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Recent identification key to Iraqi snakes

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Abstract

Since 1959, Khalaf put up the first taxonomic key for snakes in Iraq. Until now, there are no taxonomic key for snakes in Iraq. Therefore, we have put up a new taxonomic key based on several taxonomic key from previous references (Khalaf, 1959, Latifi, 1991, Leviton *et al.*, 1992, Afrasiab & Mohamad, 2011, Afrasiab *et al.*, 2013, Afrasiab and Mohamad , 2014, Amr and Disi, 2011). This key is a new reference for Studies and Research, where it lacks a key classification. I found new species found in Iraq such as *Eryx jayakari* (Boulenger, 1888), *Natrix natrix* (Pallas, 1814), *Spalerosophis microlepis* (Jan, 1865), *Lytorhynchus diadema kennedyi* (Schmidt, 1939), *Eirenis coronelloides* (Jan, 1862). *Zamenis hohenackeri* (Strauch, 1873), *Malpolon insignitus* (Geoffroyde ST-Hilaire, 1809), sub species *Macrovipera lebetina obtuse* (Dwinubsky, 1832), Genus: *Montivipera* (Nilson, Tuniyev, Andr n, Orlov, Joger & Herrmann, 1999) and sub species *Montivipera raddei kurdistanica* (Kucharzewski, 2011), *Pseudocerastes persicus* (Dumeril, Bibron & Dumerril, 1854) *Walterinnesia morgani* (Mocquard, 1905).

Keywords: key, snakes, identification, families.

Introduction

During different time periods and that Iraq was under British occupation has a working group of zoologists classification a survey on several areas in Iraq and put some taxonomic keys for a number of animals including reptiles. I have adopted collection and search data and information about snakes existing in Iraq. The data were collected through field visits to the Natural History Museum of Iraq, as

well as some faculties and departments in Iraqi universities, which means this regard. Might as well I have to collect data and information from ancient and modern researches and books, as well as from the Internet, As well as some websites that are interested snakes. We can classification of snakes of three groups of snakes:

- 1- Nonvenomous snakes called Aglypha have simple teeth and they were not connected to venom gland.
- 2- Semivenomous snakes called Opisthoglyph have grooved rear fangs and it larger than the other teeth and it open to canal or groove located in the back of the mouth on the upper jaws.
- 3- Venomous snakes with open canal or groove and have anterior fangs.

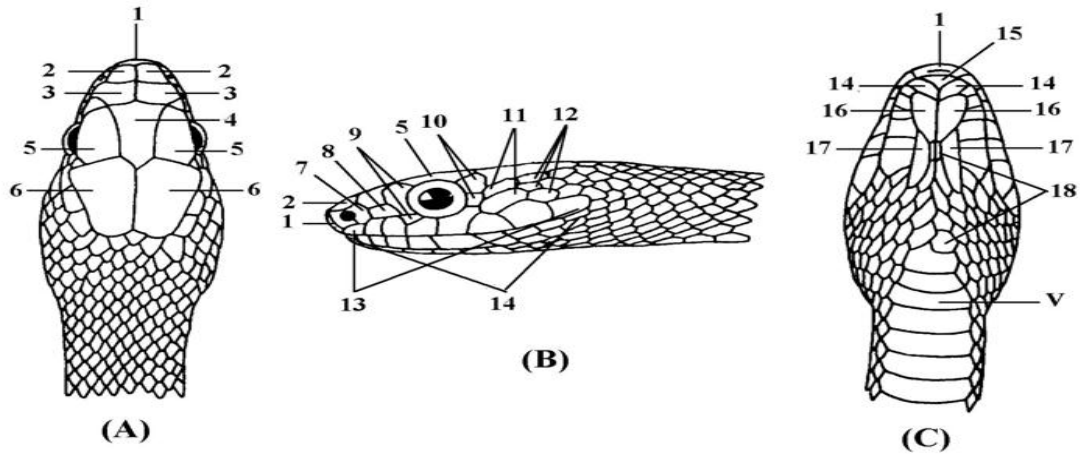
Results and Discussion

Since 1959, Khalaf put up the first taxonomic key for snakes in Iraq. Until now, there are no taxonomic key for snakes in Iraq. Therefore, we have put up a new taxonomic key based on several taxonomic key from previous references (6), (7),(8), (2), (1), (10) (4), (11), (3).

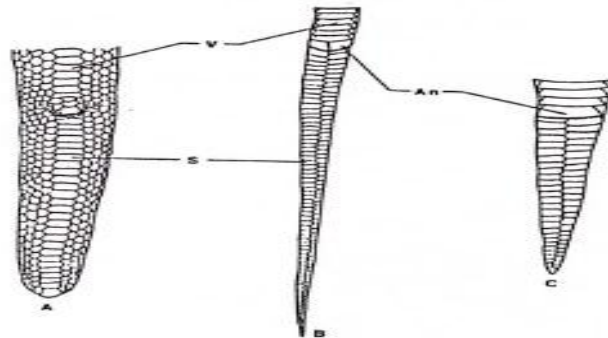
Identification Key:

Families key

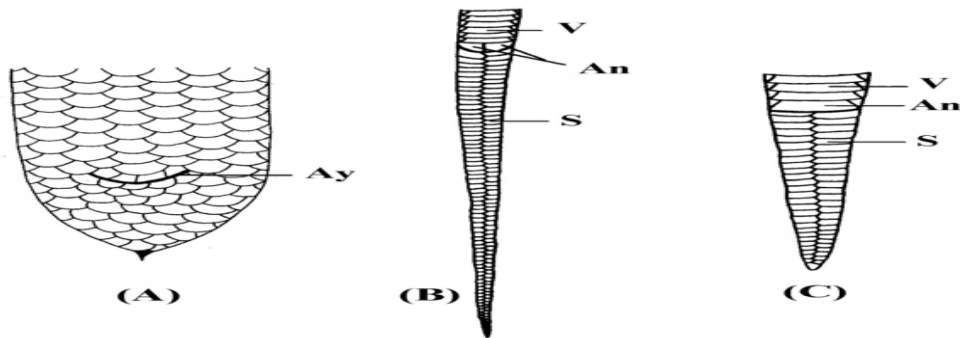
- 1- a- Body laterally compressed and tail is flattenedHydrophidae
- b-Cylindrical body and tail roun.....2
- 2- a- Ventral scales similar to dorsal scales3
- b- Ventral scales distinct and different from dorsal scales4
- 3- a- Fourteen dorsal scale rows.....Leptotyphlopidae
- b- Dorsal scale rows more than 14Typhlopidae
- 4- a- Ventral scales narrower than body width.....Boidae
- b- Ventral scales roughly the width of belly.....5
- 5- a- Head with small scales or large scales in this case more than three scales the eyesViperidae
- b- Head with large scales, often three scales between the eyes6
- 6- a- No pit between eyes and nostrils, loreals scales present, no Anterior poisonous bite teeth (Fang)Colubridae
- b- No pit between eyes and nostrils, loreals scales absent7
- 7-a- Dorsal scales surface 15. An anterior canines absent.....Colubridae
- b- Dorsal scales surface 21 or more. An anterior canines percent.....Elapidae



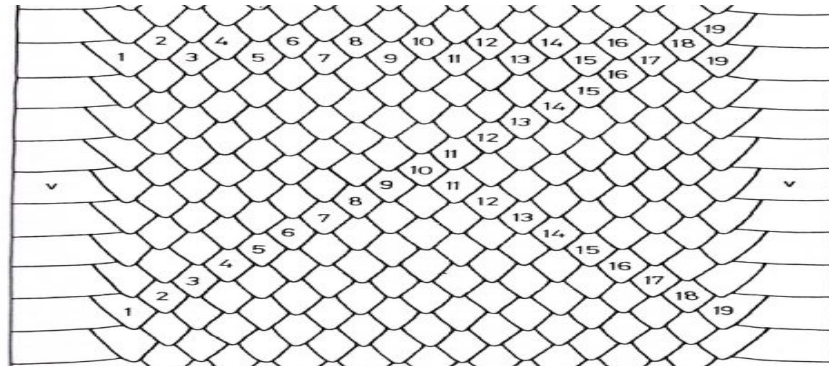
- Head plates in a typical snake: A- Dorsal, B- Lateral, C- Ventral views. 1: Rostrale, 2: Internasalia, 3: Praefrontalia, 4: Frontale, 5: Supraocularia, 6: Parietalia, 7: Nasale, 8: Frenale, 9: Praeocularia, 10: Postocularia, 11: Temporalia, 12: Posttemporalia, 13: Supralabialia, 14: Sublabialia, 15: Mentale, 16: Anterior Inframaxillaria, 17: Posterior Inframaxillaria, 18: Gularia, V: Ventrale



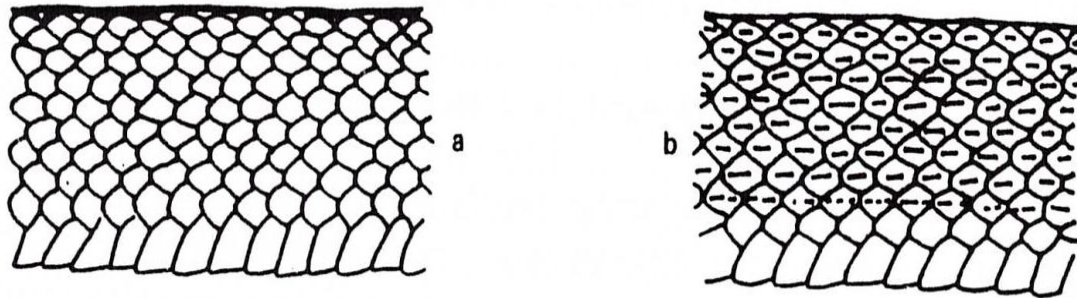
-Venteal views of tails in snake families: A- Boidae, B- Colubridae, C- Viperidae



-A-Typhlopidae, B-Colubridae, C-Viperidae Ay: Anal cleft, An: Anale, S: Subcaudale (slightly modified from Basoglu & Baran, 1978).



- Body scale counting methods in snakes, V: ventrals



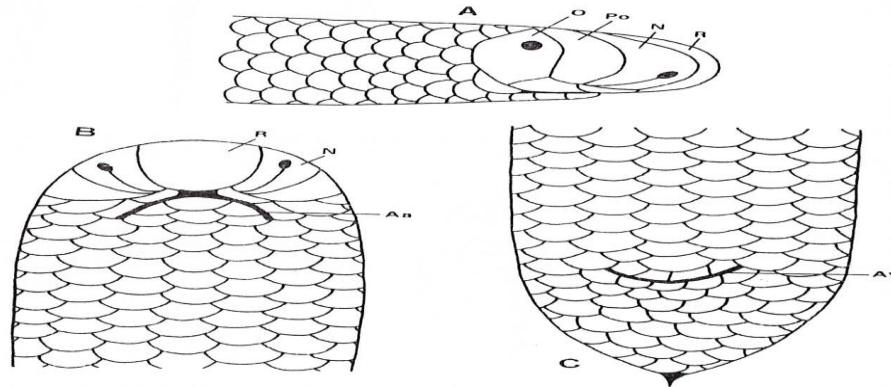
- Scale types in snakes, a: smooth, b: keeled



-a-Head with large scales Colubridae b-Head with small scales Viperidae

FAMILY: TYPHLOPIDAE

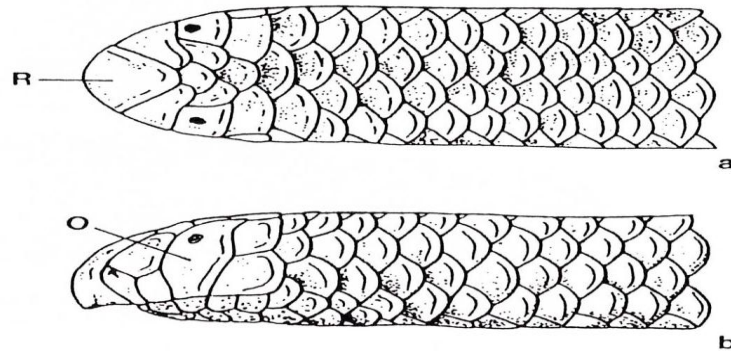
- 1-a- Nasal shield completely divided; the nostril between two nasals; the suture continued above the nostril to the upper surface of the head..... *Indotyphlops braminus*
- b- Nasal shield incompletely divided, the cleft proceeding from the second labial (Figure: A)..... *Xerophlops vermicularis*



-Figure: A, Body scales in *Xerophlops vermicularis* A- lateral head, B-ventral head, C-ventral tail, R: rostrale, N: Nasale, Po: proculare, O: ocular, Aa: mouth opening, Ay: anal cleft.

FAMILY: LEPTOTYPHLOPIDAE

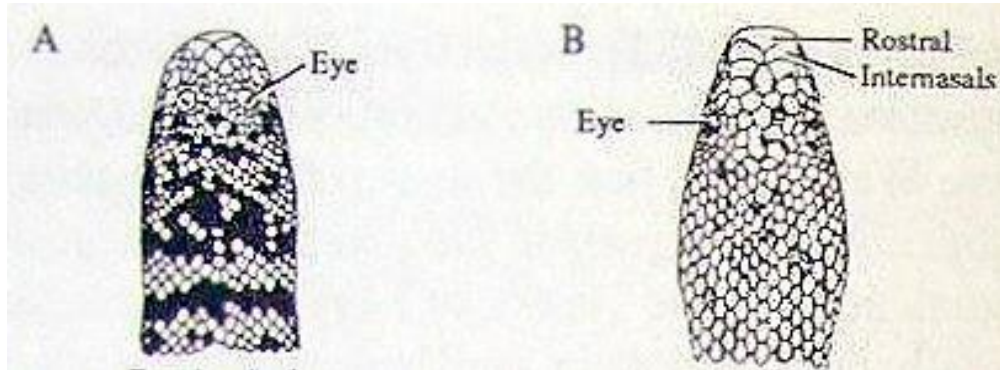
1-a- Snout hooked, the preoral portion concave inferiorly. Labials two. Ocular scale reaching the lip, between the first and second labials. Tail short (figure: A)
 *Leptotyphlops Macrorhynchus*



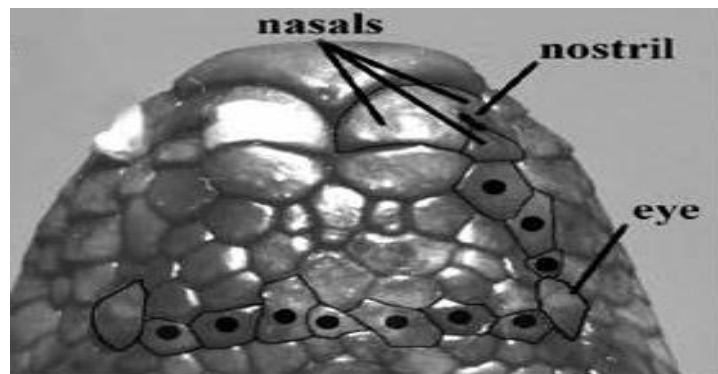
-Figure: A, Head plates in *Leptotyphlops macrorhynchus*, a- dorsal, b- lateral views. R: rostrale, O: oculare

FAMILY: BIOIDAE

- 1- a. Eyes directed strongly dorsally, lying on top of head, separated by 4-5 series of scales; tail sharply pointed, ending in a downward-hooked, claw-like conical scale (figure, A, A).....*Eryx jayakari*
- b. Eyes directed laterally or dorsolaterally, separated by 5 or more series of scales; tail blunt, ending in a blunt, rounded scales.....2
- 2- a. Three large shields behind internasals, the middle shield inserted between the other two and in contact with the internasals (fig, A,B-B).....*Eryx jaculus jaculus*
- b. Two large shields behind internasals, a third large median shields may insert itself between the other two but does not contact internasals.....*Eryx jaculus familiaris*
- 3-a- Six to 9 scales between eyes 4 scales behind internasal scales..... *Eryx miliaris*



-Figure: A, Head plate A, *Eryx jayakari*. B, *Eryx jaculus*



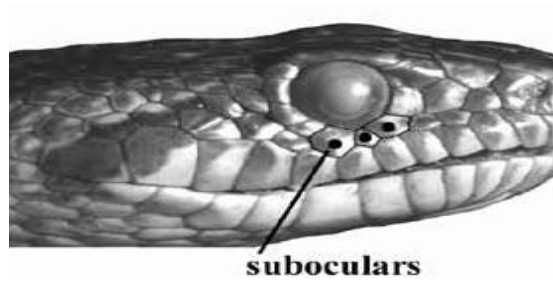
-Fig: B, *Eryx jaculus*, dorsal view of forehead, evidencing the nasals, the nostril, the eye, the scales between the nasal and the eye, and the scales between the eyes.

3-3-1-4- FAMILY COLUBRIDAE

- 1-a- Loreal scales present, vertical pupil or elliptical.....2
- b- Loreal scales present, round pupil 3
- 2-a- Loreal scales contact with eye (fig, A,a) *Telescopus*
- b- Loreal scales not contact with eye, two preocular (figure, A,b)*Lytorhynchus*
- 3-a- Upper labials separated from eyes by scales (figure,B) *Spalerosophis*
- b- At least one upper labial scales contact eye, upper labials 7 or more.....4
- 4-a- Dorsal scales 17 or less.....5
- b- Dorsal scales more than 17.....7
- 5- a- One loreal scale 6
- b- Two loreal scales (figure, C)..... *Malpolon*
- 6-a- Upper labials scales 9, loreal scales narrow and drawn..... *Psammophis*
- b- Upper labials scales less than 9, loreal scale Square shape, dorsal scales less than 190.....*Eirenis*
- 7-a- Dorsal scales keeled*Natrix*
- b- Dorsal scales smooth..... 8
- 8-a- One preocular, dorsal scales 23 (Rarely 25)..... *Zamenis*
- b- Preocular more than one9
- 9-a- Dorsal scales 19.....10
- b- Dorsal scales 21 to 29, preoculars 3..... *Hemorrhhois*
- 10-a- Upper preocular in contact with frontal..... *Platyiceps*
- b- Upper preocular in not contact with frontal..... *Dolichophis*



-Figure: A, a- Loreal in contacts with the eye in *Telescopus*. b- Lorealis separated from the eye by a preocular.



-Figure: B, *Spalerosophis*. Lateral view of head evidencing the series of subocular scales.

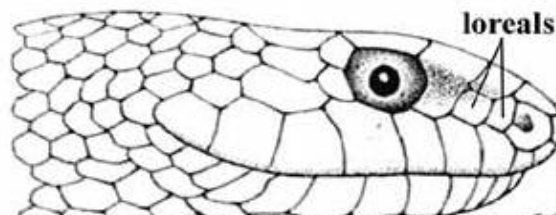


Fig: C, *Malpolon*. Lateral view of head.

Genus: *Telescopus*

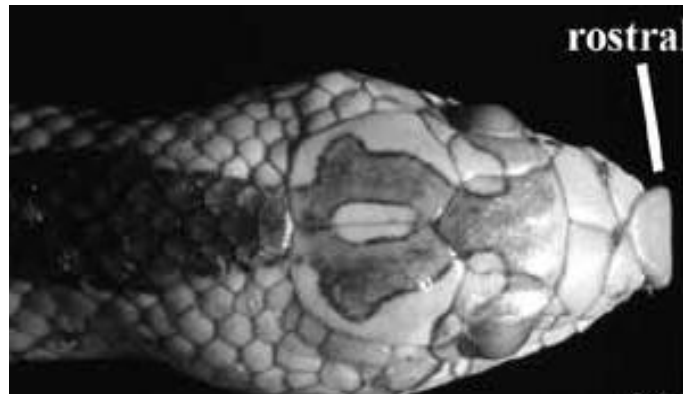
- 1-a- Nine supralabials. Ten lower labials. Anal divided..... *Telescopus nigriceps*
- b- Seven or eight upper labials. Ten or eleven lower labials. Anal single or divided.....2
- 2-a- Anal very rarely divided. Dorsal in 19-21 rows..... *Tarbophis fallax iberus*
- b- Anal more frequently divided. Higher number of dorsals (21-21-15).....
 *Telescopus tessellatus*.

Genus: *Lytorhynchus*

- 1-a- Rostral scales enlarged and inclined posteriorly, loreals square, ventral scales 184-198, subcaudal scales 36-46 *Lytorhynchus diadema mesopotamicus*

b- Rostral shield broadly truncate, loreals deeper than long, ventral scales 174.....

..... *Lytorhynchus diadema kennedyi*

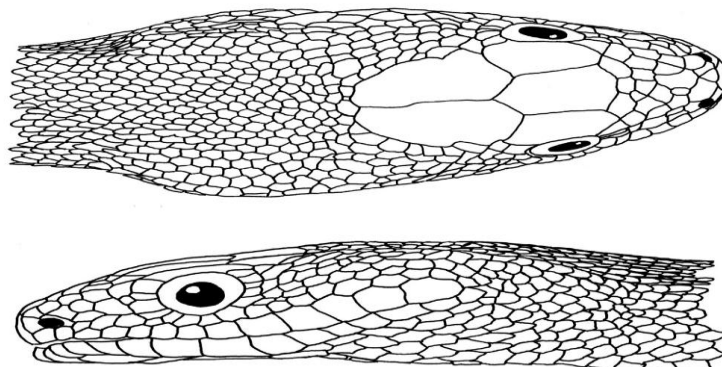


- *Lytorhynchus*, dorsal view of head evidencing the rostral scale

Genus: *Spalerosophis*

1-a- Less than 30 dorsal scales row, 8 scales in place of internasals, prefrontals, and loreal. No dark transverse strip between nasals..... *Spalerosophis diadema*

b- More than 39 dorsal scales row, 26 scales in place of internasals, prefrontals, and loreals. A transverse strip between nostrils and also on rostral.....*Spalerosophis microlepis*

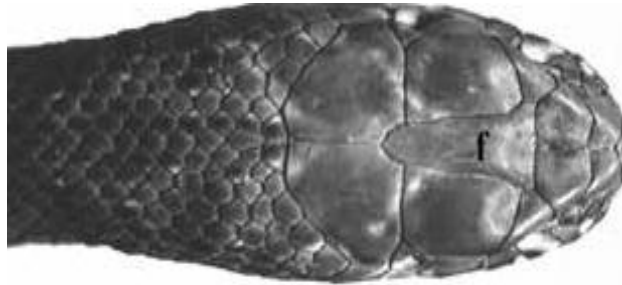


-Dorsal and lateral head view of *Spalerosophis microlepis*

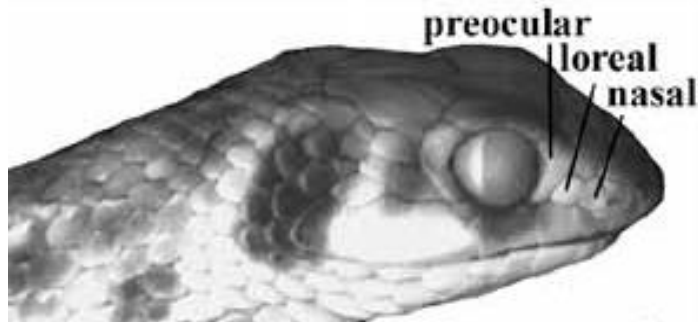
3-3-1-4-4- Genus: *Malpolon*

1- a- Profile of head distinctly and sharply convex, frontal as broad as the supraocular, a single loreals, a large dark spot between the parietals and the angle of mouth (figure, B)*Malpolon Moilensis*

b- Dorsal surface of snout with longitudinal concave furrow, frontal narrower than the supraocular, two loreals, no dark spot between parietals and angle of mouth(figure, A)..... *Malpolon monspessulana insignitus*



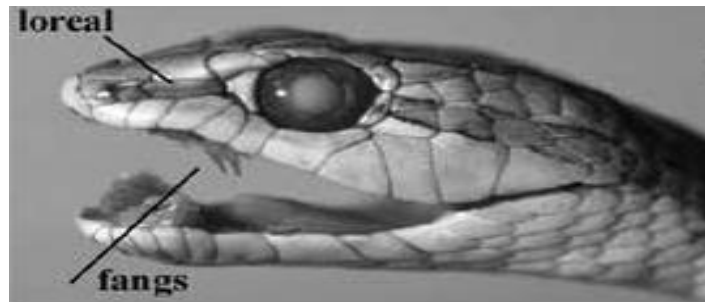
-Figure: A, *Malpolon monspessulanus*, dorsal view of head (f = frontal scale).



-Fig: B, *Malpolon moilensis*, lateral view of head.

Genus: *Psammophis*

1-a- Loreals three to four times as long as deep. Grooved fangs below the posterior border of the eye. Two upper labials border eye..... *Psammophis schokari*



-*Psammophis*, lateral view of head evidencing the poisonous fangs and the loreal scale.

Genus: *Eirenis*

1-a- Trunk uniform or with longitudinal brown lines, dorsal scales 17-17-15. Posterior chin shields in contact with each other *Eirenis decemlineata*

b-Dorsum crossed by brown spots or banded, although some time obscurely.....3

2-a- Dorsum uniform behind the neck. Dorsals scales 15 rows. Posterior chin shields usually separated from each other by scles (figure, A).....*Eirenis collaris*

b- Dorsal scales 15 rows. Black mark on the nape reaching through the eyes to the anterior labials. Frontal as long as its distance from the end of the snout, much shorter than the parietals.....*Eirenis persicus*

3-a- One (rarely two) postocular. Dorsum with brown spots, or banded, and nuchal collar, scale rows 17-15-13.....4

- b- Postoculars two. Obscure transverse bands and nuchal collar. Scale rows 15-15-13.....*Eirenis coronella fraseri*
- 4-a- Head with black crown (figure, B, a)*Eirenis coronelloides*
- b- Head without black crown (figure, B, b)..... *Eirenis coronella coronella*



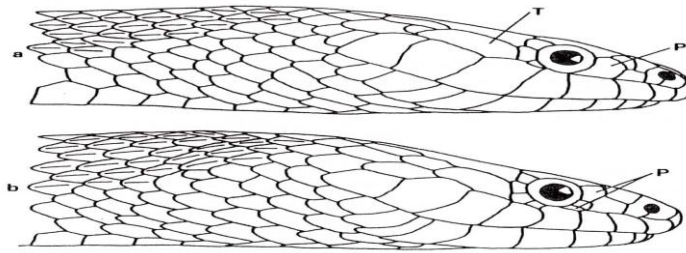
-Fig: A, *Eirenis collaris*, head pattern



-Figure B: a. Head with a crown (*Eirenis coronelloides*). b. Head without a crown (*Eirenis coronella*).

Genus: *Natrix*

- 1-a- 2-3 preoculars, 3-4 postoculars. Ventrals scales 160-197, subcaudals 48-86.....*Natrix tessellate*
- b- One preocular, three postoculars, Ventrals scales 173-180, subcaudals 60-69.....
..... *Natrix natrix*



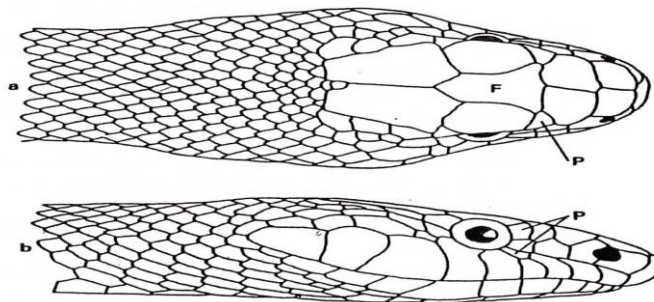
- Head plates in *Natrix* spp., a- *N. natrix*, b- *N. tessellate*

Genus: *Zamenis*

- 1-a- 23-24 rows of smooth dorsal scales with single pit and the scales with white edges except that of the dark spots. 3 of 7 dorsal scales little larger than the other dorsal scales, in contact with parietals. Ventral scales 209-226, subcaudal scales 62-54..... *Zamenis hohenackeri*

Genus: *Hemorrhois*

- 1- a- Dorsal scales very faintly keeled. Number of preocular and subocular at least three. Upper preocular in contact with frontal, fifth and sixth upper labials border eyes, ventral scales 192-226, subcaudal scales 62-105.....*Hemorrhois ravergieri*



-Head plate in *H. ravergieri*. A- dorsal, b- lateral views. P: Preoculare, F: Frontale

Genus: *Platyceps*

- 1-a- More than seven supralabials. Larger snake. Posterior chin shields about as long as or longer than the anterior pair.....2 b- No such streak on the neck. Loreals usually longer than deep. Ventral scales more than 2123
- 2-a- Supralabials eight, fourth and fifth border eye. Color uniform with four or five pairs of large, dark lateral markings or spots on the neck, no other spots behind (figure, A)..... *Platyceps najadum* b- Supralabials nine, fifth and sixth border eye. Ventral scales less than 212.....*Platyceps ventromaculatus*
- 3-a- Frontal longer than its distance from the end of the snout (figure, B)*Platyceps rogersi*
 b- Frontal as long as its distance from the end of the snout.....*Platyceps rhodorachis*

-Genus: *Echis*

1-a- Head scales irregular, scales on snout smooth or slightly keeled, 3-4 scale rows eyes and upper labials. Scales arranged in oblique rows pointing downwards. Tail thin, about one-tenth the length. Nostril between two (rarely three) shields.....*Echis carinatus*

Genus: *Cerastes*

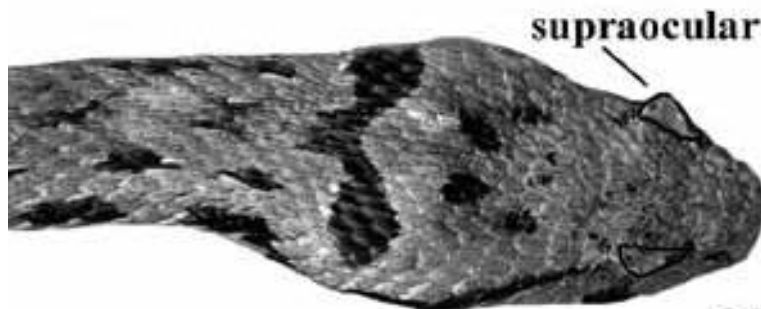
1-a- With or without horn-like scales above each eye, 13-19 scales between eyes ventral scales 154-166, dorsal scales more than 30, four or five series of scales between the eye and the labials lateral scales smaller than the dorsals, subcaudal scales keeled.....figure a. *Cerastes cerastes gasperretti*



Figure a- *Cerastes cerastes*, horned form.

Genus: *Vipera*

1-a- Two or more small supraoculars, 2-3 scalerows between eye and upper labials, ventral scales 162-180..... *Macrovipera lebetina obtuse*
b- Supraocular plate large, one row of scales between eye and postocular scale, ventral scales 170-180..... *Montivipera raddei kurdistanica*



-*Montivipera raddei*, dorsal view of head.

Genus: *Pseudocerastes*

1-a- 23-25 dorsal scales rows at midbody, one series of scales between nasal and rostral..... *Pseudocerastes persicus*

b- 21 dorsal scales rows at midbody, 2 series of scales between nasal and rostral.....*Pseudocerastes fieldi*

Family: Elapidae

1-a- Dorsal scales rows 23, subcaudals 41-45, juvenile dorsal color is black without any pattern..... *Walterinnesia aegyptia*

b- Dorsal scales rows less than 23, subcaudals less than 41, juvenile color pattern, consisting of 25 to 33 reddish crossbars on an otherwise black body
.....*Walterinnesia morgani*

Dissection:

In this study I found many species were newly in Iraq *Eryx jayakari* (Boulenger, 1888) new record in Basra according Afrasiab & Ali (1). Al-Moussawi (9), Afrasiab, (10) found *Natrix natrix* (Pallas, 1814) the first time in the Baghdad, Dialah Bridge, 10 km east of Baghdad. *Spalerosophis microlepis* (Jan, 1865) north of Qala Deza, NW of Sulaymaniya new record by Afrasiab & Mohamad (4). *Lytorhynchus diadema kennedyi* (Schmidt, 1939) from Al-Qaim, Anbar province new record by Afrasiab and Ali (1). according Afrasiab & Mohamad, (4) discovered new species *Eirenis coronelloides* (Jan, 1862). *Zamenis hohenackeri* (Strauch, 1873) the first time from Choman village north of Erbil by Afrasiab & Mohamad (2), Afrasiab *et al* (11) new genus and species. *Malpolon insignitus* (Geoffroyde ST-Hilaire, 1809) describes by Afrasiab *et al* (2013) and sub species *Malpolon insignitus* found sub species *Macrovipera lebetina obtuse* (Dwinubsky, 1832) new found from high mountains of Hawraman in Sulamainiya. Genus: *Montivipera* (Nilson, Tuniyev, Andrén, Orlov, Joger & Herrmann, 1999) and sub species *Montivipera raddei kurdistanica* (Kucharzewski, 2011) describes by Leviton *et al* (8). *Pseudocerastes persicus* (Dumeril, Bibron & Dumerril, 1854) may be found in Iraq said Amr, & Disi (5), Leviton *et al* (8). *Walterinnesia morgani* (Mocquard, 1905) found in north of Iraq by Corkill (3).

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