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# RESISTANCE OF SOME DATE PALM VARIETIES AGAINST DATE PALM WEEVIL *RHYNCHOPHORUS FERRUGINOUS (COLEOPTERA: CURCULIONIDA)* IN TURBAT, BALOCHISTAN

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## Abstract

*Rhynchophorus ferruginous Olivier (Coleoptera: Curculionidae), is a serious pest most of the world internal tissue damaging bother of date palm tree in several countries its damage is sever as time and growth increase by this pest. In Pakistan it infests date palm trees on large scale in Sindh and Balochistan provinces. Turbat is the main date palm growing area of Balochistan where about 200 verities of date Palms are cultivated. The infestation of Rhynchophorus ferruginous is increasing day by day in Turbat and make damage of date Palm trees severally, as result yield is affected in Balochistan. Consumption of date palm weevil larvae on steam pieces of date palm was observed on all tree verities, maximum consumption 210 grams was recorded on begum Jhangi while lowest 128 grams recorded on Shakri. The egg fecundity was recorded 70%, 60% and 30% respectively on Begum Jhangi Alleni and Shakri. Maximum larval developmental period was recorded on Begum Jhanghi and lowest on Shakri, that was 108 and 99 days respectively. During Present study, 06 Date Palm forms were visited for field observation, total 55 trees of date palm were found infested by date palm weevil, out of these highest 30 trees of Begums Jhanghi, 18 of Alleni 7 of Shakri were recorded.*

*Present study revealed that Begum Jhanghi was the most susceptible verity of date palm and Shakri was the most resist verity is Shakri in field as well as in laboratory in Turbat, Baluchistan.*

## 1. INTRODUCTION

The scientific name of date palm (Phoenix dactylifera L.) it is a tropical fruit it is included into family of plant called Arecaceae. The fist origin of the date palm tree is believed to Persian Gulf, obviously in Iran, Arabia, Oman, Iraq and Northern areas of the Africa. Frequently it urbanized in some parts of the Iraq, and still it is important state for the dates assembly in world. Further Persian and gulf areas, such as Egypt seems next vast cultivator country to produce dates round about between 2000 to 3000 BC. The tree of date palm similarly started to grow in many other parts of the word including Brazil Spain, Cyprus, Bangladesh, Peru, Nagaland, Argentina, North America and Pakistan (Khushk, 2005). Aldryhim Y. and S. Albukiri. 2003 study distribution and behavior about red palm weevil, Rhynchophorus ferrugineus on infested date palms. Pakistan is the 4th largest date palm producing country with total area about 90100 hectares, it produces about 567,300 lots /annually. In Pakistan date palms are cultivated into all

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provinces but Sindh and Balochistan are major provinces for cultivation date palm trees. In the Balochistan mostly date palm selection including Begum Jhangi inhabits maximum area of 98950 hectares (1489989 plants) with a producing about 6990 kg hector, while other yielding variety were per hector of 79090 kg was obtained by Alleni Balochistan Administration of 2009. Turbat district Kech is most important district of Balochistan for date palm cultivation because of favorable climatic conditions. About 200 verities of different date palms were cultivated in various parts of district Kech. Begum Jhanghi and Alleni are the commercially important varieties. The red palm weevils were dangerous pest of the date's plant all over the place in the world, red palm weevil attack on many trees including its attack on the date palm tree, coconut palm tree (Caztobin, 2008; Vidyasagar, 2008 and R.fnomis, 2008). Red palm weevil are many species, accountable for the economic harms. The one of them is including *Rhynchophorus ferrugineus* Olive, this species mostly found in Asia, including Pakistan, and Malaysia, India and Sri Lanka. While some other types found in America such as *Rhynchophorus palmarum* and *Rhynchophorus phoenicious* types were evident, in the Africa it was also causes huge damages to cited palm plants. According to many researchers it origin is still unknown, some researchers shows its origin in India some shows its origin in gulf areas while some others shows its origin in African countries, like Lefroy in 1906 and Nirula,in 1956) showed that India is first place from where this was firstly reported on coconut palm . Lal, 1917; Buxton, 1918 also have described this destructive pest reported from India on coconut palm. The date palm weevil is massive destructive pest of date palm tree in some of the Arabian Gulf countries such as Sultanate of Oman Saudi Arabia, Egypt, and United Arab Emirates (Cox, 1993; Kaakeh at al., 2001b). In Turbat, Balochistan, the yield of dates achieved are lower than the potential yields of existing of date palms, it is due to infestation of date palm weevil. Lefrory. H.M (1906), consider this insects as destructive to Indian crop. In view of the above facts, the presently we have observed / examined the resistance of different date palm varieties i-e Begum Jhangi , Alleni and Shakri against date palm weevil in laboratory and field in Turbat district Kech.

## 2. MATERIALS AND METHODS

### 2.1 Study place

Our study area is Turbat district Kech. The district Kech is most important area for cultivation of the date palms. Turbat Balochistan is included into hot semi-arid area on the bases of tropical region. Mostly this region co-related with gulf area of word. On the basis of geological survey this area remains hot. The seasons of this area depend upon the wind blowing from Quetta and Dasht area of Iran. Our research areas are mostly Turbat city and its surrounding like Obser, Joosak, date palm research area and Kalaatuk, Gugdaan, kosh kalat

**2.3) Symptoms of infested palm tree:**

The red palm weevil cancelled tissue borer's plants. It is very difficult to obtain the date palm weevil in the tree. The symptoms made by date palm weevil is deep inside of the crown region. The outer hole made by other some insects are also look alike the date palm weevil. *Derobrachus hovorei*. Major infestation includes the fallen of branches down word direction of the date palm, especially from crown region branches become umbrella like structure. In severe infestation red palm weevil, damage whole trunk from inside. Abbas (2010), exposed that *Rhynchophorus ferrugineus* is key beetle bother of a widespread array of date palm trees. Infestation of red palm weevil changes according the size and height of palm trees he moreover detected its life phase in test centre.

**2.4) Detection of the red palm.** The detection of red palm weevil is possible by hearing feeding voices from trunk. The other methods are that someone should follow the trunk tunnels made by weevil. When we scorch the tunnels eaten frays were seen with bad smell odour

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**Figure (01): Big tunnel made red palm weevil in trunk**

**2.4) Collection method of insect:**

Our collection method was based on manual we us iron saw and axe methods. Different life stages including adult red palm weevil (male &female), larvae and pupae were collected from infested date palm trees, from different localities of district Kech Balochistan, Pakistan such as Turbat city, Shay Tigger, Koshkalat and Gugdan. We have collected all the life stages preferably from infested trees of date palm of some commonly grown varieties such as Begum Jhangi, Alleni (Halleni) and Shakri, for further study we brought these specimens in laboratory. The selected palms were which mostly consumed assortments. It includes three selections, Begum Jhangi, Alleni (Halleni) and Shakri. Each specimens of the red palm weevil were reserved distinctly, variety wise inside different jars, for their culture by giving regular food and labelled each.



**Figure (02): collecting of Red palm weevils from tree trunk in Turbat district kech**

**2.5) Raring method of red palm weevil**

Raring method of red palm weevil were conduct in the laboratory underneath the organised situation on the natural food, providing artificially pieces of middle parts of palm trunk. it is vital to sustain temperature. We maintain the temperature in between 25±30 °C and humidity 60-70% except cocoon. We use different material to maintain the temperature and humidity. We provide the natural diet of food special our three selected varieties begum Jhanghi Alleni and Shakri. In laboratory swarms remained documented distinctly to discover difference among months. Together fit and infected fragments were detected and record infestation calculation. Shahina, *et al.,* (2009), study rearing method of *Rhynchophorus ferrugineus* in laboratory as well as in pulverised environment as to carry out different effectiveness readings using EPNs. Each data was documented at every month with intermissions for years (January 2015 to December 20016). Investigations were booked every first of week. Signs of infestation were captured. Al-Ayedh (2011), Research were completed for growth and usefulness of semi artificial food which is present at kingdom of Saudi Arabia.

**3) Results and discussions:**

**Egg fecundity** The females laid eggs at different quantity. Female lay eggs especially in morning and evening times. Egg fecundity is different in each female. It depends upon the diet. The

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more sugar contents diets, result females lay more eggs. we provided the females lays egg about -190-230 per season. These eggs were laid by different interval of the days. The average eggs laid by females were 3-4 per day.

**Morphology of the eggs:** eggs were oval, cylindrical in structure, these eggs were about 2-3 mm long. The anterior portion of eggs were small narrow in structure while posterior structure was thick and oval in structure. Externally eggs were whitish in colour. Eggs were covered with thick cuticle.



**Figure No (09) shows eggs of red palm weevil**

**Table N01 showing the hatched and unhatched ratios on different selected varieties**

| Name of variety | Eggs kept in variety | Hatched ratio | Un hatched ratio | Hatched % | Un hatched % |
|---|---|---|---|---|---|
| Begum Jhanghi | 150 | 120 | 30 | 80 | 2 |
| Alleni(Halleni) | 150 | 110 | 40 | 73 | 26 |
| Shakri | 150 | 105 | 45 | 70 | 30 |

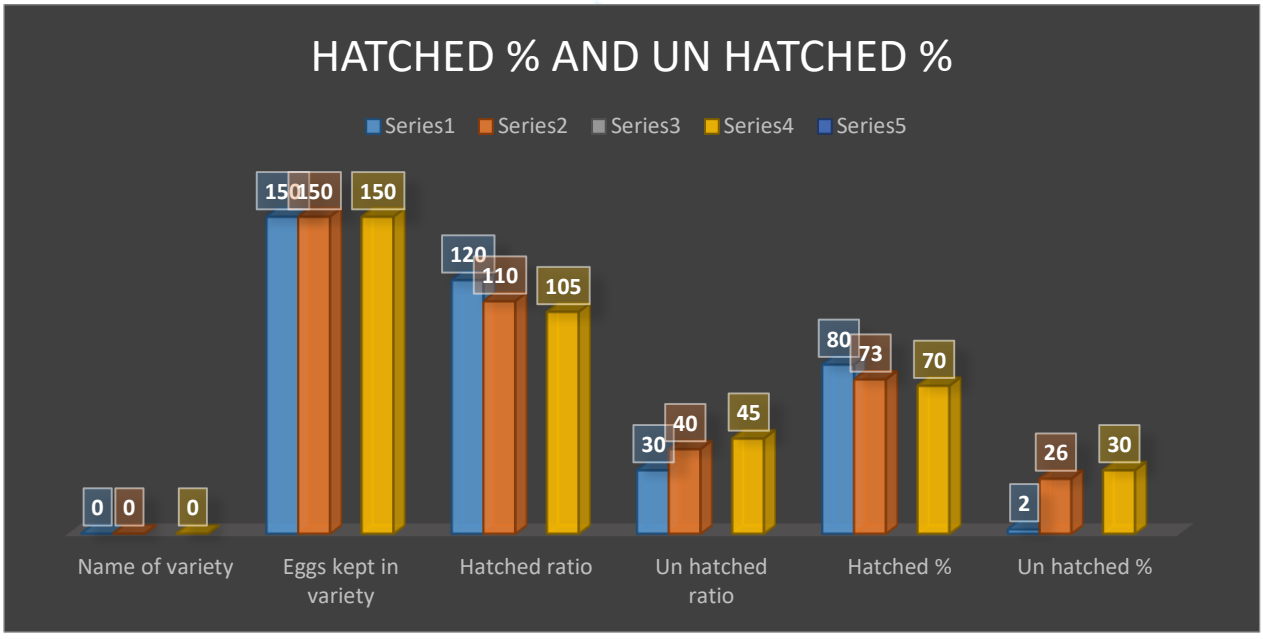



**Figure No (10): showing hatching and unhatched ratios**

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**Development of the larval stages:** larvae of the red palm weevil were whitish in colour after hatching process. from its anterior parts mouth were present. Mouth contain the mandibles for chewing fibres of the date palm stems the first larval stages were smooth only one segment was appearing but that was not clearly visible. Larvae of red palm weevil grow many mm long, first larval instar were 2-4 mm in length while last eighth larval instar were 45-50 mm in length (shown in figure No 02) (Hussain et al. 2013, Paddy 2009). The total larval days were also different in ranges on each selected variety, on begum Jhanghi variety total larval days were observed about 99 days, on Alleni total larval days was recorded from 99-110 days while on Shakri it was recorded maximum larval days about 112-120 days respectively. During our study we observed four generations of the red palm weevil .in each generation. We obtain only little variation of the larval stages. Larval, pupal feeding method and behaviour was deliberate, as nourishing, struggling. They also mentioned that the development from young to timeworn larvae they damage the intermit parts Li Lei et al., (2009)

**Table no 04 - Measurement in mm of each larva on different selected varieties**

| Larval instar | Begum Jhanghi | Alleni(Halleni) | Shakri |
|---|---|---|---|
| 1st | 4 | 3 | 2.0 |
| 2nd | 5 | 4 | 4 |
| 3rd | 11 | 10 | 9.0 |
| 4th | 27 | 16.0 | 15.8 |
| 5th | 28 | 26 | 25.3 |
| 6th | 35 | 34 | 32 |
| 7th | 46 | 42 | 39 |
| 8th | 50.2 | 49.5 | 48.3 |

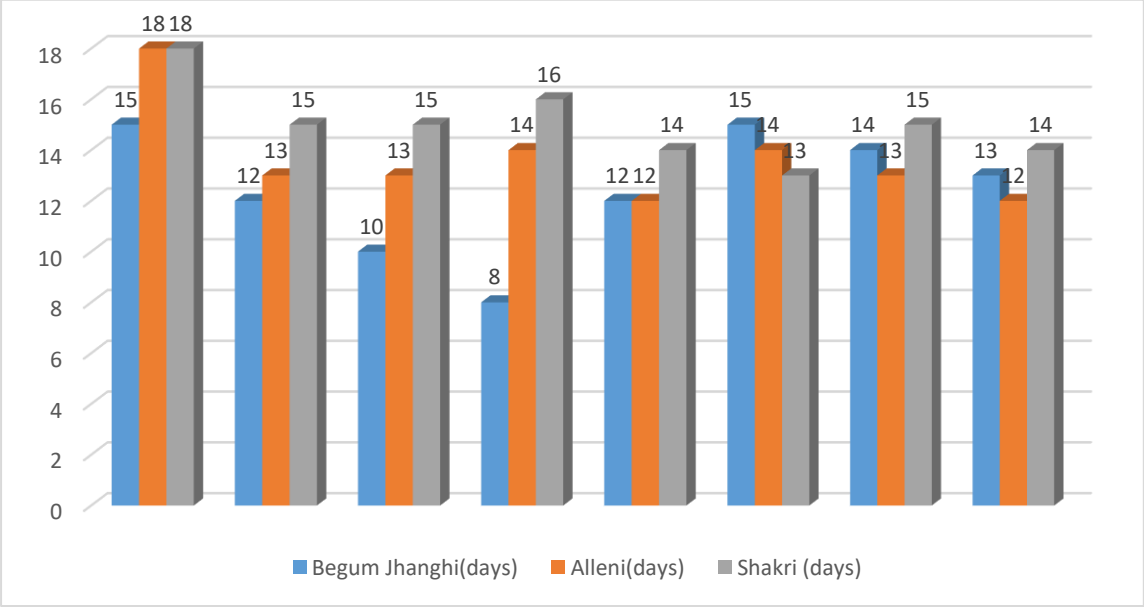



**Figure No (12) shows the measurement of each larva**

**Pupa of the red palm weevil:** After few days eighth larval instar stopped feeding. In this stage it goes to pre-pupal stages. The pre-pupal stages remain 3-4 days on different varieties

After three to four days it wrap itself with fibres of the stem of date palm tree. The pupa was brownish in colour. the size of each pupa on different verities were also different. Morphology of pupa shoe that from its anterior part head is present with antennae. dorsal surface possess wing turned down word to ventral surface, segments were also clearly visible

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from this region. Ventral surface of the pupa of red palm weevil contain two pair of legs at abdomen region. From anterior of the ventral surface snout is present, besides snout two setae are also present.



**Figure (14) showing pupa of red palm weevil**

**Cocoons of weevil: after** pre-pupal stage larvae wrap itself inside of the fibers this condition of wrapping in fibers is cocoons. Pupa in the cocoons remains14-30 days inside of fibers. The cocoons were two types one was larger and second one was smaller in size. After carefully observation we observed that larger cocoons develop into females while smaller once was develop into males.



**Figure No (15) shows larger and smaller cocoons**

**Adult red palm weevil**: after completing the pupal stage red palm weevil, adults emerge from the cocoons. They were large in size. A. Hathal and M. H. 1997 Showed biological character and morphological character of Rhynchophorus ferrugineus at Saudi Arabia. Adult's body divided into head thorax and abdomen regions possess two antennae two setae and one snout from its anterior region. While legs were present at abdomen region. After emergence from the cocoons adult red palm weevil searching food and it partners. Male start damaging trunk with their snouts. Especially females bore inside of trunk for egg laying and feeding purpose

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**Figure No (16): shows the emerging of red palm weevil from cocoons**

**Discussions and conclusions**

The date palm weevil is injurious pest for the date palm trees as well as on coconut palm in the world it destroys million of the tree trunk. Date palm weevil after attack damage completely tree trunk or make big hole inside tree trunk; it attacks reported from all over the world .it loss the economically values as well as nutritional values of the many countries. our present study was occurring in Turbat Balochistan Pakistan. Turbat Balochistan is still undiscovered area for research purpose. The people of Turbat region is still unaware about this destructive pest except those who are working in the gulf countries. We observed the egg laying process. We also observe feeding behaviour of the red palm weevil including different larval instars, we also the damage of different larval stages. During our study we observe that most susceptible variety which is Begum Jhanghi and second susceptible variety was Alleni while more resistant variety was Shakri We also observe the eight larval instar on each selected variety, total larval days were also variant on begum Jhangi variety total larval days were observed 90-99 days while on Alleni variety it was observed 99-110 days and on the third selected variety Shakri total days of larval stages were observed 110-120 days respectively .we also observe carefully flying behaviour of the Red palm weevil, adult red palm can fly for one or more kilometres. We observe that mostly adult red palm weevil first opens their right wings and then left wing for flying purpose.

**REFERENCES:**

Rahalaker, G. W., A. J. Tamhankar, and K. Shanthram (1978). An artificial diet for rearing red palm weevil, *Rhynchophorus ferrugineus* Oliv. *J. Plantation Crops* 6: 61-64.

Salama, H.S., Zaki, F.N. & Abdel-Razek, A.S (2009). Ecological and biological studies on the red palm weevil Rhynchophorus ferrugineus (Olivier). *Archives of Phytopathology and Plant Protection* 42, 392–399.

Shahina, F., Salma, J., Mehreen, G., Bhatti, M.I. & Tabassum, K.A (2009). Rearing of *Rhynchophorus ferrugineus* in laboratory and field conditions for carrying out various efficacy studies using EPNs. *Pakistan Journal of Nematology* 27, 219–228.

Tellez, R., Angulo, C., and Pardo, D. (2006). Evolving the walking behavior of a 12 doff quadruped using a distributed neural architecture. Biologically Inspired Approaches to Advanced Information Technology, pages 5–19.

Viado, B. G and E. A. Bigornia (1949). A biological study of the Asiatic palm weevil, *Rhynchophorus ferrugineus* (Olivier) (Curculionidae: Coleoptera). *The Philippine* Agri. 33:1-27.

Frontier in Medical & Health Research

ISSN: (e) 3007-1607 (p) 3007-1593

Wattanapongsiri.A (1966). A revision of the genera *Rhynchophorus* and *Dynamis* (Co leoptera: Curculionidae). *Department of Agriculture Science Bulletin*, Vol. 1. Bangkok (TH)

Li L, Zhang Q, Hu X, Warren A, Al-Rasheid KAS, Al-Khedheiry AA, Song W, (2009). A redescription of the marine hypotrichous ciliate, *Nothoholosticha fasciola* (Kahl, 1932) nov gen., nov comb. (Ciliophora: Urostylida) with brief notes on its cellular reorganization and SS rRNA gene sequence. European Journal of Protistology, 45:237-248.

Murphy, S. T., and B. R. Briscoe (1999). The red palm weevil as an alien invasive: biology and the prospects for biological control as a component of IPM. *Biocontrol News and Information*. 20: 35-46.

Nirula, K.K. (1956). Investigations on the pests of coconut palm. Part IV. *Rhynchophorus ferrugineus*. *Indian Coconut Journal* 9, 229–247.

Riad, M (2006). The date palm sector in Egypt'. *CIHEAM- Options Mediterraneennes, 45-53.*