the stem is separated from the leaves, as shown in Fig. 11 and Fig. 12, the leaves 28 do not greatly spread, and a leaf stalk 28a extends long. As shown in Fig. 11 and Fig. 13, the stem 26 extends long as a whole. Since the leaves 28 of the leaf lettuce are mainly eaten, so that when the stem 26 extends long, the commercial value of the leaf lettuce may be degraded.

[0006] The present invention is made considering the above-described conventional problem, and provides a method for raising leaf-and-stem vegetables, which is capable of reducing production cost and producing the leaf-and-stem vegetables of a high commercial value by efficiently irradiating the leaf-and-stem vegetables with light suitable for the growth thereof, and a light source device for raising the leaf-and-stem vegetables, which is used in the above method for raising leaf-and-stem vegetables.

[Solution to Problem]

[0007] In order to solve the above-described problem, the method for raising leaf-and-stem vegetables by irradiating the same with light according to the invention of claim 1 includes the step of providing a stem growth-inhibiting period when a stem growth-inhibiting light source irradiates tops of the stems with only light having a blue component light at high ratio, which inhibits the growth of stems and at the same time a leaf growth-accelerating light source device irradiates leaves with light having a red component light at high ratio, which accelerates the growth of the leaves, ~~at least~~ during an initial growth period when the stems and the leaves become distinguishable from each other.

[0008] The method for raising leaf-and-stem vegetables according to the invention of claim 2 is characterized in that in the feature of the above invention described in claim 1, ~~further including the step for a leaf growth-accelerating light source to irradiate the leaves of the leaf-and-stem vegetables with light having a red component light at high ratio, which accelerates the growth of the leaves, in the stem growth-inhibiting period~~the initial growth period is preferably from the third day to the tenth day after seeding.

[0009] The method for raising leaf-and-stem vegetables according to the

invention of claim 3 is characterized in that in the feature of the above invention described in claim 1 or 2, the leaf-and-stem vegetables are selected among head-non-forming lettuces, Brassica campestris, pak-choi and Spinach.

[0010] The method for raising leaf-and-stem vegetables according to the invention of claim 4 is characterized in that in the feature of any one of the above inventions described in claim 1 to claim 3, the stem growth-inhibiting light source is composed of LEDs or organic ELs.

[0011] The light source device for raising leaf-and-stem vegetables, which is adapted to irradiate the leaf-and-stem vegetables with light to raise the same according to the invention of claim 5 includes a stem growth-inhibiting light source device ~~for irradiating the~~ provided at an area facing to the stems of the leaf-and-stem vegetables ~~with~~ for irradiating tops of the stems with only a stem growth-inhibiting light having a blue component light at high ratio, which inhibits the growth of stems, during an initial growth period when the stems and leaves become distinguishable from each other and a leaf growth-accelerating light source device ~~for irradiating the~~provided at an area facing to the leaves of the leaf-and-stem vegetables ~~with a~~ for irradiating the leaves with a leaf growth-accelerating light having a red component light at high ratio, which accelerate growth of leaves, during the initial growth period.

[Advantageous Effects of Invention]

[0012] According to the invention of claim 1, there is provided the stem growth-inhibiting period when the stem growth-inhibiting light source irradiates tops of the stems in which there are plant growing points with only light having the blue component light at high ratio, which inhibits the growth of stems ~~at least~~ and at the same time a leaf growth-accelerating light source device irradiates leaves with light having a red component light at high ratio, which accelerates the growth of the leaves during an initial growth period when the stems and leaves become distinguishable from each other. ~~Therefore~~Since only the light having the blue component light at high ratio, which inhibits the growth of stems is irradiated from the stem growth-inhibiting light source, the growth of the stems that are scarcely used for food is inhibited, whereas nutrients used for growth are taken into the whole leaves and accordingly the growth of the leaves are accelerated~~, thereby accelerating the growth of the leaves~~. As a result, the leaf-and-stem vegetables are enhanced in appearance as vegetables,

thereby improving the commercial value thereof. Further, the leaf growth-accelerating light source device irradiates the leaves with the light having the red component light at high ratio, which accelerates the growth of leaves. Therefore, the growth of the leaves used for food is accelerated, whereby the leaf-and-stem vegetables of an increased commercial value as ingredients can be raised, and the harvested amount thereof can be increased.

[0013] According to the invention of claim 2, ~~the leaf growth-accelerating light source irradiates the leaves with the light having the red component light at high ratio, which accelerates the growth of leaves, in the stem growth-inhibiting period~~ the initial growth period is preferably from the third day to the tenth day after seeding. Therefore, the growth of the leaves used for food is accelerated, whereby the leaf-and-stem vegetables of an increased commercial value as ingredients can be raised, and the harvested amount thereof can be increased.

[0014] According to the invention of claim 3, the leaf-and-stem vegetables are selected among head-non-forming lettuces, brassica campestris, pak-choi and spinach, and mainly the leaves thereof are used for food, so that the commercial value of these leaf-and-stem vegetables can be improved.

[0015] According to the invention of claim 4, the stem growth-inhibiting light source is composed of LEDs or organic ELs so that the power consumption is small to save energy, and the durable life as the light source is long, thereby it is possible to decrease the running cost. In addition, the LEDs can be readily adjusted in the wavelength of light emitted therefrom to produce monochromatic lights. With regard to the organic ELs, heat generated from light sources is small to prevent damages to the leaves due to heat.

[0016] According to the invention of claim 5, the light source device for raising leaf-and-stem vegetables includes ~~the~~ a stem growth-inhibiting light source device ~~for irradiating the~~ provided at an area facing to the stems of the leaf-and-stem vegetables ~~with the~~ for irradiating tops of the stems with only a stem growth-inhibiting light having the blue component light at high ratio, which ~~adapted to~~ inhibits the growth of stems, during an initial growth period when the stems and leaves become distinguishable from each other; and ~~the~~ a leaf growth-accelerating light source device ~~for irradiating the~~ provided at an area facing to the leaves of the leaf-and-stem vegetables ~~with the~~ for irradiating the leaves with a leaf growth-accelerating light having ~~the~~ a red component light at high ratio, which ~~adapted to~~ accelerates the growth of leaves, during the initial growth period. ~~and a~~Accordingly, the

stem growth-inhibiting light source can irradiate tops of the stems with only a light having a blue component light at high ratio adapted to inhibit the growth of the stems, whereas the leaf growth-accelerating light source can irradiate the leaves with light having a red component light at high ratio adapted to accelerate the leaves.

[Brief Description of Drawings]

[0017] [Fig. 1] is a view showing a leaf-and-stem vegetables-raising system in which a method for raising the leaf-and-stem vegetables in accordance with the present invention is applied to the raising of leaf lettuces.

[Fig. 2] is an enlarged view showing a part of a light source device for raising the leaf-and-stem vegetables.

[Fig. 3] is a bottom view showing the arrangement of light emission bodies of the light source device for raising the leaf-and-stem vegetables.

[Fig. 4] is a view showing the irradiation condition of the light source device for raising the leaf-and-stem vegetables irradiating a top of a plant body with a light during an initial growth period.

[Fig. 5] is a view showing the irradiation condition of a light irradiated from the light source device for raising the leaf-and-stem vegetables on a top of a plant body during a middle growth period.

[Fig. 6] is a view showing the irradiation condition of a light irradiated from the light source device for raising the leaf-and-stem vegetables on a top of a plant body during a late growth period.

[Fig. 7] is a photograph showing the state in which a leaf lettuce after grown according to the present embodiment is divided into leaves and a stem.

[Fig. 8] is a view showing a leaf after grown according to the present embodiment.

[Claims]

[Claim 1] A method for raising leaf-and-stem vegetables by irradiating the same with light, the method comprising the step of providing a stem growth-inhibiting period when a stem growth-inhibiting light source irradiates tops of the stems with only light having a blue component light at high ratio, which inhibits the growth of stems and at the same time a leaf growth-accelerating light source device irradiates leaves with light having a red component light at high ratio, which accelerates the growth of the leaves, ~~at least~~ during an initial growth period when the stems and the leaves become distinguishable from each other.

[Claim 2] The method for raising leaf-and-stem vegetables according to claim 1, ~~further comprising the step for a leaf growth-accelerating light source to irradiate the leaves of the leaf-and-stem vegetables with light having a red component light at high ratio, which accelerates the growth of the leaves, in the stem growth-inhibiting period~~ wherein the initial growth period is a period from a third day to a tenth day after seeding.

[Claim 3] The method for raising leaf-and-stem vegetables according to claim 1 or claim 2, wherein the leaf-and-stem vegetables are selected among head-non-forming lettuces, brassica campestris, pak-choi and spinach.

[Claim 4] The method for raising leaf-and-stem vegetables according to any one of claim 1 to claim 3, wherein the stem growth-inhibiting light source is composed of LEDs or organic ELs.

[Claim 5] A light source device for raising leaf-and-stem vegetables, which is adapted to irradiate the leaf-and- stem vegetables with light to raise the same, comprising:

a stem growth-inhibiting light source device ~~for irradiating the~~ provided at an area facing to the stems of the leaf-and-stem vegetables ~~with~~ for irradiating tops of the stems with only a stem growth-inhibiting light having a blue component light at high ratio, which inhibits the growth of stems, during an initial growth period when the stems and leaves become distinguishable from each other; and

a leaf growth-accelerating light source device ~~for irradiating the~~ provided at an area facing to the leaves of the leaf-and-stem vegetables ~~with a~~ for irradiating the leaves with a leaf growth-accelerating

light having a red component light at high ratio, which accelerates the growth of leaves, during the initial growth period.