**Abstract**

 Isolates of *Alternaria altenata* fungi that had the potential to produce Alternariol (AOH) were morphological characterized based on morphologic, microscopic and molecular aids by PCR and DNA Sequencing technique. The frequently and the appearance percentage of this fungi through the initial isolation from infected tomato fruit were determined. The responsible gene for Alternariol production was determined by using specific primer.

 The study included the extraction and detection of AOH by using thin layer chromatography (TLC) and high performance liquid chromatography (HPLC). The study also included the effect of different ecological conditions (i.e. temperature, pH, culture media, dark and light ) on *A. alternata* growth and AOH production.

 The lethal dose (LD50) of AOH and its cytogenetic influences in bone marrow of mouse male which included the calculation of mitotic index ,chromosomal aberration and micronucleus formation percentage.

 Results revealed a wide distributin of *A*. *altrenata* in Karbala province where 23 isolates were obtained with the phenotypic characters at frequently 38% and 21.5% appearance .

 The molecular test (diagnosis) showed a success with the pair AAF2,AAR3 primer in diagnosis of *A. alternata* by using PCR with a molecular weith of 340bp. Results of DNA sequencing by using NCBI BLAST ensuring the results of morphological identification and the success molecular test of pair primer AAF2,AAR3 in molecular test by using NCBI BLAST loci revealing that all isolation belonging to *A. alternate*. There are two different clade in Karbala first one was alignment 100% with china isolate , 99% with Saudi Arabia isolate . The second one alignment 100% with Turkey and Mexico isolate. Analysis of mega 6 divided these isolates in to two group G1(1, 3, 5, 6, 7, 8, 9, 10, 11, 13, 14, 15, 16, 17, 20, 22, 24). G2(4, 12, 18, 19, 21, 23).

 PKSJ primer succeeded in the detection the gene that responsible of AOH production by PCR at 514bp.

 Results showed the Rf of AOH was 0.43 by using methanol solvent and mobile phase (tuleun : athylacetate : formic acid) 6: 3: 1. The similar To the supplied (as standard) with extracted alternariol by HPLC. Different environmental conditions affected in *A. alternata* growth and AOH production. 25ºC is optimum temperature for growth where the colony diameter was 8.2 cm during the incubation period ( 7 days ) comper 20, 30 and 35 ºC , while the mean of growth was increase and decrease of temperature to 2.1 cm at 35C. at 30C achieved a maximum production 141.1 mg/ml whereas, the lowest value was 74.5mg/ml at 35C

 The pH 6 was significantly superior compare with 5,7 and 8 treatment , where best growth 8.5 cm ,the growth mean was decrease with other pH reaching the lowest value 4.3 at pH 8. the production AOH was also influenced by the acidity pH wasgose the highest value 116.1mg/ml, reaching the lowest 57.8mg/ml at pH 8. PSA is the best culture media for *A.alternata* growth and AOH production with significant differences of other media types 8.2cm diameter of colony, 112.8mg/ml for AOH production . dark is increase significant of light treatment 8.2cm colony diameter at dark wile 6.5cm at light, so increase significant AOH production 182.8mg/ml at dark and 74.5mg/ml at light.

 results showed that the dose 368mg/kg of AOH was the lethal dose LD50. And this AOH affects different parameters of bone marrow. Mitotic index was decrease of the control by significant differences, 14.2% at control and 2.1% at 80mg/kg . Chromosomal aberration show with the increase AOH concentration with significant differences 3.55% at 80mg/kg of AOH while 0.10% in control. Micronucleus formation with AOH treatment differ by significant increase 16.2 at 80mg/kg and 3.7 at control.