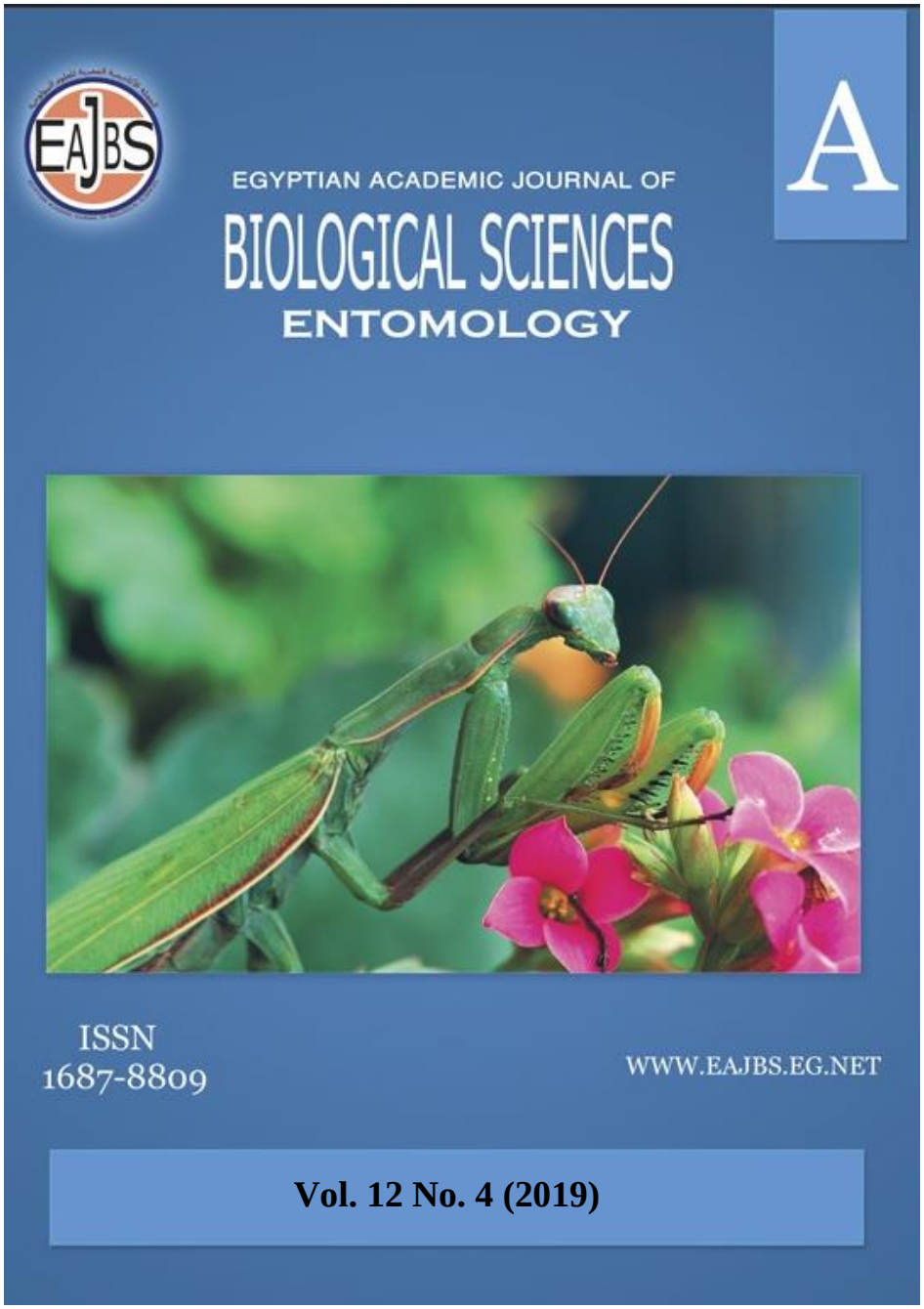

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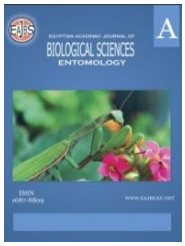

Taxonomic Studies of Family Nitidulidae (Coleoptera) Except Cypocephalinae In Egypt

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ABSTRACT

The taxonomy of Family Nitidulidae has received little attenuation; all previous studies were limited to descriptions of new species and lists with general notes of some species. In this work, eleven Egyptian species belonging to four subfamilies and sex genera were taxonomically studied. Keys to the subfamilies, genera and species of family Nitidulidae. The diagnostic characters, synonyms, local geographical distribution and illustrations are given to the species.

INTRODUCTION

Nitidulidae are one of the largest and most diverse families belonging to the superfamily Cucujoidea contains about 230 genera more than 4,000 species classified in the world (Cline *et al.*, 2014) and are diverse ecologically and present in all life-history strategies employed, i.e predation, frugivory, fungivory, detritivory, necrophagy, herbivory and some species are pests (Powell, 2015). The nitidulid beetles are well-documented pests of ripening fruits, vegetables and grains (Hinton, 1945). Most species are plant feeding, the adults feeding on the flowers and shoots of their host plants, the larvae occur in flower buds or seed capsules, others are associated with decaying or fermenting material, some species occur on carrion, especially that in the last stages of decay where bones, dried tissue and sinews and hide are all that remain, many species occur in decaying plant material ranging from compost and fermenting fruits, to mouldy grains and hay, under bark of recently dead trees and in compost (Larson, 2013). Some species are found on sap-flows or fermenting wounds on trees, hence the common name sap-beetle (Martin, 1977 & Parsons, 1943). Several species are known agricultural pests of field and stored products, the corn sap beetle, *Carpophilus dimidiatus* on field corn; the complex *Carpophilus dimidiatus* (F.) and *Carpophilus mutilatus* Erichson on stored maize (Abogast and Throne 1997); the dried fruit beetle *Carpophilus hemipterus* (L.); the pineapple beetle, *Urophorus humeralis* a pest of dried fruit. Sap beetles are often considered minor pests but the presence of large numbers of sap beetles on a host plant can prove economic in terms of crop damage caused by the feeding beetles, but the

damage on crop value is primarily due to the contamination of products ready for sale by adults and larvae.

The numerous nitidulid species is worldwide serious pests on economic crops, for example, *Urophorus humeralis; Carpophilus hemipterus; Carpophilus dimidiatus; Carpophilus mutilatus*; *Carpophilus obsoletus* (Parsons, 1943; Dobson, 1959; Archibald & Chalmers, 1983; Hinton, 1945; Gillogly, 1962; and Kuschel, 1990).

Generally, the nitidulids comprised over 35% of all beetles collected from the carrion (Payne 1965 and Shubeck *et al*., 1981). Large numbers larvae of *Nitidula flavomaculata* Rossi, found in the genital area of the victim of a partially decayed human female corpse (Adair and Kondratieff, 1996).

Nitidulid species can be collected by yeast or molasses baited pitfall traps (Martin, 1977). The system of the family has been greatly changed and essentially improved during the last 20-30 years; however there are no comprehensive publications devoted a general view on the system of this family, although some important aspects of the system of this group are still needed to be considered (Kirejtshuk, 2008). Taxonomic monographs, which cover a detailed review of bibliography, are (Grouvelle, 1913; Jelínek and Audisio, 2007 and Habeck, 2002).

MATERIALS AND METHODS

The present taxonomic work started by examining the Egyptian reference insect collections for material to obtain a general knowledge of the diversity and distribution of nitidulid beetles in Egypt. These collections are Alfieri collection, Faculty of Agriculture, Al-Azhar University, Ministry of Agriculture collection, Plant Protection Research Institute, Ain Shams University collection, Department of Entomology, Faculty of Science and Cairo University collection, Department of Entomology, Faculty of Science.

Examination and illustrations of the external features of specimens were achieved using M6C-9 (made in USSR) stereo binocular microscope. All drawings were made by a square eyepiece. Ocular micrometer was used in making measurements. The source of local distribution for each species is based on the material examined and published data.

Mounting specimens preparation with the drawing of some species was made in laboratory of insect research, Plant Protection Department, College of Agriculture, AlAzhar University.

The taxonomic keys used in identification, terminology used in species descriptions and nomenclature and the systematic adopted are according to (Leschen and Marris, 2005; Larson, 2013; Bousquet, 1991; Audisio, *et al*., 2009 and Parsons, 1943).

List of abbreviations:

TL (Total length of specimens): the distance between anterior margin of clypeus and posterior apex of pygidium.

PL (Pronotal length): the distance between anterior and posterion margins of pronotum.

PW (Pronotal width) the distance between the largers points of lateral margins of pronotum.

EL (Elytral length) the distance between posterior apex of scutellum and elytral distal apex.

EW (Elytral width) the distance between the largers points of lateral margins of elytra.

ALFC: Alfieri collection, Faculty of Agriculture, Al-Azhar University

MAC: Ministry of Agriculture collection, Plant Protection Research Institute

ASUC: Ain Shams University collection, Department of Entomology, Faculty of Science

CUC: Cairo University collection, Department of Entomology, Faculty of Science.

RESULTS AND DISCUSSION

Family: Nitidulidae Latreille, 1802

The family Nitidulidae or sap beetles identified by the body convex, suboval, or elongate, slightly depressed; length 1.5 to 12 mm. Black to pale color with markings red or yellowish. Antennae with 11 segments, the last 3 antennomeres forming a club. Labrum transverse, bilobed, may be covered by clypeus; mandibles broad, with a brush of setae on inner margin. Tarsal formula 5-5-5 except subfamily Cybocephalinae are 4-4-4. Tarsomeres dilated, the fourth segment minute, the fifth long; claws simple or toothed. Elytra truncate apically and exposing the part or all of pygidium, some with two or three terga exposed. Body variously setose, from sparse or densely simple or broadened setae to scale-like, decumbent or erect hairs of various colors. Surface smooth, punctate, or rugose.

Key to the Subfamilies, Genera and Species of Nitidulidae

1- Tarsal formula 4-4-4…….……..…….…… **Cybocephalinae**

- Tarsal formula 5-5-5 ……..…….. 2

2 (1). Labrum and clypeus fused, the line of union marking a distinct suture; lateral margin of front more or less straight between the eye and the anterior margin of clypeus and covering base of antenna in dorsal aspect. Pronotum margined basally, slightly overlapping base of elytra; body mostly pubescent; color testaceous to piceous, with or without darker spots; labrum concealed by and connate with clypeus……... **Cryptarchinae *Cryptarcha bifasciata***

- Labrum free, more or less visible. Elytra longer, covering abdomen or at most with pygidium and apex of the preceding segment visible. Abdominal sternite 5 basolaterally with a sharply impressed C- to U-shaped line (hidden when retracted under sternite 4); metasternum with a large triangular area set off by an oblique line from mesocoxal rim to metepisternal suture. Body convex to slightly flattened, the abdomen conspicuously convex..... 3

3 (2)- Outer margin of middle and hind tibiae with a single row of small spines; maxillae with one lobe; antennae distinctly clubbed; side margins of elytra usually clearly visible from above; epiplurae broad and extending to tip elytra ……..……**Meligethinae**.. ***Meligethes***……..…4

- Outer margin of middle and hind tibiae with two rows of small spines …….…..... 5

4 (3) Head dorsally with circum-ocular furrows not developed; scutellum punctured in posterior half of exposed portion..……..… ***Meligethes planiusculus***

- Head dorsally with circum-ocular furrows narrow and impressed; scutellum punctured on exposed portion …..……..…….……5

5 (4) - Elytral humeral striae usually distinct; 4th and 5th antennomeres subequal as long as wide..…….……..…….. …..…… ***Meligethes serripes***

- Elytral humeral striae scarcely distinct; 4th and 5th antennomeres subequal longer than wide. ……..... ..... ***Meligethes nigrescens***

6 (3)- Elytra short and truncate apically, not covering pygidium; abdomen with two or three dorsal segments exposed; abdominal segments 9 and 10 visible in dorsal view; males having an external button-like 10th tergite,……..…**Carpophilinae** ……7

- Elytra short not covered the apex of pygidium; elytral punctures and setae irregular; abdomen with no more than pygidium exposed, occasionally the rear margin of the penultimate segment is visible; abdominal segments 9 and 10 not visible in dorsal view. Labrum free, not concealed by clypeus; males not having an external button-like 10th tergite ……..... **Nitidulinae**..... 11

7 (5)- Elytra exposing two abdominal tergites; pronotal bead not thickened in apical ½ ……...…***Carpophilus***…… ……..8

- Elytra exposing three abdominal tergites; pronotal bead, viewed laterally, 2x as thick in

apical ½ as basal ½. Body convex…… …….. ***Urophorus humeralis***
8 (7)- Mesosternum disc separated from sides by carinae obliquely extending from apex of prosternum to mesocoxae…….9
- Mesosternum disc without carinae as above. ……..…… ……..…….10
9 (8) Elytra distinctively patterned with pale humeral and apical patches …… ……. ***Carpophilus hemipterus***
- Elytra lacking distinctive pattern as above, humeral areas sometimes faintly lighter ……. ***Carpophilus obsoletus***
10 (8) Hypomeron densely punctate, punctures deeply impressed, edges distinct; antennal segment 3 about 1.3x length of segment 2 …..…… ***Carpophilus dimidiatus***
- Hypomeron weakly punctate; antennal segment 3 less than 1x length of segment 2; male metatibia gradually expanded…….….***Carpophilus mutilates***
11 (6) Claws dentate on base. Elytra serially punctate, setose, or striate. Elytra truncate or separately rounded to expose most of pygidium…….. ***Anister raffrayi***
- Claws simple. Elytra without striae, irregularly punctate. Elytra entire, most of pygidium covered..... ***Nitidula eremita***

Subfamily: Carpophilinae Erichson, 1842

According to Alfieri (1976), in Egypt, Carpophilinae is represented by five species belonging to two genera, i.e., *Carpophilus hemipterus* (Linnaeus), *C. obsoletus* Erichson, *C. dimidiatus* Fabricius, *C. mutilates* Erichson and *Urophorus humeralis* Fabricius. In the present work, the five species are studied.

Genus *Carpophilus* Stephens, 1830

Genus *Carpophilus* Stephens, 1830: Mandibulata. Volume III. London: Baldwin and Cradock, p. 50.

Type species: *Dermestes hemipterus* Limiaeus, 1758

Generic diagnosis:

Shape ovate to oblong, moderately convex to weakly flattened. Colour variable, ranging from pale brown to black, some species with distinctive patterning on elytra. Surfaces moderately dull to shining. Usually clearly but shallowly punctured with fine, decumbent pubescence. pronotal bead not thickened in apical half. Head broad but distinctly narrower than the pronotum. Clypeus indistinct Labrum separated from clypeus by a clypeolabral suture. Frontoclypeal suture absent. Eyes usually large. Antennae a little longer than the head, first segment enlarged and often widened on the outside, second and third cylindrical, about of equal length, club compact, flattened, rounded or oval in outline. Antennal grooves moderately deep and convergent. Anteenae with a distinct, flattened, 3-segmented club. Elytra short and truncate; pygidium transverse; two abdominal tergites normally exposed in dorsal view; males having an external button-like 10th tergite; second and third abdominal ventrites shorter than first and fourth; last ventrite of male deeply emarginated to allow the reception of the supplementary sclerite. Tarsal formula 5-5-5.

***Carpophilus dimidiatus* Fabricius, 1792 (Fig. 1)**

***Carpophilus dimidiatus* Fabricius, 1792**: Entomologia systematica emendata et aucta. Secundum classes, ordines, genera, species adjectis synonymis, locis, descriptionibus, observationibus. Tom I. Pars I. Hafhiae: Christ. Gottl. Proft, p. 261.

***C. auropilosus* Wollaston, 1854**: Insecta Maderensia; being an account of the insects of the Islands of the Madeiran Group. London: J. van Voorst, p. 117.

***C. pusillus* Stephens, 1830**: Mandibulata. Volume III. London: Baldwin and Cradock, p. 51.

Diagnosis: TL: 2.1 mm; PL: 0.6 mm; PW: 1.0 mm; EL: 1.0 mm; EW: 0.55 mm.

Body subparallel. Colour: head deep rufopiceous, pronotum rufopiceous paler than the head, elytra deep brown. Body covered with vestiture of decumbent golden setae; average length of elytral setae as long as eye. Head: Antennomere 3 about 1.3 x length of segment 2. Pronotum

with sides evenly arcuate, anterior angles obtusely rounded; posterior angles broadly rounded, not produced into a distinct tooth; disc strongly convex; punctures strongly impressed on the disc, separated by 1- 3 diameters; granulate microsculpture clearly present between punctures. Pronotal carina narrowly not sinuate in anterior 1/3. Prosternum and hypomeron densely and strongly punctured. Prosternal process with apex rounded and not greatly expanded laterally behind procoxae. Elytra: Punctures relatively strongly impressed, separated by 1 diameter; granulate microsculpture present. Mesoventrite punctate; discal carinae absent. Metaventrite with axillary space present toa level of ¼ the length of the metepisternum, posterior edge extending to ½ the length of the metepisternum. Male metatibia not strongly dilated at base.

Material examined: (4) Giza (on Cottonseeds) 1.I.1929……(MAC)
(1) Zaitoun 20.II.1929…….(ALFC)
(2) Gabel Asfar 7.VI.1954……..(ASUC)

***Carpophilus hemipterus* (Linnaeus, 1758) (Fig. 2)**

***Carpophilus hemipterus* (Linnaeus, 1758)**: Systema naturae per regna tria naturae, secundum classes, ordines, genera, species, cum characteribus, differentiis, synonymis, locis. Tomus I. Editio decima, reformata. Holmiae: Laurentii Salvii, 358.

***C. aterrimus* W. J. Macleay, 1871**: Notes on a collection of insects from Gayndah. Transactions of the Entomological Society of New South Wales 2 [1869-1873]: 161.

***C. bimaculatus* (Linnaeus, 1767)**: Systema naturae, per regna tria naturae, secundum classes, ordines, genera. Species cum characteribus, differentiis, synonimis, locis. Tomus I. Editio duodecima. Tomus I, Pars II. Holmiae:Laurentii Salvii,, 569.

***C. brevipennis* Germain, 1856**: Descripcion de coléopteros de diversas especies que no se hallan en la obra del senor Gay. Anales de Iα Universidadde Chile 1855: 397.

***C. cadaverinus* (Fabricius, 1801)**: Systema Eleutheratorum secundum ordines, genera, species adiectis synonymis, locis, observationibus, descriptionibus. Tomus I. Kiliae: Bibliopolii Academici Novi, p. 354.

***C. circumdatus* Ragusa, 1892**: Catologo ragionato dei coleotteri di Sicilia. II Naturalista Siciliano 11: p. 187.

***C. dimidiatus* (Heer, 1841)**: Fauna Coleopterorum Helvetica. Pars 1 (3). Turici: Orelii, Fuesslini et Sociorum, p.413.

***C. ficus* (Fabricius, 1801)**: Systema Eleutheratorum secundum ordines, genera, species adiectis synonymis, locis, observationibus, descriptionibus. Tomus II. Kiliae: Bibliopolii Academici Novi, p. 603.

***C. flexuosus* (Herbst, 1790)**: Natursystem aller bekannten in- und auslandischen lnsekten, als eine Fortsetzung der von Büffonschen Naturgeschichte. Der Kâfer dritter Theil. Berlin, p. 246.

***C. pictus* (Heer, 1841)**: Fauna Coleopterorum Helvetica. Pars 1 (3). Turici: Orelii, Fuesslini et Sociorum, p. 413.

***C. quadriguttatus* Thunberg, 1794**: Dissertatio entomologica sistens Insecta Svecica. Quorum partem Quintam. Cons. Exp. facult. Med. Ups. praeside Carol. Pet. Thunberg publico examini subjicit Isaacus Haij, stip. Kahreanus Westrogoth. Upsaliae: litteris viduae direct. Johann. Edman, p. 70.

C. quadratus Fabricius, 1798: *Supplementum entomologiae systematicae.* Hafhiae: Profit et Storch, p. 74.

Diagnosis: TL: 2.1- 3.0 mm; PL: 0.6- .0.9 mm; PW: 1.0- 1.3 mm; EL: 1.0- 1.3 mm; EW: 0.55- 0.9 mm.

Body obovate to subparallel; feebly shining; sparsely. Colour dark brown with pale maculae on humeral and apical areas on the elytra. Vestiture of decumbent golden or black setae; average length of elytra setae shorter than the eye. Body coarsely punctate, especially pronotum sublaterally near posterolateral angles. Antennomere 3 and 2 subequal. Pronotum

with sides evenly arcuate, converging anteriorly and widest near the base; anterior angles obtusely rounded; posterior angles obtusely angulate; disc weakly convex; punctures strongly impressed on disc, separated by 1- 2 diameters; glabrous between punctures with sparse microsculpture. Pronotal carina not sinuate in anterior one third. Prosternal process with apex evenly arcuate and expanded laterally behind procoxae, with a median longitudinal carina. Prosternum and hypomeron punctate. Elytra with strongly impressed punctures, separated by 1 diameter or less. Mesoventrite with disc separated from lateral region by carinae extending from prosternal process to mesocoxae; discal area divided by median longitudinal carina. Metaventrite with axillary space poorly developed and present to a level of 1/5 the length of the metepisternum. The first segment of the abdomen ventrally with a raised line that runs parallel to the hind coxae for the most part and reaches the episternum near the front.

Material Examined:

(1) Giza, 13.V.1934; (3) Giza, 14.VII.1923; (1) Giza, 11.VII.1932, (1) Cairo, 15.VII.1923, (6) Giza, 26.VII.1923; (5) Giza, 17.VII.1923; (3) Giza, 27.VII.1923; (1) Cairo, 16.IX.1923; (1) Giza, 26.VI.1923 on apricot; (1) Giza, 30 .VIII.1923; (1) Cairo, 20.VII.1920 on onion BUbbS; (7) Giza, 29.V.1924; (3) Giza, 28.V.1924; (1) W.Digla, 18.IX.1923; (1) W.Hoff, 10.IV.1916, (1) Alex., 18.VIII.1921; (2) Cairo, 5.VII.1924; (5) Giza, 18.VII.1923; (2) Giza, 17.VII.1924; (4) Giza, 4.VII.1923; (3) Giza, 3.VII.1923; (1) Zamalik, 20.VI.1923; (1) Zagazig, 18.VII.1923; (3) Zagazig, 8.VII.1923; (2) Zagazig, 11.VII.1923 on watermelon; (3) Zagazig, 9.VII.1923; (1) Giza, 1.VII.1923; (1) Zamalik, 26.VI.1923; (5) Giza, 12.VII.1923; (5) Giza, 16.VII.1923; (3) Giza, 5.VII.1923; (1) Zagazig, 12.VII.1923; (3) Giza, 7.VII.1923; (2) Giza, 3.IV.1923; (3) Giza, 2.VII.1923; (2) Zagazig, 11.VII.1923; (1) Alex., 21.VIII.1921; (2) Giza, 10.VII.1923; (1) Giza, 15.VII.1923; (2) Giza, 15.X.1923; (1) Giza, 8.VII.1923; (1) Zagazig, 8.VII.1923 on watermelon; (1) Zagazig, 4.VII.1923; (1) Giza, 25.VI.1923; (1) Zagazig, 13.VII.1923; (2) Giza, 31.VII.1923; (1) Zagazig, 10.VII.1923; (2) Giza, 18.IV.1923; (1) Cairo, 6.III.1924; (1) Alex., 16.VIII.1921; (1) Giza, 19.VII.1923; (1) Giza, 1.VI.1924; (1) Giza, 31.V.1924; (1) Rode El-Farag, 6.VI.1923; (4) Zamalik, 18.VI.1923; (11) W.Hoff, 11.IV.1915; (1) Zamalik, 19.VI.1923; (1) Giza, 29.V.1923; (1) Giza 4.XII.1923; (1) Giza, 26.VI.1923; (1) Giza, 31.V.1923 on tomato fruit; (1) Giza, 6.VI.1923 on Agur; (1) Giza, 20.VII.1920; (2) Maadi, 11.VIII.1925 on pomme grunte; (2) Giza, 22.XII.1924 on ruffa cylindrica; (1) Giza, 17.I.1925; (5) Giza, 15.XI.1924 on maize; (4) Helwan, 10.IX.1929; (1) Maadi, 10.VIII.1925 on pommegrante; (1) Cairo, 18.VI.1924; (2) Giza, 29.I.1925; (9) Helwan, 17.IX.1929; (7) Cairo, 23.VII.1925; (2) Cairo, 2.VIII.1925; (1) Helwan, 4.IX.1920; (1) Cairo, 25.VII.1925; (2) Giza, 10.II.1925; (1) Maadi, 10.VIII.1925; (1) Giza, 14.II.1925 on pomme grunte; (2) Giza, 14.II.1925 on dates; (3) Maadi, 9.VIII.1925; (2) Giza, 8.VI.1924; (3) Giza, 11.VI.1924, (5) Gabel Asfar, 3.VII.1928; (2) Giza, 16.II.1925 on dates; (1) Giza, 20.VI.1925; (1) Helwan, 10.IX.1930; (2) Giza, 28.I.1925; (1) Rode El Farag,16.III.1925; (1) Breeding on peach; 27.XI.1924; (1) Giza 16.VI.1924 on Squash; (1) Giza, 11.II.1925 on dates; (1) Rode El Farag, 16.III.1925 on orange fruit, (1) Gabel Asfar, 5.VII.1928; (1) Giza, 14.II.1925; (1) Giza, 21.I.1925 on Maize cobs; (3) Giza, 21.I.1925; (1) Giza, 31.V.1924 on apricot; (1) Giza, 29.I.1925 on Maize; (1) Giza, 10.XII.1924; (1) Giza, 10.IX.1929; (1) Giza, 1.II.1925; (1) Cairo, 18.VI.1914; (1) Giza, 19.XI.1924; one sample without dates …… (MAC)

(1) Ramleh 29.XI.1912; (2) Cairo 4.IX.1913; (1) Cairo 11.VIII.1913; (1) Ramleh 15.X.1913; (1) Ein Shams 6.III.1914; (4) Cairo 10.IV.1910; (1) Ogret ElSheikh 11-15.IV.1921; (1) Rodete el Serg 1.III.1936……..…….(ALFC)

(3) Alexandria 15.VIII.1923; (2) Alexandria 14.VII.1947; (2) Gabel Asfar 7.VI.1954; (1) Gabel Asfar 8.XI.1953; (1) Mansourah 20.IV.1957; (1) Mansourah 25.IV.1957; (3) El Baharia Oasis 28.I.1958; (1) Borge El Arab 3.III.1955; (2) Suez Road 9.X.1955……..……(ASUC)

***Carpophilus mutilatus* Erichson, 1843 (Fig. 3)**

***C. mutilatus* Erichson, 1843**: Versuch einer systematischen Eintheilung der Nitidularien. Zeitschrift fir dieEntomologie, 4, p. 258.

***C. luridus* Murray, 1864**: Monograph of the family of Nitidulariae. Part I. Transactions of the Linnean Society of London 24: p. 377.

***C. pilosellus* Motschulsky, 1858**: Insectes des Indes orientales. l:ière Série. Ětudes Entomologiques 7: p. 41.

Diagnosis: TL: 3.0 mm; PL: 1.0 mm; PW: 1.2 mm; EL: 1.3 mm; EW: 0.8 mm.

Body parallel. Colour variable, light tan to brown; body covered with pits provided with white setae; average length of elytral setae distinctly shorter than the eye. Second and third antennomeres equal in length. Pronotum with sides weakly curved, convergent anteriorly; anterior angles obtusely angled; posterior angles broadly rounded, not produced into a distinct tooth; disc moderately convex; punctures moderately impressed on disc, separated by 1 diameter or less; granulate microsculpture clearly present between punctures; microsculptures absent. Pronotal carina narrowly explanate, not sinuate in anterior 1/3. Prosternum rugose, hypomeron granulate. Prosternal process with apex subrounded and not greatly expanded laterally behind procoxae. Elytra: Punctures weakly to slightly impressed, separated by 1-3 diameters; granulate microsculpture present. Metatibia not strongly dilated at base.

Material examined:

(1) Bred cage, 11.XI.1917, (2) Zamalik, 20.VI.1923; (1) Sammalut, 27.VIII.1916; (2) Giza, 14.VII.1923; (1) Giza, 27.V.1924; (4) Giza, 16.VII.1923; (1) Alex, 13.VII.1924; (1) Giza, 9.VII.1923; (3) Giza, 12.VII.1923; (2) Abu Tig, 20.II.1929; (2) Giza, 8.IV.1923; (6) Giza, 17.VII.1923; (3) Zamalik, 25.VI.1923; (1) Giza, 2.VIII.1923; (3) Giza, 11.VII.1923; (3) Cairo, 8.VIII.1917; (2) Abu Tig, 5.III.1917; (1) Abu Tig, 29.III.1924; (1) Abu Tig, 20.III.1924; (2) Giza, 5.VII.1923; (3) Giza, 15.VII.1923; (1) Zamalik, 24.VI.1923; (5) Giza,30.VII.1923; (1) Giza,8.VII.1923; (2) cairo,25.VI.1923;(1)without locality,8.X.1917;(1)Abu Tig, 8.III.1924; (2) Giza, 19.XI.1924; (8) Helwan, 17.IX.1929; (5) Baharia oasis, 16.XII.1925; (1) Giza, 12.XII.1924 on eggplant fruit; (3) Gabel Asfar, 25.VII.1928; (8) Mansouriya, 30.XII.1925; (23) Baharia Oasis, 15.XII.1925; (1) Giza, 16.XII.1924; (5) Helwan, 10.IX.1929; (3) Giza, 13.XI.1924; (1) Giza, 12.XII.1925; (2) Giza, 12.VIII.1924; (1) Giza, 16.XII.1925; (4) Baharia Oasis , 24.III.1925; (4) Giza 15.XII.1924; (1) Embaba, 22.II.1925; (2) Baharia Oasis , 30.V.1925; (1) Helwan, 10.IX.1920; (2) Gabel Asfar, 5.VII.1928; (1) Maadi, 30.VIII.1933; (1) Cairo, 15.V.1910; (1) Giza, 3.IX.1913; (1) Al-Agouza, 29.III.1925 on potatoes; (9) port said, 12.VI.1928; (3) Helwan, 17.IX.1923; (2) Giza, 18.XI.1924; (1) El-Dokki, 16.II.1925; (2) Gabel Asfar 25.VI.1925; (8) Helwan, 1.VII.1929;; (1) Giza, 13.XII.1924; (1) Giza, 11.VII.1925; (1) El-Dokki, 16.II.1915; (1) Helwan, 10.III.1929; (1) Giza, 10.XII.1924; (2) Gabel Asfar, 10.VII.1924; (2) Giza, 3.V.1925; (1) Giza, 6.XII.1925; (1) Giza, 30.VIII.1924; (2) Helwan, 16.II.1913; (1) Maadi, 7.VIII.1931; (1) Maadi, 24.III.1933……(MAC)

(3) Ayat 20.IX.1907; (7) Cairo 10.IV. 1910; (1) Shoubra 20.III.1920; (2) Cairo 9.V.1916; (1) Cairo 1.V.1910; (1) Giza 23.III.1921; (1) Giza 20.VI.1921; (1) Abou Rawash 16.V.1906……..……..(ALFC)

(12) Gabel Asfar 6.XI. 1953…….……..(ASUC)

***Carpophilus obsoletus* Erichson, 1843 (Fig. 4)**

***Carpophilus obsoletus* Erichson, 1843**: Versuch einer systematischen Eintheilung der Nitidularien. Zeitschrift fir dieEntomologie, 4, p. 259.

***C. cribellatus* Motschulsky, 1858**: Insectes des Indes orientales. l:ière Série. Ětudes Entomologiques 7: p. 41.

***C. immaculatus* P. H. Lucas, 1846**: In: Exploration scientifique de I'Algérie pendant les

années 1840, 1841, 1842 publiéepar ordre du gouvernement et avec le concours d'une Commission Académique. Sciences Physiques Zoologie. Vol. II. Histoire naturelle des animaux articulés. Cinquiĕme classe. Insectes. Premier Ordre. Les coléoptĕres. Paris: Imprimerie Nationale, p. 217.

***C. sericeus* Motschulsky, 1858**: Insectes des Indes orientales. l:iĕre Série. Ĕtudes Entomologiques 7: p. 41.

***C. strigipennis* Motschulsky, 1858**: Insectes des Indes orientales. l:iĕre Série. Ĕtudes Entomologiques 7: p. 41.

Diagnosis:

TL: 3.05- 3.8 mm; PL: 1.0- 1.2 mm; PW: 1.45- 1.5 mm; EL: 1.0- 1.5 mm;
EW: 0.8- 1.0 mm.

Colour dark brown to black, body covered with large and dense pits provided with pale yellow setae; average length of elytra setae shorter than eye. Second and third antennomere subequal in length. Pronotum with sides curved, converging anteriorly and widest near the base; anterior angles obtusely rounded; posterior angles obtusely angulate, not produced into a tooth; disc convex; punctures large and ovate and strongly impressed on disc, separated by less than 1 diameter; microsculpture small micropunctures sparsely present, glabrous between punctures. Elytra: Surface undulate, punctures at disc of similar size, punctures ovate and strongly impressed, separated by less than 1 diameter; granulate microsculpture present. Metatibia not strongly dilated at base.

Material examined:

(3) Cairo 10.IV.1910; (2) Palace Kouba 15.IV.1921; (2) Giza 20.VI.1921...(ALFC)
(9) Giza, 7.VII.1923; (3) Giza, 17.VII.1923; (2) Giza, 4.VII.1923; (2) Giza, 24.IX.1923; (1) Giza, 15.VII.1923; (2) Giza, 16.VII.1923; (2) Giza, 8.VII.1923; (1) Giza, 24.VII.1923 on Cage bred on peach fruit; (1) Giza, 27.VIII.1916 on millet; (1) Cairo, 20.VII.1920 on onion; (1) Giza, 29.V.1924; (2) Giza, 27.V.1924; (2) Maadi, 11.III.1916; (1) Giza, 31.V.1924; (1) Giza, 1.VI.1924; (1) Giza, 2.VI.1924; (2) Maadi, 5.V.1918; (11) Giza, 27.V.1924 on Tomato; (3) Giza, 29.V.1924 on squash; (8) Maadi, 31.III.1916 on bee hive; (1) Mansouriya, 12.XII.1928; (1) Giza, 16.VII.1923 on peach fruit; (5) Giza, 8.VIII.1912 bred on pommegrante; (1) Giza, 10.VIII.1912; (1) Giza, 10.VIII.1924 bred on pommegrante; (1) Giza, 25.V.1924; (1) Helwan, 4.IX.1929; (2) Giza, 28.VIII.1923 on peach fruit (6) Giza, 7.VII.1923 on cuge bred on peach fruit; (1) Giza, 27.VIII.1916 peach fruit; (1) Cairo, 20.VII.1920; (2) Giza, 15.IV.1923; (2) Giza, 14.VII.1923; (1)Giza, 8.VIII.1916; on millot; (1) Giza, 29.V.1924 on olearce; (1) Giza, 1.VI.1924 on apricot fruit; (1) Giza, 2.VI.1918 on squash fruit; (2) Giza, 9.VII.1923; (1) Giza, 30.V.1924..(MAC)

Genus *Urophorus* Murray, 1864

***Urophorus* Murray, 1864:** Monograph of the family of Nitidulariae. Part I. Transactions of the Linnean Society of London 24: p. 342

Type species: *Ips rubripennis* Heer, 1841.

Generic diagnosis:

Usually shining, and nearly glabrous. Pronotal bead, viewed laterally, 2x as thick in apical half as basal half. Elytra rather short, three abdominal tergites normally exposed in dorsal view.

***Urophorus humeralis* Fabricius, 1798 (Fig. 5)**

***Urophorus humeralis* Fabricius, 1798**: Supplementum entomologiae systematicae. Hafhiae: Profit et Storch, p. 74.

***U. punctatus* (Fleutiaux, 1887)**: Descriptions de coléoptĕres nouveaux de Γ Annám. Rapportés par M. le capitaine Delauney. *Annales de Iα Société Entomologique de France* (6) 7: 61.

***U. richeckeri* (Fall, 1910)**: Miscellaneous notes and descriptions of North American

Coleoptera. Transactions of the American Entomological Society 36: 124.

Diagnosis: TL: 3.8 mm; PL: 1.3 mm; PW: 1.5 mm; EL: 1.7 mm; EW: 1.0 mm. Color deep brown to black. The body covered with large pits, provided with hairs. Elytra shortened to leave the last three tergites uncovered. Body broadly oblong oval; convex; sparsely pubescent; Prothorax slightly more than one-half wider than long, arcuately narrowed in front, subparallel basally, not at all sinuate before the hind angles, which are a little obtuse and feebly defined. Elytra as wide as prothorax, one-sixth wider than long. Pygidium and last abdominal sternum not depressed.

Material examined:

(9) Barrage 17.IX.1933……..……..(ALFC)

(9) Barrage (Qalyubiya) 17.IX.1933; (1) Mansouriya, 12.XII.1978; (1) Giza on Fig Fruits Ficus caria L.24.VII.1942……..……..(MAC)

(4) Mansourah 25.IV.1957; (6) Borge El Arab 6.XI.1956; (6) Gabel Asfar 8.XI.1953…….……..(ASUC)

Subfamily: Meligethinae Thomson, 1859

In Egypt, Alfieri (1976) mentioned that, Meligethinae represented by five species belonging to two genera, i.e., *Pria dulcamarae* Scopoli, *Meligethes lugubris* Sturm, *Meligethes nigrescens* Stephens, *Meligethes planiusculus* Heer and *Meligethes serripes* Gyllenhal. In the present work, the last three species are studied, the other two species not represented in the above mentioned Egyptian insect collections.

Genus *Meligethes* Stephens, 1830

***Meligethes* Stephens, 1830:** Mandibulata. Volume III. London: Baldwin and Cradock, p. 30.

Type species:

Generic diagnosis: Body convex to slightly flattened, the abdomen conspicuously convex. Head narrower in proportion to the pronotum. Antenna with the first segment much rounded on the inner side; antennal club three segments in both sexes and tightly segmented. Elytra longer, covering abdomen or at most with pygidium and apex of the preceding segment visible. Mesosternum carinate. Middle and hind tibiae usually about the same width as the front; outer margin of middle and hind tibiae with a single row of small spines. Abdominal sternite 5 basolaterally with a sharply impressed C- to U-shaped line (hidden when retracted under sternite 4) Tarsi dilated.

***Meligethes nigrescens* Stephens, 1830 (Fig. 6)**

***Meligethes nigrescens* Stephens, 1830**: Mandibulata. Volume III. London: Baldwin and Cradock, p. 47.

***M. funebris* Förster, 1849**: Uebersicht der Kâfer-Fauna der Rheinprovinz. Erster Nachtrag. Verhandlungen des Naturhistorischen Vereins der Preussischen Rheinlande und Westphalens 6: 23.

***M. medius* Rey, 1889**: Remarques en passant. Famille des Nitidulides. L 'Ĕchange. Revue Linnéenne 5 (52): 28.

***M. pallipes* Rey, 1889**: Remarques en passant. Famille des Nitidulides. L 'Ĕchange. Revue Linnéenne 5 (52): 28.

***M. picipes* Sturm, 1845**: Deutchslands Fauna in Abbildungen nach der Natur mít Beschreibungen. V. Abtheilung Die Insecten. Zweites Bándchen. Káfer. Nürnberg: Verfasser, p. 47.

***M. saulcyi* Reitter, 1872**: Erster Nachtrag zur Revision der europaischen Meligethes-Arten. Berliner Entomologische Zeitschrift 16: 133.

***M. seminulum* LeConte, 1857**: Reports upon insects collected on the Survey. Reports of exploration and surveys for a railroad routrfrom the Mississippi river to the Pacific Ocean 9 (1): 37.

***M. subrugosus* Stephens, 1830**: Mandibulata. Volume III. London: Baldwin and Cradock, p. 48.

***M. subsimilis* Rey, 1889**: Remarques en passant. Famille des Nitidulides. L 'Ĕchange. Revue Linnéenne 5 (52): 28.
***M. xanthocerus* Stephens, 1830**: Mandibulata. Volume III. London: Baldwin and Cradock, p. 48.
Diagnosis: TL: 2.0 mm; PL: 0.65 mm; PW: 1.0 mm; EL: 1.5 mm; EW: 0.65 mm.
Color black, legs pale pitchy yellow. Body covered with minute pits, provided with yellowish hairs. Dorsal surface between punctures smooth. Third antennomere distinctly thinner than second; fourth and fifth antennomeres subequal in length. Clypeus with anterior margin of emarginate to subtruncate, with narrowly bordered; occipital sulci present. Pronotum with obtuse to obtusely rounded posterior angles, never directed posteriorly; pronotum with dorsal punctures of discal portion as large as or larger than eye facet, usually deep and dense; scutellum regularly punctured on most of the exposed portion. Elytral humeral angle moderately distinct, not protruding laterally; elytral humeral striae scarcely distinct. Protibia finely, slightly irregularly denticulate; dorsal sculpture. Anterior tibiae with outer edge finely, slightly irregularly denticulate.
Material examined:
(3) Ramleh (Alexandria), III; IV and V……..… (ALFC)
***Meligethes planiusculus* Heer, 1841 (Fig. 7)**
***Meligethes planiusculus* (Heer, 1841)**: Fauna Coleopterorum Helvetica. Pars 1 (3). Turici: Orelii, Fuesslini et Sociorum, p. 404.
***M. murinus* Erichson, 1845**: [I., II. Lieferung, pp. 1-320]. In: Naturgeschichte der Insecten Deutschlands. Erste Abtheilung. Coleoptera. Dritter Band. Berlin: Nicolaischen Buchhandlung, p. 191.
***M. ruficornis* Heer, 1841**: Fauna Coleopterorum Helvetica. Pars 1 (3). Turici: Orelii, Fuesslini et Sociorum, p. 404.
***M. seniculus* Erichson, 1845**: [I., II. Lieferung, pp. 1-320]. In: Naturgeschichte der Insecten Deutschlands. Erste Abtheilung. Coleoptera. Dritter Band. Berlin: Nicolaischen Buchhandlung, p. 192.
Diagnosis: TL: 2.5 mm; PL: 0.8 mm; PW: 1.15 mm; EL: 1.2 mm; EW: 0.7 mm.
Color slightly luster black. The body covered with dense pits, provided with pale yellowish-white hairs. Third antennomere is distinctly thinner than the second antennomere; fourth and fifth antennomeres subequal, short, nearly as long as wide. Clypeus with anterior margin arcuately emarginate, distinctly and narrowly bordered, slightly protruding anteriorly. Occipital sulci of head not developed, absent or indistinct. Pronotum with punctures on discal portion as large as or larger than eye facets, usually deep and dense, rarely fine, sparse, and shallow; Pronotum with distinct obtuse posterior angles. Elytral humeral angle moderately distinct, not protruding laterally; elytral humeral striae usually distinct; scutellum more or less regularly and sparsely punctured at least in posterior half of exposed portion.
Material examined:
(18) Montazah (Alexandria), 1.XI.1939; (3) montazah, 1/XI/1939…….……(MAC)
(13) Borge El Arab (Alexandria) 3.III.1955; (4) Abu Qir 2.V.1939……..(ASUC)
***Meligethes serripes* Gyllenhal, 1827**
***Meligethes serripes* (Gyllenhal, 1827)** *Insecta Suecica. Classis I. Coleoptera sive Eleuterata. Tomi I. Pars IV. Cum appendice ad partes priores.* Lipsiae: F. Fleischer, p. 301.
***M. alpigradus* Reitter, 1871**: Revision der europaischen Meligethes-Arten. Verhandlungen des Naturforschenden Vereins in Brünn 9: p. 82.
***M.exaratus* Forster, 1849**: Uebersicht der Kâfer-Fauna der Rheinprovinz. Erster Nachtrag. Verhandlungen des Naturhistorischen Vereins der Preussischen Rheinlande und Westphalens 6: p. 12.

***M. eligethes quadridens* Forster, 1849**: l. c. p. 21.

Diagnosis: TL: 2 mm; PL: 0.6 mm; PW: 1 mm; EL: 1.05 mm; EW: 0.6 mm.

Color slightly luster black. Body covered with dense pits, provided with pale yellowish-white hairs. Clypeus with anterior edge slightly bordered, frequently emarginated at the middle. Posterior base of pronotum without punctures; the proepisternal-prosternal sutures markedly raised. Third antennomere distinctly thinner than second; fourth and fifth antennomeres subequal, short, nearly as long as wide. Clypeus with anterior margin truncate or sinuate medially. Occipital sulci narrow, moderately to deeply impressed; Pronotum with dorsal punctures larger than eye facet, dense and deeply impressed; pronotum with obtusely distinct to rounded posterior angles, never directed posteriorly; scutellum minutely punctured on exposed portion. Elytral humeral striae usually indistinct. Protibial with serrate outer margin the 1st and 6th teeth apically equal and longer than other equal teeth.

Material examined:

(1) Hammam, 16/III/1930; (2) Mansouriya, 27.V.1934; (1) Abu Qir, 12/VIII/1934; (1) Fayoum, 13.V.1934 (MAC)

Subfamily: Cryptarchinae Thomson, 1859

In Egypt, Alfieri (1976) mentioned that, Cryptarchinae represented by one species belonging to one genus, i.e., *Cryptarcha bifasciata* Baudi di Selve In the present work, this is studied.

Genus *Cryptarcha* Shuckard, 1840

***Cryptarcha* Shuckard, 1840:** The British Coleoptera delineated, consisting of figures of all the genera of British Beetles, drawn in outline by W. Spry, M.E.S. London, p.165.

Type species: *Nitidula strigata* Fabricius, 1787

Generic diagnosis: Body mostly pubescent. Color testaceous to piceous, with or without darker spots. Head dorsally with a fine transverse line behind the level of eyes separating more densely and coarsely punctate anterior area from less densely or coarsely punctate posterior region. Labrum and clypeus fused, the line of union marking a distinct suture; lateral margin of front more or less straight between the eye and anterior margin of clypeus and covering the base of antenna in dorsal aspect. Pronotum margined basally, slightly overlapping the base of elytra.

***Cryptarcha bifasciata* Baudi di Selve, 1870 (Fig. 8)**

***Cryptarcha bifasciata* Baudi di Selve, 1870**: Coleopterorum messis in insula Cypro et Asia minöre ab Eugenio Truqui congregatae recensitio: de Europaeis notis quibusdam additis. Pars tertia. Berliner Entomologische Zeitschrift 14: 52.

Diagnosis: TL: 3.0 mm; PL: 1.0 mm; PW: 1.8 mm; EL: 1.95 mm; EW: 1.0 mm.

Color: head reddish black, the disc of pronotum black and its margins red, elytra luster black, with two large reddish deep yellow spot basally, in addition to the reddish deep yellow band in the middle. Body covered with arranged large pits, provided with hairs.

Material examined: (1) Matariah 15.IV.1910 (ALFC).

Subfamily: Nitidulinae Latreille, 1802

In Egypt, Alfieri (1976) mentioned that, Nitidulinae is represented by seven species belonging to four genera, i.e., *Anister raffrayi* Grouvelle, *Nitidula eremita* Audisio, *N. canaria* Schaller, *N. flavomaculata* Rossi, *N. maculosa* Fairmaire, *Oturovana carpophiloides* Reitter and *Xenostrongyluslus histrio ovalum* Fairmaire. In the present work, the first two species are studied, the other five species not represented in the above mentioned Egyptian insect collections.

Genus *Anister* Grouvelle, 1901

***Anister* Grouvelle, 1901:** Description d'un nouveau genre de Nitidulidae du nord et de Test de l'Afrique. Bulletin de Iα Société Entomologique de France, P. 102.

Type species: *Anister raffrayi* Grouvelle, 1901

Dorsum pubescent. Antennal segments six and seven dentate on the inner side. Elytra serially

punctate, setose, or striate. Elytra truncate or separately rounded to expose most of pygidium. Prosternal tip depressed behind coxae. Hind tarsi bilobed or at least dilated to three times the width of the fourth segment. Claws dentate on base.

***Anister raffrayi* Grouvelle, 1901 (Fig. 9)**

***Anister raffrayi* Grouvelle, 1901**: Description d'un nouveau genre de Nitidulidae du nord et de Test de l'Afrique. Bulletin de Iα Société Entomologique de France: 102.

***A. ares* Hinton, 1942**: A new leaf-mining nitidulid (Coleoptera). The Entomologist 75: 126.

***A. carpophiloides* (Reitter, 1915)**: Neue Coleopteren aus Aegypten. Bulletin de Iα Société Entomologique d'Egypte 6: 136.

Diagnosis: TL: 2.5 mm; PL: 0.7 mm; PW: 1.2 mm; EW: 1.1 mm; EW: 0.7 mm.

Color luster black. Body covered with dense pits ,provided with white hairs.

Material examined: (1) Ghargada 1.X.1935; (3) Wadi Hoff 11.V.1922; (1) Wadi Digla 29.IV.1935 (ALFC).

Genus: Nitidula Fabricius, 1775

Nitidula Fabricius, 1775: Systema entomologiae, sistens insectorum classes, ordines, genera, species, adiectis synonymis, locis, descriptionibus, observationibus. Flensburgi et Lipsiae: Korte, xxxii + 832 pp.

Type species: *Silpha bipustulata* Linnaeus, 1761

Body elongate, head broad, clypeus indistinct. Antennae a little longer than the head, the first segment enlarged, second convex, third long and slender, club large, nearly round in outline. Antennal grooves short and slightly convergent. Labrum feebly bilobed. Mandibles with blunt apices and no secondary teeth. Lacinia broad, rounded at tip, heavily bearded. Maxillary palpi with first segment small, second much larger and clavate, third smaller than the second, fourth cylindrical and about as long as the second. Ligula with large paraglossae; palpi with first segment small, second and third long and about of equal length. Mentum strongly transverse, feebly emarginated in front. Prothorax nearly as broad as the elytra. Elytra long, exposing only the tip of the pygidium; epipleurae broad, nearly attaining the apices. Prosternal process greatly expanded behind the coxae, but not attaining the metasternum. Mesocoxae a little further apart than the procoxae; the metacoxae about twice as far apart as the mesocoxae. Ventral segments of equal iength, first a little longer than the rest. Tarsi feebly dilated; claws simple. The Male eighth dorsal segment just visible from behind.

***Nitidula eremita* Audisio, 1990 (Fig. 10)**

Nitidula eremita Audisio, 1990. Nota sobre Nitidulidae ibero-marroquies (Col.). Eos, Revista Espaňola de Entomologia 66: 25-27.

Nitidula ciliata Erichson, 1843. Versuch einer systematischen Eintheilung der Nitidularien. Zeitschrift fir dieEntomologie, 4, p. 275.

Diagnosis: TL: 6.0 mm; PL: 1.1 mm; PW: 2.2 mm; EL: 3.4 mm; EW: 1.3 mm.

Colour deep yellow, elytron with an indistinct large blackish spot at basal one third in length.

Material examined:

(6) Wadi Hoff, 3/III/1916; (1) E.Romani, 29/XI/1916; (1) Mokattam, V, 1970; (4) Wadi Rashid, 28/III/1915; (1) Wadi Abu Nesuor, 23/XI/1925; (2) Helwan, 16/X/1932; Helwan, 13/XI/1929; (1) Helwan, 23.XII.1930 (MAC)

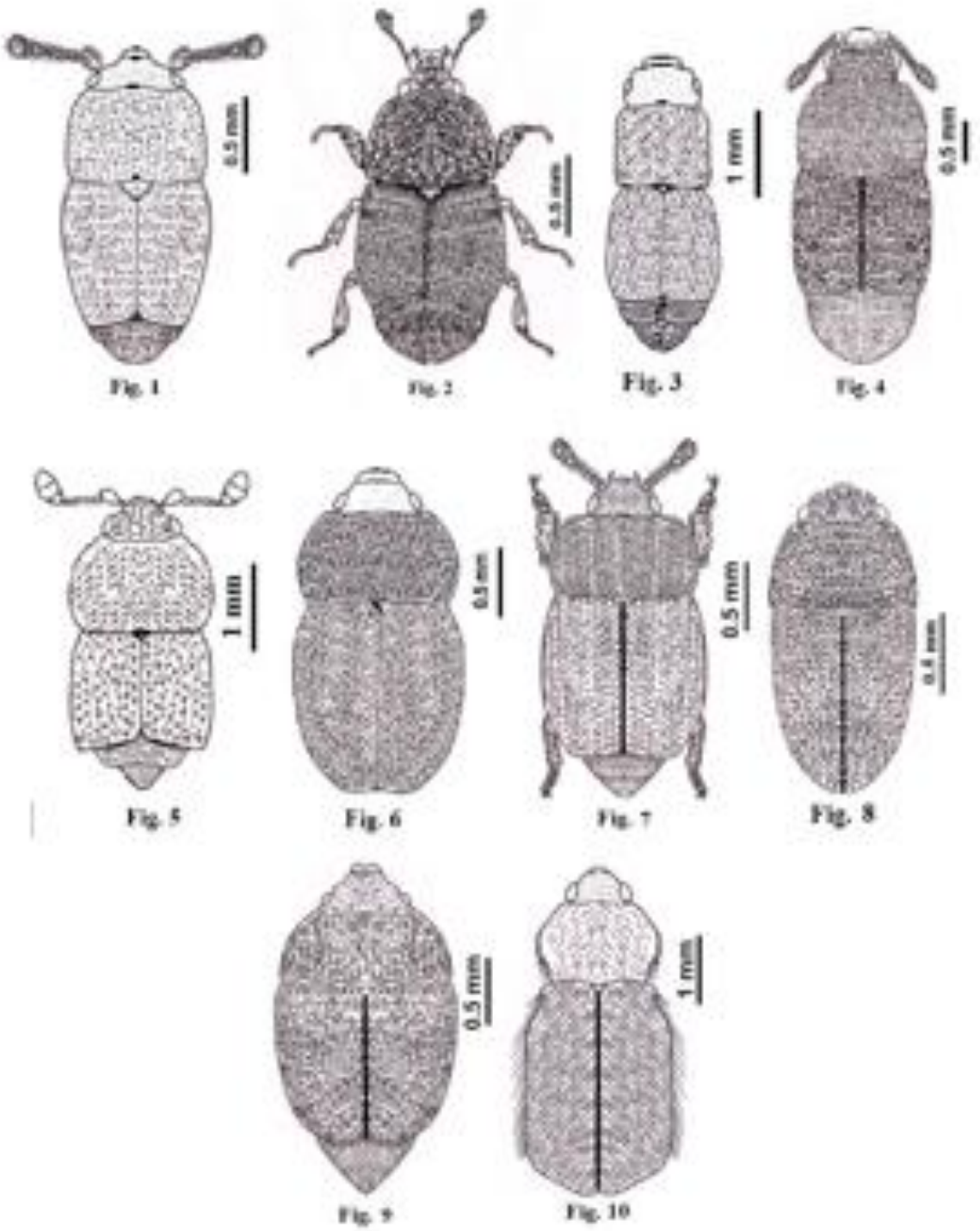

Fig. 1: ***Carpophilus dimidiatus,*** **Fig. 2:** ***C. hemipterus*****, Fig. 3:** ***C. mutilatus*****, Fig. 4:** ***C. obsoletus*****, Fig. 5:** ***Urophorus humeralis*****, Fig. 6:** ***Meligethes nigrescens*****, Fig. 7:** ***M. planiusculus*****, Fig. 8:** ***Cryptarcha bifasciata*****, Fig. 9:** ***Anister raffrayi*****, Fig. 10:** ***Nitidula eremita.***

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