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EVALUATION OF ANTI INFLAMMATORY ACTIVITY OF *CAMELLIA SINENSIS* AND *CARICA PAPAYA* FORMULATION.

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ABSTRACT

Aim: The aim of this study is to analyze the anti-inflammatory effect of *carica papaya* and *camellia sinensis* formulation preparation.

Introduction :The search for new drugs from plant sources is a multidisciplinary endeavor involving the examination of traditional medicine, routine biological screening, toxicological evaluation and the development of bioassays. Over the past decade, interest in drugs derived from medicinal plants has markedly increased.This is mainly due to their high effectiveness and low side effects.

Materials and methods: 2 grams of green tea powder and papaya powder were mixed in 100 ml of distilled water . The extract was boiled for 10 mins at 75 C . The extract was concentrated to 10 ml preparation.The prepared final extract is used in albumin denaturation assay and egg albumin denaturation assay to determine the effectiveness of anti-inflammatory activity.

Results : Papaya and green tea extract showed good anti inflammatory effect .From the results it is evident that these have high anti inflammatory effect even in combination.

Conclusion: Thus it is clear that the anti inflammatory effect papaya leaves and green tea were effective even at low concentration.

KEYWORDS: Green tea,Papaya,Anti inflammatory.

INTRODUCTION:

The search for new drugs from plant sources is a multidisciplinary endeavor involving the examination of traditional medicine, routine biological screening, toxicological evaluation and the

development of bioassays. Over the past decade, interest in drugs derived from medicinal plants has markedly increased.

Carica papaya is a dicotyledonous, polygamous, and diploid species which is a member of the Caricaceae(1). Carica papaya originated from South Mexico and Central America. C. papaya plant, the most prominent being papain and chymopapain, which is produced from the latex of the young fruit, stem, and the leaves. C. papaya leaves have been used in folk medicine for centuries(2). Carica papaya leaf contains active components such as alkaloids, glycosides, tannins, saponins, and flavonoids, which are responsible for its medicinal activity. Papaya has magnificent antioxidant action which assumes part in the balance of free radical generation and prevents pathogenesis (3) . Latex is one of the main constituents of papaya which contains papain, glycyl endopeptidase, chymopapain and caricain, and the wealth of these proteinases in various parts of papaya plant (4).

Green tea is a composition made from Camellia sinensis leaves which originated from china. Camellia sinensis is a species of evergreen shrubs or small trees in the flowering plant family Theaceae(5) . Its leaves and leaf buds are used to produce tea. Tea is composed of polyphenols, caffeine, minerals, and trace amounts of vitamins, amino acids, and carbohydrates. Green tea has an abundance of antioxidants properties(6). The phytochemicals present in green tea are known to animate the CNS system and promote the health benefits of an individual. The aging of skin is a complicated process that is intervened by senescence and some extrinsic elements such as UV radiation - photoaging that may lead to multiple disorders. The green tea has numerous antioxidant properties that diminishes these ROS and RNS species thereby controlling the effect of photoaging(7).

From the previous articles it has proved that along with the antioxidant activity of green tea through cellular, animal, and human experiments, green tea and its major component, epigallocatechin-3-gallate (EGCG) have been demonstrated to have anti-inflammatory effects(8). Previous findings have also indicated that green tea and EGCG suppress the gene and/or protein expression of inflammatory cytokines and inflammation-related enzymes(9). The present study was conducted to evaluate and compare the anti-inflammatory effects of extracts of green tea leaves (Camellia sinensis) against the denaturation of protein(10).

The area of interest in this study is green tea and papaya leaves. These are the most easily available and contain numerous beneficial effects naturally. Thus the study is thereby progressed to reveal the health and medicinal beneficence of such compounds and to evolve as a medicinal compound to treat multiple diseases.

Many studies have shown the anti inflammatory and antioxidant activity of papaya leaves and green tea formulation individually but the combination effect of those two components is not yet

explored. Hence the novel combination of papaya leaves and green tea extract is evaluated to figure the synergistic effect of those combinations.

MATERIALS AND METHODS:

PREPARATION OF PLANT EXTRACT

Collection of Plants and preparation of plant extract:For extraction and isolation purposes, cinnamon and lodhra bark plant extract were collected, shade-dried, and powdered.2 grams of green tea powder and papaya powder were mixed in 100 ml of distilled water . The extract was boiled for 10 mins at 75 C . The extract was concentrated to 10 ml preparation.

ANTI INFLAMMATORY ACTIVITY:

ALBUMIN DENATURATION ASSAY

The anti-inflammatory activity for Solanum tarvum gel with specific alterations 0.05 mL of Solanum tarvum gel of various fixation (10µL,20µL,30µL,40µL,50µL)was added to 0.45 mL bovine serum albumin(1% aqueous solution) and the pH of the mixture was acclimated to 6.3 utilising a modest quantity of 1N hydrochloric acid. These samples were incubated at room temperature for 20 min and then heated at 55 °C in a water bath for 30 min. The samples were cooled and the absorbance was estimated spectrophotometrically at 660 nm. Diclofenac Sodium was used as the standard. DMSO(dimethyl sulfoxide) was used as a control. The standard used for comparison of anti-inflammatory action was Diclofenac sodium.

% Inhibition = Absorbance of control - Absorbance of sample x 100 / Absorbance of control.

Colour change was recorded before and after incubation.

EGG ALBUMIN DENATURATION ASSAY:

A 5ml solution was made which consisted of 2.8ml of freshly prepared phosphate buffered saline of pH - 6.3, 0.2 ml of egg albumin extracted from hens egg. Specific concentrations were prepared separately for Syzygium caryophyllatum as (10µL,20µL,30µL,40µL,50µL). Diclofenac sodium was used as the positive control.. Then the mixtures were heated in a water bath at 37ºC for 15 minutes. After which the samples were allowed to cool down to room temperature and absorption was measured at 660 nml.


BOROSILICATE
GLASS
75mm
GREEN
TEA


GREEN
TEA
LABQUEST
BY BOROSIL
HME250
25%
75%
0%
100%
HEATER OFF

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Figure 1 represents the synthesis of Carica papaya and camellia sinensis extract

RESULTS:

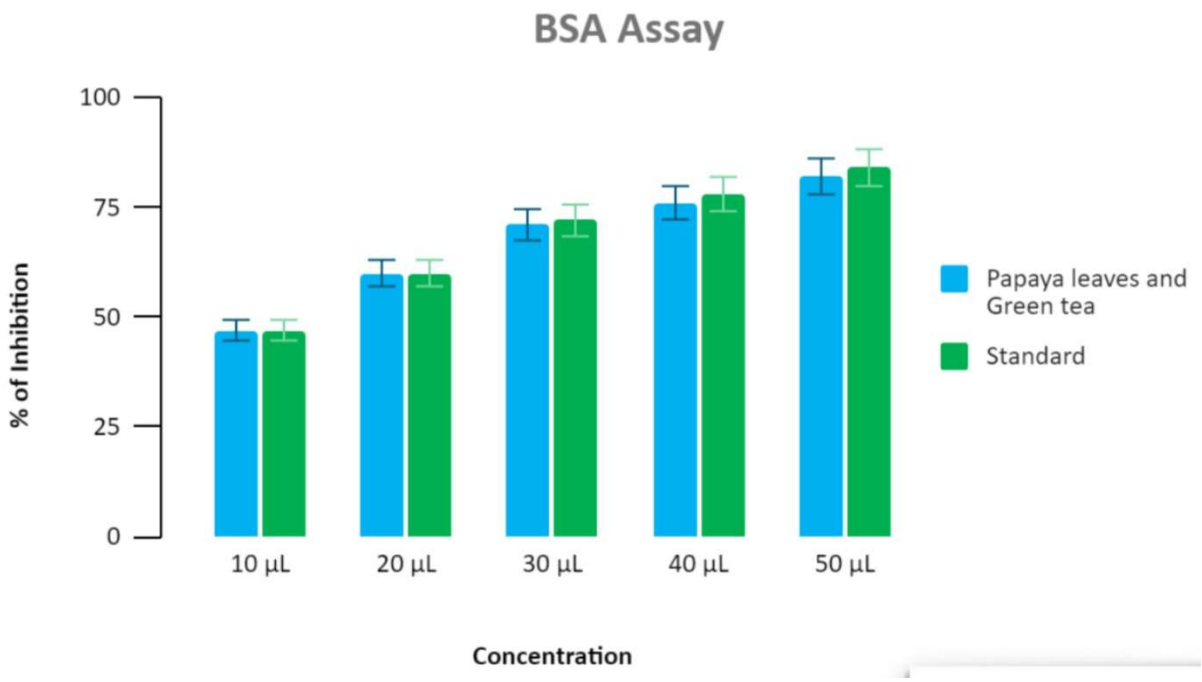

Figure1: The figure represents the anti-inflammatory activity of papaya leaves and green tea extract on BSA assay where blue color denotes papaya leaves and green tea extract whereas green color denotes standard. The bar graph is plotted against different concentrations of 10 µL, 20 µL, 30 µL, 40 µL, 50 µL in which 10 µL showed 45% anti inflammatory activity, 20 µL showed an anti inflammatory of 65% , 30 µL showed an anti inflammatory activity of 74% , 40 µL showed an anti inflammatory activity of 80% and 50 µL showed 80 % anti inflammatory similar activity to that activity of diclofenac standard drug.

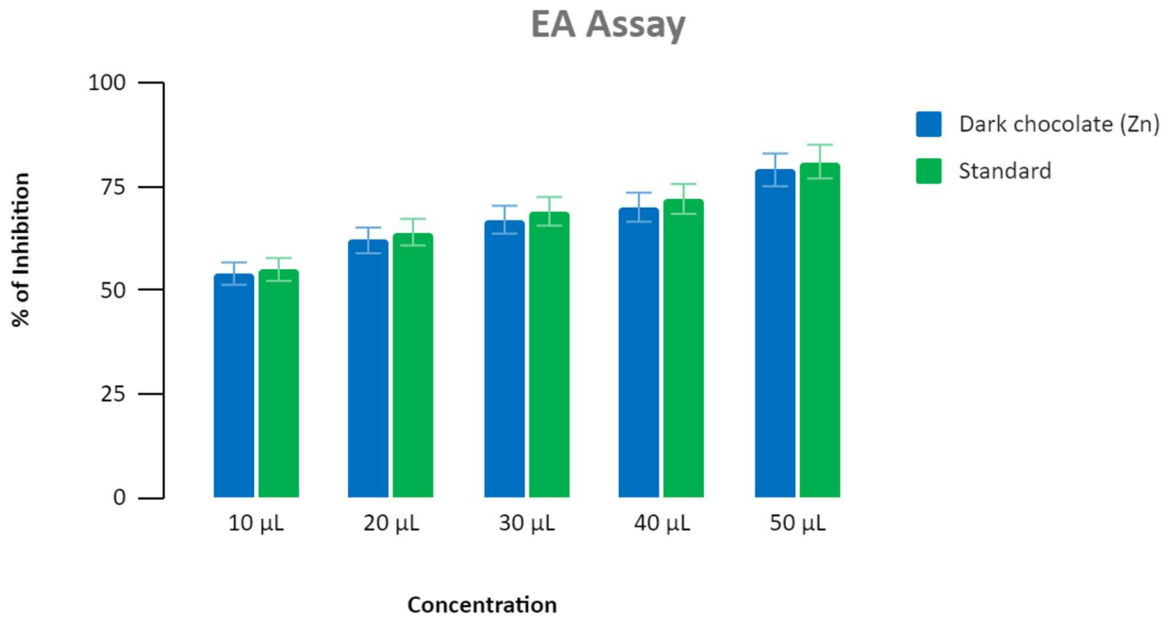

Figure 2: The graph represents the antioxidant activity of papaya leaves and green tea extract on EA assay where blue colour denotes papaya leaves and green tea extract whereas green color denotes standard. The bar graph is plotted against different concentrations of 10 µL, 20 µL, 30 µL, 40 µL, 50 µL in which 10 µL showed 52% anti inflammatory activity, 20 µL showed an anti inflammatory of 60% , 30 µL showed an anti inflammatory activity of 70% , 40 µL showed an anti inflammatory activity of 74% and 50 µL showed 79 % anti inflammatory similar to that activity of standard drug.

DISCUSSION:

The above results of our study shows that the anti-inflammatory activity of papaya leaves and green tea extract is on par with the standard drug which is diclofenac.

Many Researches have been conducted to check the anti-inflammatory activity of papaya leaves and green tea extract separately.Apart from easily obtained and inexpensive, it can cure diseases with fewer side effects than modern medicine (11). Papaya leaves were used not only because of contained various chemical compounds with pharmacological effects but also alkaloids, flavonoids, saponins, and tannins compounds indicated as anti-inflammatory.Laila(12) in her study has explained about the Anti-inflammatory effect of papaya leaf through quasi-experimental design .Purposive sampling was used, creating papaya leaves extract of 50 ppm, 100 ppm, 200 ppm, 400 ppm, 600 ppm, and 800 ppm concentration, made 24 total samples by four times replication. Based on the red blood cell lysis inhibition, the anti-inflammatory activity was measured and was compared with diclofenac sodium.

The anti-inflammatory activity of green tea extract is also high in comparable with the papaya leaves.Many Studies have been done to find out various medicines based on the anti-inflammatory effect of green tea extract.The commonly used drug for the management of inflammatory conditions are non-steroidal anti-inflammatory drugs (NSAIDs), which have several adverse effects especially gastric irritation leading to the formation of gastric ulcers.Nowadays most people are bending towards natural products. Chatterjee (13) et al in his study has explained how natural products have contributed significantly towards the development of modern medicine. Of late, traditional medicine is being re-evaluated worldwide, by extensive research on different plant species and their active therapeutic principles .He also emphasizes on the use of green tea extract for its anti-inflammatory effect.

The unique aspect about our research from other different articles is that we have utilized a blend of papaya leaves and tea extract and analyzed the anti-inflammatory which speaks about its synergistic effect as well. When contrasted with different investigations our research has nearly improved results and practically equivalent properties that of the standard that is diclofenac.The growth of our research is still possible by in vitro and vivo studies , thus it tends to be utilized as an option for diclofenac which is the standard which is utilized these days. Our team has extensive knowledge and research experience that has translate into high quality publications (12-18)

CONCLUSION:

Thus it is clear that the anti-inflammatory effects of papaya leaves and green tea were on par with the standard drug even at low concentration.It even had low to no side effects. Hence these compounds can be incorporated to produce natural drugs with no side effects in the future and can be an alternative to diclofenac which is commonly used nowadays.

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CONFLICT OF INTEREST

The authors declare that there are no conflicts of interest in the present study.

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