

DEVICE AND METHOD FOR CLEANING AND PROCESSING NATURAL EXTRACTS

FIELD OF THE INVENTION

The present invention relates to a device and method for cleaning and processing natural extracts. The device is particularly suitable, but not limited to cleaning and processing edible swiftlet nests, also colloquially known as "birds' nests", and will be described in this particular context.

BACKGROUND TO THE INVENTION

The following discussion of the background of the invention is intended to facilitate an understanding of the present invention. However, it should be appreciated that the discussion is not an acknowledgement or admission that any of the material referred to was published, known or part of the common general knowledge in any jurisdiction as at the priority date of the application.

Currently, edible swiftlet nest are cleaned by soaking the raw swiftlet nest in water for a predetermined period of time so as to separate or detach impurities such as swiftlet feathers, fragments of egg shells, sand etc. from the nest.

After soaking for the predetermined period of time, the detached impurities are picked up or pinched using a device, such as a pair of tweezers. The remaining swiftlet nest is then further processed (dried etc.).

Soaking the swiftlet nest in water however results in wastage of valuable portions of the swiftlet nest and typically low yield of edible swiftlet nests. This is because the useful/valuable part of swiftlet nest is essentially made up of collagen material which dissolves when soaked in water over an extended period of time.

In addition, the cleaning process described above is labour intensive as little or no automation is involved which affects productivity. The quality and cleanliness of the remaining swiftlet nest is also dependent on the skill and experience of the worker concerned. Soaking and picking the wanted portions of the swiftlet nest involve the

use of different pieces of equipment. There therefore exists an inherent need to achieve a more efficient method of swiftlet nest cleaning process so as to increase the productivity and efficiency of each labourer as well as the yield, quality and cleanliness of the swiftlet nests.

It is an object of the present invention to overcome, or at least alleviate one or more of the aforementioned problems.

SUMMARY OF THE INVENTION

In accordance with a first aspect of the present invention there is a device for cleaning and processing natural extracts comprising a tweezers formed using two hollow rods; each hollow rod comprising a first end portion and a second end portion;

Wherein each first end portion is bent at an angle with respect to the longitudinal axis of the respective hollow rod such that in use the first end portions move towards each other to contact the natural extract; and each second end portion is operable to be connected to a cleaning solution source; a vacuum suction source; or an air blower.

Preferably, for processing raw swiftlet nest, one of the second end portion is adapted to be operably connected to a water source and the other of the second end portion is adapted to be operably connected to a vacuum suction source. In such instance, preferably, the preferred pressure from the water dispenser is set at 2 bar and the vacuum pressure (negative pressure) from the vacuum suction source is set at -85 kPa.

Preferably, the hollow rods are made of stainless steel.

Preferably, the device is operably coupled with a base machine, the base machine comprises a work table, a cleaning solution source; a vacuum suction source; and an air blower.

Preferably, the device comprises grips affixed to a portion near the central region of each hollow rod.

In accordance with a second aspect of the present invention there is a method for cleaning and processing swiftlet nest comprising connecting the device of the first aspect to a water source and a vacuum suction source;

moving the first end portions of the tweezer towards each other until each first end portion contact the target region of the swiftlet nest;

wherein upon contact, water flows out from one of the first end portion to soften the swiftlet nest to loosen the bond between the swiftlet nest and any impurities, while the vacuum suction via the other first end portion sucks/extracts the impurities which have been loosened.

BRIEF DESCRIPTION OF THE DRAWINGS

The following invention will be described with reference to the following drawings of which:

Fig. 1 is a perspective view of the device for cleaning and processing natural extract in accordance with an embodiment of the invention;

Fig. 2 is a side view of the device for cleaning and processing natural extract in accordance with an embodiment of the invention;

Fig. 3 is an end view of the device for cleaning and processing natural extract in accordance with an embodiment of the invention;

Fig. 4 is a perspective view of the base machine for use with the device for cleaning and processing natural extract in accordance with an embodiment of the invention;

Fig. 5 is a front perspective view of the base machine for use with the device for cleaning and processing natural extract in accordance with an embodiment of the invention;

Fig. 6 is a side perspective view of the base machine for use with the device for cleaning and processing natural extract in accordance with an embodiment of the invention; and

Fig. 7 is a back perspective view of the base machine for use with the device for cleaning and processing natural extract in accordance with an embodiment of the invention.

Other arrangements of the invention are possible and, consequently, the accompanying drawings are not to be understood as superseding the generality of the preceding description of the invention.

DETAILED DESCRIPTION OF THE INVENTION

It is to be appreciated that 'natural extracts' in the context of the invention may refer to any natural occurring products extracted from its natural habitat with impurities and/or dirt such as, but not limited to roots (carrots, sweet potatoes, ginseng), swiftlet nests, etc.

In accordance with an embodiment of the invention and as shown in Fig. 1 to 3 there is a device for cleaning and processing natural extracts, particularly suited for natural extracts such as swiftlet nests.

The device comprises a pair of tweezers 12 formed using two hollow rods 14. Each hollow rod 14 comprises a first end portion 16 and a second end portion 18.

Each hollow rod 14 is preferably made of a metal such as stainless steel as it is durable, hard and does not rust or corrode easily.

Each first end portion 16 is bent at an angle with respect to the longitudinal axis of the respective hollow rod 14. The extent to which the first end portion 16 is bent must maintain the hollowness of the hollow rods 14, that is, the angle should not exceed a certain predetermined angle such that the hollowness of the rod 14 is compromised.

Each second end portion 18 is adapted to operably attach to one of the following:-

a water/cleaning solution source 20;

a vacuum suction source 22; or

an air blower (air pressure outflow).

End portion 18 may be operably attached to the source 20, 22, or air blower via rubber or PVC tubes.

To form the pair of tweezers 12, biasing means 26 is disposed between the two hollow rods 14. In this preferred embodiment, biasing means 26 may be a y-shaped or v-shaped metal piece. One side of the v-shaped biasing means 26 is attached to one of the hollow rods 14 while the other side of the v-shaped biasing means 26 is attached to the other hollow rod 14, in a way where the converging end of the v-shaped biasing means 26 faces the second end portion 18 while the diverging ends of the biasing means 26 faces the first end portion 16.

For ease of usage by a user, grips 28 may be affixed to a convenient portion near the central region of each hollow rod 14.

In the embodiment, the v-shaped biasing means 26 may be attached to the hollow rods 14 via the grips 28.

When pressure is applied to the formed tweezers 12 via pressing the grips 28 towards each other, the edge of first end portion 16 of each hollow rod 14 contacts and faces each other forming a 'closed' loop position with minimal gap between the contacted surface 30.

When pressure is removed, biasing means 26 act to move the first end portion 16 of a hollow rod 14 away from the first end portion 16 of the other hollow rod 14.

In use, the device may be coupled with an apparatus 40. Fig. 3 to 7 shows a preferred apparatus 40 in the form of a base machine for use with the tweezers 12.

Base machine 40 comprises a work table 42, a water/cleaning solution source 20; a vacuum suction source 22; and an air blower (air pressure outflow). Base machine 40 may further comprise at least one lamp for illumination in operation; three flow control valves for regulating the water/cleaning solution source 20; ventilation fan grill operable to cool the base machine 40; solenoid valve operable to shut off,

release, dose, distribute the water/cleaning solution and air pressure. Base machine 40 is suited to receive electrical input from an AC electrical source.

Base machine 40 may comprise an additional DC power outlet for connection with an existing brush instrument for cleaning and wiping off dirt and other impurities on the swiftlet nest.

Work table 42 comprises a tray 44 for containing the swiftlet nest while cleaning and processing takes place. Sources 20, 22 and air blower may be integrated as container packs on the base machine 40.

Base machine 40 may further comprise other elements such as indicator panel 50 which provides to a user indications on the level of air pressure, strength of vacuum suction, rate of water dispensed etc.

Indicator panel 50 further comprises switches for activating the main power; lamp; brush; a float switch for regulating the water/cleaning solution source 20; switches for activating and regulating the vacuum suction source 22; ventilation fan etc.

Indicator panel 50 also provide users means for monitoring water pressure, air pressure and vacuum pressure (negative pressure) in the form of respective gauges.

A lock panel may be added to the indicator panel 50 to prevent unauthorized tempering of the indicator panel 50.

The device will next be described in the context of cleaning and processing swiftlet nest.

A user or trained technician connects one of the second end portion 18 of the tweezers 12 to a water dispenser 20 and the other second end portion 18 to a vacuum suction source 22 via rubber/PVC tubings. The user next switches on the water dispenser 20 and the vacuum suction source 22 and tune it to the desired settings. For effective workings, the preferred water pressure from water dispenser 20 is preferably set at 2 bar and the vacuum pressure (negative pressure) from the vacuum suction source 22 at -85 kPa. Air pressure (if required for other applications) is set at 2.5 bar.

Next, the user moves the tweezers 12 to a target region of the raw swiftlet nest (already in the tray 44) and applies pressure to the grips 28. As the grips 28 is pressed, the tweezers 12 move to the closed position, with the first end portions 16 moving towards each other, each first end portion 16 contacting the target region of the raw swiftlet nest.

Upon contact, water which flows out from one of the first end portion 16 acts to soften the swiftlet nest to loosen the bond between the nest and any impurities, while the vacuum suction via the other first end portion 16 sucks/extracts the impurities which have been loosened.

Water flowing to the tray 44 is quickly drained to prevent any build-up of water which may soak the swiftlet nest and causes collagen to dissolve.

To avoid any loose/broken swiftlet nests from being drained away, mesh filter (not shown) may be fitted at the drainage opening; the mesh filter operable to allow water to pass through but retaining the loose/broken swiftlet nests.

The above process is repeated as many times as desired at different target regions of the raw swiftlet nest until the impurities are extracted.

It is to be appreciated that depending on the application, the device 10 may be adapted for different combinations as follows:-

Combination 1 (for raw swiftlet nest purpose):

First hollow rod 14 - To channel water/liquid

Second hollow rod 14 - To channel vacuum suction

Combination 2 (for full washing/soaking applications):

First hollow rod 14 - To channel water/liquid

Second hollow rod 14 - To channel water/liquid

Combination 3 (for full vacuum applications):

First hollow rod 14 - To channel vacuum suction

Second hollow rod 14 - To channel vacuum suction

Combination 4 (for blow dry, air cleaning applications):

First hollow rod 14 - To channel air pressure outflow

Second hollow rod 14 - To channel air pressure outflow

Combination 5:

First hollow rod 14 - To channel water/liquid

Second hollow rod 14 - To channel air pressure outflow

Combination 6:

First hollow rod 14 - To channel vacuum suction

Second hollow rod 14 - To channel air pressure outflow

The advantages of the device are as follows:-

In the prior art, the tweezers require pull and release method to remove impurities while vacuum tweezers uses press and release method and thus the device 10 achieves a relative ease of use. Further, the targeted application of water and vacuum suction ensures that impurities are then isolated from the swiftlet nest almost immediately and does not require the nest to be completely soggy before any cleaning process takes place. This prevents unnecessary loss of collagen and increases yield, quality and cleanliness of swiftlet nests.

Further, the use of the vacuum suction and water provided by each hollow rod 14 prevents impurities built up at the first end portions 16 of the tweezers 12. Therefore, the tweezers 12 may be used for a longer period of time as compared to the prior art device which needs to be cleaned/washed after every two to three pickings.

It is also appreciated that the 'press and release' method of cleaning the swiftlet nests using the current inventive device makes the user's job easier as it reduces the need to pluck' or 'pinch' the impurities from the swiftlet nest due to the vacuum suction contact via hollow rod 14.

While particular embodiments of the present invention have been herein described, it would be obvious to those skilled in the art that various changes and modifications can be made without departing from the spirit and scope of the invention

CLAIMS

1. A device for cleaning and processing natural extracts comprising

a tweezers formed using two hollow rods; each hollow rod comprising a first end portion and a second end portion;

wherein each first end portion is bent at an angle with respect to the longitudinal axis of the respective hollow rod such that in use the first end portions move towards each other to contact the natural extract; and each second end portion is operable to be connected to a cleaning solution source; a vacuum suction source; or an air blower.
2. The device according to claim 1, wherein one of the second end portions is adapted to be operably connected to a water source and the other of the second end portions is adapted to be operably connected to a vacuum suction source.
3. The device according to claim 1 or 2, wherein water flows out from one of the first end portion to soften the natural extract.
4. The device according to claim 3, wherein the bond between the natural extract and any impurities is loosened.
5. The device according to claim 4, wherein vacuum suction on the other first end portion sucks/extracts the impurities which have been loosened.
6. The device according to any of the preceding claims, wherein the hollow rods are made of stainless steel.
7. The device according to any of the preceding claims, wherein the preferred pressure from the water dispenser is set at 2 bar and the vacuum pressure (negative pressure) from the vacuum suction source is set at -85 kPa.
8. The device according to any of the preceding claims, wherein the device is operably coupled with a base machine, the base machine comprises a work table, a cleaning solution source; a vacuum suction source; and an air blower.

9. The device according to any of the preceding claims comprising grips affixed to a portion near the central region of each hollow rod.

10. The device according to any of the preceding claims wherein the natural extract is a raw swiftlet nest.

11. A method for cleaning and processing natural extracts comprising

connecting the device as claimed in claim 2 to a water source and a vacuum suction source;

moving the first end portions of the tweezer towards each other until each first end portion contacts the natural extract;

wherein upon contact, water flows out from one of the first end portion to soften the natural extract to loosen the bond between the natural extract and any impurities, while the vacuum suction via the other first end portion sucks/extracts the impurities which have been loosened.

12. The method according to claim 11 wherein the natural extract is a raw swiftlet nest.