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**Title of Thesis:** Evaluation of F1 hybrid trees between LeConte pear and some other pear cultivars.

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### ABSTRACT

Production of new low chilling requirements genotypes is one of the most important objectives in pear breeding program to suit warm Egyptian climate conditions. Evaluation of chilling requirement of pear cultivars parents and seedlings of F1 hybrids were estimated after 200, 300, 400 and 500 chilling hours at 7.2°C.

Cultivars used as parents (LeConte, Hood and YaLi) were varied in chilling requirement. Hood had the lowest number of chilling hours below 200 chilling hours to bud break, LeConte below 500 chilling hours while, YaLi failed to break bud at 500 chilling hours. F1 hybrids LeConte x Hood (LH) and F1 hybrids LeConte x YaLi (LY) were varied in chilling hours according to its male parent. Using of Hood parent reduced chilling hours of hybrids LH while YaLi parent increased chilling hours of hybrids LY. F1 hybrids 9LH, 10LH, 16LH, 17LH, 19LH, 20LH, 24LH, 35LH and 44LH were found to be promising progenies as they had low chilling hours.

Hood begins bud burst on 19<sup>th</sup> Feb. prior two weeks to bud burst of LeConte, which, it begins at 8<sup>th</sup> March. While, YaLi begins bud burst on 29<sup>th</sup> March. Three progenies 9LH, 17LH and 44LH had very early opened buds before 11<sup>th</sup> Feb. this were earlier than their parents Hood (week) and LeConte (month).

Our results showed a considerable variation in resistance levels to fire blight among parents and progenies. LeConte was susceptible (61.5%). Whereas, Hood and YaLi were moderately susceptible 35.5% and 40.83%, respectively. While, two progenies 21LH and 44LH appeared to be the most promising, a very resistant.

The results confirmed presence significant differences for morphological characteristic such as growth habit, trunk tree and leaf character among the parents and its hybrids. The highest genetic similarity was (89%) between hybrid 18LH and both of 15LH and 25LH, while the lowest genetic similarity was (73%) between the parent LeConte and both of 9LH and 17 LH also, between hybrids 17LH and 15LH.

**Key words:** Pyrus pear - Chilling requirements – Bud burst – Evaluation hybrids – Fire blight resistant – LeConte Hood YaLi.

اسم الطالب: عماد حامد إبراهيم محمود الباسل  
عنوان الرسالة: تقييم أشجار هجن الجيل الأول بين صنف كمثرى الليكونت وبعض أصناف الكمثرى الأخرى.

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### المستخلص العربي

دراسة تقييم أشجار هجن الجيل الأول الناتجة من تهجين صنف كمثرى الليكونت كأم وصنفي الهود واليالي كأباء، والتي أجريت خلال الفترة من ٢٠١١ وحتى ٢٠١٤ بمزرعة خاصة بالقطا محافظة الجيزة، بهدف إنتاج تراكيب وراثية جديدة تتميز بالتكبير في التفتح للهروب من مرض اللفحة النارية و أيضا إنتخاب الهجن ذات الاحتياجات البرودية المنخفضة التي تتناسب الظروف المناخية المصرية.

وفي هذه الدراسة تم تقييم احتياجات البرودة للهجن والاصناف محل الدراسة بعد ٢٠٠، ٣٠٠، ٤٠٠، ٥٠٠ ساعة برودة عند درجة حرارة ٧.٢ م° وكذلك ميعاد تفتح البراعم والإختلافات المورفولوجية بين الهجن والأباء بالإضافة الى إجراء عدوي بيكتريا *Erwinia amylovora* المسبب للفة النارية وتقييم درجة تحمل الأباء والهجن لمرض اللفة النارية.

وأوضحت النتائج أن صنف الهود منخفض في احتياجات البرودية اقل من ٢٠٠ ساعة برودة برودة لكسر سكون البراعم بلية صنف الليكونت الذي يحتاج اقل ٥٠٠ ساعة، بينما صنف اليالي احتياجات البرودية اعلى من ٥٠٠ ساعة برودة. كما لوحظ زيادة نسبة تفتح البراعم بزيادة ساعات البرودة. كما اختلفت الهجن الناتجة في احتياجات البرودة حيث أدى استخدام صنف الهود كأم الى تقليل احتياجات البرودة لهجين LH بينما أدى استخدام صنف اليالي كأم إلي زيادة احتياجات البرودة لهجين LY عن صنف الليكونت (الأم).

هجن 9LH, 10LH, 16LH, 17LH, 19LH, 20LH, 24LH, 35LH, 44LH تعبير واعدة نظرا لإنخفاض احتياجاتها البرودية لأقل من ٢٠٠ ساعة برودة.

أوضحت النتائج أن الهجن 9LH, 20LH, 44LH مبكره جدا وتبدأ خروج براعمها قبل ١١ فبراير أي قبل صنف الليكونت بشهر وقبل صنف الهود بأكثر من اسبوع وبالتالي يمكنها الهروب من الظروف البيئية المناسبة لإنتشار مرض اللفة النارية.

صنف الليكونت حساس لمرض اللفة النارية حيث كان نسبة الاصابة ٦١.٥%، بينما كان صنف الهود واليالي متوسط الحساسية ٣٥.٥% و ٤٠.٨٣% علي التوالي، في حين اختلفت درجة حساسية الهجن من حساس جدا إلي مقاوم جدا، وأوضح هجينى 21LH, 44LH درجة عالية من المقاومة لمرض اللفة النارية وكانت نسبة الاصابة ٩.١٦% و ٨% على التوالي.

وجود إختلافات مورفولوجية واضحة بين الأباء وبعضها وبينها وبين الهجن في طبيعة نمو الاشجار وقطر الجذع وإرتفاع الأشجار وايضا إختلافات في شكل الاوراق ومساحتها.

سجلت أعلى نسبة تشابه وراثي باستخدام تقنية ISSR بين الهجين 18LH وكلا من 15LH و 25LH وكانت (٨٩%) بينما كانت أقل نسبة تشابه وراثي (٧٣%) بين الأب الليكونت وكلا من 9LH و17LH وايضا بين الهجينين (17LH و 15LH).

الكلمات الدالة : تقييم هجن - تفتح البراعم - احتياجات البرودة - مقاومة اللفة النارية - الليكونت ، الهود ، اليالي .

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