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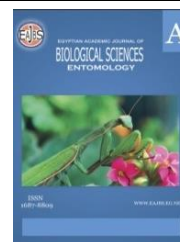
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Taxonomic Revision of Tribe Akidini (Coleoptera: Tenebrionidae) in Egypt

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ABSTRACT

In this work tribe Akidini of subfamily Pimellinae belonging to family Tenebrionidae was revised. In Egypt, two genera are *Akis* Herbst and *Morica* Solier compressed 9 species were recorded in the tribe Akidini; seven species belonging to the genus *Akis* are *A. cyrenaica*; *A. elevata*; *A. gestroi*; *A. latreillei*; *A. reflexa*; *A. sculptior*; *A. trilineata* and two species belonging to genus *Morica* which are *M. constitubera* and *M. grossa*. Representatives of most species were available whether from the field survey during the present work and/or at the Egyptian Reference Insect Collections. The present study has been planned to survey, Classify and determine the recent taxonomic status of the available species of tribe Akidini in Egypt. Diagnosis of tribe, genera and species with illustrations of all taxa are given.

INTRODUCTION

Family Tenebrionidae is a large group of Coleoptera with worldwide distribution. They live mainly in the soil, under logs and stones or tree trunks. They are mostly of little direct economic importance. They generally feed on the material of plant Origin; however, a few species have become associated with stored products in the storage and the root. Feeding larvae of other species can also be agricultural pests, especially of young plants and during dry conditions. Also, young seedlings can be damaged by some adult tenebrionids, and other fungal-feeding tenebrionid species may become local pests of cultivated mushrooms (Booth *et al*, 1990). Family Tenebrionidae can be distinguished from other tenebrionoid families by closed procoxal cavities; tarsal formula 5-5-4; antennae typically 11-segmented, their insertions hidden by lateral extension of genae; abdomen with five visible sternites, the first three connate, 4 and 5 movables.

The higher classification, zoogeography and world distribution were discussed by many investigators (Koch, 1935, 1940; 1941 & 1955; Keleinikova, 1963; Alfieri, 1976; Salem *et al* 1986, 1992 & 2020; Medvedev, 1990; Matthews, 1998; El-Moursy *et al* 1996, 1998 & 2001; Bouchard *et al* 2005, 2007, 2009 & 2011; El-Shewy *et al* 2023 and Rahik *et al* 2023

The systemic position of Akidini and their geographical distribution were treated by Reitter 1904; Shalaby 1958; Español 1959; Watt 1974 & 1992; Kaszab, 1979-1981 & 1982; Lawrence, J. F. and A. F. Newton (2005); Lillig, M. and Pavlicek, T. (2003);

Alejandro; López-Pérez 2010; Elshewy *et al* 2016. Recent taxonomic position and senior synonyms are provided following Löble *et al* (2008).

MATERIALS AND METHODS

The present taxonomic work was based on the examination of all specimens that were collected during trips by using pitfall traps, in addition to the preserved specimens in the Egyptian Reference Insect Collections for materials regarded as Akidini beetles; these collections are; The Egyptian Reference Museum of insects (plant protection research institute), collection of Alfieri (Al-Azhar University, faculty of Agriculture), Collection of faculty of Science (Ain Shams University) and Collection of faculty of Science (Cairo University).

RESULTS AND DISCUSSION

Diagnosis of Tribe Akidini:

The species of tribe Akidini are characterized by their rhombus-shaped head; epistome prominent, hidden in the mandibles and leaving a large part of labrum uncovered. Mentum big and very transverse, more or less thick emarginated anteriorly; submentum non-petiolate; the depth of its emargination more or less sinuate. The ligula is entirely or nearly entirely hidden under the mentum; its cilia only appear; the labial palpi prominent, the last segment truncated to the tip and elongated scuriform. Maxillae uncovered; their inner sides terminated by a well-pronounced horny claw, entire or bi-dentate. All segments of maxillary palpi slightly triangular. The labrum is a little prominent; partially under epistome. Eyes are short, not at all prominent and greatly transverse. Antennae with the third segment very long; the ninth and tenth short, small and sub-moniliform; the last one oval. Prothorax strongly emarginated forwards, lateral margins flattened. Scutellum sub-triangular and slightly rounded. Elytra very embracing abdomen, sides very narrow; elytral epipleura wide and little narrow folded. Legs long, generally thin; posterior coxa oval, strongly separated; spurs of femur mediocre and robust; tarsus smooth. Inner coxa large, quadrangular. Metathoracic episternum narrow, parallel. Mesothoracic epimerons big and oblique.

Key to Genera:

1-Legs long and strongly rugose; anterior femur thin and not widened anterior. Prothorax transverse mediocre, truncate at base. Elytra oval, not convex, shoulder angulated, with 1-2 dorsal ridges..... **Akis HERBEST**
 - Legs mediocre and robust, slightly rugose; anterior femur widened and swollen anteriorly. Prothorax is strongly transverse and strongly curved at the base. Elytra oval convex, shoulder rounded, with 4 dorsal-ridges.**Morica SOLIER**

Genus: *Akis* HERBEST, 1799

Akis HERBEST, 1799: Natursyst. Käf., 8: 124.

Type species: *Akis trilineata* HERBEST, 1799: Natursyst. Käf., 8: 130.

Body: slightly dull, interrupted by a considerable constriction to the basis of the prothorax.

Head: carinated above eyes, dilated and rounded to the level of antennae, particularly narrow forward; the epistome more or less emarginated; mentum rather big, plane, cordiform, greatly rounded on sides, sinuate at middle; lateral teeth of submentum large, emarginated, internal angle prolonged and sharp; ligula hidden under the mentum; labrum transverse, entire. Antennae long, robust, second segment transverse, third segment very long and cylindrical, 4-8 segments obconic, depressed, subequal, 9 in the same shape, shorter, 10 transversal, 11 oval, acuminate at apex; Prothorax more or less transverse,

cordiform, strongly emarginated anteriorly, its basis truncate, broadly thin and raised on sides, with its posterior angles prominent, sharp and straighten; scutellum rather big rounded behind. Elytra cordiform or plane, greatly sloped and narrow behind, carinated laterally and rounded to shoulders; their epipleura large and subvertical. Legs long, rough; femur rounded; last tarsal segment little longer than the 1st. Prosternum curved behind the anterior coxae; Mesosternum sloped. Abdomen more finely and densely punctate, sometimes wrinkled. With a brilliantly articulated membrane between the third and fourth abdominal sterna.

This genus is represented in Egypt by seven species.

key to *Akis* species

- 1- Elytral ridges carinated 2
 – Elytral ridges tuberculated 5
 2- Elytra with one carinated ridge (Fig. 5) *latreillei* SOLIER
 – Elytra with two carinated ridges, internal one short not reach the base 3
 3- Area between the base of elytra and internal dorsal ridge completed by granules 4
 – Area between the base of elytra and internal dorsal ridge smooth (Fig. 3)
 *elevata* SOLIER
 4- Posterior margin of pronotum broadly emarginated, posterior angles of pronotum curved and acute (Fig. 7) *sculptior* KOCH
 - Posterior margin of pronotum narrowly emarginated, posterior angles of pronotum straight and acute (Fig. 1) *trilineata* HERBEST
 5- Tubercles of the internal dorsal ridge close to each other and appear as delicate carina (Fig. 2) *cyrenaica* SCHUSTER
 – Tubercles of internal dorsal ridge far from each other 6
 6 - Tubercles rounded (Fig. 6) *reflexa* FABRICUS
 – Tubercles sharp (Fig. 4) *gestroi* SCHUSTER

***Akis trilineata* HERBEST, 1799**

Akis trilineata HERBEST, 1799: Natursyst. Käf., 8: 130.

Akis barbara SOLIER, 1836: Ann. Soc. Ent. France, 5: 673.

Type locality: Italy: Sardinia: Barbara.

Diagnosis:

Body: 17-21 mm. in length and 8-9.5 mm. in width. Black oblong oval. Habitus Figure 1. Head wider than long, its length 3-4 mm., width 3.7-4.7 mm.; finely punctate. Antennae long 8-10 mm., third segment twice as long as second segment; Prothorax transverse, wider than long; anterior margin straight; Posterior margin narrowly emarginated; Lateral sides slightly curved; anterior angles little prominent; posterior angles of pronotum straight and acute; finely punctate. Elytra elevated, longer than wide; with 2 carinated dorsal ribs, internal carinated rib short and the area between the base of elytra and internal dorsal rib completed by granules; scutellum cordiform. Legs long rugose, last tarsal segments twice as long as first segments. Abdomen finely punctate.

World Distribution: Mediterranean species are confined to Egypt and Italy.

Local Distribution: this species is restricted in Egypt to the Sinai

Material examined: Wadi Talaa, 19. II. 1999, 1 (MSAC).

***Akis cyrenaica* SCHUSTER, 1927**

Akis reflexa cyrenaica SCHUSTER, 1927: Ann. Mus. Civ. Genova, 52: 376.

Akis reflexa cyrenaica; ALFIERI, 1976: Mem. Soc. Ent. Egypt, 5: 183.

Type locality: Libya: Jaghbub.

Diagnosis:

Body 16–24mm. in length and 6-9 mm. in width. Dark black, oblong, parallel and narrow. Habitus (Fig. 2).

Head small, quadrate, its length 2.5-3.5 mm. and width 2.5 – 3.3 mm; scarcely punctate. Antennae long 6-8 mm.; third segment twice as long as second segment; Prothorax wider than long; anterior margin bisinuate; posterior margin truncate; lateral sides rounded and sinuate posteriorly; anterior angles little prolonged; posterior angles strongly acuminate and pointed in male, little long prominent in female. Disc scarcely punctated. Scutellum triangular. Elytra less flattened, slightly convex; longer than wide; with 2 dorsal tubercular ridges, granules of internal ridge elongated, very near, close to each other and make a carina. Legs long rugose, last tarsal segment little longer than the first segment. The abdomen is punctuated and weakly wrinkled in the middle of abdominal segments. Male genitalia (Figs. 2a, 2b, 2c, 2d).

World Distribution: North African species are distributed only in Egypt and Libya.

Local Distribution: this species is common in the western part of the Mediterranean coast, and it's southwardly distributed in the Western Desert at Gebel Mansouriya in Giza and Luxor in the Upper Nile. In addition, it is recorded from the northern part of the Eastern Desert at Isthmic Desert.

Material examined: Abu Qir, 10. VII. 1955, Dr.T., 2 (ASUC); Amria (Mariout) 12. VII. 1924, 2 (MAC); Bahig, 18. IV. 1933, 14 (MAC); Burg El Arab, 3. III. 1955, Aly, 2 (ASUC); Burg El Arab, 9. IV. 1955, Aly, 2 (ASUC); Burg El Arab, 17. IV. 1924, 10 (MAC); Dabaa, 10. III. 1930, 1 (MAC); Dekheila, 8. IV. 1955, Aly, 1 (ASUC); Dekheila, 23. III. 1928, 1 (MAC); G. Mansouriya, 20. III. 1955, Aly, 1 (ASUC); G. Mansouriya, 11. III. 1924, 1 (MAC); Hamamat, 26. VII. 1926, 2 (MAC); Hamamat, 26. VII. 1926, 2 (MAC); Kasr Mariout, 26. VII. 1956, 10 (MAC); King Mariout, 24. VII. 1917, 1 (MAC); Luxor, 10. XI. 1927, 1 (MAC); Mersa Matrouh, 27. III. 1920, 11 (MAC); Mersa Matrouh, 22. III. 1933, 10 (MAC); Mersa Matrouh, 19. III. 1929, 7 (MAC); Mersa Matrouh, 18. III. 2005, Neven, 2 (Auth); Mersa Matrouh, 22. VIII. 1954, 2 (CUC); Mersa Matrouh, 29. VIII. 1954, 1 (CUC); Mersa Matrouh, 29. VIII. 1954, 3 (CUC); Montazah, 4. III. 1955, Aly, 3 (ASUC); Salloum, 24. III. 2004, Neven, 2 (Auth); Serapium, III. 1924, 1 (MAC); Sidi Barani, 29. IV. 1914, 1 (MAC); Suez Road, 9. X. 1955, Aly, 1 (ASUC).

***Akis elevata* SOLIER, 1836**

Akis elevata SOLIER, 1836: Ann. Soc. Ent. France, 5: 671.

Akis elevata; ALFIERI, 1976: Mem. Soc. Ent. Egypt, 5; 183.

Type locality: Egypt: Nubian area.

Diagnosis:

Body: 16-23 mm. in length and 7-9 mm. in width. Dark black, nearly brilliant and oblong oval. Habitus (Fig. 3).

Head nearly quadrate, as long as wide, its length 3-4 mm. and width 2.3-3.5 mm., finely punctate. Antennae long, 7.5-9 mm.; third segment twice as long as second segment. Prothorax little transverse, as long as wide; anterior and posterior margins straight and emarginated; lateral sides highly curved and elevated, anterior angles little prominent; posterior angles very narrow, prolonged, truncated and forming two projections to tip at male but large, not truncate at female. Scarcely punctate. Elytra with 2 dorsal carinated ridges, internal carinated ridges short not complete to the base of elytra by granules, external carinated ribs acute serrate anteriorly. The scutellum is slightly triangular. Legs long, rugose; last tarsal segments twice as long as the first segment. Abdomen densely punctate. Male genitalia (Figs. 3a, 3b, 3c, 3d).

World Distribution: Palearctic species recorded from Arabia, Egypt, Iraq, Palestine, and North Africa.

Local Distribution: The species is common in the Sinai Peninsula and the northern part of the Eastern Desert and spreads southwardly toward Gebel Elba; and westwardly toward the Nile Delta, the western part of the Mediterranean Coast, and the Western Desert.

Material examined: Abu Rawash, 13. XI. 1954, 1 (CUC); Gabal Asfar, 27. IX. 1954, Aly, 1 (ASUC); Gabal Elba, 18. III & IV. 1928, Tewfik, 1 (MAC); Kharga Oasis, 12. IX. 1917, Alfieri, 1 (ALFC); Kharga Oasis, 12. IX. 1917, L.H.G., 2 (MAC); Kharga Oasis, 24. IX. 1914, Adair, 1 (MAC); Kharga Oasis, 2. XII. 1918, Adair, 1 (MAC); Kharga Oasis, 12. III. 1927, L.H.G., 1 (MAC); Mersa Halaib, 16. I. 1933, Priesner, 1 (MAC); Mex, 4. VIII. 1934, 1 (MAC); W. Deib, 28. I. 2000, 8 (ASUC); W. Deib, 20. I. 2003, 2 (Auth).

***Akis gestroi* SCHUSTER, 1922**

Akis reflexa gestroi SCHUSTER, 1922: Mem. Soc. Ent. Ital., 1: 18 – 19.

Akis reflexa gestroi; ALFIERI, 1976: Mem. Soc. Ent. Egypt, 5; 184.

Type locality: Libya: Benghazi.

Diagnosis:

Body: 16-24.5 mm. in length and 8.5-10 mm. width. Black, dull. Habitus figure 4.

Head wide, its length 2.2-3.5 mm. and width 2.5-4.2 mm.; very finely punctate. Antennae long 7.5-9.5 mm.; third segment twice longer than second. Prothorax is twice as wide as long; anterior and posterior margins straight; lateral margins rounded and sinuate posteriorly; anterior angles pointed, prominent, on the sides weakly rounded; posterior angles strongly acuminate, prominent in the male considerably longer than in the female; disc very finely, dispersed punctate. Elytra oblong oval depressed; longer than wide; with 2 dorsal tuberculate ridges, granules far from each other and sharp, acuminate granules. Legs long and robust; last tarsal segment little longer than the first segment. Abdomen finely punctate. Male genitalia (Figs. 4a, 4b, 4c, 4d).

World Distribution: North African elements distributed in Egypt and Libya

Local Distribution: this species is common in North West of Egypt, mainly in the western part of the Mediterranean Coast, and extends its distribution southwardly in the Western Desert until Baharia Oasis, the desert part of Giza, and Fayoum Oasis.

Material examined: Baharia Oasis, 14. X. 1927, 1 (MAC); Bahig, 19. IV. 1963, 2 (MAC); Burg El Arab, 20. VI. 2004, 3 (Auth); Burg El Arab, 17. IV. 1963, 8 (MAC); Dabaa, 10. V. 1930, 2 (MAC); Fayoum, II. 2006, 2 (Auth); Hammam, 23. III. 2005, 2 (Auth); Hammam, 16. III. 1930, 6 (MAC); Kerdasa, 20. X. 2004, 4 (Auth); Kerdasa, 15. IX. 1929, 8 (MAC); King Mariout, 6. IV. 1937, 4 (MAC); Mansouria, 8. VII. 1930, 2 (MAC); Mersa Matrouh, 10. VII. 1927, 1 (MAC); Mersa Matrouh, 27. I. 1968, 1 (MAC); Mex, 25. III. 2005, 3 (Auth); Mex, 15. III. 1930, 10 (MAC); Mex, 1. XI. 1929, 4 (MAC); Mex, 4. VIII. 1934, 1 (MAC); Sophia, 28. IX. 1923, 6 (MAC); Without Label 5 (ASUC).

***Akis latreillei* SOLIER, 1836**

Akis latreillei SOLIER, 1836: Ann. Soc. Ent. France, 5: 675.

Akis latreillei; ALFIERI, 1976: Mem. Soc. Ent. Egypt, 5; 183.

Type locality: Morocco.

Diagnosis:

Body: 21-24 mm. in length and 8-9 mm. in width. Slightly brilliant black, oblong and parallel. Habitus (Fig. 5).

Head wide, its length 3.3 mm. and width 3.6 mm., finely punctate. Antennae: long 7.5 mm.; third segment twice longer than second. Prothorax transverse, as long as wide; anterior margin slightly curved; posterior margin straight; laterally very reflected; anterior and posterior angles truncate, rather oblique at the male and female. scarcely finely punctate. Elytra is longer than wide, with one long dorsal carinated ridge but does not reach to base of elytra. Legs rugose, last tarsal segment twice as long as the first segment. Abdomen finely punctate.

World Distribution: Mediterranean species recorded from Asia Minor, Cyprus, Egypt, and North Africa.

Local Distribution: This species is confined to Gebel Elba.

Material examined: Gebel Elba, 12. XII. 2003, Ashraf, 1 (Auth).

Akis reflexa (FABRICIUS, 1775)

Pimelia reflexa FABRICIUS, 1775: Syst. Ent.: 525.

Akis reflexa SOLIER, 1836: Ann. Soc. Ent. France, 5: 658.

Akis reflexa; ALFIERI, 1976: Mem. Soc. Ent. Egypt, 5; 184.

Type locality: Egypt.

Diagnosis:

Body: 17-23 mm. in length and 5.5-9 mm. in width. Dark black, oblong, parallel and narrow. Habitus (Fig. 6).

Head quadrate as long as wide, its length 2.5-3.5 mm. and width 2.7-3.5 mm., scarcely punctate. The antennae slightly are long 6-7 mm.; the third segment is twice as long as wide. Prothorax almost as wide as elytra, little wider than long; anterior margin slightly sinuate; posterior margin truncate; lateral sides rounded and elevated, sinuate posteriorly; anterior angles prominent; posterior angles strongly acuminate, prominent in the male but very large at the female. Disc scarcely punctate. Elytra flat, longer than wide; with 2 dorsal tuberculated ridges, granules of tuberculs far from each other and rounded in shape. The scutellum is slightly triangular. Legs long, last tarsal segments little longer than first segments.

The abdomen is strongly punctuated at the male and finely at the female. Male genitalia (Figs. 6a, 6b, 6c, 6d).

World Distribution: North African species recorded from Algeria and Egypt.

Local Distribution: this species is the commonest of the genus *Akis* in Egypt. It is dispersed in all ecological zones in Egypt.

Material examined: Abu El Sood, 1. IV. 1925, 5 (MAC); Abu Qir, 30. VI. 1907, Alfieri, 1 (ALFC); Abu Qir, 23. I. 1914, Alfieri, 1 (ALFC); Abu Qir, 25. VII. 1926, 1 (MAC); Abu Rawash, 1. IV. 1925, 2 (MAC); Abu Rawash, 4. VIII. 1928, 1 (MAC); Amriya, 7. I. 1911, Alfieri, 1 (ALFC); Aswan, 21. V. 1919, Alfieri, 1 (ALFC); Baharia Oasis, 20 & 24. III. 1925, 1 (MAC); Baharia Oasis, 14. X. 1927, 6 (MAC); Baharia Oasis, 9 (ASUC); Bahig, 18. IV. 1963, 3 (MAC); Barrage, III. 1904, Ferrante, 1 (EESC); Burg, 22. I. 1922, Alfieri, 1 (ALFC); Burg, 14. IV. 1953, 2 (CUC); Burg, 2. V. 1954, 1 (CUC); Burg, 6. V. 1955, Shafiq, 2 (CUC); Burg, 2. V. 1955, 1 (CUC); Burg, 14. IV. 1953, 2 (CUC); Burg, 2. V. 1954, 1 (CUC); Burg, 6. V. 1954, 1 (CUC); Burg, 2. V. 1955, 1 (CUC); Burg, 6. V. 1955, 1 (CUC); Burg Abu Sir, 6. V. 1954, 1 (CUC); Burg Abu Sir, 2. V. 1954, 1 (CUC); Burg Abu Sir, 6. V. 1954, 1 (CUC); Burg Abu Sir, 6. V. 1956, Shafiq, 1 (CUC); Burg Abu Sir, 2. V. 1956, 1 (CUC); Burg Abu Sir, 6. V. 1956, 1 (CUC); Burg El Arab, 9. IV. 1954, Aly, 3 (ASUC); Burg El Arab, 17. IV. 1964, 5 (MAC); Burg El Arab, 17. IV. 2003, Neven, 4 (Auth); Burg El-Arab, 14. VI. 1925, Alfieri, 1 (ALFC); Cairo, VIII. 1909, Alfieri, 1 (ALFC); Cairo, 21. IX. 1913, 3 (MAC); Dekheila, 3. VIII. 1938, Carneri, 1 (ASUC); Dobaa, 25. III. 1931, 5 (MAC); El Arish, 13. IV. 1924, 1 (MAC); El Dabaa, 13. IX. 1916, 3 (MAC); El Dabaa, 10. V. 1930, 1 (MAC); El Katta, 12. IX. 1925, 1 (MAC); El-Hammam, 7. IV. 1921, Alfieri, 1 (ALFC); Fayoum, VII. 1908, Ferrante, 1 (EESC); Fayoum, 15. IV. 1931, 3 (MAC); Fayoum, 19. IV. 2004, Neven, 1 (Auth); G.Asfar, 8. XI. 1953, Aly, 4 (ASUC); Gabal El Mansoriah, 11. III. 1924, 13 (MAC); Gezeira, 15. V. 1922, Alfieri, 1 (ALFC); Hammam, 18. III. 1930, 4 (MAC); Hamamat, 26. VII. 1926, 1 (MAC); Hammam, 16. III. 1930, 1 (MAC); Hammam, V. Innes Bey, 2 (EESC); Helwan, 20. IX. 1911, Alfieri, 1 (ALFC); Helwan, 8. X. 1920, 12 (MAC); Helwan, 29. IX. 1930, Farag, 3 (CUC); Helwan, 29. IX. 1930, 1 (CUC); K35, El Tour, 25. IV. 1934, Rabinovitch, 1 (MAC); King Mariout, 6. IV. 1937, 2 (MAC); Luxor, 14. I. 1927, 9 (MAC); Maadi, 23. V. 1912, 17 (MAC); Maadi, 1. VIII. 1938, Carneri, 1 (ASUC); Mansouria, 8. VI. 1930, 1 (MAC); Mansouria, 8. VI. 1930, 3 (MAC); Mariout, 4. III. 1914, 2 (MAC); Mariout, 12. VII. 1924, 4 (MAC); Mariout, 13 & 16. XII. 1925, 2 (MAC); Mex, 4. VIII. 1934, 1 (MAC); Mex, 1. VIII. 1938, Carneri, 1.

(ASUC); Montazah, 11. IV. 1951, Dr.T.S., 1 (ASUC); Rafa, 9. IX. 1917, 1 (MAC); Ramlah, 15. X. 1913, 1 (MAC); Sarabiaum, 29. V. 1928, 2 (MAC); Shobra, 28. IX. 2006, Neven, 2 (Auth); Sidi Bisher, 27. IX. 1916, 1 (MAC); Tamalay (Mounofia), 1. XII. 1993, H. Fadl, 1 (ASUC); W. Hoff, 17. X. 1930, Farag, 2 (CUC); W. Hoff, 17. X. 1930, 4 (CUC); W. Hoff, 13. X. 1930, Farag, 1 (CUC); W. Hoff, 13. X. 1930, 1 (CUC); Wadi Digla, III. 1923, 1 (MAC); Wadi Shalal, 26. I. 2000, H. Fadl, 1 (ASUC); Without label, 7 (ASUC); Without label, 2 (CUC); without label, 1 (CUC); Zagazig, 30. IX. 1914, 2 (MAC).

***Akis sculptior* KOCH, 1935**

Akis elevata var. *sculptior* KOCH, 1935: Bull. Soc. Ent. Egypt, 18: 52.

Akis elevata var. *sculptior*; ALFIERI, 1976: Mem. Soc. Ent. Egypt, 5; 183.

Type locality: Egypt: Cairo: Maadi.

Diagnosis:

Body: 19-23 mm. in length and 7-11mm. in width. Black, oblong oval. Habitus figure 7.

Head wider than long, its length 3-4 mm., width 3.7-4.7 mm.; finely punctate. Antennae long 8-10 mm., third segment twice as long as second segment. Prothorax transverse, wider than long; anterior margin straight; posterior margin slightly curved; lateral sides curved and sinuate posteriorly; anterior angles little prominent; posterior angles very narrow, prolonged, truncated and forming two projections to tip at male but large, not truncate at female. Disc scarcely punctate. Elytra elevated, longer than wide; with 2 carinated dorsal ridges, internal carinated ridge short and complete to the base of elytra by granules. Legs long, last tarsal segments twice as long as the first segment.

Abdomen finely punctate. Male genitalia (Figs.7a, 7b, 7c, 7d).

World Distribution: Palearctic species recorded from Arabia, Egypt and Jordan.

Local Distribution: It is widely distributed in the eastern part of Egypt; in the Sinai Peninsula, Eastern Desert, Gebel Elba and Nile Delta and its Valley.

Material examined: 6th Tower Suez Road, 9. XI. 1913, Adair, 1 (MAC); Giza, 23. III. 1954, 1 (CUC); Giza, 9. I. 1972, 1 (CUC); K34 Suez Road, 19. X. 1953, 1 (CUC); Kafr El Cheikh, 17. XII. 1933, 1 (MAC); Kom Ombo, 29. I. 1954, Aly, 1 (ASUC); Nadura, 28. IX. 1914, Adair, 1 (MAC); Suez Road, 6. III. 1950, 6 (MAC); W. Digla, 4. XI. 1999, M. S. Abdel-Dayem, 2 (MSAC); Wadi Arab Galala, 1. III. 1926, Alfieri, 1 (MAC); Wadi Digla, 20. X. 1954, Shafiq, 4 (CUC); Wadi El Telah (Sinai), 23. III. 1997, 3 (MAC); Wadi El Telah (Sinai), 23. III. 1997, H. Fadl, 2 (Auth); W. Hoff, 11. I. 1985, H. Fadl, 1 (ASUC); Wadi Sayyal, 9. IX. 1927, Farag, 1 (MAC); Wadi Shaab (Shalateen), 6. X. 1995, H. Fadl, 1 (ASUC); Without label, 2 (CUC).

Genus: *Morica* SOLIER, 1836

Morica SOLIER, 1836: Ann. Soc. Ent. France, 5: 646.

Type species: *Morica octocostata* SOLIER, 1836: Ann. Soc. Ent. France, 5: 649.

Body: brilliant and interrupted by a considerable constricted to the basis of elytra.

Head Short, carinated above eyes; epistome slightly emarginated; Mentum large, subcordiform, plane, with little elevated sides, its base more or less sinuate; sometimes having two small indentations, slightly prominent and slightly emarginated in angle; lateral teeth of submentum less emarginated, their internal angles never prolonged in a sharp projection; ligula hidden under the mentum, divided transversally, thick, with very thin lateral sides, Internal lobe of maxilla terminate with a horny claw, robust entire, last segment of palpi little bigger than the preceding, and slightly securiform; labrum prominent, transverse and horny. Eyes short, considerably transverse and nearly right. Antennae short, third segment notably very longer than second; 4-8 segments widen, sub-triangular, little elongate, decreasing gradually in width; 9-10 very short, transverse, equally compressed; 11th segment very small, oval in shape. Thorax Prothorax is strongly transverse and its sides more strongly rounded and thin, the width less two times than of median length, to laterally dilated, but hardly elevated backwardly in the two sexes;

emarginated anteriorly: base indentated in arch of circle, and to posterior angles little or particularly prolonged behind, and similar in the two sexes. Scutellum small. Elytra regularly oval, slightly narrow and slightly prominent behind and strongly embracing to narrow sides; legs slightly thick, very short and very robust; femur acute, compressed anteriorly; anterior tibia dense or slightly rough and slightly triangular or filiform. Abdomen finely punctuated.

key to *Morica* species

- 1- Elytral ridges tuberculated. Intervals between ridges granulated with 1-2 granules *costitubera* MARSEUL
 - Elytral ridges carinated Intervals between ridges smooth *grossa* (LINNAEUS)

***Morica constitubera* (MARSEUL, 1883)**

Akis constitubera MARSEUL, 1883: Abeille, 21: 182 – 183.

Akis schweinfurthi QUEDENFELDT, 1890: Ber. Ent. Zeitschr., 35: 139.

Morica pharao REITTER, 1904: Best.- Tab., 53: 38.

Akis constitubera; ALFIERI, 1976: Mem. Soc. Ent. Egypt, 5; 183.

Type locality: Libya: Cyrenaica.

Diagnosis:

Body: 18-22 mm. in length and 8-11 mm. in width. Sub-parallel, slightly convex, and sub-dull. Habitus (Fig. 8).

Head rectangular in shape, its length 3.5-4 mm. and width 3.4-4 mm.; with dug of foveolate deep of each side and finely punctate. Antennae long, 6-7 mm.; third segment twice as long as second segment. Prothorax wider than long; anterior and posterior margins straight; lateral sides thin, elevated, rounded and sinuate posteriorly; anterior angles sub-acute; posterior angles greatly acuminate and prolonged in males and little prolonged in female; finely punctate but deep in the anterior part of the disc. Elytra oblong oval, longer than wide, margin thin carinated and flat in both sexes; with 2 dorsal tubercular ridges, distance between ridges granulate by one or two granules. Scutellum wide rounded posteriorly. Legs rugose; last tarsal segment little longer than the first segment. Abdomen dots punctate.

World Distribution: North African species recorded from Egypt and Libya.

Local Distribution: *M. constitubera* inhabits the western part of the Mediterranean Coast and extends its distribution eastward to North Sinai.

Material examined: Amriya (Mariout), 12. VII. 1924, 1 (MAC); Amria (Mariout), 13. VII. 1924. 1 (MAC); Amriya, 13. VI. 1925, Alfieri, 3 (ALFC); El-Arish 13. VII. 1924, Alfieri, 2 (ALFC); Mersa Matrouh, 29. III. 1927, Mellor, 1 (MAC).

***Morica grossa* (LINNAEUS, 1767)**

Morica grossa (LINNAEUS, 1767): Syst. Nat. ed., 12: 676.

Morica octocostata SOLIER, 1836: Ann. Soc. Ent. France, 5: 649.

Type locality: Egypt

Diagnosis:

Body: 19-22 mm in length and 9-11 mm in width. Black, brilliant and oval. Habitus (Fig. 9).

The head is short and slightly rectangular; its length is 4-4.8mm. and width 3.3-4.5mm.; The head is slightly punctuated. Antenna: short, 5-6 mm.; third segment twice as long as second. Prothorax wider than long by twice; anterior margin straight; posterior margin strongly curved; lateral sides strongly rounded; anterior and posterior angles little prolonged and similar in 2 sexes. Disc slightly punctate. Elytra transverse, longer than wide; each elytron with 4 prominent coasts, greatly toothed posteriorly; interval fine and little deep punctation. Scutellum small, rounded posteriorly. Legs short finely ragouse; last tarsal segment as long as the first segment. Abdomen Finely punctate. Male genitalia (Figs. 9a-9f).

World Distribution: Mediterranean specimens recorded from Libya, Egypt, Portugal, Spain, Syria and Tunisia.

Local Distribution: This species is widely distributed in the Western part of the Mediterranean Coast and spreads eastwardly to the North of the Sinai Peninsula. Moreover, it is reached southwardly until Baharia Oasis in the Western Desert and Helwan in the Eastern Desert.

Material examined: Agamy, 20. VII. 2005, Neven, 2 (Auth); Alexandria, 11. IX. 1910, Alfieri, 1 (ALFC); Alexandria, IV. 1911, 1 (MAC); Ameria (Mariout), 12. VII. 1924, 1 (MAC); Amryia, 10. IV. 1932, 2 (MAC); B.El Arab, 20. VIII. 1945, Aly, 1 (ASUC); B.El Arab, 9. IV. 1954, Aly, 1 (ASUC); B.El Arab, 20. VIII. 1955, Sh.El.A., 1 (ASUC); Baharia Oasis (El Ayat), 4. X. 2004, Neven, 1 (Auth); Bahig, 18. IV. 1963, 7 (MAC); Bahig, 18. IV. 1963, 7 (MAC); Behig, 1. III. 1927, Alfieri, 1 (ALFC); Behig, 28. II. 1927, 1 (MAC); Burg, 6. V. 1955, Shafiq, 1 (CUC); Burg, 2. V. 1955, 1 (CUC); Burg, 6. V. 1955, 1 (CUC); Burg El Arab, 26. X. 1933, 3 (MAC); Burg El Arab, 18. X. 1933, Mabrouk, 2 (MAC); Burg El Arab, 19. X. 1963, 3 (MAC); Burg El Arab, X. 1958, 2 (MAC); Dekheila, 23. III. 1928, 16 (MAC); El Hammam, 18. III. 1956, Sh.El.A., 1 (ASUC); El-Arish, 7. X. 1911, Alfieri, 4 (ALFC); El-Hammam, 12. I. 1910, Alfieri, 3 (ALFC); El-Hammam, 12. I. 1910, Alfieri, 1 (ALFC); Helwan, 10. IV. 1932, 1 (MAC); King Mariout, 15. V. 1915, 1 (MAC); King Mariout, 8. VIII. 1934, 1 (MAC); M. Matrouh, 15. IX. 1957, Aly, 4 (ASUC); M. Matrouh, 21. IV. 1919, 1 (MAC); M. Matrouh, 6. IV. 1919, 1 (MAC); M. Matrouh, 10. VII. 1927, 10 (MAC); M. Matrouh, 28 & 30. VII. 1929, 11 (MAC); Mariout, 10. III. 1914, 11 (MAC); Mariout, 1. III. 1920, Carneri, 2 (ASUC); Mariout (El Burg), 13 & 16. II. 1925, 1 (MAC); Mariuh, 26. IV. 1932, 6 (MAC); Mersa Matrouh, 10. VII. 1927, Alfieri, 1 (ALFC); Mersa Matrouh, 18. III. 1933, 6 (MAC); Mersa Matrouh, 18. III. 2007, Ahmed, 3 (Auth); Mex, 14. I. 1912, Alfieri, 1 (ALFC); Mex, 21. VIII. 1939, Carneri, 1 (ASUC); Mex, 4. VIII. 1934, 2 (MAC); Salloum, 24. III. 1933, 1 (MAC); Sidi Barani, 29. IV. 1936, 1 (MAC); Zayd City, 18. IX. 2006, Neven, 3 (Auth).

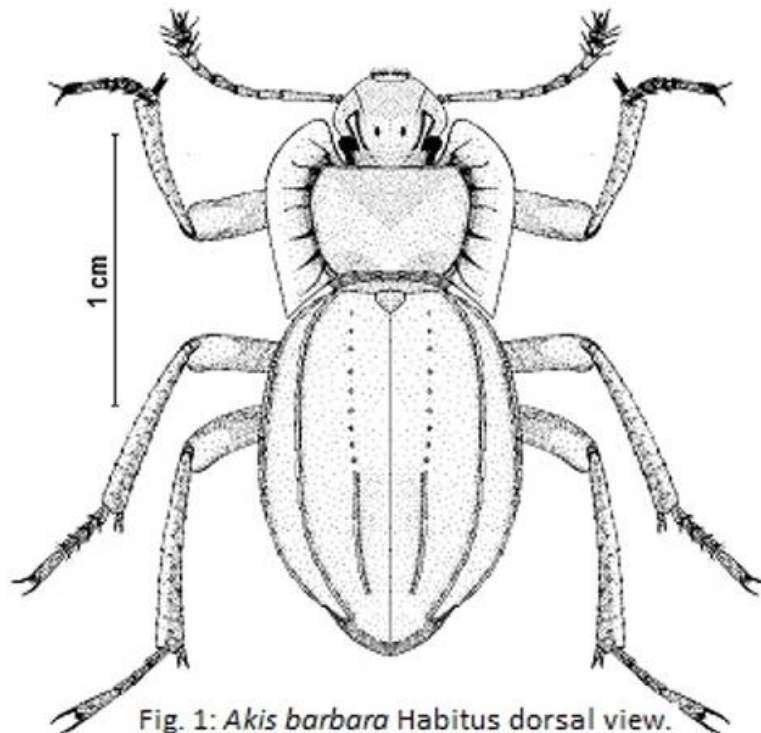


Fig. 1: *Akis barbara* Habitus dorsal view.

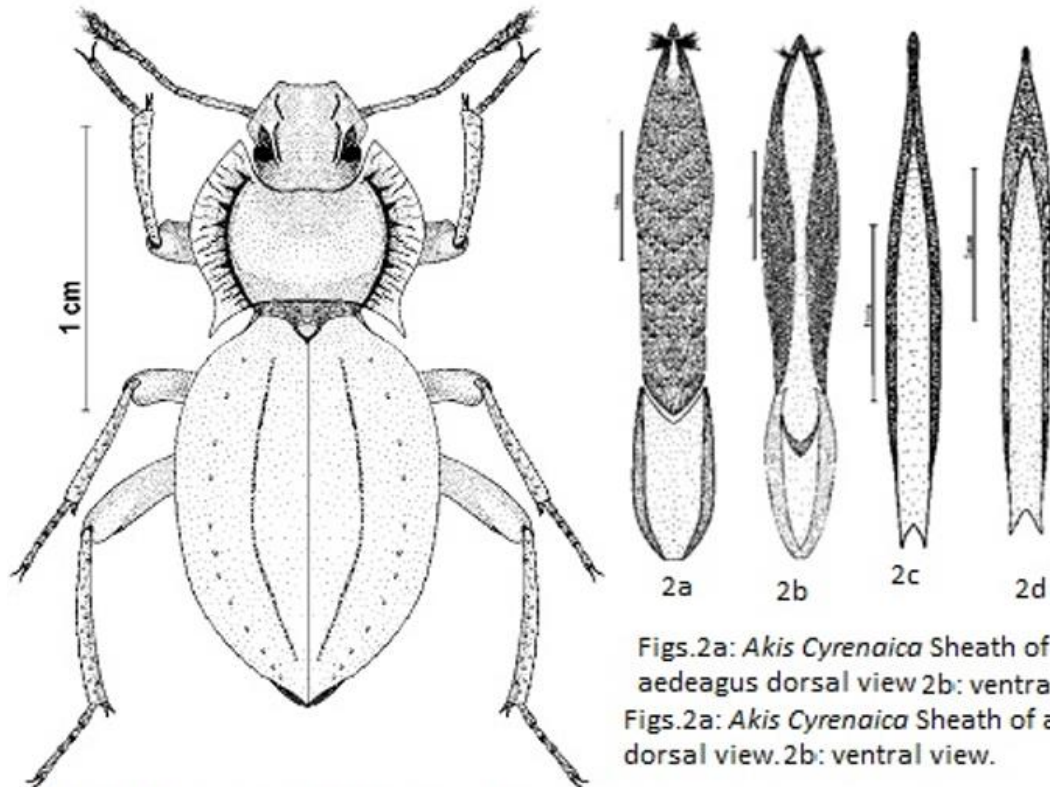


Fig. 2: *Akis cyrenaica* Habitus dorsal view.

Figs.2a: *Akis Cyrenaica* Sheath of aedeagus dorsal view 2b: ventral view.
 Figs.2c: *Akis Cyrenaica* Sheath of aedeagus dorsal view. 2d: ventral view.

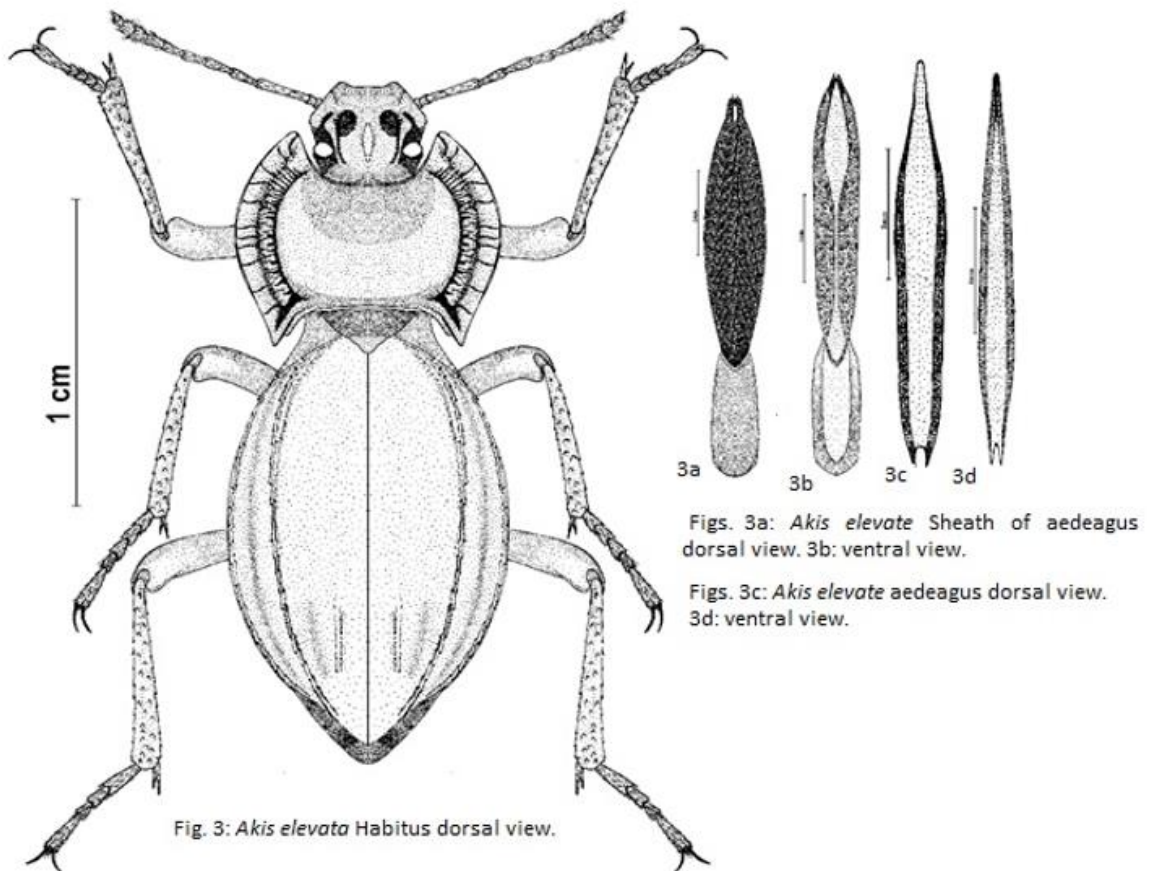


Fig. 3: *Akis elevate* Habitus dorsal view.

Figs. 3a: *Akis elevate* Sheath of aedeagus dorsal view. 3b: ventral view.

Figs. 3c: *Akis elevate* aedeagus dorsal view. 3d: ventral view.

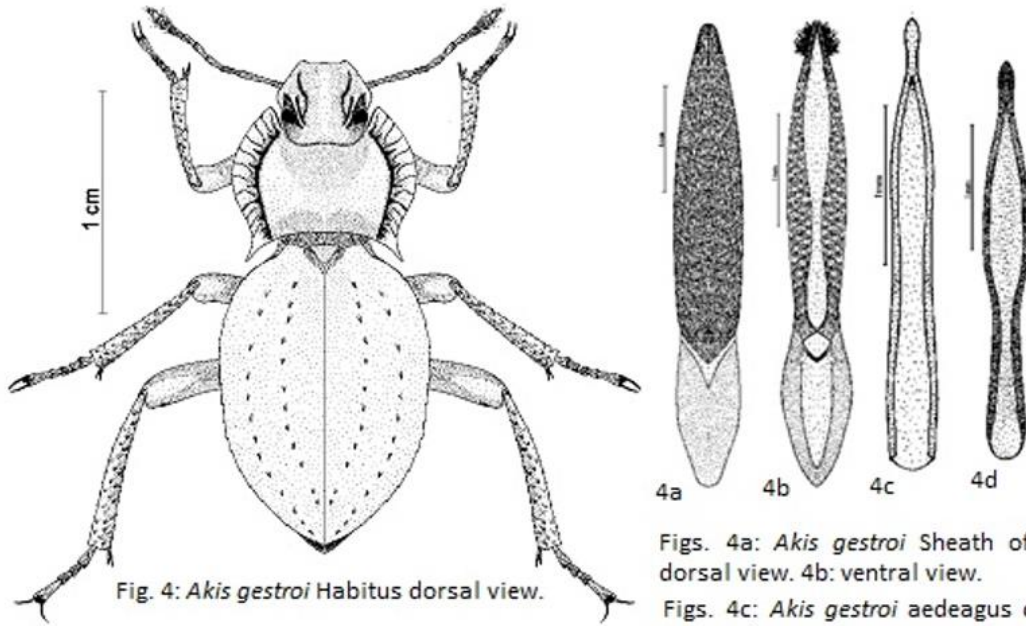


Fig. 4: *Akis gestroi* Habitus dorsal view.

Figs. 4a: *Akis gestroi* Sheath of aedeagus dorsal view. 4b: ventral view.

Figs. 4c: *Akis gestroi* aedeagus dorsal view. 4d: ventral view.

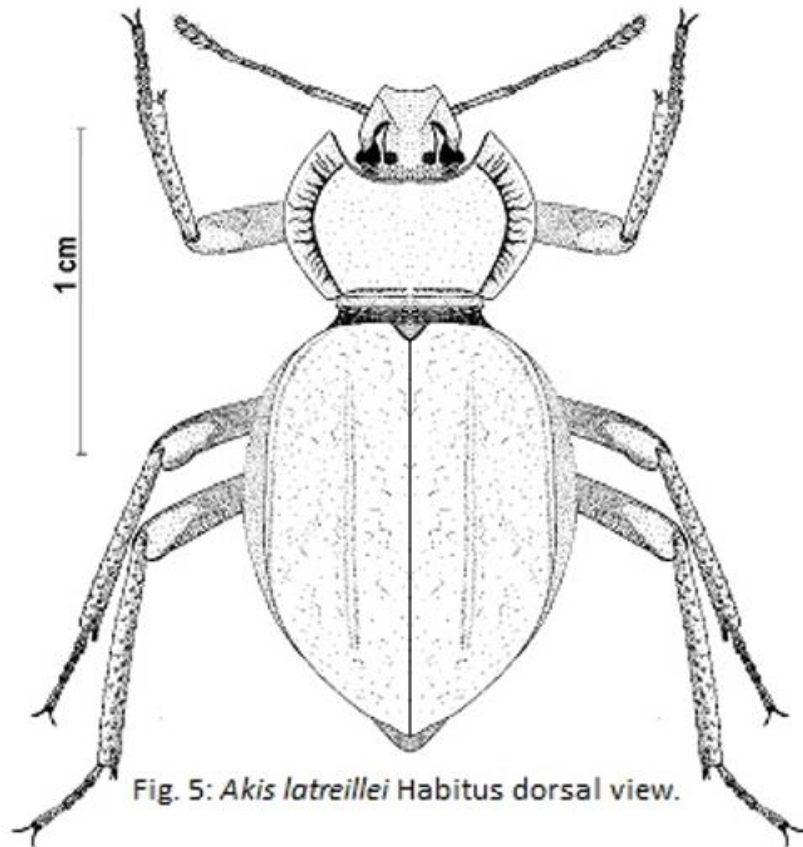


Fig. 5: *Akis latreillei* Habitus dorsal view.

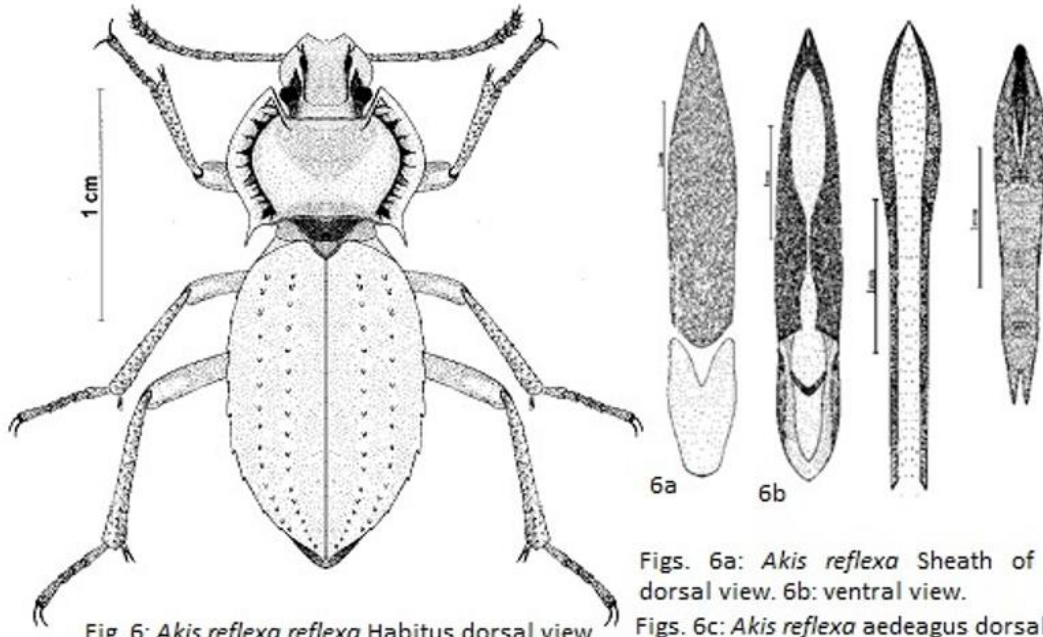


Fig. 6: *Akis reflexa reflexa* Habitus dorsal view.

Figs. 6a: *Akis reflexa* Sheath of aedeagus dorsal view. 6b: ventral view.

Figs. 6c: *Akis reflexa* aedeagus dorsal view. 6d: ventral view.

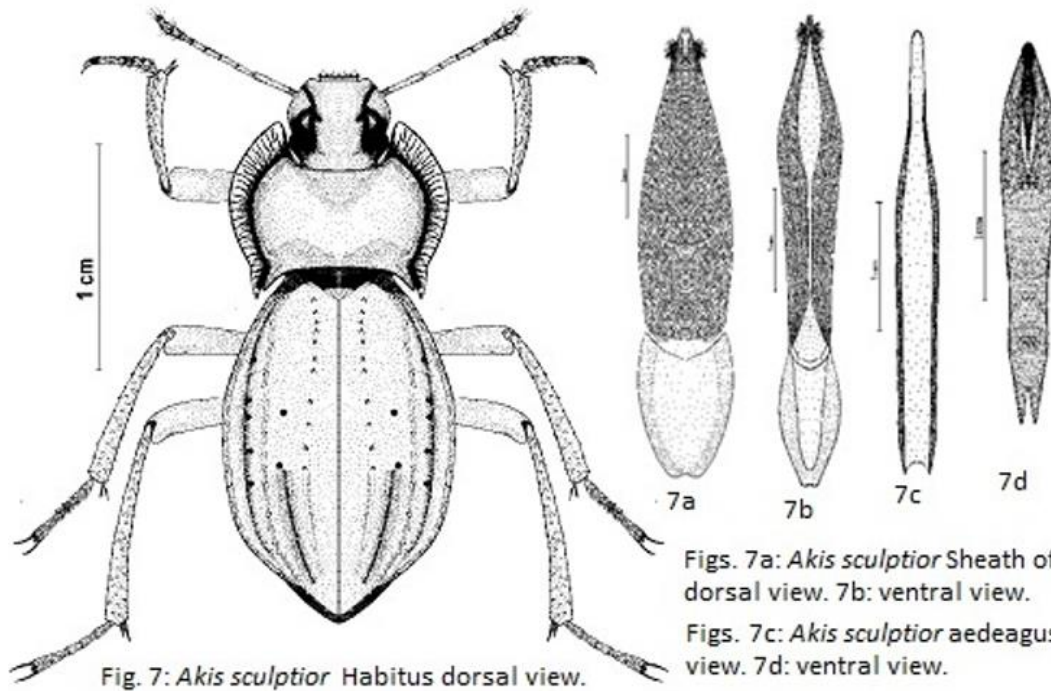


Fig. 7: *Akis sculptior* Habitus dorsal view.

Figs. 7a: *Akis sculptior* Sheath of aedeagus dorsal view. 7b: ventral view.

Figs. 7c: *Akis sculptior* aedeagus dorsal view. 7d: ventral view.

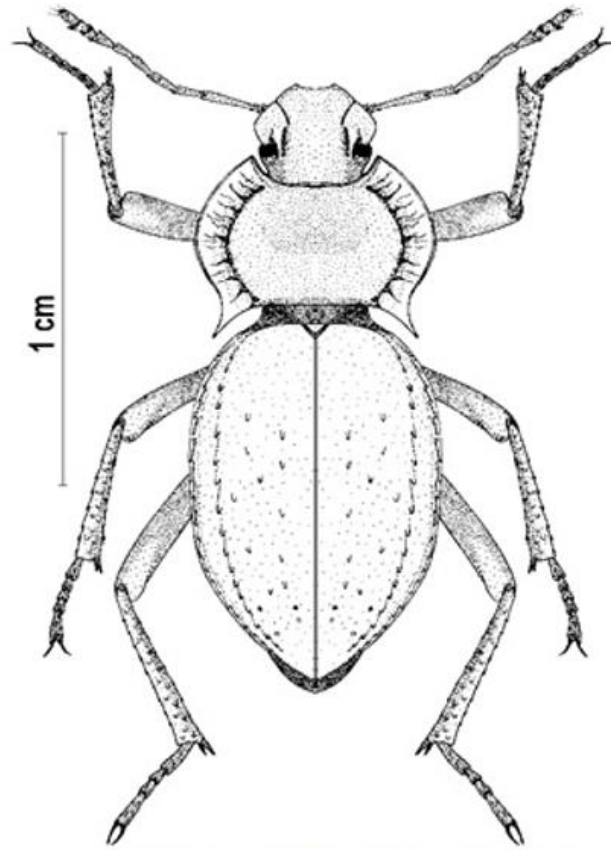
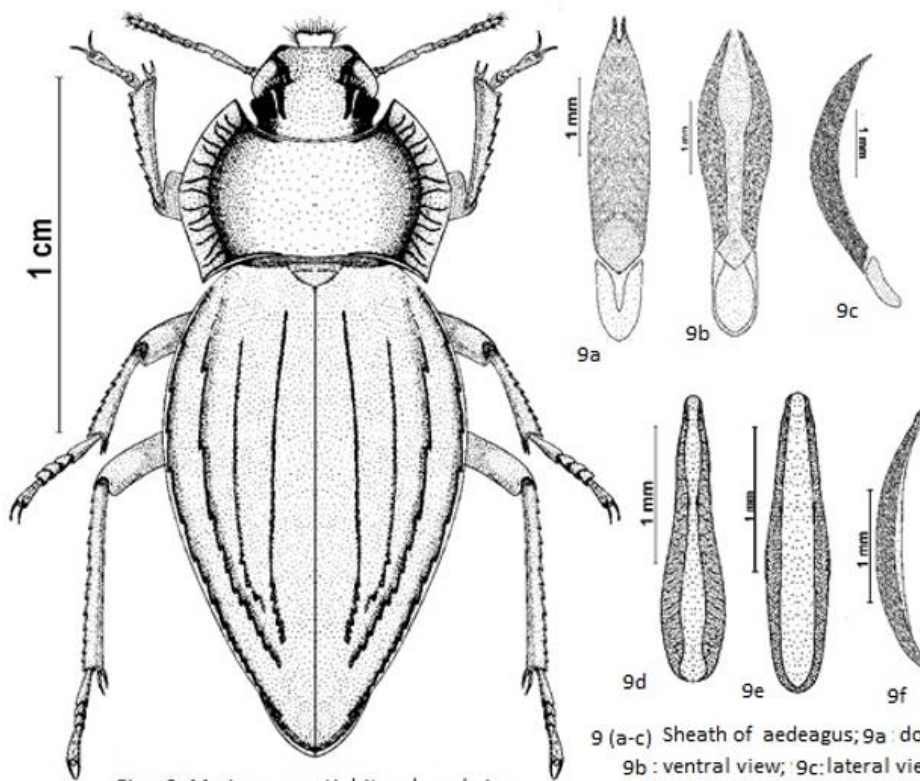


Fig. 8: *Morica constitubera* Habitus dorsal view.



Figs. 9: *Morica grossa* Habitus dorsal view.

9 (a-c) Sheath of aedeagus; 9a : dorsal view;
 9b : ventral view; 9c: lateral view.
 9 (d-f) : Aedeagus; 9d : dorsal view;
 9e: ventral view; 9f : lateral view.

Declarations:

Ethical Approval: Ethical Approval is not applicable.

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Acknowledgments: Not applicable

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