Systematic Studies on The Male Genital Organs of Central Anatolian Elateridae (Coleoptera) Species Part I: The Subfamilies Elaterinae and Melanotinae

İç Anadolu Bölgesi Elateridae (Coleoptera) Türlerinin Erkek Üreme Organları Üzerinde Sistematik Çalışmalar, Kısım 1: Elaterinae ve Melanotinae Altfamilyaları

Research Article / Araştırma Makalesi

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ABSTRACT

Taxonomical studies on the family Elateridae were mainly condensed on morphological characters. In palearctic region, most comprehensive studies were done in France, Armenia, Italy, Czech and Slovak Republics, Poland. These studies, which cover male genital organ structures, are systematical researches. In this study, male genital organs of Central Anatolian species of the subfamilies Elaterinae and Melanotinae were examined. Morphology of male genital organs were drawn in detail and described. Male genital organ structures of *Adrastus circassicus* and *Melanotus (s.str.) bajulus* were examined in detail for the first time. According to male genital organ morphologies, systematical status of examined species are discussed.

Key Words
Male genital organs, Elaterinae, Melanotinae, Systematic.

ÖZET

Elateridae familyası üzerinde yapılan taksonomik çalışmalar çoğunlukla morfolojik karakterler üzerinde yoğunlaşmıştır. Palearktik bölgedeki en kapsamlı çalışmalar Fransa, Ermenistan, İtalya, Çek cumhuriyeti, Slovakya ve Polonya'da yapılmıştır. Bunlar sistematik çalışmalar olup erkek üreme organ yapılarını da içermektedir. Bu çalışmada, Elaterinae ve Melanotinae altfamilyalarının İç Anadolu türlerinin erkek üreme organları ayrıntılı biçimde çizilmiş ve tartışılmıştır. *Adrastus circassicus* ve *Melanotus (s.str.) bajulus* türlerinin erkek üreme organ yapıları ilk defa ayrıntılı biçimde incelenmiştir. İncelenen türlerin sistematik durumları erkek üreme organ morfolojilerine göre tartışılmıştır.

Anahtar Kelimeler
Erkek üreme organı, Elaterinae, Melanotinae, sistematik.

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INTRODUCTION

Taxonomical studies on the family Elateridae were mainly condensed on morphological characters. In palearctic region, most comprehensive studies were done in France [1], Armenia [2], Italy [3], Czech and Slovak Republics [4], Poland [5]. These studies, which cover male genital organ structures, are systematical researches. Male genital organ of the family Elateridae is trilobate type [3]. That consist of basal piece, a pair of parameres and median lobe. Median lobe is situated between parameres, divided two arms at basal and it carries openning of sperm duct at apical [4].

MATERIAL AND METHOD

Male genital organs of species of the subfamilies Elaterinae and Melanotinae, which were collected from Central Anatolian populations, were prepared by using standart methods. Their morphologies were described and drawn in detail from dorsal view.

RESULTS

Subfamily: Elaterinae Leach, 1815
Tribe: Elaterini Leach, 1815
Genus: *Mulsanteus* Gozis, 1875
Mulsanteus guillebaeui (Mulsant and Godart, 1853)

Male Genital Organ (Dorsal) (Figure 1): Basal piece wide, its lateral margins angled at middle, its anterior margin medially concave "U" shaped concave arms of basal piece pointed; median lobe clearly longer than parameres, slightly sclerotized, arms of median lobe thick, short, slightly arcuate, not exceeding ventral posterior margins of parameres, median lobe almost parallel sided from basal to apical, strongly narrowing at apical, its apex pointed finger shaped; outer lateral margins of parameres almost parallel from basal to medio-distal, between medio-distal and apical firstly strongly narrowing then broadening and forming slightly pointed teeth with two bristles, apical of parameres triangular, apex of parameres slightly pointed.

Tribe: Synaptini Gistel, 1856
Genus: *Peripontius* Gurjeva, 1979
Peripontius crassus (Buyson, 1906)

Male Genital Organ (Dorsal) (Figure 2): Basal piece wide, arms of basal piece narrowing from medial towards anterior and pointed, posterior margin slightly concave, anterior margin widely 'V' shapedly notched, lateral margins almost parallel sided, outer margins strongly sclerotized thin and line like, rest of basal piece feebly sclerotized; median lobe longer than parameres, feebly sclerotized, arms of median lobe becoming pointed towards posterior, median lobe strongly narrowing from basal to medial, slightly narrowing from medial to apical, apex blunt; parameres feebly sclerotized, outer lateral margins sinuate from basal to apical, without teeth at distal, apex slightly pointed.

Peripontius omissus (Buyson, 1889)
Male Genital Organ (Dorsal) (Figure 3): Basal piece narrow, posterior margin flat, anterior margin 'U' shapedly notched, lateral margins feebly arcuate, arms of basal piece narrowing from medial towards anterior and pointed, outer margins strongly sclerotized thin and line like, rest of basal piece feebly sclerotized; median lobe thick and barely longer than parameres, feebly sclerotized, arms of median lobe long and thin, median lobe gradually narrowing from basal to medial, slightly broadening at medial, narrowing towards apical like bullet shaped, apex pointed; parameres strongly sclerotized except its apical part, outer lateral margins broadly narrowing at medial and sinuate, without distal teeth, apex pointed.

Peripontius terminatus (Erichson, 1842)
Male Genital Organ (Dorsal) (Figure 4): Basal piece narrow, posterior margin slightly concave at medial, anterior margin widely 'U' shapedly notched, arms of basal piece narrowing from medial towards anterior and blunt, outer margins strongly sclerotized thin and line like, rest of basal piece feebly sclerotized; median lobe thick and longer than parameres, slightly sclerotized, arms of median lobe extending towards with feebly narrowing, median lobe gradually narrowing from basal to proximal, very slightly narrowing from

proximal to apical, triangular shape at apical, apex bluntly pointed; parameres outer lateral margins arcuately concave, parameres with triangular projection at distal, narrowing from distal to apical, apex feebly pointed, with a bristle.

Genus: *Adrastus* Eschscholtz, 1829
Adrastus anatolicus Platia and Schimmel, 1991
Male Genital Organ (Dorsal) (Figure 5): Basal piece looks like 'U' letter, posterior margin straight, lateral margins medially cornered, apex of basal piece arms rounded, outer margins strongly sclerotized thin and line like, rest of basal piece feebly sclerotized; median lobe clearly longer than parameres, slightly sclerotized except the arms and junction point of the arms of median lobe, arms of median lobe long and slender, median lobe bullet shaped from posterior through apical, apex pointed; parameres feebly sclerotized except thin posterior margin, triangularly shaped, outer lateral margins arched from basal to medial, almost parallel through apical, apex feebly pointed, without teeth at distal outer margin.

Adrastus circassicus Reitter, 1896
Male Genital Organ (Dorsal) (Figure 6): Basal piece "U" shaped, arms of basal piece rounded at apex, posterior margin slightly convex, basal piece slightly sclerotized except strongly sclerotized outer margins; median lobe clearly longer than parameres, normally sclerotized, median lobe gradually narrowing from basal to apical, narrowing stronger at apical, arms of median lobe long, sinuate, narrowing to posterior and bluntly pointed; outer lateral sides of parameres parallel sided from basal to medial, narrowing from medial to medio-distal, sinuate from medio-distal to distal, constituting pointed teeth between apical to distal, apex of parameres sharply pointed.

Adrastus montanus (Scopoli, 1763)
Male Genital Organ (Dorsal) (Figure 7): Basal piece rectangular, arms of basal piece rounded, basal piece slightly sclerotized except strongly sclerotized outer margins, anterior margin 'U' shapedly notched, posterior margin strongly convex; median lobe clearly longer than parameres, normally sclerotized except feebly sclerotized apex and medial part, from basal to apical bullet like, arms of median lobe long and extending parallelly, blunt at basal; parameres slightly sclerotized except strongly sclerotized outer margins, lateral outer margins gradually broadening from basal to proximal, extending parallelly from proximal to distal, divergent at distal and bearing a hair, pointed at apex, parameres without distal teeth.

Genus: *Synaptus* Eschscholtz, 1829
Synaptus filiformis
Male Genital Organ (Dorsal) (Figure 8): Basal piece "U" shaped, arms of basal piece rounded at apex, basal piece slightly sclerotized except strongly sclerotized outer margins, anterior margin 'U' shapedly notched, posterior margin concave, lateral margins feebly arcuate; median lobe distinctly longer than parameres, median lobe feebly sclerotized except arms of median lobe and their junction point, arms of median lobe long, thin, arcuate and pointed at basal, arms of median lobe clearly exceeding ventral posterior margins of parameres, median lobe gradually narrowing from basal to apical, pointed at apex; parameres feebly sclerotized except thin line at posterior, ventral part of parameres triangular, reduced ventrally, parameres holding on median lobe with finger like projections, lateral outer margins parallel from basal to medial, sinuate from medial to apical, paramere without distal teeth.

Tribe: Ampedini Gistel, 1856
Genus: *Ampedus* Dejean, 1833
Ampedus cinnaberinus (Eschscholtz, 1829)
Male Genital Organ (Dorsal) (Figure 9): Basal piece lateral margins arcuate, posterior margin roof like concave, anterior margin feebly "U" shapedly notched, arms of basal piece feebly pointed, basal piece slightly sclerotized except strongly sclerotized outer margins; median lobe clearly longer than parameres, normally sclerotized, arms of median lobe long, crescent like, arms of median lobe exceeding ventral posterior margins of parameres, median lobe gradually narrowing towards apical and feebly pointed at apex; parameres triangular, lateral outer margins gradually narrowing from basal to distal, abruptly broadening and forming distal teeth, distal teeth short and weakly pointed, apically triangular and bearing a hair.
Ampedus elegantulus (Schönherr, 1817)

Male Genital Organ (Dorsal) (Figure 10): Basal piece posterior margin roof like concave, anterior margin concave, lateral margins feebly arcuate, basal piece slightly sclerotized except strongly sclerotized outer margins; median lobe clearly longer than parameres, median lobe feebly sclerotized except outer margins and thin line medially, arms of median lobe wide medially pointed at basal, arms of median lobe crescent, median lobe parallel sided from basal to medial and gradually narrowing from medial to apical, apex of median lobe finger shaped; parameres weakly sclerotized, lateral outer margins feebly narrowing from basal to distal, distal teeth weakly pointed and directed posteriorly, bluntly pointed apically .

Ampedus nigroflavus (Goeze, 1777)

Male Genital Organ (Dorsal) (Figure 11): Basal piece lateral margins arcuate from basal to medial and parallel sided from medial to apical, posterior margin straight, anterior margin roof like notched, arms of basal piece rounded at apex, basal piece slightly sclerotized except strongly sclerotized outer margins; median lobe clearly longer than parameres, normally sclerotized, gradually narrowing from basal to proximal, almost parallel sided from proximal to distal, triangular at apical, rounded at apex, arms of median lobe short and divergent, pointed at basal; lateral outer margins of parameres almost parallel sided from basal to medial, gradually narrowing from medial to distal, bearing distal teeth, triangular at apical and bearing five hairs, apex of parameres pointed.

Ampedus platiai Schimmel, 1990

Male Genital Organ (Dorsal) (Figure 12): Basal piece lateral margins arcuate, posterior margin concave, anterior margin "V" shapedly notched, arms of basal piece feebly pointed at apex, basal piece slightly sclerotized except strongly sclerotized outer margins; median lobe distinctly longer than parameres, normally sclerotized, arms of median lobe short, crescent shaped and pointed at basal, median lobe almost parallel sided from basal to medial, slightly concave from medial to distal, gradually narrowing from distal to apical, its apex finger shaped; parameres triangular, lateral outer margins slightly broadening from basal to proximal, gradually narrowing from proximal to distal, bearing distal teeth, triangular at apical with two hairs and pointed at apex.

Ampedus pomonae (Stephens, 1830)

Male Genital Organ (Dorsal) (Figure 13): Basal piece lateral margins slightly arcuate, posterior margin straight, anterior margin "U" shapedly notched, arms of basal piece rounded at apex, basal piece slightly sclerotized except strongly sclerotized outer margins; median lobe clearly longer than parameres, normally sclerotized, arms of median lobe long, slightly crescent shaped, curved outside and weakly pointed, median lobe gradually narrowing from basal to distal, strongly narrowing from distal to apical, weakly pointed at apex; parameres triangular, outer lateral margins broadening from basal to proximal, gradually narrowing from proximal to distal, distal teeth pointed, triangular at apical with a hair, pointed at apex.

Ampedus samedovi Dolin and Agajev, 1983

Male Genital Organ (Dorsal) (Figure 14): Basal piece lateral margins almost straight, posterior margin medially roof like concave, anterior margin concave, arms of basal piece blunt at apex, basal piece slightly sclerotized except strongly sclerotized outer margins; median lobe longer than parameres, normally sclerotized, arms of median lobe short, thick, crescent like and pointed at basal, median lobe gradually narrowing from basal to proximal, parallel sided from proximal to distal, gradually narrowing from distal to apical, rounded at apex; parameres triangular, outer lateral margins broadenning from basal to proximal, gradually narrowing proximal to distal, distal teeth strong and pointed, triangular at apical, pointed at apex.

Ampedus sanguinolentus (Schrank, 1776)

Male Genital Organ (Dorsal) (Figure 15): Basal piece posterior margin slightly concave, anterior margin "V" shapedly notched, lateral margins straight, basal piece slightly sclerotized except strongly sclerotized outer margins; median lobe distinctly longer than parameres, anterior and medial part of outer margins of median lobe strongly sclerotized, the rest of median lobe slightly sclerotized, arms of median lobe thin, horn like, pointed at basal and exceeding ventral

posterior margins of parameres, median lobe bullet like from basal to apical, feebly pointed at apex; parameres strongly sclerotized except slightly sclerotized outer margins, lateral outer margins gradually narrowing from basal to distal, distal teeth short and blunt, parameres pointed at apex.

Tribe: Agriotini Champion, 1894
Genus: *Dalopius* Eschscholtz, 1829
Dalopius marginatus (Linnaeus, 1758)
Male Genital Organ (Dorsal) (Figure 16): Basal piece rectangular, posterior margin straight, anterior margin strongly "V" shapedly notched, basal piece slightly sclerotized except strongly sclerotized outer margins; median lobe clearly longer than parameres, median lobe slightly sclerotized except strongly sclerotized outer margins and medial line, arms of median lobe thin, long, sinuately closing each other and pointed at basal, median lobe feebly narrowing from basal to apical, rounded at apex; lateral outer margins of parameres broadening from basal to proximal and triangular, concave from proximal to medial, concave from medial to distal, distal teeth small and blunt, slightly pointed at apex.

Genus: *Agriotes* Eschshcoltz, 1829
Agriotes gurgistanus (Faldermann, 1835)
Male Genital Organ (Dorsal) (Figure 17): Basal piece square shaped, posterior margin straight, anterior margin "U" shapedly concave, lateral margins feebly arcuate, arms of basal piece pointed at apex, strongly sclerotized except outer margins; median lobe distinctly longer than parameres, median lobe slightly sclerotized except strongly sclerotized arms of median lobe and their junction point, outer margins and thin line from medial to distal, arms of median lobe horn shaped, posteriorly narrowing, not curving outside at basal and not exceeding ventral posterior nargins of parameres, median lobe narrow and almost parallel sided between basal to medio-distal, broadening at medio-distal, rounded at apex; parameres strongly sclerotized except weakly sclerotized at apex, lateral outer margins of parameres almost parallel sided from proximal to medio-distal, feebly broadening from medio-distal, narrowing distally and forming small distal teeth, pointed at apex.

Agriotes heydeni Schwarz, 1891
Male Genital Organ (Dorsal) (Figure 18): Basal piece anterior margin medialy triangular "U" shapedly concave, posterior margin roof like concave, lateral margins cornered medially, arms of basal piece pointed at apex, basal piece slightly sclerotized except strongly sclerotized outer margins and posterior line; median lobe clearly longer than parameres, median lobe slightly sclerotized except strongly sclerotized arms of median lobe and their junction point, outer margins, apical part and thin line from medial to distal, arms of median lobe curved medially, from medial towards posterior almost parallel sided, long, thin and exceeding clearly ventral posterior margins of parameres, median lobe gradually narrowing from posterior to proximal, almost parallel sided between proximal and distal-apical, distinctly narrowing towards apex, rounded at apex; parameres feebly sclerotized except outer margins of distal teeth and inner margins, lateral outer margins of parameres slightly broadening from basal to proximal, weakly sinuate from proximal to distal, distal teeth short and weakly pointed, apex of parameres feebly pointed.

Agriotes infuscatus Desbrochers des Loges, 1870
Male Genital Organ (Dorsal) (Figure 19): Bazal piece posterior margin medially feebly roof like concave, lateral margins narrow at posterior one to three and the rest wide and parallel, anterior margin "V" shapedly notched, arms of basal piece pointed at apex, basal piece slightly sclerotized except strongly sclerotized outer margins; median lobe distinctly longer than parameres, median lobe slightly sclerotized except strongly sclerotized arms of median lobe and their junction point, outer margins, arms of median lobe long, thin, arcuate and not exceeding ventral posterior margins of parameres, median lobe slightly narrowing from basal to medio-proximal, bullet shaped from medio-proximal to apical, pointed at apex; parameres strongly sclerotized except apical part, lateral outer margins almost parallel sided up to distal teeth, distal teeth short and weakly pointed, pointed at apex.

Agriotes lineatus (Linnaeus, 1767)
Male Genital Organ (Dorsal) (Figure 20): Basal

piece rectangular, posterior margin feebly roof like concave, anterior margin "U" shapedly notched, lateral margins cornered medially, basal piece slightly sclerotized except strongly sclerotized outer margins; median lobe clearly longer than parameres, arms of median lobe short, slightly curved inside and pointed at basal, median lobe weakly narrowing from basal to proximal, parallel sided from proximal to distal, feebly narrowing from distal to apical, finger shapedly projected at apex, medial line from basal of parameres to distal, outer margins and arms of median lobe strongly sclerotized; parameres normally sclerotized, lateral outer margins feebly broadening from basal to medial, almost parallel sided from medial to distal, distal teeth small and pointed, strongly narrowing towards apical, pointed at apex.

Agriotes modestus Kiesenwetter, 1858
Male Genital Organ (Dorsal) (Figure 21): Basal piece wide, anterior margin "U" shapedly notched, posterior margin feebly concave, lateral margins cornered posteriorly, arms of basal piece slightly pointed at apex, basal piece slightly sclerotized except strongly sclerotized outer margins; median lobe distinctly longer than parameres, strongly sclerotized, arms of median lobe short, thin and not exceeding ventral posterior margins of parameres, median lobe bullet shaped, weakly pointed at apex; parameres strongly sclerotized, lateral outer margins of parameres parallel sided up to short and pointed distal teeth, triangular at apical, pointed at apex.

Agriotes paludum Kiesenwetter, 1859
Male Genitalia (Dorsal) (Figure 22): Basal piece wide, anterior margin medially depressed 'V' shaped, posterior margin feebly roof like, lateral margins convex at medial, arms of basal piece pointed at apex, feebly sclerotized except outer lines; median lobe barely longer than parameres, slightly sclerotized except strongly sclerotized arms, joining point of arms, outer lines, apical part ve medial lines between arms to distal part, arms of median lobe thin and long, not exceding ventral posterior margin of parameres, median lobe parallel sided except proximal feebly thickening, rounded at apex; parameres slightly sclerotized, lateral outer margins almost parallel sided from proximal to medio-distal, concave from medio-distal to distal teeth, distal teeth short and pointed, apex of parameres feebly pointed.

Agriotes propleuralis Platia and Gudenzi, 1998
Male Genital Organ (Dorsal) (Figure 23): Basal piece wide, anterior margin "U" shapedly notched, posterior margin straight, lateral margins arcuate, arms of basal piece pointed at apex, basal piece slightly sclerotized except outer margins; median lobe clearly longer than parameres, median lobe slightly sclerotized except strongly sclerotized arms of median lobe and their junction point, outer margins and thin line, arms of median lobe short, thin, curved outside at basal, not exceeding ventral posterior margins of parameres, median lobe almost parallel sided from basal to apical, apex rounded; lateral outer margins of parameres strongly sclerotized except feebly sclerotized apex, parameres slightly arcuate basal to apical, distal teeth small and pointed, apex of parameres pointed.

Agriotes proximus Schwarz, 1891
Male Genital Organ (Dorsal) (Figure 24): Basal piece wide, posterior margin slightly concave, anterior margin "U" shapedly notched, lateral margins feebly sinuate, basal piece normally sclerotized except strongly sclerotized outer margins; arms of median lobe, apical margins and medial line of median lobe heavily sclerotized, the rest of median lobe slightly sclerotized, arms of median lobe sinuate and blunt at basal, median lobe bullet shaped except weakly concave part from proximal to medial, its apex finger shaped; parameres feebly sclerotized, lateral outer margins of parameres slighyly arcuate from basal to distal, distal teeth small and pointed, apical of parameres strongly narrowing, apex of parameres distinctly pointed.

Agriotes sputator (Linnaeus, 1758)
Male Genital Organ (Dorsal) (Figure 25): Basal piece posterior margin roof like concave, anterior margin medially depressed "V" shapedly notched, arms of basal piece pointed at apex, basal piece normally sclerotized except strongly sclerotized outer margins; median lobe clearly longer than parameres, arms of median lobe, juntion point of arms of median lobe, outer margins, apical part, thin line from basal to distal of median

lobe strongly sclerotized, the rest of median lobe slightly sclerotized, arms of median lobe short, thick and not exceeding ventral posterior margins of parameres, median lobe gradually narrowing up to proximal, parallel sided from proximal, rounded at apex; parameres weakly sclerotized except outer margins, lateral outer margins of parameres feebly sinuate, distal teeth of parameres short and feebly pointed, apex of parameres rounded.

Subfamily: MELANOTINAE Candèze, 1859
Genus: *Melanotus* Eschscholtz, 1829
Altcins: *Melanotus (s. str.)* Eschscholtz, 1829

Melanotus bajulus (Erichson, 1841)
Male Genital Organ (Dorsal) (Figure 26): Basal piece posterior margin straight, anterior margin "U" shapedly notched, arms of basal piece feebly divergent, lateral margins medially widest and their apex slightly pointed, basal piece normally sclerotized except strongly sclerotized outer margins; median lobe distinctly longer than parameres, slightly sclerotized except heavily sclerotized arms of median lobe, arms of median lobe long and posteriorly narrowing, arcuate and bulky at basal, exceeding ventral posterior margins of parameres, median lobe strongly narrowing from basal to proximal, almost parallel sided from proximal to apical, its apex bulky and rounded, bearing opening; parameres normally sclerotized, lateral outer margins gradually broadening from basal to proximal, almost parallel sided from proximal to distal, strongly broadening distally and forming posteriorly directed distal teeth, pointed at apex.

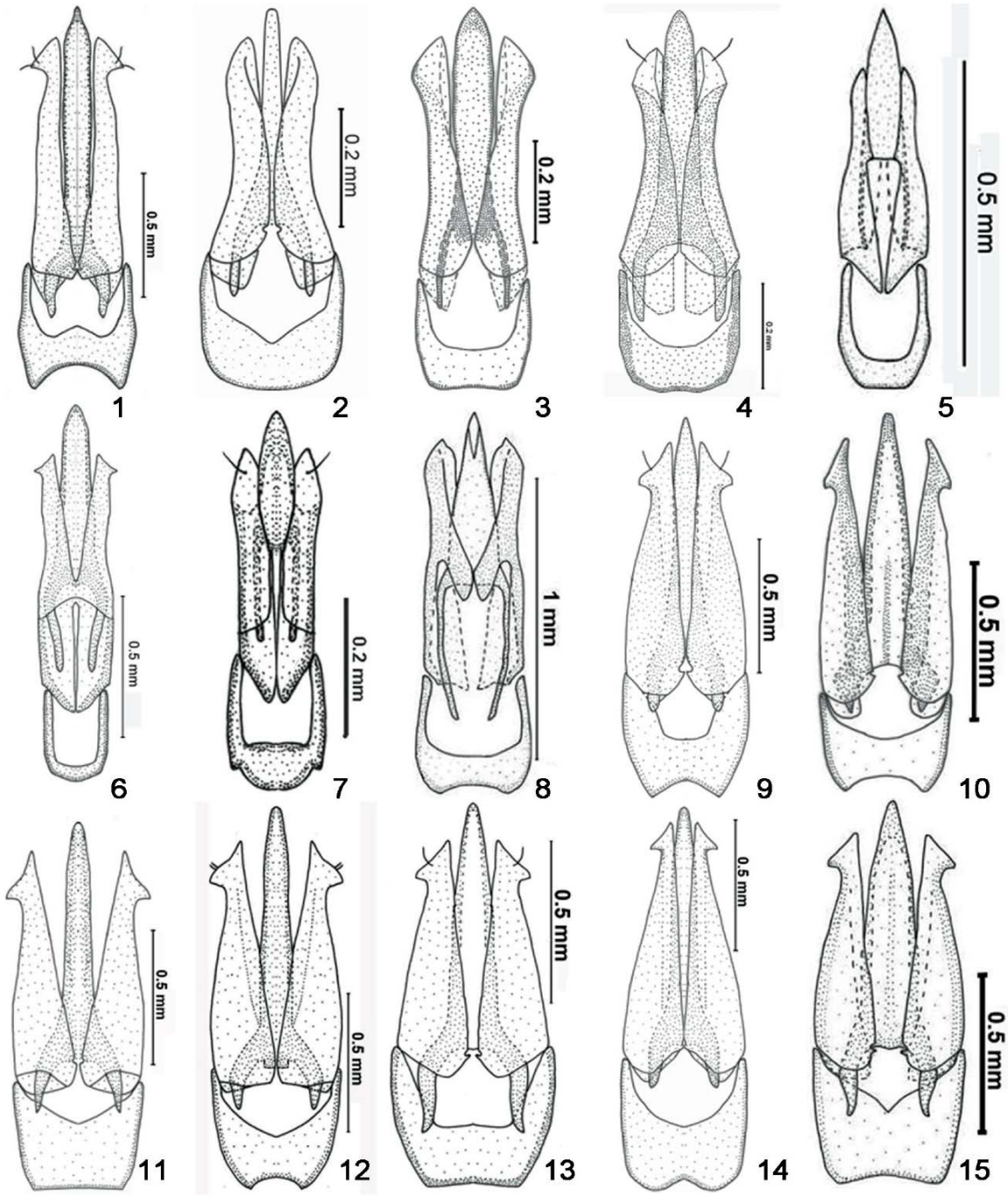
Melanotus fraseri Platia and Schimmel, 1993
Male Genital Organ (Dorsal) (Figure 27): Basal piece anterior margin "U" shapedly notched, posterior margin "V" shapedly concave, lateral margins feebly arcuate, arms of basal piece pointed at apex, basal piece slightly sclerotized except strongly sclerotized outer margins; median lobe distinctly longer than parameres, arms of median lobe, their junction point, outer margins, apical part and thin line from medial to distal heavily, the rest slightly sclerotized, arms of median lobe long and narrowing posteriorly, rounded basally, arms of median lobe exceeding ventral posterior margin of parameres and arcuate, median lobe gradually narrowing up to medial, parallel sided from medial to distal, clearly narrowing after distal and its apex finger shaped, parameres slightly sclerotized except posterior margins, lateral outer margins of parameres broadening from basal to proximal, sinuate from proximal to distal, distal teeth short and weakly pointed, apex of parameres pointed.

Melanotus fusciceps Gyllenhal, 1817
Male Genital Organ (Dorsal) (Figure 28): Basal piece wide, anterior margin "U" shapedly notched, posterior margin straight, corners of posterior and lateral margins triangularly projected, lateral margins almost parallel sided, arms of basal piece feebly pointed at apex, basal piece slightly sclerotized except strongly sclerotized outer margins; median lobe distinctly longer than parameres, inner part of arms of median lobe and their junction point, outer margins, apical part strongly sclerotized, rest of median lobe weakly sclerotized, arms of median lobe long and broadened arcuately up to medial, curved to inside and blunt, exceeding ventral posterior margin or parameres, median lobe gradually narrowing from basal to apical, thin cylindirical at apex; parameres slightly sclerotized except heavily sclerotized half of their posterior, lateral outer margins of parameres strongly arcuate from basal to distal, almost parallel sided at distal, distal teeth feebly pointed and directed posteriorly, bulky at apical and trapezoidal, bearing a hair at apical, their apex pointed.

DISCUSSION

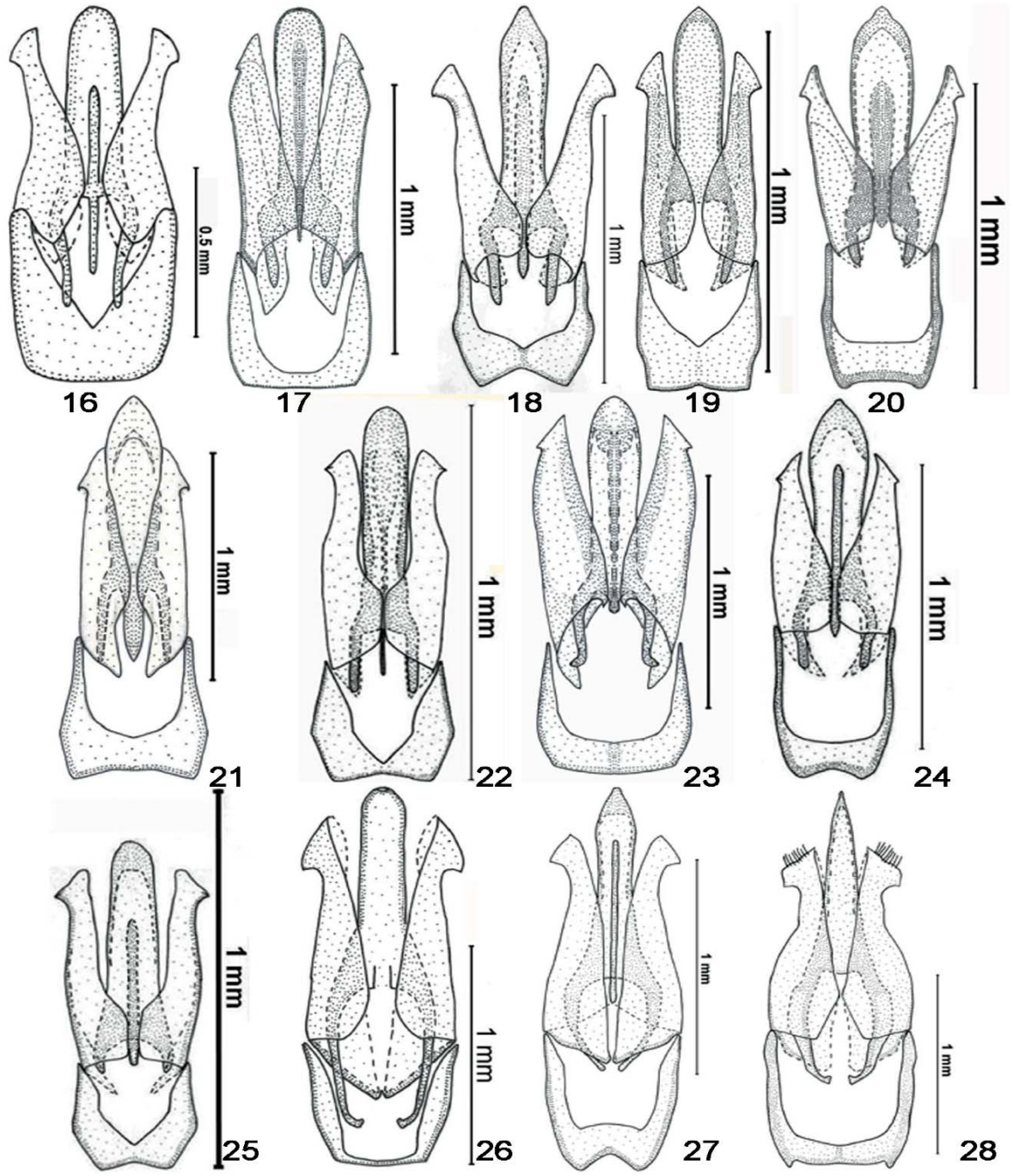
Totally 28 species which are distributed as ten species of genera ***Agriotes*** and ***Dalopius*** of tribe Agriotini, seven species of genera ***Ampedus*** of tribe Ampedini, one species of genus ***Mulsanteus*** of tribe Elaterini and seven species of genera ***Adrastus***, ***Peripontius*** and ***Synaptus*** were examined from the subfamily Elaterinae, that has the highest number of species in this study and three species of genus *Melanotus* from the subfamily Melanotinae.

Male genital structure of ***Mulsanteus guillebeaui*** was examined from the genus ***Mulsanteus***. Our findings were compared with Platia's (3) findings



Figures 1-15: 1. *Mulsanteus guillebeaui*, 2. *Peripontius crassus*, 3. *Peripontius omissus*, 4. *Peripontius terminatus*, 5. *Adrastus anatolicus*, 6. *Adrastus circassicus*, 7. *Adrastus montanus*, 8. *Synaptus filiformis*, 9. *Ampedus cinnaberinus*, 10. *Ampedus elegantulus*, 11. *Ampedus nigroflavus*, 12. *Ampedus platiai*, 13. *Ampedus pomonae*, 14. *Ampedus samedovi*, 15. *Ampedus sanguinolentus*.

and we detected that our findings exhibit differences with concave posterior margin of basal part, long and almost parallel arms of median lobe. Male genital structures of detected species, ***M. adanensis*** Schimmel et al. 2009, ***M. kahramanensis*** Schimmel et al. 2009, ***M. manuelae*** Platia & Gudenzi 1998, ***M. rubiginosus*** Ohira 1966 and ***M. shirozui*** Ohira 1966 from literature [6-8] and other groups of the family Elateridae were evaluated together. As a result of that long, thin and parallel sided parameres, significant distal teeth of parameres, projected apex of median lobe may be considered as generic characters, on the other hand more species should be examined to prove this situation.



Figures 16-28: 16. *Dalopius marginatus*, 17. *Agriotes gurgistanus*, 18. *Agriotes heydeni*, 19. *Agriotes infuscatus*, 20. *Agriotes lineatus*, 21. *Agriotes modestus*, 22. Agriotes paludum, 23. *Agriotes propleuralis*, 24. *Agriotes proximus*, 25. *Agriotes sputator*, 26. *Melanotus (s.str.) bajulus*, 27. *Melanotus (s.str.) fraseri*, 28. *Melanotus (s.str.) fusciceps*.

Male genital organ structure of three species of the genus ***Peripontius*** of Synaptini were examined. ***P. crassus*** is clearly separated with thin median lobe and thick basal piece from ***P. omissus*** and ***P. terminatus***. In ***P. omissus*** arms of median lobe are thin, apex of median lobe is feebly pointed, lateral margins of parameres are slightly concave, apical of parameres are clearly bulky, while in ***P. terminatus*** arms of median lobe are thick, apex of median lobe is almost rounded, lateral margins of parameres clearly concave, apical of parameres are feebly bulky. ***P. jagemanni*** Platia & Gudenzi 2000, ***P. orchymonti*** Platia 2008, ***P. rutilipennis*** Illiger 1807, ***P. saroveci*** Platia 2004 and ***P. turcicus*** Platia &

Tarnawski 1998, which were given by Platia [3,9,10], Platia and Gudenzi [11] and Platia and Tarnawski [12], were examined to detect generic characters of male genital organ structure of genus. Short arms of median lobe, concave outer lateral margins of parameres and loss of distal teeth of parameres could be evaluated as generic characters for genus ***Peripontius***.

A. anatolicus, ***A. circassicus*** and ***A. montanus*** were collected from research area. These species have distinct differences on male genital organ morphologies. According to that, posterior margin of basal piece is straight in ***A. anatolicus***, feebly arcuate in ***A. circassicus*** and clearly convex in ***A. montanus***. ***A. anatolicus*** and ***A. montanus***, which have toothless parameres, are clearly separated from ***A. circassicus*** having pointed parameres distal tooth. ***A. anatolicus*** and ***A. montanus*** are separated with posteriorly broadened parameres and differences in structure of basal piece. In order to detect generic characters of genus ***Adrastus***, findings on male genital structure of species, which are ***A. axillaris*** Erichson 1841, ***A. binaghii*** Leseigneur 1969, ***A. kerkiniensis*** Platia & Gudenzi 2009, ***A. lacertosus*** Erichson 1841, ***A. limbatus*** Fabricius 1777, ***A. pallens*** Fabricius 1792, ***A. rachifer*** Geoffroy 1785 and ***A. temperei*** Leseigneur 1974, were examined and compared with species of ***Peripontius***, ***Synaptus*** and ***Tolphorea*** of same tribe additionally from literature [1,3,13]. According to that narrow structure of male genital organs may be considered as generic character of male genital structure of genus ***Adrastus***.

Male genital organ structure of ***Synaptus filiformis*** was examined from the genus ***Synaptus***, which is monotypic genus. There is not any difference between collected populations from research area and findings of Leseigneur [1] and Platia [3]. According to examination of diagnostic characters of other genera and ***Synaptus filiformis***, atrophy of dorsal part of parameres and medially situated cross projections are the most remarkable differences. As a result of comparison with ***Adrastus***, ***Peripontius*** and ***Tolphorea***, the genus ***Synaptus*** is seem to be closer to ***Peripontius*** and ***Tolphorea*** Gurjeva 1983 with thick male genital organ than genus ***Adrastus***.

In this study, male genital structures of seven species of ***Ampedus*** were examined. These species are ***A. cinnaberinus***, ***A. elegantulus***, ***A. nigroflavus***, ***A. platiai***, ***A. pomonae***, ***A. samedovi*** and ***A. sanguinolentus***. According to thick and triangular median lobe (***A. elegantulus***, ***A. pomonae*** and ***A. sanguinolentus***) and thin and slender median lobe (***A. cinnaberinus***, ***A. nigroflavus***, ***A. platiai*** and ***A. samedovi***), species were examined into two groups. In first group, ***A. elegantulus*** is separated from ***A. pomonae*** and ***A. sanguinolentus*** with arms of median lobe, that is short and not exceeding anterior margins of basal piece. In ***A. pomonae*** basal piece is wide and its anterior margin is "U" shapedly notched, while it is short and its anterior margin is "V" shapedly notched in ***A. sanguinolentus***. In second group, ***A. samedovi*** is separated from other species with clearly small distal teeth of parameres. In ***A. cinnaberinus***, apex of median lobe is more pointed than ***A. nigroflavus*** and ***A. platiai***. According to general structure of male genital organs, ***A. nigroflavus*** and ***A. platiai*** are very similar, however, arms of median lobe exceed anterior margin of basal piece in ***A. nigroflavus***, while arms of median lobe do not exceed in ***A. platiai***. According to the present literature [3,4,14] and examined species, male genital organ structures of species of the genus ***Ampedus*** are very similar and can be differentiated with minor characters. Especially minor diagnostic characters of outer morphology are seemed to reflect to male genital organ structure. Therefore, detailed studies should be continued on this genus.

The genera ***Dalopius*** and ***Agriotes*** were examined from tribe Agriotini. Male genital organs of nine ***Agriotes*** species were examined from research area. Species were examined in three groups due to rounded apex of median lobe (***A. paludum, A. sputator***, ***A. gurgistanus*** and ***A. propleuralis***), pointed apex of median lobe (***A. infuscatus*** and ***A. modestus***) or projected apex of median lobe (***A. heydeni***, ***A. lineatus*** and ***A. proximus***) In first group ***A. paludum*** and ***A. sputator*** are separated from ***A. gurgistanus*** and ***A. propleuralis*** with cornered outer margins of basal piece and not pointed apex of parameres. ***A. paludum*** and ***A. sputator*** separated by morphologies of arms median lobe. ***A. paludum***'s arms of median lobe are long and thin while arms of lobe of ***A. sputator*** are short and thick. ***A. gurgistanus*** and ***A. propleuralis*** are separated from

each other by some characters. In ***A. propleuralis*** apex of median lobe is feebly pointed and arms of median lobe are curved to outside at basal, while apex of median lobe is rounded and arms of median lobe are straight at basal. In second group, ***A. infuscatus***'s basal piece is broadened at posterior, its arms of median lobe is thin, feebly pointed at basal and teeth of parameres are feebly pointed, ***A. modestus***'s basal piece is narrow at posterior, its arms of median lobe is feebly thin, pointed at basal and teeth of parameres are clearly pointed. In third group, ***A. heydeni*** is separated from ***A. lineatus*** and ***A. proximus*** with cornered posterior and lateral margins of basal piece, arms of median lobe are exceeding ventral posterior margins of parameres and teeth of parameres are big. ***A. lineatus*** and ***A. proximus*** are the closest species among examined species and they are situated at same couplet in diagnostic key. In ***A. proximus***, median lobe narrows at medial and arms of median lobe is thin and sinuate, while median lobe does not narrowing at medial, arms of median lobe are thick and almost parallel. After examination of other species from the present literature [1,3,7,10,11,13,15-24,35,36], detecting the generic characters is seemed difficult. Structure of median lobe, presence or absence of distal teeth of parameres, shape of distal teeth of parameres, shape of basal piece, which may be evaluated as generic characters, species do not show unity for genus but show differences between species groups (***A. gurgistanus*** (Falderman, 1835), ***A. lineatus*** (Linnaeus, 1767), ***A. nuceus*** Fairmaire 1866, ***A. sordidus*** (Illiger, 1807), ***A. turcicus*** Candèze 1863 species groups). This gives rise to thought that species groups of genus ***Agriotes***, which are continuing to diverge evolutionary, may be evaluated as subgenera. This situation could be proved with detailed studies on this genus in the future. Another examined species is ***Dalopius marginatus*** of tribe Agriotini. In this research, our findings on this species were compared with findings of Platia [3] and a few differences were found, which are on anterior margin of basal piece, arms of median lobe and apex of median lobe.

In this study, another examined subfamily is Melanotinae. Three species were examined from the genus ***Melanotus*** (***s. str.***) of Melanotinae. These species are ***M. bajulus***, ***M. fraseri*** and ***M. fusciceps***. One of the notable characters is structure of median lobe. Median lobe is cylindrical and its apex is rounded in ***M. bajulus***, it is medially depressed and its apex is feebly pointed in ***M. fraseri***, it is triangular and its apex is strongly pointed. According to structure of arms of median lobe, ***M. bajulus*** is clearly separated from ***M. fraseri*** and ***M. fusciceps***. Arms of median lobe are long and arcuate in ***M. bajulus***, while they are short and arcuate in ***M. fraseri*** and ***M. fusciceps***. ***M. bajulus*** and ***M. fraseri*** are similar with triangular distal teeth of parameres, on the other hand ***M. fusciceps*** is separated from them by trapezoidal distal teeth of parameres. According to our findings and present literature [1,3,14,25-34], well-developed median lobe, which clearly exceeds parameres, seems like genus character, however, that character is shared with ***Metriaulacus*** Schwarz 1901, ***Priopus*** Laporte 1840 and ***Szombathya*** Platia 1986 of the subfamily Melanotinae. Consequently, this character may be the peculiar to the subfamily. As a result of comparisons between the genera, male genital organ structure of the genus ***Melanotus*** is closer than genera ***Metriaulacus*** and ***Szombathya***.

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