

Effect of *Hibiscus sabdariffa* and tea extract on cellular immunity in lab animals

تأثير نبات الكجرات والشاي في المناعة الخلوية في الحيوان المختبري

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في هذه الدراسة تم معرفة تأثير المستخلص المائي لنبات الكجرات والشاي الأسود والأخضر في المناعة الخلوية في الحيوان المختبري متمثلة باختبار البلعمة في اختزال صبغة نترولوتترازوليوم واختبار الحساسية المتأخرة متمثلاً باختبار الجلد. وظهر نبات الكجرات زيادة معنوية واضحة لاختبار البلعمة تحت مستوى $p \geq 0.05$ مقارنة بالشاي وكان اختبار الجلد ايجابياً بظهور علامات التحسس الاحمرار و التصلب والتنخر وظهور الادمه بعد مرور 24-72 ساعة من الحقن.

Abstract

In this study , the effect of aqueous extract of *Hibiscus sabdariffa* calyces ,black and green tea leaves were studied in lab animals . Cellular immunity which represented by the phagocytes as in the reduction of NBT dye and skin DHT test. *Hibiscus* extract was showed higher significant NBT reduction in $P \geq 0.05$ compare with tea extract and control where's there three plants were stimulated cellular immunity in skin DTH test demonstrated by signs of reaction such as redness ,thickness ,necrotic ,indurations and erythma after 24-72 hr.

Introduction

In the last years there has been significant increase in the use of natural products in health care and there potential application in agriculture , pharmaceutical and food industry are being investigated (Gomez *et al.* ,2008) .In fact about 30% of drugs industrialized countries are derived from plants (Kanfman *et al.*,1999).Plants play an essential role in the health care needs not only for treatment disease , but also to improve the immunological response against many pathologies. *Hibiscus sabdariffa* is the member of the family malvaceae ,was used for different uses as vegetables ,some of oils ,refreshing drink and food preserves (Fasoyira *et al.* ,2005) . The calyces have been found to *be rich in vitamin c and other antioxidants such as flavonoids and also minerals* (Wong *et al.* ,2002 ;Babalola *et al.* ,2001) . Fruits are also rich sources of vitamins and antioxidants , which are essential as health food in the building up of body immune system and preventing disease (CAT,2001.) .The tea plant *Cammellia sinesis* , family is

theaceae is a perennial evergreen plant that is semi tree or shrub depending on the environment . Green and black tea are processed differently during manufacturing .Green tea is non oxidized where's black tea is fully oxidized . Caffeine the most content of black tea where's catechins in green tea is the most important . The effect of plants are multiple from antitumor ,antimicrobial ,antimutagenis and immune system immunomodulatory (Chan *et al* ,2006;Roberts *et al* ,2005 ;Charles *et al* ,2007 ; DellAlca ,2004)

Materials and Methods

Plant extracts

1gm of tea leaves and *Hibiscus* calyces with 10 ml of boiling distal water for 1hr at water bath . Aqueous extract were then filtered and cooled at room temperature (Charles *et al*,2007).

Animals

Healthy Newzland rabbit(*Orcyctalagus cuniculus*) about 1-15 kg. were used as experimental animals . They hands at room temperature in labium condition during experimental condition .

Immunization program

Animals were divided into 4 groups , 5 animals for each group. Three groups were given 5ml of plant extracts orally and 5 animals were given 5 ml of distal water as normal control daily for three weeks. At the beginning of five week, animals were heart punctured for blood .Blood were saved with anticoagulant for cellular test (Al- Thahab, 2006).

Cellular immune procedures:

Nitrobluetetrazolium done according with (Park *et al* .,1968).Skin DTH test was done as in (Tompkins *et al*.,1973).

Statistical analysis

Statistical analysis was done depending on (Dawed and AL-Yas,1990)

Results

The ability of three plants extract was varied in $P \geq .05$ *Hibiscus* extract showed higher effect in phagocyte reduction NBT process compare with tea extract and control . Tea extract was rarely less effect , table (1) .In effect of three plants on skin DHT

test ,there are stimulate T cells showed clearly in tuberculin like mild reaction were noted as redness ,erythma ,indurations , necrotic ,table (2) .

Discussion

Natural products play an important role in the field of new drugs research and development (Jin Ming *et al* ,2003) . Knowledge of plant biologically active compound and their mechanism of action are desirable not only for the discovery of novel therapeutic agents that would validate folkloric remedies , but also for the design of new active molecules or modification of current drugs against divers maladies . One of important application area is immunotherapy . Plants have been shown to modulate the immune system (Spelman *et al* ,2006 ;Cooper ,2007) .In this study the effect of *Hibiscus* extract on phagocytes process and delayed type hyper sensitivity as in skin test was clearly . Many researches that proved the plant was induce apoptosis in human leukemia cells and inductive effect on tumor promotion in mouse skin and in human leukemia . Seeds of this plant when breasting in the first six months of life stimulates immune system and protects them from diarrhea and acute respiratory infection (UNICEF ,2006; Okasha *et al* ,2008) . Anthocyanin ,flavonoids ,glycosides ,protocatechuic acid , vitamin c and other substances which are antioxidant so there are improve immune system .Green and black tea are posses some contents that share in effects on immune system. Researches improved tea plant is protect against several forms of cancer ,cardiovascular disease and microbial infection. Immunomodulatory properties was show in human peripheral blood mononuclear cell (Charles *et al* ,2007) . Caffeine , polyphenol ,saponin ,tannin ,glycosides in black tea and catechins in green tea that share in effect on immune system varies in stimulatory or suppressor .So in this study we investigated the effect of complementary and alternative medicine plants such as *Hibiscus sabdroffira* and black and green tea may be immunomodulatory and found that black tea had more effect on T cell compared with others. (Kamath *et al* ,2003 ;Hamant and Yassen,2007 ; Chan *et al* ,2006) .

Table (1) : The effect of plants extract on phagocytes process in rabbits

Plant extracts	Mean ± Standard deviations	P ≥.05
<i>Hibiscus sabdraffira</i>	.4240 ± 6.542	.000
Black tea	.3600 ± 9.798	.001
Green tea	.3580 ± 5.070	.000
Control	.3800 ± 9.899	.001

Table (2): Skin DTH test in rabbits

Plants extract	Redness	Necrotic	Skin DTH indurations(cm) (24 hours)	Skin DTH indurations (cm) (48 hours)	Skin DTH indurations (cm) (72 hours)
<i>H.sabdraffira</i>	+	+	.5	.5	.5
Black tea	+	+	.8	.9	.8
Green tea	+	+	.5	.5	.5
Control	-	-	-	-	-

+ : positive effect - : negative effect

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