

Morphological Study to The Forms and Number Of Chelicerae in Scorpions and Spiders

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Abstract

Chelicerae are jointed appendages near the mouth of some arthropods Scorpions and Spiders belong to the class Arachnida , Scorpions chelicerae are recognized by the fixed finger has four teeth: distal, subdistal, medial, and basal with movable finger in the Buthidae family chelicerae are consists from fixed finger has the medial and basal teeth fused into a bicuspid and movable finger has a single subdistal tooth and two basal teeth there are two teeth small on the internal margin and two teeth large form a fork in external tooth . Scorpionidae family the chelicerae consist from fixed finger(medial and basal teeth are fused into a bicuspid) and movable finger(one subdistal and basal tooth) on the external margin the distal external tooth is smaller than the distal internal tooth. then all Spiders have poison glands and release their secretions into their venom sacs near their chelicerae, claws consisting a fixed upper finger and a movable lower finger. Fangs are part of the chelicerae in spiders and used in feeding and defense in some family of spiders like Araneidae family chelicerae are strong vertical with lateral condyle and furrow with two rows of teeth , but chelicerae in Salticidae family are enlarged and inner margin with one tooth several teeth or a split tooth. The chelicerae teeth are important diagnostic characteristics for the taxonomy between Scorpions and Spiders and form that are used to be considerable taxonomic importance .

Key Words: Chelicerae, Fixed finger ,Movable finger ,Scorpions ,Spiders

Introduction

Scorpions and Spiders belong to the class Arachnida of the phylum Arthropoda, Arachnid has a pair of chelicerae therefore has two hands chelicerae used to grab or pierce or tear prey most also have second feeding appendage chelicerae to help get and break up food [1,3] in Scorpions the claws consisting a fixed finger and a movable finger(upper and lower) chelicerae and the functional are jaws ,basal segment called coxa and that the second and third segments called tibia its fixed finger has four denticles, from base to tip: basal (b), median (m), subdistal (sd), and distal (d) , and the tarsus is movable finger has a powerful adductor and a relatively weak abductor muscle , fixed and a movable finger are equipped and with various teeth denticles, and granules presence or absence position to be taxonomic importance . [2, 5] but Spiders distinguished by prosomal poison glands exiting through their chelicerae modified as fangs all spiders have poison glands and release their secretions Each chelicera consists of two parts basal part and a movable part or fang. The inner edge of the fang is serrated and weak muscle in fang [19, 20]; venom of spiders are injected through a tiny opening at the tip of the fang Movement of the cheliceral with two muscles in the basal part . [7,18].

Material and methods

Scorpions and Spiders were collected in 2021-2022 this specimens were collected from green land and desert land and shed or under objects, wood and stone from provinces Baghdad and Najaif ,specimens were move to laboratory for study and recognized. The identification and Preservation of Specimens allowing to the keys of Kovarik [9,12,15] after kill and but the Spiders in freezer for 6 hours then specimens were transferred in to 70-80% alcohol (either

ethyl alcohol or isopropyl alcohol), then Scorpions kill in boiled water at (99°C), then put in by put in fixation solution (Formalin) 12%, Isopropyl Alcohol 30%, Glacial Acetic Acid 2% and Distilled Water 56%) for 24-48hr. Then transferred to 50% of Isopropyl Alcohol for 1 hr. and 70% of Isopropyl Alcohol for storage. Specimens were examined under the dissecting microscope (20x) and compound microscope (10x) [4, 6, 8], take pictures by using camera with resolution of 10 pixel.

Results and Dissection

Chelicerae are the first appendages of the prosoma, in Scorpions have pair of chelicerae in front of the head and the functional are jaws or tiny pincers used in feeding. [10]. The Buthidae family (plate 1,2,3) chelicerae are consists from fixed finger has the medial and basal teeth fused into a bicusp and movable finger has a single subdistal tooth and two basal teeth there are two teeth small on the internal margin and two teeth large form a fork in external tooth. Scorpionidae family (plate 4,5,6) the chelicerae consist from fixed finger (medial and basal teeth are fused into a bicusp) and movable finger (one subdistal and basal tooth) on the external margin the distal external tooth is smaller than the distal internal tooth. [2, 17]. In Spider have pair of chelicerae they located on the front of cephalothorax and like jaws, chelicerae are three type: jackknife, scissor and segmented, each chelicera consists of two parts paturon is a lower part in the cephalothorax and fang upper part of bite the two parts like a folding knife this chelicerae have venom glands can inject the venom in prey when biting it [11, 20]. The Araneidae family (plate 7, 8) chelicerae are strong vertical with lateral condyle and furrow with two rows of teeth. but the Salticidae family (plate 9) chelicerae sometimes enlarged and inner margin with one tooth several teeth or a split tooth. [16]. The chelicerae give the group its name, are the only appendages that appear before the mouth and they are used in feed, catch and defense but in spiders chelicerae use to inject venom into prey and some spiders use chelicerae to grasp objects and dig burrow. Chelicerae are important taxonomic set of characters in scorpions and spiders. [13, 14]. μ

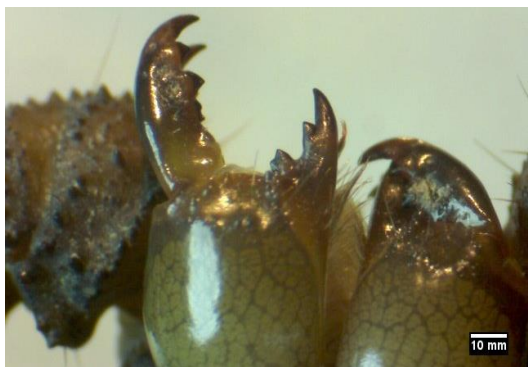
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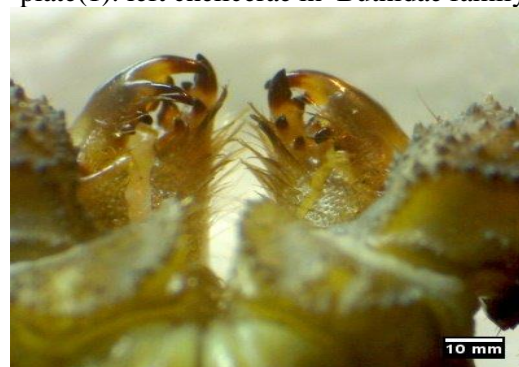
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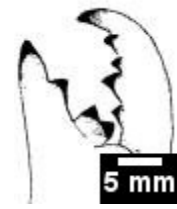
plate(1): left chelicerae in Buthidae family



plate(2): chelicerae in Buthidae family (dorsal side) (200x)



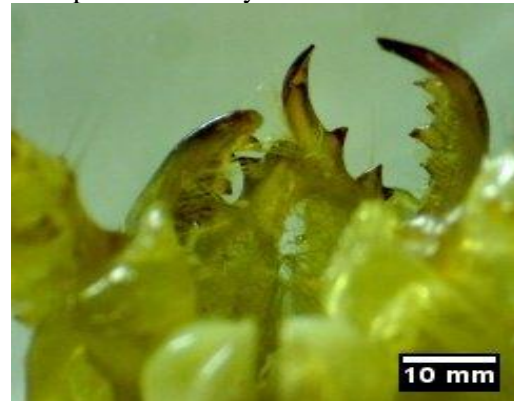
plate(3): chelicerae in Buthidae family (ventral side) (200x)



plate(4): Right chelicerae in Scorpionidae family



plate(5): chelicerae in Scorpionidae family (dorsal side)



plate(6): chelicerae in Scorpionidae family (ventral side)



plate(7): chelicerae in Araneidae family (dorsal side) (200x)



plate(8): chelicerae in Araneidae family (ventral side)(200x)



plate(9): chelicerae in Salticidae family (ventral side)(200x)