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A Review on Coacgulation Activity of Ageratum Conyzoid Plant

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Abstract

Ageratum conyzoides (billygoat-weed, chickweed, goatweed, whiteweed, mentrasto) is native to Tropical America, particularly Brazil, but has become an invasive weed in many other parts of the world. It is a 0.5-1 m tall herb with ovate leaves 2-6 cm long and white to mauve flowers. The dichloromethane extract of Ageratum conyzoides aerial parts. (Aster-aceae), a plant widely used in folk medicine for a variety of diseases including sleeping sickness, was recently discovered to have strong activity (IC50 = 0.78 g/mL) against bloodstream forms of Trypanosoma brucei rhodesiense.

This study set out to assess the haemostatic potential of an aqueous extract of Ageratum conyzoides leaves in order to support or refute the plant's traditional use as a hemostatic agent. According to the ability of the extract to reduce bleeding time in experimental animals, Ageratum conyzoides leaf aqueous extract seems to have hemostatic properties. Although the extract prevented whole blood coagulation, it did cause blood material precipitation. Because of their ability to (a) cause vasoconstriction, (b) precipitate proteins at bleeding sites, and (c) promote the natural process of blood coagulation, various substances can be used to control local bleeding. The extract's ability to stop bleeding may be due to a confluence of two mechanisms. According to the findings of the current experiments, these mechanisms include the precipitation of blood constituents (as evidenced by the heavy precipitation), forming a bung to plug the blood vessel cut.

Keywords: *Ageratum conyzoides*; Haemostatic effect; Blood coagulation

Introduction

Cardiovascular disease ranked first globally in 2012, with respiratory disorders, cancer, and type 2 diabetes following closely after. Ischemic heart disease was Indonesia's second most common cause of death in 2012, only surpassed by stroke. Included in acute coronary syndrome is ischemic heart disease. The heart's coronary artery atherosclerosis sets acute coronary syndrome apart. Over a ten- to fifteen-year period, atherosclerosis develops and is linked to elevated blood fat (triglycerides, cholesterol, and low-density lipoprotein) and inflammation.

Blood thinning medications, such as clopidogrel, aspirin, and an anticoagulant (enoxaparin, fondaparinux, bivalirudin, and unfractionated heparin), are used either alone or in combination to patients with coronary artery disease. It has been demonstrated that these drugs reduce morbidity and death. Acute coronary syndrome (ACS) can be treated with a combination of blood thinning drugs. However, these blood thinning drugs can lead to an increased risk of bleeding, which can put patients' lives at risk. Sometimes, reversing this risk can be beneficial. For example, in patients with Acute Coronary Syndrome caused by Enoxaparin, the rate of bleeding was 4.7% in some cases. The Family Compositae (Ageratum) plant is found in many parts of the world, particularly in West Africa and East Africa. It has many medicinal properties. In Igbo and Yoruba, the plant is known as "nri'ewu" or "goat weed". The leaves of this plant are used in Nigeria to treat a wide range of ailments. The pressed extract from the leaves of this plant is mainly used in Nigeria's eastern states for wound dressing and to stop bleeding after fresh cuts. Ageratum coryzoides is a well-known traditional herbal medicinal plant that has been demonstrated to have hemostatic effects in the form of decoction or extract in preclinical studies.

This plant has a variety of uses in medicine, such as eye disease, colic, wounds, wound healing, anti-epileptic, infectious disease, headaches, dyspnea and antiasthmatic. uterine problems, fever, measles infection, snake bite, pain associated and diarrhoea. This article will discuss the active phytochemicals of this herb that play a role in the pharmacological activities of this herb, followed by a bioactivity prediction and pharmaceutical products that have been developed so far. It is also worth exploring the pharmacological effect and the pharmaceutical formulation of this herb.

Figure 1: (A.conyzidesPlant).

Botanical Characteristics	***Ageratum conyzoides***
Habit	It is a tropical, annual herb that grows straight (to a height of about 1 m), is hairy, thin, branching, and stinks.
Leave	The leaves are opposite, simple, stalked ovals that are 5–50 mm broad and 20–100 mm long. They have prominent veins, an attenuated base with a sharp tip, and a toothed border. The leaves are also covered with small white hairs.

Stem	The stem is aerial, cylindrical, green, and week in younger plants but with time turns to slightly brown and strong.
Root	In younger plants, the stem is vertical, cylindrical, green, and weak; over time, it becomes stronger and slightly brown.
Flower	The terminal inflorescence is branching and produces 4–18 flower heads (60–70 individual flowers) that are borne on long peduncles (50–150 mm long; 5 mm broad) and encircled by two or three rectangular, green bracts. The individual flowers might be white, purple, or pale blue in colour.

Table 1: (Botanical Characteristics).

Phytochemistry

The essential oil of this plant is mentioned in a large number of publications on phytochemistry. Depending on the time of year, the oil content ranges from 0.11 to 0.58% for the leaves and from 0.03 to 0.18% for the roots. The oil content of fresh flowers was found to be 0.2% after water distillation. The oil yield from the seed's petroleum ether extract was 26%.

Taxonomy	
Domain	Eukaryote
Kingdom	Plantae
Phylum	Spermatophyta
Subphylum	Angiospermae

Table 2: Microscopic aspect.

Root

In cross-section, the root of A. conyzoides has a cylindrical contour with suber and lenticels. Del-VechioVieira et al. (2008 found that the root of Ageratum fastigiatum (Gardn.) R.M. King et H. Rob. has a peridermis desquamation mechanism. There are around five layers of cells with straight or slightly sinuous walls that make up the cortical parenchyma. This region also has inter-cellular air spaces (aerenchyma) and cellular inclusions.

The endodermis is uniseriate and has Casparian strips. The vascular system is made up of xylem, which covers the majority of the root, and phloem, which is arranged in a few layers and surrounds the xylem.

Figure 2: (A.conyzoides Root).

Stem

The stem is cylindrical in cross-section. The epidermis is uniseriate and covered with a thin, striated layer of cuticle. Striations in the stem cuticle have also been reported in Ageratum fastigiatum and other Asteraceae genera such as Baccharis and Elephantopus. There are also non-glandular trichomes that are multicellular. Non-glandular trichomes and glandular trichomes are very common in Asteraceae, according to Metcalfe and Chalk (1950). Some species, like the one under study, have only non-glandular tric homes in the stem.

Figure 3: (A.Conyzoidesstem).

Lacerations - liquid bandage
Alternative Names

(Skin adhesives; Tissue adhesive; Skin cut - liquid bandage; Wound - liquid bandage).

A laceration is a deep cut that penetrates the skin. You can take care of a little cut at home. A large cut requires immediate medical attention. One useful tool for stopping the bleeding and sealing the wound is a liquid bandage or liquid glue. if the cut is minor. Using a liquid bandage is easy. Applying it results in minimal burning. After just one application, liquid bandages completely cover the incision. Because the wound is sealed shut, there is less chance of infection. The fact that these items are waterproof means you can wash or take a bath without worrying. The seal lasts anywhere from five to ten days. It will come down on its own when it has fulfilled its function. After the seal has fallen off, you can occasionally reapply more liquid bandage, but only after consulting your healthcare provider. However, as of right now, the majority of little cuts should be mostly healed.Major natural disasters (e.g., earthquakes, debris flows, and hurricanes) have become more frequent and intense around the world as a result of abnormal extreme weather or climate, resulting in mass casualties and significant economic loss. The most dangerous factors leading to casualties are acute massive bleeding and wound infection following tissue trauma.

Generally speaking, An antibiotic and a local anaesthetic are periodically added to a polymer that has been dissolved in a solvent (often alcohol or water) to create a liquid bandage; some brands, however, may also contain alcohol for the same purpose. When the carrier evaporates, the polymer forms a thin film that covers the wound. Ethyl cellulose, pyroxylin/nitrocellulose, polyvinylpyrrolidone (water-based), methylacrylate-isobutene-monoisopropylmaleate (alcohol-based), and acrylate or siloxane polymers (hexamethyldisiloxane or isooctane solvent based) are examples of polymers that might be used.

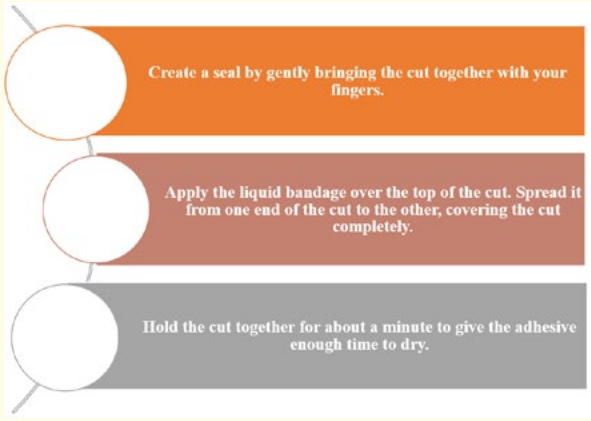

Figure 4: (How to applying the Liquid bandage?).

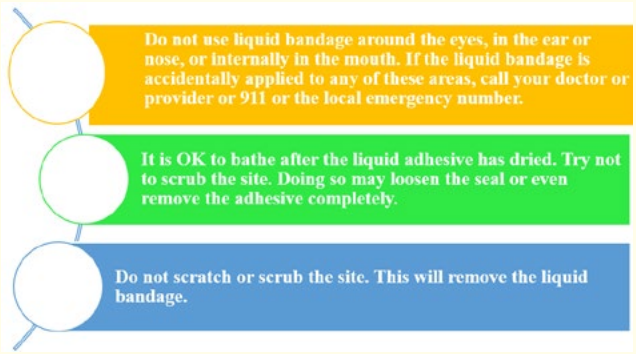

Figure 5: (Caring of Liquid bandage).

Figure 6

Liquid Bandage Uses

Liquid bandages and skin sprays are useful in a range of circumstances. These work wonders for cuts, various joint and finger aches, and other locations where bandages tend to come off. Specifically, liquid bandages and sprays work well in the following situations:

- Blisters: Using a liquid skin bandage will help you prevent blisters from developing in the first place as well as remove existing ones. If you frequently acquire blisters in one spot after doing something specific, consider bandaging that spot with a liquid bandage.
- Paper cuts: Applying a standard bandage for a paper cut might be annoying since it keeps coming off and obstructs the usage of touch screen gadgets. Using a tablet or smartphone is possible after using a clear liquid bandage spray.
- Chapped fingers: Several times a day, moisturise your skin and place a liquid skin bandage over the fissures. Your chapped fingertips will heal faster with the help of this practise!
- Shaving nicks: Using a liquid adhesive bandage to cover the area can help stop infection. Only after the bleeding has totally ceased should the liquid bandage be applied.
- Skin tags: Applying a liquid bandage to a skin tag causes it to shrivel up.
- Face wounds: Using a liquid bandage on one's face is much more inconspicuous and discreet than wearing a regular bandage. As a result, when someone has a cut on their face that requires a bandage, they frequently prefer to use liquid bandage spray over a regular bandage.
- Cracked nails: Liquid waterproof band aids help nails become stronger and less prone to cracking. It both repairs existing cracks and prevents new cracks from forming.

Figure 7: (Liquid Bandage Uses).

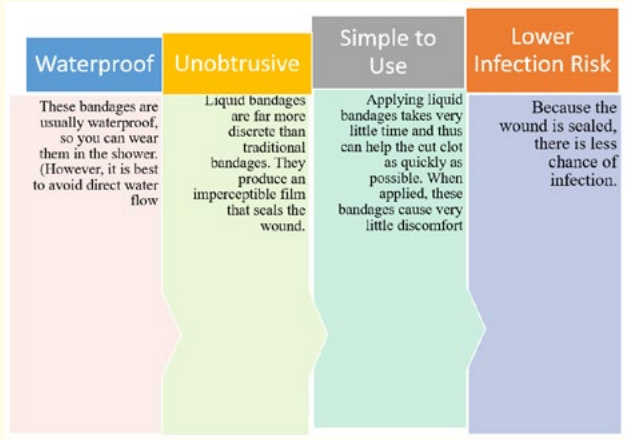

Figure 8: (Benefits of Liquid Bandages).

Have you used a clear or skin-colored liquid bandage before? There are numerous advantages to using these bandages, the most obvious of which is that clear liquid bandages are subtle and less noticeable. Here are some additional benefits of using liquid bandages.

- Waterproof: These bandages are usually waterproof, so you can wear them in the shower. (However, it is best to avoid direct water flow.)
- Unobtrusive: Liquid bandages are far more discrete than traditional bandages. They produce an imperceptible film that seals the wound.
- Simple to Use: Applying liquid bandages takes very little time and thus can help the cut clot as quickly as possible. When applied, these bandages cause very little discomfort.

Band aid liquid bandages fall off on their own after a couple of days and do not need to be removed manually. This makes liquid bandage removal extremely simple.

Figure 9: (Some examples of Liquid Bandage).

Rational of Work

While applying normal bandage there are so many problems faced by individual personal i.e During application/Retention time on surface, Rashes and marks after removal after wetting during both hand wash cleaning it will not retain so much time.

For resolving such type of problem liquid bandage is a new approach in which drug is dissoved with volatile solvent including polymer. By liquid bandage above problems were easily resolved. Liquid bandage plays an important role in coagulation and as well as wound healing or as a blood stopper. Applying a liquid bandage is a fast process. When applied, it only slightly burns. The size of scars that develop at the site of the injury may also be decreased by using these products.

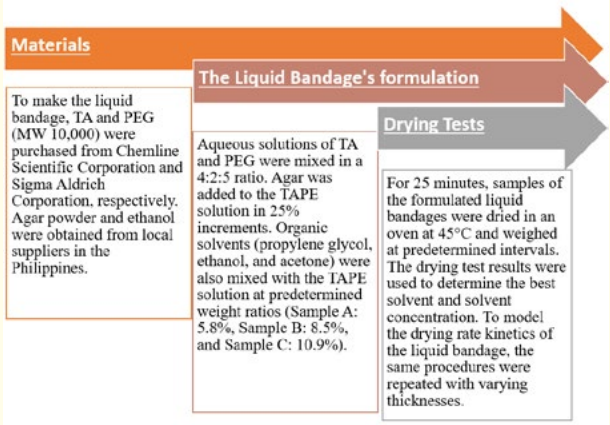

Figure 10: (Materials and Methodology).

Materials: To make the liquid bandage, TA and PEG (MW 10,000) were purchased from Chemline Scientific Corporation and Sigma Aldrich Corporation, respectively. Agar powder and ethanol were obtained from local suppliers in the Philippines.

The Liquid Bandage's formulation: Aqueous solutions of TA and PEG were mixed in a 4:2:5 ratio. Agar was added to the TAPE solution in 25% increments. Organic solvents (propylene glycol, ethanol, and acetone) were also mixed with the TAPE solution at predetermined weight ratios (Sample A: 5.8%, Sample B: 8.5%, and Sample C: 10.9%).

Drying Tests: For 25 minutes, samples of the formulated liquid bandages were dried in an oven at 45°C and weighed at predetermined intervals. The drying test results were used to determine the best solvent and solvent concentration. To model the drying rate kinetics of the liquid bandage, the same procedures were repeated with varying thickness.

Tests for drying

Because of its low vapour pressure, ethanol dries the fastest of all the solvents tested. According to qualitative observations, it is also the one with the best mixing consistency. Further testing reveals that decreasing the amount of ethanol added reduces the time required to reach a specific liquid content, indicating that solvent removal is not concentration-driven. As a result, a lower initial amount of ethanol is preferred, as long as the mixture is still workable with the amount of added solvent.

Adhesion Strength Characterization

The force displacement curve or the corresponding stress-strain curve can be used to calculate adhesion strength.

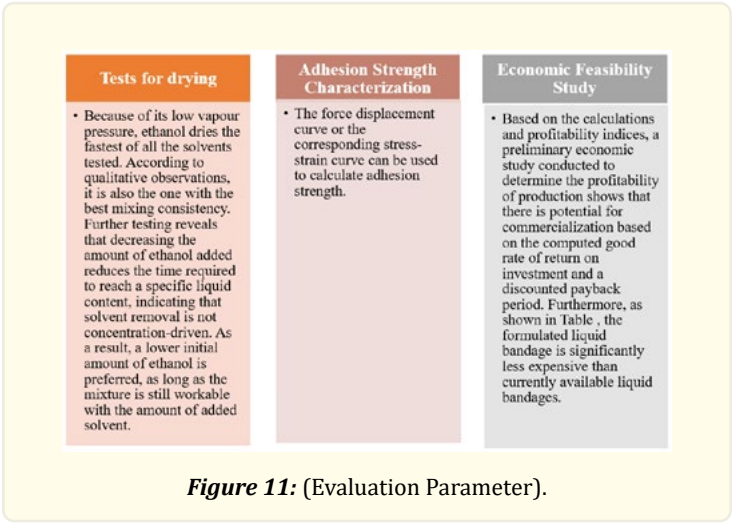

Figure 11: (Evaluation Parameter).

Economic Feasibility Study

Based on the calculations and profitability indices, a preliminary economic study conducted to determine the profitability of production shows that there is potential for commercialization based on the computed good rate of return on investment and a discounted payback period. Furthermore, as shown in Table, the formulated liquid bandage is significantly less expensive than currently available liquid bandages.

Liquid Bandage	***Price (PHP/ounce)***
TAPE-agar	15
New Skin	600
Medique Liquid Skin	367

Table 3: Table of Price comparison of TAPE-agar with commercial liquid bandages.

Conclusion

The necessity to create new tactics and alternate methods, like using plant extracts, to reduce these problems is justified by the high cost and restricted availability of antifungal medications (polyenes, imidazoles, and azoles), the quick spread of fungal infections resistant to multiple drugs, and the resistance that comes with using conventional synthetic fungicides. Researchers from all over the world have recently focused a great deal of their efforts on taking advantage of specific plants and the metabolites they produce in the hopes of finding novel, readily available medicines that can disrupt these resistance mechanisms. Conventional bandages function by enclosing the wound until the injured region recovers and the surrounding skin and dressing peel off. The type of liquid bandage and the depth of the incision determine how long that takes. When it comes to numerous difficult-to-bandage places, like knuckles and the spaces between fingers, liquid bandages cling better than plastic or cloth adhesive bandages. Clear the dishes. Take a swim. A liquid dressing will not come off. A liquid bandage is a colorless adherent material that can be sprayed or painted directly on a wound. It reduces pain by covering nerve endings and helps wounds heal by maintaining a proper moisture balance and keeping bacteria and debris out, says Ann Salamone, president of Rochal Industries, a private research company in Boca Raton, Fla., that develops polymer systems for wound care.

There are two broad types of liquid bandages:

- Over-the-counter (OTC) gels and sprays known as skin protectants can prevent anything from minor cuts to massive, chronic bedsores.
- Tissue adhesives, sometimes known as suture substitutes, make up the second class of liquid bandages.

Uses

Professional *healthcare* providers use this type of liquid *dressing* to *dress the most* serious skin *wounds*.

Doctors and veterinarians *can* also use these materials to repair incisions in some internal organs or to close surgical incisions. Suture *changes* are less traumatic for patients than staples or stitches because they do not require anesthesia or *recovery to remove them*.

The main difference between *these* two *classes* of liquid *dressings* is that *a* suture *substitute* can be used on a bleeding wound, *while* skin protectants *do not* cover actively *bleeding incisions*.

Impact Of COVID-19 on the Liquid Bandage Market:

The liquid *dressings* market is geographically *segmented* into five *regions*: North America, Europe, Asia Pacific, Latin America, Middle *East* and Africa. *North America is expected to hold the major market share in the global market due* to the *increasing* demand for liquid *dressings*, *increased incidence of decubitus pain* in the *region* and *increasing surgical procedures* in *various* healthcare *sectors*. *During* the *forecast* period, Europe is expected to *account for* a *significant share* of the global liquid *dressings market*. The *use* of liquid *dressings* as an alternative to surgical sutures, *along* with other elements *such as* well-established healthcare facilities and early adoption of technologically *advanced products*, is expected to promote the *spread* of liquid *dressings*.

Key Market Segments: Liquid Bandage Market
Global Liquid Bandage Market: By Sales Channels

- Online Sale.
- Offline Sale.

Global Liquid Bandage Market: By Application

- Acute Wound.
- Chronic Wound.
- Oerative Wound.

Figure 13: (Liquid Bandage).

Figure 12: (Normal Bandages).

Figure 14: (Liquid Bandage). ***Figure 15:*** (Liquid Bandage).

Figure 16: (Liquid Bandage). ***Figure 17:*** (Liquid Bandage).

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