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Taxonomic review of tribe Sepidiini (Coleoptera: Tenebrionidae: Pimeliinae) From Egypt

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Abstract

Tribe Sepidiini is represented in the world by 6 subtribes, 55 genera, 33 subgenera, and 1009 species and subspecies. It's represented in Egyptian fauna by one subtribe (Sepidiina) belonging to two genera and 7 species. A key is presented to both genera and species to facilitate recognition of the tribe. A diagnosis of tribe and genera, full description for species and illustration of taxonomic character are involved.

Keywords: Coleoptera, tenebrionidae, pimeliinae, sepidiini ground-dwelling darkling beetles, key, classification, Egypt.

Introduction

The tribe Sepidiini commonly known as Toktokkie beetles (tok-tok beetles), The larvae of some species are known to damage crops but haven't major effect, their body facilitate to accumulation and moisture absorption by open and non-connate suture of body.

The morphological characters of each species are mainly based on both sex. The taxonomic hierarchy, synonyms and distribution, obtained from Lillig and Pavlicek 2003^[26]; Král and Löbl *et al* 2008^[28]; Marcin J. Kamiński *et al* 2019^[29]; Bouchard, Patrice *et al* 2021^[11] and Gerner Olivia 2022^[24].

Materials and Methods

The present work is based on examination of all specimens which were collected during occasional trips in different regions of Egypt by using method sweeping net, pitfall traps or light traps, in addition to the preserved specimens in the main four insect collections in Egypt: Plant Protection Research Institute Ministry of Agriculture collection [MAC]; Ain shams Univ. Collection, Entomology Depart., Faculty of Science [ASUC]; Alfieri collection, Entomology Depart., Faculty of Science, Al-Azhar Univ [ALFC] Cairo Univ. Collection, Entomology Depart., Faculty of Science [CUC].

Results

Tribe Sepidiini Eschscholtz, 1829

Sepidiini Eschscholtz, 1829:19.

Diagnostic character

Head free or committed in pronotum until eyes; submentum stalked; ligula prominent and emarginated; last segment of maxillary palp triangle; clypeus almost separated from frons (Fig-1) antennae spindle shaped, eleven segmented (Fig-2), last segment free (except Vita). Pronotum no adjoining to elytra, anterior sides more prominent above head, hardly or no emarginated forward; scutellum big and transverse (Fig-3) epipleura of elytra vertical; posterior coxae more or less strongly separated; trochantins of mid legs almost very small and punctated (Fig-4); spurs big; tarsus ciliated and spiny; prosternal process rectangular; mesosternum parallel with narrow and oblique epimeron; metasternum large with rounded internal sides and very small epimeron.

Key to genera and species of tribe Sepidiini

1. Last antennal segment free; process of first abdominal sternite rounded or curved apically (Fig-5) *Sepidium* 2

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- Last antennal segment short and confused with tenth segment; process of first abdominal strit sinuated or bilobed apically (Fig-6)..... *Vieta* 5
- 2. Apex of elytra strongly pointed or triangular, coasts of elytra strongly elevated and sharply tuberculated apically; protuberance of anterior margin of pronotum deeply divided into two swollen parts; lateral tooth of pronotum big, wide, sharp and bifid at apex *Reichei*
- Apex of elytra rounded, coasts of elytra elevated and rounded tuberculated apically; protuberance of anterior margin of pronotum rounded and not divided into two swollen parts; lateral tooth of pronotum simple 3
- 3. Protuberance of anterior margin of pronotum strongly prominent overhead and weakly sinuated at middle; lateral tooth of pronotum short and conical shaped, curvature from protuberance to lateral tooth not angled; tubercules of elytral ribs rounded apically *dathan*
- Protuberance of anterior margin of pronotum weakly prominent overhead and rounded or marginated anteriorly; lateral tooth of pronotum long nearly with parallel sides, curvature from protuberance to lateral tooth angled; tubercules of elytral ribs very weakly rounded apically 4
- 4. Protuberance of anterior margin of pronotum rounded, lateral tooth of pronotum wide and rounded at apex; elytral ribs slightly long and weakly pointed tuberculated. *tricuspidatum*
- Protuberance of anterior margin of pronotum marginated and angled laterally, lateral tooth of pronotum big, flat, wide, shorter than wide and truncated at apex with insecion..... *tomentosus*
- 5. Antennal club includes two segments, last segment slightly short and setosed *costata*
- Antennal club with last segment appear only as compact suture inserted in the club 6
- 6. Pronotum with lateral tooth obtuse and almost rounded at apex; anterior protuberance more or less divided *Tuberculata*
- Pronotum with lateral tooth small, almost parallel and rounded at apex; anterior protuberance clearly marginated and weakly double-swelling *luxorii*



Fig 2: 11-segmented antenna



Fig 3: connection of pronotum and elytra



Fig 4: Midcoxa

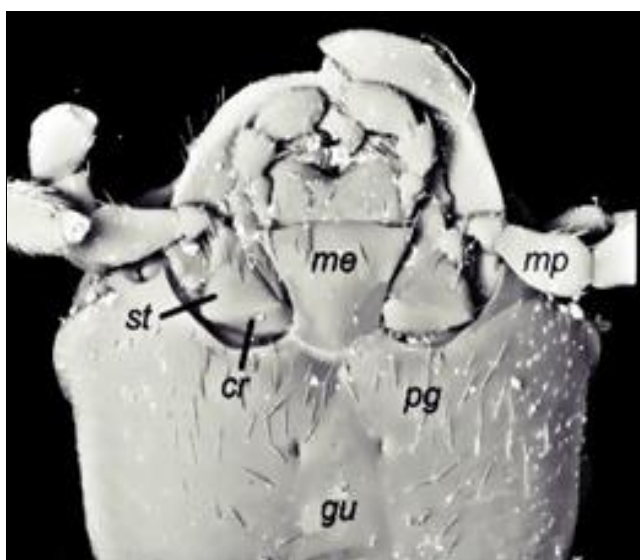


Fig 1: Ventral portion of head

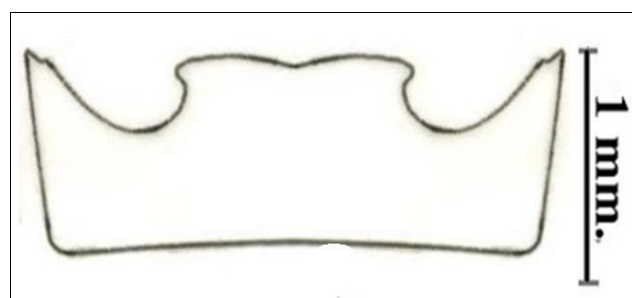


Fig 5: First abdominal strit of *Sepidium*

Abbreviations: CR-Cardo, GU-Gula, ME-Mentum; MP-maxillary palp; PG-Postgena; ST-Stipes.

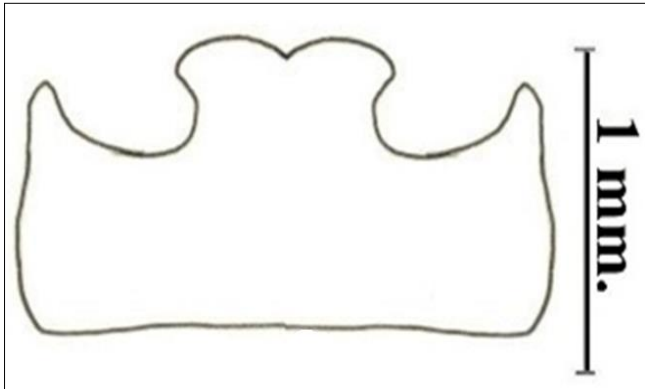


Fig 6: first abdominal sternite of *Vieta*

Abbreviations:

SC-Scutellum; CX-Coxa; TN-Trochantin; TR-Trochanter.

Genus *Sepidium* Fabricius, 1775

Sepidium Fabricius, 1775:250.

Type species: *Sepidium tricuspdatum* Fabricius, 1775: 250.

Generic diagnosis

Body pubescent, unequal dorsally. Head prominent enough, leaned, excavated at frons; mentum transverse, narrow basally and weakly emarginated anteriorly; ligula hardly emarginated;

maxillary palp thick with last segment slightly secureform; labrum transverse, weakly rounded or truncated forward; clypeus shrunk and truncated anteriorly; eyes subreniform, transverse and stretched out; antennae robust, 2nd segment very short, 3rd segment very stretched out, segments 4th - 10th subcylindrical and slightly decreasing, last segment few thicker, conical or oval. Pronotum slightly transverse, very greatly carinated on median line, this median line prolonged in a tuber bifid advancing on head, pronotum provided laterally with strong down hearted thorn, arched and often bifide; basis of pronotum bisinuated with slightly prominent posterior angles. Elytra oblong or parallel, slightly convex, sub-vertical posteriorly, rounded at shoulders, carinated laterally; epipleura of elytra wide and without fold; legs mediocre and robust; posterior coxae globular; femora compressed and slightly shrunk basally; tibiae rounded; first segment of posterior tarsus as long as last one or slightly shorter.

***Sepidium dathan* Crotch, 1872**

Sepidium dathan Crotch, 1872: 268.

Sepidium abiram Crotch, 1872: 268.

Sepidium vietaeformis Reitter, 1914: 385.

Type locality: Sinai (Egypt).

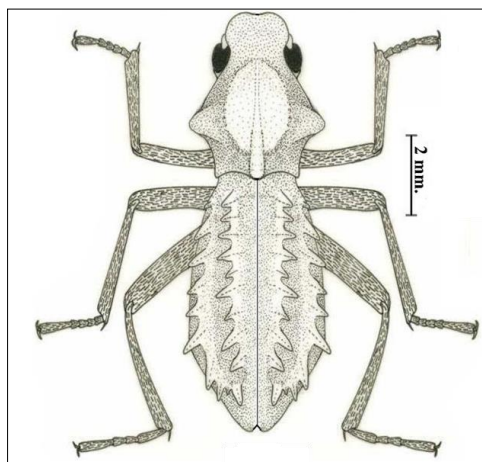


Fig 7: Habitus of *Sepidium dathan* Crotch



Fig 8: Head and antennae

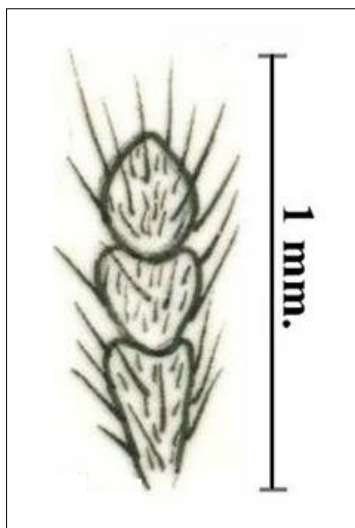


Fig 9: Last antennal segments

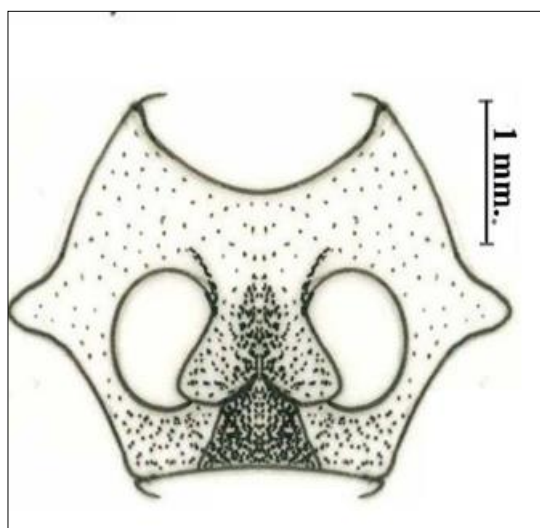


Fig 10: Prosternal process

Description

Body 11.5-13 mm. in length, strongly pubescent, blackish brown. Head transverse, strongly excavated on frons; labrum truncated anteriorly; clypeus narrow and truncated forward; eyes big, prominent laterally and with elevated interior ridge; antennae robust, long, nearly reach to basis of pronotum, 2nd segment very short, 3rd segment very stretched out, segments 4th - 9th slightly decreasing gradually, 10th segment conical and wider than precedent, last segment few thicker and oval shape. Pronotum transverse, strongly convex, strongly carinated on mid line, this carina strongly prominent anteriorly over head in protuberance shape weakly sinuated forward, lateral sides of pronotum with strong and short conical tooth, basis of pronotum bisinuated with marked posterior angles. Elytra oblong, convex, rounded at apex, with two ribs dorsally, tubercles of elytral ribs strongly prolonged and blunt apically; legs robust, long and pubescent; first segment of posterior tarsus as long as last segment; prosternal process passing fore coxae, pointed and bifid posteriorly.

Distribution

World: Egypt, Libya, Israel, Lebanon and Syria.

Local: This species is distributed in Lower Nile Valley, Eastern Desert and Sinai.

Material Examined

Rodet El-Homrrah 12. 2. 1926, Alfieri (2); Toura 1. 5. 1909, Alfieri (2); Massara 12. 11. 1910, Alfieri (1); Toura 12. 1. 1917, Alfieri (1); W. Gerawi, 24. 6. 1925, Alfieri (1); W. Um Mitla 21. 3. 1937, Rabinovitch (1) {8, ALFC}
 Wadi Digla 2. 3. 1956, P.H.P. (1) {1, ASUC}
 W. Um Elek 3. 1. 1931, Farag (1) {1, CUC}
 Maasara, Odair (4); W. Abu Gufan 26. 3. 1918 Odair (1); Mariout 10. 3. 1914, L.H.G.V.O.S. (1); Ogret El-Sheikh 17. 12. 1933 Rabinovitch (1); Helwan 14. 12. 1935, Farag (1); Helwan 16. 3. 1930, Farag (1); W. Hoff 5. 3. 1933, Rabinovitch (2); W. Um Anied 14. 10. 1934 Rabinovitch (1) {12, MAC}

***Sepidium reichei* Allard, 1870**

Sepidium reichei Allard, 1870: 49.

Sepidium bispinicollis Reitter, 1914: 389.

Type locality: Algeria.

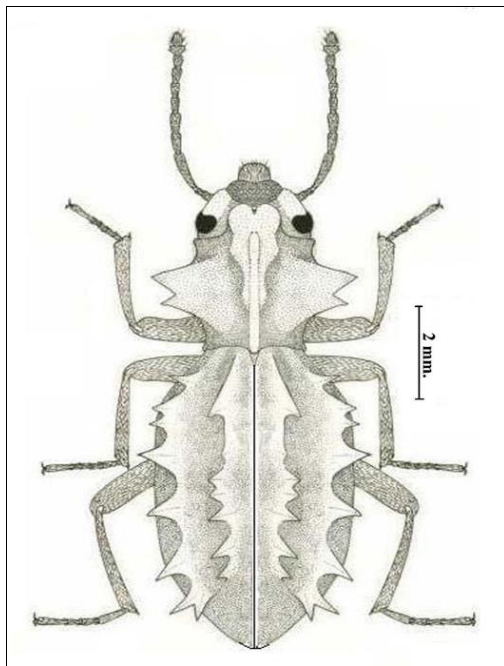


Fig 11: Habitus of *Sepidium reichei* Allard

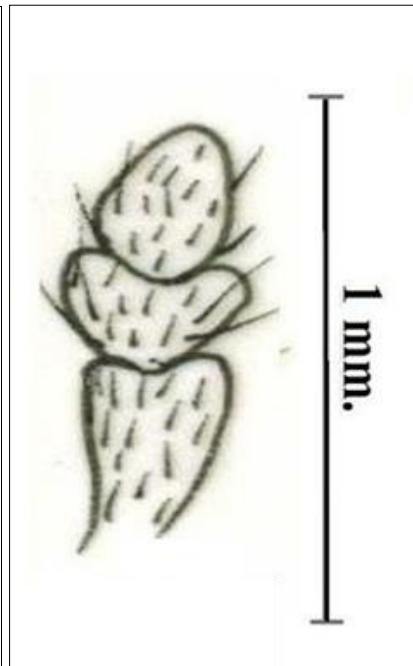


Fig 12: Last antennal segments

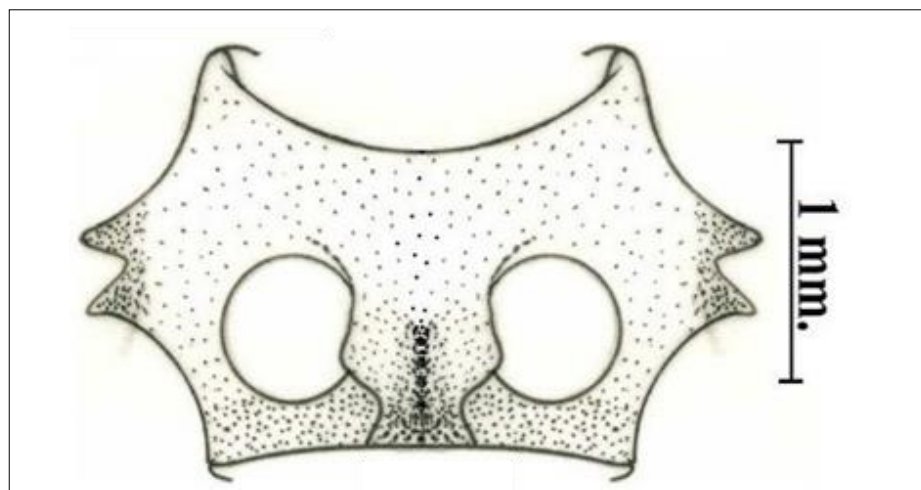


Fig 13: Prosternal process

Description

Body 9-10 mm. in length, dark brown and pubescent. Head, antennae and legs as *S. dathan*. Pronotum transverse, protuberance of anterior margin deeply divided into two swollen and narrow parts, lateral tooth of pronotum strongly wide, long, sharp and strongly bifid at apex. Elytra oblong, convex, acute and bifid at apex, with two ribs dorsally, tubercles of elytral ribs strongly prolonged and strongly sharp apically; prosternal process passing fore coxae, wide and rounded posteriorly.

Distribution

World: Algeria, Egypt, Libya and Tunisia.

Local: This species is distributed in Coastal Strip.

Material examined:

El-Hammam 16. 9. 1924, Alfieri (1); El-Hammam 20. 12. 1907, Alfieri (1); King Mariout 14. 12. 1924, Alfieri (3); 10. 11. 1924, Alfieri (1); Alexandria 2. 6. 1910, Alfieri (1).
 {7, ALFC}
 Burg El-Arab 3. 3. 1955, Aly (1) {1, ASUC}

***Sepidium tricuspidatum tomentosus* Erichson, 1841**

Sepidium tomentosus Erichson, 1841:178, t. 8.

Sepidium serratum Sol. 1843:240.

Sepidium maillei Solier, 1844:239.

Sepidium remotum Sahlberg, 1903:50.

Type locality: Algeria.

Description: After Reitter (1914a)

protuberance of anterior margin of pronotum marginated and angled laterally, lateral tooth of pronotum big, flat, wide, shorter than wide and truncated at apex with insecion.

Distribution

World: Algeria, Egypt, Tunisia and Malta.

Note: This species is not represented in The Egyptian Insect Collection.

***Sepidium tricuspidatum tricuspidatum* Fabricius, 1775**

Sepidium tricuspidatum Fabricius, 1775:250.

Tenebrio alexandrinus Forskal, 1775:78.

Sepidium cerisyi Solier, 1844:238.

Sepidium korah Crotch, 1872:268.

Sepidium immundum Reitter, 1914:388.

Type locality: Algeria.

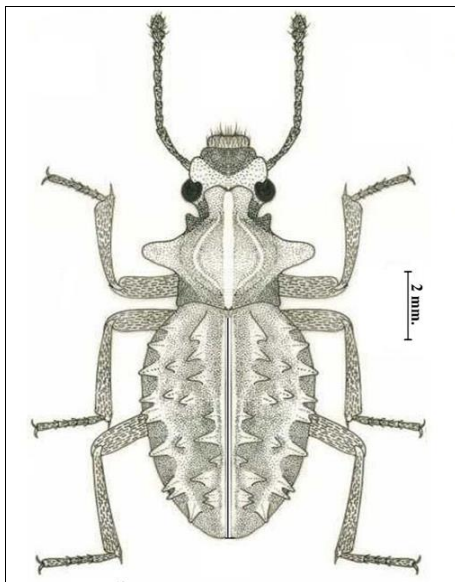


Fig 14: Habitus of *Sepidium tricuspidatum* Fab.

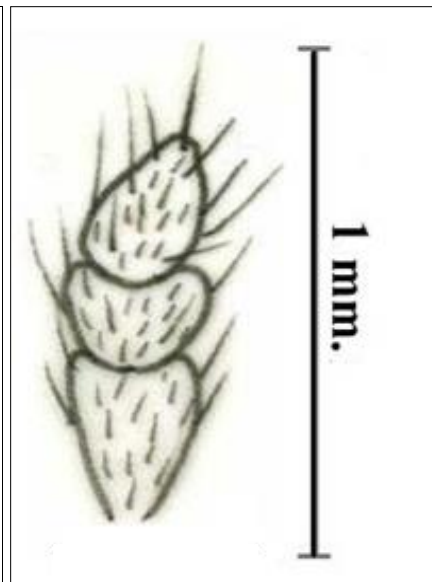


Fig 15: Last antennal segments

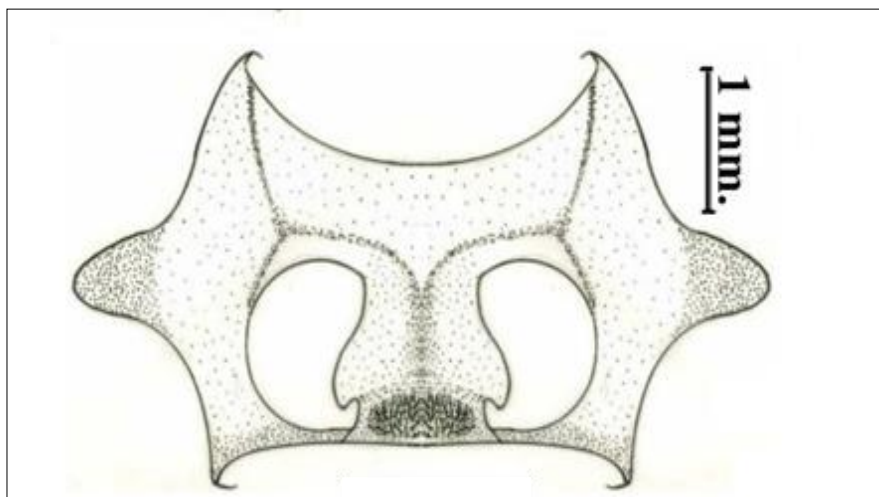


Fig 16: Prosternal process

Description

Body 11-13 mm. in length; Pronotum transverse, protuberance of anterior margin short, narrow, rounded and sinuated anteriorly, lateral thorn of pronotum big, wide, straight, nearly with parallel side and rounded at apex, disk of pronotum with several elevation, tubercles of elytral ribs elevated and sharp; prosternal process quadrate posteriorly.

Distribution

World: Algeria, Egypt, Libya, Israel and Syria.

Local: This species is distributed in Coastal Strip and Sinai.

Material examined

W. Gaifi (Sinai) 19. 4. 1928 (1); Amriya 4. 3. 1914 (4); Burg El-Arab (Mariout) 24. 3. 1927 (1); 13. 2. 1926 (1); 17. 3. 1925 (2); El-Arish (Gebel El-Arish) 1. 4. 1920 (1); El-Hammam (Mariout) 2. 2. 1919 (1); 4. 2. 1910 (1); king Mariout 1. 4. 1934 (1); 11. 3. 1935 Rabinovitch (1); Mersa Matrouh 20. 2. 1929 (1); Mex 15. 3. 1927 (2); Burg 8. 3. 1927 (1).
 {17, ALFC}
 Alexandria 1. 4. 1928, Carneri (1); Mariout 1. 3. 1938, Carneri (2); Burg El-Arab 7. 4. 1945, Aly (1); Burg El-Arab 18. 4. 1953, H.P. (1); Burg El-Arab 3. 3. 1955, Aly (2); Montazah 11. 4. 1951, Dr.T.S. (1); Abu Mina 8. 4. 1954, Aly (4) {12, ASUC}
 Burg 25. 3. 1934, Tawfiq (3); Abu Qir 15. 3. 1952 (1) {4, CUC}
 Alexandria 5. 1911 Bloudewa (1); Mariout 10. 3. 1914 L.H.G.Q.G.S. (7); El-Burg (Mariout) 8. 3. 1925 Rabinovitch (5); Mex 20. 3. 1926 Alfieri (1); Alexandria 4. Innes (1); 16. 2. 1963 Breeding (1); Burg 8. 3. 1927 H.C.E. (2); 6. 4. 1937 (1); King Mariout 16. 3. 1935 Rabinovitch (1).
 {19, MAC}

Genus *Vieta* Hope, 1840

Vita Hope, 1840: 116.

Vieta Laporte, 1840: 196.

Dymonus Soleir, 1844: 219.

Type species: *Dymonus tuberculatus* Solier, 1844.

Divieta Reitter, 1914: 390.

Type species: *Vieta costata* Allard, 1874.

Type species: *Sepidium vestitum* Guerin-Meneville, 1831.

Description:

Body pubescent, unequal dorsally. Head prominent enough, leaned, excavated at frons; mentum transverse, narrow basally and weakly emarginated anteriorly; ligula hardly emarginated; maxillary palp thick with last segment slightly secureform; labrum transverse, weakly rounded or truncated forward; clypeus shrunk and truncated anteriorly; eyes subreniform, transverse and stretched out; antennae robust, 2nd segment very short, 3rd segment very stretched out, segments 4th - 10th subcylindrical and slightly decreasing, last segment few thicker, conical or oval and clearly confused with 10th segment. Pronotum slightly transverse, very greatly carinated on median line, this median line prolonged in a tuber bifid advancing on head, pronotum provided laterally with strong down hearted thorn, arched and often bifid; basis of pronotum bisinuated with slightly prominent posterior angles. Elytra oblong or parallel, slightly convex, sub-vertical posteriorly, rounded at shoulders, carinated laterally; epipleura of elytra wide and without fold; legs as in *Spidium*.

***Vieta costata* Allard, 1874 (Fig 17-19)**

Vieta costata Allard, 1874: 149, t.5, f.7.

Type locality: Egypt.

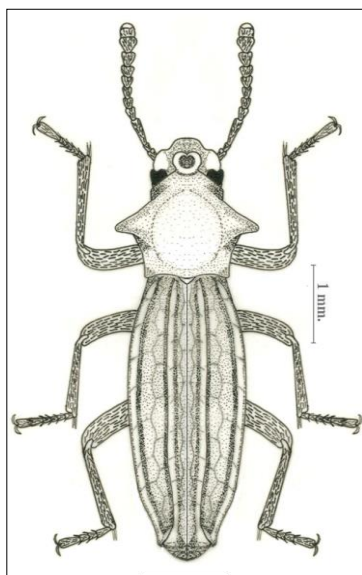


Fig 14: Habitus of *Vieta costata* Allard

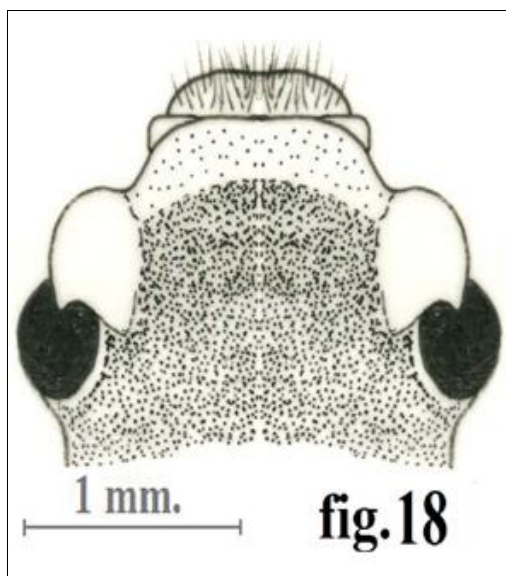


Fig 15: Head

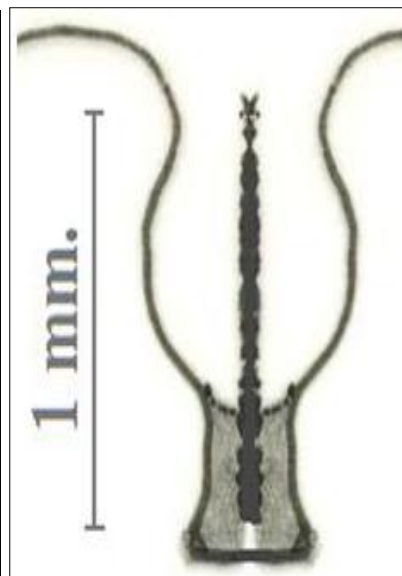


Fig 16: Prosternal process

Description

Body pubescent. Head prominent enough, excavated at frons; labrum transverse, truncated forward; clypeus shrunk and truncated anteriorly; eyes subreniform, transverse and stretched out; antennae robust, 2nd segment very short, 3rd segment very stretched out, segments 4th - 10th subcylindrical and slightly decreasing, last segment few thicker, conical or oval and clearly confused with 10th segment. Pronotum

slightly transverse, very greatly carinated on median line, this median line prolonged in a tuber bifid advancing on head, pronotum provided laterally with strong down hearted thorn; basis of pronotum bisinuated with slightly prominent posterior angles. Elytra oblong or parallel, slightly convex, sub-vertical posteriorly, rounded at shoulders, carinated laterally.

Distribution**World:** Egypt.**Local:** This species is distributed in Sinai.**Material examined**

Wadi Aideib (1) {Auther Col., 1}

Vieta luxorii* Allard, 1874Vieta luxorii* Allard, 1874: 150, t.5, f.9.**Type locality:** Egypt.**Description:** (After Reitter, 1914a).

Pronotum with lateral tooth small, almost parallel and rounded at apex; anterior protuberance clearly marginated and weakly double-swelling.

Distribution**World:** Egypt.**Local:** This species is distributed in Upper Nile.**Note:** This species is not represented in The Egyptian Insect Collections.***Vieta tuberculata* (Solier, 1843)***Dymonus tuberculatai* Solier, 1843:223.*Dymonus gibbicollis* Solier, 1843:224.**Type locality:** Egypt.**Description:** (After Reitter, 1914a).

Pronotum with lateral tooth obtuse and almost rounded at apex; anterior protuberance more or less divided.

Distribution**World:** Egypt, Saudi Arabia and Yemen.**Local:** This species is distributed in Coastal strip**Note:** This species is not represented in The Egyptian Collections.**Conclusions**

The research focuses on the tribe Sepidiini, particularly the Toktokkie beetles, highlighting their morphological characteristics and taxonomic details based on various studies. Specimens were collected from different regions in Egypt and examined. Detailed descriptions of genera and species within the tribe are provided, including diagnostic characters and distribution patterns. Figures illustrating key morphological features accompany the descriptions. The study contributes to understanding the diversity and distribution of Sepidiini beetles in Egypt, aiding in their classification and identification.

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