

THE ACTUAL STAGE THE KNOWLEDGE ABOUT THE DAMAGES BRUCHIDES

STADIUL ACTUAL AL CUNOȘTIȚELOR DESPRE SPECIILE DE BRUCHIDE DĂUNĂTOARE

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ABSTRACT

In this paper is presented the actual stage the knowledge about the damages bruchides, respectively a short history of the knowledge about the systematics of bruchides, the systematics of bruchides of the Palearctic region and the morfological characteristics of the representatives groups systemathics. The first work dedicated to the systematic study of the bruchides was SCHÖNHERR'S work, 1833, 1839, (quoted by LOUKIANOVITCH and TER MINASSIAN, 1957) where a large number of bruchides was described. LOUKIANOVITCH and TER MINASSIAN, 1957, divide the bruchides of the Pale arctic region into 5 distinct subfamilies: Rhaebinae, Kytorrhinae, Pachmerinae whose representatives are often injurious the seeds of several palm trees, Bruchinae and Amblycerinae subfamily. In 1967, KASZAB describes the 6th subfamily, named Urodininae.

KEYWORDS: bruchidae, history, systematics, morfological characteristics

REZUMAT

Lucrarea prezintă stadiul actual al cunoștințelor despre speciile de bruchide dăunătoare, respectiv un scurt istoric al cunoștințelor, despre sistematica bruchidelor în regiunea Palearctică și caracteristicile morfologice ale celor mai importante grupe sistematice. Prima lucrare dedicată studiului sistematic al bruchidelor a fost lucrarea lui SCHÖNHERR'S, 1833, 1839, (după LOUKIANOVITCH și TER MINASSIAN, 1957) unde a fost descris un număr mare de bruchide. LOUKIANOVITCH și TER MINASSIAN, 1957, divide bruchidele din regiunea Palearctică în 5 subfamilii distincte: Rhaebinae, Kytorrhinae, Pachmerinae, Bruchinae și Amblycerinae. În 1967, KASZAB descrie cea de a 6-a subfamilie: Urodininae.

CUVINTE KEIE: bruchide, istoric, sistematică, caracteristici morfologice

DETAILED ABSTRACT

The first species of bruchides: *Dermestes pisorum* L. and *Curculio chinensis* L is described in 1758, by LINNÉ (quoted by LOUKIANOVITCH and TER MINASSIAN, 1957).

The first work dedicated to the systematic study of the bruchides was SCHÖNHERR'S work, 1833, 1839, (quoted by LOUKIANOVITCH and TER MINASSIAN, 1957) where a large number of bruchides was described.

The work published by ALLARD, 1868 (quoted by LOUKIANOVITCH and TER MINASSIAN, 1957) contains general information about the bruchides in Europe and the area around Mediteranea, under the form of determinatives; four geni have been described in this work: *Cercomorphus* Perris, *Urodon* Schönh, *Spermophagus* Schönh, *Bruchus* L.

LOUKIANOVITCH and TER MINASSIAN, 1957, divide the bruchides of the Pale arctic region into 5 distinct subfamilies: Rhaebinae, Kytorrhinae, Pachmerinae whose representatives are often injurious the seeds of several palm trees, Bruchinae and Amblycerinae subfamily. In 1967, KASZAB describes the 6th subfamily, named Urodininae.

In Europe, another important work that brings information about the spreading, morphology, bio-ecology and control of bruchides, belongs to BALACHOWSKY, 1962.

SHORT HISTORY OF THE KNOWLEDGE ABOUT THE SYSTEMATICS OF BRUCHIDES

In 1758 LINNÉ (quoted by LOUKIANOVITCH and TER MINASSIAN, 1957) described the first species of bruchides: *Dermestes pisorum* L. and *Curculio chinensis* L. In 1761 and 1767 he also described the *Bruchus* genus with the *atomarius* and *seminarius* species. Not accidentally Linné offers information about these four species of bruchides. Two of them: *Dermestes (Bruchus) pisorum* L. and *Curculio (Callosobruchus chinensis)* L. are major pests of leguminous plants grown for beans, and this proves that they have been known long before the scientific study of the bruchides began. *Bruchus atomarius* L. is a widely spread species in the Pale arctic area reaching its northern borders. *Bruchus seminarius* L. can be frequently found in these areas.

Belonging to **Phytophaga** (*Chrysomeloidea*), **Bruchidae** family was included, at the beginning, by many authors, starting with LATREILLE, within the **Curculionidae** family. The separation of the bruchides from the curculionides was made for the first time by SPINOLA, in 1843; then by LACORDAIRE 1845, 1866, motivated by the lack of morphological resemblance between the representatives of **Bruchidae** and **Curculionidae** families (according to LOUKIANOVITCH and TER MINASSIAN, 1957).

The first work dedicated to the systematic study of the bruchides was SCHÖNHERR'S work, 1833, 1839, (quoted by LOUKIANOVITCH and TER MINASSIAN, 1957) where a large number of bruchides was described. Many of these names now became synonyms, but the thorough scientific distinctions in describing a large number of species haven't lost their importance up to the present moment.

The work published by ALLARD, 1868 (quoted by LOUKIANOVITCH and TER MINASSIAN, 1957) contains general information about the bruchides in Europe and the area around Mediteranea, under the form of determinatives; four geni have been described in this work: *Cercomorphus* Perris, *Urodon* Schönh, *Spermophagus* Schönh, *Bruchus* L. Between 1886 and 1891 a large number of works written by BAUDI (quoted by LOUKIANOVITCH and TER MINASSIAN, 1957) appeared, being dedicated to the bruchides from the European fauna. In this work the author, for the first time, divides the *Bruchidae* family into two tribes:

1. **Rhaebini** with only one genus: *Rhaebus*;

2. **Mylabrini** (at present **Bruchidae**), in which he included the following geni: *Mylabris* (with the *Kytorrhinus* subgenus), *Pachymerus*, *Caryoborus*, and *Spermophagus*. In parallel with the determination of the geni, 114 species have been described in this work.

ABEILLE DE PERRIN's work, 1888 (quoted by LOUKIANOVITCH and TER MINASSIAN, 1957), presents a translation and taken over from BAUDI's work, referring especially to the fauna of France. The determination table in this work described three geni, namely *Bruchus* L. genus, *Caryoborus* Germ. and *Spermophagus* Stev. with 72 species.

REDTENBACHER, 1858 (quoted by LOUKIANOVITCH and TER MINASSIAN, 1957), includes, in the **Bruchidae** family, the following geni: *Bruchus*, *Spermophagus*, *Urodon*, *Brachytarsus*, (*Anthribus*), *Tropiderus*, *Diodyrhynchus*, *Rhinomacer*, *Nemonyx*, which at the present moment are included in the **Rhinomaceridae** family.

BEDEL, 1901, (quoted by LOUKIANOVITCH and TER MINASSIAN, 1957), when establishing the fauna of the Sena river, included in the **Bruchidae** family (in his work, **Lariidae**) two more tribes: **Rhaebini** and **Lariini**. 27 species and two geni have been described within the **Lariini** tribe, namely *Laria (Bruchus)* genus and *Spermophagus* genus.

PIC, 1901-1915 (quoted by LOUKIANOVITCH and TER MINASSIAN, 1957), is the author of several articles on bruchides, which were described by him especially within some geni from the tropical regions. The most important work is the well-known **catalog**, but at the present moment it is outdated.

SCHILSKY's work (1905) (quoted by LOUKIANOVITCH and TER MINASSIAN, 1957) was published in the "**Käfer Europa's**" series in which the bruchides from the Palearctic region have been described, over 100 species.

HOFFMAN, 1945 (quoted by LOUKIANOVITCH and TER MINASSIAN, 1957), determined the bruchides from France, eliminating *Urodon* genus from the family.

The systematic study of the bruchides in North America has been carried out by HORN, 1874 and then by BRIDWELL, 1919-1946 (quoted by LOUKIANOVITCH and TER MINASSIAN, 1957). A special interest has been shown to Bridwell's work,

1932, where the main subfamilies and the geni of **Bruchidae** family are mentioned.

Beside the scientific works that were published, the great representative work belongs to LOUKIANOVITCH and TER MINASSIAN, 1957, in the collection and the concentration of the fauna material of the weevils in URSS, including the establishing of connections with the host plant and the manner of injuring.

The works of BRIDWELL, 1932, LOUKIANOVITCH, 1939, CROWSON, 1953 (quoted by LOUKIANOVITCH and TER MINASSIAN, 1957), bring their contribution in the structure of the fauna, the place of subfamilies and geni within the systematic framing. It seems that the profound solving of this issue still requires a deep study of filo-genetic connections between the representatives of **Phytophaga** and **Rhynchophora** groups.

One can not say that the fauna study of the bruchides is concluded. Largely, PIC's Catalogue, 1913, is outdated; WINKLER's Pale arctic Catalogue 1932, does not make the known fauna visible (according to a quote by LOUKIANOVITCH and TER MINASSIAN, 1957).

ZACHER (1951) drew up a list of the bruchides living on leguminous plants in the Pale arctic region, which is completed by the quote by LOUKIANOVITCH and TER MINASSIAN, (1957) with the species found in the U.R.S.S. region and surroundings.

LOUKIANOVITCH and TER MINASSIAN, 1957, divide the bruchides of the Pale arctic region into 5 distinct subfamilies: **Rhaebinae**, **Kytorrhinae**, **Pachmerinae** whose representatives are often injurious the seeds of several palm trees, **Bruchinae** and **Amblycerinae** subfamily. In 1967, KASZAB describes the 6th subfamily, named **Urodininae**.

In Europe, another important work that brings information about the spreading, morphology, bioecology and control of bruchides, belongs to BALACHOWSKY, 1962.

The **Bruchidae** family, considered as a pretty large and homogeneous group among **Phytophagoidea**, includes over 1000 known representatives, species that are spread all over the world, the highest abundance being in the tropical and subtropical regions (BALACHOWSKY, 1962).

According to DANON, 1968, 93 species have been collected and identified in Serbia, varieties and aberrations of insects belonging to **Bruchidae** family, which have been classified into 3 geni

(*Caryabosus*, *Bruchus*, *Spermophagus*) and 3 subgeni (*Bruchidius*, *Acanthoscelides*, *Callosobruchus*).

In 1966, RYBALCO drew up the list of the bruchides, counting 27 items, found in the steppe region of Ukraine.

In 1970, JOHNSON drew up a remarkable monographs of the bruchides from *Acanthoscelides* genus, distinguishing over 1300 species world-wide, out of which 600 species in the new world (American Continent) and 100 species known in the United States.

THE SYSTEMATICS OF BRUCHIDES

Rhaebinae subfamily

The body is thin and elongated. The color of the body is metallic green. The head is elongated in the anterior side (fig. 2). The antennae are thread-like, their length being equal to 1/2 of the body length. The elytrons are 2 1/2 longer than the total width of their base, being slightly widened in the middle, with clear dotted grooves. The elytrons do not cover the top of the pigidium. Adults have structural characteristics that are common to the representatives of the **Curculionidae** family, given by the bright colors with metallic reflexes, and also typical for **Bruchidae**'s, given by the structure of the head, antennae, legs and elytrons (LOUKIANOVITCH and TER MINASSIAN, 1957; BALACHOWSKY, 1962; KASZAB, 1967).

The **Rhaebinae** subfamily included the **Rhaebus** Fisch genus with species: *Rhaebus gebleri* Fisch-W.; *Rh. mannerheimi* Motsch.; *Rh. komarovi* Luk.; *Rh. solskyi* Kraatz.

Pachmerinae subfamily

These bruchides have oval body, convex in the dorsal side. The color of the body is brown-reddish or yellow, without spots or with vague spots on the elytrons. The head has very convex eyes, especially towards the insertion of the antenna, with a little evident cut, the antennae being inserted in front of it (fig. 3, 4). The side parts of the pronotum are dentated. The elytrons are covered with thick, short pubes, the grooves are generally dotted, delimited by smooth inter-grooves, which are continuous from the base to the top. The fore and middle legs have each 2 short spurs, distally disposed, covered by pubes. The thighbones of the posterior legs are strongly thickened, the interior edge is highly dentated, being jointed with the shinbones, re-bent like an arc

(fig. 22) (LOUKIANOVITCH and TER MINASSIAN, 1957; BALACHOWSKY, 1962; KASZAB, 1967).

The subfamily included the following geni whith species:

The *Pachymerus* Thunb. genus (*Caryoborus* Schon) with species: *Pachymerus accaciae* Gyll. (sin.*P. pallidus* Ol.); *P. ahngeri* (Sem); *P. lagonychi* Motsch.; *P. pallidus* (Ol.);

The *Pseudopachymerus* Pic. genus whith species: *Pseudopachymerus lallemanti* (Mars).

Figure 1: The body forms: a) *Acanthoscelides obtectus* Say (quoted by Cushman); b) *Bruchus pisorum* L. (quoted by Cushman); c) *Caryedon serratus* (quoted by Kingsolver); d) *Euspermophagus sericeus* Geoffr. (quoted by Cushman)

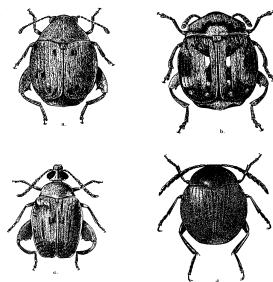


Figure 2: The head forms: 2 - *Rhaebus mannerheimi* Motsch.; 3 - *Pachymerus ahngeri* Sem., 4 - *Pachymerus lagonychi* Motsch.; 5 - *Bruchus pisorum* L., 6 - *Bruchidius unicolor* Ol., 7 - *Bruchidius glycyrrhizae* Fähr.; 8 - *Kytorrhinus quadriplagiatus* Motsch.; 9 - *Euspermophagus sericeus* Geoffr. (Quoted by Luk și T.M.)

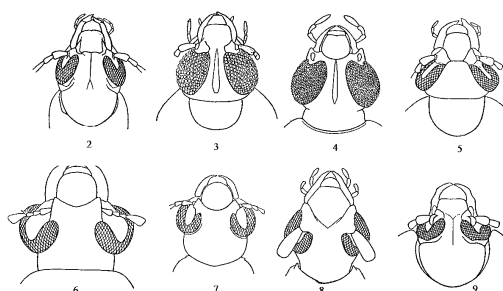
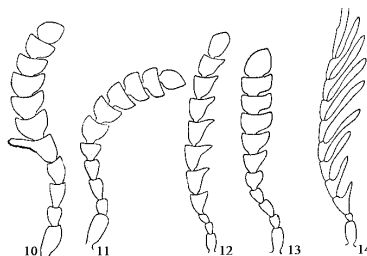


Figure 3: The antennas forms. 10 - *Bruchus hamatus* Mill., ♂; 11 - *Bruchus hamatus* Mill., ♀; 12 - *Bruchidius marinus* Boh., ♂; 13 - *Bruchidius villosus* F., ♂; 14 - *Kytorrhinus obscurus* Luk și T.M., ♂. (quoted by Luk și T.M.)



Bruchinae family.

The body is oval or bell shaped, usually covered with bright colored, uniform pubes or the pubes forms spots and stripes on the pronot and elytrons (fig.1). The head is orthognat, at rest it draws near the anterior coxes and prothorax. The eyes are convex, with a deep cut in the anterior side. The antennae measure ½ of the body length, longer in the case of males than of females, often serrate (fig. 10, 11, 12). The elytrons are usually longer than the total width of the base and they do not cover the pigidium (fig. 23). The elytrons have deep grooves and inter-grooves, in some cases they do not reach the top. The fore and middle legs are thin. The posterior legs are longer and stouter. The middle legs of males usually have dentated or spur-shaped plates, highly important in systematics. The color is yellow-reddish, in some cases it can be dark.

Bruchinae subfamily includes the most species of the **Bruchidae** family, important for the damages the produce to leguminous plants from the economical point of view. Quoted by LOUKIANOVITCH și TER MINASSIAN, 1957; BALACHOWSKY, 1962; RYBALCO, 1966; KASZAB, 1967; KINGSOLVER, 1969; DECELLE, 1979; JERMY și BALÁZS, 1990; PIERRARD, 1992) the **Bruchinae subfamily** includes the following geni:

The *Callosobruchus* Pic. genus with species: *Callosobruchus ademptus* Sharp; *C. analis* Fab.; *C. chinensis* (L.) (sin. *C. pecticornis* L., *C. rufus* De Geer., *C. scutellaris* F., *C. barbicornis* F.; *C. bistriatus* F. (sin. *Bruchus chinensis* L., *Pachymerus chinensis* L.); *C. maculatus* F. (sin. *C. quadrimaculatus* F., *C. ornatus* Boh., *C. chinensis* Thumb., *Pachymerus quadrimaculatus* Fabr.); *C. phaseoli* Gyll.; *C. rhodesianus* Pic.; *C. somalicus* sp. n.; *C. sulcaticollis* Pic.; *C. subinnotatus* Pic.

Bruchus L. genus.

The head is tightened in the posterior side (fig. 5). The pronot is tightened in the foreside and the edge of the side part has always a tooth (fig. 15, 16, 17); dorsally, with a pit more or less visible. The dorsal side has a dense, smoothed pubes, which forms spots and strips. The thighbones in the posterior side have a strong, visible, very rarely absent tooth (fig. 22) (e.g. *B. venustus* Fahr). The abdomen is not covered by elytrons

(fig. 23a). At present from *Bruchus* genus (SAY and HORN, 1905 (quoted by Johnson, 1970); PETRI, 1912; PANIN, 1951; TER MINASSIAN, 1954; LOUKIANOVITCH and TER MINASSIAN, 1957; BALACHOWSKY, 1962; RYBALCO, 1966; KASZAB, 1967; KINGSOLVER, 1969; DECELLE, 1975, 1979; WEND, 1981; JERMY and BALÁZS, 1990; PIERRARD, 1992) make the following species: *Bruchus affinis* Fröl. (sin. *B. flavimanus* Boh.; *B. affinis affinis* Fröl.; *B. affinis ruthenicus* Beck.; *B. affinis monticola* Bed.; *B. atomarius* (L.) (sin. *B. granarius* L., *B. seminarius* Boch., *B. troglodytes* Fahr.; *B. auriviltii* Blanc.; *B. brachialis* Fahr (sin. *B. pallidicornis* Muls., *B. ruficornis* All., *B. terminatus* Woll.); *B. dominicanus* Jekel (*B. mimosae* F.); *B. dentipes* Baudi (*B. dentipes dentipes* Baudi; *B. dentipes ochraceosignatus* Heyd.); *B. ervi* Fröl. (sin. *B. sertatus* Ill.); *B. emarginatus* Allard.; *B. griseomaculatus* Gyll.; *B. hamatus* Mill.; *B. incurvatus* Motsch.; *B. laticollis* Boh.; *B. lentis* Fröl. (sin. *B. lentis* Boh.); *B. luteicornis* Ill.; *B. lugubris* Fahr.; *B. loti* Payk. (sin. *B. lathyri* Steph., *B. oxytropis* Gebler, *B. wasasterjernii* Fahr.); *B. mulkaki* Luk. et T.-M., sp.n.; *B. pavlovskii* Luk. et T.-M.; *B. perezi* Kr.; *B. pisorum* L. (sin. *B. pisi* L., *B. salicis* Scop., *B. cruciger* Geoff., *Laria pisorum* L.); *B. rufimanus* Boh. (sin. *B. fabae* Matsch.); *B. rufimanus rufimanus* Boh.; *B. rufimanus velutinus* Muls.; *B. rufipes* Herbst.; *B. sibiricus* Germ.; *B. sibiricus sibiricus* Germ.; *B. sibiricus occidentalis* Luk. et L.-M., subsp.n.; *B. sibiricus transcaasicum* Luk. et L.-M., subsp.n.; *B. signaticornis* Gyll. (*B. pallidicornis* Boh.); *B. tristiculus* Fahr.; *B. tristis* Boh.; *B. ulicis* Muls. et Rey.; *B. unicolor*; *B. venustus* Fahr.; *B. viciae* Ol.

Bruchidius Schilsky genus

The prothorax is cone-shaped, without little teeth, or border on the side edge (fig. 18, 19), the posterior thighbones have only one tooth, on the inside edge, which is not visible from outside. The sexual dimorphism is given by the antennae of the males which are pectinated and the color is different from the one of the females (fig. 12, 13) (BALACHOWSKY, 1962)

O more complete description of the *Bruchidius* genus was carried out in 1905 by SCHILSKY (according to JOHNSON, 1970)

At present from *Bruchidius* genus (PETRI, 1912; TER MINASSIAN, 1954; LOUKIANOVITCH and TER MINASSIAN, 1957; BALACHOWSKY, 1962; KASZAB, 1967; DECELLE, 1979; WENDT, 1981; JERMY and BALÁZS, 1990; PIERRARD, 1992; OFUYA and CREDLAND, 1996) includes the following species: *B. annulicornis* All.; *B. apicipennis* Heyd.; *B. astragali* Boh.; *B. astrolineatus* Pic.; *B. atbasaricus* Luk. et T.-M.; *B. aurivilli* Blanc.; *B. bagdassarjani* Luk. et T.-M.; *B. biguttatus* Ol.; *B. bimaculatus* Ol.; *B. buettikeri*; *B. bythinocerus* (Reitt.); *B. cinerascens* Gyll.; *B. convexicollis* Luk. et T.-M., sp.n.; *B. crassicornis* Luk. et T.-M., sp.n.; *B. debilis* Gyll.; *B. dispar* Gyll.; *B. fasciatus* Ol. (sin. *B. villosus* Ol.); *B. femoralis* (Gyll.); *B. gilvus* Gyll.; *B. glycyrrhizae* (Fähr); *B. glycyrrhizae glycyrrhizae* (Fähr); *B. glycyrrhizae obscuripennis* Luk. et T.-M., subsp.n.; *B. holodendri* Gebl.; *B. holosericeus* (Schönh.); *B. incarnatus* Boh.; *B. incipiens* Kol.; *B. imbricatus* Panz.; *B. Ischwaensis*; *B. jocosus* Gyll. (sin. *B. longicornis* Germ.; *B. quinqueguttatus* Kraatz.); *B. kamschaticus* Motsch.; *B. königi* Schilsky; *B. lautus* Sharp; *B. longulus* Schils.; *B. lucifugus* Boh.; *B. martinezi* All.; *B. marginalis* F.; *B. mordelloides* Baudi; *B. mulsanti* Bris; *B. murinus* Boh.; *B. myobromae* Motsch.; *B. nanus* Germ.; *B. obscuripes* (Gyll.); *B. orchesiodes* (Heyd); *B. orchesiodes orchesiodes* (Heyd); *B. orchesiodes cachridis* Luk. et T.-M., subsp.n.; *B. onobrychidis* Luk. et T.-M., sp.n.; *B. pallidulus* (Reitt.); *B. pauper* Boh.; *B. perparvulus* Boh. (sin. *B. pygmaeus* Boh.); *B. poecilus* (Germ); *B. poupilliere* All.; *B. prolongatus* Luk. et T.-M.; *B. ptilinoides* (Fähr); *B. pubicornis* Luk. et T.-M., sp. n.; *B. richteri* Luk. et T.-M.; *B. reitteri* Schils.; *B. reichardti* Luk. et T.-M.; *B. robustus* Luk. et T.-M., sp.n.; *B. seminarius* (L.); *B. scutulatus* Baudi; *B. sericatus* Germ.; *B. tibialis* Boh.; *B. trifolii* Mots. (sin. *B. alfieri* Pic.); *B. tuberculicauda* Luk. et T.-M.; *B. tuberculatus* (Hochh.); *B. unicolor* Ol. (sin. *B. olivacens* Germ., *B. cisti* Fabr.; *B. varipictus* Motsch; *B. varius* Ol.; *B. virescens* (Boh.); *B. virgatoides* Luk. et T.-M., sp.n.; *B. virgatus* Fähr.; *B. villosus* F.; *B. quinqueguttatus* Ol.

***Acanthoscelides* Schilsky genus**

The representatives of *Acanthoscelides* Schilsky genus identified over 1000 species classified and

characterized. They have morphological characteristics similar to *Bruchus* genus. (BALACHOWSKY, 1962) The first description of the *Acanthoscelides* Schilsky genus has been made by Schilsky (1905) (quoted by JOHNSON, 1970).

Here is a synthesis of the morphological characteristics described by several authors: the body is short, oval, usually large or middle-sided, covered with bright colored yellow-grayish pubes (fig. 1). The head is short and widened. The antennae are not serrate. The pronotum is tightened in the fore side, its side limits being bent and have no teeth or bottoms (fig. 20). The median lobe of the pronotum base is not situated on the top and does not have median longitudinal groove (PANIN, 1951). The shield is large, usually rectangular. The elytra are usually 1 ½ longer than the width of the shoulders, and more or less widened in the posterior side, with dotted grooves, sometimes hidden in the pubes. The posterior thighbones are thickened, with a large tooth at the base, followed by two little teeth well distinguishable (fig. 22), the shinbones are straight and the pigidium is not covered by elytra (LOUKIANOVITCH and TER MINASSIAN, 1957; BALACHOWSKY, 1962; KASZAB, 1967; JOHNSON, 1970).

At present, from *Acanthoscelides* genus (PETRI, 1912; LOUKIANOVITCH and TER MINASSIAN, 1957; BALACHOWSKY, 1962; KASZAB, 1967; KINGSOLVER, 1968; KINGSOLVER, 1969; JOHNSON, 1970; LUCA, 1972; KINGSOLVER, 1975; LĂCĂTUȘU and contributors, 1985; WENDT, 1981; 1986; EGAROV, 1989; JERMY and BALÁZS, 1990; PIERRARD, 1992) includes the following species: *Acanthoscelides andrewsi*; *A. aureoliastes*; *A. aureolus* (Horn); *A. bisignatus* (Horn); *A. biustullus* (Fall); *A. chesneyae* Luk. et T.-M., sp. n.; *A. coliginosus* Daud; *A. coluteae* Luk. et T.-M., sp. n.; *A. comstocki*; *A. curtipennis* Pic.; *A. chiricahuse* (Fall.); *A. clandestinus* (Mots); *A. collusus* (Fall); *A. compressicornis* (Schaeffer); *A. daleae*; *A. dufau* Pic.; *A. fraterculus* (Horn); *A. fumatus* (Schaeffer); *A. fumatus* (Schaeffer); *A. griseolus* (Fall); *A. gilvus* (Gyll.); *A. gilvoides* Luk. et T.-M., sp. n.; *A. guatemala*; *A. gussakovskii* Luk. et T.-M.; *A. guadeloupensis* Pic.; *A. hespenheide*; *A. inquisitus* (Fall); *A. johnique*; *A. lherminieri* Fähr.; *A. lobatus* (Fall); *A. margaretae*; *A. mimosae* F.; *A. mexicanus* (Sharp); *A. mixtus* (Horn); *A. napensis*; *A.*

obrienorum; *A. obtectus* (Say) (sin. *Bruchus obtectus* Say, *B. obsoletus* Say., *B. fabae* Fitch., *A. breweri* Crotch., *A. irresectus* Fahr., *A. pallipes* Fahr., *A. subellipticus* Woll., *A. varicornis* Motsch., *A. auberti* Abeille de Perrin; *A. obreptus* Bridwell (sin. *A. armitagei* Pic.); (sin. *A. argillaceus* Sharp); *A. obvelatus* Bridwell; *A. ochraceicolor* Pic.; *A. oregonensis*; *A. pallidipennis* Motsch. sp.n.; *A. pauperculus* (Le Conte); *A. perforatus* (Horn); *A. plagiatus* Reiche

et Saulcy; *A. prosopoides*; *A. prosopoides* (Schaeffer); *A. pugiunculus* (Fall); *A. pulloides* (Fall); *A. pullus* (Fall); *A. pyrrhomelas* (Philipp); *A. rufovittatus* (Schaeffer); *A. seminulum* (Horn); *A. semenovi* Luk. et T.-M.; *A. subaequalis*; *A. submuticus* (Sharp); *A. turanus* Luk. et T.-M.; *A. turnawskii*; *A. zacathan*; *A. zeteki* sp.n.; *Mylabris spinigera* Baudi (BOROWIEC, 1980) and *Megabruchidius dorsalis*, sp.n. (MIGLIASSIO and ZAMPETTI, 1988).

Figure 4: The pronot forms: 15-*Bruchus hamatus* Mill.; 16-*Bruchus affinis* Fröl.; 17-*Bruchus laticollis* Boh.; 18-*Bruchidius incipiens* Kol.; 19-*Bruchidius lautus* Sharp; 20-*Acanthoscelides gilvus* Gyll.; 21-*Euspermophagus calystegiae* Luk și T.M. (quoted by Luk și T.M.)

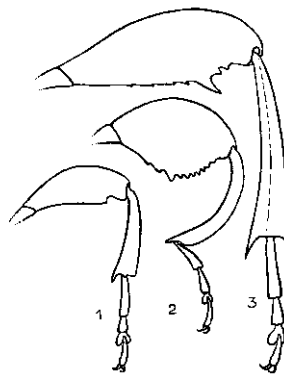


Figure 5: Posterior legs: 1. *Bruchus rufimanus* Boh.; 2. *Pachymerus acaciae* Gyll.; 3. *Acanthoscelides obtectus* Say (quoted by Luk și T.M.)

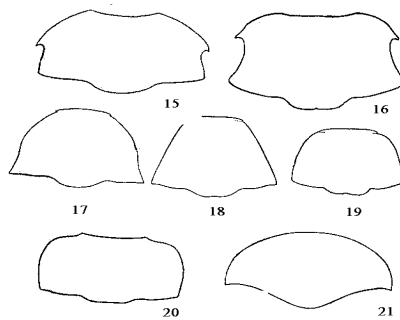
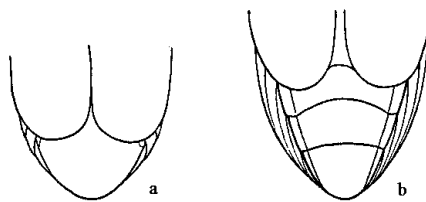


Figure 6: The abdomen – Pigidium: a. *Bruchus pisorum* L.; b. *Kytorrhinus quadriplagiatus* Motsch. (quoted by Luk și T.M.)



Kytorrhinae subfamily

The antennae of the males are pennate and those of the females are serrate. (fig. 23 b). The posterior joints are of the same length as the shinbone.

The *Kytorrhinus* genus Fischer-W. includes the following species (PETRI, 1912; LOUKIANOVITCH and TER MINASSIAN, 1957; BALACHOWSKY, 1962; KASZAB, 1967; JERMY and BALÁZS, 1990): *K. immixtus* Motsch.; *K. karasini* Fischer; *K. obscurus* Luk. et T.-M., sp.n.; *K. pectinicornis* Melich.; *K. reitteri* Schils.; *K. senilis* Sols.; *K. thermopsis* Motsch.; *K. quadriplagiatus* Motsch.

Amblycerinae subfamily

The species of this family distinguish themselves by a globular, sub-globular, short shape of the body (fig. 1 d) and the color of the body is mostly black or uniform dark-colored. The pronotum has no side grooved (fig. 21). The eyes are convex (fig. 9), the antennae are nearly threadlike. The posterior shinbones are not thickened, their width being equal to ½ of that of the coxae, with an internal longitudinal bottom, usually with only one short tooth. The fore and medium shinbones have no spurs. The extremity of the posterior shinbones has long mobile spurs.

In *Euspermophagus* Zach. genera included the following species (LOUKIANOVITCH and TER MINASSIAN, 1957; BALACHOWSKY, 1962; KASZAB, 1967; DECELLE, 1979; JERMY și BALÁZS, 1990): *Euspermophagus calystegiae* Luk. et T.-M., sp.n.; *E. canus* Baudi; *E. caucasicus* Baudi; *E. complectus* Sharp.; *E. eous* Luk. et T.-M.,

sp. n.; *E. glabratus* Gyll.; *E. japonicus* (Schilsky); *E. küsteri* Schilsky; *E. sericeus* (Geoffr.); *E. turanicus* Luk. et T.-M., sp.n. ; *E. variolosopunctatus* Gyll., *Spermophagus somalicus* sp.n., (DECELLE, 1979).

The *Zabrotes* Horn genera (LUCA, 1972; TERMINASSIAN, 1954; LOUKIANOVITCH and TERMINASSIAN, 1957; BALACHOWSKY, 1962; KASZAB, 1967; JERMY and BALÁZS, 1990): *Zabrotes semifasciatus* Boh.; *Z. subfasciatus* Boh. (sin. *Z. pectoralis* Sharp.; *Spermophagus dorsopictus* Lepesme; *S. maculatus* Boh. (JERMY and BALÁZS, 1990).

Urodininae subfamily

The body is elongated, ovoid and highly convex. The head, up to the eyes, is hidden underneath the pronotum. The eyes are large, convex. The rostrum is short, blunted. The pronotum is bell-shaped. The erytrons are short, with downwards rounded edges, that do not cover the pigidium. The elytrons are irregularly dotted. The posterior thighbones are thickened and the shinbones are straight. The males have thickened distally blunted shinbones in the medium side.

The fifth ventral ring of the males is hollowed and that of the females is usually the same but covered with pubes. The large, triangle pigidium has a grooved base.

In **Urodininae** sub-family included the *Urodon* Schönh genera with species (KASZAB, 1967): *Urodon rufipes* Ol.; *Urodon suturalis* Fabr.; *U. conformis* Suffr.; *U. pygmaeus* Gyll.; *U. canus* Küst.; *U. musculus* K. et J. Daniel; *U. concolor* Fahrs; *U. schusteri* Schilsky.

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