

First record of Red-Back Spider *Latrodectus hasselti* Thorell ,1870(Araneae:Theridiidae) from Basrah, South of Iraq

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ABSTRACT

This work is a part of Ph.D thesis submitted by the second author. The Red-back spider *Latrodectus hasselti* Thorell,1870 is reported from temperate and tropical zone throughout the world ,we report *Latrodectus hasselti* for the first time from Safwan area, Basrah, South of Iraq, we provide detail taxonomic description for the species based on female specimen collected from the area mentioned above.

Keywords: Iraq, *Latrodectus hasselti*, Taxonomy, Ecology.

1. Introduction

The spider of the genus *latrodectus* Walckenaer 1850 (Araneae:Theridiidae) occur in temperate and tropical zone throughout the world, members of this genus are venomous due to the highly potent neurotoxin α -latrotoxin contained in their venome ,which triggers massive neurotransmitter release upon injection in vertebrates (Orlav *et al.* , 2000).

L.hasselti are a widow spider (Stallybrass, 1969) they are the most medically importance, Its bite is usually mild and frequently may not be felt, symptoms may rise within an hour after biting and start as a reddish lump with red streak publishing out from it, followed by pain, sweating, muscular weakness, nausea, vomiting, abdominal cramping, increasing blood pressure, perspiration and rigidity accompanied by sever hypertension. The very young or elderly persons are high risk groups, especially those who have pre existed cardiovascular disease (Cavalieri, 1987; Korszniak and story, 1994). Sever ache was explained as pain more

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than a bee sting or a like it, however, pain could be increase within the first hour (Geoffrey and Gray, 2003) there is no report of sting by this spider in our region.

This species is distributed in a wide area from South-East Asia to Australia and New Zealand. It can be found in places around buildings, outdoor furniture, machinery and pile of materials. In the bush, they nest under logs and rocks. This spider builds its web in dry, sheltered places, e.g. among stones, in logs, culverts and sheds (Forster, 1995).

Australia is the native region of the red back spiders (Nimorakiotakis and Winkel, 2004). Since 1959, the Australian species were known as *L. mactans hasseltii* and was believed conspecifics with *L. mactans* Fabricius populations as far distant as the Mediterranean (Levi, 1959). However, the taxonomy of this genus is still largely unresolved (Levi, 1983).

Only 31 species have been reported under this genus (Platnick, 2014), The Australian red back, *Latrodectus hasseltii* Thorell 1870, found across much of Australia (Raven and Gallon, 1987; Isbister and Gray, 2003). *Latrodectus hasseltii* is listed occurring in South East Asia (Platnick, 2010), including New Guinea (Chrysanthus, 1975), The Philippines (Cariaso, 1967), India (Patel, 1973; Manju and Kumar, 2001), and more recently, has become established outdoors in New Zealand (Forster, 1984; Forster and Forster, 1999) and Japan (Ori et al., 1996; Nihei et al., 2004) as well as in greenhouses in Belgium (Blick *et al.*, 2004). Shahi *et al.* (2011) recorded *Latrodectus hasseltii* from Iran. The only recorded of *Latrodectus scelio* from Baghdad / Iraq was done by Abdul-Rassoul *et al.* (2012).

2. Materials & Methods

2.1 Studying area

Safwan city is in the west of Basrah province located at latitude 30° 15' 45" north, longitude 47° 42' 26" east, Safwan city has a lot of farms of greenhouses and ornamental trees. Maximum temperature in summer is 55°C the minimum temperature in winter is 10 °C, maximum relative humidity is 90% and minimum as low as 20%.

2.2 Spiders collection

Spider was collected during February 2014, it was found in its web with 3 egg sacs ,collection was done by hand picking and then preserved in 75% - 80% ethyl alcohol in 10ml plain tubes, alcohol was replaced after two weeks to avoid any contamination. Live specimen was photographed at the field by digital camera Canon EOS-550 D, the temperature and relative humidity were recorded by field thermometer, KT-903.

Spider parts were photographed, under dissecting microscope Wild M3B Heerbrugg Switzerland by digital camera MDCE-5C. USB 2.0. All measurements are given in millimeters, length and width variations of the body, cephalothorax, abdomen, legs, and eyes are given below.

2.3 Preparation of body part

The identification based on the color of the live specimens, arrangement of eyes, and female epigynum. Recognition was carried out by morphological characteristics according to the taxonomic key diagnostic (Levi, 1959).

Female genitalia were carefully removed from the abdomen by lifting the mid epigastric furrow using no.1 insect pin fixed in a wooden handle. The margins of the epigyne were picked close to each as possible with a fine needle, and then the entire shield was detached using fine

forces .The epigynes were macerated in 60% H₂O₂ hot solution (80 °C) from 5 to 15 minutes to wash them where they were passed on series of different concentrations of alcohol started with 30%, 50%, 70%, 90% and 100% for 5 minutes for each concentration.

The genitalia were directly placed in the depression of concave microscope slide and drawing by camera lucida with dissecting, after drawing the genitalia were preserved in 10 ml vial (contain 70% alcohol) with the original specimen.

3. Results

No. of collected spiders =3 females (1holotype, 2 para types).

Red-back spiders were found close to farmers dwelling in their web with 3egg sacs (Figs. 1, 2). Spiders were found in hole near the root of eggplant tree, the hole was covered with tangle web. The temperature and relative humidity were 17°C and 27% respectively.



Fig.1Female with egg sac in their web



Fig.2 Female with their egg-sac

4. Habitat

Female with their egg sacs were collected from farm that contain vegetable crops and ornamental trees, all seeds and saplings were imported from foreign countries, these plants may have the juvenile of the red-black spider, or my introduced in Iraq by transportation of goods by cars or other media, however, Greenstone *et al.* (1987), explained that *L. hasselti* were not found in aerial samples, also Nihei *et al.* (2004) studied *L. hasselti* dispersal, and they found that it does not spread by ballooning but hitchhikes on vehicles or walks. In addition, the climate when the specimens were collected was suitable for these species to maintain and made its web. It has the ability withstand temperatures from below 0°C to 40°C (Forester, 1995).

5. Description

Adult female of *L. hasselti* (Figs 1, 2), total length of the body is 10.66-10.78 mm.

Prosoma: Length, 3.06-3.24 mm.

Eyes: eight, arranged in two rows (plate.1), the diameter of anterior median eyes, anterior lateral eyes, posterior median eyes, posterior lateral eyes were 0.22-0.24, 0.28-30, 0.23-0.26, 0.21-0.23 mm respectively .

Chelicera: 0.70-0.73 mm long, chelicera teeth absent, labium longer than wide, 0.42-0.43 long. 0.21-0.22 wide, Maxilla: 0.67-0.68mm long, 0.35-0.37 mm wide.

Carapace: black, fovea with radiating stria on sides, slightly wider than long, length 3-3.06 mm, width 4-4.2 mm. With four pairs of legs, first leg, femur 6.01-6.03, patella 1.88-1.90, tibia 4.76 -4.78, metatarsus 6.1-6.3, tarsus 1.69-1.71. Second leg, femur 4.5-4.9, patella 1.65-1.68, tibia 2.88-2.9, metatarsus 3.54-3.56, tarsus 1.07-1.09. Third leg femur 3.88 -3.91, patella 1.27-1.29, tibia 2.13-2.16, metatarsus 3.06-3.09, tarsus 1.25-1.28. Fourth leg, femur 6.08 -6.10, patella 1.46-1.49, tibia 4.05-4.08, metatarsus 5.53-5.57, tarsus 1.72-1.76mm. Presence of row comb-like hair on fourth tarsus (Fig. 3).



Fig.3 Presence of one row comb –like hair under the fourth tarsus.

Opisthosoma: length 7.60-7.64 mm, black with red to orange stripe mid dorsally, ventrally with a small transverse red band in front of the spinnerets (Figs. 4, 5). Globular, overlapping carapace, spinnerets situated towards posterior end.

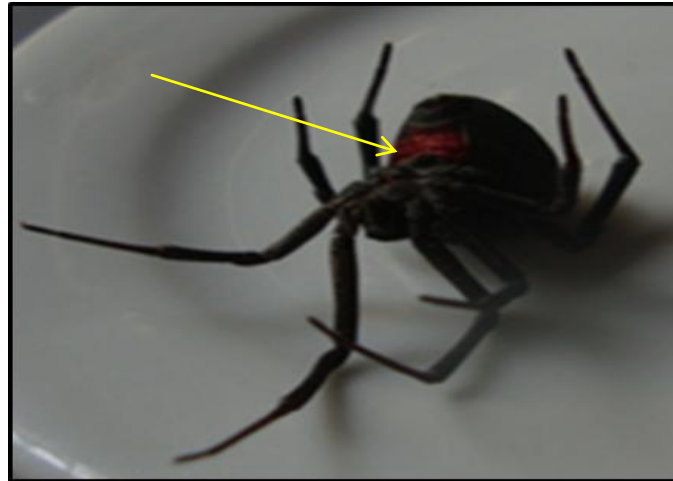


Fig.4 The abdomen of *L. hasselti* with red mark



Fig.5 Red longitudinal stripe on the upper surface of abdomen

Epigynum: with a pair of dumb-bell-shaped seminal receptacles copulatory duct coiled around the seminal receptacles, fertilization ducts curled, present laterally (Plate.2).

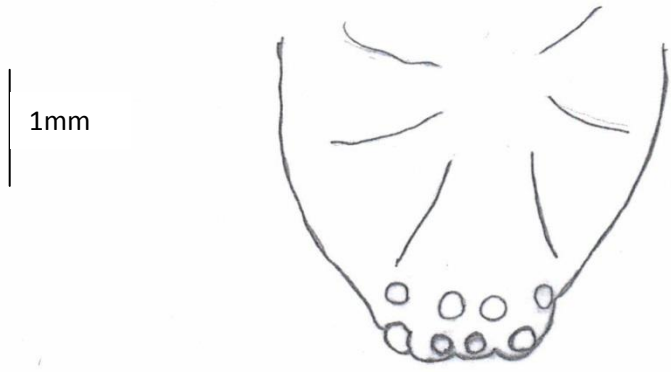


Plate 1: Arrangement of eyes

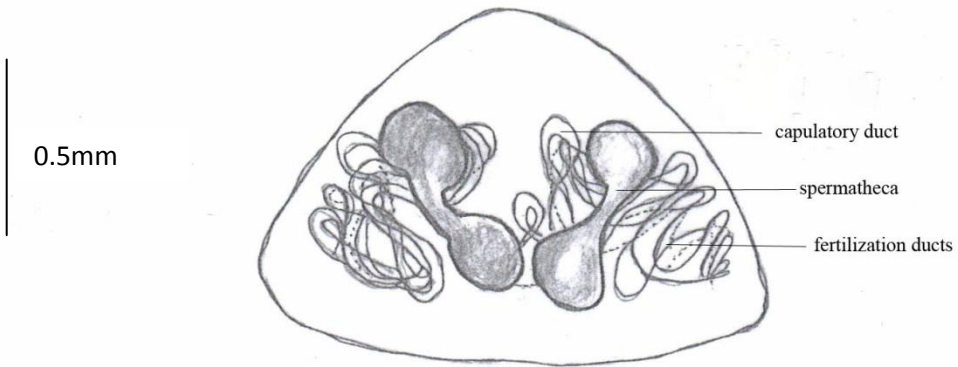


Plate 2: epigynum

6. Remarks

L. hasselti resemble in appearance *L. katipo* but the later different by have a white-bordered red stripe that runs from the uppermost surface of black abdomen back to the spinnerets, in addition the black abdomen has been described as satin or silky in appearance but *L. hasselti* was smooth (Foster & Foster,1999).

References

- Abdul-Rassoul , M. S; AL-Jalely, B. H; AL-Nuaimi, K. T (2012) First record of red –back spider *Latrodectus scelio* Thorell ,1870 (Araneae :Theridiidae) in Baghdad ,Iraq. Bull. Iraq nat .Hist .Mus .12(2):1-5.
- Blick, T; Bosmans, R; Buchar, J; Gajdos̃, P; Hãnggi, A; Van Helsdingen, P. J; Ruz̃icka, V; Starega, W; Thaler, K (2004) Checkliste der Spinnen Mitteleuropas. Checklist of the spiders of Central Europe. (Arachnida: Araneae). Version 1.
http://www.arages.de/checklist.html#2004_Araneae
- Cariaso, B. L (1967) Biology of the black widow spider, *Latrodectus hasselti*, Thorell (Araneae: Theridiidae).Philippine Agriculturist 51:171–180.
- Cavalieri, M. D; Urso, D; Lassa, A (1987) Characterization and some properties of the venom gland extract of a Theriid spider (*Steatoda paykulliana*) frequently mistaken for black widow spider (*Latrodectus tridecimguttatus*). Toxicon. 25: 965–974.
- Chrysanthus, P (1975) Further notes on the spiders of New Guinea II (Araneae, Tetragnathidae, Theridiidae). Zool Verh (Leiden) 140:1–50.
- Forster, L. M (1984) The Australian red back spider (*Latrodectus hasselti*): its introduction and potential for establishment and distribution in New Zealand, In: Laird M (Ed): Commerce and the spread of pests and disease vectors. New York, 273–289.
- Forster, L. M (1995) The behavioral ecology of *Latrodectus hasselti* (Thorell), the Australian red back spider (Araneae:Theridiidae): a review. Record Western Australian Museum. 52: 13–24.
- Forster, R. R; Forster, L. M. (1999). Spiders of New Zealand and their worldwide kin.University of Otago Press, Dunedin, New Zealand.
- Geoffrey, K. I; Gray, M. R (2003) Latroductism: a prospective cohort study of bites by formally identified redback spiders. Med J Australia. 179 (21): 88–91.
- Greenstone, M. H; Morgan, C. E; Hultsch, A. L; Farrow, R. A; Dowse, J. E (1987) Balloonig spiders in Missouri. USA, and New South Wales, Australia: family and mass distributions. J Arachnol 15:136-170
- Isbister, G. K; Gray, M. R (2003) Latroductism: a prospective cohort study of bites by formally identified redback spiders.Med J Aust 179:88–91.
- Korszniak, N. V; Story, D. F (1994) Effects of the venom of a Theriid spider, *Steatoda capensis* Hann, on automatic transmission in the rat isolated atria and caudal artery. Toxicon. 32: 85–96.
- Levi, H. W (1959) The spider genus *Latrodectus* (Araneae, Theridiidae). Trans Am Microscopical Soc. 78: 7–43.

- Levi, H. W. (1983). On the value of genitalic structures and coloration in separating species of widow spiders (*Latrodectus* sp.) (Arachnida: Araneae: Theridiidae). *Verh. Naturwiss Ver Hamburg*. 26: 195–200.
- Manju, S; Kumar, D (2001) Rare sighting of poisonous spider *Latrodectus hasseltii indicus* Simon (Araneae: Theridiidae) in a cotton field in Baroda district, Gujarat. *Curr Sci* 81:1170–1171.
- Nihei, N; Yoshida, M; Kaneta, H; Shimamura, R; Kobayashi, M (2004) Analysis on the dispersal pattern of newly introduced *Latrodectus hasseltii* (Araneae: Theridiidae[sic]) in Japan by spider diagram. *J Med Entomol* 41:269–276.
- Nimorakiotakis, B; Winkel K. D (2004) Spider bite-the red back spider and its relatives. Reprinted from *Australian Family Physician* 33(3): 153–157.
- Ori ,M; Shinkai, E; Ikeda, H (1996) Introduction of widow spiders into Japan. *Med Entomol Zool* 47:111–119.
- Orlova, E. V; Rahman, M. A; Gowen, B; Volynski, K. E; Ashton, A. C; Manser, C; Van Heel ,M; Ushkaryov, Y. A (2000) Structure of alpha-latrotoxin oligomers reveals that divalent cation-dependent treatments from membrane pores .*Nat. Struct. Biol.* 7, 48-53.
- Patel, B. H (1973) Some interesting theridiid spiders (Araneae:Theridiidae) from Gujarat, India. *Bull Brit Arachnol Soc* 2:149–152.
- Platnick, N. I. (2010) The World spider catalog, version 10.5.
[http:// research.amnh.org/entomology/spiders/catalog/INTRO1.html](http://research.amnh.org/entomology/spiders/catalog/INTRO1.html) .
- Platnick, N. I. (2014) .The world spider catalog, version 15.
<http://research .amnh .org/entomology /spiders /catalog /index.html>
Dol:10.55310/db.iz.0001.
- Raven, R. J; Gallon, J. A (1987). The redback spider. In: Covacevich J, Davie P, Pearns J (eds) *Toxic plants and animals a guide for Australia*. Queensland Museum, Brisbane,pp 307–311.
- Shahi, M; Hosseini, A; Sheshad, K. H; Rafinjad, J (2011). The occurrence of red –back spider *Latrodectus hasselti* (Araneae:Theridiidae) in Bandar Abbas, southern part of Iran. *Iran J Arthropod-Borne Dis* ,2011,5(1):63-68.
- Stallybrass, F. C (1969) Spider bites. *Lancet*. 15, 1: 572.