soluble oral film dosage, comprising: at least one water-soluble polymer; at least one active pharmaceutical ingredient; a stevioside based sweetener as an aftertaste enhancer; and at least one high potency sweetener (a primary sweetening agent) as a taste masking agent.

[Advantageous Effects]

The proposed oral film dosage has excellent effects of masking a nasty taste and may be easily prepared by a simple process at low cost, thereby being preferably used in various applications such as an oral cleanser, a bad breath remover, a carrier for a nutrient supplementary agent, and a tongue soluble formulation enabling absorption of drugs in the oral cavity as well as the stomach and bowels, and so forth.

[Brief Description of the Drawings]

These and other objects, features, aspects, and advantages of the present invention will be more fully described in the following detailed description of examples,

taken in conjunction with the accompanying drawings. In the drawings:

Fig. 1 is a graph showing results of dissolution experiments for a quickly soluble oral film dosage prepared at pH 1.2 according to Example 9 of the present invention in comparison with a control (Zofran® Zydis tablet available from GlaxoSmithKline Co., 8mg);

Fig. 2 is a graph showing blood concentration profiles for pharmacokinetic tests using Ondansetron film dosage (8mg) and Zofran® Zydis tablet (8mg);

Fig. 3 is a graph showing blood concentration profiles for pharmacokinetic tests in comparison of Sildenafil Citrate film dosage (25mg) and Viagra® tablet (25mg);

Fig. 4 is a graph showing blood concentration profiles for oral administration tests to Beagle dogs using montelukast sodium film dosage (5mg) and Singulair® chewable tablet (5mg); and

Fig. 5 is a graph showing sweetness profiles of high potency sweeteners (primary sweetening agents) according to an exemplary embodiment of the present invention; as shown in Fig. 5, acesulfame potassium (ACK), aspartame (AST) and stevioside (STS) exhibit delayed expression of sweetness in sequential order.

[Mode for the Invention]

The present invention describes a composition for a quickly soluble oral film dosage comprising active pharmaceutical ingredients, capable of efficiently masking a nasty taste as well as being rapidly dissolved in an oral cavity.

A preferred film dosage according to the present invention may include a active pharmaceutical ingredients, stevioside and/or its derivative, at least one high potency sweetener (a primary sweetening agent), a film forming agent, and at least one additional component described below.

Examples of the additional component may include pharmaceutically available additives such as a salivation stimulator, a thickener, a filler, a plasticizer, a secondary sweetening agent, an acidic agent, a flavor, an emulsifier, a surfactant, a binder, a preservative, a pigment, a coolant, and the like. Components of such additives will be described in great detail.

In the present invention, a quickly soluble film is obtained by dissolving a drug with a nasty taste, a high potency sweetener (a primary sweetening agent), stevioside and/or its derivative for improving an aftertaste in water or oil, emulsifying the solution, adding a water-soluble polymer and other additives to the emulsified solution, and forming the mixture into a shaped film.

As described above, the quickly soluble film of the present invention contains the primary sweetening agent with high potency sweetness, that is, the high potency sweetener.

According to an exemplary embodiment, the high potency sweetener (the primary sweetening agent) may include at least one sweetener selected from a group consisting of aspartame, acesulfame salts, sucralose, saccharine salts, neotame, cyclamate salts, thaumatin, Luo han guo extract and licorice extract. The high potency sweetener more preferably includes at least one selected from a group consisting of aspartame, sucralose, neotame and acesulfame salts.

In case of chemicals with a strong nasty taste, they have a strong bitter taste and nasty taste in an aftertaste thereof. Adding 0.1 to 10 wt.% of stevioside based sweetener, that is, stevioside and/or its derivative relative to the total weight of the chemicals may mask the bitter and/or nasty taste.

Examples of stevioside may include Steviten Light (containing at least 98% of stevioside), Steviten Rich (containing 100% of enzyme treated stevia), Stevia extract REB-A 73% (containing at least 73% of Rebaudioside A), and Rebaten 97%(containing at least 97% of Rebaudioside A) etc., all of which are manufactured by DaePyung Co. Ltd. in Korea.

Among these, the enzyme treated stevia is a product

with improved taste prepared using sugar transferase in order to add glucose to the stevia extract, thus reducing an inherent bitter taste of stevioside while increasing solubility thereof. The stevia extract Rebaten 97% shows the highest sweetness and the most excellent equality of sweetness among seven (7) kinds of sweet ingredients contained in stevia and is obtained from stevia by an alternative separation process.

As for maximum sweetness of each of high potency sweeteners after the lapse of time shown in Fig. 5, acesulfame potassium (ACK) firstly expresses the maximum sweetness, followed by aspartame, sucralose and stevioside in sequential order. Therefore, a nasty taste remained after a drug is absorbed in an oral cavity may be controlled by stevioside most slowly expressing sweetness.

The quickly soluble oral film dosage of the present invention may include a water-soluble polymer.

Examples of the water-soluble polymer may include pullulan, gelatin, pectin, low viscosity pectin, hydroxypropylmethyl cellulose, low viscosity hydroxylpropylmethyl cellulose, hydroxyethyl cellulose, hydroxypropyl cellulose, carboxymethyl cellulose, polyvinylalcohol, polyacrylic acid, methyl methacrylate copolymer, carboxyvinyl polymer, polyethyleneglycol, alginic acid, low viscosity alginic acid, sodium alginate, modified

starch, casein, whey protein extract, soy protein extract, zein, levan, elsinan, gluten, acacia gum, carageenan, Arabic gum, guar gum, locust bean gum, xanthan gum, gellan gum, agar, and the like.

Preferably, the water-soluble polymer may include at least one selected from a group consisting of pullulan, gelatin, pectin, low viscosity pectin, low viscosity alginic acid, hydroxypropylmethyl cellulose, and modified starch.

An amount of such water-soluble polymer in the quickly soluble film may range from 50 to 90wt.%, preferably 60 to 80wt.%, and more preferably 60 to 70wt.% relative to the total weight of the quickly soluble film.

The active pharmaceutical ingredient used in the quickly soluble film may be any of pharmacologically active substances for oral administration, in particular, be capable of being quickly dissolved to rapidly express efficacy of a medicine. Examples of such substances may include: diabetic remedy such as glimepiride, pioglitazone, etc.; insomnia remedy such as zolpidem, eszopiclone, etc.; genitor-urinary remedy such as tolterodine, trospium, etc.; obesity remedy such as sibutramine; enzyme formulation such as streptokinase; gastric ulcer remedy such as omeprazole; cough remedy and expectorant such as theophylline, clenbuterol, etc.; dermal disorder remedy such as finasteride; antiemitic drug such as ondansetron; anti-

depression drug such as fluoxetine; antihistamine drug such as fexofenadine hydrochloride; antipyretic, analgesic and antiphlogistic remedy such as aspirin, ibuprofen, ketoprofen, meloxicam, etc.; hormone drug such as testosterone; circulatory organ remedy such as felodipine, atorvastatin, amlodipine camsylate, doxazosin, simvastatin, lercanidipine, etc.; gastrointestinal remedy such as famotidine, ranitidine, lansoprazole, etc.; heart vascular disease remedy such as amlodipine, nitroglycerin, etc.; psychoneurotic drug such as paroxetine; impotency remedy such as sildenafil, tadalafil, vardenafil, etc.; Alzheimer's disease remedy such as donepezil; osteoporosis remedy; arthritis remedy; epilepsy remedy; muscle relaxing agent; cerebral function enhancer; schizophrenia remedy; immuno-suppression agent; antibiotic agent such as ampicillin, amoxicillin; anticancer agent; Supportives in tumor therapy ; vaccine; oral cleanser; anemia remedy; constipation remedy; allergy remedy; anti-blood coagulation agent; oral vaccine; melatonin; vitamin; nutrient; probiotic preparation, multi-symptom cold/flue medications; health functional foods, and so forth.

The active pharmaceutical ingredient may be at least one selected from a group consisting of triclosan, cetylpyridium chloride, domiphen bromide, quaternary ammonium salt, zinc compounds, sanguinarine, fluoride, alexidine, octenidine, EDTA, aspirin, acetaminophen, ibuprofen, ketoprofen,

diflunisal, fenoprofen calcium, naproxen, tolmetin sodium, indomethacin, benzonatate, caramiphen, edisylate, menthol, dextromethorphan hydrobromide, chlophedianol hydrochloride, diphenhydramine, pseudoephedrine hydrochloride, phenylephrine, phenylpropanolamine, pseudoephedrine sulfate, bromophenylamine maleate, chlorophenylamine maleate, carbinoxamine maleate, clemastine fumarate, dexchlorpheniramine maleate, diphenhydramine hydrochloride, diphenhydramine citrate, diphenylpyraline hydrochloride, doxylamine succinate, promethazine hydrochloride, pyrilamine maleate, tripelennamine citrate, triprolidine hydrochloride, acrivastine, loratadine, brompheniramine, dexbrompheniramine, guaifenesin, ipecac, calcium iodide, terpine hydrate, loperamide, famotidine, ranitidine, omeprazole, lansoprazole, aliphatic alcohol, nicotine, caffeine, strychnine, picrotoxin, pentylenetetrazol, phenylhydantoin, phenobarbital, primidone, carbamazepine, ethosuximide, methosuximide, phensuximide, trimethadione, diazepam, benzodiazepine, phenacemide, pheneturide, acetazolamide, sulthiame, bromide, levodopa, amantadine, morphine, heroin, hydromorphone, methophone, oxymorphone, levorphanol, codeine, hydrocodone, xycodone, nalorphine, naloxone, naltrexone, salicylate, phenylbutazone, indomethacin, phenacetin, chloropromazine, methotrimeprazine, haloperidol, clozapine, reserpine, imipramine, tranylcypromine, phenelzine, lithium,

apomorphine, sildenafil, tadalafil, vardenafil, ondansetron, donepezil, zolpidem tartrate, granisetron, montelukast, pholcodine, butylscopolamine, fentanyl citrate, oxycodone hydrochloride, buprenorphine hydrochloride, escitalopram oxalate, rivastigmine tartrate, esomeprazole magnesium, aripiprazole, zolmitriptan, rizatriptan benzoate, telmisartan, risperidone, benzocaine, cetirizine hydrochloride, bambuterol hydrochloride, galantamine hydrobromide, lercanidipine hydrochloride, paroxetine hydrochloride, meloxicam, tolterodine tartrate, doxazosin mesylate, and pharmaceutically available salts thereof.

If one of the ondansetron salts is an ondansetron hydrochloride, a quickly soluble film including the ondansetron hydrochloride as the active pharmaceutical ingredient may have bioequivalence.

If one of the montelukast salts is a montelukast sodium, a quickly soluble film including the montelukast sodium as the active pharmaceutical ingredient may have bioequivalence.

If one of the sildenafil salts is a sildenafil citrate, a quickly soluble film including the sildenafil citrate as the active pharmaceutical ingredient may have bioequivalence.

An amount of such active ingredient may range from 0.1 to 30wt.%, preferably 10 to 20wt.% relative to the total

weight of the quickly soluble film.

The filler may reduce greasy features of the film in the mouth and endow a skeleton structure to the film. In addition, adhesion between films is decreased while a film disintegration speed and a drug elution rate as well as stickiness may be controlled. An amount of the filler may range from 1 to 15wt.% relative to the total weight of the quickly soluble film.

As for an exemplary embodiment, the filler may include at least one selected from a group consisting of microcrystalline cellulose, cellulose polymer, magnesium carbonate, calcium carbonate, limestone powder, silicate, clay, talc, titanium dioxide and calcium phosphate.

A plasticizer may be used to regulate flexibility of the film. An amount of the plasticizer in the quickly soluble film may range from 0.1 to 15wt.% relative to the total weight of the quickly soluble film.

As for an exemplary embodiment, the plasticizer may be at least one selected from a group consisting of sorbitol, maltitol, xylitol, glycerin, polyethyleneglycol, propyleneglycol, hydrogenated starch syrup, starch syrup, triacetin, glycerol oleate, sucrose fatty acid ester and double chain fatty acid.

The quickly soluble film of the present invention may further include a secondary sweetening agent in an amount of

0.1 to 10wt.% relative to the total weight of the quickly soluble film.

As for an exemplary embodiment, the secondary sweetening agent may be at least one selected from a group consisting of sucrose, glucose, maltose, oligosaccharides dextrin, alpha cyclodextrin, beta cyclodextrin, gamma cyclodextrin, methyle beta cyclodextrin, hydroxypropy beta cyclodextrin, cluster dextrin, indigestible dextrin, hydrogenated indigestible dextrin, invert sugar, fructose, lactose, galactose, starch syrup, sorbitol, maltitol, xylitol, erythritol, hydrogenated starch syrup, mannitol and trehalose.

The quickly soluble film of the present invention may further include an acidic agent. The acidic agent serves to control taste together with the sweetener and may function to stimulate secretion of saliva in order to dissolve the quickly soluble film. An amount of the acidic agent may range from 0.1 to 10wt.% relative to the total weight of the quickly soluble film.

As for an exemplary embodiment, the acidic agent may be at least one selected from a group consisting of citric acid, malic acid, fumaric acid, tartaric acid, ascorbic acid, succinic acid, adipic acid and lactic acid.

The quickly soluble oral film dosage of the present invention may further include flavor. The inventive film

dissolved and absorbed in an oral cavity may need appropriate flavor. Such flavor may natural flavor, artificial flavor or a mixture thereof.

The natural flavor may include aromatic plants, especially, extract and/or oil obtained from leaves, flowers, fruits of the aromatic plants. The plant oil may include spearmint oil, cinnamon oil, peppermint oil, lemon oil, clove oil, bay oil, thyme oil, cedar leaf oil, nutmeg oil, sage oil, almond oil, and the like. The artificial flavor may include synthetic fruit flavors such as lemon, orange, grape, lime, strawberry, etc. and other synthetic flavors such as vanilla, chocolate, coffee, cocoa, pine leaf, ginseng, red ginseng, citrus, etc.

An amount of such flavor depends on various parameters such as types, kinds and/or desired levels of the flavors commonly used in the art and, may range from 1 to 15wt.% relative to the total weight of the quickly soluble film.

When the oiltype flavor is used, an emulsifier may be added in order to enable the flavor to be miscible with water-soluble substances. An amount of the emulsifier depends on kind or amount of the flavor and may range from 0.1 to 10wt.% relative to the total weight of the quickly soluble film.

As for an exemplary embodiment, the emulsifier may be

at least one selected from a group consisting of glycerin fatty acid ester, sucrose fatty acid ester, lecithin, enzyme treated lecithin, polysorbate, sorbitan fatty acid ester and propyleneglycol.

The quickly soluble oral film dosage of the present invention may further include an appropriate pigment. An amount of the pigment is varied as needed and may range from 0.01 to 10wt.% relative to the total weight of the quickly soluble film. The pigment may include natural and/or synthetic pigment.

The quickly soluble oral film dosage may further include a cooling agent. The cooling agent is not particularly limited but includes, for example, WS3, WS23 or questice-L. An amount of the cooling agent is varied as needed and may range from 0.01 to 5wt.% relative to the total weight of the quickly soluble film.

The present invention provides a quickly soluble film comprising a quickly soluble oral film dosage composition.

The inventive film is preferably a thin film to maintain desired tensile strength and other physical strength even in the form of very thin film. As for an exemplary embodiment, the quickly soluble film may have a thickness of 20 ㎛ to 200 ㎛ and, preferably, 40 ㎛ to 100 ㎛.

The present invention provides a method for preparation of a quickly soluble oral film dosage.

As an exemplary embodiment of the present invention, the method for preparation of a quickly soluble film includes:

(1) preparing a quickly soluble film composition comprising an active ingredient, at least two high potency sweeteners and a water-soluble polymer;

(2) introducing the prepared film composition into a molding machine to form a film at 50 to 80□; and

(3) ageing the formed film for 1 to 10 days under 50 to 70% relative humidity.

The method for preparation of the quickly soluble oral film dosage according to the present invention may be performed by the following processes.

(1) Solution preparing process

a) Preparation of first solution: The water-soluble polymer is placed in boiling water to be completely dissolved.

b) Preparation of second solution: Additives such as a pigment, a sweetener, an acidic agent and/or a filler are combined together to prepare the second solution.

c) Preparation of third solution: All of an active ingredient, menthol, a flavor and a cooling agent are mixed with an emulsifier to prepare the third solution.

d) Preparation of fourth solution: Blending the second and third solutions results in the fourth solution.

e) Preparation of fifth solution: After raising the temperature to 60□ or more, the fourth solution is combined with the first solution to prepare the fifth solution.

(2) Forming process

After filtering the fifth solution, the filtered solution is introduced into a molding machine to form a film. The temperature of the molding machine ranges from 50 to 80□ and produces the film in a roll form via a belt drum drier.

(3) Ageing process

The formed film is subjected to an ageing process for 1 to 10 days under 50 to 70% relative humidity, so as to have a water content suitable for slitting or cutting. Such water content may range from 8 to 12%.

In addition, the following processes may be further performed after the above processes.

(4) Cutting process

After slitting the aged roll of film into smaller rolls, the smaller rolls are cut into desired sizes followed by putting them in containers and/or aluminum foils.

(5) Packaging process

The containers and/or aluminum foils having the products are packaged into small boxes or manufactured into final products through blistering.

According to the foregoing preparation method, the present invention may provide the quickly soluble film

without a nasty taste only by adding stevioside and/or its derivative, regardless of applying specific techniques to coat active ingredients contained in the film.

Also, the quickly soluble film prepared according to the present invention may be rapidly disintegrated and dissolved by saliva in a mouth without requiring water, so as to be easily administrated to a patient, aged person and/or child who have difficulties in swallowing typical tablets.

Hereinafter, the present invention will be described in greater detail by the following examples. However, these examples are intended for illustrative purposes and a person skilled in the art will appreciate that the present invention is not restricted thereto.

EXAMPLES

Examples 1 to 3 and Comparative Examples 1 to 3

Meloxicam as an active pharmaceutical ingredient was added to prepare films having constitutional compositions shown in the following Table 1. Six (6) adult men and women orally took the prepared films. A time period spent for completely dissolving the film with saliva in an oral cavity was measured and a sensory test was performed. The sensory test was randomly conducted and test results are show in the following Table 2.

TABLE 1

Ingredient	Comparative example 1 (wt.%)	Comparative example 2 (wt.%)	Comparative example 3 (wt.%)	Example 1 (wt.%)	Example 2 (wt.%)	Example 3 (wt.%)
Aspartame	2.5			2.5		
Sucralose		2.5			2.5	
Acesulfame potassium			2.5			2.5
Steviten-rich				3.5		
Enzyme treated stevia					3.5	
Rebaten 97%						3.5
Citric acid	0.6	0.6	0.6	0.6	0.6	0.6
Oxidated starch	5	5	5	5	5	5
Lecithin	0.4	0.4	0.4	0.4	0.4	0.4
Menthol	0.5	0.5	0.5	0.5	0.5	0.5
Carageenan	0.2	0.2	0.2	0.2	0.2	0.2
Polysorbate 80	0.4	0.4	0.4	0.4	0.4	0.4
Peppermint oil	0.8	0.8	0.8	0.8	0.8	0.8
Pullulan	66.6	66.6	66.6	63.1	63.1	63.1
Microcrystalline cellulose	3	3	3	3	3	3
Lemon flavor	2	2	2	2	2	2
Meloxicam	18	18	18	18	18	18
Total weight	100.0	100.0	100.0	100.0	100.0	100.0

* an input amount of each component was calculated under the presumption that a water content of the prepared film is 10%.

As a result of the foregoing sensory test, it was found that the compositions not containing stevioside and/or its derivative (Comparative Example 1, 2 and 3) and the compositions containing the same (Examples 1, 2 and 3) showed no substantial difference in terms of disintegration time in the mouth. However, the compositions containing

stevioside had superior effects of masking a nasty taste over the compositions without stevioside. These results are shown in Table 2.

As for raw materials used,herein, aspartame and oxidated starch were manufactured by Daesang Co. Ltd., acesulfame potassium was manufactured by Nutrinova GmbH, sucralose was manufactured by Tate and Lyle plc, carageenan was manufactured by MSC, polysorbate was manufactured by Ilsin Wells, pullulan was manufactured by Hayashibara Co. Ltd., and peppermint oil and lemon flavor were manufactured by Bolak Co. Ltd.

TABLE 2 - Sensory test result

	Sweetener	Disintegration time in mouth (sec)	Initial result of sensory test	sensory test result after 1 minute
Comparative example 1	Aspartame	55	1	5
Comparative example 2	Sucralose	53	1	4
Comparative example 3	Acesulfame potassium	54	1	5
Example 1	Aspartame + steviten-rich	51	1	1
Example 2	Sucralose + enzyme treated stevioside	52	1	1
Example 3	Acesulfame potassium + rebaten 97%	53	1	1

* As the test result value increases, a nasty taste is strong.

Examples 4 to 8 and Comparative Examples 4 to 8

After altering kinds of the water-soluble polymers

and using meloxicam as a active pharmaceutical ingredient films having constitutional compositions shown in the following Tables 3 and 4 were prepared. Six (6) adult men and women orally took the prepared films. A time period spent for completely dissolving the film with saliva in an oral cavity was measured and a sensory test was performed. The sensory test was randomly conducted and test results are show in the following Table 5.

TABLE 3

Ingredient	Example 4 (wt.%)	Example 5 (wt.%)	Example 6 (wt.%)	Example 7 (wt.%)	Example 8 (wt.%)
Sucralose	2.5	2.5	2.5	2.5	2.5
Steviten-rich	3.5	3.5	3.5	3.5	3.5
Citric acid	0.6	0.6	0.6	0.6	0.6
Hydroxypropyl starch	5	5	5	5	5
Lecithin	0.4	0.4	0.4	0.4	0.4
Menthol	0.5	0.5	0.5	0.5	0.5
Carageenan	0.2	0.2	0.2	0.2	0.2
Polysorbate 80	0.4	0.4	0.4	0.4	0.4
Peppermint oil	0.8	0.8	0.8	0.8	0.8
Low viscosity pectin	63.1				
Gelatin		63.1			
HPMC			63.1		
Low viscosity alginic acid				63.1	
Polyvinyl alcohol					63.1
Microcrystalline cellulose	3	3	3	3	3
Lemon flavor	2	2	2	2	2
Meloxicam	18	18	18	18	18
Total weight	100.0	100.0	100.0	100.0	100.0

* An input amount of each component was calculated under the presumption that a water content of the prepared film is 10%.

TABLE 4

Ingredient	Comparative Example 4 (wt.%)	Comparative Example 5 (wt.%)	Comparative Example 6 (wt.%)	Comparative Example 7 (wt.%)	Comparative Example 8 (wt.%)
Sucralose	2.5	2.5	2.5	2.5	2.5
Citric acid	0.6	0.6	0.6	0.6	0.6
Hydroxypropyl starch	5	5	5	5	5
Lecithin	0.4	0.4	0.4	0.4	0.4
Menthol	0.5	0.5	0.5	0.5	0.5
Carageenan	0.2	0.2	0.2	0.2	0.2
Polysorbate 80	0.4	0.4	0.4	0.4	0.4
Peppermint oil	0.8	0.8	0.8	0.8	0.8
Low viscosity pectin	66.6				
Gelatin		66.6			
HPMC			66.6		
Low viscosity alginic acid				66.6	
Polyvinyl alcohol					66.6
Microcrystalline cellulose	3	3	3	3	3
Lemon flavor	2	2	2	2	2
Meloxicam	18	18	18	18	18
Total weight	100.0	100.0	100.0	100.0	100.0

* An input amount of each component was calculated under the presumption that a water content of the prepared film is 10%.

As a result of the foregoing sensory test, it was found that the disintegration time in the mouth was substantially the same and the nasty taste masking effects were excellent, regardless of different kinds of water-soluble polymers. These results are shown in Table 5.

As raw materials used, herein, the low viscosity pectin was GENU pectin DSS manufactured by CP Kelco ApS, gelatin was 100 Bloom products manufactured by Geltech,

hydroxypropylmethyl cellulose was Demacol HE 5/6 BV manufactured by Demasa, the low viscosity alginic acid was Login manufactured by MSC, and hydroxypropyl starch was products manufactured by Grain Processing Corp.

TABLE 5

	Sweetener	Water soluble polymer	Disintegration time in mouth (sec)	Initial result of sensory test	Sensory test result after 1 minute
Example 4	Sucralose + steviten-rich	Pectin	57	1	1
Comparative example 4	Sucralose	Pectin	59	1	4
Example 5	Sucralose + steviten-rich	Gelatin	54	1	1
Comparative example 5	Sucralose	Gelatin	55	1	4
Example 6	Sucralose + steviten-rich	HPMC	53	1	1
Comparative example 6	Sucralose	HPMC	54	1	4
Example 7	sucralose + steviten-rich	Alginic acid	56	1	1
Comparative example 7	Sucralose	Alginic acid	58	1	4
Example 8	Sucralose + steviten-rich	PVA	53	1	1
Comparative example 8	Sucralose	PVA	54	1	4

* As the test result value increases, a nasty taste is strong.

Examples 9 to 13 and Comparative Examples 9 to 13

As active pharmaceutical ingredients, ondansetron zolpidem tartrate, tadalafil, lercanidipine, and/or donepezil were added to prepare films having constitutional compositions shown in the following Table 6. Table 7 shows constitutional compositions without stevioside.

According to the constitutional compositions shown in Tables 6 and 7, the films were prepared. Six (6) adult men and women orally took the prepared films. A time period spent for completely dissolving the film with saliva in an oral cavity was measured and a sensory test was performed.

The sensory test was randomly conducted and test results are show in the following Table 8.

TABLE 6

Ingredient	Example 9 (wt.%)	Example 10 (wt.%)	Example 11 (wt.%)	Example 12 (wt.%)	Example 13 (wt.%)
Sucralose				1	1.2
Aspartame	4	3	3	1	1.2
Acesulfame potassium			1		
Rebaten 97%	4	3	2	1	1.2
Citric acid	0.2	0.2	0.2	0.6	0.6
Hydroxypropyl starch	4	4	2	0.3	4
Lecithin	0.1	0.5	0.1	0.4	0.4
Menthol	0.4	2.3	0.3	3	3
Carageenan	0.1	0.1	0.1	0.1	0.2
Polysorbate 80	0.4	0.5	0.3	0.3	0.3
Peppermint oil	0.8	2.7	0.6	3	3
Pullulan	72.5	59.4	68.2	72.1	68.4
Microcrystalline cellulose	1.4	1.4	0.7	0.7	4
Lemon flavor	2	2	1.5	1.5	1.5
Ondansetron	10.1				
Zolpidem tartrate		20.9			
Tadalafil			20.0		
Lercanidipine				15	
Donepezil					10
Total weight	100.0	100.0	100.0	100.0	100.0

* An input amount of each component was calculated under the presumption that a water content of the prepared film is 10%.

TABLE 7

Ingredient	Comparative Example 9 (wt.%)	Comparative Example 10 (wt.%)	Comparative Example 11 (wt.%)	Comparative Example 12 (wt.%)	Comparative Example 13 (wt.%)
Sucralose				1	1.2
Aspartame	4	3	3	1	1.2
Acesulfame potassium			1		
Rebaten 97%	0	0	0	0	0
Citric acid	0.2	0.2	0.2	0.6	0.6
Hydroxypropyl starch	4	4	2	0.3	4
Lecithin	0.1	0.5	0.1	0.4	0.4
Menthol	0.4	2.3	0.3	3	3
Carageenan	0.1	0.1	0.1	0.1	0.2
Polysorbate 80	0.4	0.5	0.3	0.3	0.3
Peppermint oil	0.8	2.7	0.6	3	3
Pullulan	76.5	62.4	70.2	73.1	70.6
Microcrystalline cellulose	1.4	1.4	0.7	0.7	4
Lemon flavor	2	2	1.5	1.5	1.5
Ondansetron	10.1				
Zolpidem tartrate		20.9			
Tadalafil			20.0		
Lercanidipine				15	
Donepezil					10
Total weight	100.0	100.0	100.0	100.0	100.0

* An input amount of each component was calculated under the presumption that a water content of the prepared film is 10%.

As a result of the foregoing sensory test, it was found that the disintegration time in the mouth was substantially the same regardless of different kinds of

active ingredients while addition of stevioside exhibited excellent effects of masking an aftertaste which remained after 1 minute. These results are shown in Table 8.

TABLE 8

	Sweetener	Disintegration time in mouth (sec)	Initial result of sensory test	Sensory test result after 1 minute
Example 9	aspartame + Rebaten 97%	53	1	1
Comparative example 9	Aspartame	54	1	5
Example 10	Aspartame+ Rebaten 97%	49	1	1
Comparative example 10	Aspartame	50	1	5
Example 11	Aspartame + acesulfame potassium + Rebaten 97%	51	1	1
Comparative example 11	Aspartame + acesulfame potassium	52	1	4
Example 12	Sucralose + aspartame + Rebaten 97%	53	1	1
Comparative example 12	Sucralose + aspartame	55	1	4
Example 13	Sucralose + aspartame + Rebaten 97%	52	1	1
Comparative example 13	Sucralose + aspartame	53	1	4

* As the test result value increases, a nasty taste is strong.

Example 14

Ondansetron based quickly soluble film prepared according to Example 9 of the present invention was subjected to dissolution experiments at pH 1.2 in comparison with a conventional product named Zofran® Zydis tablet

containing ondansetron available from GlaxoSmithKline Co.(GSK) based on Notice of the Food and Drug Administration and the experimental results are shown in Fig. 1. As shown in the accompanying drawings, there was no substantial difference in elution between both of the formulations.

Example 15

Ondansetron based quickly soluble film prepared according to Example 9 of the present invention was subjected to pharmacokinetic tests in comparison with a conventional product named Zofran® Zydis tablet containing ondansetron available from GlaxoSmithKline Co.(GSK). The experiments is conducted for healthy fourteen (14) adult men and women with Latin square method based on Notice of bioequivalence test standard of the Food and Drug Administration.

The experimental results are shown in Table 9 and Fig. 2. It was confirmed that the inventive film of this example has the bioequivalence as shown in Table 9 and Fig. 2.

TABLE 9 - Pharmacokinetic test result of ondansetron film formulations

Parameter	Group 1	Group 2
AUC0~24(ng.hr/mL)	244.78± 91.83	259.64 ± 87.10
Cmax(ng/mL)	30.93± 10.71	33.16 ± 8.89
Tmax(hr)	1.86± 0.71	1.94±0.75

Note 1) Group 1 is Ondansetron film formulations

(8mg). Group 2 is Zorfran® Zydis ODTs

Example 16 to 20

As active pharmaceutical ingredients, sildenafil free base, sildenafil lactate, sildenafil citrate, granisetron, and montelukast sodium were added to prepare films having constitutional compositions shown in the following Table 10. The sensory test was randomly conducted and test results were that unpleasant aftertaste was well masked.

TABLE 10

Ingredient	Example 15 (wt.%)	Example 16 (wt.%)	Example 17 (wt.%)	Example 18 (wt.%)	Example 19 (wt.%)
Sucralose	1.7	2	2	1.5	0.5
Neotame	1	2	0		
Acesulfame potassium	0.5	0.5	1	0.5	
Rebaten 97%	2	2	2	2	0.5
Citric acid	0.2	0.2	0.2	0.6	0.6
Hydroxypropyl starch	2	2	2	3	2
Span20	0.1	0.5	0.1	0.4	0.4
Menthol	0.4	2.3	0.3	3	3
Carageenan	0.1	0.1	0.1	0.1	0.2
Pigment	0.1	0.1	0.1	0.1	0.1
Polysorbate 80	0.4	0.5	0.3	0.3	0.3
Peppermint oil	0.8	2.7	0.6	3	3
Pullulan	62.3	77.5	55.1	81.5	78.9
Microcrystalline cellulose	1.4	1.4	0.7	1.5	4
Beta cyclodextrin			0.7		
Lemon flavor	2	2	0.8	1.5	1.5
Sildenafil free base	25				
Sildenafil lactate		4.2			
Sildenafil citrate			35		
Granisetron hydrochloride				1	
Montelukast sodium					5

Total weight	100.0	100.0	100.0	100.0	100.0

Example 21

Sildenafil citrate based quickly soluble film prepared according to Example 18 of the present invention was subjected to pharmacokinetic tests in comparison with a conventional product named Viagra® tablet containing sildenafil citrate available from Pfizer Inc. The experiments is conducted for healthy eight (8) adult men and women with Latin square method based on Notice of bioequivalence test standard of the Food and Drug Administration.

The experimental results are shown in Table 11 and Fig. 3. It was confirmed that the inventive film of this example has the bioequivalence as shown in Table 11 and Fig. 3.

TABLE 11 - Pharmacokinetic test result of sildenafil citrate film formulations

Parameter	Group 1	Group 2
AUCO~24(ng.hr/mL)	711.87± 89.38	728.64 ± 87.10
Cmax(ng/mL)	255.39± 31.17	269.24 ± 88.90
Tmax(hr)	0.83± 0.42	0.81±0.35

Note 1) Group 1 is Bexcore sildenafil film formulations (25mg). Group 2 is Viagra® tablets (25mg)

Example 22

Using the Montelukast based quickly soluble film

prepared in mixed ratio according to Example 20, as well as a commercially available solid dosage form, that is, Singulair® purchased by Merck & Co., as a control formulation, respectively, oral administration to Beagle dog was conducted to compare bioavailability of the foregoing materials.

More particularly, each test specimen was given to six (6) healthy male Beagle dogs, weighing 10.20 to 12.20 kg (10.99±0.87kg), and these animals were subjected to basal breeding in separate cages for two (2) weeks before experiments. The control formulation administered to Beagle dogs was Singulair® chewable tablet (5mg, Merck & Co.), while the inventive test formulation used therein was the formulation prepared in Example 20, which is a quickly soluble film containing 5mg of Montelukast relative to 100mg of the formulation. Beagle dogs were divided into two groups, each consisting of six (6) animals, and both groups received oral administration of the foregoing control formulation and test formulation, respectively. According to any conventional method for oral drug administration, 5mg of the formulation was orally administered with water by force-feeding to each Beagle dog.

The experimental results are shown in Table 12 and Fig. 4. It was confirmed that the inventive film of this example has the bioequivalence as shown in Table 12 and Fig.

4.

TABLE 12 - Pharmacokinetic test result of montelukast film formulations

Parameter	Group 1	Group 2
AUC0~24(ng.hr/mL)	12398± 3029.7	12151.2 ± 1353.3
Cmax(ng/mL)	1010.7± 226.7	962.0 ± 73.2
Tmax(hr)	5.3± 3.3	4.0±0.0

Note 1) Group 1 is Bexcore montelukast based quickly soluble film formulations (5mg). Group 2 is Singulair® chewable tablets (5mg)

Example 23 to 27

As active pharmaceutical ingredients, Galantamine HBr, Doxazosin mesylate, Tolterodine tartrate, paroxetine hydrochloride and bambuterol hydrochloride were added to prepare films having constitutional compositions shown in the following Table 13. The sensory test was randomly conducted and test results were that unpleasant aftertaste was well masked.

TABLE 13

Ingredient	Example 23 (wt.%)	Example 24 (wt.%)	Example 25 (wt.%)	Example 26 (wt.%)	Example 27 (wt.%)
Sucralose	1.6	1.7	2	1.5	
Aspartame					2.5
Acesulfame potassium	0.6	0.5	0.7	0.5	
Rebaten 97%	2	1.9	2	2	1.5
Citric acid	0.2	0.2	0.2	0.6	0.6
Hydroxypropyl starch	2	2	2	3	2
Span20	0.1	0.5	0.1	0.4	0.4
Menthol	0.4	2.3	0.3	3	3

Carageenan	0.1	0.1	0.1	0.1	0.2
Pigment	0.1	0.1	0.1	0.1	0.1
Polysorbate 80	0.4	0.5	0.3	0.3	0.3
Peppermint oil	0.8	2.7	0.6	3	3
Pullulan	78.3	74.1	87.4	63.5	71.9
Microcrystalline cellulose	1.4	1.4	0.7	0.5	3
Lemon flavor	2	2	1.5	1.5	1.5
Galantamine HBr	10				
Doxazosin mesylate		10			
Tolterodine tartrate			2		
Paroxetine hydrochloride				20	
Bambuterol hydrochloride					10
Total weight	100.0	100.0	100.0	100.0	100.0

Example 28 to 32

As active pharmaceutical ingredients, pholcodine, butylscopolamine, fentanyl citrate, oxycodone HCl and buprenorphine HCl were added to prepare films having constitutional compositions shown in the following Table 14. The sensory test was randomly conducted and test results were that unpleasant aftertaste was well masked.

TABLE 14

Ingredient	Example 28 (wt.%)	Example 29 (wt.%)	Example 30 (wt.%)	Example 31 (wt.%)	Example 32 (wt.%)
Sucralose	1.7	1.5	2	1.5	
Aspartame					1.5
Acesulfame potassium	0.5	0.6	0.7	0.5	
Rebaten 97%	2	2	2	2	1.5
Citric acid	0.2	0.2	0.2	0.6	0.6
Hydroxypropyl starch	2	2	3.8	3	7
Span20	0.1	0.5	0.1	0.4	0.4
Menthol	0.4	2.3	0.3	3	3
Carageenan	0.1	0.1	0.1	0.1	0.2
Pigment	0.1	0.1	0.1	0.1	0.1
Polysorbate 80	0.4	0.5	0.3	0.3	0.3
Peppermint oil	0.8	2.7	1.6	3	3

Pullulan	78.3	74.1	86.4	71.5	74.9
Microcrystalline cellulose	1	1	0.4	0.5	3.5
Beta cyclodextrin	0.4	0.4	0.3	0.5	3.5
Lemon flavor	2	2	1.5	1	1.5
Pholcodine	10				
Butylscopolamine		10			
Fentanyl citrate			0.2		
Buprenorphine HCl				12	
Oxycodone HCl					5
Total weight	100.0	100.0	100.0	100.0	100.0

Example 33 to 37

As active pharmaceutical ingredients, hydromorphone HCl, escitalopram oxalate, rivastigmine tartrate, esomeprazole magnesium, and aripiprazole were added to prepare films having constitutional compositions shown in the following Table 15. The sensory test was randomly conducted and test results were that unpleasant aftertaste was well masked.

TABLE 15

Ingredient	Example 33 (wt.%)	Example 34 (wt.%)	Example 35 (wt.%)	Example 36 (wt.%)	Example 37 (wt.%)
Sucralose	1.7	1.6	2	1.5	
Aspartame					1.5
Acesulfame potassium	0.5	0.5	0.7	0.5	
Rebaten 97%	2	2	2	2	1.5
Citric acid	0.2	0.2	0.2	0.6	0.6
Hydroxypropyl starch	4	2	3.8	3	4
Span20	0.1	0.5	0.1	0.4	0.4
Menthol	0.4	2.3	0.3	3	3
Carageenan	0.1	0.1	0.1	0.1	0.2
Pigment	0.1	0.1	0.1	0.1	0.1
Polysorbate 80	0.4	0.5	0.3	0.3	0.3
Peppermint oil	0.8	2.7	0.6	3	3
Pullulan	79.3	74.1	81.6	71.5	61.9
Microcrystalline cellulose	4.4	1.4	3.7	2.5	2

Lemon flavor	2	2	1.5	1.5	1.5
hydromorphone Hcl	4				
Escitalopram oxalate		10			
Rivastigmine tartrate			3		
Aripiprazole				10	
Esomeprazole magnesium					20
Total weight	100.0	100.0	100.0	100.0	100.0

Example 38 to 42

As active pharmaceutical ingredients, zolmitriptan, rizatriptan benzoate, telmisartan, risperidone and vardenafil HCl were added to prepare films having constitutional compositions shown in the following Table 16. The sensory test was randomly conducted and test results were that unpleasant aftertaste was well masked.

TABLE 16

Ingredient	Example 38 (wt.%)	Example 39 (wt.%)	Example 40 (wt.%)	Example 41 (wt.%)	Example 42 (wt.%)
Sucralose	1.7	1.6	1	1.5	
Neotame			1		1.5
Acesulfame potassium	0.5	0.5	0.7	0.5	
Rebaten 97%	2	2	2	2	1.5
Citric acid	0.2	0.2	0.2	0.6	0.6
Hydroxypropyl starch	3	2	2.8	3	4
Span20	0.1	0.5	0.1	0.4	0.4
Menthol	0.4	2.3	0.3	3	3
Carageenan	0.1	0.1	0.1	0.1	0.2
Pigment	0.1	0.1	0.1	0.1	0.1
Polysorbate 80	0.4	0.5	0.3	0.3	0.3
Peppermint oil	0.8	2.7	0.6	3	3
Pullulan	79.3	74.1	68.6	79.5	79.4
Microcrystalline cellulose	6.9	1.4	0.7	3.5	2
Lemon flavor	2	2	1.5	1.5	1.5
Zolmitriptan	2.5				
Rizatriptan benzoate		10			
Telmisartan			20		

Risperidone				1	
Vardenafil HCl					2.5
Total weight	100.0	100.0	100.0	100.0	100.0

Example 43 to 48

As active pharmaceutical ingredients, benzocain, loratidine, phenylephrine HCl, diphenhydramine HCl, Dextromethorphan hydrobromide, and cetrizine HCl were added to prepare films having constitutional compositions shown in the following Table 17. The sensory test was randomly conducted and test results were that unpleasant aftertaste was well masked.

TABLE 17

Ingredient	Example 43 (wt.%)	Example 44 (wt.%)	Example 45 (wt.%)	Example 46 (wt.%)	Example 47 (wt.%)	Example 48 (wt.%)
Sucralose	1.7	1.6	1	1.5	1	1
Neotame					0.5	0.5
Acesulfame potassium	0.5	0.5	0.7	0.5		
Rebaten 97%	2	2	2	2	1.5	1.5
Citric acid	0.2	0.2	0.2	0.6	0.6	0.6
Hydroxypropyl starch	5	2	5	3	4	4
Span20	0.1	0.5	0.1	0.4	0.4	0.4
Menthol	0.4	1.3	0.3	3	3	3
Carageenan	0.1	0.1	0.1	0.1	0.2	0.2
Pigment	0.1	0.1	0.1	0.1	0.1	
Polysorbate 80	0.4	0.5	0.3	0.3	0.3	0.3
Peppermint oil	0.8	2.7	0.6	3	3	3
Pullulan	79.3	75.1	78.6	79.5	79.4	72
Microcrystalline cellulose	4.4	1.4	4.5	2	2	2
Lemon flavor	2	2	1.5	1.5	1.5	1.5
Benzocain	3					
Loratadine		10				
Phenylephrine HCl			5			
Diphenhydramine HCl				2.5		
Dextromethorphan hydrobromide					2.5	
Cetrizine HCl						10
Total weight	100.0	100.0	100.0	100.0	100.0	100.0

[Industrial Applicability]

In terms of dose acceptability, the inventive oral film dosage exhibited more excellent effects of masking a nasty taste. As is apparent from the foregoing description, the quickly soluble oral film dosage according to the present invention has advantages of efficiently masking a nasty taste, and being easily produced by simple processes at low cost. Therefore, the inventive oral film dosage may be effectively used in various applications such as an oral cleanser, a bad breath remover, a carrier for nutrient supplementary agent, and a tongue soluble formulation enabling absorption of drugs in the oral cavity as well as the stomach and bowels, and so forth.

While the present invention has been described with reference to exemplary embodiments, it will be understood by those skilled in the art that various modifications and variations may be made therein without departing from the scope of the present invention as defined by the appended claims.

[Claims]

1. A quickly soluble oral film dosage, comprising:

at least one water-soluble polymer; at least one active pharmaceutical ingredient; a stevioside based sweetener as an aftertaste enhancer; and at least one primary sweetening

agent as a taste masking agent.

2. The oral film dosage according to claim 1, wherein the stevioside based sweetener includes at least one selected from a group consisting of stevioside, enzyme degradable stevioside, rebaudioside A and products containing them with high contents.

3. The oral film dosage according to claim 1, wherein the primary sweetening agent is at least one selected from a group consisting of aspartame, acesulfame salts, neotame, sucralose, thaumatine, saccharine, licorice extract, neohesperidin and moneyline.

4. The oral film dosage according to claim 1, wherein the film contains 0.1 to 10wt.% of the stevioside based sweetener and the primary sweetening agent, respectively, relative to the total weight of the quickly soluble film and wherein the stevioside based sweetener and the primary sweetening agent are contained in a relative ratio by weight (w/w) of 1:3 to 3:1.

5. The oral film dosage according to claim 1, wherein the water-soluble polymer is at least one selected from a group consisting of pullulan, gelatin, pectin, low viscosity

pectin, hydroxypropylmethyl cellulose, low viscosity hydroxylpropylmethyl cellulose, hydroxyethyl cellulose, hydroxypropyl cellulose, carboxymethyl cellulose, polyvinylalcohol, polyacrylic acid, methyl methacrylate copolymer, carboxyvinyl polymer, polyethyleneglycol, alginic acid, low viscosity alginic acid, sodium alginate, modified starch, casein, whey protein extract, soy protein extract, zein, levan, elsinan, gluten, acacia gum, carageenan, Arabic gum, guar gum, locust bean gum, xanthan gum, gellan gum and agar.

6. The oral film dosage according to claim 5, wherein the water soluble polymer is at least one selected from a group consisting of pullulan, gelatin, low viscosity pectin, low viscosity alginic acid and low viscosity hydroxylpropylmethyl cellulose.

7. The oral film dosage according to claim 1, wherein the active pharmaceutical ingredient is at least one selected from a group consisting of diabetic remedy; insomnia remedy; genito-urinary remedy; obesity remedy; enzyme; gastric ulcer remedy; cough remedy and expectorant; dermal disorder

remedy; antinausea drug; antidepression drug; antihistamine drug; antipyretic, analgesic and antiphlogistic remedy; hormone drug; circulatory organ remedy; gastrointestinal remedy; psychoneurotic drug; impotency remedy; osteoporosis remedy; arthritis remedy; epilepsy remedy; muscle relaxing agent; cerebral function enhancer; schizophrenia remedy; immuno-suppression agent; antibiotic agent; anticancer agent; Supportives in tumor therapy; vaccine; oral cleanser; anemia remedy; constipation remedy; vitamin; nutrient; probiotic preparation; multi-symptom cold/flue medications; and health functional foods.

8. The oral film dosage according to claim 7, wherein the active pharmaceutical ingredient is at least one selected from a group consisting of triclosan, cetylpyridium chloride, domiphen bromide, quaternary ammonium salt, zinc compounds, sanguinarine, fluoride, alexidine, octenidine, EDTA, aspirin, acetaminophen, ibuprofen, ketoprofen, diflunisal, fenoprofen calcium, naproxen, tolmetin sodium,

indomethacin, benzonatate, caramiphen, edisylate, menthol, dextromethorphan hydrobromide, chlophedianol hydrochloride, diphenhydramine, pseudoephedrine hydrochloride, phenylephrine, phenylpropanolamine, pseudoephedrine sulfate, bromophenylamine maleate, chlorophenylamine maleate, carbinoxamine maleate, clemastine fumarate, dexchlorpheniramine maleate, diphenhydramine hydrochloride, diphenhydramine citrate, diphenylpyraline hydrochloride, doxylamine succinate, promethazine hydrochloride, pyrilamine maleate, tripelennamine citrate, triprolidine hydrochloride, acrivastine, loratadine, brompheniramine, dexbrompheniramine, guaifenesin, ipecac, calcium iodide, terpine hydrate, loperamide, famotidine, ranitidine, omeprazole, lansoprazole, aliphatic alcohol, nicotine, caffeine, strychnine, picrotoxin, pentylenetetrazol, phenylhydantoin, phenobarbital, primidone, carbamazepine, ethosuximide, methosuximide, phensuximide, trimethadione, diazepam, benzodiazepine, phenacemide, pheneturide, acetazolamide and sulthiame, bromide levodopa, amantadine, morphine, heroin, hydromorphone, methophone, oxymorphone, levorphanol, codeine, hydrocodone, xycodone, nalorphine, naloxone, naltrexone, salicylate, phenylbutazone, indomethacin, phenacetin, chloropromazine, methotrimeprazine, haloperidol, clozapine, reserpine, imipramine, tranylcypromine, phenelzine, lithium, apomorphine, sildenafil, tadalafil, vardenafil, ondansetron,

donepezil, zolpidem tartrate, granisetron, montelukast, pholcodine, butylscopolamine, fentanyl citrate, oxycodone hydrochloride, buprenorphine hydrochloride, escitalopram oxalate, rivastigmine tartrate, esomeprazole magnesium, aripiprazole, zolmitriptan, rizatriptan benzoate, telmisartan, risperidone, benzocaine, cetirizine hydrochloride, bambuterol hydrochloride, galantamine hydrobromide, lercanidipine hydrochloride, paroxetine hydrochloride, meloxicam, tolterodine tartrate, doxazosin mesylate, and pharmaceutically available salts thereof.

9. The oral film dosage according to claim 8, wherein one of the ondansetron salts is an ondansetron hydrochloride, and a quickly soluble film including the ondansetron hydrochloride as the active pharmaceutical ingredient has bioequivalence.

10. The oral film dosage according to claim 8, wherein one of the montelukast salts is a montelukast sodium, and a quickly soluble film including the montelukast sodium as the active pharmaceutical ingredient has bioequivalence.

11. The oral film dosage according to claim 8, wherein one of the sildenafil salts is a sildenafil citrate, and a quickly soluble film including the sildenafil citrate as the

active pharmaceutical ingredient has bioequivalence.

12. The oral film dosage according to claim 1, wherein the quickly soluble film further comprises at least one of additives.

13. The oral film dosage according to claim 12, wherein the additives comprise at least one selected from a group consisting of a filler, a plasticizer, a secondary sweetening agent, an acidic agent, a flavor, an emulsifier, a pigment and a cooling agent.

14. The oral film dosage according to claim 13, wherein the filler is at least one selected from a group consisting of microcrystalline cellulose, cellulose polymer, magnesium carbonate, calcium carbonate, limestone powder, silicate, clay, talc, titanium dioxide and calcium phosphate.

15. The oral film dosage according to claim 13, wherein the plasticizer is at least one selected from a group consisting of sorbitol, maltitol, xylitol, glycerin, polyethyleneglycol, propyleneglycol, hydrogenated starch syrup, starch syrup, triacetin, glycerol oleate, sucrose fatty acid ester and double chain fatty acid.

16. The oral film dosage according to claim 13, wherein the secondary sweetening agent is at least one selected from a group consisting of sugar, glucose, maltose, oligosaccharides dextrin, alpha cyclodextrin, beta cyclodextrin, gamma cyclodextrin, hydroxypropy beta cyclodextrin, methyle beta cyclodextrin, cluster dextrin, indigestible dextrin, hydrogenated indigestible dextrin, invert sugar, fructose, lactose, galactose, starch syrup, sorbitol, maltitol, xylitol, erythritol, hydrogenated starch syrup, mannitol and trehalose.

17. The oral film dosage according to claim 13, wherein the acidic agent is at least one selected from a group consisting of citric acid, malic acid, fumaric acid, tartaric acid, ascorbic acid, succinic acid, adipic acid and lactic acid.

18. The oral film dosage according to claim 13, wherein the flavor is a natural flavor, an artificial flavor or a mixture thereof.

19. The oral film dosage according to claim 13, wherein the emulsifier is at least one selected from a group consisting of glycerin fatty acid ester, sucrose fatty acid ester, lecithin, enzyme treated lecithin, polysorbate,

sorbitan fatty acid ester and propyleneglycol.