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# MORPHOMETRIC AND ECOLOGY OF LATRODECTUS MACTANS SPECIES FROM DISTRICT KECH, BALOCHISTAN

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## Abstract

The species *of Latrodectus mactans* (Fabricius, 1775), generally identified as black widow's spider, this species a homeopathically very important. This species belongs to family theridiidae have its place into genus Latrodectus Walckenaer, 1805. This genus generally involves about 29 designated species which are spread across hot, temperate, subtropical regions of worldwide (Garb, González, & Gillespie, 2004). Widows spider are familiar for strong neurotoxic virulence, mainly comprising the α-latrotoxin, which brings huge neurotransmitter discharge on presynaptic nerve termini and its results as medical syndrome identified as latrodectism (Vetter & Isbister, 2008). Owing to diverse morphology, ecology, and toxically importance

## 1. Introduction

Morphology and Morphometrics Species *L. mactans* displays distinct sexual morphology. The adult female's length measure about 10–30 mm in their body measurement without legs measurements and regarded as globose, silky black belly bearing indicative red pattern on ventral apparent. While males are slighter less (8–10 mm) a these are brighter

in coloring, and have comparably lengthier legs comparative to their body extents. Juveniles show dorsal strip arrangements that weaken through continual sheds (Kaston, 1970).

Morphometric factors play a serious role in sorts of documentation in Latrodectus. Analytical sizes typically comprise carapace width and, length, abdomen width and, length tarsus segment lengths femur tibia, tibia patella, metatarsus and genital parts. leg formula of the L. mactans commonly follows this condition IV > I > II > III, it reflecting its functional variation for the web management and their prey apprehension. Female's epigynal arrangement and male's palp morphology offer absolute taxonomic approval and are very important in distinctive closely associated species (Garb et al., 2004).

### 1.1. Ecology and Behavior

Naturally, *L. mactans* is inactive hunter, nocturnal, that builds asymmetrical deep cobwebs in the area where shielded microhabitats. These species Favored habitats comprise rock cracks, below logs, agronomic arenas, unrestrained rodent holes. This species proves tough synanthropic inclinations, frequently stirring near the human settlement, where target accessibility and structural sanctuaries are plentiful (Foelix, 2011).

The spider is generalist killer, nourishing primarily on beetles and some further arthropods entangled in gluey silk cobwebs. Females picket globular egg bags, each of them containing numerous hundred egg. Spiderlings scatter through inflating, easing local annexation. Ecological variables including aridity temperature effect appear on inhabitant's density and periodic activity arrangements

### 1.2. Worldwide and Local Distribution

Worldwide, *L. mactans* is resident to tropical and subtropical regions of America, mainly south-east United States and some regions of Central America Mexico, with predictable extensions into Caribbean parts. Phylogenetic revisions show that black widow spiders take endured important dispersion and divergence events, but some are eased by human's conveyance (Garb et al., 2004).

In Pakistan, this spider has been described in latest years; however, some confirmed histories primarily include species as *Latrodectus hasselti*. up to date, around no confirmed peer-reviewed certification of *L. mactans* in Pakistan. This outcome signifies that it is the first recognized record of *Latrodectus mactans* from the District Kech, Balochistan, Pakistan, thus spreading its identified topographical dispersal into the South Asia. The occurrence of this species therapeutically important species in this

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region has vital inferences for their biodiversity citations, environmental valuation, and community health consciousness.

Additional its molecular exploration, long-term environmental observing is suggested to describe whether this sort of typifies famous residents or fresh

## 2. Materials and Methods

**Study Area:** Ground investigations were showed in District Kech, this district located in southern Baluchistan. This district is categorized by semi-arid climate, warm summers, minor winters, normal or lesser flora, and primarily rock-strewn and sandy territories. The specimen sites comprised agrarian arenas, human houses, storing zones, boundary walls, normal rocky cracks. This survey was taken during sunset and dark hours, when this species of widow spiders is maximum vigorous.


*Figure 1: map of Baluchistan showing district Kech at the corner*

**2.1. Specimen Collection:** Specimens were together manually by using pincers and indulgent brushes. Each species was sensibly detached from their webs and shifted to labeled plastic flasks. These vials contain75–80% ethanol aimed at conservation. these vial were also characterized with assemblage date with name and localities, environment description, and name of the collector. Egg bags, once current, remained serene individually and well-maintained.


*Figure 2: showing the collection of spiders from field*

2.2. **Morphological Documentation:** Each specimen was carefully observed under the stereomicroscope of their outer morphological typescripts. Documentation was completed on regular taxonomic sources and issued explanations of the *Latrodectus mactans* (Kaston, 1970; Garb et al., 2004). Analytic characters measured carefully were: Silky black coloring of mature female, Diverse reddish hourglass design on ventral front, Body dimension and belly figure, female Structure of epigynum, pedipalp of male morphology. Fair morphological structures were cross-matched with printed images of diligently linked species as to evade misidentification.

*Figure: 3 showing dorsal ventral surface and stripped parts*

2.3. **Morphometric Investigation:** Morphometric dimensions were measured by using standardized optical micrometer in a stereomicroscope and micros crew gadget. Whole capacities were noted in millimeters (mm). The following parameters were measured; observations were based on following parameters, Total length body length, Total length of Carapace and its width, Abdominal length and its width, Length of separately each leg parts it including femur, tibia patella, tarsus, metatarsus, Morphometric sizes

were observed carefully from numerous adult samples including males and females as to explanation the sexual differentiations of each specimen.

**2.4. Distributional Calculation:** Area wise data was also recorded to regulate spatial existence of specimens inside District Kech. Environment features including type, vegetation shelter cover, nearness to human constructions were also recorded to estimate biological penchants.

## 3. Results and Discussions

### 3.1. Diagnostic Characters:

This species mostly recognized as a Cob-web spiders or this type of spiders are rare, these are recognized by their typical hunting procedures and disparities. Morphology of the organization of spiders are naturally considered their condensed shape, with a compacted abdomen. Cephalothorax also have observed compressed structure. The Cob web spiders are differing in structure, their body ranging from small to intermediate sized types. These exhibition shows widespread variation of the colors and forms, which generally provision them in camouflage on shadow spaces and more surfaces wherever they delay for catching targets. although few alter their action as caporal environment, this type of action improves their disguise with atmosphere. Legs arrangement in the *Latrodectus mactans* spiders shows four pairs of the legs, correspondingly comprising seven portions: it including like coxa, metatarsus trochanter, patella femur, tibia, tarsus. Legs in *Latrodectus mactans* are adapted for grasping and operational or management their target. Chasing Tactic of *Latrodectus mactans* are tangling to custom webs. They commonly stop long on floras or new leaves, with arrangement round adjacent areas. When objective inclines, these spiders quickly attack and confine their mark with vigorous anterior legs. Visualization of *Latrodectus mactans* spiders obviously have strong imagining and skillful of identifying deeds and sensing conceivable target or threats. dimorphism in specimens are present in the size, females logically presence larger than males. Males displaying additional different design of shades. Size be different in numerous mm in their measurement, these have blazingly colored spiders. Carapace of this species looks like convex in arrangement and long Belly have elliptical shaped or curved in organization. There are four sets of eyes and total including eight eyes, intermediate eyes reduced from adjacent eyes, settled into two diagonal rows. Legs number two and one are strong and elongated, legs three and four. Genitalia have progressive organization.

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3.2. **DISTRIBUTION**: Worldwide, found in Pakistan, India, Arctic region, and Siberia.

3.3. **ECOLOGICAL STATUS**:

Mostly present in garden and flowering areas. The fertilizing insects, which are visiting on flowers, are the leading source of their food. These found in brood, under stones, desserts, moisture areas and agricultural zones.

Table 1: *Morphometric measurements (in mm) body parts of Latrodectus mactans*

| Specimens | Sex | Head | | Chelicera | Palp | Abdomen | | Spinnerets | Total length |
|---|---|---|---|---|---|---|---|---|---|
| | | Length | Width | Width | Length | Length | Width | Length | |
| Male (1) | ♂ | 3.01 | 1.11 | 1.01 | 3.02 | 7.12 | 2.05 | 0.78 | 18.1 |
| Female (1) | ♀ | 3.8 | 2.13 | 1.58 | 4.55 | 9.13 | 4.21 | 0.74 | 26.14 |
| male (2) | ♂ | 2.6 | 2.04 | 1.03 | 3.01 | 6.05 | 2.1 | 0.98 | 17.81 |
| female (2) | ♀ | 3.62 | 3.4 | 1.8 | 5.73 | 9.08 | 4.07 | 0.56 | 28.26 |

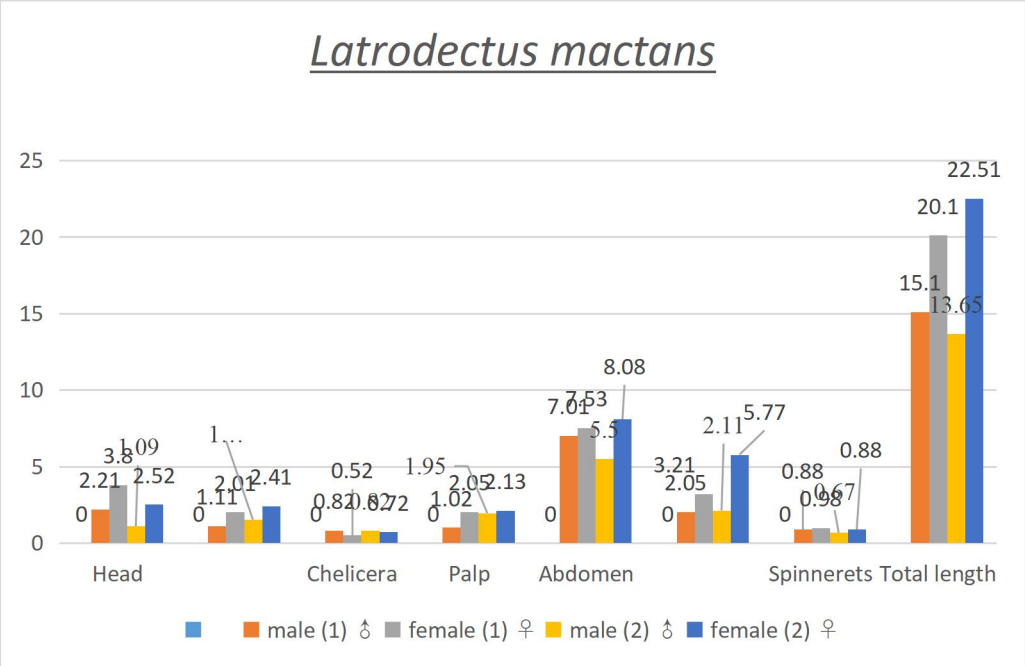


*Figure 4: Measurements Of The Different Body Portions l.Mactans.*

Body consist on two parts one is known as cephalothorax while other one is abdomen. Cephalothorax obviously categories from little millimeters to around centimeters; it is also based on restrictive on ecology. The abdomen of species differs considerably in the size; it sorts millimeters to many centimeters in length.

Total body length of this species is collective size of abdomen and cephalothorax it varies from significantly, reaching from several cm. Femur extents from few millimeters to several centimeters. Patella differs between millimeters to about centimeters. Tarsus coxa, tibia, metatarsus, measurement generally measured about some millimeters to little centimeters.

Table 2: *Different Leg Parts Of The Latrodectus Mactans Species*

| | Species | Sex | Leg length | Fumer | Patella | Tibia | Metatarsus | Tarsus | Total length of legs |
|---|---|---|---|---|---|---|---|---|---|
| Specimen | Latrodectus mactan | ♂ | Leg 1 | 7 | 3.5 | 4.07 | 3.5 | 1.05 | 18.07 |
| | | | Leg 2 | 5.3 | 2.5 | 4.01 | 3.5 | 2 | 15.31 |
| | | | Leg 3 | 2.05 | 2.5 | 3.5 | 3 | 1 | 11.05 |
| | | | Leg 4 | 8 | 3.05 | 4.06 | 4.5 | 1.01 | 19.61 |
| | | ♀ | Leg 1 | 6.5 | 5.5 | 5.7 | 6.5 | 1.4 | 24.2 |
| | | | Leg 2 | 6.5 | 3.5 | 6 | 6.5 | 1.2 | 22.5 |
| | | | Leg 3 | 4.1 | 3.5 | 4 | 4.3 | 2.5 | 15.9 |
| | | | Leg 4 | 7.8 | 6.5 | 6.01 | 6.6 | 1.5 | 26.91 |

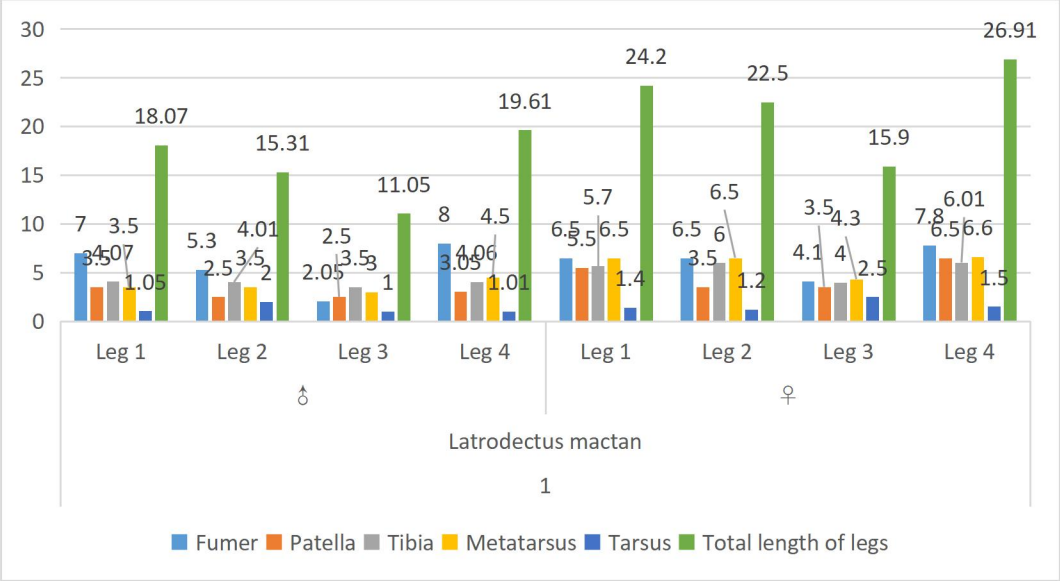


*Figure 5: Measurements Of The Different Body Parts L.Mactans*

## 4. Discussion

The current study forms the existence of *Latrodectus mactans* (Fabricius, 1775) from the District Kech, representative a important faunistic reflection for province of Balochistan. *L. mactans* is a famous and medically significant species inside *genus Latrodect* this species extensively dispersed in hot and moderate districts. However, doing research is long-established usual range is mainly limited to central America and North America. Consequently, the current existing evidences from southern Balochistan prolongs the professed distributional border of *latrodectus mactans* species and highlights the essential vigilant taxonomic endorsement and area biodiversity review.

Morphologically, each inspected specimens from the District Kech carefully match indicative atmospheres of L. mactans, mainly the abdomen, cephalothorax and the existence of ventral enflamed hourglass pattern in the females. Morphometric investigation more maintained the documentation, in the female's specimen it is showing higher body size, globose abdominal characters and relative leg span pattern (IV > I > II > III), this is the reliable with available metaphors (Kaston, 1970; Garb et al., 2004). Male were relatively slighter in size and displayed lengthened legs with well-established palpals organs.

Environmentally, existence of Latrodectus into the district Kech is a reliable to species' recognized aptitude to reside semi-arid, bothered, and synanthropic atmospheres. The working part is categorized by desiccated climatic situations, thin

foliage, and broad human disbursements, all of them offer appropriate microhabitats including rock cracks, wild assemblies, agronomic field limits, and stowage parts.
These surroundings closely resemble habitats where widow spiders are frequently found in other parts of the world. The ability of Latrodectus species resent in human-linked environments suggests ecological flexibility, which may assist unintentional introduction and establishment into new areas.

From a biogeographical standpoint, the occurrence of L. mactans-like specimens in Balochistan raises important questions concerning species identification accuracy, possible misidentification, or undocumented introduction pathways. The genus Latrodectus is known for enigmatic species similarity, and morphological overlap between species such as *L. mactans, Latrodectus geometricus*, and *Latrodectus hasselti* is well documented. Without molecular endorsement (e.g., COI barcoding), there remains a possibility that the recorded specimens may represent a closely related species rather than a true *L. mactans* population. Therefore, future integrative taxonomic approaches combining molecular data and morphological perspectives are needed.

Naturally, the presence of this species of widow spiders in the district Kech has many health valuable significance, individuals of the genus possess neurotoxic poison is capable of causing a disease, latrodectism in the human being. Although there are no medical cases noted throughout our investigations, it enhancing the human–spider relations in to rural areas.

Overall, this research countersigns the first recognized existence of *Latrodectus mactans* from District Kech Balochistan. More ever, it too gives emphasis to requirement for attention in understanding distributional histories founded merely on morphology. Broad ecological demonstrating it is suggested to settle species individuality and explain the factual status of the widow spiders into southwestern districts Balochistan, Pakistan.

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