

- Curtis, K.H., Julie, A.C., Melinda, S.B., Uriel, K., Robert, F.S., John, H.O., Saidi, T.M.N., Peter, M., Orit, H., Joseph, H., Cara, P., Eric, M.M. and Charles, H.K., 2004. *Am. J. trop. Med. Hyg.*, **70**: 449-456.
- Chingwena, G., Mukaratirwa, S., Kristensen, T.K. and Chimbari, M., 2002. *J. Helminthol.*, **76**: 283-93.
- Castro-Trejo, L., Garcia-Vasquez, Z. and Casildo-ieto., 1990. *Vet Parasitol.*, **35**: 157-61.
- Dreyfuss, G., Novobilsky, A., Vignoles, P., Bellet, V., Koudela, B. and Rondelaud, D., 2007. *J. Helminthol.*, **81**:7-12.
- Gohar, H.A.F. and El-Gindy, H.I., 1960. *J. Egypt. med. Assoc.*, **43**:816-835.
- Kendall, S.B., 1950. *J. Helminthol.*, **24**: 63-74.
- Keyyu, J. D., Monrad, J., Kyvsgaard, N.C. and Kassuku, A. A., 2005. *Trop. Anim. Hlth. Prod.*, **37**: 303-314.
- Krailas, D., Dechruksa, W., Ukong, S. and Janecharut, T., 2003. *J. trop. Med. Publ. Hlth.*, **34**: 286-90.
- Liang, L., Mondal, M.M.H., Idris, M.A., Lokman, H.S., Rajapakse, R.P.V.J., Satrija, F., Jose, L., Diaz, E., Suchart, U. and Attwood, S.W., 2010. *Parasites and vector*, 3:57. doi:10-1186/1756-3305.
- Mage, C., Bourgne, H., Toullie, J.M., Rondelaud, D. and Dreyfuss, G., 2002. *Vet. Res.*, **33**: 439-347.
- Mavenyengwa, M., Mukaratirwa, S., Obwolo, M. and Monrad, J., 2006. *J. Vet. Res.*, **73**:95-100.
- Morakot, K. and Sakchai, W., 2006. *J. Paraistol. Res.*, 99: 306-308.
- Maqbool, A., Hayat, C.S., Tanveer, A., Salahuddin, M. and Ahmad, A., 2003. *Iranian J. Vet. Res. Univ. Shiraz*, **4**:1382.
- Malek, E.A., 1984. *Medical and economic malacology*. Academic Press, New York.
- Pfukeni, D.M., Monrad, J and Mukaratirwa, S., 2005a. *J.S.Afr. Vet. Assoc.*, **71**: 9-17.
- Pfukeni, D.M., Mukaratirwa, S., Willingham, A.L. and Monrad, J., 2005b. *Onderstepoort J. Vet. Res.*, **72**: 67-86.
- Philippi, T.G., 1970. *Malacologie*, **10**:113-151.
- Phiri, A.M., Phiri, I.K., Chota, A. and Monrad, J., 2007. *J. Helminthol.*, **81**: 85-92.
- Rondeland, D., Vigners, P., Fousi, M., Moncef, M. and Dreyfuss, G., 2007. *Parasitol. Res.*, **100**: 861-865.
- Sheikh, B.A., Isani, G.B. and Ansari, N.N., 1984. *Pakistan Vet. J.*, **4**:28.
- Sri-Aroon, P., Butraporn, P., Limsoomboon, J., Kaewpoolsri, M., Chusongsang, Y., Charoenjai, P., Chusongsang, P., Numnuan, S. and Kiatsiri, S., 2007. *Southeast Asian J. trop. Med. Publ. Hlth.*, **38**:294-301
- Szmidi-Adjide, V., Rondelaud, D. and Dryefuss, G., 1994. *Bull. Soc. Fr. Parasitol.*, **12**: 183-188.

(Received 28 April 2011, revised 30 December 2011)

*Pakistan J. Zool.*, vol. 44(6), pp. 1765-1769, 2012.

## Dubas Bug, *Ommatissus lybicus* (Tropiduchidae: Hemiptera) - A New Record From Panjgur, Balochistan, Pakistan

Arif Shah,<sup>1\*</sup> Ata-Ul-Mohsin,<sup>1</sup> Imran Bodlah,<sup>1</sup> Muhammad Naeem<sup>1</sup> and Zahid Hafez<sup>2</sup>

<sup>1</sup>Pir Mehr Ali Shah Arid Agriculture University, Rawalpindi, Pakistan

<sup>2</sup>Department of Agriculture Research Balochistan, Quetta

**Abstract:** - Dubas bug, or the Old world date bug, or plant-hopper of Middle East *Ommatissus lybicus* Bergevin (Tropiduchidae: Hemiptera) has been recorded in several countries in the near East and North Africa. Dubas bug, locally known as Sheragoo (due to secretion of honeydew) is recorded for the first time from Pakistan. Its seasonal distribution, host plant, habitat, habits and natural enemies in Pakistan have been discussed in this paper.

**Key words:** Dubas bug; *Ommatissus lybicus*, Tropiduchidae, Hemiptera, date palm, honeydew, Sheragoo, biphagous, bivoltine.

**D**ate palm is one of the important fruits of Pakistan. The major growing areas are restricted to some districts such as Panjgur and Turbat of Balochistan, Sukker and Khairpure of Sind and D.I. Khan of Khyber Pakhtoonkhawa. Factors such as improper fertilization, imbalanced nourishment and biotic stress, *i.e.*, red palm weevil, mites and mainly the presence of Dubas bug *Ommatissus lybicus* Bergevin, adversely affect the date yield (GOB, 2006).

Dubas bug, so called from the honeydew, Arabic,  *dibis* (Hussain, 1963), or the Old world date bug (Klein and Venezian, 1985), is also known as the Planthopper of Middle East (Howard, 2001). Dubas bug was first noted as pest of date palm in Basra area of Iraq, between 1919-1920 (Ramachandra, 1922) and was named as new Fulgorid, *Cinixii*, group but the description,

\* Corresponding author: arifshahkakar@gmail.com

drawing and typical damage symptoms (secretion of honeydew) assumed that it be the same pest (Dowson, 1936). Since its first record in 1919 from Iraq, it was reported from Iran (1937), Sudan (1980), and Israel (mid 1980s) (Afchar, 1938; Askari and Bagheri, 2005; El-Haidari, 1982; Klein and Venezian, 1985). This notorious pest is now distributed in several countries in the near East and North Africa (Alfieri, 1933, 1934; Dowson, 1936; Hussain, 1974; Gharib, 1966; Hussein and Ali, 1996; Waller and Bridge, 1978; El-Haidari, 1982; El-Haidari and Al-Hafidh, 1986).

Date palm is the only host of this bivoltine pest and it is not a diseases vector (Gassouma, 2004; Howard, 2001). It only causes direct damage to date palm by draining sap. In case of heavy infestation, this pest produces extremely large quantities of honeydew, which cover the leaves and support sooty mold that growth on the honey dew and reduce the photosynthetic activities (Dowson, 1936; Mokhtar, and Al-Mejeni 1999; Klein and Venezian, 1985; Elwan and Al-Tamiemi, 1999; Gassouma, 2004). However, sooty mold was not observed on palm infested with dubas bug in the Arava valley, Israel (Klein and Venezian, 1985).

Dubas bug is considered a major pest of date palm in several countries of Old World (Kelin and Venezian, 1985), and it is the ranked one among pests of date palm in Iraq (Heil, 2007). In case of heavy infestation, the dubas bug might reduce the crop yield to level less than 50% (Gassouma, 2004). However in Iraq no damage and no losses in production were detected in the presence of this pest in large numbers on date palms (Ramachandra, 1922; Kelin and Venezian, 1985).

The genus *Ommatissus* has 11 species which differ based mainly on the extent and position of the dark marking on the face, lorae and genae, and on male genitalia (Asche and Wilson, 1989). In this study, host range, distribution and re-description of Dubas bug was carried out to establish whether the *Ommatissus lybicus* species present in Panjgur is the same as that found in other parts of the world. In this manuscript, this species is presented as a first record from Pakistan.

#### *Materials and methods*

During the course of 2008-10 in the month of

June and October surveys of infested date orchards in five Union Councils (UCs) were carried out. In each UC, 10-15 orchards were selected at random. The number of Dubas bug adults were collected from infested plants in selected area using an aspirator and preserved through wet and dry methods for identification and re-description. Both nymphs and adults were also collected by using yellow sticky traps. Nymphal instars were preserved in alcohol for description purpose. Sampling was done on weekly basis.

Specimens were identified according to Asche and Wilson (1989), while the illustrations were prepared using a Nikon microscope (SMS-1500 with 30x 1-11.25x), measurements of different body parts were taken by using an ocular micrometer in Nikon microscope (XSZ 107 BN, with 10x). Line drawings of important body parts were prepared with the help of stedler pen (0.2mm).

#### *Ommatissus lybicus* Bergevin (Fig. 1)

*Ommatissus binotatus* var. *lybicus* Bergevin,  
1930:20

#### *Identification characters*

Lorae dark brown; penis without sub-apical tooth or spine

#### *Re-description of female*

Body yellowish green or yellowish earth; 5-7mm long; about 2.7 times longer than wider at thorax. Forewing one times longer than wider. Eyes about 1.4 times longer than wider in dorsal view; distance between eyes is 1.1 times the eyes length. Vertex basal width to median length ratio is 1.35-1.61: 1.1. Frons spot quadrilateral; 1.3 times longer than wider. The frons ratio of median length to width at eyes is about 1.14-1.1. Pronotum 1.1 times wider than longer; width about 1.8 times shorter than distance between two dots on pronotum. Pronotal spot circular, 2.2 times wider than longer. Forewing one times longer than wider; about 1.1 times longer than body size; tegmina and wings translucent. Thorax 1.3 times wider than longer. Hind legs are shown in Figure 1D and genitalia are shown in Figure 1E.

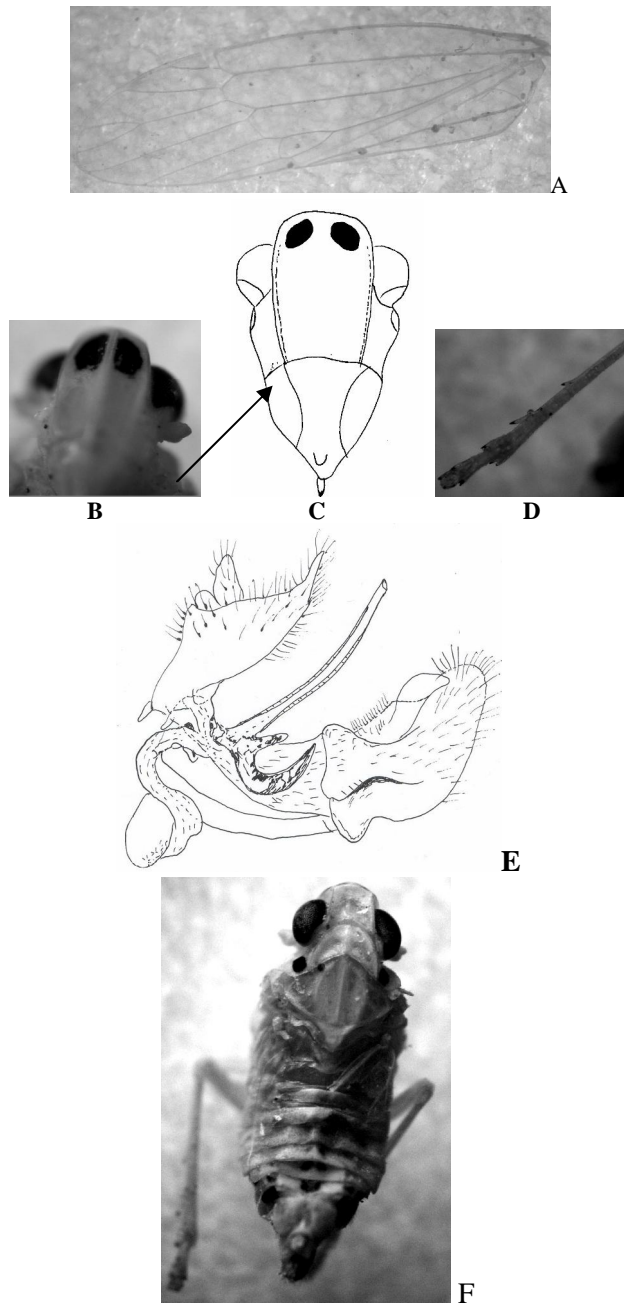


Fig. 1. *Ommatressus lybicus*; A, fore wing venation; B, two spots on upper frons; D, spines on meta leg; E, male genitalia; F, adult (wings removed).

Measurements (in mm at 10X): Dorsal eye length: 0.38; Eye width: 0.28; Distance between eyes: 0.43; Head width: 0.93; Maximum thorax width: 1.25; Maximum thorax length: 1; Distance

between two dots (Pronotum): 0.63; Pronotum width: 0.35; Pronotum length: 0.31; Pronotum spot size: 0.6; Frons spot size (length): 0.28; Frons spot size (width): 0.13; Frons spot size length: 0.13; Frons spot width: 0.1.

#### Male

About 1.7 times shorter than female. Abdominal segment 7-8, lack four spots.

#### Description of nymphal instars

1 <sup>st</sup> instar	1.1-2.3mm, 3 grey spots on each abdominal segment; eyes red; wing buds not developed.
2 <sup>nd</sup> instar	1.73-2.25mm; 2 grey lines along the dorsal side of the body; wing buds extending downward
3 <sup>rd</sup> instar	2-2.23mm; wing buds covering 1 <sup>st</sup> abdominal segment and part of 2 <sup>nd</sup> segment
4 <sup>th</sup> instar	3-4mm; wing buds covering 1-2 part of 3 <sup>rd</sup> segment.
5 <sup>th</sup> instar	2.6-3mm; wing buds covering 1-3 part of 4 <sup>th</sup> segment.

Each instar with 16 white waxy filaments (with several finer filaments) at caudal part of body.

#### Remarks

Specimens collected from Pakistan were compared with the description given by Asche and Wilson (1989) and Kelin and Venezian (1985) and found to be similar.

#### Material examined

Khuda Badan, Tusaap, and Gramkan, 23-vi-2009, 50 male and 50 female, date palm; Tusap, 1-vii-2008, 20 male and 30 female, date palm; Gramakan, Khuda Badan, Washbood, 20-x-2010, 40 male and 60 female, date palm.

#### Seasonal distribution

Dubas bug has two distinct generations (summer and over-wintering) in a year (Ba-Angood *et al.*, 2009; Klein and Venezian, 1985). Payandeh *et al.* (2010) described that the nymphs of Dubas bug were active from April to May and August to October, at first and second generations respectively. But in our studies the nymphs of 1<sup>st</sup> (over-wintering/spring) and 2<sup>nd</sup> (summer) generations emerged on first week of April, and 4<sup>th</sup> week of August in 2009, while during the second

year (2010) the first instar nymphs of respective generations came out during the last week of March and 3<sup>rd</sup> week of August, respectively. The pest hibernates and aestivates in egg stage during the first and second generation, respectively (Askari and Bagheri, 2005). During the current survey in 2008, 2009 and 2010 it is now distributed in the whole date growing area of Panjgur. Dubas bug being weak flyer and with shorter period of adult stage (15-20 days), can be dispersed and distributed in the orchards through wind and plant material.

#### Host plant

Lepseme in 1947 reported that *Chamerops humilis* L. is an alternate host of the Dubas bug while Gossama in 2004 reported that date palm is the only host of this pest. However, during the course of current studies the Dubas bug (*Ommatissus lybicus*) was collected from *Nanorrhops richieana* (Family Palmae) locally called Pish/Dazz about 15 -18 Km apart from date growing area in district Panjgur of Balochistan. Dubas bugs were found feeding on all varieties (Kehraba, Jan-sore, Mozavati, Rabbai, Sabzoo and Abe-dandan) but with different degree of infestation in relation to variety and agronomic practices. Kehraba was most preferred. The name of wild species Dazz was further confirmed from "Flora of Balochistan" written by Bickle, and Forest Department, Balochistan.

#### Damage and loss

On the basis of honeydew droplets from plants recorded on water-sensitive paper (WSP) and oily appearance of leaves, the cultivar Kehraba was more infested and susceptible as compared to other cultivars of the area. According to date growers, severe hopper infestation could result in premature fruit shedding (30% growers), delay in fruit maturity (20% growers), reduction in fruit shelf life (5% growers), reduction in post-harvest storage period (40% growers), and change in taste from sweet to bitter (50% growers) and fruit weight loss (100% growers). Majority of the growers reported that severe hopper infestation leads to 25-30% loss in the yield.

#### Habits and habitats

Being sap feeders, the nymphs and adults suck the sap from leaflets, midrib of fronds, and in case of severe infestation can be found on the fruit stalk and fruit. The nymphs and adults prefer the shady and green part of date palm. The adults lay eggs in the leaflets and remain dormant on an average of 62.70 and 147.60 days during summer and over-wintering generation. The bug completed the whole life cycle on fronds as described by Jasim and Al-Zubaidy (2010).

#### Natural enemies

During the current survey in 2008-2010, different bio-control agents like *Coccinella septempunctata* and spiders were found to be feeding on adults. Immature of *Chrysoperla* sp. and *Coccinella septempunctata* were feeding on various nymphal instars of Dubas bug. Ants (unidentified) were also observed in colonies of Dubas bug.

#### Acknowledgements

We wish to express our sincerest gratitude to Dr. Ashraf Posswal, CABI, for confirmation of the specimen from British Natural History Museum.

#### References

- Afchar, D.J., 1938. *Insects Nusbies Aux Arbres Frutries en Iran* (en Iranien), Teheran.
- Alfieri, A., 1933. *Proc. 5th Int. Congr. Ent. Paris*, **5**: 479-482.
- Alfieri, A., 1934. *Bull. Soc. Ent., Egypt*, **18**:445-448.
- Asche, M. and Wilson, M.R., 1989. *Syst. Ent.*, **14**: 127-147.
- Askari, M. and Bagheri, A., 2005. *Proceeding of Int. conference on mango and date palm: culture and export. University of Agriculture, Faisalabad*, pp. 247-251.
- Ba-Angood, S., Al-Ghrabi, A., Sand, A. and Hubsaisan M.A., 2009. *Arab J. Pl. Prot.*, **27**: 1-9.
- Dowson, V.H.W., 1936. *Trop. Agric. (Trin.)*, **13**:180-181.
- El-Haidri, H.S., 1982. *Date Palm J.*, **1**: 308.
- El-Haidri, H.S. and AL-Hafidh E.M.T., 1986. *FAO Bulletin, Baghdad*, **17**.
- Elwan, A.A. and Al-Tamiemi, S. S., 1999. *Egypt. J. agric. Res.*, **77**: 1547-1553.
- Gassouma, M.S., 2004. *Pest of date palm (Phoenix dactylifera)*. Proceeding of Regional Workshop on Date Palm Development in the Arabian peninsula, Abu-Dhabi, UAE May 2004, <http://www.icarda.cgiar.org/APRP/datepalm/Topics/Pest/pest.htm> Government of Oman (2000). <http://www.Eteconics.Com/Omn/gi/natural.Asp> (Accessed: 23 August 2008).

- Gharib, A., 1966. *Ent. Phytopath. Appl.* 24: 3747 (Persian, French, pp. 20-22.
- GOB, 2006. Project proposal for the control of Dubas bug in Panjgur district. *Agriculture Extension Department, Balochistan Report*, pp. 5.
- Heil, M.J., 2007. *Iraqi dates production-a matter of national pride*. file://H:/ DVIDS news Iraqi date production, pp. 1-4.
- Howard, F., 2001. Insect pest of palms and their control. *Pesticides outlook-December 2001*, pp. 240-243.
- Hussain, A.A., 1963. *Bull. Ent. Res.*, **53**: 737-745.
- Hussain, A.A., 1974. *Dates palm and dates with their pests in Iraq*. University of Baghdad, Ministry of Higher Education and Science Research, Iraq, pp. 166.
- Hussein, A.E. and Ali, M.A., 1996. *Bull. ent. Soc. Egypt*, **74**: 1-8.
- Jasim, H.K. and Al-Zubaidy, H.K. 2010. *Acta Hort.*, (Ishs) 882: 465-470.
- Klein, M. and Venezian, A., 1985. *Phytoparastica*, **13**: 95-101.
- Lepseme, P., 1947. *Les insectes des Palmiers*. LeChavalier, Paris, pp. 904.
- Mokhtar, A.M. and Al-Mejeni, A. M., 1999. *Agric. Sci.*, **4**:1-4.
- Payandeh, A., Kamali, K. and Fathipour, Y., 2010. *Mun. Ent. Zool.*, **5**: 726-733.
- Ramchandra, R.Y., 1922. *Mem. Dep. Agric. Mesopotamia*. No. 6, 21 pp.
- Waller, J.M. and Bridge, J., 1978. *Pest. Abstr. News Suman*, **24**: 313-326.

(Received 31 January 2011, revised 30 September 2011)

*Pakistan J. Zool.*, vol. 44(6), pp. 1769-172, 2012.

## Prevalence of Human Malaria Infection in Pakistani Areas Bordering Iran: District Turbat, Pakistan

Mohammad Iqbal Yasinzai and Juma Khan  
Kakarsulemankhel\*

Department of Zoology, University of Balochistan,  
Saryab Road, Quetta

**Abstract:** This paper reports the prevalence of malarial parasites in the human population of District Turbat. Out of a total of 5912 blood samples 46.4% were found positive for malarial parasite. The incidence of *Plasmodium falciparum* was 69.4% and *P. vivax* was 30.5%. The incidence was higher

(72.1%) in males. Age wise, the prevalence of the disease was 70.7% and 69.2% for age group 21-years and above and 11-20 years. The prevalence was higher 87.5% in May. No case of *P. malariae* and *P. ovale* was detected.

**Key words:** Human malaria, slide positivity rate, *Plasmodium vivax*, *P. falciparum*

Malaria is one of the most devastating diseases in the world. Over 3 billion people live under the threat of malaria in 24 endemic countries and it kills over a million each year, mostly children (Korenromp, 2005).

An outbreak of malaria occurred in February, 2004, in the rural districts of Sindh and Balochistan provinces, *falciparum* malaria accounted for about 85% of cases (IRIN, 2004). Pakistan could be witnessing upcoming malarial endemicity in various rural areas, owing to the deep, stagnant flood waters providing breeding sites for large numbers of mosquitoes. Cases of malaria in Pakistan have also been imported in the past few decades because of the influx of Afghan refugees. In the many camps that the Afghan refugees occupied in Pakistan, 150 000 cases of malaria were diagnosed and treated each year, about 30% of which were due to *Plasmodium falciparum* (Rowland and Nosten, 2001).

Hozhabri *et al.* (2000) observed slide positivity rate 5.9% with 65% cases of *P. falciparum* and 35% of *P. vivax* in children, at Jhangra, Sindh. Bhalli and Samiullah (2001) presented a review of *falciparum* malaria. Akbar (2002) found high incidence of *falciparum* as compared to *vivax* (65% vs 35%) among 100 positive children for malaria at Baqai Medical University. Murtaza *et al.* (2004) studied 3.1% slide positivity with 58% *P. falciparum* and 42% *P. vivax* in Sindh. Mahmood *et al.* (2006) studied 348 patients with fever at Civil Hospital and Ankle Sria Hospital Karachi from August 2003 to December, 2005 and observed 35% positivity rate, with *P. falciparum* 88.5% and *P. vivax* 9%. Malaria in NWFP was studied by Saleem *et al.* (2006) and observed that cerebral malaria was more common in males (64%) and most vulnerable group was pregnant women. Nizamani *et al.* (2006) observed an average slide positivity rate 2.4% in Sindh and *P.*

\* Corresponding author: kakarzoologist@yahoo.com