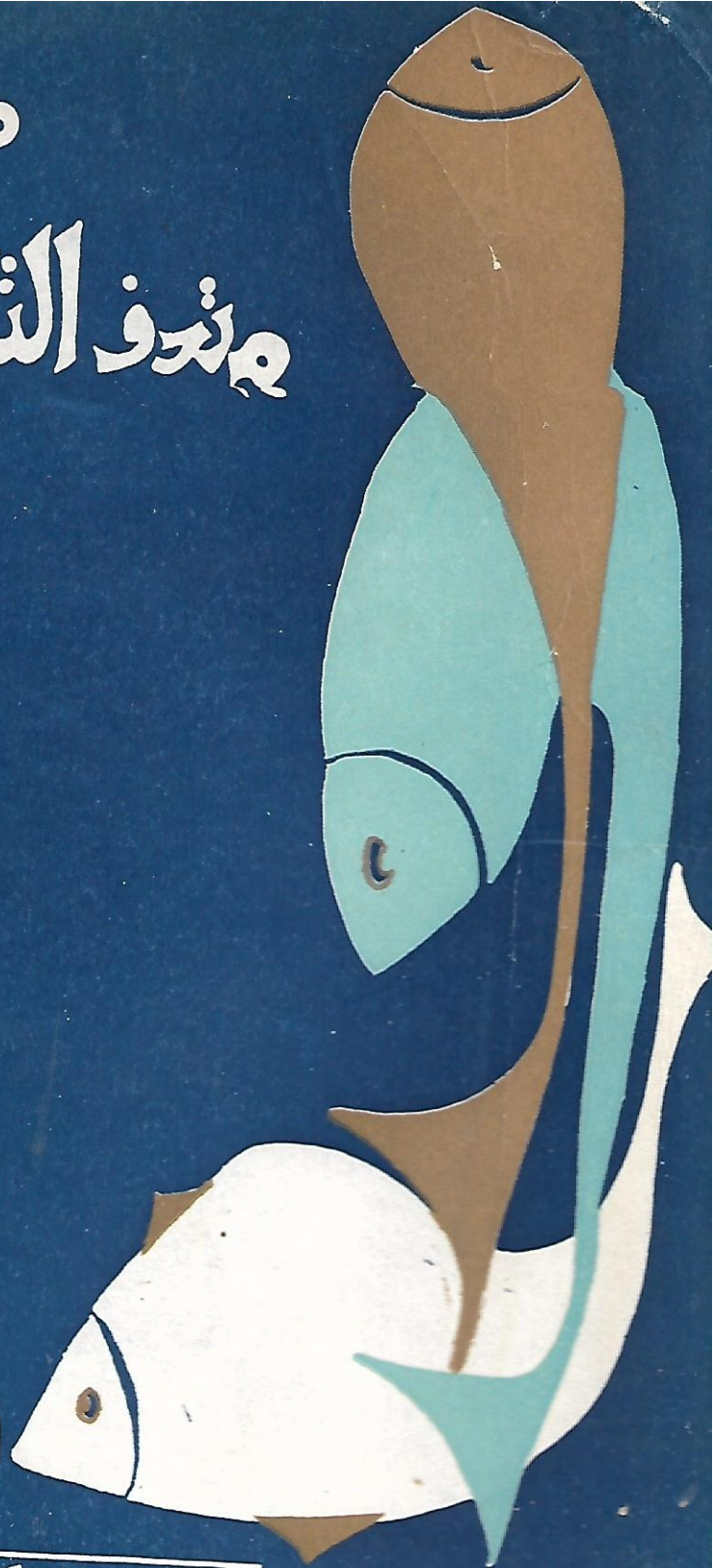
مجلة متحف التاريخ الطبيعي



جامعة البصرة ، العدد الأول ، حزيران ١٩٧٤

هيئة تحرير المجلة

رقم الايداع في المكتبة الوطنية ببغداد ١٩٧ لسنة ١٩٧٥
٦ / ٢ / ١٩٧٥

مطبعة النعمان ـ النجف الاشرف تلفون ٣٢٠٩٧

كلمة السيد رئيس الجامعة

يستطيع الأنسان دون الكائنات الحية الاخرى تغيير ما حوله حسب ما تمليه عليه حاجاته وطموحاته ، والانسان العربي حينما يقف شامخاً على أرضه الزاخرة بالخير والعطاء من جهة وجوانب عديدة من واقعه المتخلف منها مجال العلم والتقصي من جهة أخرى ، يجد لزاماً عليه أن يتحرك بتخطيط علمي مسبق لدراسة ما يحيطه من جوانب بضمنها الظواهر البايولوجية .

من هـذا الواقع أنطلقنا فى مجال العمل فى جامعة البصرة ، وكانت من احدى هذه الانطلاقات عملنا مع ذوي الأختصاص فىالجامعة على أثبات فكرة متحف التاريخ الطبيعي وأبرازها الى حيز الوجود .

انني سعيد جداً بهذه المناسبة أن اسجل تقديري الى جميع الذينعملوا ويعملون بأخلاص لتطوير المتحف وجعله معهداً مناسباً للدراسات البايولوجية فى المستقبل ، أضافه الى كونه مدرسة للثقافة الشعبية ، وأتمنى لمجلة المتحف والتي هي الثمرة العلمية الأولى كل تقدم وأزدهار .

الدكتور نزار نظيف الشاوي

رئيس جامعة البصرة

أستاذ

كلمة السيد مدير المتحف

تشكل المتاحف العلمية الحديثة عنصران هامان فى حياة الجامعات فهي المعاهد التي يتم عن طريقها جمع ودراسة الظواهر البايولوجية للمنطقة من جهة وكونها صورة تمثل ربط الجامعات بالجماهير الشعبية عن طريق معروضاتها التربوية من جهة أخرى من هذا المنطلق كانت فكرة انشاء المتحف الطبيعي فى جامعة البصرة بعد أن قمنا قبل أفتتاح المتحف (فى ٧ نيسان ١٩٧٢) بخمسة سنوات تقريباً بجمع وحفظ العديد من فقريات خليجنا العربي وجنوب عراقنا الحبيب فى مختبرات قسم علوم الحياة بكلية العلوم وكانت بذرة وضعها دعم وأسناد السيد رئيس الجامعة فى تربة صالحة هي جهود العاملين فى هذه الجامعة فكانت بداية وصار المتحف .

أن قيام المتحف وسط بيئة مائية ذات طابع يمثل البيئات المائية الثلاث (كما هو واضح فى تعليمات المتحف فى الصفحات التالية) جعل مسيرة المتحف تتجة منذ البداية نحو الدراسات المائية أولاً والتأكيد على المنطقتين الهامتين وهما الخليج العربي وجنوب العراق ولقد توجه أهتمامنا بدراسة الحياة البايولوجية فى الأهوار حيث أستخدمنا محطة بايولوجية صغيرة لدراسة هجرة الطيور هناك وأعددنا حلقات خاصة تحمل أسم المتحف وجامعة البصرة والعراق أضافة الى معدات المحطة الأخرى وباشرنا العمل فيها بنجاح أضافة الى ذلك فقد بوشر بأقامة الأكويريوم (الأسماك الحية) والذي سيضم أسماك الخليج

والمياه الداخلة العراقية وبالرغم من حداثة متحفنا فهو معروف لدى اكثر من مئتين معهد ومتحف فى العالم عن طريق تبادل المعلومات والمجلات العلمية ونحن بهذا سعداء جداً حينما نفي بوعودنا لهذه المعاهد بتزويدها بالعدد الأول من مجلتنا التي نتمنى لها التقدم والتطور كما نأمل ذلك لمتحفنا الذي هي جزء منه خدمة للروح العلمية التقدمية السائدة الآن تحت ظل الثورة ورجالها الأمنـــاء .

الدكتور خلف حنون الربيعي
مدير متحف التاريخ الطبيعي
استاذ مساعد

تعليمات متحف التاريخ الطبيعي في جامعة البصرة

أقر مجلس جامعة البصرة نظام متحف التاريخ الطبيعي بجلسته التاسعة للعام الدراسي ٧٢ ــ ٧٣ وقد أوضح فيه الأهداف الرئيسية للعمل في المتحف كما هو مبين أدناه : ــ

المادة الأولى :

متحف التاريخ الطبيعي معهد علمي يعنى بالدراسات البايولوجية في العراق بصورة عامة وفي جنوب العراق خاصة وهو معهد وطني لحفظ النماذج والمجموعات الحيوانية والنباتية والجيولوجية العراقية وتصنيفها وعرضها للجمهور وهو تابع لجامعة البصرة ويدار تحت أشرافها .

المادة الثانية :

للمتحف ان يحقق أهدافه بالوسائل الآتية : ــ

أ ــ التآزر مع الدوائر العلمية المختصة في الجامعة للقيام بالأبحاث البيولوجية التي تخدم أغراض الجامعة في التقدم العلمي وتعطيها طابعا متميزاً في العراق كالأهتمام بالدراسات المائية والتأكيد على جمع وتصنيف مجموعتي الحيوانات والنباتات في البيئات المائية الجنوبية الثلاث (البحرية والنهرية والاهوار) ومساعدة المعنيين بهذه الدراسات وتقديم التسهيلات الممكنة لهم .

ب ــ القيام بالسفرات العلمية داخل العراق والأقطار المجاورة لغرض جمع النماذج ودراسة بيئاتها .

جـ ــ الاتصال المباشر بالدوائر الفنية والمتاحف في داخل العراق وخارجه

لتنمية المجموعات والمعروضات ودراستها وتبادل المعلومات والنشرات العلمية والنماذج معها .

د — أصدار النشرات والبحوث والتقارير ذات العلاقة بأعمال المتحف ونشاطه العلمي وتوزيعها على المؤسسات العلمية والاختصاصيين فى الداخل والخارج على أساس التبادل .

هـ — يحق للمتحف انشاء مراكز بحوث صغيرة ومحطات بايولوجية بعد موافقة رئيس الجامعة الغرض منها تسهيل مهمة الباحثين فى البيئات البايولوجية المختلفة والمساعدة على جمع النماذج العلمية من تلك المناطق وتكون مرتبطة بالمتحف اداريا وعلمياً .

و — يعمل المتحف على انشاء متاحف صغيرة فى بقية المحافظات الجنوبية هدفها تشجيع وجمع نماذج علمية من مناطق المحافظة لعرضها للجمهور تحت أشراف المتحف من الناحية العلمية والفنية .

المادة الثالثة :

يتألف المتحف من أقسام علمية تحدد أختصاصاتها العلمية حسب الحاجة وفى حالة التوسع والتطور يحق للجامعة أستحداث أقسام جديدة بعد اقتراح المجلس العلمي للمتحف .

المادة الرابعة :

يختص القسم العلمي بالمتحف بجمع النماذج وتسجيلها فى سجلات خاصة والقيام بدراستها والاقتراح بتبادلها أو حفظها فى القسم ويكون مسئوولاً عن تطوير القسم علمياً وان يقدم تقريراً سنوياً على سير ونشاطات القسم الى ادارة المتحف .

المادة الخامسة :

يقدم المتحف التسهيلات الممكنة للمدارس اثناء الزيارات الرسمية ويساعد الهواة من رجال التعليم او غيرهم على دراسة طرق حفظ النماذج وتحنيطها وذلك بفتح دورات خاصة لهم عند توفير الامكانيات لذلك .

المادة السادسة :

يؤلف رئيس الجامعة مجلسا علميا تمثل فيه الاقسام العلمية ذات العلاقة في الجامعة والدوائر العلمية ذات العلاقة خارج المتحف وتكون أعماله : ـ

أ ـ التخطيط العلمي للمتحف .

ب ـ الاشراف ومراقبة نشاطات الاقسام العلمية في المتحف .

المادة السابعة : ـ

يعين رئيس الجامعة مدير متحف من ذوي المؤهلات العلمية ويكون مدير المتحف مسؤولا امام رئاسة الجامعة عن سير المتحف وتقدمه وعن قيام موظفيه ومستخدميه بواجباتهم وعن تنفيذ توصيات المجلس العلمي المنوه عنه في المادة السادسة وله صلاحية عميد كلية ضمن الحدود التي يقرها رئيس الجامعة وذلك من الناحيتين الادارية والمالية وعلى مدير المتحف ان يرفع تقريرا سنويا عن طريق المجلس العلمي الى رئيس الجامعة عن سير المتحف وفعاليات والاقتراحات التي تكفل له النمو والتقدم .

المادة الثامنة : ـ

يعين للمتحف أمناء اقسام من حملة الشهادات الجامعية وفنيون بحسب اختصاصات المتحف واحتياجاته امين القسم مسؤولا عن تطوير قسمه .

المادة التاسعة :

للمتحف ميزانية خاصة ونظام حسابات خاص وتتكون مالية المتحف من:

أ ـ المنحة السنوية من ميزانية الجامعة .

ب - تبرعات الجهات المختلفة الحكومية والاهلية .

جـ - ايرادات دخولية المتحف .

د - ايرادات بيع النماذج والمطبوعات والنشرات وغيرها .

المادة العاشرة : -

أ - يتولى شؤون المكتبة امين يحمل شهادة عالية ويقوم باعمال التصنيف والتنظيم ومسك سجلات الكتب والمجلات ومعاملات التبادل .

ب - يتولى الناحية الفنية للمتحف فنيون يقومون بالاعمال الفنية بالمتحف وملاحظون وكتبة للاعمال الادارية والمالية بحسب الحاجة .

المادة الحادية عشر : -

يعين للمتحف مرشد للزوار من حملة الشهادات العالية المختصين بموضوعات المتحف ويكون مسؤولا عن ارشاد الطلاب وغيرها اثناء الزيارات للمتحف وكذلك صيانة المعروضات ومسك سجلاتها والعمل على تحسين شروط عرضها بالاتفاق مع الشعب الفنية المختصة .

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مطبعة النعمان ـ النجف الاشرف ـ تلفون ٣٢٠٩٧

MESSAGE FROM THE PRESIDENT

All living things are at the mercy of the enviornment in which they live except man , who can make , alter , or control it as he likes : If man has to take full advantage of his surroundings in a rational way , he should know well what is going on around him in the nature ; the laws that govern the life and the change : To explore and to study this our Museum has made a start for the region , where the University of Basrah is located , namely , the South Iraq and the Arabian Gulf ; in the former particularly the extensive marshy regions lying at the confluence of two great rivers . the Tigris and the Euphrates .

I am particularly glad to note the keen interest taken by the staff of the Biology Department of College of Science in the day to day activities of the Museum .

Being fully aware of the educational , aesthetic , and recreational roles , the Museum has to play in the welfare of the public and the country , it has been the policy of the university to support the Museum in all possible way in its activities and I can assure that the University will continue to do the same :

On this auspicious occasion of the release of the first Bulletin on Natural History I congratulate all those who have worked for it.

I wish the Bulletin every success .

Prof . Dr . N . El– Shawi

President , University of Basrah

MESSAGE FROM THE DIRECTOR

The accumulation of zoological specimens collected during four years of field trips in and around Basrah by the Biology department of the University of Basrah has necessitated the starting of a Natural History Museum , where these collections could be prese-- rved and safely stored for scientific study :

Thus the Natural History Museum of the University og Basrah was officially opened in 1972 .

The main aim of the Museum s to conduct studies on the fauna and flora of the Arabian Gulf , the Shatt -- al -- Arab , and the extensive marshes of South Iraq : As a preliminary step we have begun the survey of the region . Preparations are nearly completed to start the ringing of birds for the study of migration :

The Museum at present has four sectiins -- namely ,

1 — Fish and Aquarium (Curator : Dr. S. M. Shamsul Hoda)
2 — Amphibia and Reptilia (Curator : Dr. Khalaf Al -- Robaae)
3 — Birds (Curator : Mr. P . V . George)
and 4 — Mammals (Curator . Dr . Khalaf Al -- Robaae)

The collections of these Sections are open to specialists for study . The Museum erhibits is open to pulic .

To publish the results of the work done in the Museum and in other institutions on subjects related to the natural history of the region specified above in particular , and of Iraq and neighbo--

uring countries in genral , it has been decided to start t
Bulletin .

The Bulletin will be published at irregular intervals as
materials are ready , and will be available on exchange basis
similar publications .

We welcome exchange of specimens with other musems .
facilities would be extended to visiting biologists to study the fau
and flora of this region with the Museum staff .

Asst . Prof : Dr : Khalaf Al -- Robaae Director

Bull , Basrah nat , Hist , Mus ,
Vol , 1 No , 1 : 1974 June

TURSIOPS ADUNCUS BOTTLE NOSED DOLPHIN : A NEW RECORD FOR ARAB GULF ; WITH NOTES ON CETACEA OF THE REGION .

Khalaf Al -- Robaae
Director , Basrah Natural History Museum

One dolphin was collected on 15 January 1974 from Ras Al – Mataf , Arab Gulf by a fishing boat . Mr : Bashir Zahroon of the Iraqi National Fisheries Company has presented the specimen to the Museum :

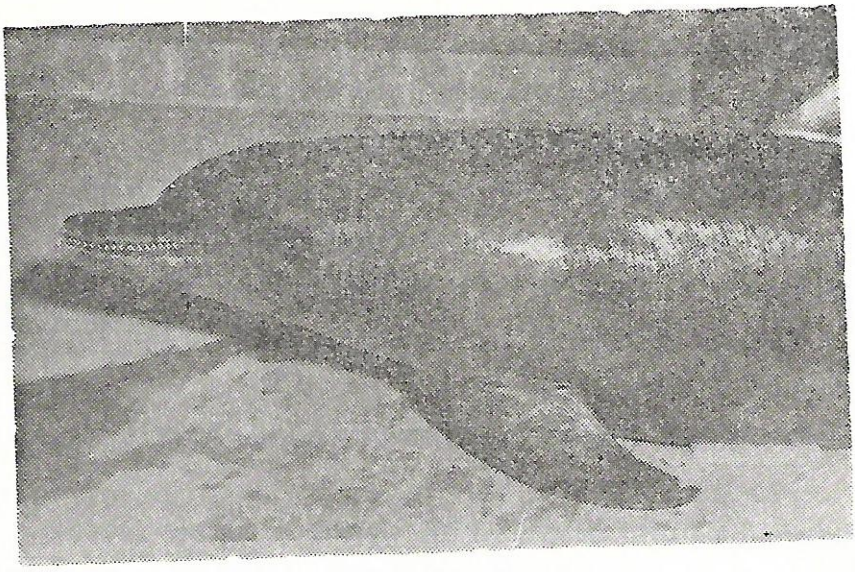
The dead dolphin was black on the back and light gray on the belly . The black around the eye extended anteriorly (see Plate 1) . The specimen has been identified as a male Tursiops aduncus (Ehrenburg , 1832) . The measurements are given below:

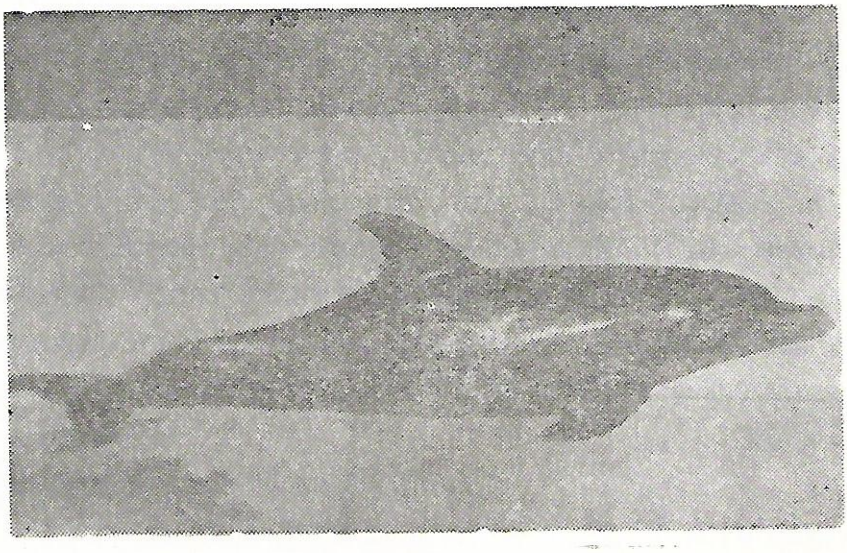
Total length 2 m .
Pectoral fin 35 cm .
Height of dorsal fin 21 cm .
Width of the flukes 54 cm .

The lower jaw contained 26 teeth on each side while the upper jaw had only 25 teeth on each side ; each tooth measured about one centimeter in diameter :

The present collection of T . aduncus from the Arab Gulf forms the first record of this species from this region . The distribution of this species as given by (Hershkovitz 1966) is as follows :

Platei





Distribution .

Indian Ocean : from the Rea Sea and South Africa to Bay of Bengal and Australia Pacific : from New Zealand , Australia , Indonesia , and China Seas , on the west to American waters from Baja California to Chile , on the east ; Atlantic Ocean ; from Gulf of San Matias , Rio Negro , Argentina to Rio de la Plata and in the Rio Urguway to Paysandu , Urguway , and off Rio Grande do Sul , Brazil :

The Fauna of Cetacea From Arabian Gulf

Several species of Whales and Dolphins have been recorded from the Arabian Gulf by different authors .

The latest information available to me is given below .

The Dolphins are locaiy known by the name " Dughoos " in Arabic and the Whales as " Hoodt " .

1 — Sotalia lentigenosa (Owen 1866) Steno (Souse) lentigenosa , Gray 1866 ; proc zool . Soc . London , 1866 .

A male Dolphin was caught in a branch of Khor - Al - Zubair (Arab Gulf -- Iraqi Waters) by fisherman on 25 July 1967 , is the second record of this species . The specimen (length 220 cm) has been preserved in the Mammalia Section in the Natural History Museum in Basrah .

Recorded by (Al -- Robaae , 1970) .

Distinguished from S . lentigenosa by its colour and its dorsal fin . The animal was described and figured as new record for Arabian Gulf by the author .

Recorded by (Al -- Robaae) .

5 — Pseudorea crassidens (Owen 1846) .

False killer whale , El -- Hoodt El -- Kattil (Arab) .

Pseudorea crassidens -- Owen 1846 .

A history of British fossil mammals and birds , P . 518 , Fig . 213 (Skull) .

One specimen was found in 1964 in Dowha at 40 Km . South of Kuwait (Arab -- Gulf -- Kuwaiti Waters) in muddy area . The skeleton of this specimen is displayed in the Natural History Museum -- Kuwait . The skeleton was mounted in Audio -- Visual Department -- Kuwait .

6 — Balaenoptera musculus -- (Linnaeus 1758) .

Great Blue Whale , El -- Hoodt El -- Azrak (Arabic) .

(Balana) musculus Linnaeus 1758 . Syst . Nat . ed . 10 . 1 : 76 . True 1898 , Proc . U. S. Nat . Mus ., 21629 .

Type History : -- Thoma 1911 Proc . Zool . Soc . London , 1911 , 2 : 156 (Type History) .

A dead whale was found entangled in the submarine telegraph cable , and for years a large whale haunted the harbour of Masket in Arabia . Another whale was found in " Kadguma " on the Kuwaiti Coast on June 6 , 1963 in muddy area . Its skeleton was mounted by the Natural History Museum in Shuaikh Secondary School , Kuwait .

Recorded by . (Blanford) dead specimen .

2 — Sotalia plumbea -- (G : Cuvier , 1856) .

Delphinus plumbeus G . Cuvier 1826 Regeanima , ed . 2 , 1 . 228 ftn . Pucheran 1959 Rev . Mag . Zool (2) , 8:145 , 449 . (Characters) Bruyns 1960 , Malayan Nat . Journ . 14 : 159 Fig . pp . 164 — 5 (animal) (Indian -- Arabian Sea , Arabian Gulf , Gulf of Aden , Red Sea , Suez Canal) . Local name " Dorfeel " (Kuwait) .

One speciment was recorded by Buryns in 1960 from the Kuwait Coast (Hershkovitz , 1966) .

Recorded by (Buryns , 1960) .

3 — Sotalia fergosoni Lydeker 1903 .

Lydeker 1903, Journ . , Bombay Nat . Hist : Soc . , 15 : 411 . Plate D (Animal) .

A female was caught by fishermen on the coast of Shauikh Secondary School -- Kuwait (Arab Gulf) in spring 1962 (length 178 cm . , teeth 36/33) : The animal is preserved in the Audio -- visual aids Department -- Kuwait . The animal was described and figured as a new record from Arabian Gulf by the Author and his personal communication with Dr . P. C. Fraser (British Museum -- Natural History) .

Recorded by (Al -- Robaae) .

4 — Stenella malayana (Lesson 1826 a) . Delphinus malay-- anus .

Voyage autour du monde sur la Corvotte -- La Coquille , Zoology , I (1) : 184 Atlas , pl . 9 .

Seen by the author in the Fao area , swimming with the dolphin Sotollia lentigenosa . It is gray in colour .

(Al -- Robaae , 1969) an skeleton .

7 — Balaenoptera edeni -- Anderson (Bryde's Whale) .

Balaenoptera edeni -- Anderson . Anatomical and Zoological Research comprising an account of zoological results of two edpeditions to Western Greece 1868 and 1875 . London , pp . 551--564 .

One whale has been identified as male . Bryde's whale which was stranded on the Island infront of Um Qasr (Arab Gulf -- Iraqi Waters) .

Recorded by : (N . Mahdi , 1967) .

(Al -- Robaae , 1969) .

8 — Megaptera novaeangliae (Borowski 1781) .

Humpback Whale : El -- Hoodt El -- Ahdab (Arabic) .

Ba'aena novaeangliae -- Borowski , Gemmein . Naturgesch , des Tierreichs Berlin 2 , 1 -- (1781) 21 .

A vertebra and a rib of a whale that are said to have been found about 1954 during the construction of a wall near Fao are now in the Iraqi Natural History Museum (Bashir Allous in litt) . There is an old report that a Turkish gunboat killed this whale about a century ago in the Shatt -- Al -- Arab .

Recorded by : (R . Hatt , 1959) :

SUMMARY

The first record of Tursiops aduncus (Ehrenberg , 1832) from Arab Gulf is reported together with the status of the Cetacean Fauna of this region .

يتناول هـــذا البحث تسجيل نوع من الدولفينات (عنق الزجاج) للمرة الاولى من الخليج العربي وكذلك يشمل مسحا اوليـا لجميع الحيتان والدولفينات المسجلة لحد الآن في الخليج العربي .

ACKNOWLEDGEMENT

I am grateful to Dr. P. J. H. van Bree , Curator of Mammals , University of Amsterdam for helping me in the identification of T . aduncus and to Mr . Bashir Zaharron of the Iraqi National Fisheries Company for presenting the above specimen to the Museum .

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3 — ..... False Killer whale " pseudorca crassidens "

A new record for Arab Gulf . Iraq Nat : Hist : Mus :

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STUDIES ON CERTAIN SPECIES OF TERRESTRIAL ISOPODA (CRUSTACEA) FROM BASRAH REGION , IRAQ

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During the years 1966 -- 1971 , studies have been made on six species of terrestrial Isopoda of Southern Iraq (Basrah Region). The climatic conditions such as temperature and humidity were high,while the salinity of the soil was highest when these specimens were collected from garden grass , cactus , stems of palm -- trees , old cellars and from beneath the decayed wood . One of these specimens was collected from the coast of Shatt -- Al -- Arab .

The specimens were fixed in formalin (5%) and later in 75% alcohol , and kept in the Department of Biology , University of Basrah .

The identification was carried out in Department of Crustacea , Museum of Natural History , Berlin .

The specimens belong to the following families : -- Oniscidae : Philoscia sp. cf. Ph. moneaguensis ; Porcellionidae : Metoponorthus pruinosus . Porcellio sp . cf . Porcellio (Porcellio) evansi , Lepto-- trichs politus ; Armadilidiidae : Pareluma minuta ; Armadillidae : Periscyphis tamei . Philoscia sp . cf . Ph . moneaguensis VAN NAME forms a new record for it has not been reported earlier from Iraq .

Facilities offered by Professor K . Senglaub , Director of the Museum , to carry out present investigation , are gratefuly acknowledged .

Fam . Oniscidae

Philoscia sp : cf : Ph : moneaguensis VAN NAME , 1936 , P . 152 .

Material : 1 female (L = 4 . 5mm ; W = 1 . 5mm) , collected on 10 . 6 . 1970 .

Description : Body oblong , narrow with fine tubercles .

Cephalon : rounded behind ; linea frontalis not prominent , arched posteriorly , reaching to the middle of the eyes and bent sidely along the inner border of the eyes . Lateral lobes are marked in front of the eyes and extend downwards , slightly laterally .

Epistome sinuated at its both sides and truncated medially .

Clypeus prominent , tumid and arched . Eyes of 10 ocelli . situated postero -- laterally from the lateral lobes (Fig . 1A) . Antenna long , setose in all joints , the 5th joint of peduncle is the longest and as long as the flagellum . Flagellum of 3 joints , distal one is the longest (Fig . 1B) . Mandible without pars molaris , the left one of one brown pars incisiva , the outer of 3 unbranched setae . The right mandible of one pars incisiva of 3 brown teeth , one glossy lobe of lacinia mobilis , 2 setae and slender penicilla of unbranched setae . Maxillula . inner branch with 2 slender plumose setae . Maxilliped : with narrow palp of pointed apex , inner plate spined .

Peraeomers : the 2nd and 3rd are the longest with rounded postero -- lateral edge , directed anteriorly . The posterior edge of 4th one straight with right postero — lateral angle . The antero -- lateral edges of 5th , 6th , 7th ones are rounded . but posteriorly directed and their pleurae produced posteriorly with acute postero — lateral angles , those of 7th cover the lateral parts of lst pleomer and extend to half of 3rd pleomer . Peraeopods are densely spinose .

Pleon : is abruptly narrower than peraeon (Fig . 1C) .

Pleomers : with very small pleurae , the 2nd pleomer is the shor-- test with short lateral parts , those of 5th one extending fo half of the pleotelson .

Pleopods : the lst and 2nd ones are without endopodites , the exopodiites with vestigial pseudotacheae .

Pleotelson : is wider than long , with rounded apex and slightly sinuated sides , extending to the half uropodal protopodite .

The outer side of protopodite grooved (channeled) , with parallel keels , not converging basally . Uropodal exopodite long , the endopodite shorter than the exopodite , extending parallel from the middle of telson and not inserted at the same level of exopodite.

Colour : Cephalon brown , spotted with yellow patches , the pleon brown also . Peraeon brown with symmetric yellow wavp lines on either sides of median line .

Locality : In moist places , among the stones which are along the coast of Shatt -- Al -- Arab .

Discussion : this specimen resembles Ph . moneaguensis only in the following points : 1 — Length and width 2 — Antennae 3 — Pleon and its epimers , pleotelson and uropods .

Fam . Porcellionidae .

Metoponorthus pruinosus (BRANDT , 1833) .

Porcellio pruinosus BRANDT 1833 p . 181 ; P . truncatus H . MILNE -- EDWARDS 1840 p. 173 ; Metoponorthus pruinosus BUDDE -- LUND 1885 p . 169 ;

Metoponorthus or Porcellionidae pruinosus SARS 1898 p.184 ; VERHOEFF 1918 p . 132 , 138 ; 1951 p . 243 ; OMER — COOPER 1923 P . 105 ;

STROUHAL 1936 p . 77 ; 1948 p . 132 ; 1951 p . 123 , 1954 p . 591 ;

GRUNER 1966 p . 251 .

Material : 10 males L = (7 -- 11) mm ; 62 females L = (10 -- 13) mm , collected in May 1971 .

Deslription : Male of 11 mm long , 4.5 mm wide and female of 13 mm long , 5 mm wide .

Both sexes differ in the following points :

First peraeopod :

Male : propodus of 2 rows . each of 3 bristles,carpus of bristled -- brush , distally terminated with a long one , merus also of bristled — brush , but fewer and shorter than of carpus ;ischium with few bristles , but nothing on the base .

Female : propodus of 2 rows , each of 4 bristles , carpus with few larger and sharper bristles .

First and second pleopods :

Male : the exopodites with tracheal system , the first endo--

podite modified to gonopods , Ductus ejaculatorii are crinochaeta (separated) , the second endopodite with an apical transparent tubular process , which is an extension from chitin and as half as long the distal part .

Female : the exopodite supplied with tracheal system , but without endopodites . (Unwin , 1932) .

Embryonic development : in female , the oostegites found on 1 -- 5 peraeomers constructing marsupium . From one marsupium collected 80 -- 84 ova . All females are amphogenic . but the generations are thelygenic more than arrhenogenic .

Colouration : Body pigmented dorsally , male darker than female, slightly granulated , dorsal surface either brown with light wavy lines , symmetric on both sides of median line of peraeomer , or brown with lengthwise row of symmetric light yellow spots on its either sides .

Locality : M . pruinosus found where peoples are living , and easily collected from foundation of old houses , under stones or rotten woods , among dried leaves of decidous tree , and on stems of palm — trees . It is found also in cactus pots of Chamaeocereus silvestrii . In calm nights , easy to be collected more than in windy (Gruner , 1966) , and where high temperature and more humidity.

Porcellio sp . cf : Porcellio (Porcellio) evansi OMER -- COOPER, 1923 .

Material : 1 male , L = 12 mm ; 3 females , L = 11 -- 12 mm , collected in April 1969 .

Description : Male , L = 12 mm , W = 4 .5 mm .

Body oblong , robust , slightly convex . Linea frontalis (deeply notched in the middle , appearing two distinct prominences), lateral lobes , well developed , but not exceeding the middle tubercles of linea frontalis . Eyes of 20 ocelli , situated postero--laterally from the cephalon and transverse to base of lateral lobes (Fig . 2A) . Antenna long . each of the 2nd , 3rd joints of peduncle with 2 apical pointed processes , last joint is the longest ; flagellum of 2 joints , the proximal is one half as long as the distal one (Fig . 2B) . Mandibles are typical with pars molaris , left one distinguished from the right . Left mandible of one pars incisiva , outer 3 teeth , inner of 2 ones , lacinia mobilis tufted , tuft of setae and one branched penicilla . Right mandible of one pars incisiva of 3 teeth , glossy lacinia mobilis , tuft of setae and branched penicilla . Maxillula : outer branch of 3 + 3 spines with fine hairs on its outer edge , with a tuft hairs behind it ; inner branch of 2 plumose setae .

Peraeomers : the first peraeomer is the longest , its antero--lateral angle pointed anteriorly till the postero -- lateral angle of lateral lobe of head . The 4th , 5th peraeomers are the shortest .

The postero -- lateral angles of all peraeomeral epimers directed posteriorly , those of 7th one extend to half of the 4th pleomer and

cover the lateral parts of 1st , 2nd pleomers . The 1st , 2nd , 3rd peraeomers with antero -- lateral processes (2 in each segment) , which are concealed by posterior edge of the proceeding one .

Noduli laterales are as light patches on coxal plates of peraeo-- mers and the gland fields are situated antero -- laterally from them .

Lateral edges of all segments with transverse canalulii .

Peraeopods : of 1st , 2nd ones , the carpus with brush -- liked pad of spines . The 7th one is modified , of inflated ischium , its next three joints of serrated inner edges supplied with spines . (In female only the first peraeopod supplied with this pad) .

Pleopods : Exopodites of 1st , 2nd ones with trachea (air -- cavities) in both sexes , of oval shape , parallel to the edges (Fig . 2C,D,E,F) their endopodites are modified to small gonopods; first gonopod extending till posterior edge of its endopodite and with an apical process slightly developed and curved outwards , second gonopod extending till half length of its endopodite and con-- cealed by it , and supplied with oblique wide groove , which separates its pointed distal part from triangular proximal one (Fig . 2G,H) . Ductus ejaculatorii are separated in genital papilla (crinochaeta) , (in female , the Ist , 2nd pleopods with reduced trapezoid endopodites) . The exopodites of 1st , 2nd pleopods are yellow in colour , those of 3rd , 4th , 5th with scattered brown pigments (in both sexes) . The 6th pleomer with wide and pointed telson (pleotelson) reaches to half of the uropodal exopodite . On either side of its posterior edge , there is one tubercle , opposite to middle of uropodal protopodite , dividing each side into concave and convex edges . Uropodal protopodite shorter than telson , its ventral surface larger then the dorsal , with pointed notch on its caudal edge .

Exopodite long and large , endopodite concealed partially by telson , and reaches slightly beyond the telsonic apex .

Granulation ; The granules are distributed on dorsal surface of the head : on its posterior edge , laterally define the eyes and 2 tubercles on the pointed angles from mid -- lobe of linea frontalis . Other granulations distributed in transverse lines on dorsal surface of all segments as the following :

1st peraemer 4 lines of granules , other peraeomers 3 lines of granules ; 1st , 2nd pleomers of 1 line of granules ; 3rd , 4th , 5th pleomers of 2 lines of granules .

The posterior edges of all these segments are granulated .

The granules of telson are arranged as following : (Fig . 2 I) 4 granules in two rows on lateral sides of the pointed part of telson . 2 granules on posterior edges of 6th pleomer , each divides the edge into concave and convex ones ; 4 granules in front of the latters , and 6 granules on posterior edge of the 5th pleomer.

Colour : Cephalon and last three pleomers are dark in colour , the peraeomers and 1st , 2nd pleomers are of yellow background . Two parallel brown lines on median line of peraeon and 1st , 2nd pleomers , and two laterals on epimers of peraeomers . Lateral parts of epimers are light yellow in colour .

Discussion : this specimen differs from P . (P .) evansi in the followings : 1) the length of the body , 2) the number of ocelli of eye , 3) the lateral edges of the telson , and 4) the number and distribution of granules on the pleotelson .

Locality : the specimen were collected among palm -- tree gardens in Jumhuriyah , northern Basrah City .

Leptotrichus politus OMER -- COOPER , 1923 .

Material , 3 males , L = (8 -- 9) mm ; 8 females , L = (6 -- 8) mm ; collected April 1969 .

Description : Male , L = 9 . 5 mm ; W = 4 . 5 mm .

Body oval , very covex , dorsal surface with numerous small irregular tubercles and fine short setae .

Cephalon : with triangular prominent median lobe and prominent semi -- rounded lateral lobes , extending over the proximal half of first joint of antennal peduncle . Eyes of eight ocelli , situated parallel with the base of lateral lobes . Antenna : short extend to half of first peraeomer , 3rd joint of peduncle as long as the 4th one , the 5th is twice as long as the former . Flagellum biarticulate , the proximal one is half length of the distal .

Mandibles : without pars molaris , the left one of pars incisiva , outer of 4 brown teeth , inner of 2 ones , tuft of setae , one separated seta and one penicilla . Right mandible of one pars incisiva of 3 brown teeth , lacinia molaris glossy and bilobed , 4 setae and one branched penicilla . Maxillula : outer of 5 spines , inner of 2 plumose setae .

Peraeomers : 1st , 2nd ones are slightly longer than others , the postero -- lateral edges of 1st , 2nd , 3rd ones are straight , of 4th slightly posteriorly directed , and of 5th , 6th , 7th posteriorly directed also . Epimers of 6th slightly developed , and of 7th well -- developed , covering the lateral parts of 1st , 2nd pleomers and extending to half of 3rd pleomer . Noduli laterales

absent , but the gland fields were distinct on the coxal plates of peraeomers .

Peraeopods : of 1st , 2nd , 3rd , 4th in male , the carpus supplied with brush -- liked pad on inner side , the carpus of 1st peraeopods in male slightly rounded interiorly , additional to conspicuous spines in both sexes on distal end of all joints of peraeopods (Fig . 3 A , B) .

Pleon : short , not abruptly narrower than peraeon , but the well developed epimers of 3rd , 4th , 5th pleomers (forming continuous and unbroken line) with the lateral edges of the peraeomers. The 6th pleomer terminated with wide triangular but not pointed telsonic apex , which extends till half of uropodal protopodite (Fig . 3C) .

Pleopods : the exopodite of 1st , 2nd pleopods with pseudotracheae, the first exopodite with narrow triangular apex which is directed postero -- exteriorly (Fig.3D) . Exopodite of 2nd pleopod with trangular shape and directed posteriorly (Fig . 3 E) :

The endopodites of 1st , 2nd pleopods are modified to gonopods. The first endopodite is long , slender and slightly curved out with a pointed apical process which curved outwards . The 2nd endopodite sharp -- pointed . (In female the 1st , 2nd pleopods are without endopodites (Fig. 3 F, G)) . The posterior margins of exopodites of the last three pleopods in both sexes serrated and haired . Uropodal protopodite with lateral triangular groove , fitting with the epimers of 5th pleomer , exopodite long and robust , its distal half extending caudally from telsonic apex , endopodite extending to 2/3 of exopodite .

Colour : yellow with light -- brown , wide lines on posterior

edges of all segments , female slightly darker than male .

Locality : the specimen were collected from Jumhuriyah , northern Basrah City and found among Alfalfa (Medicago sativa .), which was planted in palm -- tree gardens .

Fam . Armadillidiidae .

Pareluma minuta OMER -- COOPER , 1923 .

Material : 1 female , L = 7 mm ; W = 2.5 mm ; collected in April 1968 .

Description : Body oblong oval , very convex , especially peraeon , capable to roll up into a ball . All parts of body covered with thickly erect and short setae .

Cephalon : transverse oblong with marginal linea frontalis ; behind linea post -- scutellaria ; lateral lobes small ;rostrally the triangular epistome . Clypeus slightly sinuated in the middle . Eyes of 7 ocelli , situated antero -- laterally and defined by linea post -- scutellaris (Fig . 4A) . Antennula inconspicuous , of 3 joints . Antenna short , supplied with densed hairs , the distal joint of peduncle is as long as the flagellum . Flagellum of 2 joints , the proximal one is half length of the distal . The antennal lobe curved , elevated and separated from antero lateral margin by a groove , where the antenna settles . Mandibles : without pars molaris , the left mandible of one pars incisiva of brown teeth , outer trifid , inner bifid , tuft of setae , 3 separated setae and brush -- liked penicilla . Right mandible : outer of one pars incisiva of 3 brown teeth , inner translucent lacinia mobilis of crenulated edge , tuft of setae and brush liked penicilla . Maxilla of outer branch terminated with 3 large curved brown spines and 4 fine spines . Inner branch ter-- minated with 2 stout plumose setae .

1 — peraeomer slightly longer than others , with thick lateral

edges , separated from the same segment by a cleft -- liked short groove , to receive the coxal plate of the second one . Coxopodite distinct from underside on entire length of the lateral edge . It is also distinct in 2nd , 3rd peraeomers . The 2nd , 3rd , 4th ones with triangular epimers , those of 5th , 6th , 7th are trapezoid (Fig . 4B) . Of 1st peraeopod , the carpus with brush -- liked pad .

Pleomers : the lateral parts of 1st , 2nd pleomers are reduced, and laterally covered by the epimers of 7th peraeomers , the 3rd , 4th , 5th with subquadrate epimers , those of 5th one extend till half of uropodal exopdite . The 6th one with broad , slightly convex sided , telson of slightly rounded apex which covers the uropods partially . Uropodal protopodite is smaller than its exopodite and concealed partially by the telson . Exopodite large , flattened , lamellar , quadrate , and it occupies the space between telson and pleura of 6th pleomer , and reaches slightly beyond the telsonic apex . Endopodite slender elongate , situated in a narrow space between exopodite and telson and exceeds slightly its exopodite (Fig . 4C) .

Pleopods : the 1st , 2nd ones with tracheal organs , their endopodites are reduced . 1st exopodite is bicurvated at its posterior edge , which supplied with fine hairs . 2nd exopodite trapezoid with more distinct hairs at its posterior edge (Fig . 4D , E) .

Marsupium : formed between 2 -- 6 peraeomers with 26 eggs (calculated) , those anteriorly are more developed than those posteriorly in the marsupium (brood -- pouch) .

Colour : cephalon and peraeomers with their epimers of light brown , posterior edges with symmetric yellow wavy stripes on either side of median line , pleomers of light brown colour .

Locality : it is collected with Periscyphis tamei from the cellars of old houses in Basrah City .

Fam . Armadillidae :

Periscyphis tamei OMER — COOPER , 1923

Material : 20 males , L = (7 -- 8) mm ; 30 females , L = (8 -- 9) mm , collected March 1969 .

Description : Male , L = 7 mm , W = 3 mm .

Body oval , very convex dorsally , being rolled up into a ball . Cephalon with small lateral lobes (Fig . 5A) . Epistome flattened without marginal line . triangular in the middle and sinuated at both sides . Clypeus sinuated ventrally . Neither antennal lobe , nor the groove for antenna to settle . Eyes of 12 ocelli .

Antenna : short , extend till the eyes , flagellum of 2 joints , the distal one is one and half as long as the proximal , and pubescent with fine hairs and scales . Mandibles : without pars molaris , left one of one pars incisiva of brown teeth , outer trifid , inner bifid ; tuft of setae ; one separated seta and brush -- liked penicilla . Right mandible of one pars incisiva of 3 brown teeth , lacinia mobilis of glossy lobe , one separated seta and brush -- liked penicilla . Maxillula : outer branch (endite) terminated into 2 stout curved spines + 3 (4) smaller ones , outer edge with fine hairs inner branch terminated with 2 slender plumose setae .

Peraeomers : the first one is the longest with thick lateral edges (coxopodites) which is rounded posteriorly and separated dorsally from the segment by a deep groove (striated longitu-- dinally) , which extends as narrow one parallel with anterior edge

of the segment . and postero -- laterally with entire corner , but cleft underside by a deep notch which receives the edge of the second segment , when the animal easily rolls up (Fig.5B) . The 2nd , 3rd peraeomers with thick antero -- lateral edges underside , and with short coxal processes . The 2nd , 3rd , 4th ones are alike in their triangular epimers with rounded apices . The 5th , 6th , 7th are similar in their trapezoid epimers , those of 7th cover the lateral parts of 1st , 2nd pleomers .

Peraeopods : in 1st , 2nd , 3rd ones . carpus with brush -- liked pad of spines , which is absent in female . The 7th peraeopod is much modified : its merus inflated ; the inner edges of merus , carpus and propodus serrated and supplied with strong spines ; of female not modified .

Pleomers : the epimers of 3rd one are larger than of others . The 6th one terminated with triangular telson of slightly wide , rounded apex and concave sides .

Pleopods : 1st exopodite slightly rounded with a depression defines tracheal organs anteriorly , nearly lateral from anterior margin ; posteriorly and anteriorly with hairs (Fig . 5C) . The first endopodite modified to gonopod , its basal part of 2 lobes , the middle part is triangular and the distal one curved out with pointed apex , which curved inwards (Fig . 5 D) . The second exopodite longer than triangular , with sinuated anterior edge and oblique posterior haired edge (Fig . 5E) . 2nd endopodite narrow and long with S-- shape at its basal part and modified to gonopod , and distally sharp -- pointed with a long hair (Fig . 5F) . (In female , the 1st . 2nd pleopods are without endopodites) . Ductus ejaculatorii are united (synochaeta) .

Exopodites of the last three pleopods furnished with hairs , at

their posterior edges . 3rd exopodite larger than the formers with sub -- quadrate proximal part and triangular distal one , containing a groove (Fig . 5G) . All exopodites with tracheal organs . Ductus ejaculatorii are united (synochaeta) .

In female : the 1st , 2nd pleopods without endopodites . The 1st exopodites smaller than others,leaf -- like shape , with a depre-- ssion on anterior edge and bilobed medial process (Fig . 5H) . The 2nd exopodite longer , triangular , the 3rd one sub -- quadrate with curved anterior edge and haired posterior one (Fig.5I , J) .

Uropods : slightly reach beyond the triangular telsonic apex , with shallow depression on its caudal edge . Uropodal protopodite large and occupies the space between the telson and the pleura of 5th pleomer . Exopodite very small , inserted in the middle dorsal surface , near to posterior margin and terminated with 2 long hairs . Endopodite long slender , concealed partially by the telson and reaches slightly beyond telsonic apex and supplied caudally with hairs and with fine ones on inner lateral margin (Fig . 5K) .

Colour : Cephalon light brown with yellow patches , posterior edges of all segments are light brown and the median line also , with yellow symmetric wavy lines laterally . Pleon yellow in colour . Dorsal surface of all segments and uropods are covered with fine , short setae and faintly granulated . Small bodies of fatty tissue distibuted under the chitin in all joints of body .

Locality : P . tamei foud in old houses , at their foundations , in the cellar or under stones in moisty places.Easily to be collected at summer nights , especially from Basrah City .

Fig . 1 : Philoscia sp . cf . Ph . moneaguensis (female)

A : dorsal view of cephalon ;

B : antenna

C : pleon + uropods

Fig . 2 : Porcellio sp . cf . P . (P .) evansi (male)

A : cephalon + 1 . peraeomer

B : antenna

C : 1 . exopodite

D : 2 . exopodite

E : 1 . endopodite

F : 2 . endopodite

G : 1 . exopodite (female)

H : 2 . exopodite (female)

I : pleotelson + uropods

Fig . 3 : Leptotrichus politus (male)

A : 1 . peraeopod

B : 7 . peraeopod

C : 5 . pleomer + pleotelson + uropods

D : 1 . pleopod

E : 2 . pleopod

F : 1 . exopodite (female)

G : 2 . exopodite (female)

Fig . 4 : Pareluma minuta (female)

A : dorsal view of cephalon

B : lateral view

C : 5 . pleomer + pleotelson + uropods

D : 1 . exopodite

E : 2 . exopodite

Fig . 5 : Periscyphis tamei

A : dorsal view of cephalon

B : 1 . peraeomer ;

C : 1 . exopodite

D : 1 . endopodite

E : 2 . exopodite

F : 2 . endopodite

G : 3 . exopodite

H : 1 . exopodite

I : 2 . exopodite

J : 3 . exopodite

K : 5 . pleomer + pleotelson + uropods

الخلاصة :

يتضمن هذا البحث دراسة لستة أنواع من (الايسوبودا) الأرضية والتي تسجل لأول مرة في منطقة البصرة كما وإن بعضها يسجل لأول مرة في العراق • ولقد تم تحقيق هـذه الأنواع في قسم القشريات بمتحف علم الحيوان التابع لمتحف التاريخ الطبيعي في برلين •

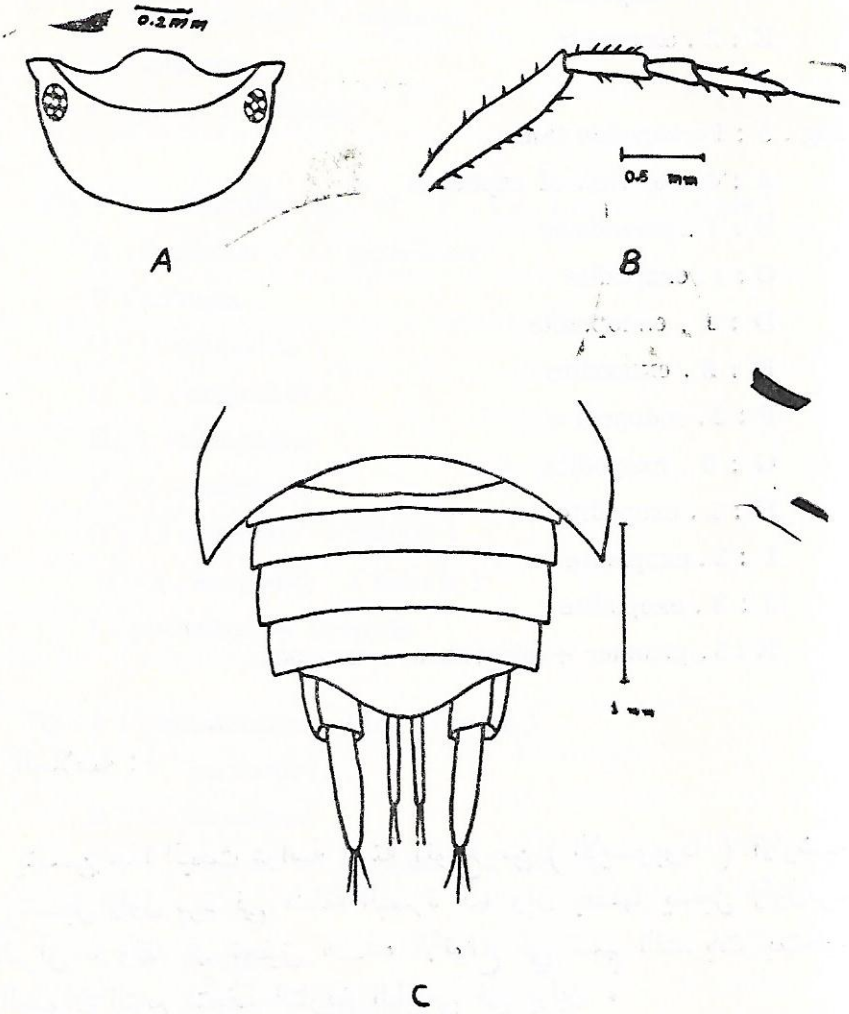

Figure 1

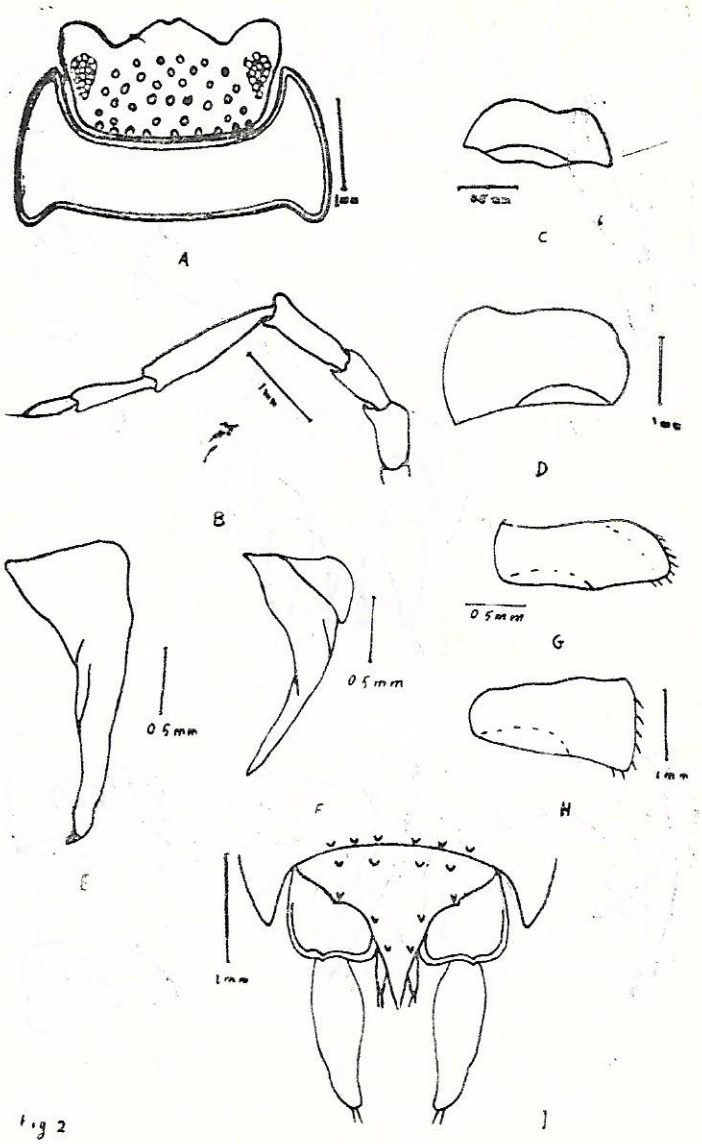

Figure 2

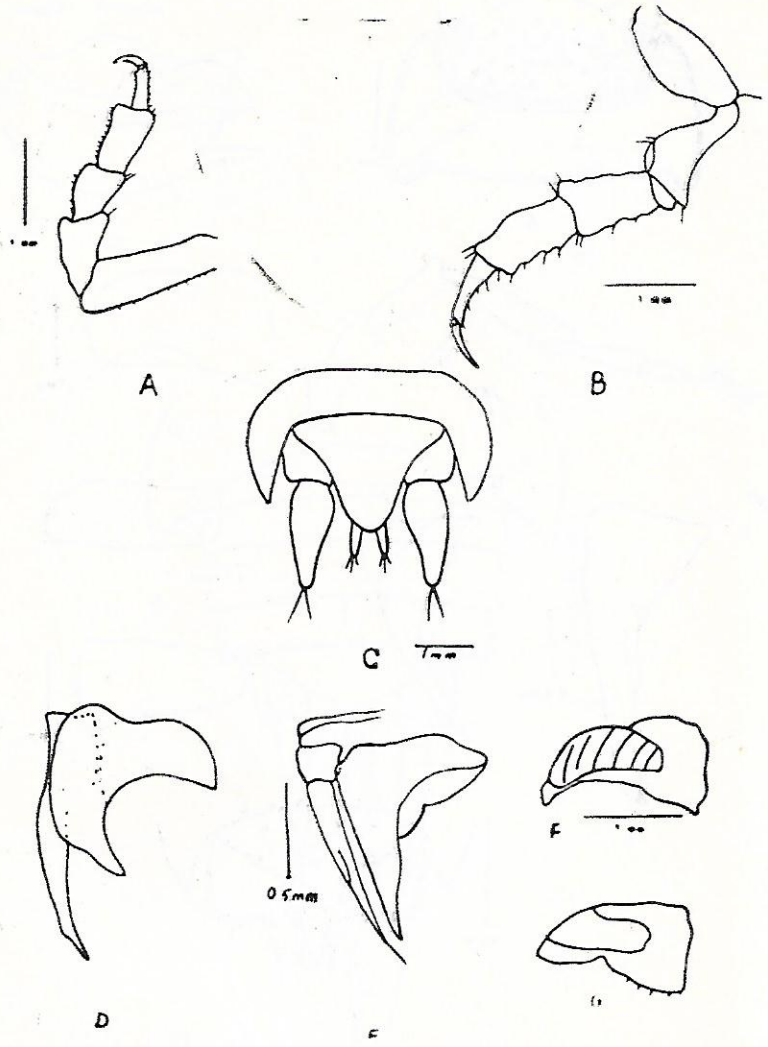

Figure 3

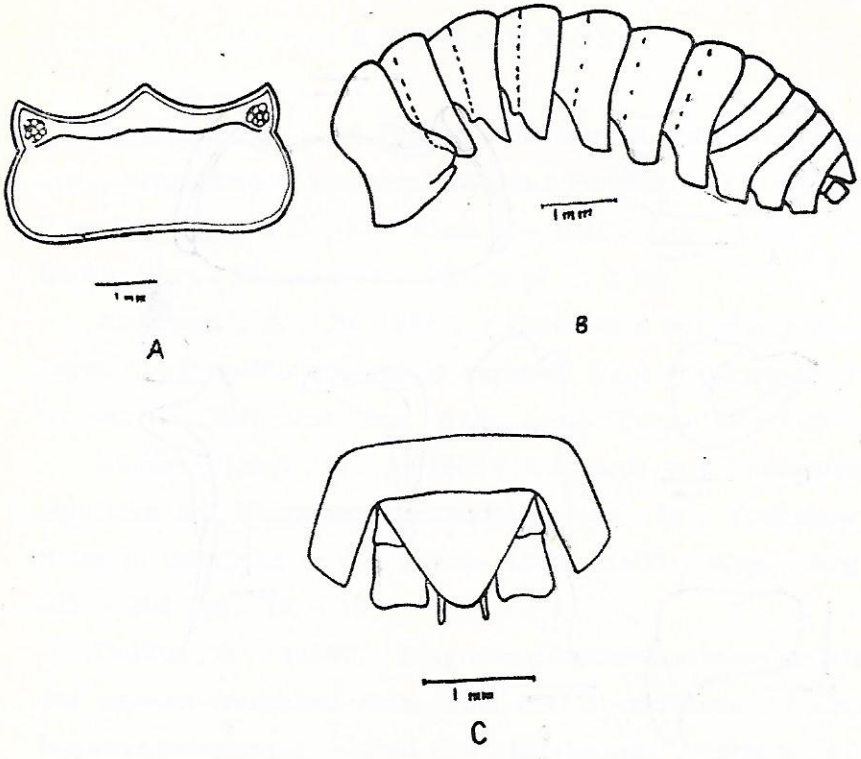

Fig 4

Figure 4

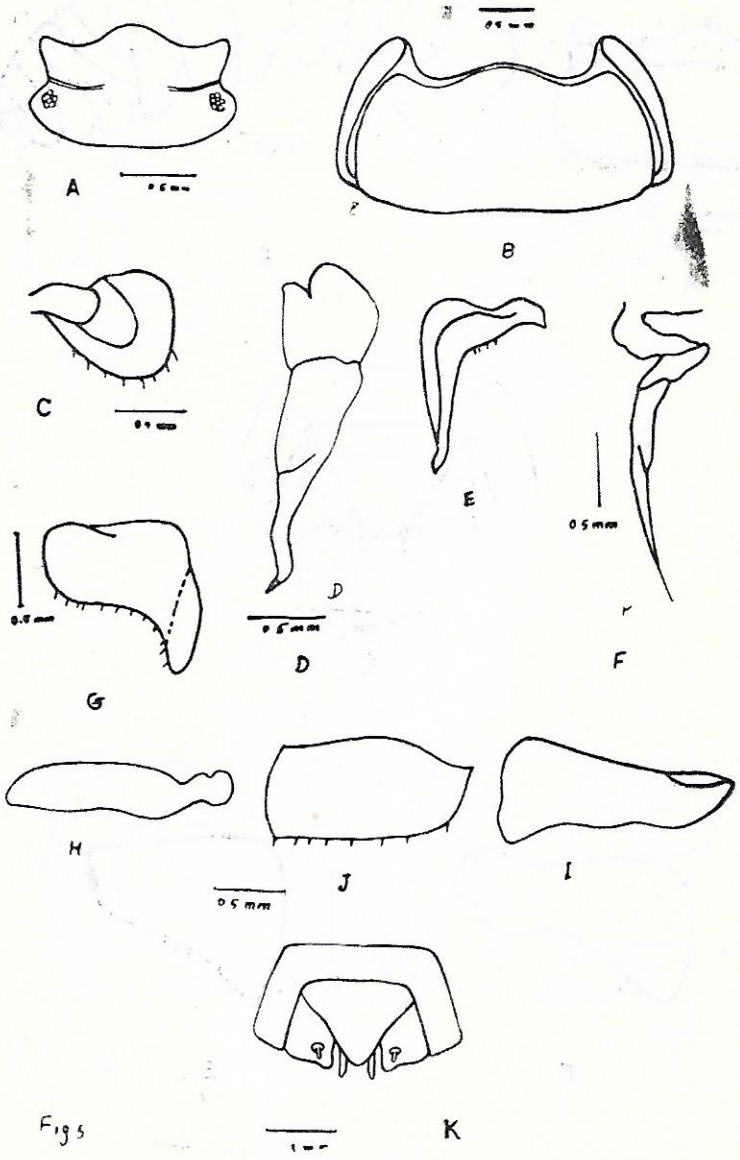

Figure 5

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SYSTEMATIC CATALOGUE OF THE SUBFAMILY HARPALINAE (INSECTA : COLEOPTERA : CARABIDAE) OF IRAQ

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INTRODUCTION

This family comprises more than 20 , 000 described species distributed throughout the world . In the temperate regions its members are almost entirely ground beetles occuring in the soil , under stones , under rotting woods , under barks ... and in similar places .

Carabidae are closely allied to family Cicindelidae but are easily distinguished by the form of the clypeus (clypeus extending laterally beyond the base of the antennae in Cicindelidae) , and the absence of the terminal hook on the lacinia of the maxilla . In many genera the legs are adapted for running in some such as Scarites , Clivina , Dyschirius they are shorter and are used for digging . Many Carabidae in their general features bear a resemb-- lance to the Tenebrionidae but may be easily separated by the number of tarsal segments .

A few of Carabidae recorded as attacking cereals and the seeds of plants like zabrus but the majority of the species are carnivorous durnig larval and adult slages .

Members of the tribe Brachinini have the property of secreting a defensive fluid from the anal end of the body . the fluid possesses caustic properties producing an effect upon the skin .

The Carabidae of Iraq were very poorly studied and were known from few faunal lists cited among the references at the end of

this catalogue . Ali (1966) made entirely complete keys to the tribes , genera and species of the given fauna of Carabidae in this catalogue . From the existing literature I found there is a need for a catalogue comprising the descriped species of Carabidae in Iraq for the subfamily Harpalinae since a catalogue have been already made for the subfamily Carabinae , Ali (1971) .

KEY TO THE TRIBES OF SUB — FAMILY HARPALINAE (CARABIDAE : COLEOPTERA)

1 — Venter with six visible sterna in both sexes ..... (2)

— Venter with eight visible sterna in male and seven in female ..... (22)

2 — Mandibles with several setae in the scrobe ; head with a suborbital longitudinal ridge and two supraorbital setae on each side ; body flat and pubescent . **Cymbionotini**

Cymbionotum Baudi .

— Mandibles glabrous or with a single seta in the scrobe ; head without a suborbital ridge 3

3 — Mandibles with a fixed seta in the scrobe..... 4

— Mandibles without a fixed seta in the scrobe 9

4 — Head with one supraorbital seta on each side 5

— Head with two supraorbital setae on each side 7

5 — Body flattened , not pedunculate ; surface of elytra striate , second interval about as wide as next 2 -- 4 together eyes unusually large ; anterior coxal cavities open behind ; front of head with several lingitudinal -- directed ridges .

Notiophilini

Gen . Notiophilus Dum .

— Body convex and pedunculate ; surface of elytra smooth or normally striate ; second interval normal ; anterior coxal cavities closed behind ; eyes of normal size . front of head a long well sclerotized lobe . **Anthiini**

Gen . Anthia Web . (A . dudecimguttat Bon .)

22 — Mandibles with a fixed seta in the scrobe , elytra truncate and usually with a narrow membranous margin at apex .

Brachiniini

segments (sometimes not dilated) 12

— Outer part of the metacoxae and the first abdominal sternum lying in the same plane ; male protarsi with the basal three segments dilated ; antennae with basal three segments glabrous 13

12 — Basal two segments of antennae glabrous ; margin of elytra without an internal plica toward apex . Harpalini

— Basal three segments of antennae glabrous ; margin of elytra with an internal plica toward apex . Zabrini

Gen . Zabrus Clairv .

13 — Form oval ; ninth interval of elytron consisting of a narrow broken carina , eighth stria forming a deep groove on apical half ; body glabrous above . Oodini

Gen . Oodes Bon .

— Form not completely oval) ninth interval normal throughout its length , eighth stria not forming a broad groove in apical half , pronotum and elytra usually pubescent . Chlaeniini

14 — Antenna inserted immediately beneath the preocular ridge 15

— Antenna inserted far below the preocular ridge , and level with the lower margin of the eyes 21

15 — Elytra completely covering the abdomen 16

— Elytra more or less truncate at apex and exposing end of abdomen 18

16 — Elytra with stria 8 deep throughout , close to the margin in front and widely separated from it behind Perigonini

Gen . Perigona Cast . (P . nigriceps Dej .)

— Elytra with stria 8 normally impressed and about equal distance

from the margin throughout 17

17 — Penultimate segment of the labial plurisetose on its inner margin . Amarini

Gen . Amara Bon .

Penultimate segment of the labial palpi bisetose on its inner margin Pterostichini

18 — Basal segment of antennae about as the next three taken together ; tarsal segment 4 not bilobed ; labrum narrower than clypeus . Zuphiini

Gen . Zuphium Latr .

— Basal segment of antennae not longer than the next two taken together 19

19 — Inner spur of of metatibia longer than the basal metatarsal segment 20

— Inner spur of metatibia shorter than the basal metatarsal segment ; prementum supported at base by projection of mentum Lebiini

20 — Lacinia produced into an obtuse ciliate lobe at apex ; tibial spurs serrulate . Tetragonoderini

Gen . Tetragonoderus Dej .

— Lacinia ending in a sharp slender hook without any ciliate lobe above it ; tibial spurs not serrulate . Masoreini

21 — Antennae inserted near the eyes at the lower edge of the orbital emargination anteriorly ; liguluinoluding its glossae and paraglossae form a short membranous lobe . Graphipterini

Gen . Graphipterus Latr . (G . minutus Dej .)

— Antennae inserted at a distance in front of the eyes ; orbit evenly rounded ; ligula including glossae and paraglossae form

1 — TRIBE APOTOMINI

Apotomus III . , Mag . Ins . VI , 1807 : 348 .

A — rufithorax pech . , Ann . Soc . Ent . Fr . VI . 1837 : 445 , t . 16 , f . 6 .

A — testaceous Dej . , Spec . Gen . Col . I , 1825 : 451 .

A — rufus (Rossi) , Fauna Etr . I , 1790 : 229 , t . 4 , f . 3 .

2 — TRIBE BROSCINI

Broscus Panzer , Index Ent . 1813 : 62 .

B — punctatus Dej . , Spec . Gen . Col . III , 1828 : 431 .

nepalensis Hope . Zool . Misc . 1831 : 21 .

3 — TRIBE TRECHINI

Trechus Clairv . , Ent . Helv . II , 1806 : 22 .

T — quadristriatus (Schr .) , Enum Ins . Austr . 1781 : 218 .

capitatus (Fourc .) , Ent , Paris 1785 : 52 .

minutus (F .) Syst . Eleuth . I , 1801 : 210 .

tempestivus (Panz .) , Fauna Ins . Germ . 73 , 1801 , 6 .

rubens Clairv . , Ent . Helv . II , 1806 .

nigriceps Sturm . Cat . 1826 : 203 .

fuscipennis Steph . Illustr . Brit . Ent . Mandib , I , 1827 : 170 .

pelitus Falder . , Fauna Ent . Transcauc . I , 1837 . 100 .

amaurocephalus Kolenati , Melet . Ent . I , 1845 : 69 .

fusculus Motsch . , Käf . Russl . 1850 : 7 .

piciventris Gräells , Mem . mapa , geol . Esp . 1855 : 39 , t . 1 . f . 5 .

syriacus Putz . . Ent . Zeit . Stettin XXXI , 1870 : 178 .

Perileptus Schaum , Naturg . Ins . Deutschl . Col . I , 1860 : 663 .

P — jedlickai nom . nov .

jeanneli Jedl . , Ann . Hist . Nat . Mus . hung . (N . S) . 2 , 1952 : 79 (not Darington)

4 — TRIBE BEMBIDIINI

Asaphidion Goizis . Recherches de l'Esp . typ . 1886 . : 6 .

A — stierlini (Hyed .) . Deutsche Ent . Zeitschr . XXIV , 1880 : 304 .

angulicolle Stierl , Mitth . SchSweiz . Ent . Ges . V . 1879 : 441 . (not Marow) .

Bembidon Latr . , Hist . Nat . Ins . III , 1802 : 82 .

B — ambiguum Dej . subsp . rugicolle Reiche . Stat . n . Ann . Soc . Ent . France (3) III , 1855 : 635 .

B — Amplum Sahlbg . , Ofv . Finska Vet . -- Soc . Förh . L , 7 . 1907 : 5 .

B — curtulum Dubal , Ann . Soc . Ent . Fr . (2) IX , 1851 : 498 .

lamprinulum Reitt . . Fauna Germ . I . 1908 : 107 .

B — luridicorne Sol . , Fedtschenka Reise Turkest . II , 5 , 1874 : 117 .

inserticeps Chaud . , Bull . Soc . Nat . Mose . XXIII . 1850 . 111 : 173

B — megaspilum Walker , List . Col . Lord . 1871 : 10 .

jordanensis Brul . , Ann . Soc . Ent . Fr . (5) V , 1875 : 443 .

serdicanum Apfelb . . Käf . Balk . I , 1904 : 92 , 114 .

B — niloticum Dej . , Spec . Gen . Col . Col . V , 1831 : 73 .

B — properans Steph . , Illustr . Brit . Ent . Mandib . II , 1828 : 27.

chalceum Steph . . l . c : 27 .

orichalicium Steph . , 1 . c : 27 .

velox Er . Käf . Mark Bransdbg . I , 1837 : 134 .

B — quadricolle Motsch . , Ins . Siber . 1844 : 270 .

inserticeps Chaud . , Bull . Soc . Nat . Mosc . XXIII . 1850:173.

B — quadrimaculatum (L) , Fauna Suec . ed . II , 1761 : 211 .

subglobosum (Rossi) , Mant . Ins . 1792 : 102 .

puchellum (Panz .) , Fauna Germ . 38 , 1797 : 8 .

quacriguttatum (Serv .) . Fauna Franc . I , 1821 : 80 .

oppositum Say , Trans . Amer . Philos . Soc . II , 1823 : 86 .

formosum Sahlberg , Ins . Fenn . I , 1834 : 198 .

coarctatum Sahlb . , I . C . 199 .

sibiricum Motsch . , Käf . Russl . 1850 : 12 (not Dej . not Motsch .)

B — quadripustulatum Serv . , Fauna Franc . Col . I , 1821 : 80 (not F . isch .)

antiguorum Crotch , List . Col . 1868 : 16 .

B — splendidum Sturm . Deutrchl . Ins . VI , 1825 : 145 , t . 159 , f . a . , A .

metallicum Sturm , Cat . 1826 : 100 .

venustulum Dej . , Spec . gen . col . V . 1831 : 76 .

luripedes Reiche , Ann . Soc . Ent . France (3) III, 1855 : 636 .

B — vicinum Luc . , expl . sc . Alg . 1846 : 86 , t . 10 , f.q,

tenusstriatum Fairm . , pet . nouv . Ent . II , 1876 : 37 , 50 .

L — ymnastis Motsch . . Etud . Ent . XI , 1826 : 27 .

L — galilaeus Brul . , Ann . Soc . Ent . Franc . . 1896 : 344 .

narentinus Reitt . , Wien . Ent . Zeit . III , 1884 : 124 .

T — achys Steph . , Illustr . Brit . Ent . Mandib . II , 1828 : 2,4 .

T — lucasi (Duval) , Ann . Soc . Ent . Franc . (2) X, 1852 : 197 .

capticus (Apetz) , Coleopt . Brehm Africa Coll . 1854 : 11 .

kuttiger Reiche , Ann . Soc . Ent . France (3) III, 1855 : 633 .

T — sexstriatus Duft . , subsp . euphraticus Reitt . stat . n .
Deutsche Ent . Zeitschr . XXIX . 1885 : 339 .

5 — TRIBE POGONINI

Diodercarus Letsch . , Ann . Mag . Nat . Hist . (10) VIII , 1931:528.

D — arrowi Lutsch . , l . c .

Pogonus Steph . . Illustr . Brit . Ent . Mandib . I , 1828 : 106 .

P — biroi Csiki , Ann . Mus . Hung . 1907 : 574 .

bironis Seidlitz . , Arch . Naturg . LXXIV , 1908 , II, 2, 1 : 189.

P — micans Chaud . , Bull . Soc . Nat . Mosc . XV 1842, II ; 820 .

P — persicus Chaus . . Bull . Soc . Nat . Mosc XV, 1842, II ; 821 .

orientalis Gebl . , Bull . Soc . Nat . Mosc . XX . 1847 : 319
(not Dej .)

tranfuga Chaud . , Ann . Soc . Ent . Belg . XIV , 1871 : 30 .

Syrdenus Chaud . ,Ann . Soc . Ent . Belg . XIV , 1871 : 22 , 34 .

S — grayi Woll . , Mag . Nat . Hist . (3) IX , 1862 : 438 .

fulvus Baudi , Berl . Ent . Zeitschr . VIII , 1864 : 206 .

extensus Chaud . , Ann . Soc . Ent . Belg . XIV . 1871 : 35 .

dilatus Fairm . , Rev . Mag . Zool . (3) I , 1873 : 323 .

6 — TRIBE LICININI

Badister Schellen . , Ent . Helv . II . 1806 : 90 .

B — bipustalatus (F.) , Ent . Syst . I , 1792 : 161 .
cruxminor (01.) , Ent . III , 1795 , 32 : 99 .
ballatus (Schr .) , Fauna Boica I , 1798 : 623 .
crucifer (Fourc .) Ent . Paris 1785 : 47 .
longicollis = quadrimaculatus = quadripunctatus = guttatus Lenzn . , Zeitscher . Ent . Breslau V , 1851 : 129 .

B — dilatus Chaud . , Bull . Soc . Nat . Mosc . X . 1837 , III : 20 .
grafi Reitt . , Wien . Ent . Zeit . XXXII , 1913 : 215,f . 4 ,6 .

Licinus Latr . , Hist . Nat . Ins . III , 1802 : 82 .

L — aegyptiacus Dej . , Spec . Gen . II , 1826 : 398 .
hierichontichus Reiche , Ann . Soc . Ent . Franc . (3) III , 1855 : 594 .

7 — TRIBE HARPALINI

Acinopus Sturm . . Cat . Ins . Samml . 1826 : 6 .

A — khalisensis Ali , B ull . B iol . Reseash cent :I:, 1965.14 .

A — laevigatus Menetr . , Cat . rais . 1832 . 128 .
nitidus Falderm . , Fauna Transcuac . 1835 : 77 .
eurycephalus Chaud . , Bull . Soc . Nat . Mosc . XV , 1842 , IV : 828 .

Clypeatus Fisch . , Bull . Soc . Nat . Mosc . XVII , 1844 , 1:31.
rufitarsis Fisch . l . c .
novorossicus Sem . , Ent . Ross . Ross . XXXII . 1898 : 604 , 609 .

A — megacephalus (Rossi) . Mant . Ins . II , 1794 : 102 , t . 3 , f , H .

sabulosus Sturm , Duetschl . Ins . IV , 1818 : 5 , t 78 , faa – 6 (not F .)

bucepralus Dej . , Spec . Gen . col . IV , 1829 : 36 .

emarginatus Chaud . , Bull . Soc . Nat . Mosc . XV , IV : 829.

rotundicollis Carret , Bull . Soc . Ent . Franc . 1898 : 54 .

A — Picipes (01.) , Eat . III , 1795 . 36 : 12 , t . 1 , f . 7.

megacephalus III . , Mag . Insectenk . I , 1802 : 353 (not Rossi) .

tristis Latr . , Hist . Nat . ed . Sonnini , VIII , 1804 : 372 .

tenebroides Duft . . Fauna Austr . II , 1812 : 126 .

pasticus Germ . , Rerm Dalmat . 1817 : 194 .

minutus Brul . , exped . scient . Moree 1832 : 118 , t . 33 – f . 11 .

A — subulosus (F.) , Ent . Syst . I . 1792 : 96 .

obesus Schönh . , Syn . Ins . I , 1806 : 191 .

lepeletieri Lucas , expl . Scient . Alg . 1846 : 66 , t . 9 , f . 1 .

mauritanicus Lucas , l . c : 67 . t . 9 , f . 2 .

2 — Acupalpus Latr . , Cuv . Regne Anim . ed . 2 , IV . 1829 : 391.

A — dorsali (F.) , Mant . Ins . I , 1787 : 205 .

celer (01 .) , Ent . , III , 1795 , 35 : 114 .

parvulus Sturm . , Duetschl . Ins . IV , 1825 : 77 .

derelictus Dawson , Geod . 1854 -- 159 .

vittatus (Gräells) , Mem . Map . Geol . 1858 : 39. t. , f . 4 .

gyllenhali C . G . T . oms . , Skand . Col . I , 1859 : 288 .

discus Reitt . , Wien . Ent . Zeit . XIII , 1894 : 82 .

A — elegans Dej . , spec . Gen . sol . IV , 18.9 : 412 .

A — suturalis Dej . , Spec . Gen . col . IV , 1829 : 448 .

3 — Amblpstomus Er . , Käf . Mark Brande . I . 1 : 1837.59

A — metalleseens (Dej .) , spec . Gen . col . IV , 1829 : 482 .

dilatus Chaud . , Enum . Carab . Cuae . 1846 : 188 .

majoricensis Chauf . , Nung . Otios . III , 1882 : 545 .

Anisodactylus Dej . , Spec . gen . col . IV , 1829 : 132 .

A — intermedius Dej . , Spec . gen . col . IV , 1829 : 139 .

A — pseudoaeneus Dej . , Spec . gen . col . IV . 1829 : 137 .

punctipennis Gebler , Bull . Soc . Nat Mosc . VI , a833 : 265 .

maculifrons Ménétr . . Ins . Lehman , 1849 : 21 .

Anoplogenius Chaud . , Bull . Soc . Nat . Mosc . XXV , 1888 , 1:88 ,

A — procerus (Shaum) , Wien . Ent . Monatschr . II , 1858:274 .

grandis Peys . , Ann . Soc . Ent . Franc . (3) VI . 1858:380 .

morio Reitt . , Deutsche Ent . Zeitschr . , 1894 : 35 (not Ménétr .)

Anthracus Motsch . , Käf . Russl . 1885 , t . VII .

A — druei Pic , L'Echange XX , 1904 : 89 .

A — hauseri Fleisch . , Wien . Ent . Zeit . XXXIII , 1924 : 268 .

Axinotoma Dej . , Spec . gen . col . IV , 1829 : 29 .

A — fallax Dej . , l . c . : 30 .

Bradycellus Er . , Käf . Mark Brandeb . I . 1 , 1837 : 64 .

B — verbasci (Duft .) , Fauna Austr . II , 1812 : 186 .

collaris Sturm , Deutschl . Ins . VI , 1825 : 74 .

pallipes Steph . , Illustr . Brit . Ent . Mandib . I , 1828 : 168 .

pallidus Steph . . l . c : 169 .

rufulus Dej . , Spec . gen . IV , 1829 : 470 . SS

fclvus Dawson , Geod . Brit . 1814 : 163 . (not Marsh . . Not Dej .)

Carterus Dej . & Boisd . , Icongr . col . d'Eur . I , 1829 : 232 .

C — gilvipes Brul . , L'Abielle XV , 1877 : 34 , 59 .

C — ignoratus Stichel , Zeitschr . Wiss . Insektenboil . 1923 : 49 , 88 .

angustipennis Brul . , L'Abielle XV , 1877 : 35 . 68 (not Chaud .)

C — validivasculus Brul . , L'Abielle XV , 1877 : 35 , 66 .

Crassodactylus Guèrin . Rev : Zool : 1847 : 50 :

C — punctatus Guerin , In Iefebvre , voy , Abyssin , Iv , 1849 : 258 :

Daptus Fisch . , Entomogr . Russ . II , 1824 : 35 .

D — vittatus pisch , subsp . flavivertis Reitt . stat . n . verh . Neturf . ver . Brünn XXXIII , 1900 : 40 .

Diachromus Er . , Käf . Mark Brandbg . I , 1 . 1837 : 43 .

D — germanus (L) . subsp . equisitus Mulsant & Rey Stat . n . Ann. Soc . Linn . (2) XV , 1870 : 403 .

Ditomus Bon . , Observ . Ent . I , 1810 , tab . Synopt .

D — ermita Dej . , Spec . gen . col . I , 1825 : 447 .

nitidulus Dej . , l . c .

talpa Redten . , Denkschr . Akad . Wiss . Wien . I. 1850 : 47 .

perforatus Reiche , Ann . Soc . Ent . Franc . (3) III . 1855 : 589.

D — obscurus Dej . , Spec . gen col . I , 1825 : 445 .

D — punctalatus Chaud . , Bull . Soc . Nat . Mosc . XVII , 1844 , II : 476 .

D — semicylidricus Gilincki , Rev . Zool . (2) XXIII , 1872 : 476 .

tenvesculptus Sol . . In Fedtschenko Reise Turkest . II , 5 1874 : 47 .

semicyaneaus Jacob . . Zsiki Ross . fasc . 5 , 1907 : 372 .

Egadroma Motsch . , Etude . Ent . IV , 1855 : 43 .

E — marginatus Dej . , Spec . gen col . IV , 1829 : 427 .

Egaploa Alluaud , Ann , Soc . Ent . Frank . LXXXV , 1916 : 64.73.

E — crenulata (Dej .) , Spec . gen . col . IV , 1829 : 432.

Gynandromorphus Dej . , Spec . gen . col . IV , 1829 : 186 .

G — peyroni Carret , Bull . Soc . Ent . Franc . 1905 : 122.

Harpalus Latr . , Hist . Nat . Crust . Ins . III , 1802:92 .

H — brachypus Stev . , Mem . Soc . Nat . Mosc . II . 1809:39 .

robustus Faldeem . , Fauna Transcaus . I , 1832 : 80 . t . 4 , f . 1 .

robustus Ménétr . . Ins . Lehm . 1849 : 25 .

H — caiphus Reiche , Ann . Soc . Ent . Franc . (3) III , 1855:630.

H — fulvus Dej . , Spec . gen col . IV . 1829 : 323 .

littoralis Ramb . . Faune Adalous , 1838 : 127 .

H — fuscipalpis Sturm , Deutschl . Ins . IV . 1818 : 66 , t . 88, f . B .

constricus Duft . , Fauna Austr . II , 1812 : 102 .

unicolor Motsch . . Ins . Siber . 1844 : 217 , t . q . f . 14 .

castibianus Vuillefroy , Ann . Soc . Ent . Franc . (4) VI , 1866 : 348 .

brunneus Torre , 8 Jahr . -- Ber . Ver . Naturk . Linz . 1877:49.

H — metallinus Ménétr . , Bull . Acad . Sc . St . Petersb . I , 1836 : 149 .

virescens Falderm . , Fauna Transcauc . I , 1835 : 89 (not Dej.)

seriatus Chaud . . Enum . Carab . 184 : 175 .

H — oblitus Dej . , Spec . gen . col . IV . 1829 : 273 .

incertus Dej . , l . c . : 318 .

H — tenebrosus Dej . , l . c : 358 .

femoralis Chaud . , Enum . Carab . 1732 : 177 (not Steph .)

chaudoiri Motsch . , Käf . Russl . 1850 : 27 .

wollastoni Dawson , Geob . Brit . 1854 : 144 .

bitigiosus Woll . , Ins . Mader . 1854 : 51 (not Dej .)

H — undulatus Gebler , Bull . Acad . Sc . St . Petersb . VIII , 1841 : 371 .

brachypus Ménétr . . Ins . Lehm . 1849 : 25 . (not Steph.)

externepunctatus Solsky , in Fedtschenko . Reise Turkest . II , 5 , 1874 : 74 .

Hemiaulax Bates , Ann , Mus , Civ . Genova (2) XII , 1892 : 347 .

H — morio (Ménétr) , Cat . rais . 1832 : 136 .

Heteracantha Brul . . Hist . . Nat . Ins . IV , 1834 : 482 .

H — depressa Brul . , l . c . t . 16 , f . 1 .

Macrophonus Tschirsch . , Horae , Ent . Ross . XXXV , 1901 : 233 .

M — oblongus (Schaum) , Wien . Ent . Monatschr . II , 1858:373.

langloisi (peyron) . Ann . Soc . Ent . Franc . (3) VI , 1858: 381 , t . 9 . f . 7 .

Odontocarus Solsky , Ann , Soc . Ent . Franc . III , 18v4 : 663 .

O — asiaticus Chaud . , Bull . Soc . Nat . Mosc , XXV , 1852 , 1 : 90 .

bucidus Reiche , Ann . Ent . Franc . (3) III , 1855 : 585 .

libanicola Mars , L'Abielle V , 1868 : 171 .

O — cephalotes Dej . . Spec . gen col . II , 1826 : 482 .

Opäonomimus Schauberger . Ent . Anz . III , 1923 : 72 .

O — hirsululus (Dej .) , Spec . gen col . IV , 1829 : 226 .

acutipennis (Küster) , Käf . Eur . IX , 1847 nr . 7 .

tataricus (Ménétr .) , Men . Acad . Sc , St , Petersb , VI . 1849 : 36 .

Ophonus Steph . , Illustr . Brit . Ent . Mandib . I , 1826 : 67 .

O — azureus (F .) , Syst . Ent . 1775 : 244 .

chlorophonus (Danz .) , Fauna Germ . 73 , 1801 , nr . 3 .

cyanexceus Torre , 8 Jahr -- Ber . Ver . Natur . K . Linz , 1877 : 46 . (not Motsch .)

chlorosceus Torre , l . c .

O — cribrellus Reiche , Ann . Soc . Ent . Franc . (3) III , 1855:926.

judaeus Reitter , Verh , Naturf , ver . Brün . XXXVIII , 1900 : 64 .

O — cribricollis De . , Spec : gen col : IV , 1829 : 200 :

craasiusculus Fairm . & Laboulbene , Faune , Ent . Franc . I , 1844 -- 56 : 126 .

fauveli Mathan , Ann . Soc . Ent . Franc . (4) II , 1862:244 .

O — israelita Brul . , Ann . Soc . Ent . Franc . (5) V , 1875:410 ,

O — judaeus Brul . , l . c .

clypealis Reitt . , Verh . Naturf . ver . Brünn . XXXIII , 1900 : 62 .

O — musaybensis Ali , Bull . Biol . Reserch Cent . I, 1965 .15:

Pachycarus Silsky , Ann . Soc . Ent . Franc . III , 1834 : 666 .

P — brevipennis Chaud . , Bull . Soc . Nat . Mosc , XXIII , 1850 , II : 444 .

Parophonus Ganglb . , Käf . Mitteleur . I , 1892 : 340 .

P — dia Reitt . , Verh . Naturf . ver . Brünn , XXXVIII , 1900:68 .

P — mendax (Rossi) . Fauna Etrusca I , 1790 : 223 , t.2, f. 10 .

P — planicollis Dej . ,Spes . gen . col . IV , 1829 : 227 .

Penthus Chaud . , Bull . Soc . Nat . Mosc . XVI , 1843 , III , : 387 , 390 .

P — tenebrioides Waltl . , Isis VI , 1838 : 451 .

tenebricosus Chaud . , Bull . Soc . Nat . Mosc . XVI , 1843 , III : 389 .

brevicollis Reott . , Wien . Ent . Zeit . III , 1884 : 249 .

Pseudophonus Motsch . , Ins . Siber . 1844 : 196 .

P — rufifes (Degeer) , Mem . Ins . IV , 1774 : 96 .

ruficornis (Fisch .) , Syst . Ent . 1775 : 241 .

pubescens (O.F. Müller) , Zool . Dan . prodr . 1776 : 77 .

fuscus (Gemelin) , In L . syst . Nat . ed . 13 , 1 , 4 , 1790 : 1987 .

pulverulentus (Rossi) , Fauna Etrusc . I , 1790 : 233 , t . 3 , f . 7 .

sericeus (Fourcroy) , Ent . Paris I , 1795 : 54 .

sagowskii Lutsch . , Berl . Ent . Zeitschr . LIV , 1909 : 108 .

P — griseus (Panz) , Fauna Germ . 38 , 1797 , nr . 1 .

bicolor (Marsh .) , Ent . Brit . I , 180. : 436 .

reichei Desbr . , Not . ent . Bourbonn . , 186 : 42 .

Sabienus Gozis , Mitsh . Scheid . Ent . Ges . VI , 1882 : 290 .

S — calydonius (Rossi) , Fauna Etrusc . I , 1790 : 288 , t . 8 , f . 8 , 9 .

cornutus (Ménétr .) , Cat . rais . 1832 (IX) : 103 .

S — tricuspidatus (F.) , Ent . syst . I, 1, 1792 : 144 .

longicornis (F .) , Ent . Syst . I , 1792 : 150 .

calydonius (Bermar) , Reise Delm . 1817 : 199 .

cornutus (Dej .) , Spec . gen . col . I , 1825 : 440 .

frioli (Solsky) , Ann . Soc . Ent . Franc . III , 1834 : 664 .

spinicollis (Chaud .) Bull . Soc . Nat . Mosc . XVI , 1843 , IV : 743 .

Stenolophus Steph . , Illustr . Brit . Ent . Mandib . I , 1826 : 65 .

S — discophorus Fisch . , Entomogr . Russ . II , 1828 : 141 .

S — persicus Mann . , Bull . Soc . Nat . Mosc . XVII , 1844 , III : 432 .

paragraphus Kolenati , Melet . Ent . I , 1845 : 68 .

Trichocellus Ganglb . , Käf . Mitteleur . I , 1892 : 366 .

T — godarti (Jaquet) , Reb . d'Ent . I , 1882 : 226 .

T — obscuricornis Reitt . , subsp . euphraticus Tschitsch , Horae , Soc . Ent . XXXII , 1899 : 453 , 472 .

8 — TRIBE CHLAENIINI

Callistus Bon . , Observ . I , 1810 , tab . Synopt .

C — lumulatus (F .) , Syst . Ent . 1775 : 247 .

cruximinor (Sulzer) , Abgek . Gesch . Ins . I , 1776 : 63 , t . 7 . , f . 6 .

eques (Schr .) , Enum . Ins . Austr . 1781 : 215 .

plateosus (Fourc .) , Ent . Paris I , 1785 : 53 .

Sulzeri (Braham) , Insect . Kalender I , 1790 : 75 .

Chlaenius Bon . , Obser . I , 1810 , tab . Synopt .

C — aeratus (Quen .) , In Schonsyn . Ins . I , 1806 : 177 .

algerinus Gory , Ann . Soc . Ent . Franc . II , 1833 : 225 .

C — amarea Andr . , Ent . Month . Mag . 56 1920 : 239 .

C — velutinus (Duft .) Fauna Austr . II , 1812 : 168 .

marginatus (Rossi) , Fauna Etrusc . I , 1790 : 212 (not . L.)

cinctus (Ol .) , Ent . III , 1795 , 35 : 87 , t . 28 (not L.)

C — canariensis Dej . , Spec . gen . col . V , 1831 : 657 .

cyanicollis Brul . , Voy . d'Orbigny Amer . merid . 1838 : 39 .

C — circumscriptus (Duft .) , Fauna Austr . II , 1812 : 166 .

sinctus (Rossi) , Fauna Etrusca I , 1790 : 212 , t . 4 , f . 9 , (not F .)

karelini Mann . , Bull . Soc . Nat . Mosc . XVI , 1843 : III : 432 .

turcmenicus Motsch . , Bull . Soc . Nat . Mosc . XXXVII , 1864 , IV : 345 .

C — coeruleus (Stev .) , Mem , Soc , Nat . Mosc . II , 1809 : 37 .

leitzingeri Lutsch . , Acta Ins . Agronom Stavropol I , 1921:19 .

C — dejeani Den . & Boisd . , Icongr . col . d'Eur . II , 1830 : 195 , t . 96 , f . 2 .

armeniacus Motsch . , Bull . Soc . Nat . Mosc . XXXVII , 1S864 , IV : 344 .

C — festivus (Panz .) , Fauna Germ . 30 , 1796 : 15 .

zonatus (Panz .) , l . c . 31 : 7 .

fischeri Krynicki , Bull . Soc . Nat . Mosc . II , 1829 : 187 ,

tenuistriatus Krynicki , l . c . V , 1832 : 78 .

C — flavipes Menetr . , Cat . rais . caus . 1832 . 114 .

exutus Friv . , Termeszettud . Tars . Evk . I . 1845 : 178 .

persicus Redt . , Denkschr . Akad . Wiss . Wien . I , 1850 , 1 : 47 .

C — lucasi Peyr . , Ann . Soc . Ent . Franc . (3) VI , 1858 : 361 , t . 9 , f . 2 .

C — spoliatus (Rossi) , Fauna Etrusca I , 1790 : 33 .

cupreomicans Letz . , Zeitschr . Ent . Breslau V , 1851 : 139 .

cuprinus Schilsky , Deutsche Ent . Zeitschr . 1888 : 181 .

C — syriacus Chaud . , Ann . Mus . Civ . Gen . VIII , 1876 : 265 .

C — viridis Mänütr . , Cat . rais . Cauc . 1832 : 115 .

C — vestitus (Payk .) , Monogr . Carab . Suec . 1790 : 73 .

marginatus (L .) , syst . Nat . ed . XII , 2 , 1767 : 670 .

dubius (Hope) , Ent . Taschemb . 1796 : 121 .

aeneus Letz . , Zeitschr . Ent . Breslau V , 1851 : 138 .

viridipunctatus Becel , Fauna Col . Bass : Seine : I , 1881 : 57 (not Goeze) .

C — richardsi Ali , Bull . Biol . Research cent . I , 1965 . 16.

9 — TRIBE OODINI

Oodes Bon . , Observ . Ent . 1 , 1810 , tab . synopt .

O — basrensis Ali , Bull . Biol . Research . Cent . I , 1965.17.

O — irakensis Andr . , Ent . Mitt . XVI , 1927 : 144 .

O — meridionalis Ali , Bull . Biol . Research . Cent,I , 1965:18.

10 — TRIBE PERIGONINI

Perigona Cast . , Etud . Ent . 1835 : 151 ,

P — nigriceps Dej . , Spec . gen . col . V , 1831 : 44 .

umbripennis (Lec .) , Trans . Amer . Philos . Soc . X , 1853: 386 .

fimicola (Woll .) , Ins . Mader . 1854 : 63 .

atriceps Fairm . , Ann . Soc . Ent . Franc . (4) IX , 1869:184.

japonica (Bates) , Trans . Ent . Soc . 1873 : 281 .

beccarii Putz . , Ann . Mus . Civ . Gen . VII , 1875 : 732 ,

disclis Chaud . , Rev . Mag . Zool . (3) IV , 1876 : 353 .

australica Sloane , Proc . Linn . Soc . N . S . Wales , XXVIII, 1903 : 635 .

apicalis Sloane , l . c .

pusilla (Pering .) . Trans . S . Afr . philos , Soc . IV , 1896. : 587 .

11 — TRIBE AMARINI

Amara Bon . , Observ . Ent . 1 , 1810 , tab . synopt .

A — deserticola Ali , Bull . Biol . Research Cent, I, 1965 . 18 .

A — communis (F .) , Syst . , Eleuth , I , 1810 : 195 .

A — fulvipes Serv . , Fauna Franc . col . 1831 . 35 .

striatopunctata Dej . , spec . gen . col . III , 1828 . : 480 .

reflexicollis Motsch . , Mem . Acad . Sc . St . Petersb . V , 1844 : 183 .

valida Fairm . , Ann . Soc . Ent . Franc . (3) VII , 1859 : 21 .

A — glenneei Bal : , Boll : Soc : ent : ital . 66 : 1934 : 244 :

A — Lucida (Duft .) , Fauna Austr . 11 , 1812 : 121 .

A — metallescens Dej . , spec . ken . col . V , 1831 : 799 .

superanus Woll . , Ins . Mader . 1854 : 48 .

solata Cozuer . , Ann . Soc . Ent . Franc , (3) VI , 1858 : 77S8.

A — mesopotamica Bal . , Mem . Soc . Ent . Ital , 69 , 1937:177 .

A — pseudofulva Ali , Bull . Biol . Research Cent . I,1965.20.

A — rufeceps (Dej .) , spec : gen : IV , 1829 : 387 :

aegyptiaa Zimm . , In Gistl . Faunas I , 1831 : 39 .

A — ruthena Tschitsch . , Horae Soc . Ent . Ross . XXVIII 1894 : 425 .

A — saxicola Zimm . , In Gistl . Faunas I , 1831 : 37 .

A — simplex Dej . , Spec . gen col , III , 1828 . 493 .

euphratica Putz . , Mem . Soc . Sc . liege (2) , 1 , 1866 : 202 .

putzeysi Fairm . , Ann . Soc . Ent . Franc . (4) VII , 1867 : 391 .

A — songarica Putz . , Soc . Sc . liege (2) 1 , 1866 : 226 .

12 — TRIBE ZABRINI

Zabrus Clairv . , Ent . Helv . 11 , 1806 : 80 .

Z — morio Ménétr . , Cat . rais . 1832 : 125 .

gibbosus Zimm . , Monogr . Carab . Zabr . 1831 : 57 (not Marsham) .

rufomarginatus Ménétr . , Cat . rais . 1832 : 125 .

piger Faderm . , Fauna Transcauc : III , 1838 : 39 : (not Dej .)

Z — ovipennis Chaud . , Bull . Soc . Nat . Mosc , XVII , 1844 , III : 427 .

pulchellus Motsch . , Käf . 1850 : 57 a .

Z — spenipes (F .) , suppl . Ent . syst . 1798 : 46 .

blapoides (Creutz .) . Ent . Vers . 1 ? 1799 : 112 .

Z — tenebrioides (Geeze) , Ent . Beytr . 1 , 1777 : 667 .

13 — TRIBE PTEROSTICHINI

Abacetus Dej . , Spec . ken . col . III , 1828 : 195 .

A — quadripustulatus (Peyr .) , Ann . Soc . Ent . Franc . (3) IV , 1858 : 371 , t . 9 , f . 4 .

Agonum Bon . , Observ . , Ent . 1 , 1810 , tab . synopt .

A — viridicupreum (Goeze) , Ent , Beytr . 1 , 1777 : 664 .

thoracicum (Fourc .) , Ent . Paris 1 , 1785 : 54 .

nigricorne (Panzer) , Fauna Germ . 6 , 1793 , nr . 4 .

modestum Sturm , Deutschl . Ins . V , 1829 : 205 .

genuinum = laticolle = irregulare = virescens = nigrescens Letz . , Zeitschr . Ent . Breslau V , 1851 : 168 .

Anchomenus Bon . , Observ . Ent . 1 , 1810 , tab . synopt .

A — dorsale Pontop , Danske Atlas 1 , 1763 .

birtdifulvum (Goeze) , Ent . Beytr . 1 , 1777 : 663 .

prasinum (Thnbg .) , Nov . Act . Upsal . IV , 1784 : 74 , f . 87 .

marchicum (Herbst) , In Füessly . Arch . Insectengesch . V , 1784 : 137 .

violaceum (Thunbg .) Nova Acta Upsal . IV , 1784 : 20 .

bicolor (Fourc .) , Ent . Paris 1 , 1785 : 44 .

thunbergi (Gemelin .) , In L . syst . Nat . ed . XIII , 1, 4 , 1790 : 1980 .

viride Gemilin , l . c . : 1986 .

cyanicolle Gebler , Bull . Acad . Sc . St . Petersb . VIII , 1841 : 371 .

A — tigridis Andr . , Ent : Mitt : XVI . 1927 . 146 .

Calathus Bon . , Observ . Ent . 1 , 1810 , Tab . Synopt .

C — fuscipes (Goeze) , Ent . Beytr . 1 , 1777 : 666 .

liporimus (Fourc .) , Ent . Paris 1 , 1785 : 55 .

cisteloides (Panz .) , Fauna Germ . II , 1793 : 12 .

flavipes (Ol .) , Ent . III , 1795 , 35 , : 76 (not Fourc.) .

fridikus (F .) , Elenth . 1 , 1801 : 189 .

violatus Germ . , Ins . spec . nov . 1824 : 13 .

planipennis Germ . , l . c . : 14 .

latus Brul . , Hist . Nat . Ins . IV , 1834 : 304 ,

C — pluriseriatus Putz . , Ann . Soc . Ent . Belg . XVI , 1873 : 60 ,

obscuripennis Reitt . , Deutsche Ent . Zeitschr . 1889 : 18 .

Chlaeniomimus Sem . , Bull . Soc . Nat . Mosc . II , 1889 , II:687.

C — virescens (Notsch .) , Bull . Soc . Nat . Mosc . XXXVII , 1864 , IV : 335 .

hybridus Reitt . , Fauna Germ . , 1908 : 185 .

Laemostenus Bon . , Observ . Ent . 1 , 1810 , tab . synopt .

L — cordicollis Chaud . , Bull . Soc . Nat . Mosc . XXVII , 1854 , 1 , : 143 .

cordatus Chevr . , Rev . Mag . Zool . (2) VI , 1853 : 392 .

nigritus Reiche , Ann . Soc . Franc . (3) III , 1855 : 599 .

L — capitatus Chaud . , Bull . Soc . Nat . Mosc . XXVII , 1854 , 1 : 144 .

Morion Latr . , Consid . gen . 1810 , tab . Meth . 159 .

M — olympicus Redten . , Russeg : Reise Pers : 1 , 2 , 18b3:980, t . A , f . 4 .

cholchius Chaud . , Bull . Soc . Nat . Mosc . XVII . 1844 , 111 : 437 .

caueasicus Motsch . , Bull . Soc . Nat . Mosc . XVIII , 1845 , 1 : 12 .

Orthotrichus Peyr . , Ann . Soc . Ent . Franc . (3) IV , 1856:717.

O — irakensis . Ali , Bull . Biol . Research Cent , I' 1965 21 .

Petrostichus Bon . , Observ . Ent . 1 , 1810 , tab . synopt .

P — affinissimis : Ali , Bull : Biol : Research Cent , I, 1965:21 :

P — beesoni Andr . , Mitt . XVI , 1927 : 145 .

P — bonboisini Reich , Ann . Soc . Ent . Franc . (3) III, 1855:608 .

P — cursor Dej . , Spec . gen . col , III , 1828:243 .

maritimus Gaub . , rev . Zool . 1844 : 340 .

P — leus Andr . , Ent . Mitt . XVI , 1927 : 146 .

hauski Jedl . , Acta Ent . Mus . Nat . Prag . , 27 , 1952:207.

P — Wollastoni Wallaston , Ins . Mader . 1854 : 46 , t. 1, f.9,
profundecernatus Woll . , Col , Hesperid . 1867 : 21 .
martini Bedel . Amm . Soc . Ent . Frabc . LXVI , 1895 : 345 ,
Sphodrus Clairv . , Ent . Helv . II , 1806 : 86 .
S — leucopthalmus (.) , syst . Nat . ed . X , 1758 : 413 ,
obsoletus (Rossi) , Fauna Etrusca . 1, 1790 : 209 .
planus (F .) , syst . 1 , 1792 : 133 .
suiniger (payk .) , Mon . Carab . Suec . 1790 : 43 ,
armeniacus Osculati , Col . pers . , 1844 : 12 .
brunneus Leitz . , Zeitschr . Ent . Breslau V, 1851 : 155 .
sulcus Motsch . , Bull . Soc . Nat , Mos . XXXVII , 1864 ,
IV : 315 .

14 — TRIBE ZUPHIINI

Zuphium Lttr . , gen . Crust . Ins . 1806 : 198 ,
Z — olens (Rossi) , Fauna Etrusca 1 , 1790 : 217 , t. 5, f. 2 .
longiusculum Chaud : . Bull Soc : Nat : Mosc : XV , 1842 ,
IV : 804 .
Z — testaceum Kiug . , symg : Phys : III , 1832, t : 21,f, 11 :
hauseri Reitt . , Wien . Ent . Zeit . XIV . 1895 : 149 .

15 — TRIBE TETRAGONODERINI

Tetragonoderus Dej . , Spec . gen . col . IV , 1828 : 485 .
T — arcuuatus Dej . , l . c . : 495 .
T — intermedium Solsky , In Fedtschenko , Reise Turkest . II ,
5 , 1874 : 45 .

16 — TRIBE MASOREINI

Aephnidius M'Leay , Annul . Javan , 1825 : 23 .

A — rificornis Chaud . , Bull . Stc . Nat . , Mosc . XXIII , 1850 , 11 : 452 .

Masoreus Dej . , Spec . gen . col . III , 1828 : 536 .

M — orientalis Dej . , l . c . : 539 .

laticolis Chaud . , Bull . Soc . Nat . Mose , XVI , 1843 , 11:778.

nobilis Woll . , Cat . Col . Canar . 1864 : 22 .

acendens Woll . , Col , Hesperid . 1867 : 17 .

17 — TRIBE LEBIINI

Apristus Chaud . , Enum . Carab . Cauc . 1846 : 42 .

A — subaeneus Chaud . , l . c . : 63 .

arens Motsch . , Bull , Soc . Nat . Mosc , XXXVII , 1864 , III : 233 .

Cymindiodea Cast . , Ann . Soc . Ent . Franc , , 1, 1832 : 390 .

C — famini (Dej .) spec . gen . col . II , 1826 : 447 .

bufo Shaum , Ent . Zeit . settin VIII , 1857 : 49 .

Cymindis Latr . , Gen . crust . Ins . 1 , 1806 : 190 .

C — andreae Ménétr . , Cat . rais . Caue . 1832 : 98 .

Imperialis Zubkoff , Bull . Soc . Nat . Mosc . X , 1837 , V : 59 , t . 3 , f . 1 .

discoidea Peyr . , Ann . Soc . Ent . Franc , (3) VI . 1858:390.

C — axillaris (F.) , Ent . syst . IV , 1794 : 441 .

homagrica (Duft .) , Fauna Austr . II , 1812 : 240 .

angularis Steph . , Illustr . Brit . Ent . Mandib . 1, 1827:31 .

leavigata Steph . , l.c. V, 1835 : 32 , t.2 , , f. 2 .

condunata (Steph .) , l . c . : 369 .

Taurica Motsch . , Ins . Siber . 1844 : 53 .

C — hierichontichus Reich Subsp . Freyi Schatzmayr , Natura . Milan 1939 / 30 : 102 .

Glycia Chaud . , Bull , Soc . Nat . Mosc . XV , 1842 , IV:805 .

G — castanea (Klig .) , Symb . Phys . III , 1831 . t .22,f.2.

seminigra Fairm . , Ann . Soc . Ent . Franc . (6) V, 1886:439 .

G — (Kluk.) , symb phys . III , 1831 t . 22, f. 3 .

karelini Motsch . , Ins . Siber . 1844 : 41 .

spencei (Gistl .) , Syst . Ins . 1, 2, 1838 : 123 ,

kruperi Reitt . , Deutsche Ent . Zeitschr . XXVIII , 1884 : 36, t . 1 , f . 1 .

G — rofolimbata Maindr . , Ann . Soc . Ent , Franc . LXXIV , 1905 : 332 .

karelini Chaud . , Bull . Soc . Nat . Mosc , XXI , 1848 , 1:73 .

Lebia Latr . , Host . Nat . Crust . Ins , III . 1802 : 85 .

L — baghdadensis Liebke , Ent . Anz . VIII , 1928 : 129 .

atriceps Pic , L'Echange XXXVIII , 1922 : 25 . (not Leconte).

L — cruxminor (L.) , Syst . Nat . ed . X , 1758 : 419 .

errata (Rossi) , Fauna Etrusca 1 , 1790 : 91 , t. 6, f. M .

andreae (Rossi) , l . c . : 221 .

cruxmajor (Ol .) , Ent . III , 1795 , 35 : 96 , t. 4., f,41,

scutellata Letz . , Zeitschr . Ent . Breslau IV , 1850 : 103 .

L — cyanocephala (L.) , Syst . Nat . ed . X , 1758 : 415 ,

rubripes = nigripes = azurescens = viridiscens , Torre , 8 Jahr . -- Berl . Ver . Naturk . linz . 1877 : 33 .

L — lucilla Reitt . , Nachr . XXIV , 1898 : 224 .

L — nilotica Chaud . , Bull . Soc . Nat.Mosc . XLIII , 1870 , II : 220 , t . 1 , f . 13 .

Metabletus Schmidt -- Goeb . , Fanula col . Birm . 1846 : 38 .

M — fuscomaculatus Motsch . , Ins . Siber , 1844 : 59 .

patruelis (Chaud .) , Enum . Carab . Cauc . 1846 : 60 ,

exclamationis , (Ménétr .) , Mem . Mem . Acad . Sc . St . Petersb . (6) VI , 1848 : 22 .

M — lateralis (Motsch .) Etud . IV , 1855 : 82 .

mutabilis Reiche , Ann . Soc . Ent . Franc . (3) III , 1855:574,

Microlestes Schmidt -- Goeb . , Fanula col . Birm . 1846 : 41 .

M — corticalis (Duf.) , Ann . Sc . Phys . Bruxellus VI , 1820:322,

suturellus (Motsch .) , Ins . Siber . 1844 : 58 .

plagiatus (Schmidt -- Goeb .) , Fanula col . Birm . 1846:39 .

binotatus Reitt . , Deutsche Ent . , Zeitschr . 1901 : 370,372 .

M — plagiatus (Duft .) , Fauna Austr . II, 1812 : 249 .

lineellus (Fisch .) , Entomogr . Russ . III , 1825 - 28 : 93 , t . 4 , f . 7 .

M — syriacus Bris . , Ann . Soc . Ent . Franc . (6) V, 1885:102,

Sigilis Ramb . , Faune Andal : 1 , 1837 : 25 : ,

S — plagiata (Reich & Sauley) , Ann . Soc . Ent . Franc . (3) III , 1855 : 578 , t . 22 , f . 4 .

Trichis , Klug . , Sumb : Phys : III , 1831 , t : 21 :

T — maculatus Klug . , l . c .

18 — TRIBE GRAPHIPTERINI

Graphipterus Latr . , Hist . Nat . Crust . Ins . III , 1802:83 ,

G — minutus Dej . , Spec . gen . col . 1 , 1825 :336 ,

19 — TRIBE ANTHIINI

Anthia Weber , Observ . Ent . 1801 : 17 .

A — duodecimguttata Bon . , Observ . Ent . II , 1813 : 451 .

20 — TRIBE BRACHININI

Brachinus Weber , Observ . Ent . 1801 : 22 .

B — baghdadensis Pic . , L'Echange XVII , 1902 : 25 .

B — bayardi Dej . , Spec . gen col . V, 1831 : 431 .

guttula Chaud . . Bull . Soc . Nat . Mosc . XV, 1822, IV:808 .

buguttatus Chaud , l . c .

bisignifer Costa . R . Accad . Sc . Napoli IX , 4 , 1882 : 33 , f . 1 .

B — brittoni Ali , Bull . Biol . Research Cent . I, 1965 . 23 .

B — crepitans (L.) , syst . Nat . ed . X, 1758 : 414 ,

explodens Steph . , Illustr . Brit . Brit . Ent . Mandib . I , 1828 : 35 .

obscurus Heer , Fauna col . Helv . I , 1 , 1838 : 14 .

fimbriolatus Lucas , explor . Sci . Alk . II , 1846 : 22 , 6, 3 , f . 8 .

sulcatulus Motsch . , Käf . Russl . 1850 : 35 .

virescens Letz . , Zeitschr . Breslau , V , 1815 : 115 .

B — ejaculans Fisch . , Entomogr . Russ . III , 1825 -- 28 : 105 , t . 2 . , f . 2 .

graecus Dej . , Spec . gen . col . V , 1831 : 430 .

costulatus Motsch . , Ins . Siber . 1844 : 68 ,

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خلاصـة

يتضمن هذا البحث الوضع التصنيفي لمجموعة من الحشرات تدعى الخنافس الارضية والتحت العائلة المسماة Harpalinae تعود هذه المجموعة الى عائلة Carabidae ويشمل البحث الانواع الموجودة في العراق وأسماءها المرادفة وتسلسلها حسب رقيها .

ان مجموعة هذه الحشرات تعتبر مفيدة في الحقل حيث تعمل كمفترسات ليرقات حشرات ضارة جدا فهي تفترس كثير من يرقات الآفات النباتية وخاصة يرقات مجموعة حرشفية الاجنحة وبذلك تعتبر أساساً في المكافحة البيولوجية.

الدكتور حسين عباس
جامعة البصرة

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FUNCTIONAL ANATOMY OF THE DIGESTIVE BRGANS OF PAMPUS ARGENTEUS EUPHRASEN (FAM . SIRAMAEIDAE) :

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Introduction

Many contributions have appeared on the structures and functions of digestive organs of fishes . Jacobshagen (1911 , 1937) , Suyehiro (1942) , Rahimullah Qureshi (1945) and Al -- Hussaini (1947) have done valuable works on the different groups of fishes and have given exhaustive historical accounts of the researches done before . In Iraq contributions made by Al -- Hamed (1965 , 1966) on the morphology and histology of the alimentary tracts of three cyprinid fishos i . e. Barbus sharpeyi Gunther , B.grypus Heckel , and B.xanthopterus Heckel are commendable . Other than this no such work has been known from this country so far the author's knowledge is concerned .

Pampus argenteus Euphrasen (Local name : Zubeidy) is economically very important fish in Iraq and is distributed through the seas of India to Malaya Archipelako . A search in literature explores the names of Bühler (1930) , Suyehiro (1942) , Khanna (1962) , Kuthalingam (1963) , Khanna and Pant (1964) , Isokawa et al (1965) and Khanna and Mehrotra (1970) . Their

works are sufficiently exhaustive in treatment so as to give a full picture of its digestive tract . Therefore detailed studies have been undertaken to explain the anatomy of the digestive organs and to correlate their structural adaptations to the normal diet .

Materials and methods .

Fresh specimens , 100 -- 350 mm in total length (T .L .) , were obtained from Basrah -- Ashar Fish Market in June -- July , 1972 and were fixed in formalin . Dissections were made on a number of specimens for the study of gross anatomy . Alizarine Red was employed for the study of bony stuctures in the buccopharyngeal cavity . Figures were made with the help of camera lucida .

Observations

Buccopharynx .

The mouth is transverse and subterminal . The gape is equal to about 3 . 4 the length of the head . The premaxillae are paired curved bones and form the border of the upper jaw . They bear villiform teeth arranged in a single row (Fig . 1 A , B .) ; rarely a few are marked on the inner side of the row . The front teeth are slightly smaller than the back teeth which are cusped (2 -- 3 small cusps) (Fig.1,C) . They measure about 100 -- 200 micron in length and number about 40 — 45 distributed equally on each side . In Alizarine preparation their tips do not take the stain . The premaxillae meet each other in a loose symphysis anteriorly .

The maxillae are large and curved,and have expanded bony processes at the posterior ends . They overlap the dentaries of lower jaw to which they are attached by skin and ligaments .

The dentaries are paired V -- shaped bones which form the major part of the lower jaw . They curve around the anterior margin of the jaw and meet in loose symphysis . The dorsal limb of the dentary is shorter than the ventral limb and bears a single row of villiform teeth extending over its whole length (Fig . 1 D, F .) . They are occasionally shed . The front teeth are smaller than the middle and back teeth which are cusped (2 -- 5 cusps) (Fig . 1 E) . They measure about 100—220 micron in length and number about 75 — 95 distributed equally on each dentary .

The maxillary and mandibular valves are sheets of membrane situated in the oral cavity just caudad of the maxillary and mand-- ibular teeth respectively (Fig . 1 A, D.) . They are widest directly in front and taper down laterally to a point just behind the angle of the mouth . The maxillary valve is crescentic in shape and its attached edge is thick while the free edge is thin and " notched " . On its ventral surface are found small papillae scattered irregularly. Little rugae are also marked in large specimens . Melanin chromat-- ophores (stellate) are irregularly spread more in number near the attached edge than near the free edge . The mandibular valve is crescentic can "perfect" ; its middle region is covered dorsally by the free end of the tongue . The surface is smooth and melanin chromatophores are marked on its dorsal surface . An elongate ' white central thickening ' is observed in both the valves .

The roof of the buccal cavity is concave and its mucous memb-- rane is thrown into longitudinal folds.In the posterior region there

are two conspicuous rounded elevations , which are provided with small pointed teeth (Fig . 1 A) . The teeth consist of broad basal ends fixed to the ' elevations ' and tapering distal ends . At the level of second to fourth gill arches the mucous membrane forms small meshes of low thin folds. The superior pharyngeals are marked here . Their posterior ends project behind into the oesophageal sac which lie on either side (right and left) of the anterior part of the large , longitudinal dorsal ridge . In front of the sac there is a depressed triangular area , the mucous membrane of which is longitudinally folded . Tiny teeth are marked on the entire surface of the buccopharyngeal cavity , more prominently on and around the aforesaid ' elevations ' than elsewhere .

An almost rectangular tongue occupies the anterior part of the floor of the buccal cavity ; its mucous membrane forms a net of thin folds which are followed by longitudinal folds (Fig . 1 D). Low transverse folds are seen at the level of third and fourth gill arches . A small , fusiform bony structure bearing 40 — 45 teeth is noticed between the two anterior limbs of the inferior pharyngeals , which lie covered in the muscles of floor . Their length — breadth ratio is 3 . 4 : Their posterior ends 25 -- 40 tiny teeth which project into the oesophageal sac and lie on either side (right and left) of the anterior part of the large , longitudinal ventral ridge .

Oesophagus

The pharynx extends posteriorly to form a large , thickwalled, muscular sac , the oesophageal sac (Pharyngeal bulb ; Oesophageal bulb ; Prestomach) . It is soft , black and elliptical . It is marked with incomplete circular lines externally and encloses a large cavity inside , the oesophageal sac cavity which is continuous anteriorly with the pharynx and posteriorly with the stomach . In the cavity theret are two large longitudinal ridges,the dorsal and ventral ridges which meet each other to incomuletely divide the sac cavity into two small chambers (a right and a left) . (Fig . 2A) . The mucous membrane of the chambers is produced into numerous papillae or processes of different lengths . They look like extended polyps of a coelenterate and have porous tube -- like bones as revealed by Alizarine Red (Fig . 2A) : A papilla consists of two regions i . e . the basal and apical regions . The basal region is produced into 3 — 6 , rarely 8 long radial or basal processes which lie embeaad in the wall of the sac . They are thick at the attached ends and taper gradually toward the free ends . The processes of one papilla are not in contact with the processes of another papilla and occupy different levels in the muscles of the sac . The apical region of a papilla is either bluntly pointed or bifid .

A papilla is provided along its whole length with small , pointed teeth and their density toward the basal region is less than those toward the apical regions.A tooth,like a papilla, consists of two reg-- ions , the basal and apical regions (Fig . 2B) . The basal region is small , swoolen and fixed to the papilla while the apical region is

long and pointed . Their junction appears to consist of some connective tissue fibres which run from the basal region to the apical region . They number 4 -- 150 and measure 74 -- 500 micron depending upon the length of the papillae .

Heavy accumulation of mucus is found at the base of the papillae . The ventral and dorsal folds bear transverse low folds and toward the posterior region the mucous membrane is thrown into 14 -- 18 low and high longitudinal folds which continue into the stomach (Fig . 2C) .

Stomach and intestine

The stomach is large and wide . It has two limbs which form an U -- shaped stucture (Fig : 3 A) : The first limb 'a — b' runs almost obliquely backward from behind the oesophageal sac to the posterior end of the peritoneal cavity and then turns sharply forward ventro -- sinistrally to form the second limb ' b -- c ' (Fig . 3B) . The latter is laterally compressed and remains almost covered by the pyloric caecae , liver and ovarp : It coursesi upuard and backward to pass into the intestine (duodenum) ' c — d ' lying between ' a -- b and ' b -- c ' .

Longitudinal folds of the stomach , 10 — 12 in number , are the posterior continuations of the oesophageal folds and their junction is marked at a prominent transverse or circular thickening (Fig . 2C) . The low folds of the sac merge into this thickening while the high folds continue into the stomach and become broader than thoes of the sac . The folds fade toward the posterioe end .

The intestine is a long convoluted tube which follows back —

and — forth winding in the small compressed peritoneal cavity (Fig . 3 B) . It is divisible into duodenum , ileum and rectum . The intestine , after forming 6 — 7 coilings with extra bends at the anterior and posterior regions of the cavity , opens at the anus . The relative length of the gut (R.L.G.) is 2 87 — 4.25 The mucosa are raised into serpentine longitudinal folds , about 25 — 30 in the third and fourth limbs . In the rectal region straight longitudinal folds , 10 — 12 in number , appear which end in the anus . Ileo -- rectal region is marked internally by a circular lip of the ileo — rectal valve (Fig . 2 D) .

Pyloric caecae (Appendices pyloricae ; intestinal caecae) are the finger — like outgrowths arising from the duodenum . They are in dendrite form with complicated branched tufts . There are 3 — 6 main caecal stems ; each gives 3 — 6 branches which divide and subdivide into four small caecal diverticulae (Fig. 3 C , D .) . They number about 500 — 760 and are spread over the stomach and the intestine . Intestinal folds pass into the caecae which appear filled up with semidigested food substances .

Liver

The liver is reddish brown and consists of the two main lobes , one on either side (left and right) of the stomach . The left lobe is larger than the right lobe and they measure about 40x23 mm and 26 x 15 mm respectively in a 200 mm (T. L.) specimen (Fig . 3 E, F.) . The lobes are roughly triangular in form with the broad ends placed anteriorly and are connected above to a median strip of liver . It extends backward from behind the oesophageal sac to the

posterior end passing downward between the two lobes of the ovary. Gall bladder is roughly elongate situated behind the sac . Bile duct opens into the duodenum . Pancreas is scattered collectively below the lobes of the liver and pyoric caecae .

Digestive tube was found to be empty or to contain some quantities of gelatinous substances . In some specimens small black pellets , 2 — 10 x 0 . 6 — 0 . 8 mm containing isopod and copepod larvae , were taken from the fourth and fifth limbs of the intestine .

Discussion

Kyle (1926) stated " ..... attempts to correlate the difference in structure of the digestive system to the nature of food have so far been quite unconbincing " . Suyehiro (1942) obtained some interesting and positive results on the relationship between the form and construction of the digestive tract and their feeding habits in fishes . In the case of Pampus argenteus Euphrasen such relation-- ship exists as explained in the following lines .

In the oesophageal sac there are well organised teeth which compensate the buccopharyngeal cavity . The posterior ends of the pharyngeals (two from the inferior pharyngeals and two from the superior pharyngeals) project into the sac cavity and probably help in mixing the food substances for trituration by teeth .

The radial processes of the different papillae are not in contact with each other and occupy different levels in the muscles of the sac . Such an arrangement of the processes and papillae appear well adapted for the storage of food in the sac .

The winding Remae of intestine in P: argenteus is complicated: Suyehiro (1942) noticed that Stromateoides argenteus has two kinds of intestine . one that is very long and another that is broader and trifly shorter . In the present observation the author has met the long and complicated type of intestine but not the " broader and trifly shorter type ofintestine " in P . argenteus ,

It is generally accepted that the value of R. L. G. depends upon the type of winding in fishes . Carnivores have less R. L. G. and herbivores have greater R. L. G. Suyehiro (1942) pointed out that generally herbivorous fishes have long intestines , which is not always true : Mookerjee and Das (1945) stated that the fishes are neither strictly herbivorous nor carnivorous and rather they are omnivorous . Al -- Hussaini and Kholy (1954) mentioned that the R. L: G: depends upon the amount of the plant matter in the diet , the more it is , the great the length of the stomach . R.L.G. in P. argenteus is 2:87 -- 4.25 87--4:25:No stomach content except some gelatinous substances and crustacean larvae was dete-- cted . It can be said that that P. argenteus is an omnivore inspite of its high value of R. L. G. and thus the author agrees with Mookerjee and Das (1954) and Suyehiro (1942) .

Summary .

The gross morphology of the digestive organs of Pampus argenteus (i . e . Zubeidy) has been studied .

The upper and lower jaws bear villiform teeth , the front are bluntly pointed and the middle and back teeth are cusped . Buccopharyneal cavity is provided with tiny teeth . Two rounded

elevations with small teeth are found on the roof . Cresecentic type of maxillary and mandibular valves are present . The cavity of the oesophageal sac is incompletely divided into two chambers . Papillae are of different lengths and are provided with tiny teeth . The radial processes of papillae remain separate from one another . A circular ileo — rectal valve separates the ileum from rectum internally . The intestine is coiled (6 — 7 loops) with extra bends . R. L. G. is 2 . 87 — 4 . 25 , The oesophageal folds are longitudinal and continue into the stomach . Intestinal folds are serpentine longitudinal and become straight at the anal end . Pyloric caecae are in dendrite form with 3 — 6 main stems which become secondarily branched . They number 500 — 760 .

Acknowledgemnt .

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Explanation of Figures

Fig . 1 .

A — Roof of buccal cavity , C — Back teeth of upper jaw enlarged , D — Floor of buccal cavity , E — Back teeth of lower jaw enlarged , F — Right lower jaw .

an — angular , bs . bony structure , dl — dorsal limb , dn — dentary ; ds — dental area of superior pharyngeal , em — enamel, es — oesophageal sac , gl — gill lamella , lf — longitudinal fold , lp — inferior pharyngeal , md — mandibular valve , mf — net of folds , mg — median groobe , mt — maxillary teeth , mth . mand-- ibular teeth , mv — maxillary valve , mx — maxilla , pp — papilla, pr — posterior process of superior pharyngeal , px — premaxilla , rg — rugae , sp — superior pharyngeal , ta — triangular area , tf — transverse fold , tg — tongue , th — tooth , vl — ventral limb , xp — cusps .

Fig . 2 .

A — Transverse section of oesophageal sac , B — tooth of papilla , C — Oesophageo -- stomach folds , D — Ileo -- rectal valve .

ap — apical region of tooth , bc — basal region of tooth , dlr — dorsal longitudinal ridge , ef — oesophageal ridge , ef — oesophageal fold , em — enamel , irv — ileo — rectal valve , jf — junction of oesphageal and stomach folds, lf — longitudinal fold , ms — muscles , pa — apical region of papilla , sf — serpe--

ntine longitudinal folds , st . stomach , tf — transverse folds , rp — radial processes , vlr — ventral longitudinal ridge ,

Fig . 3 .

A — Digestive tract , B — Winding of digestive tract , C — Pyloric caecae (left lateral view) , D — Pyloric stems (right lateral view) , E — Left lobe of liver , F — Right lobe of liver .

dd — duodenum , es — oesophageal sac , pc — pyloric caecae, ps — pyloric stems , st — stomach .

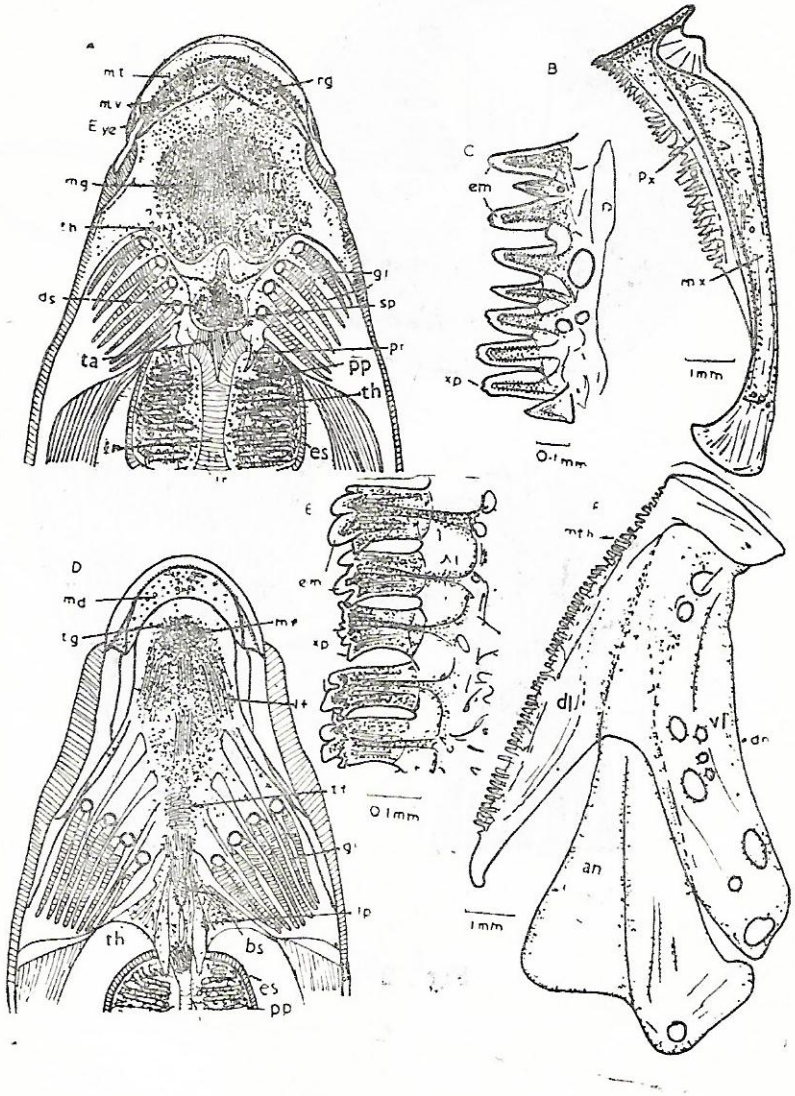
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Fig . 1

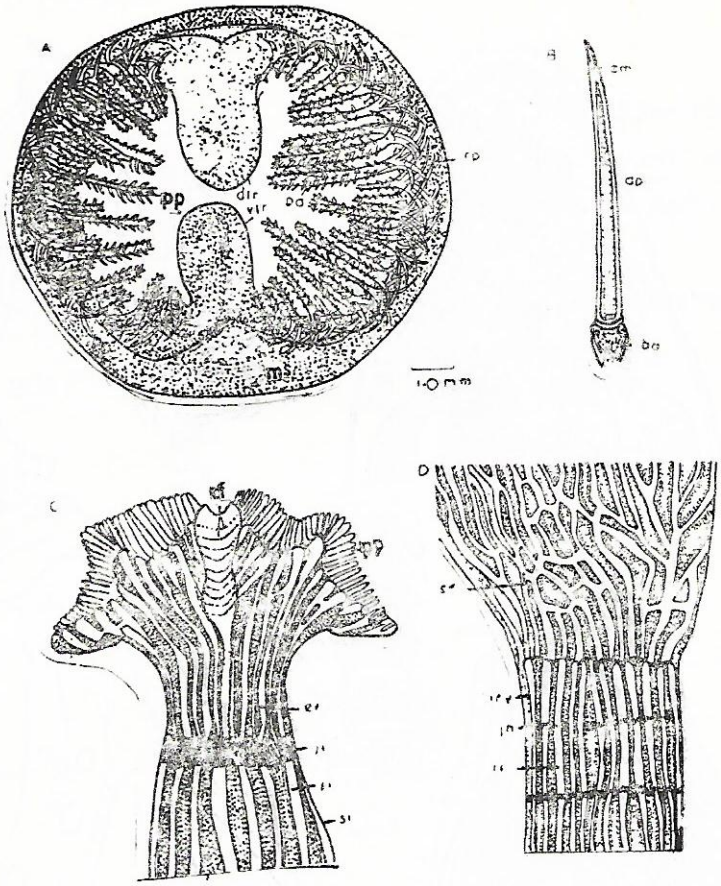
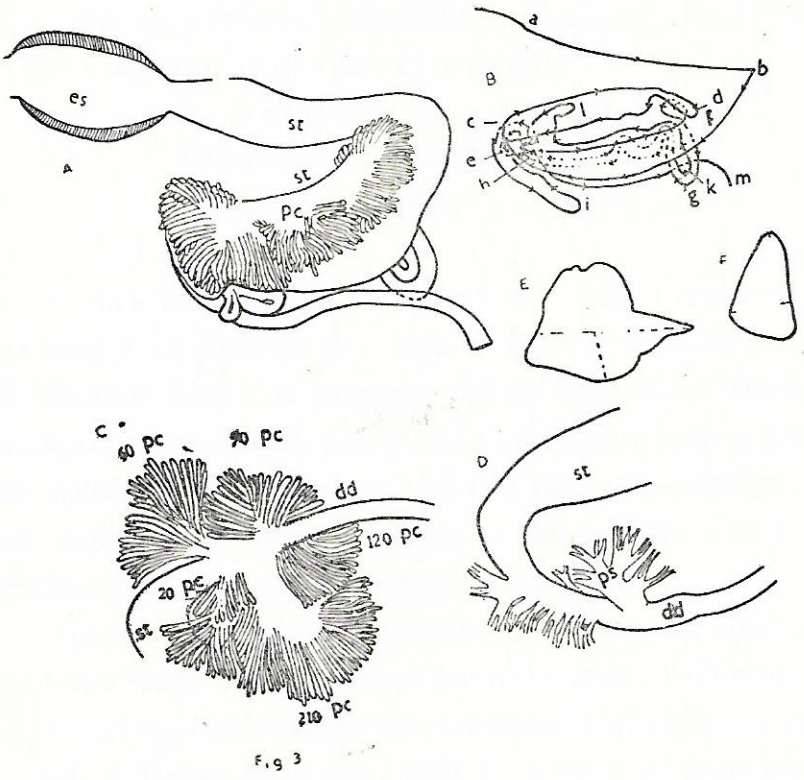


Fig 2

Fig . 2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90 pc
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st
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F.g 3

Fig . 3

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Vol , 1 No , 1 : 1974 June

TWO NEW RECORDS OF SHARKS FROM IRAQI TERRITORIAL WATERS WITH THEIR DESCRIPTIONS

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A male Hammerhead Shark Sphyrna tudes (Valenciennes) was caught on October 4 , 1971 in Khor Al-- Omia , near the Oil Floating Port . A pregnant female Gray Shark Hemigaleus balfouri Day (having two nearly full grown foeti , male & female) was collected on January 15 , 1972 in Khor Al-- Khafga . Both were captured by bottom trawling in the northern sector of the Arabian Gulf within the territorial waters of Iraq .

Sphyrna tudes is not formerly reported from the Arabian Gulf and hence forms the first record for this region . Although Hemi-- galeus balfouri is included in the Systematic List of the vertebrates of Iraq (Mahdi & Georg , 1969) , I know of no report of its occurrence from the territorial waters of Iraq and hence forms the first record for this region .

Three species of sharks of the genus Carcharhinus had been reported to enter the Iraqi marine waters (Khalaf , 1961 ; Mahdi , 1962) . Later three more species , Chiloscyllium griseum , Scoliodon

palasorrah , and Rhincodon typus were reported (Mazhar , 1966 ; Mahdi , 1971) . Concerning sharks that enter the Arabian Gulf , Blegbad (1944) reported , in addition to the six previous species , two more , Mustelus manzo , near the Iranian Coast , and Hemig-- aleus balfouri , extending from Kharg Island near Bushire , southward .

The hammerhead shark , Sphyrna tudes (Valenciennes) had been reported from different regions . Its range as far as known , includes Malay Archipelago , Indian Ocean , Arabian Sea , Red Sea , Mediterranean , and tropical parts of the Atlantic (Day , 1878 , 1889 ; Fowler , 1941) .

The grey shark , Hemigaleus balfouri Day , was recorded from the Indian Ocean (Day , 1878 , 1889) , Arabian Sea (Qureshi 1955) , and the central and southern sectors of the Arabian Gulf , where Kharg Island forms its northern limit (Blegvad , 1944) .

TAXONOMY

Order : SQUALIFORMES (SELACHII)
Family : CARCHARHINIDAE .
Genus : HEMIGALEUS .

HEMIGALEUS BALFOURI Day , 1878

Figs . 1 & 2

Description :

The grey shark , Hemigaleus balfouri Day , is set apart from all members of the genera Carcrarhinus and Scoliodon inhabiting the Arabian Gulf by the presence of spiracles . It has the following proportional dimensions in per cent of total length (Female , 805 mm) .

Trunk breadth at origin of pectoral .	11.8
Trunk height at origin of pectoral .	9.7
Snout length in front of outer nostrils .	3.1
Snout length in front of mouth .	6.8
Eye horizontal diameter .	2.4
Mouth breadth .	5.3
Mouth height .	3.1
Distance between inner ends of nostrils .	3.1
Length of lst gill opening .	3.8
Length of 2nd gill opening .	4.2
Length of 3 rd gill opening .	4.3

Length of 5th gill opening .	3.5
Length of 5th gill opening .	3.1
Vertical height of 1st dorsal fin .	11.3
Length of base of 1st dorsal fin .	9.3
Vertical height of 2nd dorsal dorsal fin .	6.8
Length of base of 2nd dorsal fin .	5.8
Vertical height of anal fin .	5.6
Length of base of anal fin .	5.2
Upper margin of caudal fin .	21.6
Lower anterior margin of caudal fin .	9.1
Outer margin of pectoral fin .	13.4
Inner margin of pectoral fin .	5.3
Distal margin of pectoral fin .	11.0
Distance from snout to 1st dorsal .	29.2
Distance from snout to 2nd dorsal .	62.1
Distance from snout to pectoral .	21.1
Distance from snout to pelvics .	44.7
Distance from snoutto anal .	62.7
Interspace between 1st and 2nd dorsal .	25.0
Interspace between 2nddorsla and caudal .	10.0
Interspace between anal and caudal .	8.3
Distance from origin of pectorals to origin of pelvics .	28.0
Distance from origin of pelvics to origin of anal .	16.1

Trunk rather slender , moderately compressed laterally rearward from pelvics , its height at origin of pectorals about 1/10 its total length . Back smooth , without any ridge . Caudal peduncle nearly 77% as wide as deep , upper precaudal pit moderately marked , the lower only weakly defined . Body sector to cloaca a little

longer than tail sector . Dermal denticles on sides of trunk closely spaced , their blades about as broad as long , with 5 ridges , the median the longest , their margins with 5 teeth , pedicel short on broad base .

Head flattened above . Snout thin -- tipped , narrow -- ovoid , its length in front of a line connecting outer ends of nostril as great as distance between inner ends of later , its length in front of mouth about 1/3 the length of head to origin of pectoral . Eye oval and noticeably large , about twice as broad as high , its horizontal diameter about 1/3 as length of snout in front of mouth with nictitating membrane . Spiracle a minute slit on a level slightly below upper edge of eye and behind the later by a distance equal to about 1/2 as horizontal diameter of eye . Gill openings sbout evenly spaced , the 3rd slightly the longest , nearly 1 4/5 times as long as horizontal diameter of eye , the 5th above the origin of pectoral , considerably the shortest . Nostril oblique , its inner end closer to mouth than to tip of snout , the anterior margin expanded as a subtriangular lobe with acute tip . Mouth ovate , about 2/3 as high as broad , its corners with deep furrows .

Teeth $\frac{11 — 3 — 11}{11 — 2 — 11}$ in specimen counted , uppers broadly trangular , with inner margins nearly straight or very weakly convex , the outer margins oblique , deeply notched toward corners of mouth with 3 to 4 denticles on outer side of base , lowers with slender unserrated cusps , erect in sides of of jaw as well as in front , broad , without denticles ; 3 smaller teeth , nearly erect ,

without basal denticles at symphysis in upper jaw , and 2 minute , slender teeth in lower .

Origin of ist dorsal a little posterior to axil of pectoral , the midpoint of its base much nearer to axil of pectoral than to origin of pelvics , its anterior margin only weakly convex , its apex narr-- owly rounded , its posterior margin nearly straight near apex but moderately concave toward base , its free rear cornte , about 1/3 as long as its base , its vertical height about as great as height of trunk at origin of pectoral . Second dorsal about 2/3 as long at base as lst and a little more than 1/2 as high , its origin a little anterior to the origin of anal , its anterior margin weakly convex , its posterior margin very slightly convex near apex and deeply concave toward base , its free rear corner acute and about 2/5 as long as its base . Interspace between lst and 2nd dorsals nearly slightly less than the distance from snout to lst dorsal . Caudal nearly 22% of total length , its axis only slightly raised , its upper contour weakly convex , its terminal sector about 1/3 the length of fin , the sub — terminal notch well marked , its lower anterior lobe about 41% as long as upper margin , each measured from its respective precaudal pit , with convex lower anterior margin , the re — entrant contour with rounded corner , a little less than a right angle . Anal a little shorter than 2nd dorsal basally and about 4/5 as high vertically , with similarly slender free rear tip . about 2/5 as long as its base . Distance from origin of anal to tips of pelvics about as long as interspace between anal and caudal. Pelvics about 1/3 as long at base as lst dorsal , with weakly convex anterior and weakly concave distal margins , narrowly rounded apices and subacute tips , their origins much closer tc origin of

anal than to origin of pectoral . Distance from origin of pelvics to origin of anal 1/3 the distance from tip of snout to pelvics . Pectoral about 1 . 5 times as long as broad , its outer margin strongly convex toward apex , distal margin moderately concave , inner margin weakly convex , inner corner and apex narrowly rounded .

The shark is dark brown with grey fins , second dorsal with black summit .

Family SPHYRNIDAE

Genus SPHYRNA

SPHYRNA TUDES (Valenciennes)

Figs . 3 & 4

Description :

The hammerhead shark , Sphyrna tudes (Valenciennes) is separable from Sphyrna blochii by the fact that eyes and nostrils are close togather in the first and widely separated in the second . It has the following proportional dimensions in percent of total length (Male , 850 mm) .

Trunk breadth at origin of pectoral .	8.1
Trunk height at origin of pectoral .	10.8
Snout length in front of outer nostrils .	2.3
Snout length in front of mouth .	7.0
Length of the lateral expansion .	24.1
Width of the lateral expansion near eye .	7.8
Eye horizontal diameter .	1.9

Mouth breadth .	6.6
Mouth height .	2.3
Distance between inner ends of nostrils .	17.8
Length of 1st gill opening .	2.8
Length of 2nd gill opening .	3.8
Length of 3rd gill opening .	3.8
Length of 4th gill opening .	3.5
Length of 5th gill opening .	2.8
Vertical height of 1st dorsal fin .	14.6
Length of base of 1st dorsal fin .	10.4
Vertical height of 2nd dorsal fin .	4.4
Length of base of 2nd dorsal fin .	4.5
Vertical height of anal fin .	4.1
Length of base of anal fin .	5.9
Upper margin of caudal fin .	34.1
Lower anterior margin of caudal fin .	11.8
Outer margin of pectoral fin .	12.4
Inner margin of pectoral fin :	3.6
Distal margin of pectoral fin .	11.8
Distance from snout to 1st dorsal .	29.2
Distance from snout to 2nd dorsal .	55.3
Distance from snout to upper caudal .	68.2
Distance from snout to pectoral .	20.0
Distance from snout to pelvics .	41.2
Distance from snout to anal .	53.5
Interspace between 1st and 2nd dorsals .	23.5
Interspace between 2nd dorsal and caudal .	8.8
Interspace between anal and caudad .	6.5

Distance from origin of pectoral to origin of pelvics . 21.1

Distance from origin of pelvics to origin of anal . 18.4

Trunk morderately compressed , its height abreast pectoral origin nearly 11 % of total length . Caudal peduncle laterally compressed , about 2/3 as wide as deep , upper precaudal pit well marked , the lower hardly defined . Dermal denticles very thin , with three ridges , smooth toward base but with five teeth toward free margin , the median the longest .

Head hammer shaped , its anterior margin thin tipped with five concavities (a narrow one in the centre , one opposite each nostril , and a large one between the central concavity and each nostril concavity) . The width of lateral expansion near eye equal to length of its hind edge and about 8% of total length . The total length of lateral expansion about three times its width near eye and nearly 24% of total length of body . A weakly marked groove along the front margin of the hammer extending from edge of nostril half way to the midline . Snout length in front of mouth almost equal to breadth of mouth . Eye small , its horizontal diameter nearly equal to length of 2nd gill opening . Mouth cresc-entic , without labial folds , or labial furrows , its breadth nearly 3 times its height . Gill openings nearly transverse , the 2nd and 3rd slightly the longest , about 2 times as horizontal diameter of eye , the 1st and 5th considerably the shortest . Spacing between successive gill openings nearly decreasing posteriorly . Nostril very close to eye , nearly transverse , distance from its outer end to eye about equal to horizontal diameter of eye .

Teeth 36 rows in specimen examined , almost similar inthe

2 jaws except that the lowers are a little smaller than the uppers, with triangular cusps , their edges coarsely serrate , the outermost teeth small and erect , but those on sides of jaws , increasingly obligue toward corners of mouth .

First dorsal originates about over inner corner of pectoral , the midpoint of its base much nearer to axil of pectoral than to origin of pelvics , its length of base nearly 2/3 its vertical height , its anterior margin weakly convex , apex subaccute , the posterior margin strongly concave , its free rear tip about 1/3 as long as its base . Second dorsal about ½ as long at base as lst and nearly 1/3 as high , its anterior margin slightly convex , posterior margin deeply concave , apex subacute , its free rear tip much more elon-- gate , being about as long as its base , its origin only slightly posterior to origin of anal . Interspace between lst and 2nd dorsal a little more than distance between origins of pectorals and pelvics. Caudal about 1/3 of total length , its axis moderately raised with well marked subterminal notch , its terminal sector about 1/6 the length of fin , the lower anterior lobe nearly 1/3 as long as upper , its tip subacute , the re — entrant contour (included between the two lobes) forming nearly a right angle . Anal about 1 . 2 times as long at base as 2 dorsal , its anterior margin moderately convex, itn posterior mafgin strongly concave with free rear tip . Pelvics about 2/3 as long at base as anal , its anterior margin weakly convex , its posterior margin moderately concave . Pectorals with weakly concave anterior and posterior margins .

The shark is brownish grey with the summit of the second dorsal black .

SUMMARY

Two species of sharks have been recorded for the first time as Iraqi marine fishes .

The first , Sphyrna tudes (Valenciennes) , has been captured on Octobper 4 , 1971 , in Khor Al -- Omia , near the Oil Floating Port . This was the first record for this species in the Arabian Gulf . The second , Hemigaleus balfouri Day , has been captured in khor Al - Khafga on January 15 , 1972.Both places are located in the northern sector of the Arabian Gulf , within the territorial waters of Iraq . Complete descriptions of both species are given .

الخلاصـــة

لقد تم تسجيل نوعين من الكواسج من المياه لاقليمية العراقيةفي الخليج العربي لأول مرة وأعطيت الأوصاف الكاملة لهما •

النوع الأول هو الكرسج الرمادي Hemigaleus balfouri الذي أصطيد في حور الخفقة بتاريخ ١٥ / ١ / ١٩٧٢ •

أما النوع الثاني فهو الكوسج أبو المطرقة Sphyrna tudes الذي أصطيد في ٤ / ١٠ / ١٩٧١ في خور العمية حيث يسجل لأول مرة في الخليج العربي •

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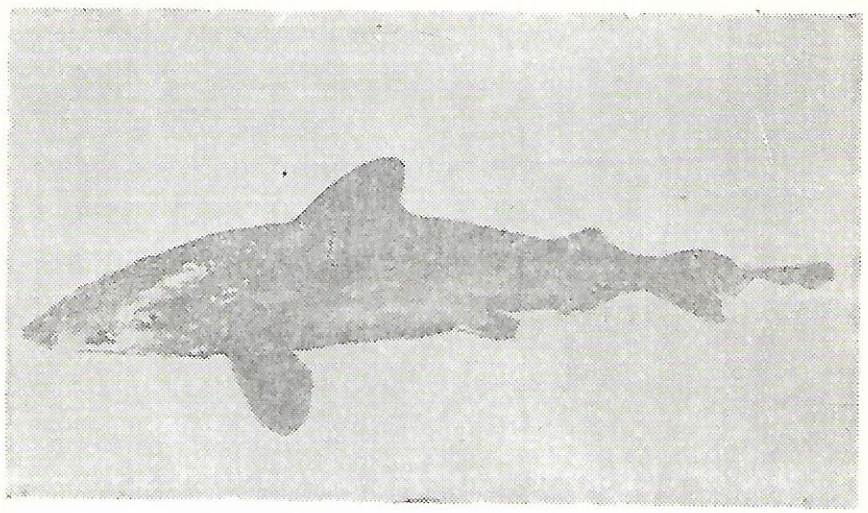


Fig . 1 . Hemigaleus balfouri , female , 805 mm . long

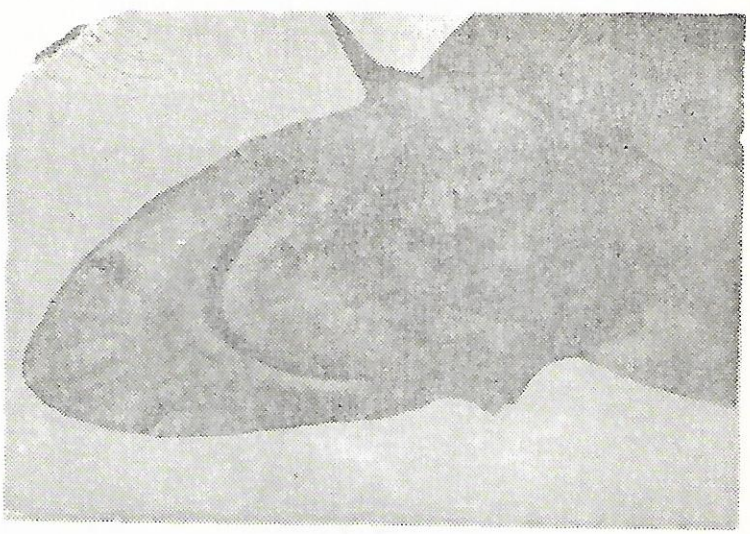
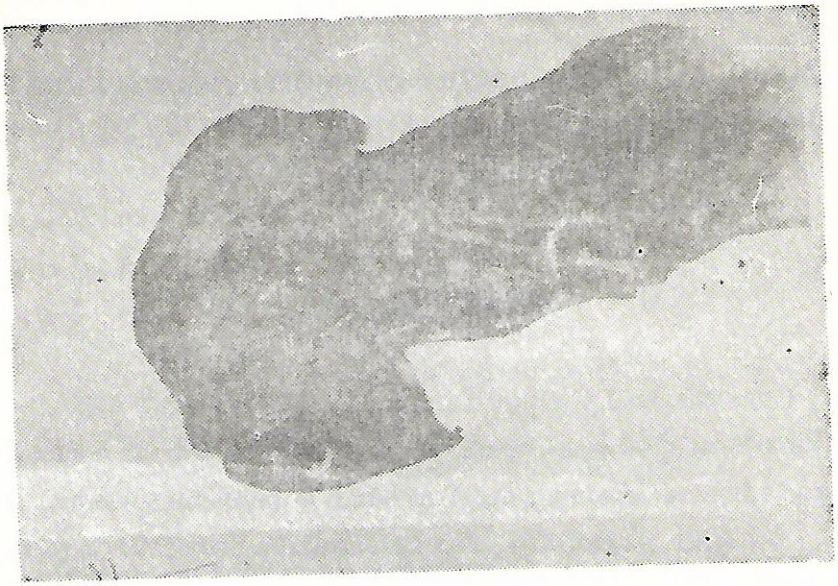


Fig . 2 . Head from below of Hemigaleus balfouri .



Fip - 3 - Head from above of sphyrna tudes

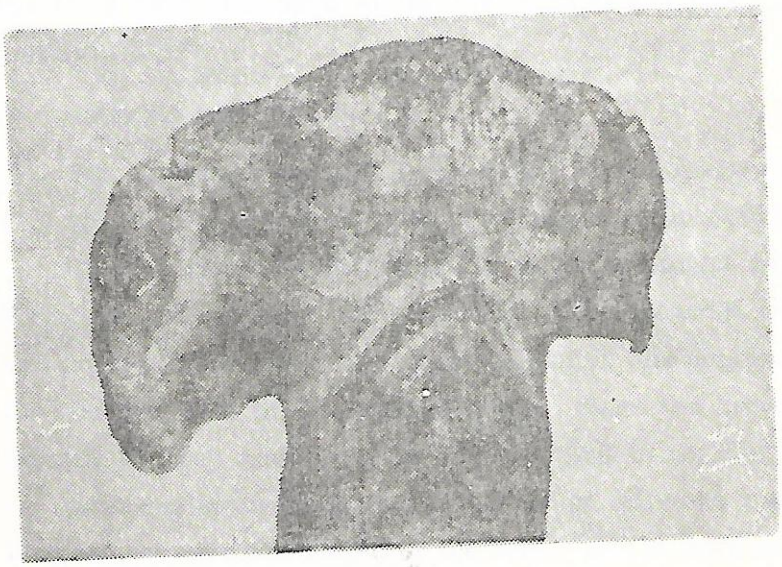


Figure 4 . Head from below of Sphyrna tudes .

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SOME OBSERVATIONS ON THE PRE AND POST -- NATAL DEVELOPMENT OF HAIRS AND MILK TEETH OF TOMB BAT TAPHOZOUS NUDIVENTRIS

K . Al -- Robaae

L . A - J · Jawad

INTRODUCTION

The tomb bat Taphozous nudiventris (Cretzschmar) is very common in the southern part of Iraq , especially in Basrah City . It is quite active and is found in large numbers from the beginning of April to the end of November (Al -- Robaae , 1970) .

The breeding in the colony takes place in June and July . An attempt was made to study the morphological development of the hairs and milk teeth in the pre -- natal and post -- natal life history .

Materials and Methods .

We collected the bats from a dilapidated house in the Old City of Basrah -- once every week -- in June and July 1972 .

The collection consisted of adult males , pregnant females and youngones . Soon after the collection , the specimens were killed and preserved.The foetus were dissected out of the pregnent females for the study of the external features . Since the live bats were difficult to keep under the captivity we had to confine our study on specimens collected from the colony at different times of the breeding season . The length of the fore -- arm is used as an index of the age . We have compared the largest foetus with the smallest

young (Table 1) . Observations were made under a dissecting binocular microscope (20 x) .

The growth and distribution of hairs and the development of the teeth at pre — and post -- natal periods are described in three different stages based on the fore -- arm length .

Distribution of Hairs .

Stage I . (Embryo)

Material : 1 specimen ; fore -- arm length 38 mm .

The whole head is crossed with hairs , a few of the frontal region were vibriassae -- like while those of the lower part of the head were longer than those of the upper part .

The back of the body , including the complete tail was covered with dense hairs . The chest and the abdomen were nearly covered among which a few were longer ones .

The fore — limbs had hairs on the dorsal part near the first claw . The hind limbs were covered all over with dense hairs .

Stage II . (New -- born)

Material . 1 specimen ; 41 mm length .

This stage is similar to the preceding one except that the abdomen and genitalia have fewer hairs .

Stage III . (Young)

Material : 1 specimen : fore -- arm length 44 mm .

No additional growth of hairs in any parts other than the regions mentioned above . The hairs were getting longer in growth . Abdomen was completely free from hairs although genitalia had a few of them ,

R e m a r k s ,

Although to the unaided eye the body was practically naked , the distribution of hairs was quite clear under the dissecting binocular microscope (20 x) .

Development of Teeth .

Stage I , (Embryo) ,

Material : 1 specimen ; fore -- arm length 38 mm .

Upper Jaw ,

Although the gum was not errupted , two pairs of incisors , one pair of canine , one pair of premolar , and two pairs of molars were externally noticeable as swellings on the gum , The canines were the most prominent . next came the incisors and premolars . The molars were least conspicuous .

Lower Jaw ,

The situation is the same as in the case of the upper jaw

except that the swellings were less conspicuous , however , the premolars were of the same size as that of the upper jaw .

Stage II , (New -- born)

Material : 1 specimen ; fore -- arm length 41 . 6 mm .

Upper Jaw .

The gum was erupted . Two pairs of well developed incisors were out and these were conspicuously curved inward towards the tip . The canines were equally developed . The three heads of tricuspid premolars were also out , each cusp was pointed and the first cusp was smaller than the third . Of the tricuspid molars , only the first head of the first molar was out .

Lower Jaw .

The gum was erupted . Incisors and canines were out . Of the three heads of the tricuspid premolars , only the first one was erupted . Of the two pairs of molars . only the first cusp of first molar was exposed . In general the teeth of the lower Jaw were less developed that the upper one .

Stage III . (Young)

Material : 1 specimen ; fore -- arm length 44 mm .

Upper Jaw ,

The incisors . canines and the tricuspid premolars were all bigger than the other two , All the three heads of first molar were expassed , while the second molar was still buried in the gum . while the the second molar was still behind in the gum .

Lower Jaw ,

The incisors and the canines were poorly developed compared with the upper jaw . The incisors had no inward bend like that of the upper jaw . Three heads of premolars were out . Molars were still not erupted .

The sequence of the milk teeth as per the size of the develop-- ment was . -- Canines -- Premolars -- Molars -- Incisors .

The dental formula : -- $I\frac{2}{2}$, $C\frac{1}{1}$, $P\frac{1}{1}$, $M\frac{2}{2}$.

D i s c u s s i o n : --

Poole (1938) observed fine hairs covering the body of the foetus of Pipistrellus subflavus : Ramakrishna (1950) marked dark hairs on the fore -- head and other parts of the body of Cymopteruos sphinx . Orr (1954) studied Antrozuos pallidus and marked the growth of hairs on the either side of the head , flight membranes and toes . Tamsitt and Valdivieso (1966) recorded

long dense hairs on the dorsum and the dorsal part of the head of the new born Stenoderma rufum . Jones (1967) found few hairs on the feet , shoulders , top of the head and some vibrissae on the lips . The present study on the distribution of hairs in the foetus and the new born of T . nudiventris reveals the presence of hairs on the head , shoulder , chest , abdomen , bach of the body , fore -- arm , hind -- limbs and tail .

Miller (1970) , Barette -- Hamilton (1910 -- 1911) , and Jones (1967) studied the development of teeth at the pre -- and post -- natal periods of the bats . Miller stated that the milk denfine of bat is highly specialized and helps young in clinging to the moreth Orr found that in full term foetus , the upper and lower canines are first to erupt, and are followed by the incisors and pre -- molars, and molars do not appear until the third to fifth day . Generally they are tricuspid . Jones noticed that all the teeth have erupted at birth in Nylticeius humeralis , and milk dental formula is

$$I \frac{2}{3}, C \frac{1}{1}, P \frac{2}{2}, = 22$$ in contrast to permanenet dental

formula : $$I \frac{1}{3}, C \frac{3}{1}, P \frac{1}{1}, M \frac{3}{3} = 28.$$

The sequence is as follows : canine -- incisors -- premolars -- molar . The present observations on the dentation of T: nudiventris reveals that the canines are the first to be appeared and immeditarely followed by the premolars . The incisors appear faster than molars. These teeth developed to the extent of enabling the blind new born

TABLE No. 2

The Measurments of the Three different stages of Taphozous nudiventris magnus

	EMBRYO F.A. = 38 mm.	YOUNG	
		F.A. = 41.6 mm.	F.A. = 44 mm.
T.L.	69	70	81
H.	24	26	26
F.A.	38	41.6	44
H.F.	18	17	18
E.	9	10	10.5
T.	8.5	10.5	11

to tightly at ached itself to the moiher (also aided by thumbs and hind feet) . This observations in confirmity with that of Miller (1970) .

The milk dental formu'a of T . nudiventris is : --

$$I\ \frac{2}{2},\ C\ \frac{1}{1},\ P\ \frac{2}{?},\ M\ \frac{3}{3} = 32$$, which is equal to the permanent condition .

SUMMARY

The distribution of hairs and development of milk teeth have been studied in three age groups (prenatal and postnatal of the Tomb Bat Taphozous nudiventris and are described .

The work has shown that the hairs present in the embryo on the abdomen as disappearing later birth .

الخلاصة

هذا البحث يتناول دراسة مورفولوجية مقارنة لتوزيع الشعر ونمو الاسنان في المرحلة الجنينية ومرحـلة المواليد الحديثة والمتأخرة للوطواط تافاسويس الكثير الانتشار في منطقة البصرة • وقد ظهر أن الشعر في الأجنة ينمو في منطقة البطن ثم يختفي في ادوار ما بعد الولادة المتأخرة كذلك بالنسبة للأسنان فأنهاء تبرز بعد الولادة مباشرة بخلاف كثير من الوطاويط التي تبرز بعض أسنانها قبل الولادة •

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NEW PLANKTONIC FORAMINIFERA FROM THE SUBSURFACE CONIACIAN AND SANTONIAN OF SOUTHEASTERN IRAQ .

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ABSTRACT

Five new planktonic species , Heterohelix nakkadyi , Heterohelix pseudoguembeliniformis , Pseudoguembelina pseudocarinata , Ventilabrella tricamerata , Globigerinelloides carteri and two new subspecies , Sigalia carpatica sayyabi and Globotruncana concavata dentata from the Coniacian and Santonian of southeastern Iraq are described and their stratigraphic positions established .

INTRODUCTION

The type section designated to be in the BPC well Zubair no . 8 , in the Ad — Dibdibba gravel and and sand region (Dibdibba Formation) , just to the southwest of the village of Zubair , northwest of the head of the Arabian Gulf and about 25 km west of the Basrah city in southeastern Iraq . The section is stratigrap—

hically well represented and contains abundant planktonic foraminifera . Itconsist of the following Upper Cretaceous formations , Khasib , Tanuma , Sadi , Hartha , Qurna , and Tayarat formations.

Regarding the geomorpholoy and lithologic composition of the area and succession Macfadyen (1938) , Al -- Naqib (1967) and Darmoian (MS . a) publications are recommended .

Holotypes , Paratypes , and figured specimens are in the personal collection of the author and will be deposited in the Natural History Museum , Basrah , Iraq .

ACKNOWLEDGMENTS

Thepresent work forms part of the doctoral thesis presented by this author to the University of London . All research was carried out at the Imperial College of Science and Techology , under the constant guidance and supervision of Mr. D. J. Carter who critically read the manuscript , and to whom the writer expresses his deep appreciation .

SYSTEMATIC PALEONTOLOGY

The classification employed here , with slight modification is taken from the " Treatise on Invertebrate paleontology , Part C Protista " , Loeblich and Tappan (1964) . Departure from this classification include the recognition of the genera Sigalia Reiss (1957) and , following Brown (1969) Ventilabrella Cushman (1928) .

Family HETEROHELICIDAE Cushman , 1927

Subfamily HETEROHELICINAE Cushman , 1927

Genus HETEROHELIX Ehrenberg , 1843

Heterohelix nakkadyi Darmoian n . sp .

Plate 1 , figues 1 — 3

Description : Test medium sized , biserial , moderately compressed , gradually expanding periphery in early stage slightly later strongly indented ; in apertural view periphery narrowly rounded ; initial chambers small , followed by 4 — 5 pairs of inflated , reniform chambers increasing slowly in size as added ; penultimate pairs of chambers nearly of the same size and shape , partially separated bp deepiy depressed median area ; sutures straight to slightly curved and depressed, much deeper in last portions ; wall calcareous,densely perforate ; peripheral margins coarsely and constantly striated or with perforations arranged in longitudinal lines ; aperture a high and narrow opening at the inner margin of the last chamber with perminent , well pronounced and thickened lips extending down to the penultimate chambers .

Dimensions of holotype : Length 0.40 mm . , width 0.27 mm.

Remarks : Heterohelix nakkadyi n. sp. is distinguished by its compressed test , a tendency to develop diverging adult chambers and its surface ornament . It is morphologically similar both to Güblerina cuvillieri Kikoine and Ventilabrella compressa van der Sius . It is separated from both by its regularly tapering test , ; striated surface ; early reniform later as wide as high chambers and by the absence of a true chamber divergence .

H . nakkdyi n. sp . is named after Dr . S. E, Nakkady late professor of Micropaleontology in Egypt .

Occurrence : Rare in the Tanuma and the lower part of the Sadi Formations .

G . renzi / H . pseudoguembeliniformis zone -- G . concavata subzone .

Heterohelix pseudoguembeliniformis Darmoian n . sp .

Plate 1 , figures 4 — 6 .

1967 Heterohelix sp . cf . Heterohelix moremani (Cushman) — PESSAGNO pl . 48 . figs . 7 — 8 , (not fig . 9).

Description : Test small , biserial , moderately compressed , about as long as broad , moderately tapering , maximum breadth at the last pair of chambers ; periphery indented throughout ; in apertural view periphery rounded ; chambers initially planispiral , followed by 6 pairs of inflated wider than high chambers which increase rapidly in size as added ; sutures strongly depressed , straight , oblique ; wall calcareous perforate ; surface smooth ; aperture a low arch on the inner margin of the last chamber bordered by well debeloped flap .

Dimensions of holotype : Length 0.28 mm . , width 0.12 mm .

Remarks : Heterohelix pseudoguembeliniformis n . sp . is morphologically similar to H . pulchra (Brotzen) but differs in having a lesser compressed and thicker test, inflated, non -- reniform chambers and straight , oblique sutures . It differs from H . moremani (Cushman) in its smaller size , sutural characters , arrangement and shape of chambers which increase regularly in size and in the possession of an apertural flap . The small specimens described by Pessagno (1967) as having low arched apertures , probably belong in the present species . They have inflated , wider than high chambers , straight oblique sutures and flap like apertural extentions .

H . pseudoguembeliniformis n. sp , may represent the transit--

ional stage through which H. pulchra (Brotzen) evolved from H. moremani (Cushman) .

Occurrence : Abundant in the Khasib and Tanuma formations . G. renzi / H . pseudoguembeliniformis zone .

Genus PSEUDOGUEMBELINA Bronnimann and Brown , 1953

Pseudoguemelina pseudocarinata Darmoian n. sp .

Plate 1 , figures 7 -- 9 ; plate 2 , figures 1 -- 2 .

Description : Test small , biserial , strongly , compressed , early stage rapidly later slowly tapering ; maximum breadth at the last pair of chambers ; periphery in very early stage entire later slightly in dented with keel -- like thickening of chambers margins ; periphery in apertural view subtruncated ; chambers initially plani-- spiral , minute and not inflated , followed by 5 pairs of rapidly increasing chambers ; last 2 -- 4 chambers large , slightly wider than high , subrectangular and inflated , in cross section perpendi-- cular to the axis of growth , chambers narrow , rhomboid , margins acute ; sutures in early stage flush , later deeply depressed and straight ; wall calcareous , finely perforate ; surface ornamented by equally distributed striae ; primary aperture a moderate sized opening at the base of the final chamber ; supplementary apertures in the adult stages along the median line sometimes covered by elongated thin apertural flaps .

Dimensions of holotype : Length 0.41 mm . , width 0 . 25 mm . , thickness 0.9 mm .

Main variation :

1 — Pseudokeel either partially developed or covering the

whole margin of the test .

3 — Chambers either symmetrical throughout or early slightly twisted .

Remarks : Pseudoguembelina pseudocarinata n . sp . is distin-- guished by its moderately to strongly compressed test keel -- like (pseudokeel) marginal thickening and entire early part ; subtru-- ncate periphery in apertural biew ; subrectangular chambers in laretal view and rhomboid in sectioned top view .

Ps . pseudocarinata n . sp . is morphologically similar to each of the following Heterohelix species , all of which appear at a stratigraphically younger level except the first which is older , H . planata (Cushman) . H. carinata (Cushman) . H, pachyma-- rginata Stenestad , H. globocarinata (Cushman) and H. glabrans (Cushman) . Compressed specimens of Ps . pseudocarinata resemble H. carinata (Cushman) but differ in having striae covering the whole surface of the test , keel -- like marginal thickening rather than a true keel and supplementary apertures between the abult chambers . However , since Cushman's description of H. carinata no one has made a detailed study of the type specimen . If the holotype is examined and found to have a wholly striated test surface , thickened peripheral margins and supplementary apertures, then it might be possible to include the present new species in its synonymy . Both H . planata (Cushman) and H . globocarinata (Cushman) are morphologically related to Ps . pseudocarinata , they differ in having less compressed and larger tests , rounded rather than rhomboid chambers in apertural view . The keel , if present restricted to the early portion . However , H . globocarinata has a strongly inflated and enlarged last pair of chambers ,

a larger primary aperture and has longer stratigraphic range . *H. pachymarginata Stenestad shows limbate , raised sutures at least* in its early stages ; a marginal keel -- like thickening restricted to the initial portion and formed by the extension of its raised limbate sutures along this part of the test . Furthermore , H . pachymarginata lacks the characteristic subtruncated periphery in apertural view .

Ps . pseudocarinata is more closely related to H : glabrans (Cushman) . The species agree in the apertural characteristics and to a lesser extent in those of the supplementary apertures . *However , they have a different surface ornamentation and keel* character . In addition , H . glabrans has a less compressed test and younger stratigraphic range .

The writer has feeling that H . glabrans (Cushman) and Ps . pseudocarinata n . sp , are from the same ancestral stock , namely H . planata stock . On the other hand , by smoothening the test surface , developing the marginal thickening into a true keel and development of supplementary apertures Ps . pseudocarinata might possibly have evolved into H . carinata .

Occurrence : Abundant in the Tanuma Formation . G. renzi / H . pseudoguebeliniformis zone . Very rare in the lower part of the Sadi Formation , G. concavata subzone .

Genus SIGALIA Reiss 1957

Sigalia carpatica Salaj and Samuel

Plate 2 , figures 4 -- 5

1955 Ventilabrella deflaensis (Sigal) . -- BETTENSTAEDT and WICHER , p . 11 , pl . 1, fig . 2 .

1957 Ventilabrella deflaensis (Sigal) . -- WICHER and

in its much more triangular test shape ; in its less coarse early costate ornamentation and less thickened and curved sutures .

S . carpatica has possibly evolved from S . deflaensis . This is suggested by their stratigraphical distribution and by the occur-- rence of several transitional forms .

Occurrence : rare in the upper part of the Tanuma Formation , abundant in the lower part of the Sadi Formation . G . renzi / H . pseudoguembeliniformis zone -- G . fornicata subzone .

Previous records of occurrence : Austria , Bavaria , France , and Morocco ,Coniacian -- Santonian ; Palestine , North Africa and West Carpathians , Santonian .

Sigalia carpatica sayyabi Darmoian n . subsp .

Plate 2 , figures 6 -- 9 .

Remarks : Subspecies differing from the typical in having 3 chambers in the last growth stage ; much more oblique , strongly raised , beaded sutures and much more strongly serrated margins .

S . carpatica sayyabi n . subsp . differs . from Ventilabrella tricamerata n. sp. (description follows) in having raised , beaded sutures , serrated periphery and flat subrectangular chambers .

This subspecies is named after Dr . A. Al -- Sayyab of the Iraq National Oil Company , Baghdad , Iraq .

Occurrence : Rare , in the uppermost part of the Tanuma and lower part of the Sadi formations . G . renzi / H . pseudoguembe-- liniformis zone -- G . concavata subzone .

Genus VENTILABRELLA Cushman 1928

Ventilabrella tricamerata Darmoian n . sp .

Plate 3 , figures 1 — 3 .

BETTENSTAEDT , p . 30 , text -- fig . 3a -- c .

1966 Sigalia carpatica SALAJ and SAMUEL , tab . 37 , fig . 2 .

Description : Test medium sized , compressed , flattened ; apical portion sharply pointed , followed by rapid expansion in breadth giving a fairly broad triangular outline ; peripheral outline in early stage entire , later serrated ; periphery in apertural view truncated , with two parallel keel -- like thickening enclosing a depressed band which often extends along both peripheral margins of the test joining the sutural extensions and giving the test a peripherally serrate appearance ; chambers in maximum nine pairs but normally seven pairs , biserially arranged , increasing rapidly but showing no divergence , first 3 pairs rather appressed , followed by subrectangular chambers ; sutures flush to slightly raised in early portion becoming more strongly raised , limbate and granular in later development with prominent beads ; wall calcareous , perforate except for the granulated parts and truncated margins ; surface coarsely ornamented in the early part , less rough to nearly smooth in the adult stage ; aperture a low opening on the inner margin of the last chamber .

Remarks : Sigalia carpatica Salaj and Samuel is morphologically resembles both S . deflaensis (Sigal) and S : carpatica sayyabi Darmoian (description follows) . It is distinguished from the first by its much more compressed test; flat and subrectangular chambers (as against the moderately inflated chambers of S. deflaensis) ; serrated margins ; truncated periphery ; haevier ornamentation in the early portion and strongly raised , beaded sutures . It differs from the second in lacking the third chamber between last pair ;

Description : Test small , compressed ; early stages of Guembelina type , biserial , adult chambers tending to become triserial in adding an extra third chamber between the last pair ; periphery slightly lobate ; periphery in apertural view narrowly rounded ; chambers 13 in number , moderately inflated , last pair with a third chamber which is rounded , compressed , level with the other two in lateral as well as apertural views ; individual chambers inflated , slightly wider than high ; sutures nearly straight , depressed , slightly oblique except the last pair which seems more curved and less oblique ; wall calcareous , perforate ; surface coarsely striate except in last three chambers , much more strongly so on peripheral margins , the striation fading out gradually towards apertural end ; aperture multiple .

Dimensions of holotype ; Length 0.28 mm . , width 0 . 20 mm., thick . 0.06 mm ,

Remark : Ventilabrella tricamerata Darmoian n. sp. differs from V . glabrata Cushman in having , three compressed chambers in the last portion instead of a proliferation of inflated chambers , and a blunt , longer rather than short apical end . It differs from V . eggeri Cushman in having a more compressed test and a striate rather than merely roughened surface .

V . tricamerata is distinguished from the morphologically similar V . ornatissima Cushman and Church (paratype figure 15) in having a more compressed test , three chambers in the adult stage and coarser surface ornament . It differs from Güblerina compressa (van der Slus) in lacking chambers of Güblerina type, in having the surface covered with medium to coarse striae , especially on the peripheral edges , (van der Slus did not mention the

surface character of his specimens but his figured form shows it smooth) . Furthermore , G . compressa has an aberrant chamber independently occupying the central nonseptate area , while the third chamber in the new species is a normal unit in a triserial stage .

As suggested by its morphologic features , V . tricamerata possibly evolved from S . deflaensis , later passing into V . ornati-- ssima on one side and . V . glabrata on the other hand ,

Occurrence : Rare specimens were found in the upper part of the Khasib Formation and abundant in the Tanuma Formation . G . renzi / H . pseudoguembeliniformis zone ,

Family PLANOMALINIDAE Bolli , Loeblich and Tappan , 1957

Genus GLOBIGERINELLOIDES Cushman and Ten Dam , 1948

Globigerinelloides carteri Darmoian n. sp.

Plate 3 , figures 4 -- 5

Description : Test medium sized , biumblicate , planispirally coiled ; periphery ovoid , moderately lobate ; axial periphery broadly rounded ; chambers 7 in the last whorl , the early ones of which are small , globular , slightly appressed while the last two are ovoid , strongly appressed,strongly compressed in a direc-- tion perpendicular to the apertural face , increasing regularly in size as added ; sutures straight , radial and depressed ; umbilici small and shallow ; wall calcareous , perforate ; surface finely hisped , the hispidity gradually decreasing towards the last chamber; aperture interiomarginal , equatorial , a rather low opening ; relict apertures hardly seen in holotype but in some well preserved

specimens they remain open in the umbilical region as supplementary apertures .

Dimensions of holotype : Length 0.30 mm . , width 0 . 22 mm . , maximum thickess (of last chamber) 0.20 mm . .

Main variation : The last two or three chambers usually are so compressed that they fuse and give the appearance of single chamber .

Remarks . Globigerinelloides carteri n . sp . is distinguished from Gl . asperum (Ehrenberg) by the character of its last two or three chambers ; the slow increase in chambers size and low arched apertural opening .

The holotype of Gl . ehrenbergi (Barr) differs from Gl . carteri in having a partially evolute test ; a greater number of chambers in the last whorl ; a nearly circular outline and sutures. In addition , its last two chambers are nither ovoidal nor appressed. The writer has examined the holotype of this species at the British Museum of Natural History , London .

Gl . carteri is similar to Gl . aissana (Sigal) , originally described from the Cenomanian of north Algeria as Globigerinella aissana . However , as the type description cortains no information about the surface ornamentation and chambers character , and as its sutures seem distinctly curved , this writer considers the two species to be distinct . This species is named after Mr. D. J. Carter, of the Imperial College of Science and Technology , London .

Occurrence : Rare in the upper part of the Khasib Formation, rare to abundant in the Tanuma and lower part of the Sadi formations . G . renzi / H . pseudoguembeliniformis zone -- G . concavata subzone .

Family GLOBOTRUNCANIDAE Brotzen 1942

Genus GLOBOTRUNCANA Cushman 1927

Gltbotruncana concavata concavata (Brotzen)

1934 Rotalia concavata BROTZEN . -- P . 66 . pl.3 , fig , 6 ,

1957 Globotruncana concavata (Brotzen) . -- BOLLI . p . 57 , pl.13 . figs . 3a -- c .

Occurrence : Very abundant in the lower part of the Sadi Formation .

G . concavata subzone .

Previous record of occurrence : The Coniacian of the Isle of Wight (England) and Cuba ; the Upper Coniacan -- Santonian of Algeria and Jamaica ; the Lower Santonian of Tunisia and Italy ; the Santonian of Trinidad , Switzerland , France , West Carpathians and Madagascar and the Campanian -- Santonian of Palestine .

As stated by Esker (1969) , other reports concerning the occurrence of G . concavata (Brotzen) in younger beds (Campanian or Masestrichtian) need re -- examination .

Globotruncana concavata dentata Darmoian n . subsp .

Plate 3 , figures 6 -- 9 .

Description ; Test medium sized , planoconvex , coiled in a very low trochospire : spiral side flat , umblilcal side strongly convex ; equatorial periphery quadrilobate , moderately lobate with two closely spaced , delicately beaded marginal keels , the lower keel diverges umbilically at the last chamber and forms delicate umbilical ridges , the upper keel diverges onto the spiral side of the test at the late portion of each chamber and is embedded in the sutural

depressions ; axial periphery truncated;chambers on the spiral side 11 , arranged in 2½ whorls , the initial chambers are small , very slightly protruding , globigerine , followed by slightly larger chambers ; the last whorl is composed of 4 , larger , crescentic shaped , slightly inflated , slightly overlapping chambers , increasing rather rapidly in size as added ; each chamber has an angular extension of the peripheral margin resembling a spine which is usually well developed on the first chamber of the last whorl ; only chambers of the last whorl visible from the convex umbilical side , strongly protruding , inflated and trunco -- conical in shape ; sutures on the spiral side distinct , slightly curved , depressed ; on the umbilical side the sutures are limbate , radial and depressed; umbilicus small , shallow , surrounded by delicately beaded ridges ; wall calcareous , perforate except for the imperforate keels and peripheral band surface finely hisped on both the spiral and the umbilical sides ; primary aperture interiomarginal , umbilical ; tegilla with accessory apertures only poorly preserved .

Dimensions of holotype : Length 0.47 mm . , Width 0 . 37 mm . , thickness (of last chamber) 0. 19 mm . .

Main variation :

1 — The spiral side is either flat , very slightly raised or concave .

2 — The periumbilical keel is either slightly or moderately developed .

Remarks ; Concave specimens of G . concavata dentata n . subsp . resemble G . concavata repanda Bolli in the test shape . number of chambers and the surface ornamentation , but differ in having a smaller test size , a small umbilicus , spine -- like marginal

projection and chambers in the last whorl which are elongated and increase rather rapidly in size . Moreover , the early chambers of the last whorl in G . concavata repanda are strongly inflated . spherical to subspherical in shapes and strongly sloping towards the central area .

Occurrence : Rare in the lower part of the Sadi Formation. G . concavata subzone .

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PLATE 1

1 — 3 Heterohelix nakkadyi n. sp .

1 , X 80 , holotype , Tanuma Formation .

2 , X 85 , paratype , Tanuma Formation .

3 , X 105 , paratype , Tanuma Formation .

4 — 6 Heterohelix pseudoguembelinformis n . sp .

4 , X 110 , holotype , Khasib Formation .

5 , X 115 , paratype , Khasib Formation .

6 , X 95 , paratype , Khasib Formation .

7 — 9 Pseudoguembelina pseudocarinata n . sp .

7 , X 90 , holotype , Sadi Formation .

8 , X 102 , holotype , Sadi Formation .

9 , X 150 , paratype , Sadi Formation .

PLATE 2

1 — 2 Pseudoguembelina pseudocarinata n . sp .

X 135 , paratype , Sadi Formation .

3 Pseudoguembelina sp. cf. Ps. pseudocarinata .

X 125 , Sadi Formation .

4 — 5 Sigalia carpatica Salaj and Samuel .

X 110 , Sadi Formation .

6 — 9 Sigalia sayyabi n . subsp .

6 , X 110 , holotype , Sadi Formation .

7 , X 100 , holotype , Sadi Formation .

8 , X 97 , paratype , Sadi Formation .

9 , X 125 , paratype , Sadi Formation .

PLATE 3

1 — 3 Ventilabrella tricamerata n . sp .

1 — 2 , X 145 , holotype , Khasib Formation .

3 , X 150 , paratype , Khasib Formation .

4 — 5 Globigerinelloides carteri n. sp .

4 , X 125 , holotype , Tanuma Formation .

5 , X 187 , paratype , Tanuma Formation .

6 — 9 Globtruncana concavata dentata n . subsp .

6 , X 85 , holotype , Sadi Formation .

7 , 8 , 9 , X 85 , paratypes , Sadi Formation .

Note : The magnifications stated above are not correct because of the reduction in size of the plate occurred at the press .

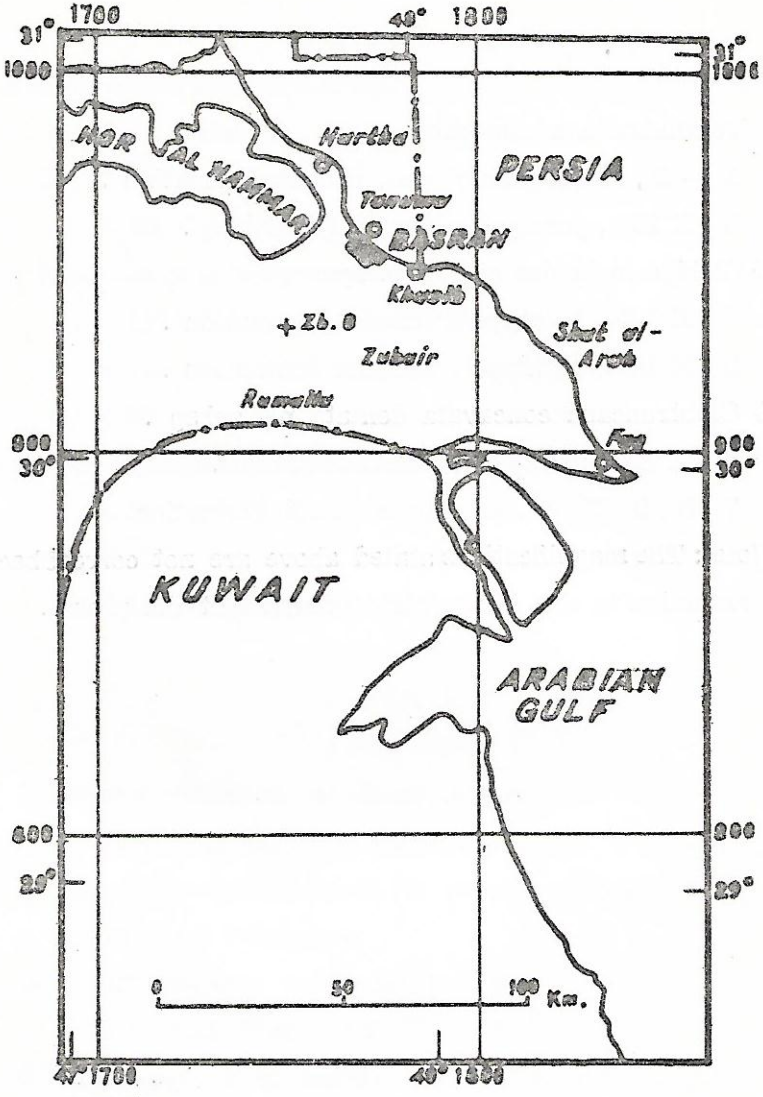
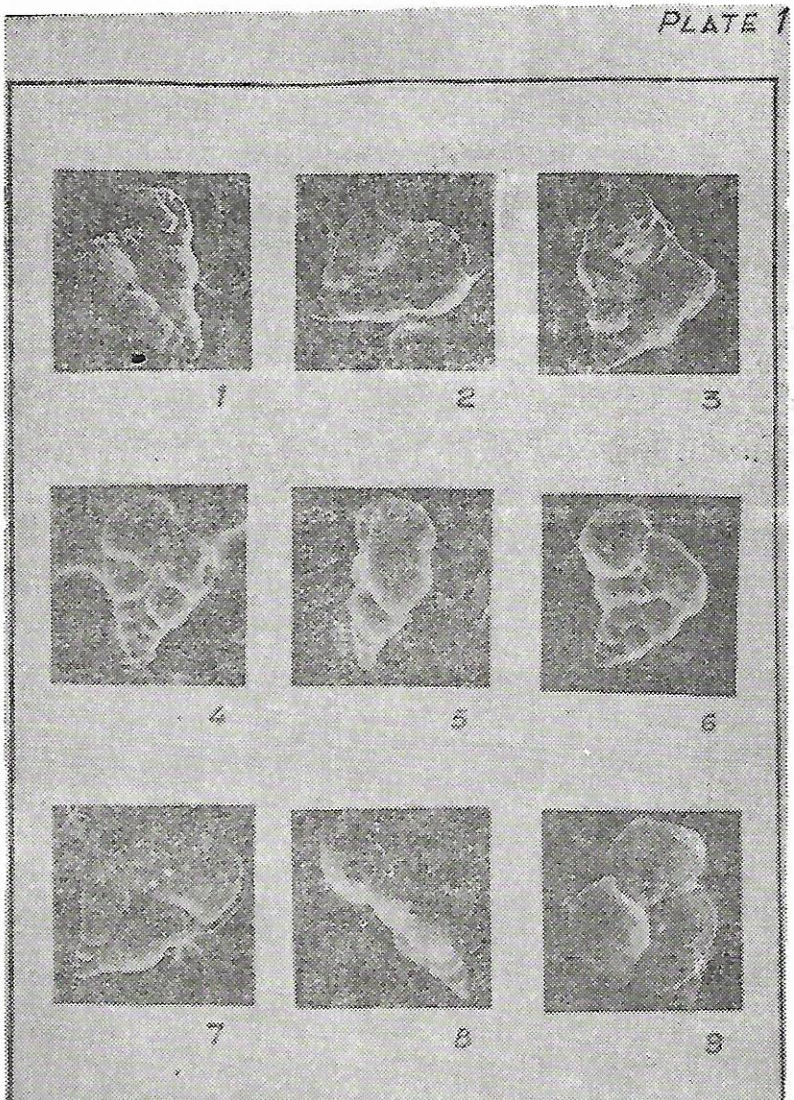
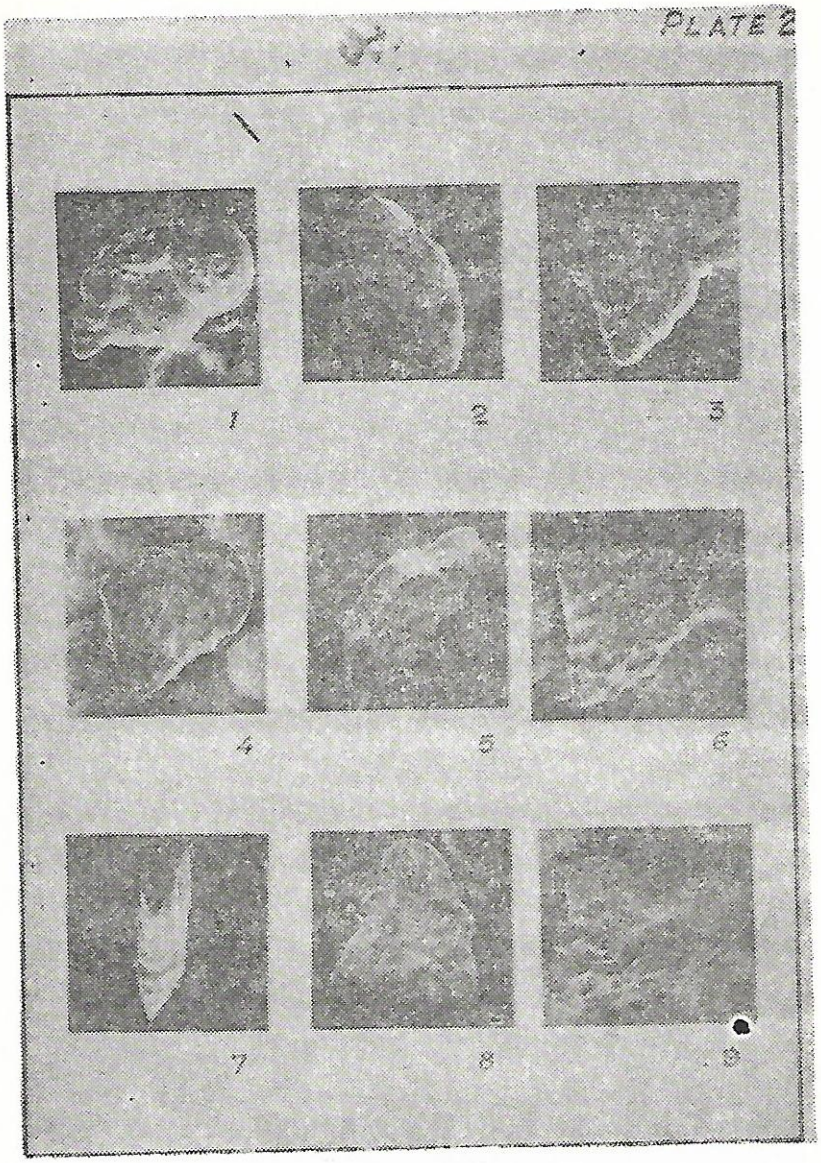


FIG. 2.
Map of southeastern Iraq showing the Position of the B.P.C. well Zubair No. 8.

PLATE 1

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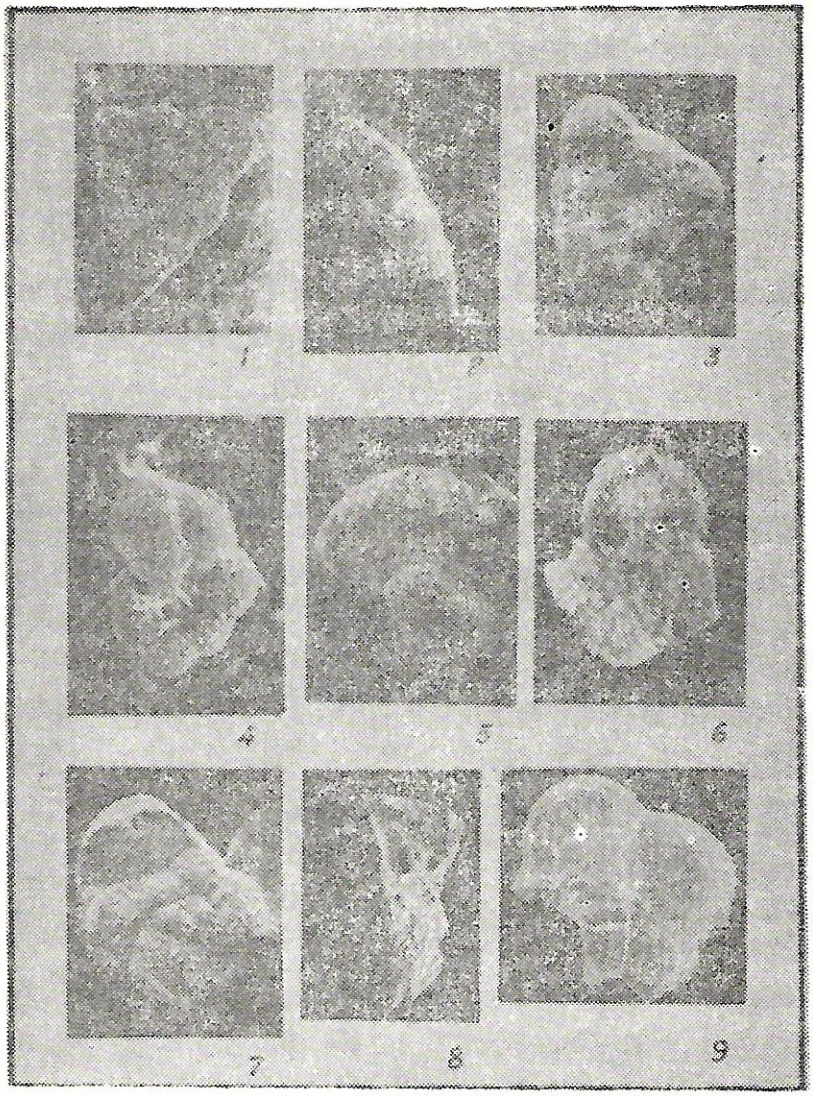
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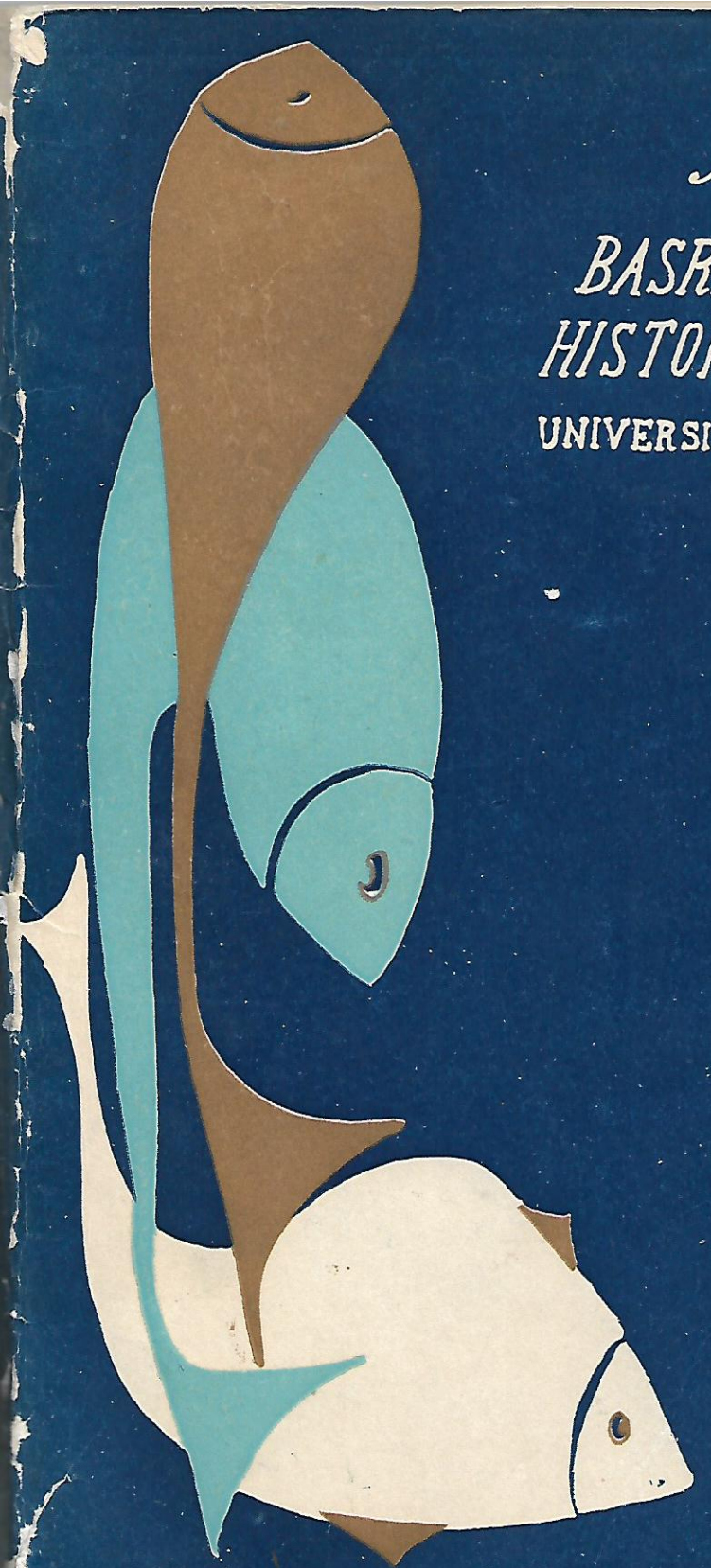

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