

UNIVERSITY OF BAGHDAD
IRAQ NATURAL HISTORY MUSEUM

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A Key to the Carabidae (Insecta,
Coleoptera) of Iraq

by

H. A. Ali (Ph. D. D.I.C.)

University of Basrah, Iraq



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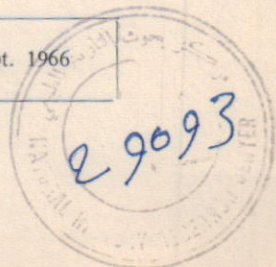
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A KEY TO THE CARABIDAE (INSECTA, COLEOPTERA) OF IRAQ

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Abstract

This study provides a more complete faunal survey of Iraqi Carabidae prepared from borrowed and personal material. All species are keyed out through tribes and genera to species.

خلاصة البحث

يتضمن هذا البحث مفاتيح للانواع المختلفة من الخنافس التي تعود الى عائلة الخنافس الارضية التي وجدت تعيش في العراق . اجري هذا البحث في متحف التاريخ الطبيعي في لندن وتحت اشراف البروفسور O.W. Richards والدكتور E.V. Britton من اساتذة المتحف . تدرج المفاتيح هذه من القبائل الى الانواع . هذا ولم تصور التراكيب المختلفة التي استعملت في التصنيف هنا وذلك لانها شائعة ومعروفة لدى الاختصاصيين .

INTRODUCTION

A large collection of Carabids from the Iraq Museum (N.H.) formed the core of the material used in this study. Other specimens were collected by the author himself. Further material, including types, in the collections of the British Museum (N.H.) was examined. Some additional types were received from various other institutions. A list of these museums has been given under the Acknowledgments.

The Carabidae of Iraq have been very poorly studied and are known only from a few faunal lists. The first list made by Heyden (1888), gave six species, although one of these was determined only to genus. Holdhaus (1919) identified 36 species of Carabids among other Coleoptera from Iraq. Andrewes (1927) identified 18 species in a collection of Iraqi Carabids, 5 of which were described as new. Roubal (1932) recorded seven species from Baghdad and described one as new.

From time to time a few species were described by various authors such as J. Muller, M. Liebke, Jedlicka and others.

From the existing literature the following points become evident. Firstly, there is no catalogue for the Carabid fauna of Iraq, nor is there any key to distinguish the species. Secondly, there is no extensive faunistic study.

CARABIDAE OF IRAQ**1. Key to the Tribes**

- 1— Middle coxal cavities not entirely enclosed by sterna, mesepimera reaching the mesocoxae 2
 — Middle coxal cavities entirely enclosed by sterna, mesepimera not reaching mesocoxae 5
- 2— Body oval; mandibles with a fixed seta in the scrobe; prosternum developed into a large plate concealing the mesosternum; scutellum of mesothorax not visible above. Omophronini
 Gen. *Omophron* Latr. (*O. rutundatus* Chaud.)
 — Body normally long; mandibles without a seta in the scrobe; prosternum normal; scutellum of mesothorax visible above 3
- 3— Procoxal cavities open behind; anterior tibiae not emarginate, with the variable spur placed a little behind the fixed one; head with only one supraorbital seta on each side; metacoxae contiguous. Carabini p. 5
 — Procoxal cavities closed behind; anterior tibiae emarginate with the variable spur placed above the emargination; mesosternum not longitudinally carinate 4
- 4— Articulation of mandibles with the head visible from above; protibiae normal; body pedunculate, flat and pubescent. Siagonini
 Gen. *Sigona* Latr. (*S. europea* Dej.)
 — Articulation of mandibles with the head concealed by the clypeus; protibiae digitate; body pedunculate but not flat or pubescent. Scaritini p. 5
- 5— Venter with six visible sterna in both sexes 6
 — Venter with eight visible sterna in male and seven in female ... 26
- 6— 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
 Gen. *Cymbionotum* Baudi p. 17
 — Mandibles glabrous or with a single seta in the scrobe; head without a suborbital ridge 7
- 7— Mandibles with a fixed seta in the scrobe 8
 — Mandibles without a fixed seta in the scrobe 13

- 8— Head with one supraorbital seta on each side 9
 — Head with two supraorbital setae on each side 11
- 9— 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 longitudinal-directed ridges. Notiophilini
Gen. *Notiophilus* Dum. p. 17
 — 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 without longitudinal ridges 10
- 10— Prothorax without visible sutures, strongly contracted behind; palpi long and slender. Apotomini
Gen. *Apotomus* Ill. p. 18
 — Prothorax with its epimera and episterna separated on each side by visible sutures. Broscini
Gen. *Broscus* Panz. (*B. punctatus* Dej.)
- 11— Head with deep frontal furrows curving round behind the eyes; palpi pointed at apex or if with a subulate apical segment then the penultimate segment of the maxillary palpi glabrous; ligula octasetose at apex. Trechini p. 6
 — Head with a shallow or deep frontal furrow but not curving behind the eyes; ligula bisetose 12
- 12— Apical segment of palpi very short and subulate, the penultimate segment dilated and pubescent. Bembidiini p. 6
 — Apical segment of palpi normal Pogonini p. 6
- 13— Head with one supraorbital seta on each side 14
 — Head with two supraorbital setae on each side 18
- 14— Mandibles short and thick, emarginate or truncate at apex. Licinini p. 6
 — Mandibles of normal length, sharp or slightly truncate, if emarginate then only two basal segments of antennae glabrous. ... 15
- 15— Outer part of the metacoxae and the first abdominal sternum not lying in the same plane; male protarsi with four dilated segments (sometimes not dilated) 16
 — 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 17
- 16— Basal two segments of antennae glabrous; margin of elytra with-
out an internal plica toward apex. Harpalini p. 7
— Basal three segments of antennae glabrous; margin of elytra
with an internal plica toward apex. Zabroni
Gen. *Zabrus* Clairv. p. 31
- 17— 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
..... *Oodes* Bon. p. 28
— 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 p. 10
- 18— Antenna inserted immediately beneath the preocular ridge19
— Antenna inserted far below the preocular ridge, and level with
the lower margin of the eyes 25
- 19— Elytra completely covering the abdomen 20
— Elytra more or less truncate at apex and exposing of
abdomen 22
- 20— 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 21
- 21— Penultimate segment of the labial palpi plurisetose on its inner
margin. Amarini
..... Gen. *Amara* Bon. p. 29
— Penultimate segment of the labial palpi bisetose on its inner
margin. Pterostichini p. 11
- 22— Basal segment of antennae about as long as the next three taken
together; tarsal segment 4 not bilobed; labrum narrower than
clypeus. Zuphiini
..... Gen. *Zuphium* Latr. p. 33
— Basal segment of antennae not longer than the next two taken
together 23
- 23— Inner spur of metatibia longer than the basal metatarsal
segment 24

A Key to the Carabidae of Iraq

- Inner spur of metatibia shorter than the basal metatarsal segment; prementum supported at base by projection of mentum ... Lebiini p. 12
- 24— Lacinia produced into an obtuse ciliate lobe at apex; tibial spurs serrulate. Tetragonoderini
Gen. *Tetragonoderus* Dej. p. 33
- Lacinia ending in a sharp slender hook without any ciliate lobe above it; tibial spurs not serrulate. Masoreini p. 13
- 25— Antennae inserted near the eyes at the lower edge of the orbital emargination anteriorly; ligula including its glossae and paraglossae forms 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 a long well sclerotized lobe. Anthiini
Gen. *Anthia* Web. (*A. dudecimguttata* Bon.)
- 26— Mandibles with a fixed seta in the scrobe, elytra truncate and usually with a narrow membranous margin at apex. Brachinini p. 13

KEY TO THE GENERA

1. Key to the Genera of Carabini

- 1— Third antennal segment with posterior surface carinate; mandibles obliquely striate on upper surface. *Calosoma* Web. p. 14
- Third antennal segment cylindrical; mandibles smooth on upper surface. *Carabus* L. p. 14

2. Key to the Genera of Scaritini

- 1— Head with one supraorbital seta on each side; antennae scapiform; head with a groove below the eyes for reception of the scape; lacinia hooked at apex. *Scarites* F. p. 16
- Head with two supraorbital setae on each side; antennae not scapiform; head without a groove below the eyes 2
- 2— Upper surface of the head with a central longitudinal carina and two oblique lateral ones, together forming an arrow directed forward; clypeus quadridentate; labrum pentasetose; venter punctate and pubescent. *Coryza* Putz. (*C. beccarii* Putz.)
- Upper surface of the head without carinae in form of an arrow. 3
- 3— Elytra with marginal series of pores widely interrupted in the middle; prothorax globose; labrum sexsetose. *Dyschirius* Bon. p. 15

- Elytra with marginal (umblicate) pores not interrupted in the middle; prothorax quadrate, pronotum bordered from apex to peduncle; labrum 6, 7, or 9 setose. *Clivina* Latr. p. 15

3. Key to the Genera of Trechini

- 1— Mandibles tridentate; palpi subulate; elytra with stria one not recurrent at apex. *Perileptus* Schaum
- Mandibles bidentate; palpi not subulate; elytra with stria one recurrent at apex. *Trechus* Schell. (*T. quadristriatus* (Schr.))

4. Key to the Genera of Bembidiini

- 1— Outer apical corner of protibiae slightly rounded 2
- Outer apical corner of protibiae obliquely cut off; scutellary striole absent 3
- 2— Elytra glabrous, striate, at least stria 2 present; mandibles short, maxillae normal. *Bembidion* Latr. p. 18
- Elytra covered with short pubescence and irregularly punctured, striae very weak. *Asaphidion* Goizis (*A. stierlini* (Heyd.))
- 3— Upper surface glabrous; elytra with stria 1 recurved at apex. *Tachys* Steph.
- Upper surface pubescent; elytra with a rudimentary recurved stria at apex. *Lymnastis* Motsch. (*L. galilaeus* Brul.)

5. Key to the Genera of Pogonini

- 1— Antennae filiform, sometimes slightly dilated at apex; prothorax cordate 2
- Antennae moniliform and dilated toward the apex; prothorax narrow and quadrangular; body relatively long and narrow. *Syrdenus* Chaud. (*S. grayi* Woll.)
- 2— Head with moderately deep frontal furrows; body moderately wide; penultimate segment of labial palpi as long as or shorter than the terminal one. *Pogonus* Steph. p. 20
- Head without frontal furrows; body narrower; penultimate segment of labial palpi longer than the terminal one. *Diodercarus* Lutsch. (*D. arrowi* Lutsch.)

6. Key to the Genera of Licinini

- 1— Basal two segments of antennae glabrous; palpi normal; first three segments of anterior tarsi dilated in male. *Badister* Schellen. p. 20

A Key to the Carabidae of Iraq

- Basal three segments of antennae glabrous; terminal segment of labial and maxillary palpi more or less securiform; first two segments of anterior tarsi dilated in male.

Licinus Latr. (*L. aegytiacus* Dej.)

7. Key to the Genera of Harpalini

- 1— Penultimate segment of labial palpi bisetose; eyes contiguous ventrally with the antennal socket 22
- Penultimate segment of labial palpi plurisetose; eyes widely separated ventrally from the antennal socket 2
- 2— Base of elytra not margined or margined only laterally; sides of front of head produced into a rounded projection or vertical horn 3
- Base of elytra margined across its whole width; sides of front of head normal 8
- 3— Front of head with a vertical tooth-like projection above the insertion of the antennae; pro and meso-tibiae short and flat; anterior tarsi not dilated in male; pronotum cordate; shoulders of elytra projected; body smooth.

Daptus Fisch. (*D. vittatus* Fisch.)

- Front of head without a vertical tooth-like projection; pro and meso-tibiae normal; body heavily punctate 4
- 4— Pronotum not narrowed behind, posterior angles rounded; two or three abdominal sterna transversely sulcate behind.

Pachycarus Sol. (*P. brevipennis* Chaud.)

- Pronotum narrowed behind into a short parallel-sided peduncle; none of the abdominal sterna sulcate 5
- 5— Body bow shaped; anterior tarsi not dilated in male, elytra convex 6
- Body more or less depressed; anterior tarsi strongly dilated in male. *Carterus* Dej. & Boisd. p. 22
- 6— Front margin of pronotum squarely truncate with the anterior angles sharp; median of mentum longer or at least as long as the lateral lobes. *Ditomus* Bon. p. 22
- Front margin of pronotum emarginate with the anterior angles rounded; tooth of mentum shorter than the lateral lobes. 7
- 7— Head including eyes a little narrower than pronotum; clypeus with a median strong tooth projecting from the anterior margin in male; mandibles large and bifurcate at apex.

Sabienus Gozis p. 25

- Head including eyes wider than the pronotum; clypeus and mandibles normal in both sexes. *Odontocarus* Sol. p. 24
- 8— Meso and metatibiae provided with rows of long hairs; apical spur of protibiae long and rod shaped; lateral borders of elytra broad, body flat and smooth.
Heteracantha Brul. (*H. depressa* Brul.)
- Meso and metatibiae with or without short hairs; apical spur of protibiae short or of a moderate size but not rod-like; lateral borders of elytra narrow 9
- 9— Gena with a vertical channel for reception of the basal segment of antenna; right mandible sometimes with a notch on the outer margin; if without then clypeus with a transverse groove on its upper surface. *Acinopus* Latr. p. 20
- Gena without a vertical channel; both mandibles always entire 10
- 10— Dilated segments of male tarsi clothed beneath with fine short erect hairs 11
- Anterior tarsi of male, if dilated, biserially squamulose beneath 15
- 11— Head, pronotum and elytra punctate and pubescent above; tarsi covered with fine short hairs above 13
- Body and tarsi glabrous and smooth; first segment of anterior tarsi narrower than the following dilated three; middle tarsi dilated in male 12
- 12— Apical spur of anterior tibiae simple. *Anisodactylus* Dej. p. 21
subg. (*Anisodactylus*)
- Apical spur of anterior tibiae trifid. *Anisodactylus* subg. (*Hexatrichus*) Tsch.
- 13— Anterior tibiae armed with one apical spur, simple or trifid; hind angles of pronotum without a fixed seta 14
- Anterior tibiae armed with two apical spurs, one longer than the other; hind angles of pronotum with a fixed seta; middle tarsi not dilated in male. *Diachromus* Er. (*D. germanus* (L.))
- 14— Anterior tibiae provided with a spur-like projection close to the apical spur, the latter simple; pronotum rounded and discoid in shape; middle tarsi not dilated in male.
Crassodactylus Guer. (*C. punctatus* Guer.)
- Anterior tibiae without a spur-like projection, the apical spur trifid; pronotum rounded only; middle tarsi dilated in male.
Gynandromorphus Dej. (*G. peyroni* Carret.)

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- 15— Tarsi glabrous above 16
 — Tarsi pubescent above 17
- 16— Pronotum and elytra heavily punctate; terminal segment of maxillary and labial palpi truncate at apex; middle tarsi not dilated in male. *Axinotoma* Dej. (*A. fallar* Dej.)
 — Body smooth or with few fine punctures on the pronotum; elytra sometimes with the outer intervals punctate; terminal segment of maxillary and labial palpi pointed or rounded at apex; middle tarsi dilated in male. *Harpalus* Latr. p. 23
- 17— Penultimate 3 sterna of the abdomen with a transverse row of setae behind; head, pronotum and elytra heavily punctate; anterior tarsi in male simple; femora with deep furrows along the ventral surface. *Penthus* Chaud. (*P. tenebrioides* Waltl.)
 — Penultimate 3 abdominal sterna with only two setae behind ... 18
- 18— Eyes and temples behind covered with short fine erect hairs; head, pronotum and elytra punctate 19
 — Eyes and temples behind glabrous; head smooth, pronotum smooth or with only a few fine punctures, elytra heavily punctate and pubescent. *Pseudophonus* Motsch. p. 25
- 19— The inner six elytral intervals with coarse punctures mixed with scattered fine ones, size 18 mm. *Macrophonus* Tsch. (*M. oblongus* (Schaum.))
 — All the elytral intervals with the same puncturation; size smaller 20
- 20— Basal segment of hind tarsi shorter than the following two together; apical spur of anterior tibiae acuminate; middle tarsi dilated in male. *Ophonus* Steph. p. 24
 — Basal segment of hind tarsi longer than the following two together 21
- 21— Base of pronotum not margined or with only a trace of margin laterally; lateral border almost parallel forming a strong transverse pronotum. *Ophonominus* Schaub. (*O. hitsululus* (Dej.))
 — Base of pronotum margined, lateral border sinuate behind. *Parophonus* Ganglb. p. 25
- 22— Head, pronotum and elytra heavily punctate and pubescent; tarsi and eyes covered with fine hairs; mentum toothed; middle tarsi not dilated in male. *Trichocellus* Ganglb.
 — Head and pronotum smooth, elytra sometimes with few fine punctures; tarsi and eyes glabrous 23

- 23— Clypeus asymmetrically emarginate in front; striae of elytra shallow and very faintly punctate, intervals with a few microscopical punctures. *Amblystomus* Er. (*A. metallescens* (Dej.))
 — Clypeus squarely truncate in front or slightly emarginate; elytral striae moderately deep. 24
- 24— Metatarsi with the first four segments laterally keeled; series of marginal umblicate pores of elytra interrupted on posterior half of the elytra 25
 — Metatarsal segments normal, not keeled laterally; series of marginal umblicate pores of elytra continuous on posterior half of elytra 28
- 25— Elytral striae coarsely punctate anteriorly and smooth posteriorly; anterior border of labrum slightly incised in the middle; pronotum rounded; middle tarsi dilated in male.
Egaploa All. (*E. crenulata* (Dej.))
- 26— Terminal segment of tarsi bisetose below. *Stenolophus* Steph.
 — Terminal segment of tarsi plurisetose below 27
- 27— Fourth segment of anterior and middle tarsi strongly bilobed in male; apex of elytra deeply sinuate.
Hemiaulax Bates (*H. morio* (Menetr.))
 — Fourth segment of anterior and middle tarsi only emarginate; apex of elytra feebly sinuate.
Egadroma Motsch. (*E. marginatus* Dej.)
- 28— Body convex, colour rusty brown to brownish white; prosternum sulcate in front; mentum toothed.
Bradycellus Er. (*B. verbasci* (Duft.))
 — Body depressed, colour reddish, yellow to black, often variegated; prosternum not sulcate in front; mentum untoothed 29
- 29— Pronotum not cordate, sides not or hardly sinuate behind; posterior angles rounded, prosternum glabrous or with a few isolated bristles, median line fine; terminal segment of tarsi plurisetose below. *Acupalpus* Latr. p. 21
 — Pronotum cordate, sides deeply sinuate behind, posterior angles sharp; prosternum with numerous long bristles; median line of pronotum distinct, terminal segment of tarsi bisetose below.
Anthracus Motsch.

8. Key to the Genera of Chlaeniini

- 1— Galea one-segmented; tooth of mentum not emarginate; tibiae finely pubescent, bristles sometimes interspersed among the pubescence. *Callistus* Bon. (*C. lunulatus* (F.))

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- Galea two-segmented; tooth of mentum emarginate; tibiae glabrous but furnished with short erect bristles. *Chlaenius* Bon. p. 26

9. Key to the Genera of Pterostichini

- 1— Epipleura of elytra interrupted at the level of the last abdominal segment by the internal plica 8
 - Epipleura of elytra either continuous or vanished at apex but not interrupted by the plica if the latter present 2
- 2— Tarsal claws serrate; dilated segments of the male pretarsi triangular in shape and longer than wide; front margin of the pronotum a little shorter than the basal margin.
Calathus Bon. p. 31
 - Tarsal claws entire or with only a feeble denticulation at base .. 3
- 3— Prosternal process compressed and sharply edged 4
 - Prosternal process not compressed and with its edge rounded. ... 5
- 4— Trochanter of the male longer than that of the female and pointed at its tip; third segment of the antennae as long as the following two together; tarsi glabrous above except a few hairs sometimes present on the basal segment.
Sphodrus Clairv. (*S. leucothalmus* (L.))
 - Trochanter similar in both sexes; third segment of the antennae shorter than the following two together; tarsi pubescent above; basal margin of the pronotum squarely truncate.
Laemostenus Bon. p. 32
- 5— Body and tarsi hairy above 6
 - Body and tarsi glabrous above 7
- 6— Apex of elytra obliquely truncate; pronotum almost disciform and wider than the head including the eyes; both body and tarsi covered above with erect setae; three basal segments of the antennae glabrous. *Orthotrichus* Peyr. (*O. irakensis* Ali)
 - Elytra rounded at apex; pronotum narrower than the head including eyes; body and tarsi covered above with short decumbent pubescence; three basal segments of antennae with scattered fine pubescence. *Chlaeniomimus* Sem. (*C. virescens* (Motsch.))
- 7— Pronotum narrow with sharp posterior angles lacking a seta.
Anchomenus Bon. p. 31
 - Pronotum more or less transverse with blunt posterior angles bearing a seta. *Agonum* Bon. (*A. viridicupreum* (Goeze))

- 8— Second antennal segment arising obliquely from the first; median tooth of mentum not emarginate and lying in the same plane as the epilobes; terminal segment of the labial and maxillary palpi pointed at apex. *Abacetus* Dej. (*A. quadripustulatus* (Peyr.))
- Second antennal segment arising normally from the first; median tooth of mentum emarginate and less prominent than the mental epilobes; terminal segment of the labial and maxillary palpi truncate or rounded at apex 9
- 9— Antennae slightly moniliform and dilated toward apex; front with a deep supraorbital groove on each side; frontal furrows fairly deep curving inward posteriorly.
Morion Latr. (*M. olympicus* Redten.)
- Antennae filiform not dilated toward apex; front without a supraorbital groove on each side; frontal furrows absent or shallow. not curving inward posteriorly.
Pterostichus Bon. p. 32

10. Key to the Genera of Lebiini

- 1— Pronotum transverse 2
- Pronotum with its lateral sides contracted behind 3
- 2— Base of pronotum produced medially into a parallel sided peduncle; third elytral interval with two setigerous pores; striae shallow, intervals flat and sometimes finely punctate; fourth tarsal segment only emarginate, claws pectinate. *Lebia* Latr.
- Base of pronotum sinuately truncate; third elytral interval with only one setiferous pore; striae deep, forming convex impunctate interval; fourth tarsal segment bilobed; claws simple.
Singilis Ramb. (*S. plagiata* (Reiche & Sauley))
- 3— Terminal segment of the labial palpi spindle shaped, pointed at apex, tarsi smooth or hairy above 4
- Terminal segment of the labial palpi flat and hatched shaped; tarsi covered with fine hairs above 7
- 4— Basal margin of the pronotum rounded 5
- Basal margin of the pronotum truncate 6
- 5— Eyes large and prominent; apical margin of the elytra with a slight emargination, mentum toothed. *Metabletus* Schmidt-Geobl. p. 34
- Eyes smaller and less prominent; apical margin of the elytra squarely truncate; mentum not toothed. *Microlestes* Schmidt-Geobl. p. 34

- 6— Hind part of the head, pronotum and elytra, especially the shoulders, covered with long yellowish hairs; the posterior seta of pronotum fixed on the hind angle; elytra yellow, having brownish black markings, twice as long as wide and parallel sided. *Trichis* Klug (*T. maculatus* Klug)
- Body glabrous above, lateral sides of the pronotum strongly contracted behind, the posterior seta anterior to the hind angle, head velvet in appearance much wider than the pronotum. *Apristus* Chaud. (*A. subaeneus* Chaud.)
- 7— Head heavily wrinkled longitudinally; elytral intervals raised; basal margin of the pronotum rounded; tarsal claws simple. *Cymindoidea* Cast. (*C. famini* (Dej.))
- Head smooth, not wrinkled; elytral intervals normal; basal margin of pronotum truncate; body smooth; tarsal claws pectinate 8
- 8— Penultimate segment of the labial palpi bisetose, shorter or at most as long as the terminal segment; pronotum cordiform and longer than wide, with the posterior angles right. *Glycia* Chaud. p. 33
- Penultimate segment of the labial palpi plurisetose, longer than the terminal one; pronotum wider than long or at least as wide as long, hind angles of pronotum obtuse. *Cymindis* Latr. p. 33

11. Key to the Genera of Masorecini

- 1— Prosternal process without seta at apex; elytral striae complete from base to apex; body shiny. *Masoreus* Dej. (*M. orientalis* Dej.)
- Prosternal process with two setae at apex; elytral striae very weak, traces of striae present on lateral sides and toward apex; body dull. *Aephnidius* MacLeay (*A. ruficornis* Chaud.)

12. Key to the Genera of Brachinini

- 1— Terminal segment of maxillary palpi truncate at apex, upper surface of the pronotum not keeled 2
- Terminal segment of maxillary palpi pointed at apex; upper surface of the pronotum with two longitudinal keels; apical border of elytra with a narrow membranous margin. *Mastax* Fisch. (*M. thermarum* Stev.)
- 2— Truncate apex of elytra without a membranous margin; elytral disc with sharp costae, glabrous and smooth; margin round the eyes glabrous. *Pheropsophus* Sol. (*P. africanus* (Dej.))

- Truncate apex of elytra with a membranous margin; elytral intervals punctate and finely pubescent. *Branchinus* Web. p.34

III. KEY TO THE SPECIES

The following keys have been formulated to the species of 38 genera representing 18 tribes of the Iraqi Carabidae. Genera represented in only one species in Iraq are not included. These could be determined either by the characters of the tribe or the genus to which they belong. Five species pertaining to *Lebia* Latr. (*L. baghdadensis* Liebke, *L. cruxminor* (L.) *L. cyanocephala* (L.), *L. lucilla* Reitt., and *L. nilotica* Chaud.) are recorded for Iraq. No key for these species is made because of the difficulty of getting the type specimens from the Paris museum for these type specimens were not in a satisfactory condition.

Keys to the species of the 38 genera are arranged as follows:—

1. Key to the Species of the Genus

CALOSOMA WEB.

- 1— Elytra four times as long as pronotum, five intervals present in each primary interval *olivieri* Dej.
- Elytra less than four times as long as pronotum, only three intervals present in each primary interval 2
- 2— Mesotibiae strongly curved, metatibiae slightly so; elytra with the surface clearly imbricate; striae well defined.
imbricatum Klug
- Mesotibiae only slightly curved, metatibiae straight 3
- 3— Shells of elytral surface flat, striae deeper than the transverse borders or shells; both effacement of striae and fineness of lines bordering shells give elytra a mat aspect. *maderae* F.
- Shells of elytral surface strong and projecting, striae not well defined, having almost the same depth of the lines bordering the shells; the projection of shells gives the elytral surface a brilliant shine. *europunctatum* (Herbst)

2. Key to the Species of the Genus

CARABUS L.

- 1— Penultimate segment of labial palpi plurisetose; anterior tarsi of male with three segments, pronotum wider than long and with clear rounded basal foveae; elytra without visible striae; hind furrows of abdominal sterna evanescent at sides.
chalconatus Mann.

- Penultimate segment of labial palpi bisetose; anterior tarsi of male with only two dilated segments; elytral striae deep; abdominal sterna not furrowed behind. *omophreoides* Reitt.

3. Key to the Species of the Genus

CLIVINA LATR.

- 1— Clypeus with a wide transverse furrow anteriorly; frons with wide longitudinal groove; elytral striae strongly punctate, four setiferous pores present on the third stria; humeral angle of elytra without a fixed seta 2
 - Clypeus convex, without any furrow anteriorly but a narrow transverse groove behind; frons convex, without a midlongitudinal groove, elytral striae smooth, with only traces of punctures, two setiferous pores present on second stria with a third one present on the hind part of third stria; elytra with a fixed seta on the humeral angles.
- 2— Midlongitudinal groove on front of head reaching clypeus; frontal furrows deep and wide; disc of pronotum with punctures arranged in Y-shape on each side; elytral striae moderately punctate, the punctures becoming shallow behind; colour rusty brown to red. *ypsilon* Dej. & Boisd.
 - Midlongitudinal groove of front short and not reaching clypeus; frontal furrows short and shallow; disc of pronotum with fine scattered punctures; elytral striae deeply punctate to apex; colour rusty red. *euphraticus* Putz.

4. Key to the Species of the Genus

DYSCHIRIUS BON.

- 1— Elytra with two pores at base 2
 - Elytra without pores at base 3
- 2— Distal tooth of protibia truncate and shorter than apical spur; lateral margin of elytra with a single setiferous pore behind shoulders, striae deeply punctate, punctures separate on inner striae; striae 1, 2 and 3 obliterated at base, two setiferous pores present on third stria; elytra ovate. *lucidus* Putz.
 - Distal tooth of protibia sharp and longer than apical spur; lateral margin of elytra with three setiferous pores behind shoulders; inner striae complete to apex; three setiferous pores present on stria 3; elytra bow-shaped. *euphratica* Putz.
- 3— Elytra elongate with rounded sides. striae deep through out to apex 4

- Elytra cylindrical with parallel sides; elytral striae obscure on apex with two setiferous pores on stria 3, clypeus triangular; with shallow transverse groove on head behind. *clypeatus* Putz.
- 4— Elytra with two basal tubercles and two preapical punctures; inner striae continuously punctate to apex. *tuberculifer* Mull.
- Elytra without basal tubercles and with a single preapical puncture; inner striae not continuously punctate to apex.
mesopotamicus Mull.

5. Key to the Species of the Genus

SCARITES F.

- 1— Last three abdominal sterna transversely sulcate 7
- Last three abdominal sterna not sulcate 2
- 2— Outer margin of mesotibia with two preapical teeth 3
- Outer margin of mesotibia with one preapical tooth 5
- 3— Pronotum with fixed seta on hind angles; stria 3 of elytra with two setiferous pores near apex; frontal angles of head rounded; front of head smooth medially and granulate laterally; abdominal sterna and metepisterna densely microsculptured. *salinus* Dej.
- Pronotum without fixed seta on hind angles; stria 3 of elytra with only a single setiferous pore near apex. 4
- 4— Elytra slightly widened behind; pronotum nearly twice as wide as long; metasternum scatteredly punctate behind the middle coxae; last four abdominal sterna with fine microsculpture.
procerus Dej.
- Elytra parallel sided; with deeper striae and more prominent intervals; pronotum less than twice as wide as long; sides of metasternum heavily granulate; all abdominal sterna densely sculptured laterally and more or less smooth medially.
eurytus Fisch.
- 5— Elytra ovate, striae faint and almost smooth, 2 pores present on posterior part of stria 3; head smooth; mentum not carinate along its lateral border; antennae and palpi black; metepisternum short; wings rudimentary. *laevigatus* F.
- Elytra parallel sided, striae deep and strongly punctate; four setiferous pores present on stria 3; head striate and punctate behind; mentum with a fine longitudinal carina along its lateral border 6

- 6— Pronotum transverse, sides feebly rounded; head striate on frontal furrows and behind the eyes, more or less punctate medially, elytral striae shallow, intervals flat; upper surface of the beetle dull black. *terricola* Bon. subsp.
aethiopicus Bann.
- Pronotum less transverse with parallel sides; head with scattered striae, punctate behind, elytral striae deep, intervals convex; upper surface of beetle shiny black. *subcylindricus* Chaud.
- 7— Elytral striae deep, intervals convex; metasternum with 3 setiferous pores on each side behind middle coxa; body narrow and convex. *khalafi* Ali
- Elytral striae shallower and almost disappearing at apex, intervals flat; metasternum with only two setiferous pores on each side behind middle coxa. *planus* Bon.

6. Key to the Species of the Genus

NOTIOPHILUS DUM.

- 1— Apex of elytra yellowish brown ; femora dark; elytral striae deeply punctate; front of head between eyes deeply striate. *biguttatus* (F.)
- Elytra entirely black; pro and middle femora testaceous, hind femora black; elytral striae weakly punctate; front of head between eyes with shallow striae. *danieli* Reitt.

7. Key to the Species of the Genus

CYMBIONOTUM BAUDI

- 1— Antennae with segments 5—10 pear shaped, second segment glabrous 2
- Antennae with segment 5—10 ovoid, not more than a half longer than wide, second segment pear-shaped; median line of pronotum fairly deep; colour red with basal third of elytra pale ferruginous. *pictula* Bates
- 2— Upper surface uniformly piceous; median line of pronotum fine. *semelederi* Chaud.
- 3— Upper surface black, median line of pronotum conspicuous. *mesopotamicus* Csiki

8. Key to the Species of the Genus*APOTOMUS* ILL.

- 1— Elytral surface polished, covered with scattered long erect setae, striae continuously deep at apex; entire body reddish brown. *rufus* (Rossi.)
- Elytra alutaceous, densely covered with short soft pubescence, striae shallow at apex 2
- 2— Entire body testaceous; antennae, palpi and legs lighter. *testaceous* Dej.
- Head and pronotum red, elytra dark brown, legs dark red. *rufithorar* Pecchioli

9. Key to the Species of the Genus*BEMBIDION* LATR.

- 1— Border of elytra angulate at shoulders 2
- Border of elytra rounded at shoulders 7
- 2— Lateral margin of elytra serrate and seulose; outer striae very clearly punctate in front. puncturation continuous to apex, stria 8 faintly punctate; antennae dark brownish, with underside of basal segments, apical parts of femora and tibiae black. *quadricolle* Motsch.
- Lateral margin of elytra entire and not setulose, stria 8 smooth. 3
- 3— Front with double folds lateral of frontal furrow, these two folds meeting just in front of anterior supraorbital seta 4
- Front not folded 5
- 4— Elytra smooth; basal segment of antennae and tibiae yellowish red; pronotum a little wider than head including eyes, with sides rounded in front and contracted behind; elytral striae finely punctate. *currulum* Duv.
- Elytra heavily microsculptured; three basal segments of antennae red, others black; pronotum much wider than head including eyes, with its upper surface transversely folded *ambiyum* Dej.
- 5— Pronotum strongly narrowed behind; elytral striae evanescent at apex, hind wings wanting. *properans* Steph.
- Pronotum cordiform, with sides sinuate behind; elytral striae complete to apex, apical stria present; hind wings present 6

- 6— Entire upper surface convex and clearly microsculptured, except disc of pronotum smooth; basal 3—4 antennal segments reddish yellow, others black; penultimate segment of maxillary palpi and femora black. *splendidum* Sturm
- Upper surface flat, elytra and disc of pronotum covered with few meshes; antennae reddish brown, becoming darker towards apex. *luridicorne* Sol.
- 7— Pronotum with base obliquely truncate, sides rounded; stria 7 of elytra absent; head and pronotum bluish green with bronze shine, both with strong isodiametric microsculpture; elytral striae finely punctate, intervals smooth. *vicinum* Luc.
- Pronotum with base squarely truncate, sides sinuate; stria 7 of elytra present 8
- 8— Frontal furrows almost parallel, not reaching the anterior margin of the clypeus 9
- Frontal furrows convergent, extent variable 10
- 9— Head and pronotum metallic blue; front of head with a few punctures; antennae, palpi and legs yellowish red, elytral apex yellow, a light brown band on each shoulder, the remaining surface dark brown with metallic blue reflections. *megaspilum* Walk.
- Entire upper surface yellowish red, head antennae, palpi and legs yellow; four well marked yellow bands on elytra. *amplum* Sahlbg.
- 10— Frontal furrows narrow, straight, reaching the anterior border of the clypeus; pronotum transverse with sides slightly narrowed behind, base obliquely truncate; head and pronotum greenish bronze; elytra metallic brown with greenish reflections, apex pale yellow with a rounded yellow spot on each side; legs and basal segment of antenna reddish brown, palpi and remaining antennal segments darker; upper surface densely microsculptured. *niloticum* Dej.
- Frontal furrows sinuately convergent, not reaching the anterior border of the clypeus; pronotum narrow and convex with sides strongly contracted behind; base squarely truncate; upper surface shiny without microsculpture; elytra with four well marked spots 11

- 11— Legs and four basal segments of antennae red, other segments black; elytral spots reddish brown. *quadripustulatum* Serv.
 — Femora and first four segments of antennae bronze black, the remaining segments black; tibiae yellow, elytral spots pale yellow. *quadrimaculatum* (L.)

10. Key to the Species of the Genus

POGONUS STEPH.

- 1— Pronotum cordiform, basal margin obliquely truncate as wide as the anterior margin; elytral striae deeply punctate 2
 — Pronotum trapezoid, basal margin squarely truncate and wider than anterior margin; elytral striae feebly punctate; base of elytra margined along its whole width; colour bronze, sometimes bluish green or metallic; legs rusty red with darker femora. *persicus* Chaud.
 2— Pronotum gently rounded in front and slightly sinuate behind, hind angles obtuse and hardly projecting laterally; elytra almost parallel sided *biroi* Csiki
 — Pronotum rounded in front and distinctly sinuate behind, hind angles right and visibly projecting laterally; elytra with rounded sides. *micans* Chaud.

11. Key to the Species of the Genus

BADISTER SCHELLEN.

- 1— Right mandible with a deep notch on its upper surface; hind wings present, pronotum of ground colour, elytra and legs yellowish red; head, ventral side of prothorax and abdomen black; elytra with two large crescent shaped black bands. *bipustulatus* (F.)
 — Left mandible notched, the right entire; hind wings absent, body entirely dark brown, legs lighter. *dilatatus* Chaud.

12. Key to the Species of the Genus

ACINOPUS LATR.

- 1— Anterior margin of clypeus deeply emarginate, clypeus with a transverse furrow; prosternum hump-shaped in ♂; upper margin of scrobe in both mandibles entire; tarsi pubescent above 4
 — Anterior margin of clypeus squarely truncate in front or only slightly emarginate; clypeus without a transverse furrow; prosternum normal in both sexes; upper margin of scrobe in right mandible notched. 2

- 2— Notch of right mandible towards base behind anterior border of clypeus; femora dark, tibiae rusty red, yellowish red.
picipes (Ol.)
- Notch of right mandible present at middle of upper margin opposite the anterior border of clypeus 3
- 3— Beetle short and wide; pronotum twice as wide as long; elytral striae deep; right mandible with its upper margin widely and deeply notched *sabulosus* (F.)
- Beetle narrow, cylindrical; pronotum less than twice as wide as long; elytral striae shallow; right mandible with its upper margin slightly notched. *laevigatus* Menetr.
- 4— Head, including eyes, wider than pronotum in male; vertex of head irregularly striate; clypeus emargination exposing the labral basal membrane; antennae red, palpi and legs dark red, upper surface darker. *megacephalus* (Rossi)
- Head, including eyes, narrower than pronotum in both sexes; vertex of head smooth; clypeus emargination not exposing the basal membrane of labrum; body entirely red. *khalisensis* Ali

13. Key to the Species of the Genus

ACUPALPUS LATR.

- 1— Fourth segment of protarsi deeply emarginate in male forming two lobes; head black, pronotum red, elytra with black marginal mark; two basal segments of antennae and legs yellow. *elegans* Dej.
- Fourth segment of protarsi slightly emarginate in male; colour not as above 2
- 2— Elytral interval 2 having the same width throughout, 3 narrow at apex as other intervals; pronotum dark brown; elytra black with rusty brown sutural interval. *suturalis* Dej.
- Elytral intervals 2 and 3 narrow at apex; both pronotum and elytra yellowish red, the latter with blackish discal mark. *dorsalis* (F.)

14. Key to the Species of the Genus

ANISODACTYLUS DEJ.

- 1— Anterior tibiae suddenly narrowed at base; tarsi glabrous above; clypeus with several setae on each side; elytra finely punctate and pubescent; colour green, blue or dark bluish green. *pseudaeneus* Dej.

- Anterior tibiae normal; tarsi finely pubescent above; clypeus with a single seta on each side; elytra glabrous; colour entirely black. *intermedius* Dej.

15. Key to the Species of the Genus

CARTERUS DEJ. & BOISD.

- 1— Outer apical angle of anterior tibia produced; pronotum heavily punctate 2
 - Outer apical angle of anterior tibia not produced but with a short spine; pronotum sparsely punctate; elytra with the sutural intervals raised on posterior half. *validivusculus* Brul.
- 2— Pronotum wider than long, as wide as elytra; first antennal segment as long as following two together; head coarsely punctate except a smooth area between the eyes. *gilvipes* Brul.
 - Pronotum as wide as long, narrower than elytra; first antennal segment shorter than following two together; head uniformly punctate. *ignoratus* Stichel

16. Key to the Species of the Genus

DITOMUS BON.

- 1— Hind angles of pronotum acute and projecting upward; posterior margin of abdominal sterna bisetose in both sexes; body heavily punctate and pubescent above; basal margin of pronotum $1\frac{1}{2}$ times as wide as front margin. *obscurus* Dej.
 - Hind angles of pronotum right, not projecting upward; posterior margin of abdominal sterna bisetose in ♀ glabrous in ♂ 2
- 2— Head and pronotum sparsely punctate; elytra scatterdely pubescent; striae finely punctate, becoming smooth posteriorly, intervals flat, with a single row of punctures along the middle of each; temples short, slightly contracted behind; upper side of beetle flat and shiny black. *semicylidricus* Gilincki
 - Head and pronotum heavily punctate and pubescent above; intervals with two irregular rows of punctures 3
- 3— Head with two rounded depressions on front, temples dilated behind the eyes, in male more prominent than eyes; head uniformly punctate. *eremita* Dej.
 - Head without rounded depressions on front, temples, narrowed behind and less prominent than eyes; vertex smooth medially. *punctulatus* Chaud.

17. Key to the Species of the Genus

HARPALUS LATR.

- 1— Border of elytra rounded at shoulders; mentum untoothed 2
— Border of elytra angulate at shoulders; mentum toothed 3
- 2— All elytral intervals, head and pronotum smooth, the latter only punctate on the base; elytra parallel sided; beetle black.
bachycarus Stev.
— Lateral intervals, head and pronotum sparsely and finely punctate; beetle more or less ovate. *undulatus* Geb.
- 3— Lateral intervals of elytra punctate and finely pubescent 4
— All intervals of elytra smooth and glabrous 5
- 4— Upper surface in both sexes dull and smooth; intervals of elytra punctate; venter of abdomen dull; antennae and tibiae rusty red, femora brown; lateral border of pronotum, apical margin of elytra and elytral sutures posteriorly reddish.
caiphus Reiche
— Upper surface shagreen, elytra more dull in ♀; outer intervals finely punctate, colour dark with bluish or greenish shine; tibiae and tarsi red, antennae and palpi yellowish red.
metallinus Menetr.
- 5— Sides of pronotum rounded from apex to base, the latter smooth with its basal foveae rugose; two penultimate abdominal sterna covered with fine hairs laterally; antennae black with first segment yellowish red; body including legs black.
fuscipalpis Sturm
— Sides of pronotum contracted posteriorly, but not sinuate; base of pronotum punctate on basal foveae 6
- 6— Two penultimate sterna of abdomen pubescent; entire base of pronotum punctate; antennae and legs dark red, upper side of beetle black with violet reflections at sides. *oblitus* Dej.
— All abdominal sterna smooth and glabrous 7
- 7— Apex of elytra strongly sinuate; pronotum convex with its base punctate at sides; antennae and palpi yellowish red; legs dark brown, tarsi lighter, body black. *tenebrosus* Dej.
— Apex of elytra feebly sinuate; pronotum transverse and flat with few punctures present on basal foveae; entire body brownish yellow. *fulvus* Dej.

18. Key to the Species of the Genus

ODONTOCARUS SOL.

- 1— Clypeus with a single seta on each side; elytra $2\frac{2}{3}$ times as long as pronotum; upper surface of body scatterdely covered with short setae. *cephalotes* Dej.
— Clypeus with 3-5 setae on each side; elytra $2\frac{1}{2}$ times as long as pronotum; upper surface of beetle closely covered with long setae. *asiaticus* Chaud.

19. Key to the Species of the Genus

OPHONUS STEPH.

- 1— Base of pronotum not margined throughout 2
— Base of pronotum margined throughout 3
2— Pronotum with its sides and basal angles rounded; upper surface of beetle sparsely punctate and pubescent; antennae, palpi and legs red, body dark brown. *musayabensis* Ali
— Pronotum with its lateral sides sinuate, basal angles right; upper surface of beetle heavily punctate and pubescent; palpi and legs yellow, body yellowish red. *judaeus* Brul.
3— Upper surface black or brown to yellowish red; apex of elytra rounded or very feebly sinuate; pronotum cordiform with sharp basal angles. 4
— Upper surface metallic green or dark blue; apex of elytra strongly sinuate; pronotum transverse with rounded or obtuse basal angles. 5
4— Entire body reddish brown; pronotum convex with its lateral sides strongly sinuate behind; elytral intervals sparsely but coarsely punctate. *cribrellus* Reiche
— Upper surface dark brown; pronotum flat with sides gently contracted behind; elytral intervals heavily and finely punctate. *israelita* Brul.
5— Upper surface metallic green; antennae, palpi and legs yellowish red; pronotum sparsely punctate, with basal foveae shallow. *azureus* (F.)
— Upper surface dark blue with violet reflections; antennae and palpi yellowish red, tibia and tarsi brownish red, femora black; pronotum heavily punctate medially, with basal foveae deep. *cribricollis* Dej.

20. Key to the Species of the Genus

PAROPHONUS GANGLB.

- 1— Upper surface entirely black 2
 - Head and pronotum black, elytra reddish brown; elytra covered with fine yellowish pubescence; antennae, palpi and legs yellowish red. *mendax* (Rossi)
- 2— Basal angles of pronotum right; elytra angulate at shoulders; base of pronotum margined throughout; antennae, palpi and legs yellowish red; front of head and pronotum sparsely but coarsely punctate. *dia* Reitt.
 - Basal angles of pronotum rounded; elytral border rounded at shoulders, base of pronotum not margined; antennae, palpi and legs red; head and pronotum only minutely punctate. *planicollis* Dej.

21. Key to the Species of the Genus

PSEUDOPHONUS MOTSCH.

- 1— Posterior angles of pronotum sharp and projecting laterally; metathoracic episterna heavily punctate; seventh elytral stria arising opposite to hind angle of pronotum. *rufipes* Degeer
- Posterior angles of pronotum blunt; metathoracic episterna almost smooth; sixth elytral stria arising opposite to hind angle of pronotum. *griseus* (Panz.)

22. Key to the Species of the Genus

SABIENUS GOZIS

- 1— Terminal segment of labial palpi truncate at apex; tooth of clypeus in male large and curved, bifid at apex and compressed on the lateral sides in front. *calydonius* (Rossi)
- Terminal segment of labial palpi pointed at apex; tooth of clypeus in male short and cylindrical, ending with three short cuspids. *tricuspidatus* (F.)

23. Key to the Species of the Genus

STENOLOPHUS STEPH.

- 1— Base of pronotum rounded; sterna and pleura of pterothorax black; venter of abdomen yellowish red to light brown; elytral striae deep, pronotum and ground colour of elytral metallic brown. *persicus* Mann.

- Base of pronotum squarely truncate; sterna and pleura of pterothorax and venter of abdomen dark brown, except yellowish-red mesopleurites; elytral striae shallow, intervals flat; both pronotum and ground colour of elytra yellowish red.
discophorus Fisch.

24. Key to the Species of the Genus
CHLAENIUS BON.

- 1— Terminal three segments of maxillary palpi plurisetose, with terminal segment flattened and securiform in male; inner margin of profemora sharp and dilated at base 13
 - All segments of maxillary palpi glabrous, with terminal segment cylindrical except in *Chlaenius viridis* Men. with inner margin of profemora normal 2
- 2— Upper surface glabrous; elytra bordered with a yellow margin; venter of abdomen glabrous and black; upper surface bronze green to light green; legs yellow. *spoliatus* (Rossi)
 - Upper surface more or less punctate and pubescent 3
- 3— Tarsi glabrous above or with only few fixed setae 4
 - Tarsi covered above with dense fine yellow pubescence 5
- 4— Border of elytra angulate at shoulders; hind marginal seta of pronotum placed anterior to basal angle 7
 - Border of elytra rounded at shoulders; hind marginal seta of pronotum placed on corner of basal angle 9
- 5— Elytra bordered with a yellow margin, becoming wider and dentate at apex; tarsi slender, heavily pubescent; both head and pronotum coarsely punctate; entire upper surface of beetle green and finely pubescent; 3 basal segments of antennae, palpi, tibiae and elytral epipleurae yellow, ventral side dark. *lucasi* Peyr.
 - Elytra not bordered by any coloured margin; tarsi scatterdely pubescent; both head and pronotum only sparsely punctate6
- 6— Head rugose behind eyes, with fine punctures mixed with scattered coarse punctures; pronotum quadrate, puncturation as on head; head and pronotum metallic green with coppery reflections; elytra dark blue with a bluish shine at base, underside black. *aeratus* (Quen.)

A Key to the Carabidae of Iraq

- Upper surface of head smooth, with only a few punctures behind eyes; pronotum cordiform with fewer coarse punctures; head and pronotum bluish green to dark violet; underside brown, darker anteriorly. *canariensis* Dej.
- 7— Elytra concolourous; interval smooth medially but with a row of punctures laterally; legs long, with slender femora, hind trochanter short; head, including eyes, as wide as pronotum; upper surface dark blue. *coeruleus* (Stev.)
- Elytra bordered with a yellow margin; intervals heavily punctate and pubescent; legs of normal length with moderately thick femora, trochanter of hind legs; head, including eyes, narrower than pronotum 8
- 8— Elytral intervals flat and heavily punctate; yellow margin of elytra slightly widened at apex; venter of abdomen without a yellow margin except anal border of last visible sternum; elytra dull green; ventral surface black. *velutinus* (Duft.)
- Elytral intervals convex, less punctate and pubescent; yellow margin of elytra also a little widened at apex but the ventral side of the abdomen bordered also with yellowish margin; elytra dull green; underside black. *festivus* (Panz.)
- 9— Elytral epipleurae heavily punctate and pubescent; terminal segment of maxillary palpi in both sexes normal; lateral border of pronotum angulate at base with hind marginal seta placed on corner of basal angle 10
- Elytral epipleurae smooth and glabrous; terminal segment of maxillary palpi flattened in male; lateral border of pronotum rounded at base with hind marginal seta fixed anterior to basal angle; palpi, mandibles, labrum and antennae red, elytral epipleurae, ventral surface of beetle and legs dark. *viridis* Menetr.
- 10— Elytral disc bordered with a yellow margin, dilating at apex and becoming dentate inwardly; head and pronotum brilliant green, ventral side of beetle dark, labrum, antennae, palpi and elytral epipleurae yellow. *vestitus* (Payk.)
- Elytral disc concolourous 11
- 11— Head smooth; pronotum cordiform with sharp basal angles; underside and elytral epipleurae uniformly dark brown; labrum, antennae, palpi and legs reddish yellow; both head and pronotum bluish green. *flavipes* Menetr.

- Head finely and densely punctate; pronotum transverse, much wider than head including eyes; underside and elytral epipleurae dark; labrum, palpi, antennae and legs golden brown; both head and pronotum metallic green 12
- 12— Upper surface of head at middle almost smooth, labrum sparsely punctate; sides of pronotum sinuate; metepimera glabrous.
syriacus Chaud.
- Head uniformly punctate; labrum densely punctate; sides of pronotum rounded; metepimera punctate and pubescent.
richardsi Ali
- 13— Elytra dark, deeply striate, intervals sparsely punctate; both head and pronotum metallic green; yellowish margin of abdominal venter wide.
circumscriptus (Duft.)
- Elytra violet blue to dark blue, striae weaker, intervals closely punctate; yellowish margin of abdominal venter narrow 14
- 14— Underside of beetle shiny black with faint iridescence; upper side violet-blue, head with greenish reflections; elytral intervals black along the middle with green reflection; an irregular row of punctures present along sides of each stria. *amarae* Andr.
- Underside of beetle dull black; upper side dark blue; elytral intervals without greenish reflections along the middle; a regular row of punctures present along sides of each stria.
dejeani Dej. & Boisd.

25. Key to the Species of the Genus

OODES BON.

- 1— Terminal segment of palpi truncate at apex; elytra with striae deep throughout their length, finely punctate, intervals convex; upper surface of beetle densely covered with fine micropunctures.
barensis Ali
- Terminal segment of palpi rounded at apex 2
- 2— Frontoclypeal sulcus distinct; elytra with striae moderately deep and finely punctate; intervals convex; palpi red.
irakensis Andr.
- Frontoclypeal sulcus faint; elytra with striae shallow, very faintly punctate; intervals flat; palpi dark red.
meridionalis Ali

26. Key to the Species of the Genus
AMARA BON.

- 1— Apical spur of anterior tibia trifold 2
- Apical spur of anterior tibia simple or with a small additional tooth on inner side 3
- 2— Pronotum with small but distinct outer basal foveae; marginal pores of elytra interrupted medially; legs red with darker tarsi, palpi dark red, elytral epipleurae brown. *mesopotamica* Bal.
- Pronotum without distinct basal foveae; marginal pores of elytra continuous from base to apex; femora and elytral epipleurae black; base of palpi, tibiae, and tarsi red. *fulvipes* Serv.
- 3— Mesofemora with 2 to 4 fixed setae on posterior margin 4
- Mesofemora with a long fringe of setae on posterior margin ... 9
- 4— Apical spur of protibiae with an additional tooth on inner side; prosternal process not margined *metallescens* Dej.
- Apical spur of protibiae simple; prosternal process either margined or not 5
- 5— Mesofemora bisetose on posterior edge; prosternal process margined and glabrous 6
- Mesofemora with four setae on posterior edge; prosternal process not margined and bisetose at apex. *simplex* Dej.
- 6— Metatibiae of male with a dense brush of short hairs on inner surface; basal segment of antennae black and yellowish-red at base 7
- Metatibiae of male without such a brush, at most with a fringe of sparse hairs; antennae entirely reddish brown. *saxicola* Zimm.
- 7— Legs entirely red; anterior margin of pronotum straight with apical angles rounded. *lucida* (Duft.)
- Legs not entirely red; anterior margin of pronotum emarginate, with apical angles projecting anteriorly 8
- 8— Elytral striae strongly deeper behind; palpi and legs dark red; basal foveae of pronotum shallow but heavily punctate. *communis* (F.)
- Elytral striae feeble, not deeper behind; palpi and legs dark with tibiae lighter; basal foveae of pronotum deep, either smooth or with few punctures. *aenea* Dej.

- 9— Penultimate 3 abdominal sterna bisetose protibiae normal; beetle short and robust 10
- Penultimate 3 abdominal sterna with a transverse fringe of hairs along hind margin of each; beetle of normal length; protibiae long and narrow 13
- 10— Elytral border rounded at shoulders; penultimate second abdominal sternum tetrasetose on its hind margin; head and pronotum yellowish red, elytra yellow. *pseudofulva* Ali
- Elytral border angulate at shoulders 11
- 11— Both head and prothorax red; legs and elytra yellow; base of pronotum heavily punctate; elytral striae strongly punctate; the punctures becoming faint behind; venter of pterothorax and abdomen yellow, becoming reddish at sides of abdomen. *rufescens* (Dej.)
- Entire body brown with lighter elytra; base of pronotum with few punctures; elytral striae faintly punctate, becoming smooth behind 12
- 12— Sides of pronotum gently narrowed behind; head and pronotum dark brown; elytral striae moderately deep; venter of abdomen brownish red to dark, legs brown. *sheeti* Ali
- Sides of pronotum strongly narrowed behind; head and pronotum red, elytra yellowish red; elytral striae shallow; venter of abdomen and legs yellowish-red. *songarica* Putz.
- 13— Entire beetle whitish-yellow; pronotum wider than long, with sides strongly contracted behind; basal angles produced into short triangles; elytra convex, with moderately deep striae, punctures of striae shallow. *deserticola* Ali
- Beetle yellowish red, slightly sclerotized; elytral striae faint and smooth or with only traces of punctures 14
- 14— Pronotum convex, with deep basal foveae, its apex and base with punctures; elytral striae with traces of punctures visible. *ruthena* Tsch.
- Pronotum flat, with long deep basal foveae, both its apex and base smooth; elytral striae entirely smooth. *glenniei* Bal.

27. Key to the Species of the Genus

ZABRUS CLAIRV.

- 1— Hind wings present; metepisternum longer than wide, pronotum with a marginal seta 2
- Hind wings absent; metepisternum short, wider than long; pronotum lacking a marginal seta. 3
- 2— Abdominal sterna plurisetose; antennae, legs and palpi red; elytral striae with a few obscure punctures in front; upper surface reddish brown. *morio* Menetr.
- Abdominal sterna bisetose; antennae, palpi and legs dark red; elytral striae deep and uniformly punctate; upper surface dark brown. *tenebrioides* (Goeze)
- 3— Abdominal sterna bisetose; elytral striae indicated only by longitudinal rows of punctures; margin of pronotum rounded with base squarely truncate. *spinipes* (F.)
- Abdominal sterna plurisetose; elytral striae present, weakly punctate; lateral margin of pronotum wider at middle, contracted behind; base of pronotum sinuately truncate. *ovipennis* Chaud.

28. Key to the Species of the Genus

ANCHOMENUS BON.

- 1— Pronotum squarish, upper surface of head and pronotum shiny; entire body dark brown. *tigridis* Andr.
- Pronotum cordiform, upper surface of head and pronotum blue and heavily microsculptured; elytra yellowish red with brown discal spot. *dorsale* Pontop.

29. Key to the Species of the Genus

CALATHUS BON.

- 1— Colour black, with antennae, palpi, tibiae and tarsi red; pronotum with base punctate, sides slightly rounded. *fuscipes* (Goeze)
- Head and prothorax red, elytra dark brown becoming darker towards apex; base of pronotum smooth with its foveae only rugose; sides of pronotum sinuate. *pluriseriatus* Putz.

30. Key to the Species of the Genus*LAEMOSTENUS* BON.

- 1— Colour red; pronotum longer than wide, with sides gently contracted behind; elytral striae deep, intervals convex in front, becoming flat behind. *capitatus* Chaud.
- Colour black, pronotum nearly as long as wide with sides rounded in front and strongly contracted behind; elytral striae shallow, intervals flat. *cordicollis* Chaud.

31. Key to the Species of the Genus*PTEROSTICHUS* BON.

- 1— Upper surface of tarsi with a distinct longitudinal furrow; elytra lacking scutellary striae; 3 basal segments of antennae and apex of palpi red; elytral striae deep and finely punctate. *cursor* Dej.
- Upper surface of tarsi entire; elytra with scutellary striae present 2
- 2— Segments 1 — 3 of antennae normally cylindrical; head sparsely punctate; upper surface of pronotum smooth, with its base coarsely punctate; elytral striae fairly deep and punctate; intervals with distinct isodiametric microsculpture. *wollastoni* Woll.
- At least one of basal three segments of antennae compressed. ... 3
- 3— Three basal segments of antennae compressed and carinate; head elytral striae deep and finely punctate, intervals flat and with isodiametric microsculpture. *affinissimus* Ali
- Only third antennal segment compressed, sometimes the second very slightly so 4
- 4— Head densely punctate; pronotum gently contracted behind; elytral striae very finely punctate; two basal segments of antennae and palpi pitchy red; head and pronotum dark green with bluish reflections. *beesoni* Andr.
- Head sparsely punctate; lateral margins of pronotum either cordiform or discoid; elytral striae moderately punctate, entire beetle black 5
- 5— Pronotum cordiform, narrower than elytra, its basal impressions finely punctate, elytral intervals with dense isodiametric microsculpture. *bonvoisini* Reiche
- Pronotum discoid, a little wider than elytra; basal impressions coarsely punctate, elytra shiny black. *leus* Andr.

32. Key to the Species of the Genus

ZUPHIUM LATR.

- 1— Head black, elytra black with two posthumeral reddish spots and one towards apex of suture; pronotum cordiform.
olens (Rossi)
- Entirely yellowish brown, elytra concolour, yellow; pronotum narrow.
testaceum Klug

33. Key to the Species of the Genus

TETRAGONODERUS DEL.

- 1— Three basal segments of antennae red, the remaining brown; sides of pronotum rounded in front and gently narrowed behind; elytra with shallow striae and flat intervals.
intermedius Sol.
- First antennal segment brown, others black, sides of pronotum sinuate behind; elytra with deeper striae and relatively convex intervals.
arcuatus Dej.

34. Key to the Species of the Genus

CYMINDIS LATR.

- 1— Tarsal claws serrate; upper surface of elytra with well marked pale bands 2
- Tarsal claws entire, upper surface of elytra entirely yellowish red.
hierichonticus
Reiche subsp. *freyi* Schat.
- 2— Elytra black with humeral patch and margins yellow; sides of elytra rounded; head, including eyes, narrower than pronotum.
axillaris (F.)
- Elytra yellow with dark brown sutural band dilated in the middle; sides of elytra parallel; head, including eyes, a little wider than pronotum.
andreae Menetr.

35. Key to the Species of the Genus

GLYCIA CHAUD.

- 1— Anterior half of elytra yellowish red, posterior half brown; head with a fixed seta behind the normal supraorbital setae.
castanea (Klug)
- Elytra greenish blue with a reddish band; head without extra supraorbital seta 2

2— Head, prothorax, antennae and legs red; upper surface of head moderately punctate; sutural band of elytra red, intervals flat.

ornata (Klug)

— Head, thorax, antennae and legs yellowish red, upper surface of head very sparsely punctate; sutural band of elytra yellow, striae deeper with visible convex intervals.

rufolimbata Maindr.

36. Key to the Species of the Genus

METABLETUS SCHMIDT-GOEBL.

1— Antennae and femora black, elytra dark brown with humeral band and hind patches yellow. *fuscommaculatus* Motsch.

— Antennae and femora testaceous, elytra light brown becoming lighter on shoulders. *lateralis* (Motsch.)

37. Key to the Species of the Genus

MICROLESTES SCHMIDT-GOEBL.

1— Elytra entirely black, hind tibiae in both sexes curved at their side posteriorly with the internal apical angle spiniform in the male; posterior half of the last visible sternum with a semicircular depression in the male. *syriacus* Bris.

— Elytra black with a long testaceous mark on each side, hind tibiae normal in both sexes 2

2— Ground colour of elytra black, 2 basal segments of antennae yellow-red, others black, last abdominal sternum of ♂ with a semicircular depression bearing erect yellow hairs at its posterior surface. *corticalis* (Duft.)

— Ground colour of elytra light brown, antennae testaceous; last abdominal sternum without a depression in both sexes. *plagiatus* (Duft.)

38. Key to the Species of the Genus

BRACHINUS WEB.

1— Apical membranous margin of elytra glabrous 2

— Apical membranous margin of elytra covered or at least bordered with fine pubescence 9

2— Elytra bicoloured 3

— Elytra concolourous at most with a red sutural mark 6

3— Elytra yellow with black or brown spots 4

— Elytra blue or brownish blue, with red or yellow spots 5

- 4— Head and prothorax yellowish red, elytral mark black, two marks present on the anterior half, the inner elongate and the outer short and almost rounded, two also present on the posterior half; first four antennal segments yellow, the remaining brown; head and pronotum sparsely and finely pubescent. *nobilis* Dej.
— Head, prothorax and elytral marks reddish brown, a large discal mark present on elytra and a small rounded spot near apex; antennae entirely red; body heavily pubescent above. *bagdadensis* Pic.
- 5— Elytra greenish blue with a small round red spot on each side behind the middle; elytral disc sparsely pubescent, intervals sharp.
— Elytra dark brown with two yellow spots on each side; elytral disc densely pubescent. *exhalans* (Rossi)
- 6— Elytra violet with a yellowish red sutural mark. pronotum as wide as long; elytra sparsely punctate and very finely striate. *sclopeta* (F.)
— Elytra greenish blue, dull blue or violet blue but lacking a sutural mark 7
- 7— Venter of abdomen red; elytra flat and very faintly striate; legs and antennae red. *explodens* Duft.
subsp. *abdomenalis* Reitt.
— Venter of abdomen black to dark brown or rusty brown with sides darker; hind exposed terga dark brown 8
- 8— Elytra dull blue with intervals convex and apical membrane relatively wide; pronotum as long as wide with its sides sinuate behind. *mesopotamicus* Ali
— Elytra violet blue with intervals flat and apical membrane narrow; pronotum longer than wide with sides parallel behind. *perigrinus* Apfelb.
- 9— Apical membrane of elytra bordered with a row of fine close pubescence; body entirely red with black elytra. *oblongus* Dej.
— Apical membrane of elytra not bordered by a row of pubescence 10
- 10— Elytra with red sutural mark, pronotum a little longer than wide; elytra dull green with fine smooth striae, ventral surface yellowish red. *plagiatus* Reiche
— Elytra without a red sutural mark 11

- 11— Entire ventral side and hind exposed terga of abdomen either brownish red or reddish yellow 12
 — Venter and exposed terga of abdomen dark brown to black; sometimes abdomen lighter anteriorly along middle part 17
- 12— Entire body dark brown; elytra with bluish green reflection, striae weak and intervals flat; head finely punctate on middle of vertex, clypeus and vertex behind with few coarse punctures. *tigridis* Ali
 — Entire body red or yellowish red 13
- 13— Entire body pale yellowish red; elytra dull blue, with fine striae and relatively long pubescence. *ganglbaueri* Apfelb.
 — Upper surface of head and pronotum red to brownish red, ventral side dark brown or red and darker laterally; elytra broad, flat and faintly striate 14
- 14— Elytra blue; antennae, palpi, labrum and tarsi tawny; head finely punctate with a few coarse punctures behind; head, prothorax and legs yellowish red. *brittoni* Ali
 — Elytra violet blue or bluish green; antennae, labrum, palpi and tarsi red 15
- 15— Head, prothorax and legs rusty red; elytra finely striate with costate intervals; sides of metathorax and abdomen dark brown ventrally. *psophia* Serv.
 — Body except elytra red to pale brown, the latter with shallow striae and flat intervals 16
- 16— Elytra dull violet blue, intervals with greenish reflections; head, prothorax, antennae and legs red; exposed abdominal terga black. *irakus* Andr.
 — Elytra dull green, head, prothorax, antennae and legs pale brown; exposed abdominal terga dark with a median pale area. *schmidti* Andr.
- 17— Elytra broad, with intervals convex, pubescence short, apical membrane wide. *ejaculans* Fisch.
 — Elytra narrow with intervals flat, pubescence long, apical membrane narrow. *crepitans* (L.)

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LITERATURE

- Ali, H.A. (1965) New species of Carabidae (Insecta, Coleoptera) from Iraq. *Bull. Biol. Res. Centre [Iraq]* **1** : 12—26.
- Andreves, H. E. (1927) Zur efraschung des Persischen golfes. Carabidae (Col.) *Ent. Mitt.*, **16** : 142—148.
- (1929) Carabidae *Mauna Brit. India, Carabidae* **1** : 431pp.
- (1935) Carabidae *Fauna Brit. India, Carabidae* **2** : 232pp.
- Antoine, M. (1957) Coleopteres Carabiques du Maroc (deuxieme partie). *Mem. Soc. Sci. Nat. Maroc, Zool.*, **3** : 17—314, 36—62 figs.
- Arnett, R.H. Jr. (1944) Rev. Silphini and Nicrophorini. *J. N. Y. ent. Soc.*, **52** : 1—25.
- Ball, G.E. (1960) Carabidae in Arnett 1960 *fascicle* **4** : 55—181 *Dtsch. ent. Z.*
- Banninger, M. (1937—38) Monographie der subtribus Scaritina (Col. Carab.) *Dtsch. ent. Z.* 1937 : 81—160; 1938 : 41—181.

- Basilewsky, P. (1950) Revision generale des Harpalinae d'Afrique et de Madagascar. Premiere Partie.
Annls. Mus. Cong. Belge, Sci. Zool., **6** : 282 pp.
- (1951) Deuxieme Partie. **9** : 333 pp., 191 figs., pls. 1—6.
- Breuning, S. (1934) Monographie der gattung *Carabus* L.
Bestimm.-Tab. eur. Coleopt. 104-110 : 1610 pp.
- Emden, F.I. Van (1942) A key to the genera of larval Carabidae (Col.)
Trans. R. ent. Soc. Lond. **92** : 1—99.
- Fowler, W.W. (1887) The Coleoptera of the British Islands **1** : 1—149
London.
- Heyden, L. Von. (1888) Neue und interessante Coleopteren aus Malatia in Mesopotamien. *Dtsch. ent. Z.* XXXVII : 72—78.
- Holdhaus, K. (1919) Koleopteren aus Mesopotamien.
Ann. nat. Mus. Wien., XXXIII : 40—49.
- Jeannel, R. (1941) Coleopteres Carabiques, Premiere Partie.
Fauna de France, **39** : 1—571.
- LeConte, J.L. (1861) Classification of the Coleoptera of North America.
Smithson. Misc. Coll. **136** (1) : 4—36.
- Lindroth, C.H. (1960) The ground beetles (Carabidae excl. Cicindelidae) of Canada and Alaska. *Opuscula Ent. suppl.* **20** (2) : 1—200.
- Muller, G. (1933—34) Carabiden Studien.
Koleopt. Rdsch. **19** : 201—221 : 20 : 41—62.
- Reitter, E. (1908) Fauna Germanica. *Die Kafer des Deutschen Reiches*
1 : 248 pp., 66 text-figs., 40 coloured pls. Stuttgart.
- Roubal, J. (1932) Sur quelques Coleopteres des environs de Baghdad.
Bull. Soc. ent. Fr. **37** : 59—64.
- Schauberger, E. (1930) Zur Kenntnis der Palaarktischen Harpalinen.
Coleopt. Centralb., **4** : 12—218.
- Sleone, T. G. (1923) The classification of the family Carabidae.
Trans. ent. Soc. Lond. 234—250.

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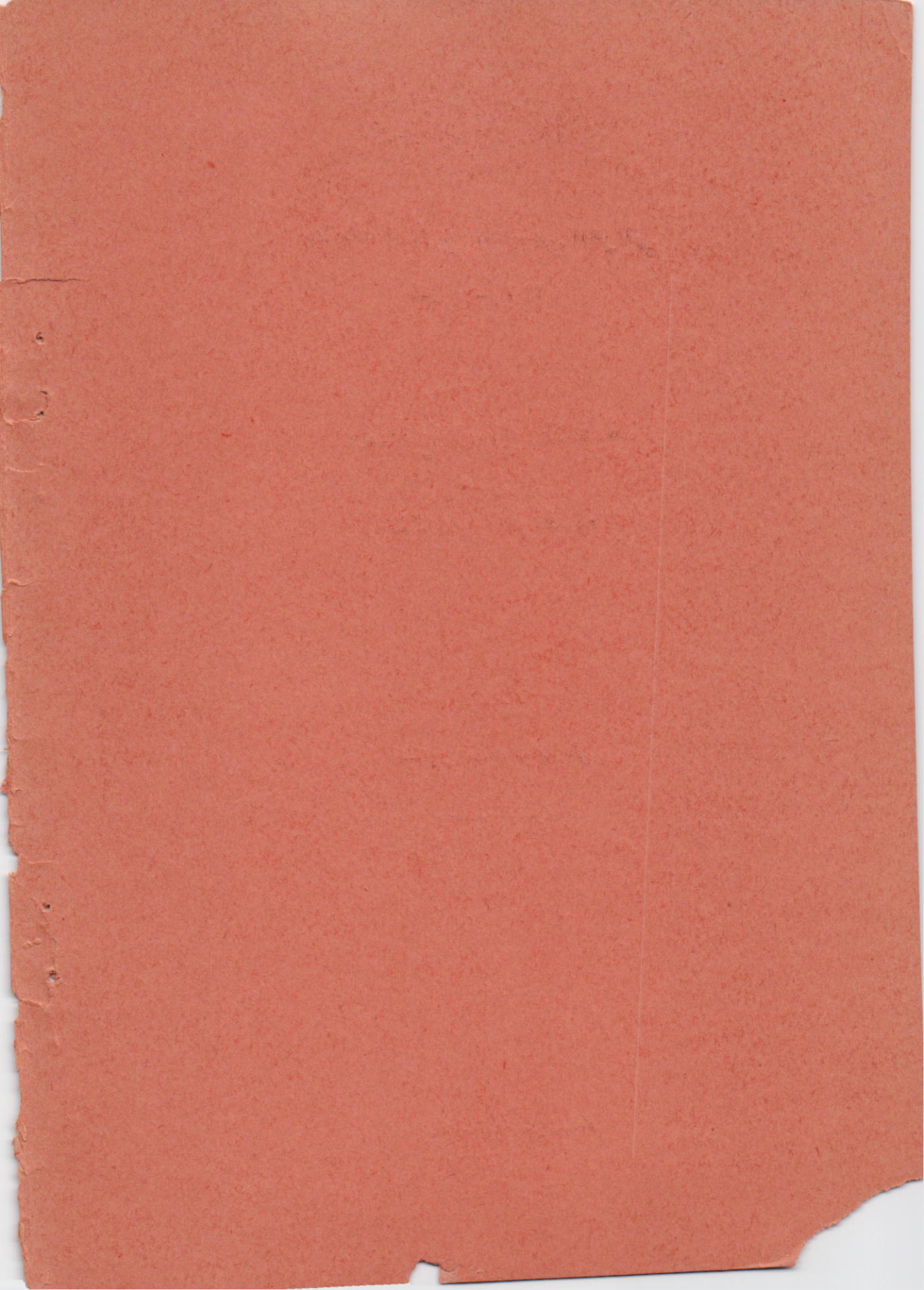
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نشرة رقم (٢٣)

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