

(2)

(1)

63

5

(Propyl gallate)

(200 ppm) (100 ppm)

(AV)

5 (RI)

(IV)

(PV)

(P<0.05)

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(1)

(2)

---

...

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## Evaluation of Antioxidant Activity of Some Natural Extracts and Propyl Gallate in Refined Palm Oil

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### ABSTRACT

Some local natural sources of antioxidant such as orange peel extract (*Citrus sinensis*), pomegranate peel extract (*Punica granatum*) and ginger extract (*Zingiber officinale L.*) were evaluated during 5 days storage of refined palm oil at 63°C as compared to the synthetic antioxidant such as propyl gallate. The above extracts were obtained with ethanol and oil (palm oil). Those extracts were added to the oil at two different levels (100 ppm and 200 ppm). Antioxidant activity of natural extracts, synthetic antioxidant and the control treatment without antioxidant under thermal treatment (Schaal test) was assessed by measuring acid value (AV), peroxide value (PV), iodine value (IV) and refractive index (RI) during 6 days storage of refined palm oil at temperature mentioned above. Antioxidant activity also measured by studying the stability of oil by the use of rancimat method. All treatments exhibited antioxidant activity. Statistical analysis results were shown that the pomegranate peel extract treatment was significantly ( $P<0.05$ ) superior than the orange peel extract and ginger extract treatments whereas, it was not significant difference about propyl gallate treatment.

**Key words:** Antioxidant activity, Natural antioxidants, Orange peel, Pomegranate peel, Ginger and propyl gallate.

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(Auto-oxidation)  
(Rancidity)  
(BHA) Butylated hydroxyanisole (PG)  
(BHT) Butylated hydroxytoluene  
Bera 2007 Stoilova (1986 Ito 2006  
(1998) Alexander (1991, Pokorny)  
2006, Rehman,) (2003, Rehman)  
(2003 Negi (1998 Alexandra  
Stoilova (2003, Rehman)  
(2007)  
(BHT)  
Hydroxyl) (Quercetin)  
80 37 74.8% 79.6% (radicals)  
(TBHQ Tertiary-butylhydroquinone)  
(BHT Bandyopadhyay) (BHA)  
(2007)  
(2003) Negi (2007) Singh Shukla

Rehman .

(2006)

(PV) 45 25 (FFA)

(IV)

.(PG)

: -1

(*Punica granatum*)  
(*Zingiber officinale L.*)

(*Citrous sinensis*)

(PG)

.(Sigma Chemical Company)  
(RBD)

.(Analytical grade)

: -2

° 2 ±45

( / 10:1) %95  
(Magnetic stirrer)

° 55

(PG)

.(200ppm 100ppm)

° 63 100

.metrohm (679) rancimat  
: -3

(PV) (RI) (PG) (IV) (AV)  
° 63  
(Control)

.(1993, AOCS)

120 (Rancimate method)  
( )

: -4  
(CRD) .(LSD)

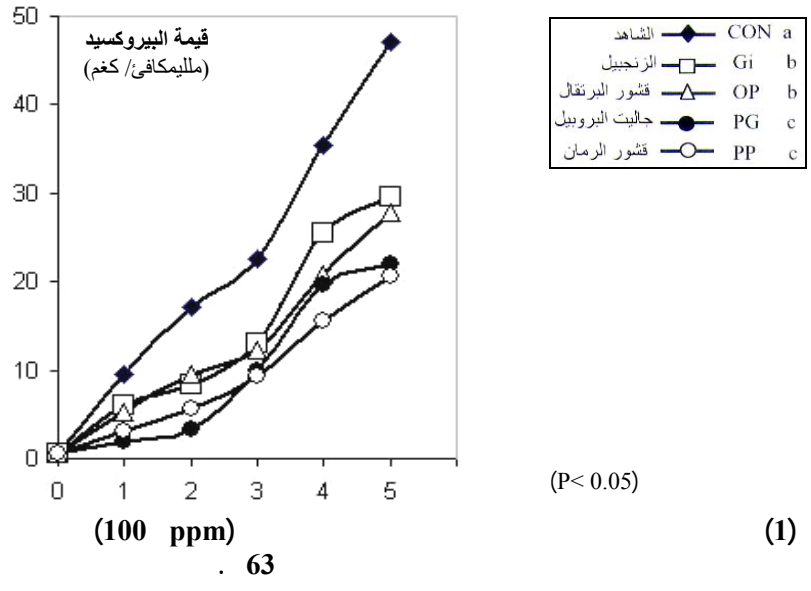
(1) (100ppm) (1) (PG)  
° 63 (P<0.05)  
( 5) ( ) / 0.5

...

20.7 21.9 27.8 29.6 47

( 5 ) /

(P<0.05)  
(P<0.05)



(200ppm)

/ 16.3 17.1 23 24.2 47

(2) (200ppm)  
(P<0.05)

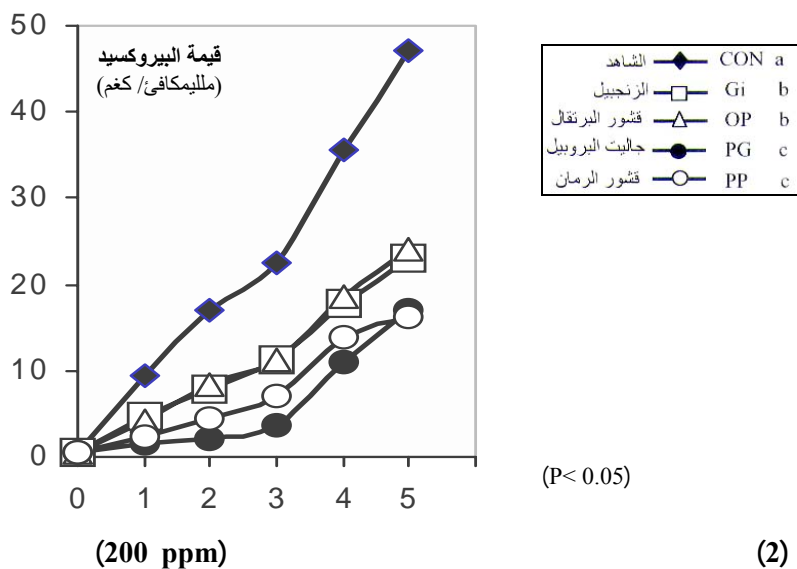
(300ppm 100ppm)

(200ppm)

(2008, Al-Kawry)

(2006) Bera

(Initiation stage)



(P < 0.05)

(2)

63

: -2

63

(100ppm)

(3)

( / 0.05)

( . . )

1.2 1.82 ( 5)

(2001/

0.91 0.94 0.99

(P < 0.05)

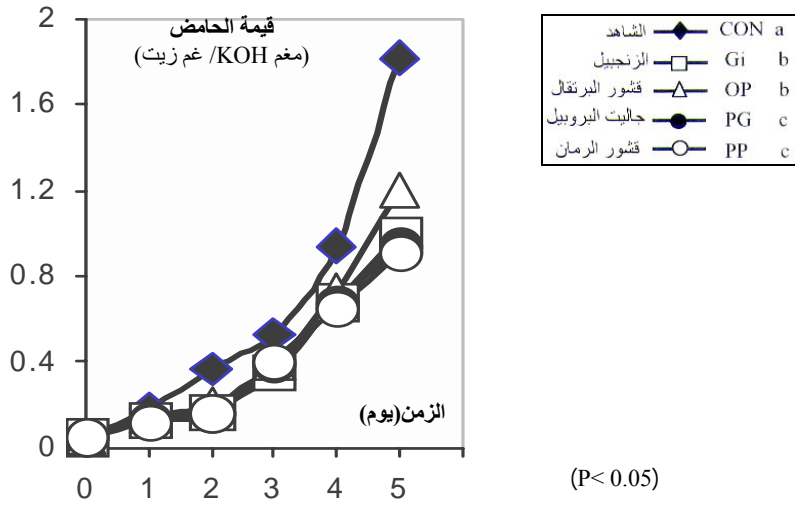
(P < 0.05)

Alexandra 2006 Rehman) .

(2003)

Rehman 1998

(2003) Negi



(P < 0.05)

63

(3)

(100 ppm)

(4)

(200 ppm)

/

0.77 0.78 0.90 0.96 1.82

(P < 0.05)

(P < 0.05)



(1967, Gunstone)

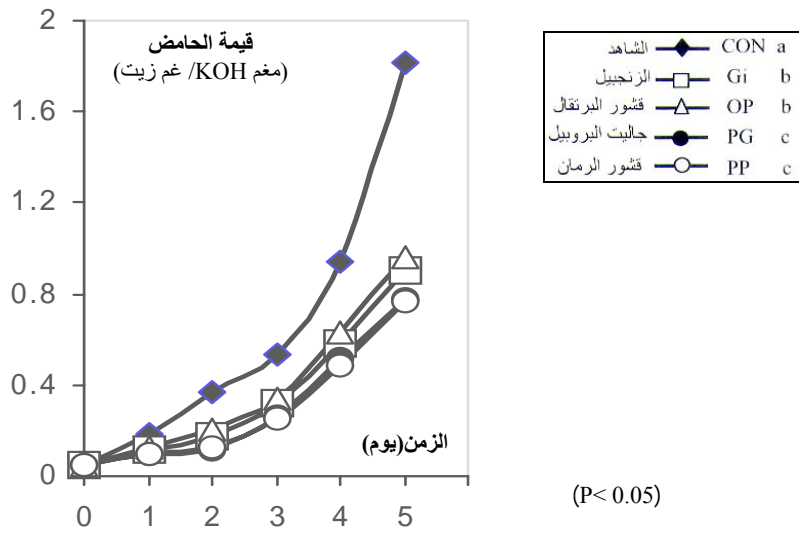
(4)

(200 ppm)

(P<0.05)

(200 ppm)

(100 ppm)



(P< 0.05)

63

(4)

(200 ppm)

-3

(5)

(100ppm)

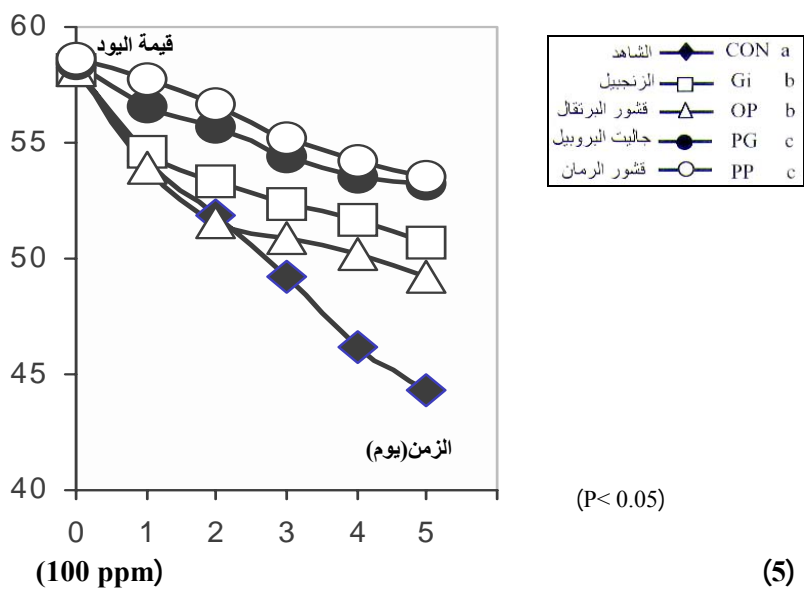
(5)

. 63

( 5)

(58)

53.5 53.2 50.7 49.2 44.3



63

(P<0.05)

(P<0.05)

(200 ppm)

(100ppm)

54.7 53.9 51.1 50.2 44.3

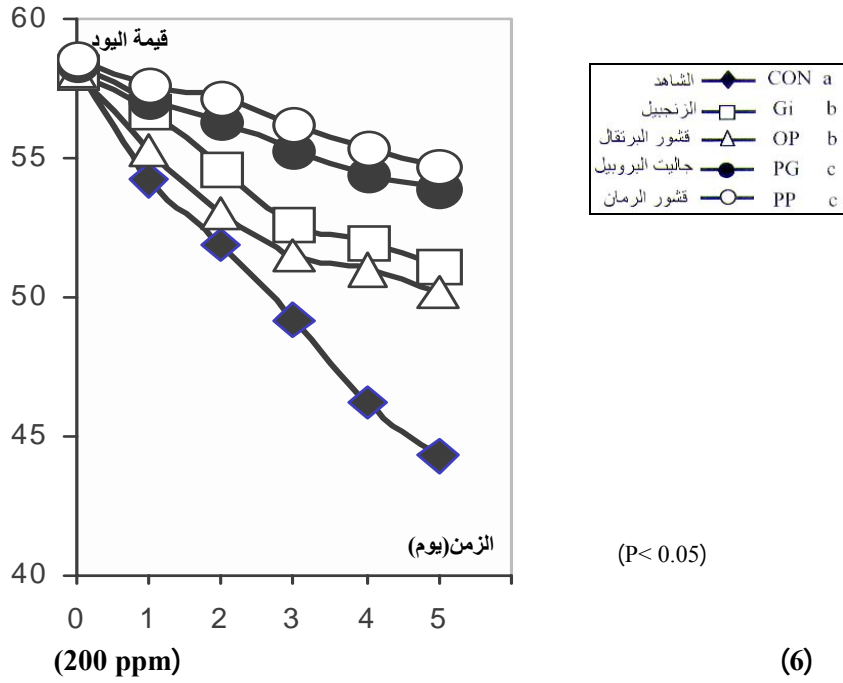
(6)  
(P<0.05)

(58)

(2006) Rehman

(55 -50)

.(2001/. . . )



(P < 0.05)

63

(6)

: -4

(7)

63

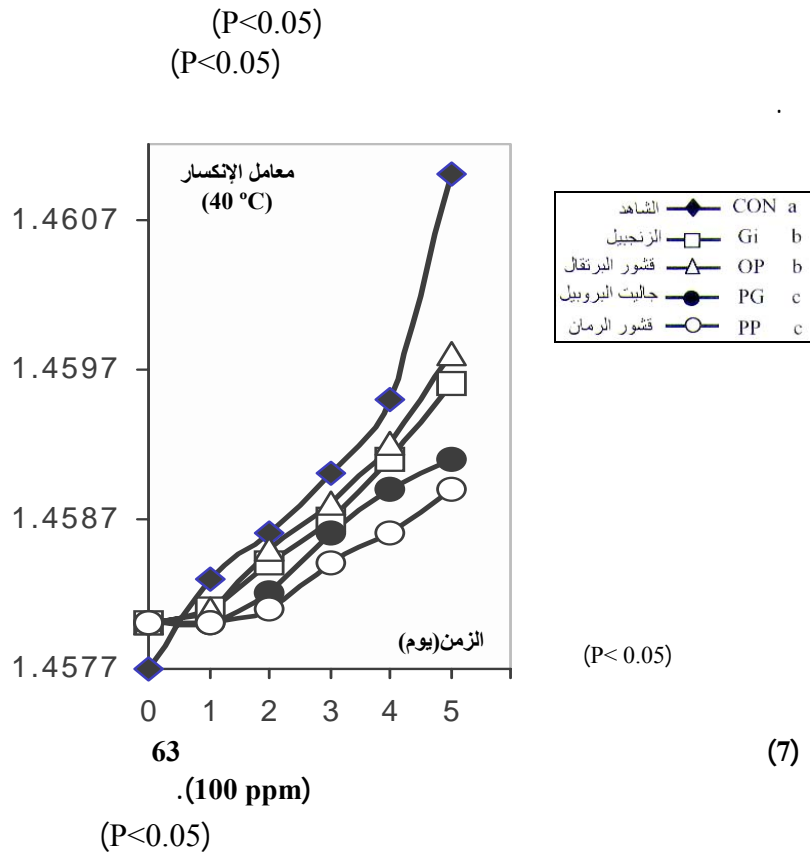
.(100 ppm)

(1.455 -1.449)

(1.458)

.(2001/. . . )

1.4589 1.4591 1.4596 1.4598 1.461

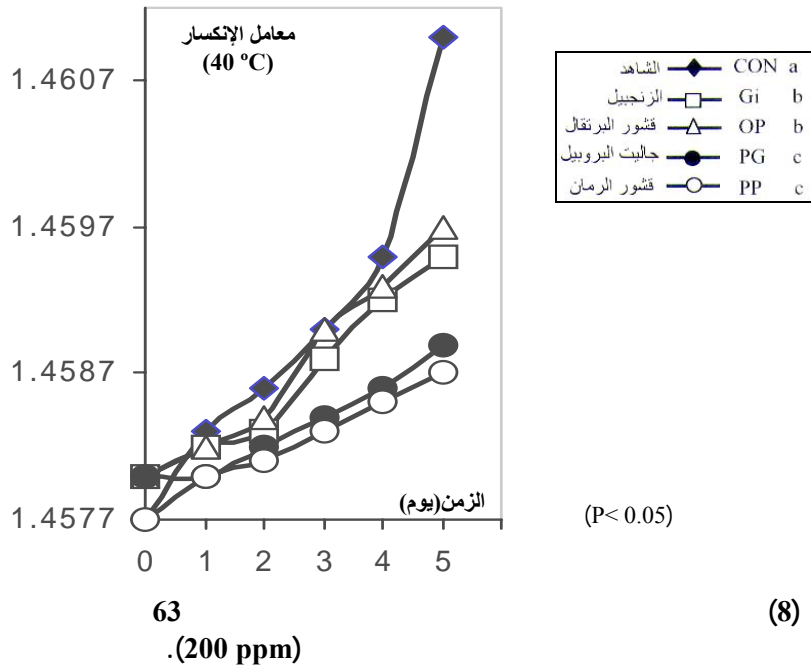


(Conjugated double bonds)  
(2007 Stoiova) (polyene) (triene) (diene)  
(100 ppm) (200 ppm)  
1.4587 1.4589 1.4595 1.4597 1.461

(8 )

(P<0.05)

(Polyphenols)  
(2003 Negi)



: -5

(9)

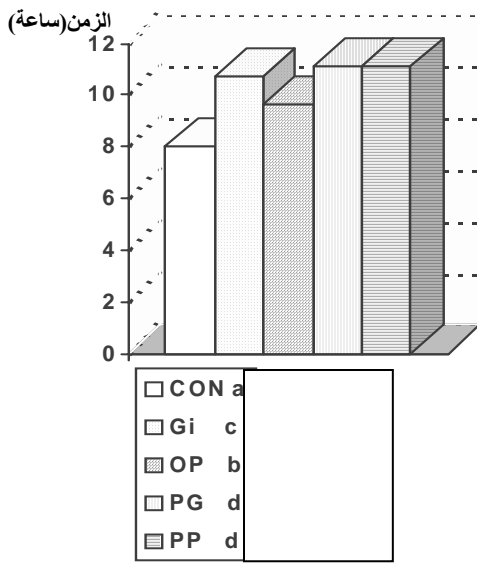
11.1 11.1 10.7 9.6 8

(P < 0.05)

(P < 0.05)

(method Schaal)

(ellagic tannins) (2000 Gil) (gallic acid) (ellagic acid)



(P < 0.05)

63

(9)

(100 ppm)

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