The inner coat of the drug delivery system is additionally surrounded by an outer coat that contains additional amounts of a desired ingredient. When the delivery device enters the gastrointestinal tract, the outer coat releases the desired ingredient contained therein and disintegrates, exposing the inner coat. By controlling parameters in the device, such as the core material, carrier material in the coating, and particulate matter, the location of release of both drug pulses can be controlled.

The afore mentioned drug delivery systems, while effective in delaying release of a drug to specific parts of the gastrointestinal tract such as, for example, the small intestine or the colon, were found to be ineffective in providing a drug in a short pulse after a certain period of time, irrespective of the presence in a specific body compartment.

There is a clear need for a drug delivery system that releases a drug after a predetermined period of time (a lag time) following administration of the drug delivery system. In addition, there is a need for a drug delivery device that combines a drug delivery system that is effective in delivering a drug in a short pulse after a predetermined period of time with a drug delivery system that provides immediate release of a drug at an earlier point in time after administration, preferably in the oral cavity.

Therefore, disclosed is a time controlled, immediate release drug delivery system for oral administration of a therapeutically effective amount of a first active ingredient to a subject in need thereof, comprising a disintegrating core comprising cellulose, a filler selected from an organic and/or an inorganic salt, and a first active ingredient, said system further comprising a first coating surrounding the core, said first coating comprising

an outer surface, said first coating further comprising a hydrophobic polymer and a water-soluble and/or water-insoluble hydrophilic substance.

A core according to the disclosure comprises

a first active ingredient in a relative amount of preferably between 0.1 and 60% (w/w; based on the total weight of the core), more preferred between 0.1 and 30 % (w/w; based on the total weight of the core), more preferred between 5 and 25 % (w/w based on the total weight of the core),

cellulose in a relative amount of preferably between 10 and 60% (w/w based on the total weight of the core), more preferred between 10 and 50 % (w/w based on the total weight of the core (w/w based on the total weight of the core), and

a filler selected from an organic and/or inorganic salt in a relative amount of preferably between 10 and 70% (w/w based on the total weight of the core), more preferred in an amount of between 10 and 60 % (w/w based on the total weight of the core).

In a first aspect, there is provided a tablet for sublingual administration of an active ingredient said tablet comprising a core and a coating (outer coating) on the exterior surface of said core and optionally a coating that separates said outer coating from said core (separation coating), wherein said outer coating comprises a mixture of

- an active ingredient in amorphous form in an amount of between about 0.1 – 10 mg;
- a coating polymer in an amount of between about 0.25 – 25 mg; and
- water in an amount of between about 0.0 – 10% w/w of the outer coating.

In another aspect, there is provided the tablet as described herein for use as a medicament.

In another aspect, there is provided the tablet as described herein for use in the treatment of male or female sexual dysfunction, desire dysfunction, or erectile dysfunction, preferably for use in the treatment of Hypoactive Sexual Desire Disorder.

In another aspect, there is provided use of the tablet as described herein in the manufacture of a medicament for the treatment of male or female sexual dysfunction, desire dysfunction, or erectile dysfunction, preferably for the treatment of Hypoactive Sexual Desire Disorder.

Throughout this specification, the term "comprising" and its grammatical equivalents indicate that the components listed are present and that other components may be present or not. The term "comprising" preferably has the meaning of "consisting only of".

The core is preferably pressed or compacted into a solid. A preferred core is a tablet. The term "tablet" encompasses a "capsule" and a "caplet". The preferred size of the core of a drug delivery system according to the invention ranges from a few millimeters to about one centimeter. Further excipients may include diluents, binders or granulating ingredients, a carbohydrate such as starch, a starch derivative such as starch acetate and/or maltodextrin, a polyol such as xylitol, sorbitol and/or mannitol, lactose such as α-lactose

Claims

1. A tablet for sublingual administration of an active ingredient said tablet comprising a core and a coating (outer coating) on the exterior surface of said core and optionally a coating that separates said outer coating from said core (separation coating), wherein said outer coating comprises a mixture of

- an active ingredient in amorphous form in an amount of between about 0.1 – 10 mg;
- a coating polymer in an amount of between about 0.25 – 25 mg; and
- water in an amount of between about 0.0 – 10% w/w of the outer coating.

2. The tablet according to claim 1, wherein said mixture comprises said active ingredient in an amount of between about 0.2 – 5,0 mg; said coating polymer in an amount of between about 0.5 – 12,5 mg; and water in an amount of between about 0.0 – 5% w/w of the outer coating.

3. The tablet according to claim 1, wherein said mixture further comprises a cyclodextrin or a polyvinylpyrolidone, or a combination thereof in an amount of between 0.25 – 25 mg.

4. The tablet according to claim 2, wherein said mixture further comprises a cyclodextrin or a polyvinylpyrolidone, or a combination thereof in an amount of between 0.5 – 12,5 mg.

5. The tablet according to any one of claims 1-4, comprising a separation coating that separates said outer coating from said core.

6. The tablet according to any one of claims 1-5, wherein said core and said optional separation coating has a volume of between 50 – 1000 mm3.

7. The tablet according to any one of claims 1-6, wherein said core comprises a cellulose, an inorganic salt and a second active ingredient.

8. The tablet according to any one of claims 1-7, wherein said separation coating comprises a hydrophobic polymer and a hydrophilic substance.

9. The tablet according to any one of claims 1-8, wherein said mixture of said outer coating further comprises a sweetener and/or a flavor.

10. The tablet according to any one of claims 1-9, wherein said separation coating is a pH-independent coating.

11. The tablet according to any one of claims 1-9, wherein said separation coating is a pH-dependent coating, preferably an acid soluble coating or an enteric coating.

12. The tablet according to any one of claims 1-11, wherein said active ingredient in amorphous form is testosterone or a functional analogue thereof.

13. The tablet according to any one of claims 1-12, wherein said core comprises 10-60% (w/w) microcrystalline cellulose, 20-70% (w/w) of an inorganic salt as a filler, and 0.1- 30 % (w/w) of an active ingredient selected from the group consisting of a PDE5 inhibitor, a 5HT1a receptor agonist, and a neutral endopeptidase inhibitor.

14. The tablet according to claim 13, wherein the inorganic salt is anhydrous dibasic calcium phosphate or calcium sulphate dihydrate.

15. The tablet according to any one of claims 1-14 for use as a medicament.

16. The tablet according to any one of claims 1-14, for use in the treatment of male or female sexual dysfunction, desire dysfunction, or erectile dysfunction, preferably for use in the treatment of Hypoactive Sexual Desire Disorder.

17. Use of the tablet according to any one of claims 1-14 in the manufacture of a medicament for the treatment of male or female sexual dysfunction, desire dysfunction, or erectile dysfunction, preferably for the treatment of Hypoactive Sexual Desire Disorder.