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Key to Some Tribes, Genera and Species of Subfamily Meloinae (Coleoptera: Meloidae) in Egypt

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ABSTRACT
Subfamily Meloinae, were represented by 5 tribes: Cerocomin Leach, 1815, Epicautini Denier, 1935, Lyttini Solier, 1851, Mylabrini Laporte, 1840 and Meloini Gyllenhal, 1810. Tribe Mylabrini was covered by Elmetwaly et. al. (2015), and tribe Meloini was covered by El-Gharbawy (2006). Accordingly, the present study was planned to revise and update the available information about tribe Cercomini, Epicautini and Lyttini. Key to the tribes and species was treated. During the present work, twenty two species in ten genera recorded in three tribes are covered in the present work.

INTRODUCTION
In Egypt, no work was done on the family Meloidae, except the work of Alfieri (1976), who monographed the Coleoptera of Egypt, including family Meloidae. He presented a list of meloids of 145 species belonging to 20 genera, with notes on distribution and host plants of some species, he divided the family into 2 subfamilies (Lyttinae and Nemognathinae). Subfamily Nemognathini was covered by Abd El-Dayem (1995), under the name (Horiinae and zonitini), and the former included 124 species belonging to 14 genera within 3 tribes (Lyttini, Mylabrini and Meloini), the first tribe represented by 10 species belonging to 4 genera which are (Cabalia Muls., Coryna Billb., Decapotoma Voigts, Diaphorocera Heyd., Lydus Latr., Oenas Latr., and Mylabris F.). The second tribe represented by 105 species belonging to 9 genera which are (Cerocoma Geoffr., Cerocis Mars., Coryna Billb., Decapotoma Voigts, Diaphorocera Heyd., Lydus Latr., Oenas Latr., and Mylabris F.). The third tribe represented by 9 species belonging to 1 genus which is (Meloe L.), which covered by El-Gharbawy (2006). He revised 7 species from nine species of this genus under subfamily Meloinae and tribe Meloini regarded as taxonomic status of Alfieri (1976).

The present work started by examining old and recent available literature about the so-called blister beetles or family Meloidae in general. Simultaneously with this step, the main Egyptian reference insect collections were examined for materials regarded as meloid beetles.
MATERIAL AND METHODS

The present taxonomic work started by examination of the Egyptian Reference Insect Collections for materials regarded as meloids beetles. These collections are: Collection of Ministry of Agriculture, Plant Protection Research Institute (MAC); Collection of Egyptian Entomological Society (EESC); Collection of Faculty of Science, Cairo University (CUC), Alfieri Collection, Faculty of Agriculture, Al-Azhar University (ALC) and Collection of Faculty of Science, Ain Shams University (ASUC). A field survey of meloids beetles was undertaken over a great area of the Egyptian territories and covered the main geographical zones.

RESULTS AND DISCUSSION

Key to some tribes, genera and species of subfamily Meloinae:

1- Fore femora with apical half of ventral surface (that opposing tibia) slightly excavated, excavation with a patch of appressed, transversely directed silky pubescence (Pl. I, fig. 1). Mandibles shorter, not pointed at apex, lateral margins appearing distinctly curved in frontal view, apical half not reclinate. Labrum longer, extending beyond basal half of mandibles. Aedeagus with one or two dorsal hooks; endo-phallus well sclerotized and also hooked…… Epicautini ...... 2

- Fore femora without a ventroapical excavation and lacking a patch of transversely directed pubescence (Pl. I, fig. 2) ......................................................... 4

2- The middle antennal segments (3rd - 5th) in male greatly extended and flat, 3rd segment long triangular, and from 6th spindly……. Epicauta fasciceps Walker

- Antenna in male less or doesn't widen, 3rd segment not triangular. The upper side with or without distinct black stains.......................................................... 3

3- Forehead in the middle between eyes with a big, heart-shaped black stain …………………. Epicauta sanguineiceps (Fairmaire)

- Forehead in the middle between eyes without distinct black stains .......................................................... Epicauta aethiops (Latreille)

4- Dorsal blade of tarsal claws smooth or at most, with a single large tooth-like projection, in which case a distinct ventral blade is absent (Pl. I, fig. 3). Labrum elongate and longitudinally furrowed or carinate. Antennae 9-11 segmented, antennae more or less elaviform in female (Pl. I, fig. 4). Antennal sockets distant from eyes, usually placed below or on frontal suture; antennae, foretibiae and often maxillae strongly and bizarrely modified in male (Pl. I, Figs. 5); Elytra completely or partially metallic. Protibiae usually with two apical spurs (rarely one or both spurs absent). Male foretarsi usually strongly modified………………………………………………………….. Cerocomini ...... 5

- Dorsal blade of tarsal claws with one or two rows of teeth along ventral margin, Claws always with a distinct ventral blade may be fringed with micropubescence, at least al basal half (Pl. I Figs. 6) or not (Pl. I, Figs. 3, 7). Labrum not longitudinally furrowed or carinate. Maxillary galeae not fringed with elongate, shaggy setae with a tuft of dense relatively elongate medially directed setae (Pl. I, fig. 8). Antennal sockets closer to eyes, placed above frontal suture. Elytral color variable, metallic or not……. Lyttini ...... 9

5- Antennae nine-segmented. .............................................................................................................. Cerocomini ...... 5

- Antennae 11-segmented. Head, pronotum and abdomen either black or metallic, never yellow-orange. .............................................................................................................. 6

6- Abdomen, rarely completely red or orange red, at least the tip of the abdomen is
dark metallic color. Anterior tarsi unequally widened. Middle tibia simply or weakly curved. .............................. *Cerocoma ephesica* Reitter
- The abdomen is always dark metallic color. Anterior tarsi shorter on which not only the second, but also the 3rd and 4th segments clearly widened, very much remarkable decreased. .............................. *Cerocoma scovitzii* intermedia Maran

7- Fore tibiae simple. 11th antennal segment sub quadrate, with two black and shiny lines on 11th antennal segment and one on 10th antennal segment. In female, Labrum completely dark; temples slightly diverging posteriorly, maximum width of head on temples. Femurs and tibiae orange-red (Pl. II, Figs. 9-13) ..................................................................................... *Diaphorocera obscuritarsis* Fairmaire
- Fore tibiae variously modified. 11th antennal segment elongate. ......................... 8

8- Head, pronotum, abdomen and 1st antennal segments black. In female, head and pronotum black (Pl. II, Figs. 14-17). ............. *Diaphorocera promelaena* Fairmaire
- Head, pronotum, abdomen and 1st antennal segments not Black. 10th antennal segments about as wide as the length of 11th, anterior portion slender and pointed at apex; 11th segment about as wide as 8th segment. In female, head and pronotum metallic, Body and fore coxae green metallic, Temples shorter than the eye length, narrowing evenly posteriorly (Pl. III, Figs. 18-22). ..................................................................................... *Diaphorocera hemprichi* Heyden

9- Dorsal blade of tarsal claws with one or two rows of teeth along ventral margin (only basally in one Mediterranean species). Claws always with a distinct ventral blade. (Pl. III, Figs. 23-24). Elytral color variable. ........................................ 10
- Dorsal blade of tarsal claws smooth (Pl. I, Figs. 6.7 & Pl. III, Figs. 25,26), or at most, with a single large tooth-like projection, in which case a distinct ventral blade is absent (Pl. I, fig. 3) ..................................................................................... 12

10- Last segment of maxillary palpi distinctly narrowed apically (Pl. IV, fig. 27). Male head strongly impressed behind eye. Antennal segments 4th -10th transverse and symmetrical (Pl. IV, fig. 28); antennae short, usually not attaining base of pronotum. Claws with relatively short teeth (Pl. III, fig. 24). Middle tarsi with segment I always enlarged in male (Pl. IV, fig. 29). Colour never metallic ........................................ 11
- Last segment of maxillary palpi not distinctly narrowed apically (Pl. IV, fig. 30). Male head not impressed behind eye. Antennal segments 4th -10th more elongate or if transverse then at least slightly asymmetrical (Pl. IV, Figs. 31, 32); antennae usually longer and attaining base of pronotum. Claws with relatively large teeth (Pl. III, fig. 29). Middle tarsi with segment I enlarged in male or not. Color metallic or not ............................................................ 13

11- Elytra black or brown black; Pronotum delicate, thin; Last segment of the antenna more shortly, hardly doubles as long as the penultimate up to the middle parallel, then suddenly narrow conically and less extended .................... *Oenas pseudafer* Kaszab
- Elytra yellow; Pronotum spherical; Last segment of the antenna long almost as long as two previous segments, acuminated. (Pl. IV, fig.33) ........................................ 12

- Pronotum longer than wide or, less commonly, as wide as long (Pl. V, fig. 34). Antennal segments 4th -10th as wide or wider than long with acentric sockets (segments appearing at least slightly asymmetrical); 3rd segment usually noticeably longer than 4th (Pl. IV, fig. 32). Color never metallic.............. ............................. *Lydus tenuitarsis* Abeille de Perrin
- Pronotum wider than long (Pl. V, fig. 35). Antennal segments 4th -10th more
elongate, 5th -6th (often 5th -10th) usually longer than wide with sockets centrally
placed (segments appearing symmetrical); 3rd segment subequal in length to 4th or
only slightly longer (Pl. V, fig.36). Color metallic or not. ........................................ 15

13- Head without a red spot in the middle between the eyes
.................................................................Alosimus viridissimus (Lucas)
- Head with a red spot in the middle between the eyes ........................................ 14
14- Head with a fine central groove, elytra narrower and longer (Pl. V, Fig. 37).
.................................................................Alosimus syriacus syriacus (Linnaeus)
- Head without a fine central groove, elytra broad and short (Pl. V, fig 38)...........
.................................................................Alosimus syriacus rauterbergi (Reitter)

15- Claws with ventral blade fringed with micropubescent, at least al basal half (Pl.
1, fig. 6 & Pl. III, Figs. 25) ................................................................. 16
- Claws with ventral blade not fringed with micropubescent (Pl. 1, fig. 7 &Pl. III,
Figs. 26). Claws with ventral blade separate from dorsal blade, both of similar
length (ventral blade rarely shorter, claws not appearing toothed). Maxillary
galeae not fringed with elongate, shaggy setae (Pl. I, fig. 8)................................. 17

16- Genae and mouthparts with elongate golden setae, these setae distinctly longer
than those on other surfaces of head. Hind tibial spurs similar, spiniform. (Pl. VI,
fig. 39) .................................................................................................. Lyttonyx bicolor (Walker)
- Genae and mouthparts with variable setation but if elongate then setae similar to
those on other surfaces of head. Hind tibial spurs variable but both never
spiniform. Tarsal segments not bilobed. Elytral ribbing not evident. Frons not
swollen between eyes, at same level as clypeus. Male gonoforceps elongate and
relatively slender, narrowing in apical half, not recurved. Eyes distinctly notched
anteriorly. Hind tibia with apex fringed laterally with setae which are no longer or
denser than on other surfaces; dorsoapical margin arcuate but not deeply incised;
hind tibia less distinctly widened to apex with apical width only ca. 1.75 that near
base. Male gonostyli elongate, distinctly setose at apex; acdeagus with one apical
dorsal hook................................................................. Cabalia rufiventris (Walker)

17- Pronotum elongate, at least 1.1 as long as wide, disk usually smooth, shiny, micro-
punctate (Pl. VI, fig. 40). Male with last abdominal sternum in most species lightly sclerotized, deeply cleft to near base with the
divided sections elongate and usually twisted to bring their ventral surface
to face laterally. Eyes large, bulged, extending to maxillae on underside of head. Male genitalia with gonoforceps usually poorly sclerotized ......18
- Pronotum as wide as long, or if slightly longer than wide, then less than 1.1 as long
as wide. Male with last abdominal sternum V-emarginate, emargination confined
to apical half of segment. Eyes variable but rarely bulged; interocular distance
greater than half head width at eyes. Male genitalia with gonoforceps well
sclerotized. Antennae subclavate, segments 6th-10th each about as wide as long;
antennae only attaining very base of elytra, not sexually dimorphic. Eyes somewhat bulged, almost extending to maxilla on underside of head...........20

18- Head decorated with an orange forehead spot; black elytra and orange abdomen
(Pl.VI, fig. 41) .................................................................Lydomorphus pallaeatusinus (Kirsch)
- Head without an orange forehead spot................................................................. 19
19- Elytra without any blackish stitching (Pl. VI, fig.42)........................................
.................................................................domorphus verrucicollis (Karsch)
- Elytral suture with blackish stitching continued to make a blackish spot apically (Pl.
VII, fig. 43).........................Lydomorphus angusticollis suturellus (Haag-Rutenberg)
20- Forehead without a median red spot.....Lytolydulus cinereovestitus (Fairmaire)
- Forehead with a median red spot .............................................. 21
- Red pronotum, elytra yellow red with a black stain before the tip on each side
  (Pl. VII, fig 44).................................................. Lyttolydulus thiebaulti (Fairmaire)
- Dark brown or black pronotum, Elytra yellow red, but without a black stain before
  the tip on each side (Pl. VII, fig. 45)............. Lyttolydulus nubeculosus Kaszab

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