

**Revision of the Genus *Amarygmus* DALMAN, 1823
and Related Genera. LXXV.
The *Amarygmus* of Borneo, Sumatra, Java and Peninsula Malaysia
and of Neighbourly Islands. Determination keys. Part I.
(Coleoptera: Tenebrionidae)¹**

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Abstract

The 285 species of the genus *Amarygmus* DALMAN, 1823 (Col.: Tenebrionidae: Amarygmini) of the mutual faunal area of Borneo, Sumatra, Java, Peninsular Malaysia and their neighbourly islands are listed. In this paper as a first attempt groups (“Sections”) of the *Amarygmus* species according to one or few easily discernible characters are created. All 285 species are assigned to one Section, and for better recognition they are figured by a drawing and/or a photograph. This paper starts with the first six out of finally twenty-six different Sections. References concerning all 285 species are provided at the end of this first paper.

Introduction

Many more than one thousand different species of *Amarygmus* DALMAN, 1823 are present in the Oriental, East Palaearctic, Papuan, Australian and Pacific faunal areas. About 900 of them have already been described. One center of their occurrence is the mutual faunal area of Borneo, Sumatra, Java and Peninsular Malaysia. About 400 different species occur in this area, at my rough estimate. However, many species are also found in other faunal areas. They are especially numerous in the Papuan faunal area, where it is probably more species occur than in the faunal area, which is the topic of this and following papers.

Amarygmus species are night active insects, and they usually are not attracted by light. Most of them can be found sitting on the bark of trees or branches at night where they can be spotted by flashlight with a certain degree of blue light. When hit by normal light, they usually jump off. Most species are able to jump like Alticini. The canopy of trees in natural forests probably provides space for many other *Amarygmus* species than those found near ground, according to my provisional impression. The *Amarygmus* fauna of the canopies has not been systematically investigated yet, and their systematic investigation will certainly further increase the number of species which have to be studied.

Determinations keys of the *Amarygmus* of special faunal areas have already been published from Sri Lanka (BREMER 2007c), from Sulawesi (BREMER 2004d,e, some additions: BREMER 2012b) and from the Philippines (BREMER 2009b, some additions: BREMER 2013).

Most *Amarygmus* ssp. of Borneo, Sumatra, Java and Peninsula Malaysia are only present in this faunal area, with only a few surpassing its borders. Therefore, the development of a mutual determination key for the species of this area is reasonable.

There are two main obstacles for developing an adequate determination key of species of this genus: the great number of occurring species and the similarity of several species.

In planning a key of species of our genus it must be considered that many species possess noticeable characters which only characterize males; it enables us to group these species according to these special sexual characters. Consequently, this approach lists only males and not females. For females one has to look

¹ Dedicated to the late Dr. Roland GRIMM (1948-2021). He knew nearly all about the Tenebrionidae of this faunal region. The author was due to him for discussions about the identification of several *Amarygmus*. Without his push to start the job, writing a determination key of the *Amarygmus* of this area, I probably would not begin this laborious challenge at my ripe old age.

upon other characters to separate them, e. g. presence or absence of maculae, form and density of punctation, width of frons, shape of antennae, etc. I try to combine both approaches, e. g. unite groups because of special sexual characters and unite groups because of characters which are present in both sexes.

In order to avoid a too sophisticated and lengthy key, I separate the key into different “Sections” according to characters which are especially obvious, e. g. creating a “Section” for species with maculae, one for species with very long elytra, one for species with dense long or short hairs on pro- and mesofemora in males, one for a group of species with very long forelegs in males (the former genus *Podamarygmus* CARTER, 1928), one for species with an outmost narrow frons, etc.

However, the first part of the key leads to the five most frequently collected species: *A. micans* (FABRICIUS, 1794), *A. metallicus* (PERTY, 1831), *A. ovoides* (FAIRMAIRE, 1882), *A. cuprarius cuprarius* (WEBER, 1801), and *A. pictarsis* (FAIRMAIRE, 1882). These species are usually found around human settlements, but very rarely in natural forests. Starting a determination with these species prevents wasting time to spot these species after passing a very long key. This part is followed by a key which leads to the different “Sections”. Each “Section” combines related species or species groups with similar characters.

Because of the impossibility to relate every species only to one peculiar identifier it sometimes happens that a species appears in different “Sections”. This is especially true for species with very special sexual characters which do not characterize females.

**List of species which had been found on
Borneo, Sumatra, Java, Peninsula Malaysia and their neighbourly islands
(references of descriptions: BREMER & LILLIG, 2014):**

Amarygmus abditus BREMER, 2007, *A. abortivus* BREMER, 2010, *A. acerbus* BREMER, 2011, *A. acutestriatus* (FAIRMAIRE, 1896), *A. acutulus* BREMER, 2010, *A. adelphus* BREMER, 2011, *A. adornatus* BREMER, 2010, *A. aeneolus* FAIRMAIRE, 1893, *A. aenescens* (FAIRMAIRE, 1896), *A. aequalis* GRIMM, 2018, *A. aequivocus* BREMER, 2014, *A. aeris* BREMER, 2010, *A. affectus* BREMER, 2010, *A. agnatus* BREMER, 2011, *A. alces* BREMER, 2012, *A. alis* BREMER, 2014, *A. amoenus* BREMER, 2011, *A. apicicornis* BREMER, 2012, *A. assessorius* BREMER, 2010, *A. assignatus* BREMER, 2010, *A. astudior* BREMER, 2006, *A. astutus* BREMER, 2011, *A. atroaeneus* BREMER, 2007, *A. avunculus* BREMER, 2012, *A. baluensis* PIC, 1951, *A. barae* BREMER, 2002, *A. batakensis* BREMER, 2007, *A. becvari* BREMER, 2002, *A. becvarensioris* BREMER, 2003, *A. (Podamarygmus) bedageiensis* PIC, 1951, *A. benevolus* BREMER, 2012, *A. betongensis* BREMER, 2004, *A. binotatus* PIC, 1915, *A. blairi* BREMER, 2001, *A. blanchardi* BREMER, 2001, *A. borneensis* (GEBIEN, 1920), *A. botryitidis* BREMER, 2011, *A. bruneiensis* PIC, 1915, *A. bryanti* BREMER, 2002, *A. buechei* BREMER, 2007, *A. burckhardti* BREMER, 2001, *A. (Varogeton) cameronensis* (MASUMOTO, 2001), *A. carus* BREMER, 2014, *A. catenatus* BREMER, 2010, *A. cechovskiyi* BREMER, 2007, *A. centesimus* BREMER, 2004, *A. cephalotes* BREMER, 2010, *A. christinae* BREMER, 2002, *A. chrysidis* BREMER, 2012, *A. cinaediae* BREMER, 2004, *A. cinctopunctatus* PIC, 1938, *A. circaeus* BREMER, 2012, *A. coccinelloides* BREMER, 2010, *A. collocatus* BREMER, 2010, *A. comitus* BREMER, 2012, *A. commodus* BREMER, 2014, *A. communis* BREMER, 2004, *A. (Podamarygmus) comptulus* BREMER, 2006, *A. concivis* BREMER, 2004, *A. consimilis* BREMER, 2005, *A. consocius* GEBIEN, 1944, *A. (Pyanirygmus) corinthius* (PIC, 1915), *A. corniguttatus* BREMER, 2004, *A. cornuotatus* BREMER, 2006, *A. coruscus* BREMER, 2011, *A. crenis* BREMER, 2009, *A. concolor* GRIMM, 2018, *A. crockeri* BREMER, 2004, *A. cuprarius* (WEBER, 1801), *A. cyamias* BREMER, 2010, *A. cyaneicollis* BREMER, 2010, *A. cycloaeus* BREMER, 2010, *A. cyitis* BREMER, 2007, *A. danumensis* BREMER, 2011, *A. deceptus* BREMER, 2012, *A. delicatulus* BREMER, 2010, *A. dignus* BREMER, 2004, *A. dimidiatus* BREMER, 2010, *A. disgregatus* BREMER, 2010, *A. disparilis* BREMER, 2005, *A. dispensatus* BREMER, 2011, *A. distinguens* BREMER, 2011, *A. diversetinctus* PIC, 1925, *A. diversipennis* PIC, 1922, *A. dohertyi* (PIC, 1915), *A. doridis* BREMER, 2009, *A. dryadiformis* BREMER, 2002, *A. dryitidis* BREMER, 2004, *A. elegans* BREMER, 2002, *A. ellipticus* BREMER, 2002, *A. emasensis* BREMER, 2010, *A. erilis* BREMER, 2010, *A. ertli* BREMER, 2005, *A. eureos* BREMER, 2010, *A. expeditus* BREMER, 2010, *A. fasciatus* GEBIEN, 1913, *A. filiaster* BREMER, 2010, *A. filiastra* BREMER, 2011, *A. filiolus* BREMER, 2002, *A. floreni* BREMER, 2011, *Amarygmus fragilis* BREMER, 2001, *A. fraterculus* BREMER, 2002, *A. fulgurans* GEBIEN, 1927, *A. furvus* (GEBIEN, 1927), *A. genalis* BREMER, 2009, *A. gilvicornis* BREMER, 2011, *A. girardi* BREMER, 2001, *A. gnitus* BREMER, 2010, *A. gnomus* BREMER, 2011, *A. haeuseri* BREMER, 2010, *A. hansbremeri* ANDO, 2017, *A. hassalti* FAIRMAIRE, 1882, *A. hilaratus* BREMER, 2007, *A. hongii* BREMER, 2011, *A. (Podamarygmus) ignotus* BREMER, 2006, *A. impunctipennis* BREMER, 2005, *A. inconditus* BREMER, 2010, *A. inditus* BREMER, 2010, *A. inermis* BREMER, 2011, *A. infans* BREMER, 2011, *A. ino* BREMER, 2012, *A. intermedius* BREMER, 2011, *A. invenustus* BREMER, 2011, *A. irideus* FAIRMAIRE, 1882, *A. iunctus* BREMER, 2010, *A. jakli* BREMER, 2009, *A. jasarensis* BREMER, 2004, *A. jenisi* BREMER, 2004, *A. katoii* MASUMOTO, 1985, *A. (Varogeton) kerleyi* (MASUMOTO, 2001), *A. klossi klossi* BLAIR, 1929, *A. klossi solakensis* PIC, 1951, *A. laevis* (KULZER, 1951), *A. lautus* BREMER, 2011, *A. lepidus* BREMER, 2010, *A. lineae* BREMER, 2002, *A. longior* BREMER, 2005, *A. lynnae*

BREMER, 2002, *A. macer* (GEBIEN, 1927), *A. maculosus* BREMER, 2002, *A. (Pyanirygmus) magnus* BREMER, 2010, *A. mahunkai* BREMER, 2003, *A. maitlandicus* BREMER, 2012, *A. makiharai* BREMER, 2011, *A. malaccanus* PIC, 1922, *A. mediofasciatus* PIC, 1938, *A. medius* BREMER, 2010, *A. (Podamarygmus) megapodius* BREMER, 2006, *A. mendax* BREMER, 2012, *A. mesotibialis* BREMER, 2003, *A. metallicus* (Perty, 1831), *A. micans* (FABRICIUS, 1794), *A. michaeli* BREMER, 2004, *A. miser* BREMER, 2011, *A. mitschkei* (PIC, 1938), *A. mnester* BREMER, 2012, *A. morpheus* BREMER, 2011, *A. muluensis* BREMER, 2010, *A. murutensis* BREMER, 2010, *A. muscivorum* GRIMM, 2018, *A. naidis* BREMER, 2012, *A. neglectus* BREMER, 2011, *A. nemoralis* BREMER, 2001, *A. neotericus* BREMER, 2010, *A. nepenthes* BREMER, 2011, *A. nepos* BREMER, 2002, *A. neso* BREMER, 2010, *A. niasensis* (PIC, 1915), *A. nicholasi* BREMER, 2004, *A. nigrofasciatus* PIC, 1915, *A. nigromaculatus* PIC, 1915, *A. nitens nitens* BREMER, 2003, *A. nitens glabratus* BREMER, 2010, *A. novior* BREMER, 2010, *A. nuntius* BREMER, 2010, *A. nyctelius* BREMER, 2010, *A. omissus* BREMER, 2002, *A. (Podamarygmus) orphanus* BREMER, 2004, *A. ovoideus* (FAIRMAIRE, 1882), *A. padangus* GEBIEN, 1927, *A. pallidior* BREMER, 2011, *A. peculiaris* BREMER, 2004, *A. persimilis* BREMER, 2004, *A. picitarsis* (FAIRMAIRE, 1882), *A. pilipes* GEBIEN, 1913, *A. plagiatus* BREMER, 2003, *A. platypodes* BREMER, 2010, *A. poringensis* BREMER, 2010, *A. postdepressus* PIC, 1938, *A. powanpowanus* MASUMOTO & MAKIHARA, 1997, *Amarygmus powanus* MASUMOTO & MAKIHARA, 1997, *A. praecellens* BREMER, 2010, *A. praestans* BREMER, 2002, *A. (Varogeton) proconsul* BREMER, 2010, *A. prosternalis* GEBIEN, 1914, *A. proteus* BREMER, 2010, *A. proventus* BREMER, 2002, *A. puerilis* BREMER, 2002, *A. pulchridorsis* FAIRMAIRE, 1893, *A. pulchrior* BREMER, 2002, *A. pullus* BREMER, 2011, *A. pupillaris* BREMER, 2010, *A. pygmaeus* BREMER, 2010, *A. (Podamarygmus) pyrenis* BREMER, 2006, *A. quadrimaculatus* PIC, 1915, *A. quantulus* BREMER, 2012, *A. recordativus* BREMER, 2004, *A. reinwardti* BREMER, 2001, *A. renovatus* BREMER, 2005, *A. rivalis* BREMER, 2004, *A. rolandi* BREMER, 2010, *A. rudis* BREMER, 2010, *A. rufonotatus* PIC, 1915, *A. sabaensis* BREMER, 2002, *A. saliutensis* BREMER, 2003, *A. sanguinans* FAIRMAIRE, 1893, *A. sappirus* BREMER, 2012, *A. sarawakensis* BREMER, 2010, *A. secernans* BREMER, 2007, *A. secretus* BREMER, 2002, *A. seductus* BREMER, 2011, *A. selatanus* (MASUMOTO & MAKIHARA, 1997), *A. semele* BREMER, 2012, *A. semiaeneus* BLAIR, 1929, *A. seminolus* BREMER, 2012, *A. semotus* BREMER, 2011, *A. seponens* BREMER, 2011, *A. sericeus* GEBIEN, 1927, *A. silvester* BREMER, 2004, *A. (Podamarygmus) simius* BREMER, 2006, *A. singulus* BREMER, 2010, *A. snizeki* BREMER, 2002, *A. sobrinus* BREMER, 2002, *A. sodalis* BREMER, 2002, *A. soror* BREMER, 2002, *A. sospes* BREMER, 2007, *A. splendidulus* (FABRICIUS, 1801), *A. steatitis* BREMER, 2005, *A. straumanni* BREMER, 2001, *A. subtilis* BREMER, 2001, *A. sumatraselatanus* MASUMOTO & MAKIHARA, 1997, *A. sumatrensis* BREMER, 2004, *A. sundaensis* BREMER, 2001, *A. taipingensis* BREMER, 2014, *A. tanahensis* BREMER, 2004, *A. tantillus* BREMER, 2010, *A. tawauensis* BREMER, 2012, *A. tenellus* BREMER, 2003, *A. tenuestriatus* Bremetr, 2003, *A. tenuifrons* BREMER, 2006, *A. tenuis* BREMER, 2010, *A. testaceipes* (PIC, 1915), *A. testaceitarsis* (PIC, 1915), *A. tiomanensis* BREMER, 2010, *A. tricolor* FAIRMAIRE, 1888, *A. tutelarlis* BREMER, 2010, *A. ulfilatis* BREMER, 2012, *A. undulatus* PIC, 1915, *A. urbanus* BREMER, 2010, *A. vanus* BREMER, 2010, *A. variegatus* BREMER, 2012, *A. variipes* BREMER, 2010, *A. venustus* BREMER, 2002, *A. venustus admixtus* BREMER, 2011, *A. verecundus* BREMER, 2010, *A. versicolor* BREMER, 2009, *A. vespertinus* BREMER, 2010, *A. vestigator* BREMER, 2012, *A. victus* BREMER, 2010, *A. viduatus* BREMER, 2010, *A. vilis* BREMER, 2010, *A. violaceus* PIC, 1915, *A. violacolor* BREMER, 2012, *A. viridicatus* BREMER, 2004, *A. (Podamarygmus) viridipes* GEBIEN, 1927, *A. viridis* BREMER, 2010, *A. (Pyanirygmus) visendus* BREMER, 2007, *A. voluptabilis* BREMER, 2005, *A. v-rufum* GEBIEN, 1927, *A. votivus* BREMER, 2010, *A. weberi* BREMER, 2004, *A. yalaensis* BREMER, 2003, *A. zynthiae* BREMER, 2011.

Key for species and species groups (“Sections”) of *Amarygmus* species of Borneo, Sumatra, Java, Peninsular Malaysia and neighbourly islands

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Section I

Key of the five most frequently found species

- 1 Species of medium size (body length 4.90-5.93 mm); elytra elongate oval, with incised striae; especially characterized and different from other species by a marked iridescence on elytra with a prevailing violet color at oblique view; frons rather narrow; antennae reach to the middle of elytra in males (antennae of females slightly shorter); pro- and mesotibiae straight; metatibiae within the basal 40 per cent approximately straight, thence slightly incurved apically; median line of metasternum within the hind 60 per cent widely impressed, this area is closely pilose only in males; protarsomeres 1-3 slightly wider and longer in males than in females. (Greater Sunda Islands, Peninsular Malaysia, The Philippines, Sulawesi, on some islands of the Pacific Ocean) (Fig. I/1) (redescription: BREMER 2005b, 49-52) *micans* (FABRICIUS)
– These characters are not found combined..... 2
- 2 Large to medium-sized, somewhat elongate oval, elytra markedly convex transversely and longitudinally; distinctly incised striae on elytra; upper side unicolored and without a violet iridescence on elytra on oblique view 3
– These characters are not found combined..... 4
- 3 Large (body length 11.3-12.1 mm), slightly elongate oval; elytra distinctly convex and with conspicuously incised striae, their punctures scarcely discernible; femora with a red or reddish brown ring and a black apical cap; upper side black or dark coppery; metatarsomere 1 shorter than metatarsomere 4; antennae relatively short (Greater Sunda-Islands; Peninsular Malaysia) (Fig. I/2) (redescription: MASUMOTO 1989, 314 as *Plesiamarygmus ovoideus* (FAIRMAIRE, 1882)..... *ovoideus* (FAIRMAIRE)
(another species of similar size from Borneo and Sumatra also presents a reddish shaft of femora and a black apical cap: *Amarygmus (Varogeton) kerleyi* (MASUMOTO, 2001)). Its metatarsomere 1 is also shorter than the metatarsomere 4. However, *A. kerleyi* has no markedly incised elytral striae but elytral rows of small, closely set punctures; furthermore, the pronotum of this species is more convex than the pronotum of *A. ovoideus*; pro- and mesotibiae of *A. kerleyi* are distinctly bent, those of *A. ovoideus* are nearly straight)
– Species smaller (body length: 7.89-9.31 mm), slightly elongate; elytra with striae and medium-sized strial punctures; elytral intervals moderately convex, with tiny, widely separated punctures; femora uniformly dark; upper side dark coppery or black; metatarsomere 1 longer than metatarsomere 4; antennae relatively long (Sri Lanka; South Thailand; South Vietnam; Taiwan; Japan: Okinawa-Is.; Peninsular Malaysia; Greater Sunda-Islands; Smaller Sunda Islands) (Fig. I/3) (redescription: BREMER 2005b, 58-61) *pictarsis* (FAIRMAIRE)
- 4 Large species (body length: 9.5-12.1 mm); elytra elongate oval (length/width ratio of elytra 1.44-1.53:1); not very convex transversely and longitudinally; striae on elytra not or inconspicuously incised, they consist of small, dense, well visible punctures, intervals of elytra in most specimens flat, but in some areas one may find specimens with slightly convex intervals; punctures on elytral intervals tiny; apices of each elytron slightly and roundedly protruding and slightly retracted towards median suture; shape of pronotum variable: the lateral margins may be subparallel within the posterior half, or are narrowed towards base; antennae long, reaching to hind third of elytra; prosternal apophysis long, narrow; legs long, slender and uniformly black; metatibiae somewhat bent in the middle in males, in females they are less bent; protarsomeres not widened in males; metatarsomere 1 somewhat longer than metatarsomere 4; upper side copper-colored or black, lustrous (Greater Sunda Islands; Peninsular Malaysia, Sulawesi; The Philippines, Islands of the Moluccas) (Fig. I/4) (redescription: BREMER 2001d, 164-166) *metallicus* (PERTY)
– These characters are not found combined..... 5
- 5 Large (body length 9.7-11.9 mm), elongate oval; longitudinally the upper side is only inconspicuously convex; apices of elytra mutually rounded; elytra with striae which are formed by minute, very dense, but well discernible punctures; intervals always slightly convex and very densely punctured (also pronotum); upper side lustrous and on elytra with colorful reflections which frequently form colored stripes (occurs from Nepal to Japan; The Philippines; Greater Sunda Islands; Smaller Sunda Islands up to Flores) (Fig. I/5) (redescription: BREMER 2005b, 54-57) *cuprarius cuprarius* (WEBER)

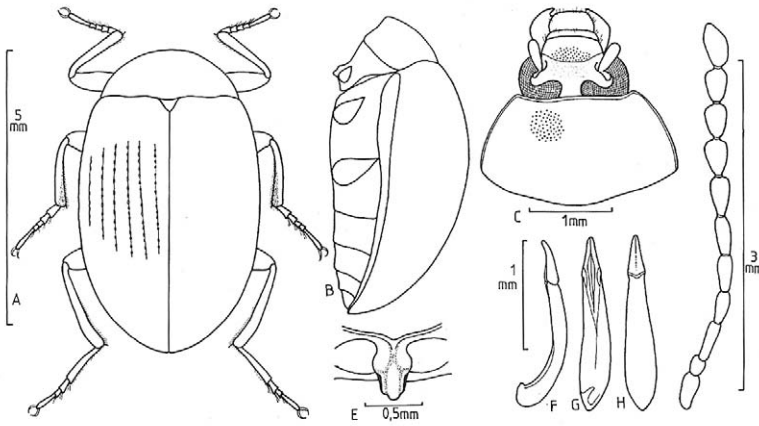


Fig. I/1: *Amarygmus micans* (FABRICIUS, 1794): **A** Habitus; **B** Body, lateral view; **C** Head and pronotum; **D** Antenna; **E** Prosternal process; **F** Aedeagus, lateral view; **G** Aedeagus, ventral view; **H** Aedeagus, dorsal view (reproduction from BREMER 2005b, p.51).

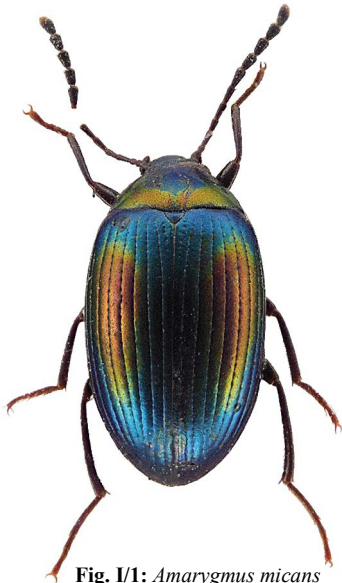


Fig. I/1: *Amarygmus micans* (FABRICIUS, 1794).



Fig. I/2: *Amarygmus ovoideus* (FAIRMAIRE, 1882).



Fig. I/3: *Amarygmus picitarsis* (FAIRMAIRE, 1882).

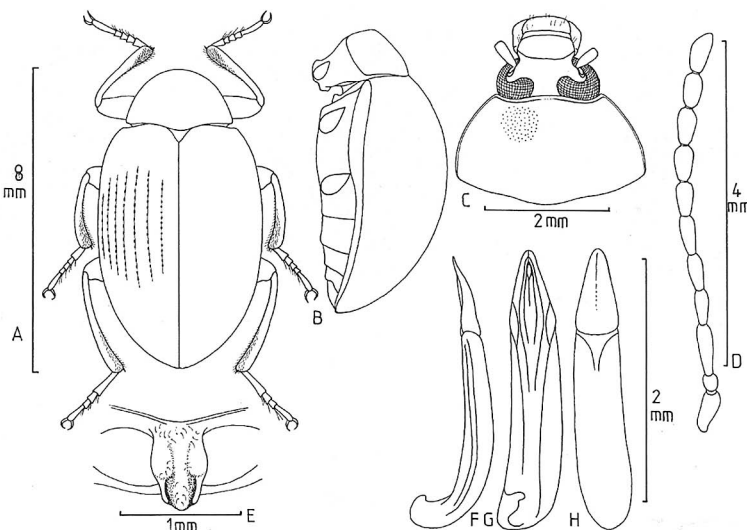


Fig. I/3: *Amarygmus picitarsis* (FAIRMAIRE, 1882): **A** Habitus; **B** Body, lateral view; **C** Head and pronotum; **D** Antenna; **E** Prosternal process; **F** Aedeagus, lateral view; **G** Aedeagus, ventral view; **H** Aedeagus, dorsal view (reproduction from BREMER 2010c, p.46).



Fig. 1/4: *Amarygmus metallicus* (PERTY, 1831): Photographs (left: the posterior parts of elytra focused; right: dorsal view).

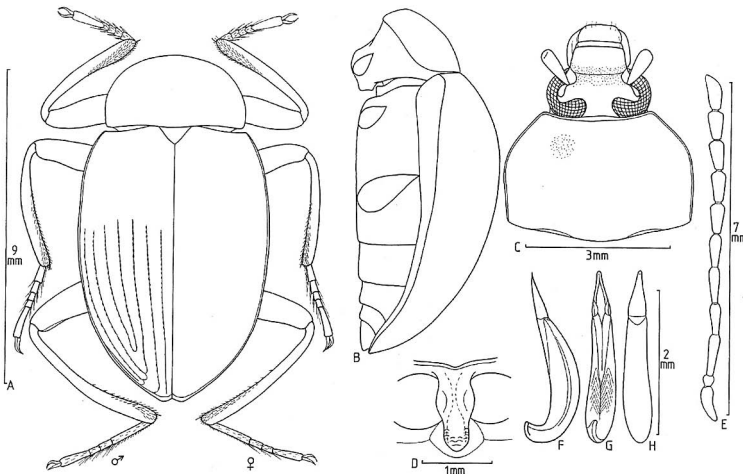


Fig. 1/4: *Amarygmus metallicus* (PERTY, 1831): A Habitus, left side legs of a male; right side legs of a female; B Body, lateral view; C Head and pronotum; D Prosternal process; E Antenna; F Aedeagus, lateral view; G Aedeagus, ventral view; H Aedeagus, dorsal view (reproduction from BREMER 2009b, p.318).

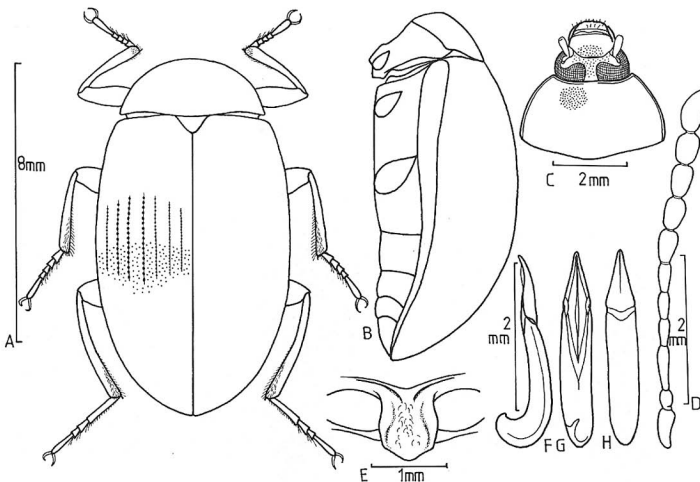


Fig. 1/5: *Amarygmus cuprarius cuprarius* (WEBER, 1801): A Habitus; B Body, lateral view; C Head and pronotum; D Antenna; E Prosternal process; F Aedeagus, lateral view; G Aedeagus, ventral view; H Aedeagus, dorsal view (reproduction from BREMER 2005b, p.55); right: Photograph.

Section II

Keys leading to following Sections (Section III – VI in this volume)

The following parts comprise groups of *Amarygmus* with striking and easily identifiable characters. It concerns groups with characters which are present in both sexes but also groups with characters which are only found in males, e. g. prolonged fore legs or broadened protibiae (in this case the females are also dealt in the species groups which concern both sexes).

- 1 Species with the greatest width of pronotum near the mid, and with base of elytra distinctly wider than base of pronotum; with a special form of aedeagus (subgenus *Dryadigmus* BREMER, 2007 of *Amarygmus* DALMAN, 1823) (Peninsular Malaysia) (Fig. II/1) (BREMER 2007a, 26-29) **cechovskyi** BREMER
- Species with the greatest width on the posterior sides of pronotum and, concerning aedeagus, with a different form of aedeagus (subgenus *Amarygmus* DALMAN, 1823)..... 2
- 2 Species with maculae on elytra, some species also maculae on pronotum (Fig. II/2)..... **Section III** (p. 60)
- Species without maculae on elytra or pronotum 3
- 3 Species with elytral rows of punctures which have a violet, blue or red bottom, some of them also have a violet, blue or red halo around these punctures (Fig. II/3) **Section IV** (p. 78)
- Species with elytral rows or striae, but without a violet, blue or red bottom of their punctures and without violet, blue or red haloes around these punctures 4
- 4 Tiny species with yellow elytra and a darker pronotum (black, darker brown, dark green) (in two species with black maculae on elytra) (body length <3.0 mm); elytra oval, convex, with rows of punctures and flat intervals (Fig. II/4) **Section V** (p. 83)
- Species without yellow elytra and a darker pronotum; species of different size 5
- 5 Species with a blue or violet coloration of the lateral parts of elytra (the disc is either yellowish-brown, reddish-brown, blue or copper-colored) (Fig. II/5) **Section VI** (p. 85)
- Species without a blue or violet coloration of the lateral parts of elytra 6
- 6 Species with very long and narrow elytra (length/width ratio >1.55:1); the sides of elytra are either subparallel, they slightly converge posteriorly, or the sides are elongate oval (Fig. II/6) **Section VII**
- These characters are not found combined (if length/width ratio of elytra is >1.55:1 then the elytra are not narrow but wide) 7
- 7 Very large species (length >12 mm) with long legs; the profemora elicit a bulging on frontal side towards their second thirds, but not, as the similarly looking *Plesiophthalmus* species, with a tooth or a sharp, step-like interruption of their anterior outline. Metatarsomere 1 is shorter than metatarsomere 4 or of equal length. The sides of elytra are mostly subparallel, the femora do not present a red ring around them (subgenus *Pyanirygmus* PIC) or they have markedly bent protibiae and a red ring around femora (subgenus *Varogeton* BREMER) (Fig. II/7) **Section VIII**
(a determination key of the species of these subgenera has already been published in BREMER 2014a, p.79)
- These characters are not found combined or, if large species are concerned, the body shape is oval and metatarsomere 1 is longer than metatarsomere 4 8
- 8 Species with uniformly white, yellow or brown antennomeres 11 (without maculae on elytra), the penultimate antennomeres are black in mature specimens and contrast with the antennomere 11 (Fig. II/8) **Section IX**
- Antennomeres 11 are not uniformly white, yellow or light brown; they are either uniformly brown (if the penultimate antennomeres are also brown), black, or only their apical thirds are lightened 9

- 9 Small to medium-sized, elongate oval, convex species, they display dense, short bristles on the dorsal side of metatibiae which get visible on 50-fold magnification in oblique view (e. g. *A. borneensis* (GEBIEN, 1920), *A. sericeus* GEBIEN, 1927, *A. bruneiensis* PIC, 1915, *A. malaccanus* PIC, 1922) (specimens of this group have a body length of 4.8-8.8 mm) (Fig. II/9) **Section X**
 (the very dense bristles cannot be overlooked in these species if one is using the correct magnification. In two species (*A. sabahensis* BREMER, 2002, *A. bryanti* BREMER, 2002) only a few bristles are present on the outer surface of metatibiae, and in these species the bristles may easily be overlooked; these two species are therefore also considered in other Sections)
- Outer surface of metatibiae smooth, without bristles or only with a few short bristles 10
- 10 Elytra and pronotum with very short, recumbent hairs on intervals of elytra, on pronotum, on frons and on clypeus; these species are of medium size (3.5-6.2 mm long), elongate oval, with flat elytral intervals; elytra either golden, blue or orange dependent on incidence of light (Fig. II/10) **Section XI**
- Elytra and pronotum without very short, recumbent hairs..... 11
- 11 The eyes are touching each other on frons (in males) or are nearly touching each other (in females) (Fig. II/11) **Section XII**
- The distance between eyes on frons is wider than a diameter of one ocellus in males, or two ocelli in females 12
- 12 Species with extremely deep, groove-like incision of fronto-clypeal suture; genae and frons jointly form a continuous semi-circle towards the fronto-clypeal suture (Fig. II/12); genae not raised. These species are small (length <4.5 mm) and have rows of punctures on elytra **Section XIII**
- Species without an extremely deep, groove-like incision of fronto-clypeal suture..... 13
- 13 Males possess markedly prolonged fore legs in contrast to females; They also have prolonged and widened protarsomeres 1-3, and the protarsomeres 1-4 present long hairs which are distinctly projecting beyond their sides. The prosternal apophysis is very wide and apically acute-angled in both sexes. The species of this Section are oval and mostly of medium size; their upper side is usually colored (subgenus *Podamarygmus* CARTER, 1928) (Fig. II/13) **Section XIV**
 (females of this Section are also considered in determination keys of other Sections)
- Males do not possess markedly prolonged fore legs, and the prosternal apophysis is not markedly wide and apically acute-angled 14
- 14 Males in contrast to females possess widened protibiae on inner sides within their apical 50 to 60 per cent or on their full length; these species are small or of medium size and possess convex elytra (Fig. II/14) **Section XV**
 (females of this Section are also considered in the determination keys of other Sections)
- Males in contrast to females do not possess widened protibiae on inner sides within their apical 50 to 60 per cent 15
- 15 Males in contrast to females present either long or short hairs on the frontal side of profemora, on the back side of mesofemora, on prosternal apophysis, on mesosternum and, in some species, on metasternum (species near *A. postdepressus* PIC, 1938) or a patch of recumbent hairs on the frontal side of profemora (species near *A. commodus* BREMER, 2014). These species are of medium or large size (Fig. II/15) **Section XVI**
 (females of this Section are also considered in the determination keys of other Sections)
- Males do not possess long hairs on the frontal side of profemora, on the back side of mesofemora, on prosternal apophysis, and on mesosternum or a patch of recumbent hairs on the frontal side of profemora 16
- 16 Males in contrast to females have a very special form either of mesotibiae, metatibiae or both of meso- and metatibiae (Fig. II/16) **Section XVII**
- In males there are no alterations of meso- and metatibiae 17

- 17 Males and not females have short or long, closely set hairs on the back sides of meso- and metafemora (Fig. II/17) **Section XVIII**
 – Species have no short or long, dense hairs on back sides of meso- and metafemora in males 18
- 18 Species not mentioned in preceding Sections with elytral rows of punctures and females with elytral rows of punctures of species with sexual characters in males which are delt in preceding Sections (species with a body length of ≈ 5.0 mm are quoted both in Section XIX and in Section XX) 19
 – Species not mentioned in preceding Sections with elytral striae and females with elytral striae of species with sexual characters which are delt in preceding Sections (species with a body length ≈ 5.0 mm are quoted both in Section XXI and in Section XXII) 20
- 19 Species with a body length >5.0 mm (Fig. II/18) **Section XIX**
 – Species with a body length <5.0 mm (Fig. II/19) **Section XX**
- 20 Species with a body length >5.0 mm (Fig. II/20) **Section XXI**
 – Species with a body length <5.0 mm (Fig. II/21) **Section XXII**



Fig. II/1: *Amarygmus (Dryadigmus) cechovskyi* BREMER, 2007, left: **A** Habitus, male; **B** Body, lateral view; **C** Head and pronotum; **D** Prosternal process; **E** Antenna; **F** Aedeagus, lateral view; **G** Aedeagus, ventral view; **H** Aedeagus, dorsal view (reproduction from BREMER 2007a, p.27); **above:** Photograph.

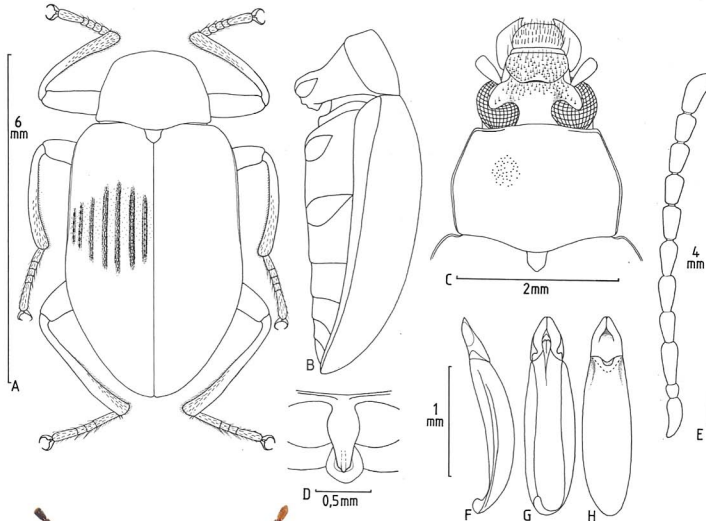


Fig. II/2: *Amarygmus lynnae* BREMER, 2002, male.

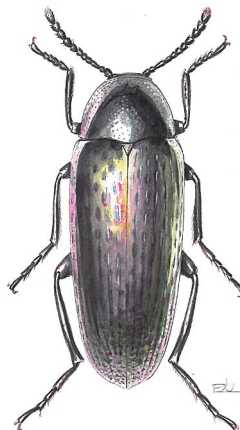


Fig. II/3: *Amarygmus selatanus* (MASUMOTO & MAKIHARA, 1997): Drawing.

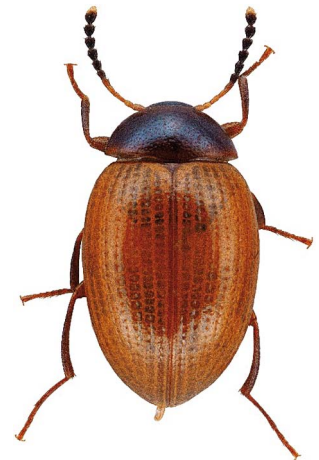


Fig. II/4: *Amarygmus semele* BREMER, 2012.

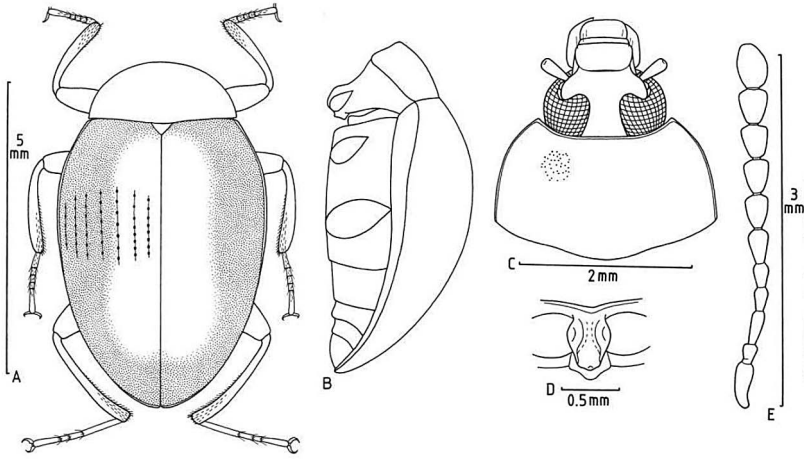


Fig. II/5: *Amarygmus ino* BREMER, 2012: **A** Habitus, female; **B** Body, lateral view; **C** Head and pronotum; **D** Prosternal process; **E** Antenna (reproduction from BREMER 2012a, p.209).

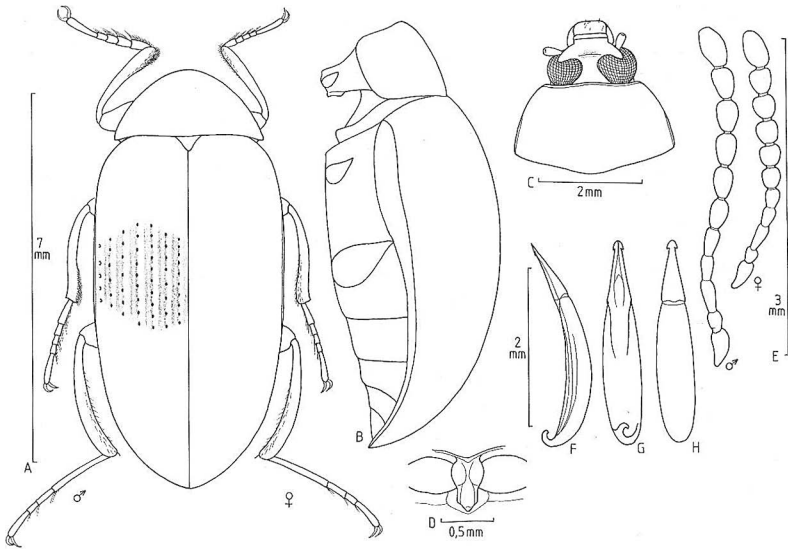


Fig. II/6: *Amarygmus blanchardi* BREMER, 2001: **A** Habitus, left side legs of a male, right side legs of a female; **B** Body, lateral view; **C** Head and pronotum; **D** Prosternal process; **E** Antennae, male and female; **F** Aedeagus, lateral view; **G** Aedeagus, ventral view; **H** Aedeagus, dorsal view (reproduction from BREMER 2004e, p.195).

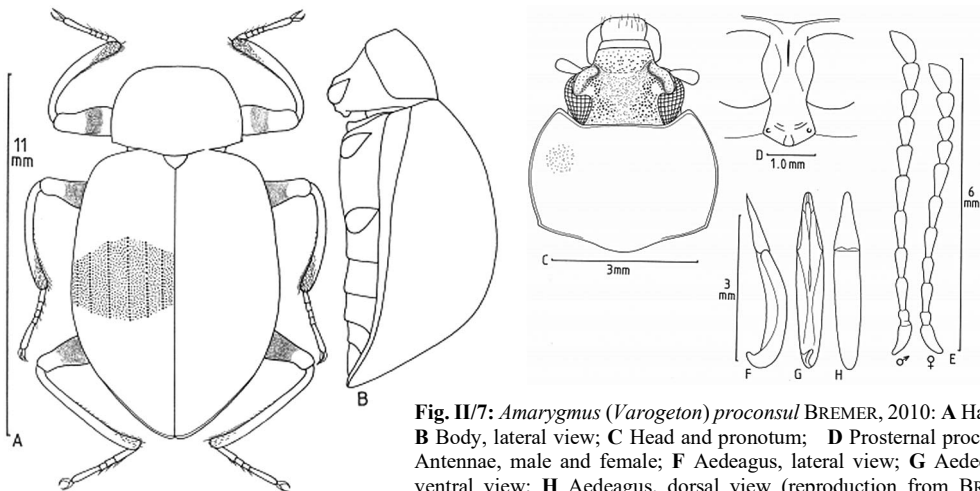


Fig. II/7: *Amarygmus (Varogeton) proconsul* BREMER, 2010: **A** Habitus; **B** Body, lateral view; **C** Head and pronotum; **D** Prosternal process; **E** Antennae, male and female; **F** Aedeagus, lateral view; **G** Aedeagus, ventral view; **H** Aedeagus, dorsal view (reproduction from BREMER 2010b, pp.50, 51).

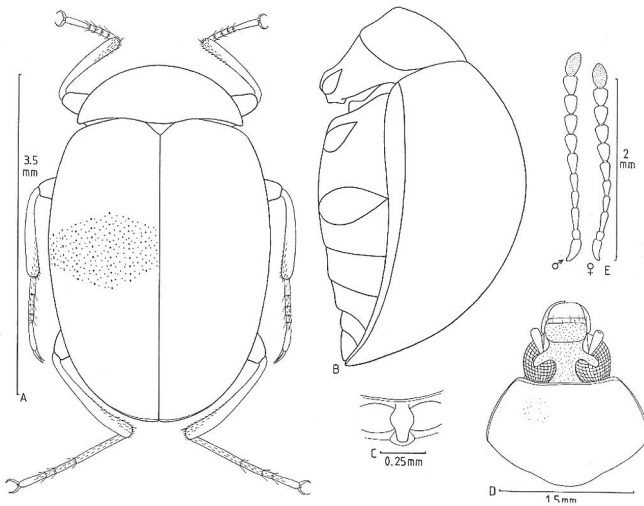


Fig. II/8: *Amarygmus gilvicornis* BREMER, 2011: **A** Habitus, male; **B** Body, lateral view; **C** Prosternal process; **D** Head and pronotum; **E** Antennae, male and female (reproduction from BREMER 2011a, p.215).

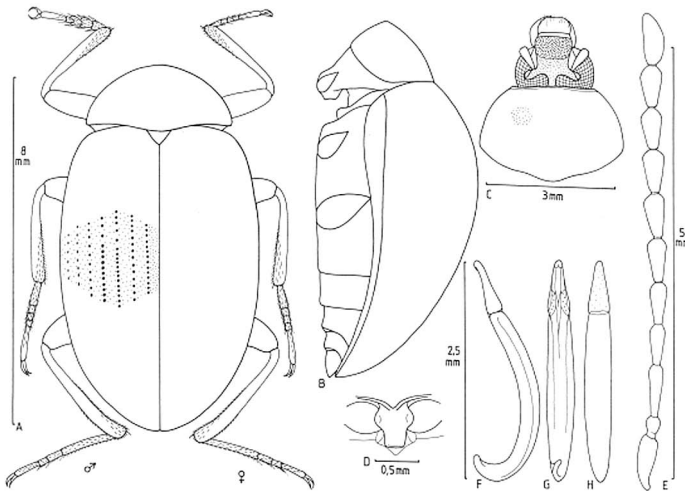


Fig. II/9: *Amarygmus malaccanus* PIC, 1922: **A** Habitus, left side legs of a male, right side legs of a female; **B** Body, lateral view; **C** Head and pronotum; **D** Prosternal process; **E** Antenna; **F** Aedeagus, lateral view; **G** Aedeagus, ventral view; **H** Aedeagus, dorsal view (reproduction from BREMER 2009a, p.42).

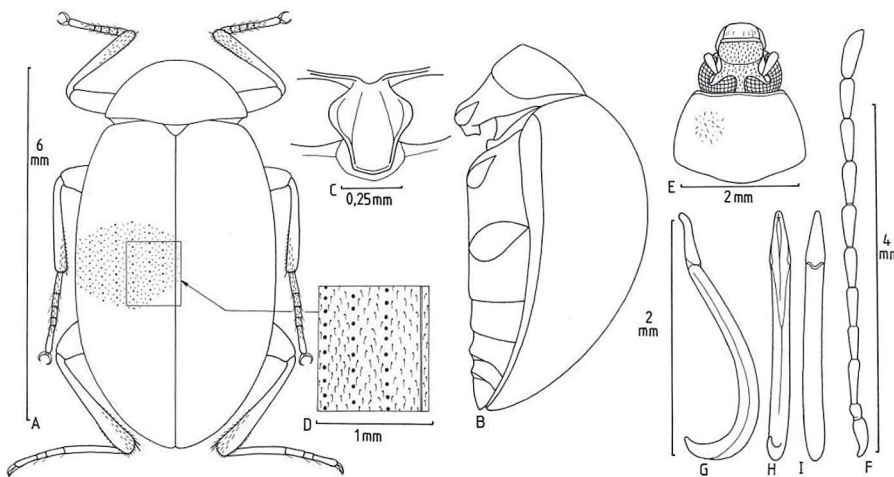


Fig. II/10: *Amarygmus lepidus* BREMER, 2010: **A** Habitus, **B** Body, lateral view; **C** Prosternal process; **D** Magnified detail of elytra showing the tiny hairs; **E** Head and pronotum; **F** Antenna; **G** Aedeagus. Lateral view; **H** Aedeagus, ventral view; **I** Aedeagus, dorsal view (reproduction from BREMER 2010b, p.47).

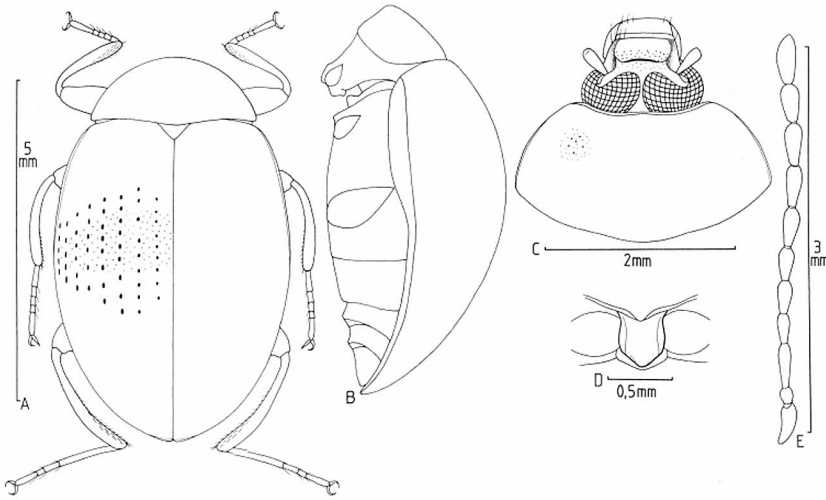


Fig. II/11: *Amarygmus powanpowanus* MASUMOTO & MAKIHARA, 1997: **A** Habitus; **B** Prosternal process; **C** Head and pronotum; **D** Prosternal process (reproduction from BREMER 2006a, p.29 as *A. nemestrinus* BREMER, 2006).

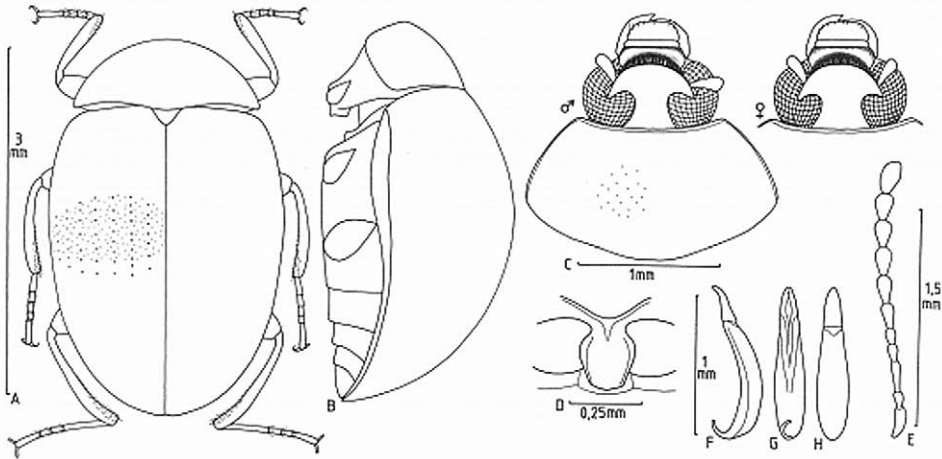


Fig. II/12: *Amarygmus straumanni* BREMER, 2001: **A** Habitus; **B** Body, lateral view; **C** Head and pronotum, male, and head of a female; **D** Prosternal process; **E** Antenna; **F** Aedeagus, lateral view; **G** Aedeagus, ventral view; **H** Aedeagus, dorsal view (original drawing).

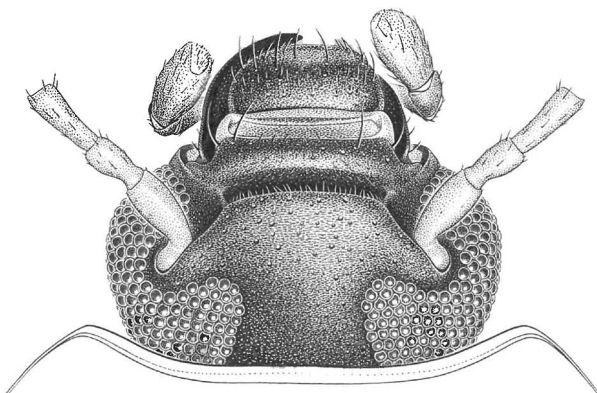


Fig. II/12: *Amarygmus straumanni* BREMER, 2001: Head.

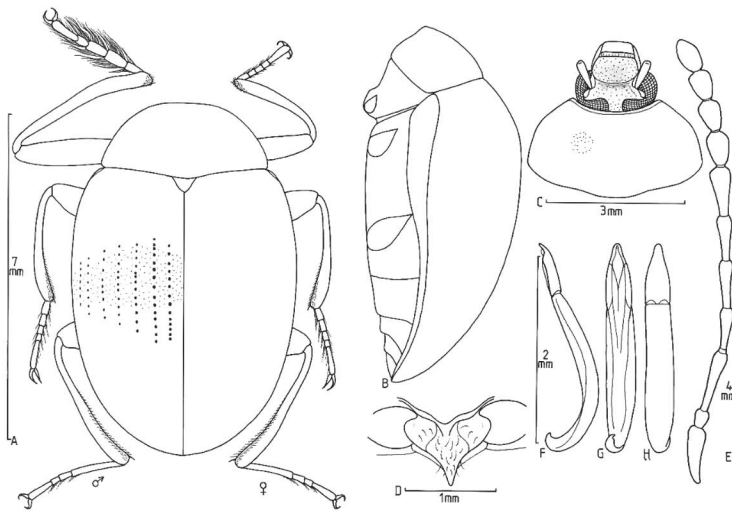


Fig. II/13: *Amarygmus simius* BREMER, 2006: **A** Habitus, left side legs of a male, right side legs of a female; **B** Body, lateral view; **C** Head and pronotum; **D** Prosternal process, male; **E** Antenna; **F** Aedeagus, lateral view; **G** Aedeagus, ventral view; **H** Aedeagus, dorsal view (reproduction from BREMER 2006b, p.59).

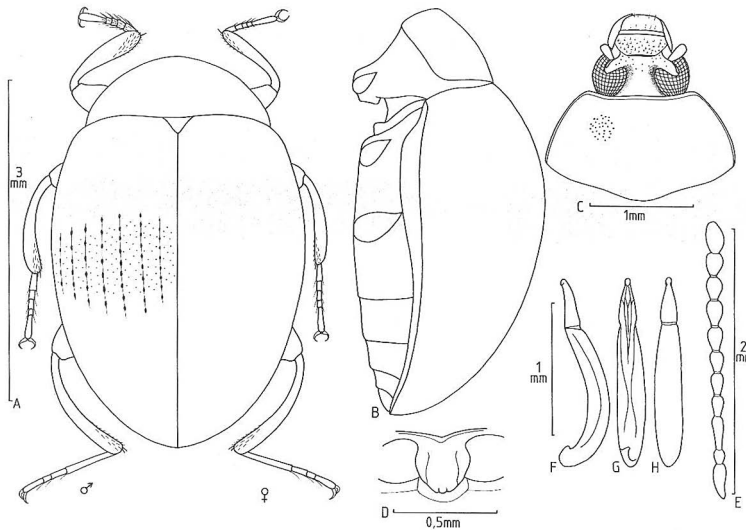


Fig. II/14: *Amarygmus sospes* BREMER, 2007: **A** Habitus, left side legs of a male, right side legs of a female; **B** Body, lateral view; **C** Head and pronotum; **D** Prosternal process; **E** Antenna, female; **F** Aedeagus, lateral view; **G** Aedeagus, ventral view; **H** Aedeagus, dorsal view (reproduction from BREMER 2007b, p.179).

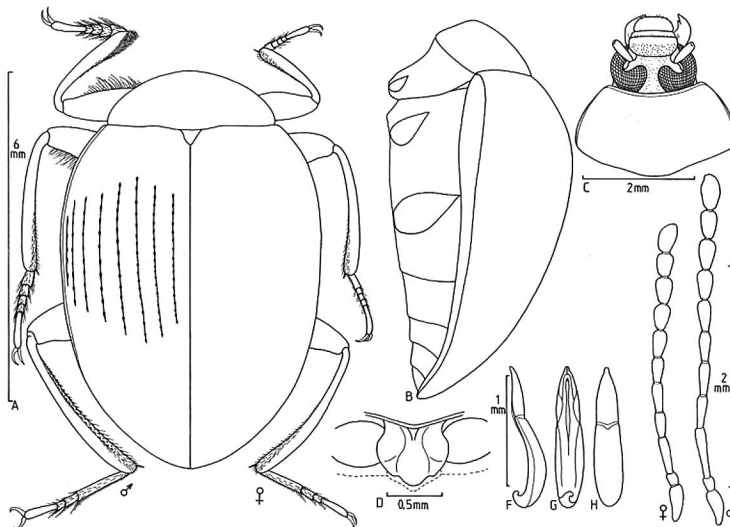


Fig. II/15: *Amarygmus postdepressus* PIC, 1928: **A** Habitus, left side legs of a male, right side legs of a female; **B** Body, lateral view; **C** Head and pronotum; **D** Prosternal process; **E** Antennae, male and female; **F** Aedeagus, lateral view; **G** Aedeagus, ventral view; **H** Aedeagus, dorsal view (reproduction from BREMER 2004a, pp.69, 70).

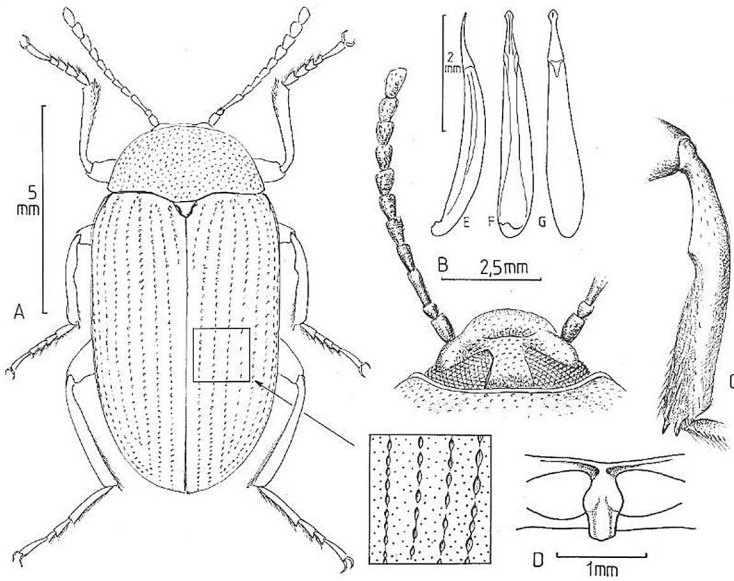


Fig. II/16: *Amarygmus hassalti* FAIRMAIRE, 1882: A Habitus, male; B Head and antenna; C Mesotibia of a male; D Prosternal process; E Aedeagus, lateral view; F Aedeagus, ventral view; G Aedeagus, dorsal view (reproduction from BREMER 2003a, p.60).

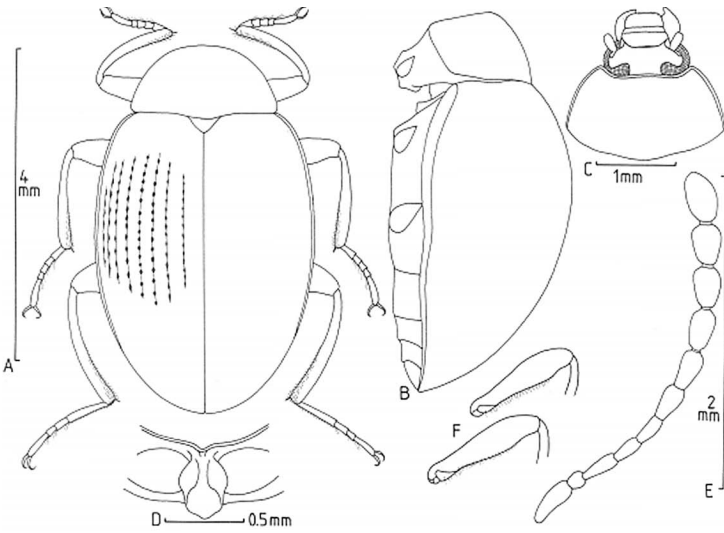


Fig. II/17: *Amarygmus michaeli* BREMER, 2004: A Habitus, male; B Body, lateral view; C Head and pronotum; D Prosternal process; E Antenna; F Meso- and metafemora of a male (reproduction from BREMER 2004b, p.151).

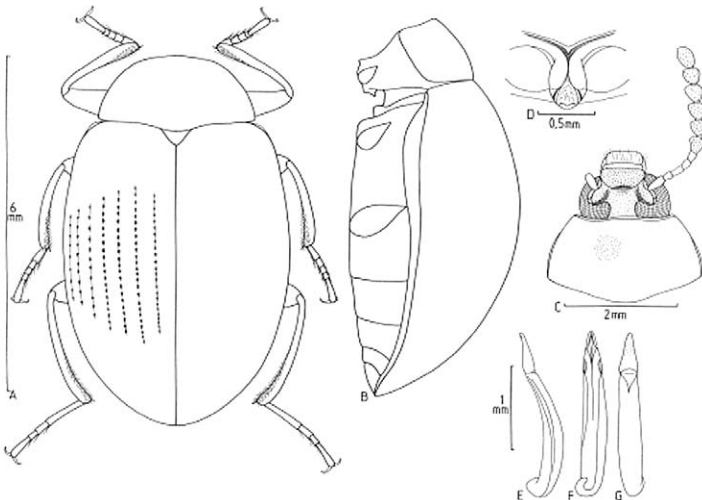


Fig. II/18: *Amarygmus peculiaris* BREMER, 2004: A Habitus; B Body, lateral view; C Antenna, Head and pronotum; D Prosternal process; E Aedeagus, lateral view; F Aedeagus, ventral view; G Aedeagus, dorsal view (reproduction from BREMER 2004b, p.155).

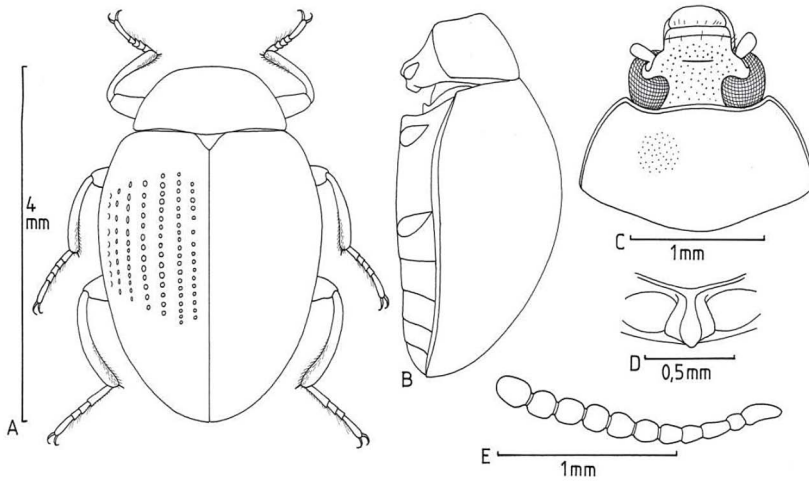


Fig. II/19: *Amarygmus sumatrensis* BREMER, 2004: **A** Habitus, female; **B** Body, lateral view; **C** Head and pronotum; **D** Prosternal process; **E** Antenna (reproduction from BREMER 2004c, 124).

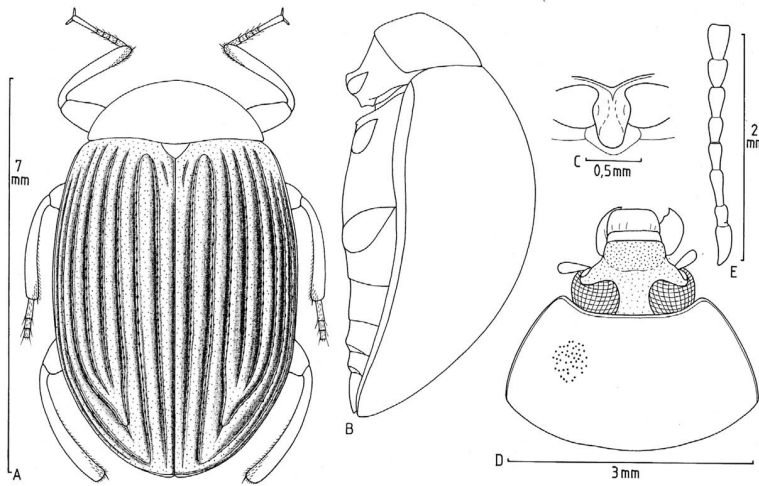


Fig. II/20: *Amarygmus padang* GEBIEN, 1927: **A** Habitus; **B** Body, lateral view; **C** Prosternal process; **D** Head and pronotum, **E** Antennomeres 1-8 (reproduction from BREMER 2010b, p.34).

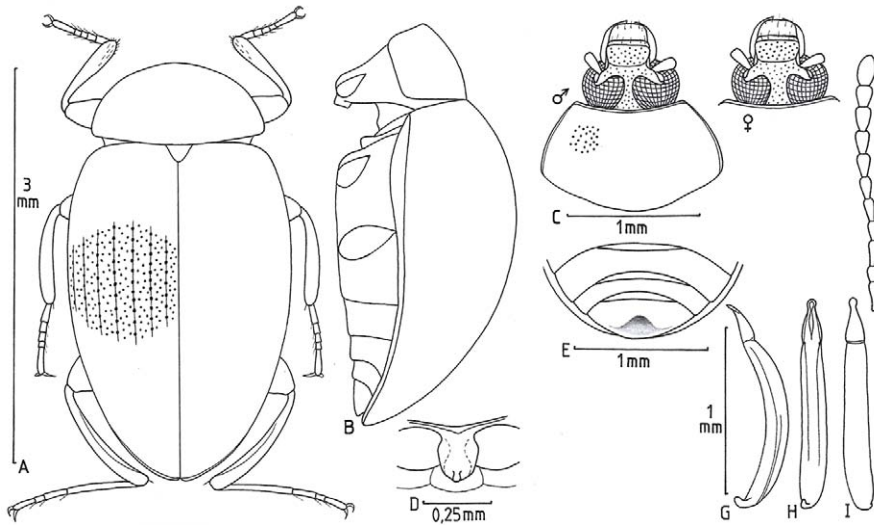


Fig. II/21: *Amarygmus fraterculus* BREMER, 2002: **A** Habitus, male; **B** Body, lateral view; **C** Head and pronotum, male, and head of a female; **D** Prosternal process; **E** Sternites 3-5 of a male (with a depression on sternite 5); **F** Antenna; **G** Aedeagus, lateral view. **H** Aedeagus, ventral view; **I** Aedeagus, dorsal view (original drawing).

Section III

Species with yellow, yellowish red, reddish brown or black maculae on elytra and (in some species) also on pronotum

Species of this **Section** belong to different species groups which are not related to each other. However, it is reasonable to combine them in one **Section** because their maculae are easily discernible. However, the species of this **Section** may be grouped to the following species groups:

1 Species affine *Amarygmus sanguinans* FAIRMAIRE 1893: All species of this group have elytral striae with closely set punctures, the elytral intervals are very densely punctured. The forelegs in males are more or less prolonged, and laterally on protarsi in males there are long, projecting hairs which originate from the soles of protarsomeres 1-4. In most of these species the antennomeres 4 are as long as the antennomeres 3 (exception *Amarygmus diversipennis* PIC, 1922) (in other species of the subgenus *Amarygmus* the antennomeres 3 are usually longer than the antennomeres 4).

Beside *A. sanguinans* FAIRMAIRE the following species with maculae belong to this species group: *A. adornatus* BREMER, 2010, *A. binotatus* PIC, 1915, *A. christiana* BREMER, 2002, *A. diversipennis* PIC, 1922, *A. elegans* BREMER, 2002, *A. fasciatus* GEBIEN, 1913, *A. hongii* BREMER, 2011, *A. liniae* BREMER, 2002, *A. lynnae* BREMER, 2002, *A. maculosus* BREMER, 2002, *A. morpheus* BREMER, 2011, *A. nigrofaciatus* PIC, 1915, *A. nigromaculatus* PIC, 1915, *A. nuntius* BREMER, 2010, *A. pilipes* GEBIEN, 1913, *A. proteus* BREMER, 2010, *A. rufonotatus* PIC, 1915, *A. pulchrior* BREMER, 2002, *A. undulatus* PIC, 1915. Further species with prolongation of forelegs, widened and prolonged protarsomeres 1-3 in males and a similar shape are *Amarygmus furvus* (GEBIEN, 1927) (known from Sumatra) and *Amarygmus elisabethae* BREMER, 2003 (known from South India) but these species have no maculae; *A. furvus* also presents antennomeres 4 of the same length as antennomeres 3 in males, however, *A. elisabethae* has a slightly longer antennomeres 3 than antennomeres 4.

2 Species near *Amarygmus quadrimaculatus* PIC, 1915. These species are oval and very convex, however, they have no distinctly longer forelegs in males. The following species belong to this group: *A. barae* BREMER, 2002, *A. becvari* BREMER, 2002, *A. quadrimaculatus* PIC, 1915.

3 Species near *A. dryadiformis* BREMER, 2002, also *A. floreni* BREMER, 2011 belongs to this group. Both species present a widened shaft of protibiae in males.

4 Species near *Amarygmus filiolus* BREMER, 2002: These small, elongate oval species present a transverse macula nearly the mid of elytra. The following taxa belong to this group: *A. filiolus* BREMER, 2002, *A. mediofasciatus* PIC, 1938, *A. iunctus* BREMER, 2010, *A. v-rufum* GEBIEN, 1927. On frons the eyes are in direct contact to each other in males (in females the distance of eyes is slightly larger on frons); elytra with small, very closely set striae punctures, the intervals are also densely punctured.

5 Species near *Amarygmus circaeus* BREMER, 2012: *A. variegatus* BREMER, 2012 and *A. coccinelloides* BREMER, 2010 belongs to this group: These species resemble the species of the second paragraph, however, in contrast to these species their frons is very wide, and they display black maculae on a yellow or red ground. Two of these species (*A. circaeus* and *A. variegatus*) are tiny (body length <2.5 mm) and have yellow elytra; *A. coccinelloides* is somewhat larger (body length 2-99-3.10 mm), and the ground color of elytra is brightly red.

Determination key of *Amarygmus* with maculae

All species with maculae are illustrated because the pattern of their maculae is essential for their identification.

- 1 Elytra with striae which consist of very closely set punctures; in some species the eyes are contacting each other on frons; species are either small or large..... 9
- Elytra with rows of distinctly separated punctures and scarcely punctured elytral intervals; eyes are either widely separated or are somewhat narrowed; species are small or of medium size..... 2
- 2 Oval, markedly convex; with a body length <2.5 mm, a very wide frons; maculae are black on a yellow ground color..... 3
- Species with a body length >2.5 mm; frons of different width..... 4

- 3 Elytra with three black maculae: a transverse one along base, a slightly oblique one just behind middle, and one at apex. Body length 1.79-1.82 mm (Sabah) (Fig. III/1) (BREMER 2012a, 204-205) *circaeus* BREMER
- Elytra with a longitudinal black colour in the middle; however, there are variants without a macula and, another one, with a black elytral base and with a black elytral interval 1. Body length 2.07-2.37 mm (Sabah) (Fig. III/2) (BREMER 2012a, 226-228) *variegatus* BREMER
(rarely specimens of *A. variegatus* without a macula occur)
- 4 Each elytron with one large macula 5
- Each elytron with two large maculae 7
- 5 Each elytron with a black macula circumvented by a brilliantly red color (giving this species the appearance of a small *Coccinella*); pronotum black, lustrous (base of pronotum lighted up); frons wide; elytra with rows of punctures and flat, scarcely punctured intervals. Body length 2.99-3.10 mm (Sabah, Crocker Mts.) (Fig. III/3) (BREMER 2010a, 175-176) *coccinelloides* BREMER
- The elytral macula is not circumvented by a shining red; frons is relatively narrow or of medium width 6
- 6 The lateral parts of pronotum are reddish brown, median there is with a black band; on each elytron with a large, red, somewhat longitudinal macula, located in the middle, the circumventing color is black; elytra oval (length/width ratio 1.26:1); frons of medium width; antennae short. Body length 3.78 mm (Sumatra) (Fig. III/4) (BREMER 2002b, 10-11) *becvari* BREMER
- Pronotum uniformly black; elytral macula large, reddish brown, circumvented by black, lustrous color; the elytral macula is located laterally in the anterior half of elytra; elytra somewhat elongate oval (length/width ratio 1.44-1.46:1); frons wide; antennae of medium length. Body length 3.27-3.42 mm (higher altitudes of Crocker Mts. of Sabah) (Fig. III/5) (BREMER 2012a, 212-214) *floreni* BREMER
- 7 On each elytron there are two large, yellow or reddish brown maculae which transversely are separated by blackish green band; elytra oval (length/width ratio 1.33:1); in males the protibiae are club-like widened and indented from below, in females the protibiae are thin and not indented from below; frons relatively wide; antennae long. Body length 2.97+3.11 mm (Sabah, higher altitudes of Crocker Mts.) (Fig. III/6) (BREMER 2002b, 12-13) *dryadiformis* BREMER
- Larger (body length >5.0 mm) 8
- 8 Pronotum reddish brown and strongly microreticulated; each elytron with two large, reddish yellow maculae which are separated by a transverse, black band; elytra less microreticulated than pronotum; body shape oval (length/width ratio of elytra 1.27:1); frons of medium width; antennae reaching to middle of elytra; in males the back side of mesofemora with short hairs; metatibiae apically not abruptly incurved. Body length 5.30 mm (Peninsular Malaysia, lowland rainforest) (Fig. III/7) (BREMER 2002b, 8-10) *barae* BREMER
- Upper side uniformly very lustrous; pronotum black, dark green or blue; the elytral maculae have a similar shape and color as in preceding species; body oval (length/width ratio of elytra 1.30-1.41:1); frons of medium width; antennae relatively short, in males longer than in females; in males on the back side of mesofemora with hairs; males with apically an abruptly incurved metatibiae. Body length 5.73-7.20 mm (Sabah, Crocker Mts.) (Figs. III/8) (PIC, 1915, 24; redescription and illustration: BREMER 2005c, 23-24) *quadrimaculatus* PIC
- 9 Very small species (body length <4.0 mm), narrow; the eyes are nearly touching each other on frons; elytra with striae which consist of small, dense punctures; the elytral intervals are densely punctured; the metatibiae are markedly bent 10
- The species are larger; the frons is distinctly wider 14

- 10 Very small (body length 3.42-3.50 mm), narrow; elytra with an elongate reddish brown macula along median suture and elytral base, laterally also one in the middle of elytra; the eyes touch each other on frons in both sexes; in males the antennomere 3 is very short and narrow and as long as antennomere 2, antennomere 4 is long and wide; in females the antennae are conspicuously shorter than in males, the antennomere 3 is distinctly longer than antennomere 2, and it is similar in length and shape as antennomere 4. Body length 3.42-3.50 mm (Sabah; Sarawak, lowlands) (Fig. III/9) (BREMER 2010a, 199-201) *iunctus* BREMER
- Body size, shape and punctuation similar as in preceding species; frons very narrow; a transverse elytral macula just behind the mid of elytra..... 11
- 11 The hind macula of elytra presents the form of a wide v; just behind the elytral base there is a large, rounded macula at the shoulders; elytra oval (length/width ratio 1.36:1), maximum of elytral width is about in the middle; elytra with striae which consist of small, closely set punctures, intervals flat, with small, distinct, relatively dense punctures; frons very narrow (the distance between eyes equals to about diameters of 2 ocelli); the maximum of width of prosternal process is situated between procoxae. Body length 3.94 mm (Sumatra) (Fig. III/10) (GEBIEN 1927, 52-53; annotations and illustration: BREMER 2005c, 29) *v-rufum* GEBIEN
(from the two syntypes described in GEBIEN'S paper I could only trace a damaged one; because of its distance between eyes on frons it is probably a female; only the antennomeres 1-6 of one antenna are preserved)
- The hind transverse macula of elytra does not present the form of a wide v, it is more or less straight; elytra with slightly incised striae which are formed by small, dense punctures; elytral intervals closely punctured..... 12
- 12 The maximum of width of elytra is situated in the middle or shortly in front of middle; the eyes are touching each other on frons in males and have a distance of about one ocellus or two ocelli in females; elytrae with one macula just behind the elytral base which median is separated by a black band which is stretching along median at suture; the fronto-clypeal suture is situated just in front of the anterior margin of eyes..... 13
- The maximum of width of elytra is situated at the end of first third of elytra; elytra are elongate oval (length/width ratio 1.45-1.47:1); the greatest width of prosternal process is situated much behind the procoxae; the macula just behind the elytral base is not separated into two lateral maculae by a black longitudinal band at the median suture; the eyes are separated on frons by a distance which is less than the diameter of one ocellus. Body length 3.36-3.52 mm (S. Sumatra) (Fig. III/11) (BREMER 2002b, 14-15) *ellipticus* BREMER
- 13 Males and females display the sexual particularities of antennae as *A. iunctus* do. The anterior and posterior margin of the transverse hind elytral macula is more or less straight, the hind one with an allusively obtuse angle. Body length 3.13-3.62 mm (Sabah; Peninsular Malaysia) (Fig. III/12) (BREMER 2002b, 17-18) *filiolus* BREMER
- The anterior and posterior margin of the hind transverse elytral macula is wavy; the eyes are touching each other on frons in males, their distance corresponds about to 2 ocelli in females; elytra oval, length/width ratio 1.34-1.42:1; elytra oval, length/width ratio 1.34-1.42:1. Body length 3.49-3.82 mm (Java; Sumatra; Peninsular Malaysia) (Fig. III/13) (PIC, 1938, 9-10; redescription: BREMER 2005c, 16-17)..... *mediofasciatus* PIC
(a similar shape of antennae of males and females as in *A. iunctus* and *A. filiolus* and a narrow frons is also found in *A. decorosus* BREMER, 2003 from Thailand, also with elytral maculae, in *A. alteritas* BREMER, 2004 from Sulawesi (without elytral maculae), and in *A. tenuifrons* BREMER, 2006 from Sabah; *A. tenuifrons* is larger and elytral maculae are missing. These species probably form a special species group and because of their strange and unique shape of antennae could be assigned as a subgenus. It is not clear whether all small species with a congruent shape, width of frons, punctuation of elytra and having macula possess the special form of antennomeres in males and females which *A. iunctus* and *A. filiolus* have)
(from all taxa mentioned above only a few specimens are known; it is therefore uncertain whether the somewhat different shapes of elytral maculae point to different taxa or are caused by variations within one or two species)

- 14 Species of medium size with one large reddish brown macula at the elytral base in combination with reddish brown macula on pronotum; in males protibiae somewhat prolonged and protarsomeres 1-3 prolonged and somewhat widened 15
- Elytra with a different pattern of maculae on elytra..... 16
- 15 Antennomere 11 is uniformly yellow or light brown; antennomeres 7-10 are longer than those of the following species; the striae on elytra are markedly incised, also on disc; elytra elongate oval, (length/width ratio 1.43-1.47:1); the form of aedeagus differs from that of the following species; upper side black, anterior part of pronotum reddish brown, anterior part of elytra next to base reddish brown (in some specimens continuously, in other specimens separated from each other by a black scutellum and the black intervals 1); femora reddish brown, except an occasionally black cap. Body length 5.41-6.93 mm (Singapore; Sarawak) (Fig. III/14) (BREMER 2010a, 227-229) *proteus* BREMER
- Antennomere 11 is uniformly black, antennomeres 7-10 are shorter and wider than those of the preceding species, nearly triangular and somewhat flattened; elytra oval (length/width ratio 1.45-1.56:1), greatest high and width of elytra at the level of anterior third, striae on the disc are somewhat less incised than those of the preceding species; in males back side of meso- and metafemora with hairs of medium length; the aedeagus differs from that of the preceding species; upper side mostly black, front part of pronotum reddish brown (extension of the reddish brown part varying individually), anterior part of elytra next to base reddish brown (separated from each other by a black scutellum and the black intervals 1; femora reddish brown with a black apical cap. Body length 6.93-8.28 mm (Singapore; Sarawak) (Fig. III/15) (BREMER 2010a, 216-218) *nuntius* BREMER
- 16 Except maculae main color of pronotum and elytra brown to black; maculae red or yellow; anterior part of pronotum red; with a round, red macula posteriorly in median part of pronotum; the elytral maculae are constantly like those as shown in Fig. II/2; antennomere 11 entirely yellow; elytra elongate oval (length/width ratio 1.46-1.56:1), greatest width and height at the end of first third; with slightly incised striae which consist of small, dense punctures. Body length: 5.95-7.24 mm. (Sabah, higher altitudes of Crocker Mts.) (Figs. II/2, III/16) (BREMER 2002, 19-21) *lynnae* BREMER
- Hind part of pronotum without a round, red macula just in front of scutellum..... 17
- 17 Antennomere 11 uniformly yellow or yellowish brown (body length 3.5-11.7 mm) 18
- Antennomere 11 not uniformly yellow or yellowish brown (at least the basal half dark colored, mostly uniformly black); body length 6.8-10.8 mm 25
- 18 Hind part of pronotum separated by a median, yellow or yellowish red band into two lateral black parts; main color of elytra yellow or yellowish-red (with black maculae) 19
- Hind part of pronotum uniformly black; frontal part of pronotum yellowish red or yellowish brown; main color of elytra yellow or yellowish red 21
- 19 Each elytron with several maculae which are separated from each other; additionally, with one V-shaped, transverse, black macula within the hind part; in the middle of elytra with a black macula at the suture; elytra elongate oval (length/width ratio 1.44-1.52:1), greatest height and width somewhat in front of middle, striae somewhat incised. Body length 5.0-5.5 mm (Sabah, rainforest, lowland) (Fig. III/17) (BREMER 2002b, 23) *pulchrior* BREMER
- In the middle of each elytron near suture without a black macula; except a black macula behind the scutellum the maculae are situated laterally..... 20
- 20 Elytra relatively stout, elongate oval (length/width ratio 1.50-1.55:1), greatest width and height somewhat in front of middle; in males forelegs very prolonged, protarsomeres 1-3 prolonged and widened. Body length 6.40-7.76 mm (Peninsular Malaysia: Cameron Highlands) (Fig. III/18) (BREMER 2002b, 13-14) *elegans* BREMER
- Similar to preceding species concerning pattern of maculae, but elytra markedly narrower (length/width ratio of elytra 1.57-1.70:1); forelegs in males sometimes extremely long. Body length 5.49-7.98 mm (Sabah; Sarawak, lowland rainforests) (Fig. III/19) (female: BREMER 2011a, 217-219; male: BREMER 2012a, 231-232)..... *hongii* BREMER

- 21 Relatively large (body length >6.4 mm) 22
 – Smaller (body length <5.6 mm), with a different pattern of maculae 23
- 22 The striae of elytra are distinctly incised and the intervals are convex; each elytron with three reddish brown maculae, the anterior one is starting at the base, the posterior one is short and at the apex (the black median band along the suture is not ending somewhat in front of apex), a large macula is situated behind middle; anterior part of pronotum reddish brown, hind part black; in males with prolonged fore-legs, protarsomeres 1-3 are also prolonged and somewhat widened; on the back side of metafemora with short hairs in the male; aedeagus narrowed in the shaft region; elytra somewhat elongate and oval (length/width ratio 1.35-1.40:1. Body length 6.4-6.9 mm (Borneo) (Figs. III/20) (PIC 1915a, 22; redescription: BREMER 2005c, 24-25) *rufonotatus* PIC
 – The striae of elytra are faintly incised and the elytral intervals are slightly convex, males present on inner side of metatibiae short tufts of long, recumbent hairs in basal fourth and apical fourth, on the back sides of meso- and metafemora two rows of long hairs; frontal part of pronotum reddish brown, hind part black; elytra with reddish brown maculae on a black ground. Body length 10.8 mm (Sabah: Gunung Alab, at 1500 m) (Fig. III/21) (BREMER 2011a, 231-233) *morpheus* BREMER
- 23 In the middle of elytra with a yellowish red center on both sides of suture which is enclosed by two transverse and black bands; a V-shaped, yellowish area is situated behind the hind transverse band; behind it, the yellowish area is bordered by a black, transverse V-shape band from which a lobe along suture is stretched backwards to the apex; body shape elongate oval, greatest width and height slightly in front of middle, length/width ratio 1.41-1.48:1. Body length 3.8-5.6 mm (Sumatra; Sarawak; Sabah; Sulawesi) (Fig. III/22) (PIC 1915a, 22; redescription: BREMER 2005c, 17-19) *nigrofasciatus* PIC
 – The black maculae within the anterior two third of elytra are not connected to each other; a black macula is present in the middle of elytra 24
- 24 The black macula in the middle of elytra is round, neither retracted to the back nor impressed from the front nor separated into two maculae by the suture; around scutellum there is a large, narrow macula; within the anterior third of elytra laterally with a large, black macula on each side; within the hind third of elytra with a transverse, black, V-shaped band with a lobe along suture to apex. Body length 4.72-5.56 mm (Sumatra; Sabah) (Fig. III/22) (BREMER 2002b, 11-12) *christianae* BREMER
 – The black macula in the middle of elytra is divided at suture by a very narrow yellow, longitudinal band into one black macula at each side of elytra; without a transverse, V-shaped band within the hind third of elytra (it is clearly separated into three maculae); shape elongate oval, length/width ratio of elytra 1.42-1.50:1; greatest width and height somewhat in front of middle. Length 4.72-5.30 mm (?Zanzibar; Peninsular Malaysia; Sarawak) (Fig. III/24) (PIC 1915a, 22; redescription: ARDOIN 1967, 1617-1619) *nigromaculatus* PIC
 (I have difficulties in assigning some specimens to *A. christianae* or to *A. nigromaculatus*; there is either a third, related species or all taxa belong to one species with a great variability of the pattern of maculae on elytra and on the lengths of antennae)
- 25 First intervals of elytra not uniformly black; near shoulders there is a round black macula; somewhat in front of middle a transverse, step-like macula is connecting the lateral margins, altogether the pattern of elytral maculae characterizes this species well; pronotum uniformly black, ground color of elytra yellowish red; elytra elongate oval, length/width ratio 1.64-1.73:1; males display markedly longer antennae and a narrower frons than females. Body length 6.79-7.89 mm (Borneo; Peninsular Malaysia; South Thailand) (Fig. III/25) (BREMER 2002b, 21-22) *maculosus* BREMER
 – Along suture the first intervals of elytra are uniformly black; anterior part of pronotum either entirely yellowish red or with a yellowish red macula on each side 26
- 26 Each elytron with three yellowish maculae, one of them on both sides of apex, the two others are more transversely aligned with undulatory anterior and posterior borders 27
 – Each elytron not with three yellowish maculae, either with an elongate, longitudinally aligned macula which is rarely reduced to a single small macula (usually on the anterior part of elytron), or with two

- large maculae situated in the anterior and the posterior part of elytra; fore legs in males are more or less prolonged..... 28
- 27 Pronotum with one distinct yellow or yellowish red macula on its anterior part or with a distinct macula on each side; individually there may be different forms of maculae; elytra elongate oval (length/width ratio 1.45-1.53:1; in males prolonged forelegs and, at inner sides of protibiae, with long, woolly hairs; protarsomeres 1-3 slightly widened in males but protarsomeres 1-4 laterally with long, projecting hairs. Aedeagus not narrowed within the shaft region. Body length 7.82-8.67 mm (Peninsular Malaysia; Sumatra; Borneo; Java; South Vietnam; Taiwan) (Fig. III/26) (GEBIEN 1913, 43; redescription: BREMER 2005c, 14-15) *fasciatus* GEBIEN
- Pronotum either uniformly black or its frontal part slightly dark brown lightened; the pattern of maculae on elytra may individually differ, but each elytron has three relatively short, yellowish red maculae; elytra elongate, relatively wide and with subparallel side in the middle region, length/width ratio 1.46-1.56:1; forelegs in males distinctly longer than in females but only with short hairs at inner sides of protibiae in apical halves; shaft of aedeagus narrowed in its middle part. Body length 7.31-7.89 mm (Sumatra; Borneo; Peninsular Malaysia; South Thailand) (Fig. III/27) (PIC 1922b, 303; redescription: BREMER 2005c, 12-13) *diversipennis* PIC
- 28 Minute tubercles are on the disc of elytral intervals (visible at 25-fold magnification); the pronotum is uniformly black or dark colored; along elytral suture there is a continuous black band which is somewhat narrowed within the hind third, however, it is partially circumventing the apex; elytra with two maculae, one in the anterior and one in the posterior part of elytra; aedeagus not narrowed in the shaft area; elytra somewhat elongate but relatively wide (length/width ratio 1.43-1.53:1); in males protibiae prolonged and on inner third with woolly hairs. Body length 9.0-9.7 mm (Java) (Fig. III/28) (PIC 1915a, 21; redescription: BREMER 2005c, 27-29) *undulatus* PIC
- The disc of elytral intervals is smooth and without minute tubercles 29
- 29 Femora with a reddish ring in their middle part, caps of femora black; anterior part of pronotum yellowish red; in males prolonged protibiae, at their inner sides with long, woolly hairs apically; protarsomeres 1-3 markedly prolonged and widened in males; and protarsomeres 1-4 with long, laterally projecting hairs; metatibiae slightly undulatory in both sexes, in males without long, projecting hairs on their inner sides within their basal halves; elytra elongate oval, length/width ratio 1.48-1.57:1. Body length 6.3-10.3 mm (Java; Sumatra; Peninsular Malaysia; Borneo) (Fig. III/29) (FAIRMAIRE 1893, 60; redescription: BREMER 2005c, 25-27) *sanguinans* FAIRMAIRE
(one of the most frequently collected species with maculae)
- Femora uniformly colored, black or dark brown; in males protarsomeres 1-3 as in *A. sanguinans*; shape of body and pattern of maculae similar to *A. sanguinans* 30
- 30 Metatibiae not slightly undulatory as in *A. sanguinans*, but in males with long, laterally projecting hairs on inner sides within the apical two thirds, additionally with long, projecting hairs on the back side of meso- and metafemora within the basal two thirds; in males the markedly prolonged forelegs do not possess long, woolly hairs on inner sides of protibiae; upper side of head reddish brown; in most specimens the elytral macula is divided by a black transverse band into an anterior and a posterior one (then the transverse, black band extends anteriorly), but also specimens with an undivided elongate macula occur; anterior part of pronotum yellowish red; clypeus markedly shorter than in the following species; aedeagus very narrowed in its shaft part and its tip is button-like accentuated; antennae much shorter in females than in males. Body length 8.7-10.8 mm (Peninsular Malaysia; Sabah) (Fig. III/30) (PIC 1915a, 23; redescription: BREMER 2005c, 10-12) *binotatus* PIC
(because of similar maculae pattern of *A. morpheus* and *A. binotatus* the differences of *A. morpheus* versus *A. binotatus* are summarized here: the antennomeres 11 are entirely yellow in *A. morpheus* (only the apical two third are yellow in *A. binotatus*), male metatibiae present on inner side long, erect hairs in the apical three-fourth in *A. binotatus* (only short tufts of long, recumbent hairs in basal fourth and apical fourth in *A. morpheus*), the tip of aedeagus is somewhat button-like accentuated in *A. binotatus*, not so in *A. morpheus*)

- Metatibiae not slightly undulatory as in *A. sanguinans*, and in contrast to preceding species in males without long, obliquely projecting hairs on inner sides of metatibiae, additionally (in contrast to preceding species) without hairs on the back sides of meso- and metafemora..... 31
- 31 In males the markedly prolonged forelegs of protibiae do not possess long, woolly hairs on inner sides; clypeus markedly longer than in the preceding species; the aedeagus is slimmed in the shaft part (but without a button-like tip); upper side of head black; anterior part of pronotum yellowish red, maculae on elytra as in *A. binotatus* but the transverse, black band is not extending anteriorly (extending anteriorly in preceding species). Body length 7.32-8.44 mm (Sabah; Sarawak) (Fig. III/31) (BREMER 2010a, 160-162) ***adornatus* BREMER**
- In males the prolonged forelegs do possess long, woolly hairs on inner sides of protibiae; the hind metatibiae are not slightly undulatory but the whole contour is regular although the shaft is slightly bent; the pronotum is entirely black; in contrast to preceding species the hind macula of elytra does not reach the apex, and the apical region is always entirely black. Body length 7.2-8.2 mm (Peninsular Malaysia) (Fig. III/32) (BREMER 2002b, 18-19) ***linae* BREMER**

Pictures of *Amarygmus* spp. with maculae on elytra and on pronotum

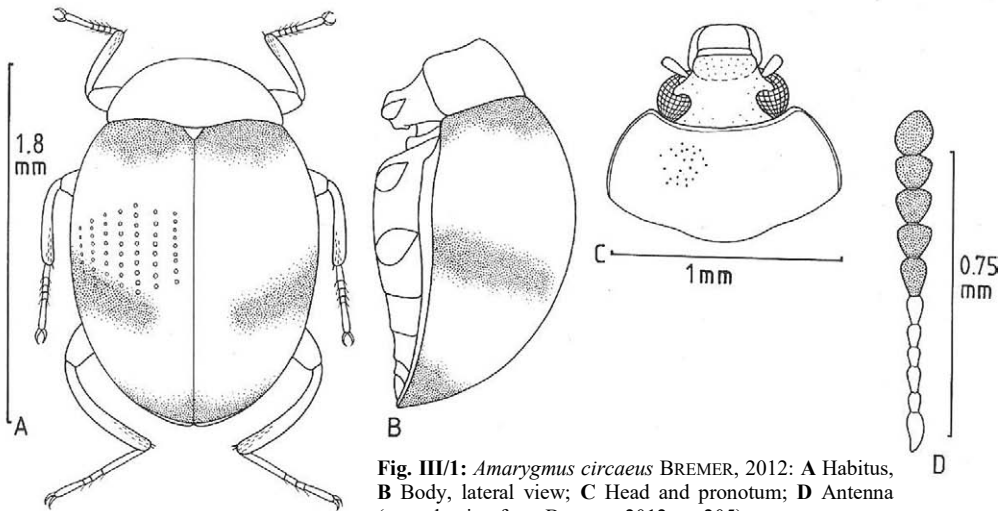


Fig. III/1: *Amarygmus circaeus* BREMER, 2012: A Habitus, B Body, lateral view; C Head and pronotum; D Antenna (reproduction from BREMER 2012a, p.205).

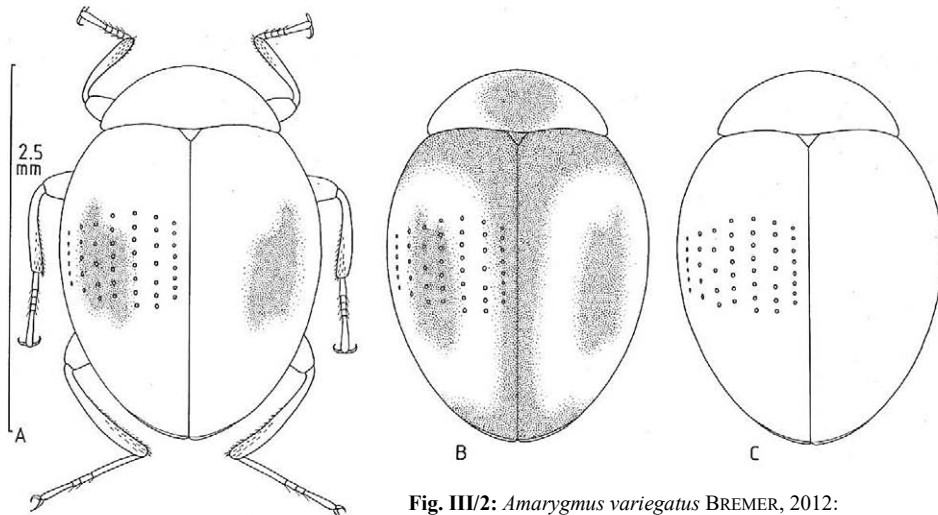
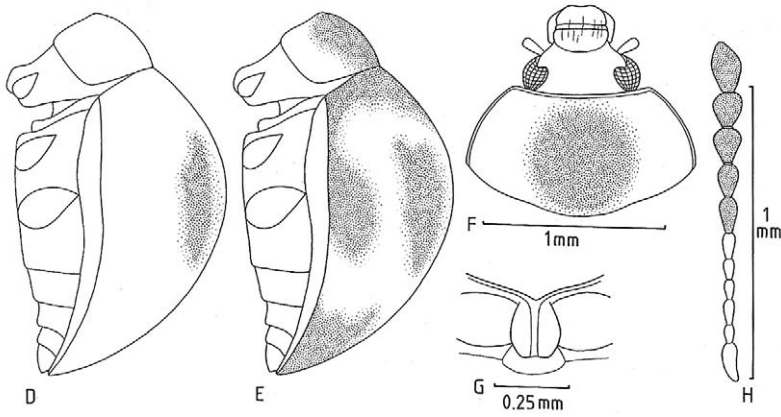


Fig. III/2: *Amarygmus variegatus* BREMER, 2012: A Habitus; B Habitus; C Habitus (different varieties), D - H →



(*Amarygmus variegatus*):

D Body, lateral view, specimen with one macula; **E** Body, lateral view, specimen with some maculae; **F** Head and pronotum; **G** Prosternal process; **H** Antenna (reproduction from BREMER 2012a, p.227).

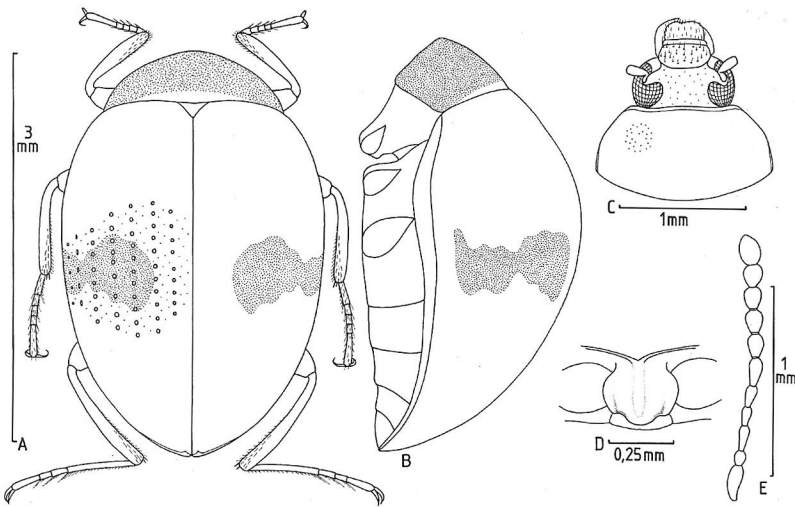


Fig. III/3: *Amarygmus coccinelloides* BREMER, 2010: **A** Habitus; **B** Body, lateral view; **C** Head and pronotum; **D** Prosternal process; **E** Antenna (reproduction from BREMER 2010a, p.176).

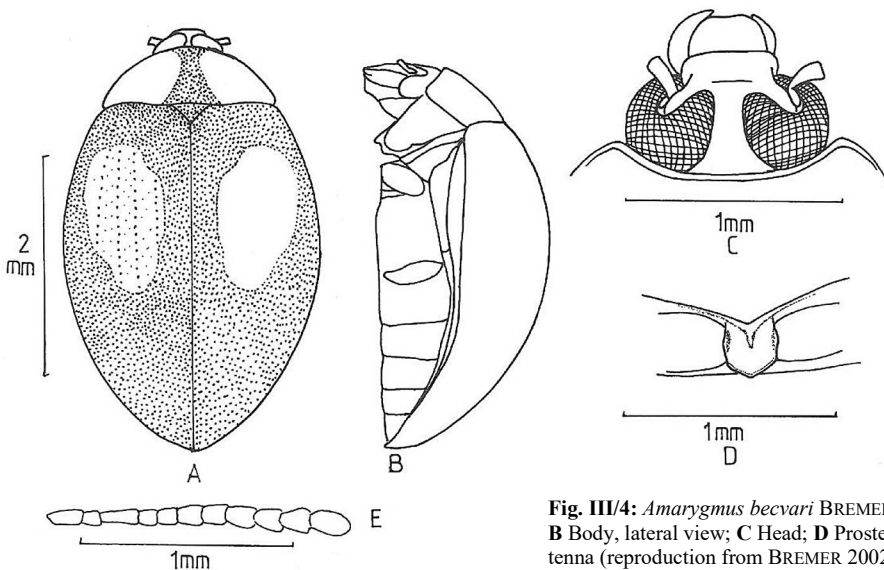


Fig. III/4: *Amarygmus becvari* BREMER, 2002: **A** Habitus; **B** Body, lateral view; **C** Head; **D** Prosternal process; **E** Antenna (reproduction from BREMER 2002b, p.27).

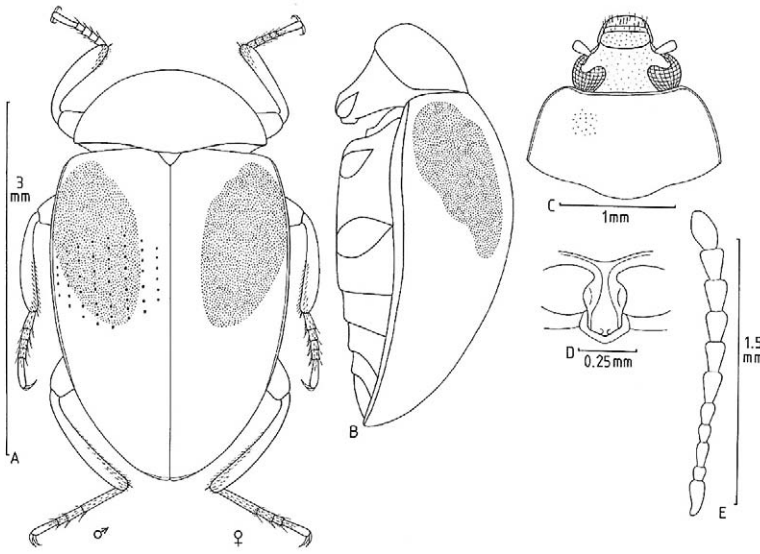


Fig. III/5: *Amarygmus floreni* BREMER, 2011: **A** Habitus; **B** Body, lateral view; **C** Head and pronotum; **D** Prosternal process; **E** Antenna (reproduction from BREMER 2011a, p.213).

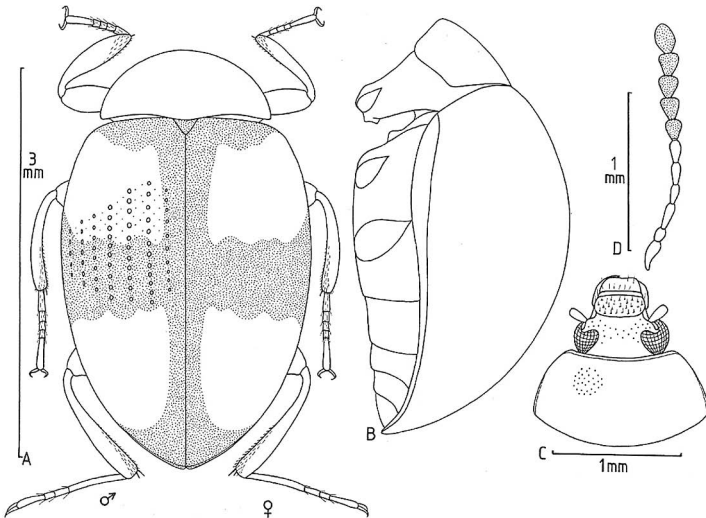


Fig. III/6: *Amarygmus dryadiformis* BREMER, 2002: **A** Habitus, left side legs of a male, right side legs of a female; **B** Body, lateral view; **C** Head and pronotum; **D** Antenna (original drawing).

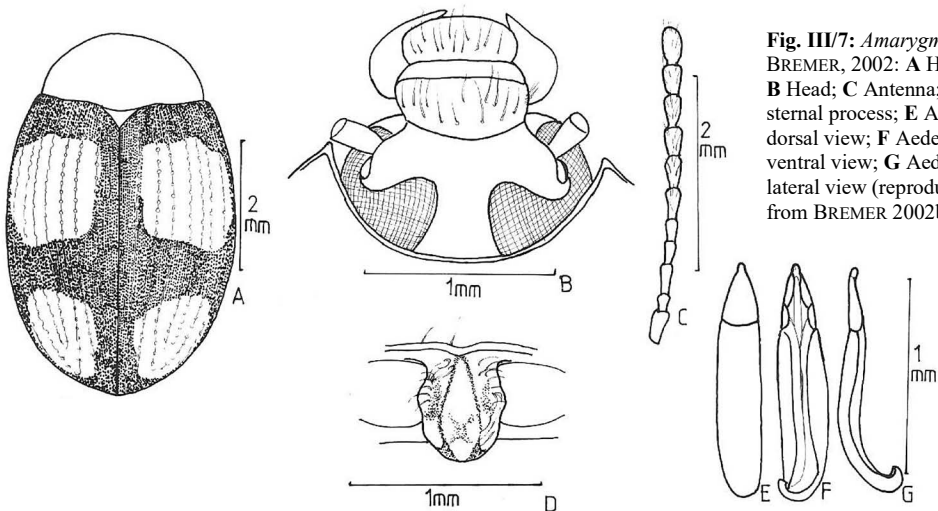


Fig. III/7: *Amarygmus barae* BREMER, 2002: **A** Habitus; **B** Head; **C** Antenna; **D** Prosternal process; **E** Aedeagus, dorsal view; **F** Aedeagus, ventral view; **G** Aedeagus, lateral view (reproduction from BREMER 2002b: p.26).

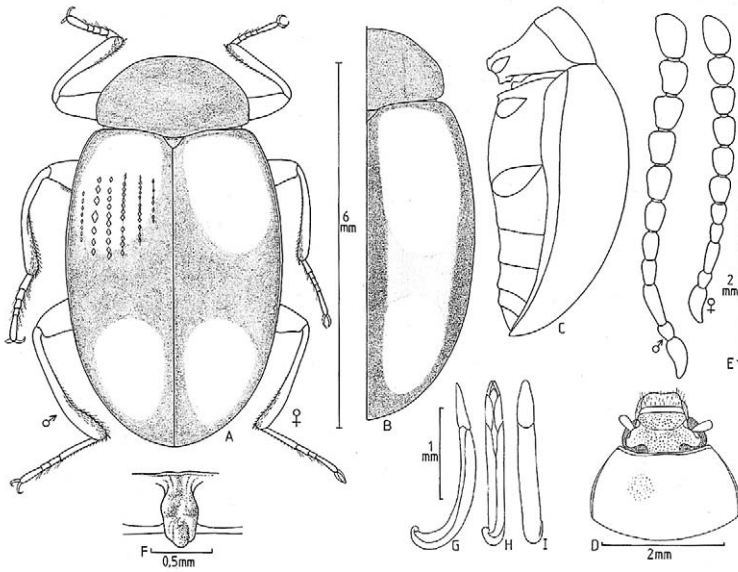


Fig. III/8: *Amarygmus quadrimaculatus* PIC, 1915: **A** Habitus, left side legs of a male, right side legs of a female; **B** Another pattern of elytral macula; **C** Body, lateral view; **D** Head and pronotum; **E** Antennae, male and female; **G** Aedeagus, lateral view; **H** Aedeagus, ventral view; **I** Aedeagus, dorsal view (reproduction from BREMER 2005c, p.45).

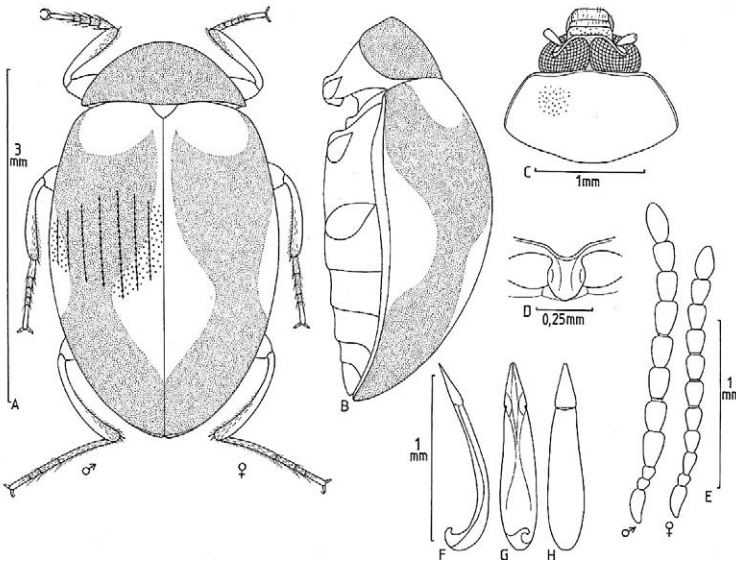


Fig. III/9: *Amarygmus iunctus* BREMER, 2010: **A** Habitus; **B** Body, lateral view; **C** Head and pronotum; **D** Prosternal process; **E** Antennae, male and female (note: different length of antennomere 3 between male and female); **F** Aedeagus, lateral view; **G** Aedeagus, ventral view; **H** Aedeagus, dorsal view (reproduction from BREMER 2010a, p.200).

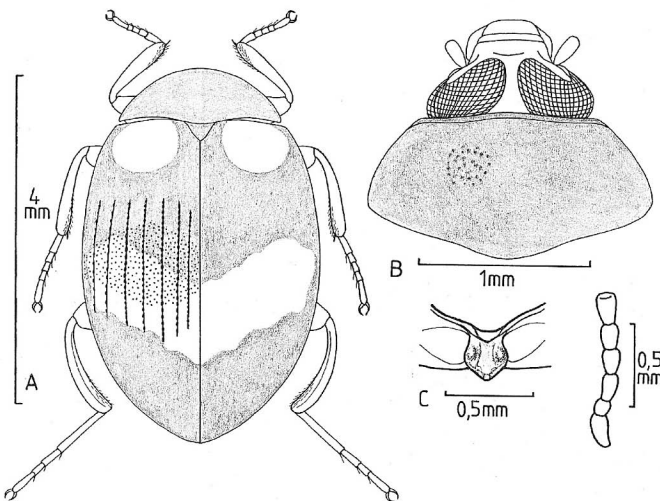


Fig. III/10: *Amarygmus v-rufum* GEBIEN, 1927: **A** Habitus; **B** Head and pronotum; **C** Prosternal process; **D** Antennomeres 1-6 (reproduction from BREMER 2005c, p.50).

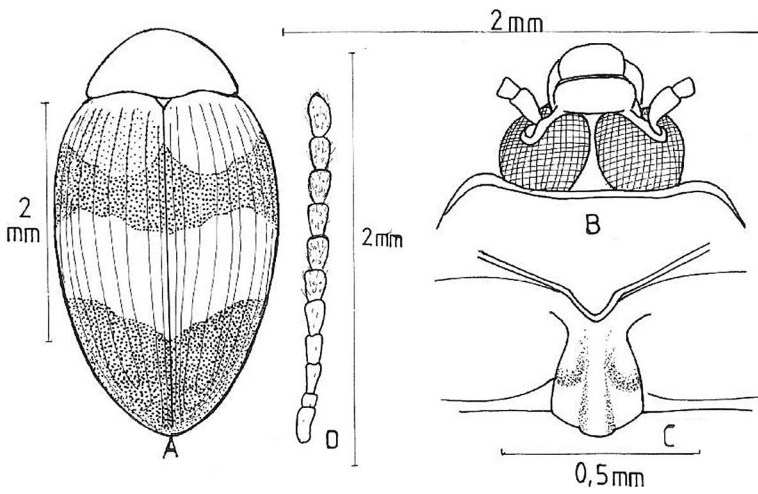


Fig. III/11: *Amarygmus ellipticus* BREMER, 2002: **A** Habitus; **B** Head; **C** Prosternal process; **D** Antenna (reproduction from BREMER 2002b, p.29).

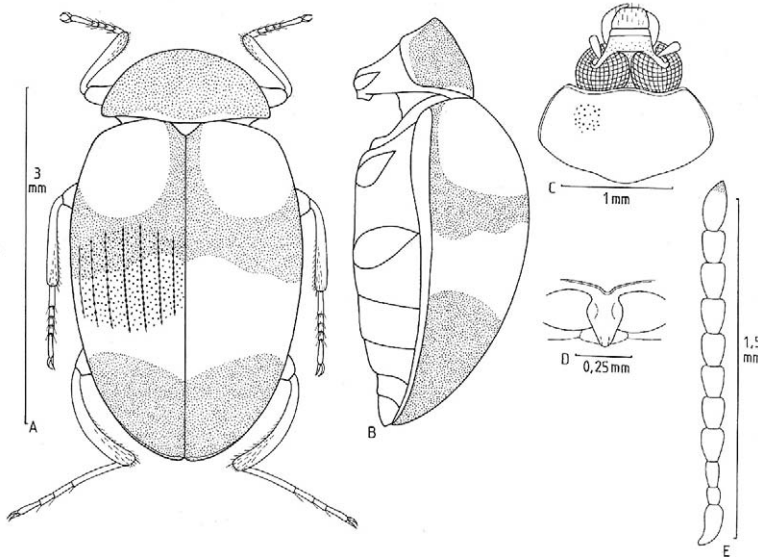


Fig. III/12: *Amarygmus filiolus* BREMER, 2002: **A** Habitus; **B** Body, lateral view; **C** Head and pronotum; **D** Prosternal process; **E** Antenna (original drawing).

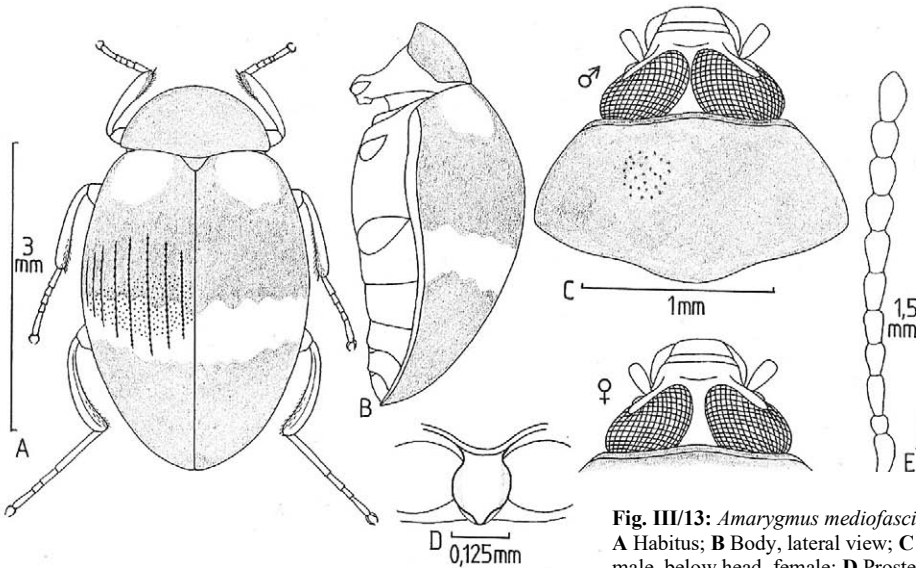


Fig. III/13: *Amarygmus mediofasciatus* PIC, 1938: **A** Habitus; **B** Body, lateral view; **C** head and pronotum, male, below head, female; **D** Prosternal process; **E** Antenna (reproduction from BREMER 2005c, p.42).

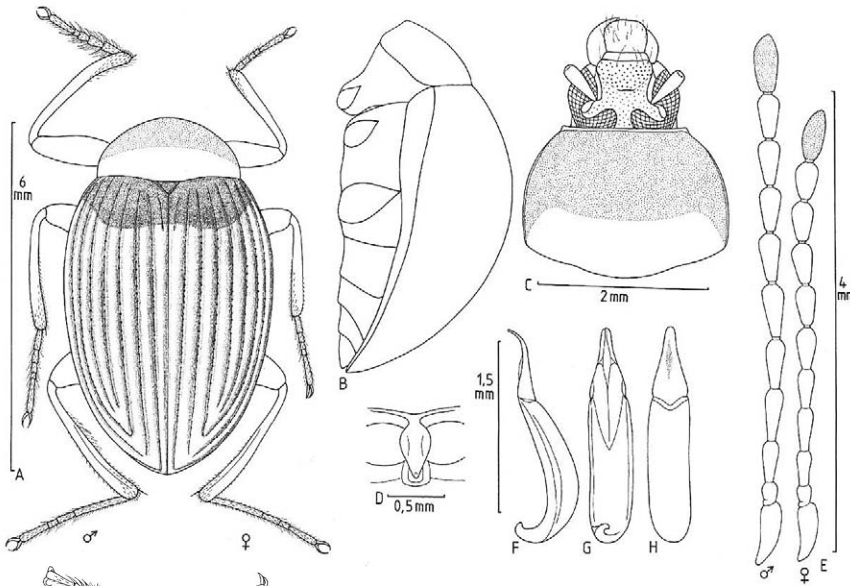


Fig. III/14:
Amarygmus proteus
BREMER, 2010: **A** Habitus, left side legs of a male, right side legs of a female; **B** Body, lateral view; **C** Head and pronotum; **E** Antennae, male and female; **F** Aedeagus, lateral view; **G** Aedeagus, ventral view; **H** Aedeagus, dorsal view (reproduction from BREMER 2010a, p.228).

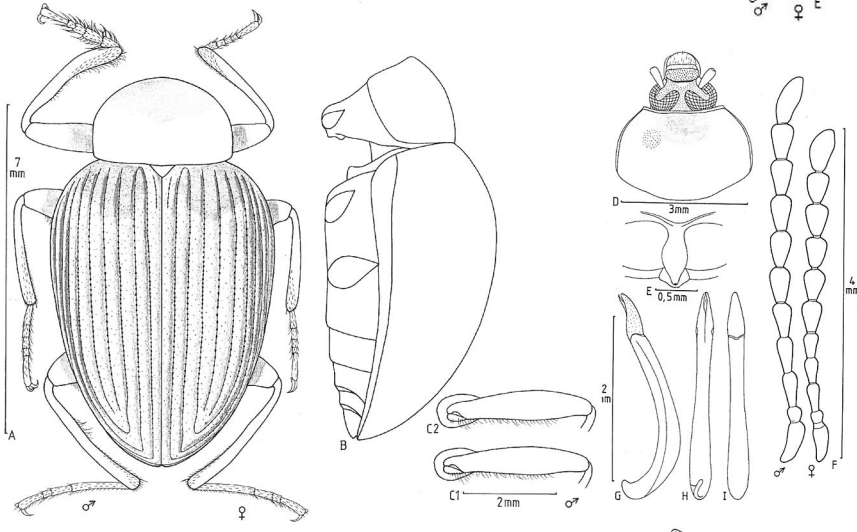


Fig. III/15:
Amarygmus nuntius
BREMER, 2010: **A** Habitus, left side legs of a male, right side legs of a female; **B** Body, lateral view; **C1** Metafemur of a male, **C2** Mesofemur of a male; **D** Head and pronotum; **E** Prosternal process; **F** Antennae, male and female; **G** Aedeagus, lateral view; **H** Aedeagus, ventral view; **I** Aedeagus, dorsal view (reproduction from BREMER 2010a, p.217).

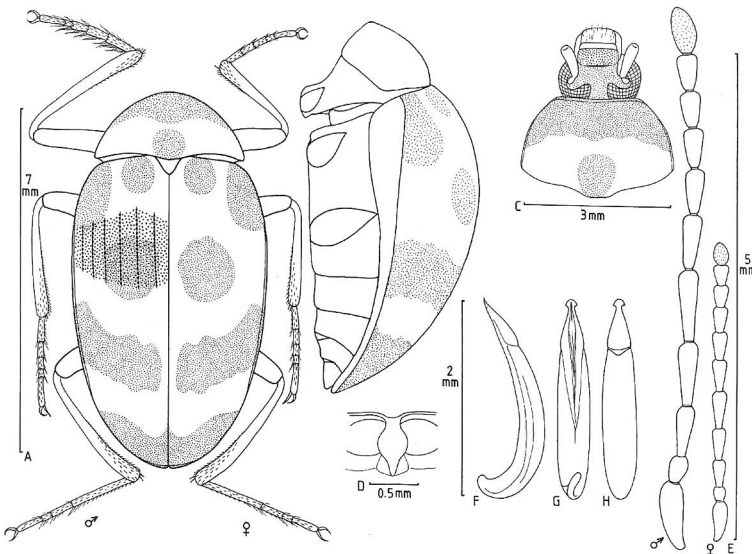


Fig. III/16: *Amarygmus lynnae*
BREMER, 2002: **A** Habitus, left side legs of a male; right side legs of a female; **B** Body, lateral view; **C** Head and pronotum; **D** Prosternal process; **E** Antennae, male and female; **F** Aedeagus, lateral view; **G** Aedeagus, ventral view; **H** Aedeagus, dorsal view (original drawing).
Photograph: Fig. II/2.

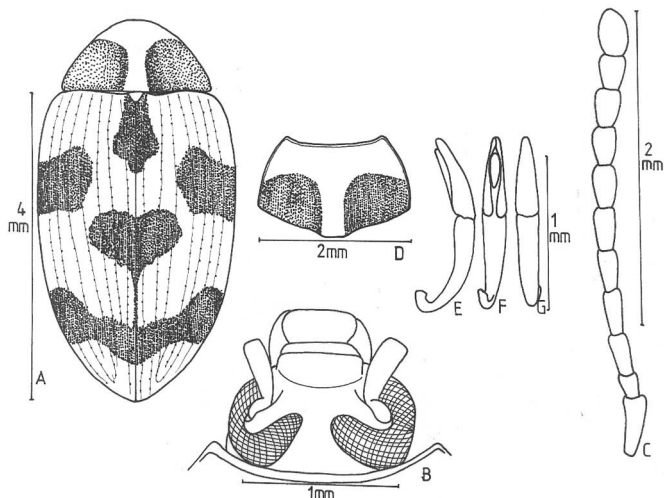


Fig. III/17: *Amarygmus pulchrior* BREMER, 2002: **A** Habitus; **B** Head; **C** Antenna; **E** Aedeagus, lateral view; **F** Aedeagus, ventral view; **G** Aedeagus, dorsal view (reproduction from BREMER 2002b, p.36).

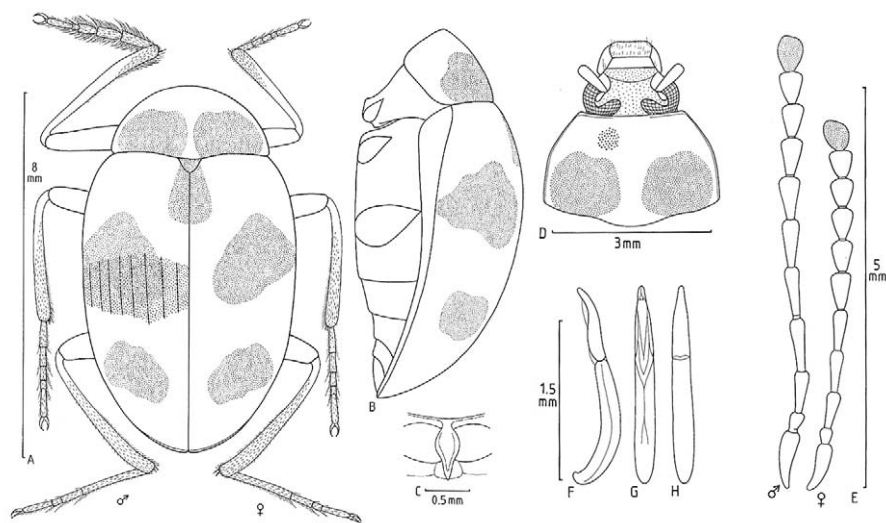


Fig. III/18: *Amarygmus elegans* BREMER, 2002: **A** Habitus, left side legs of a male, right side legs of a female; **B** Body, lateral view; **C** Prosternal process; **D** Head and pronotum; **E** Antennae, male and female; **F** Aedeagus, lateral view; **G** Aedeagus, ventral view; **H** Aedeagus, dorsal view (reproduced from BREMER 2011a, p.219).

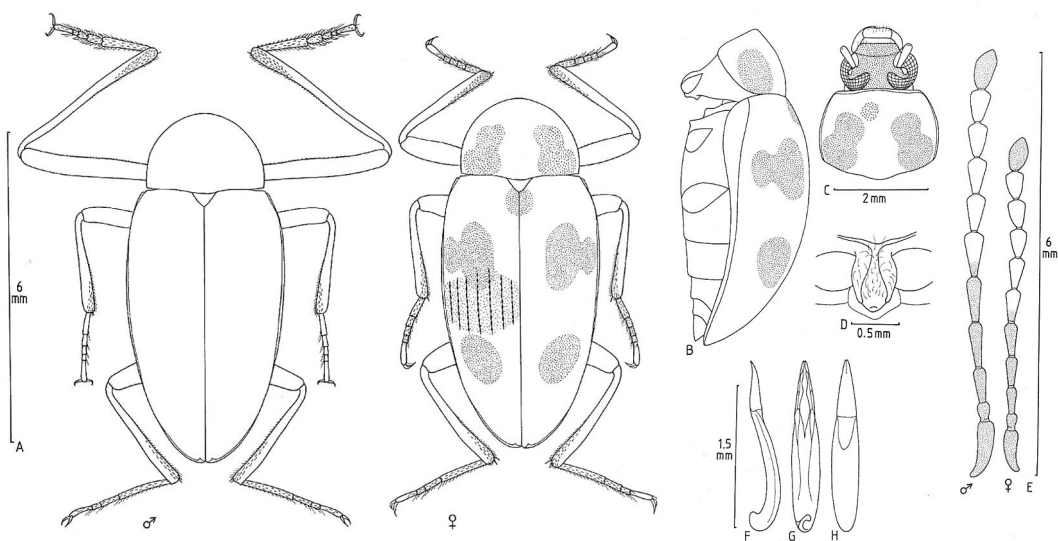


Fig. III/19: *Amarygmus hongii* BREMER, 2011: **A** Habitus, male (maculae not depicted) and habitus, female; **B** Body, lateral view; **C** Head and pronotum; **D** Prosternal process; **E** Antennae, male and female; **F** Aedeagus, lateral view; **G** Aedeagus, ventral view; **H** Aedeagus, dorsal view (reproduced from BREMER 2012a, p.231).

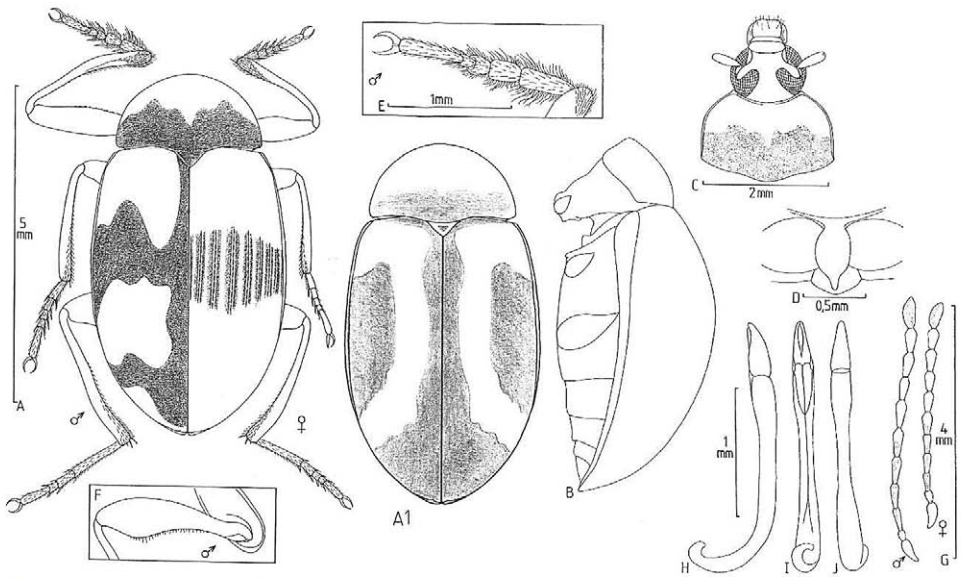


Fig. III/20: *Amarygmus rufonotatus* PIC, 1915: **A** Habitus, left side legs of male, right side legs of a female; **A1** Coloration variant; **B** Body, lateral view; **C** Head and pronotum; **D** Prosternal process; **E** Protarsomeres of a male; **F** Metafemur of a male; **G** Antennae, male and female; **H** Aedeagus, lateral view; **I** Aedeagus, ventral view; **J** Aedeagus, dorsal view (partial reproduction from BREMER 2005c, p.46).



Fig. III/20: *Amarygmus rufonotatus* PIC, 1915, female: Photograph.

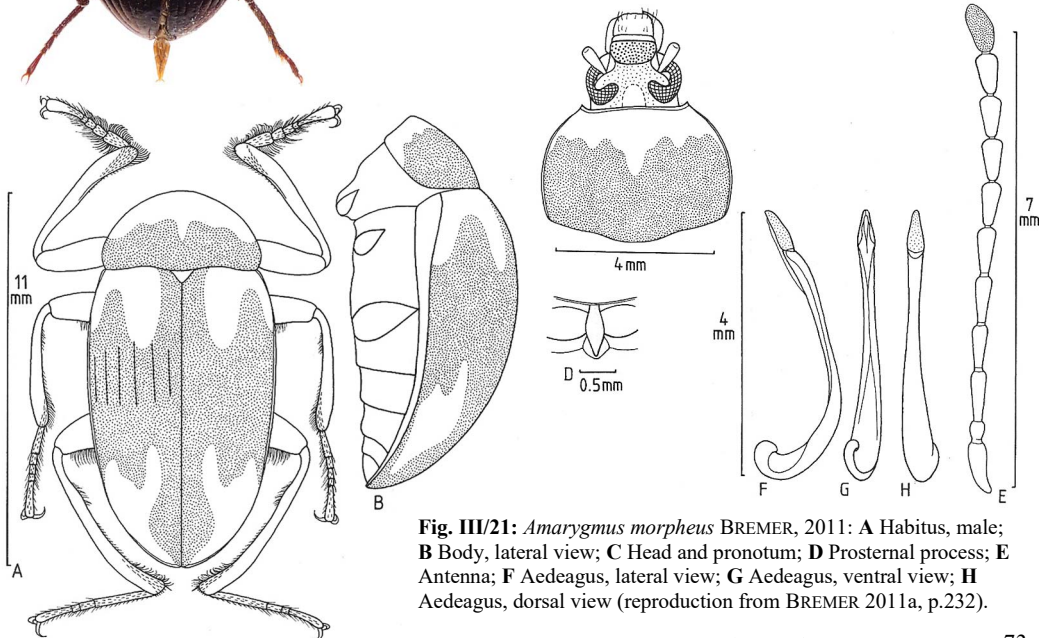


Fig. III/21: *Amarygmus morpheus* BREMER, 2011: **A** Habitus, male; **B** Body, lateral view; **C** Head and pronotum; **D** Prosternal process; **E** Antenna; **F** Aedeagus, lateral view; **G** Aedeagus, ventral view; **H** Aedeagus, dorsal view (reproduction from BREMER 2011a, p.232).

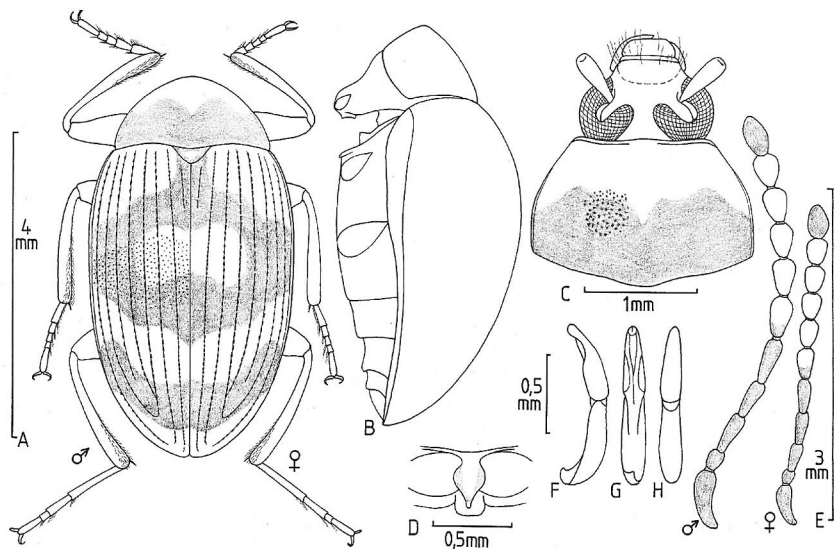


Fig. III/22: *Amarygmus nigrofasciatus* PIC, 1915:

A Habitus, left side legs of a male, right side legs of a female; B Body, lateral view; C Head and pronotum; D Prosternal process; E Antennae, male and female; F Aedeagus, lateral view; G Aedeagus, ventral view; H Aedeagus, dorsal view (reproduction from BREMER 2004b, p.215).

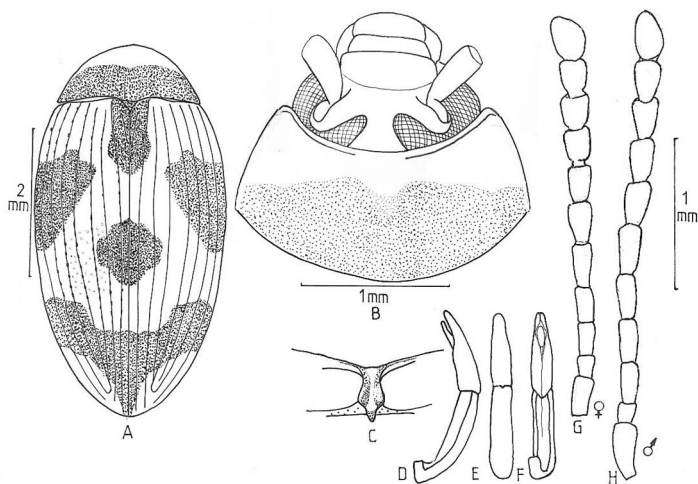


Fig. III/23: *Amarygmus christianaе* BREMER, 2002: A Body, dorsal view; B Head and pronotum; C Prosternal process; D Aedeagus, lateral view; E Aedeagus, dorsal view; F Aedeagus, ventral view; G Antenna, female; H Antenna, male (reproduction from BREMER 2002b, p.28).

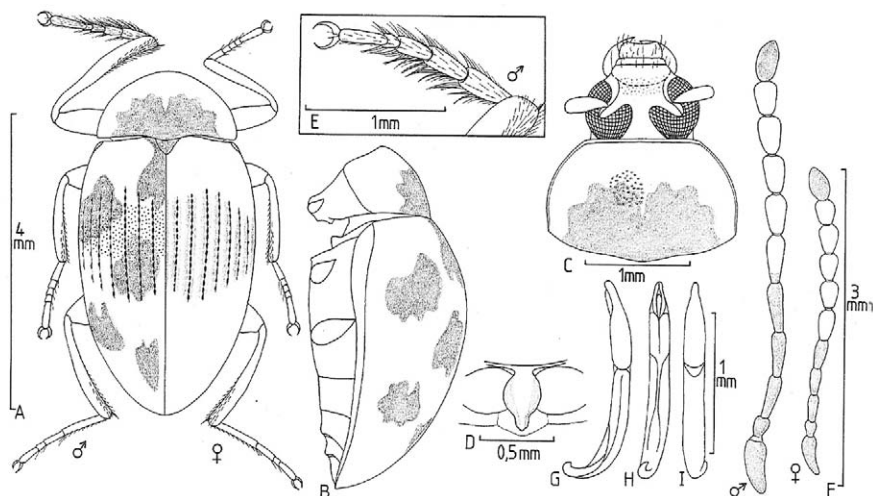


Fig. III/24: *Amarygmus nigromaculatus* PIC, 1915: A Habitus, left side legs of a male, right side legs of a female; B Body, lateral view; C Head and pronotum; D Prosternal process; E Protarsi of a male, magnified; F Antennae, male and female; G Aedeagus, lateral view; H Aedeagus, ventral view; I Aedeagus, dorsal view (reproduction from BREMER 2005c, 43).



Fig. III/24: *Amarygmus nigromaculatus* PIC, 1915: Photographs from a male and a female.

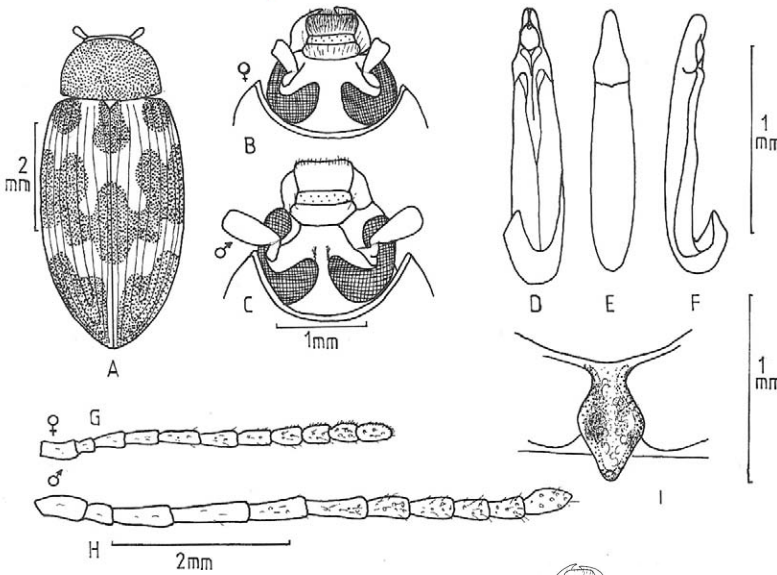


Fig. III/25: *Amarygmus maculosus* BREMER, 2002: **A** Habitus; **B** Head, female; **C** Head, male; **D** Aedeagus, ventral view; **E** Aedeagus, dorsal view; **F** Aedeagus, lateral view; **G** Antenna, female; **H** Antenna, male; **I** Prosternal process (reproduced from BREMER 2002b, p.35).

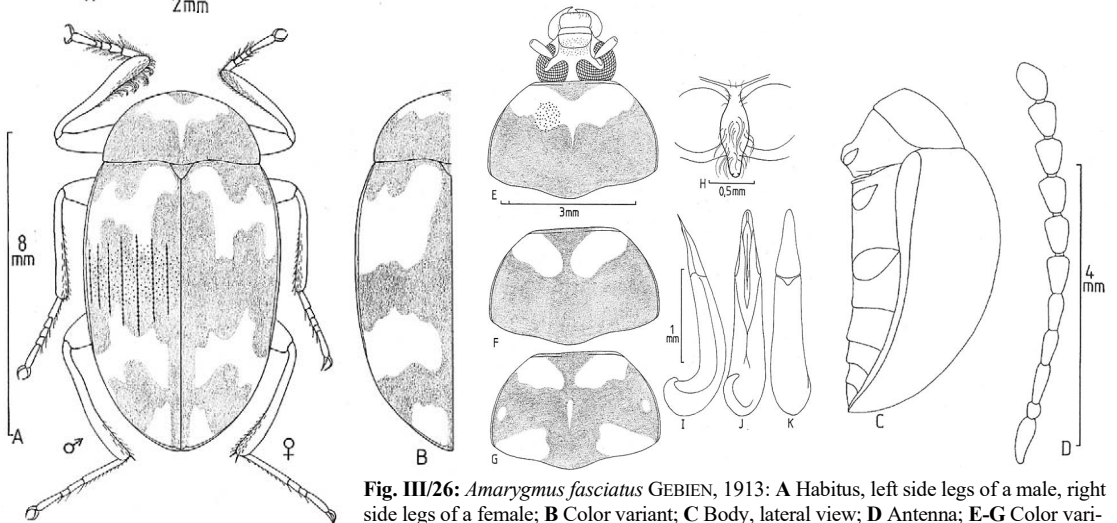


Fig. III/26: *Amarygmus fasciatus* GEBIEN, 1913: **A** Habitus, left side legs of a male, right side legs of a female; **B** Color variant; **C** Body, lateral view; **D** Antenna; **E-G** Color variants of pronotum; **H** Prosternal process of a male; **I** Aedeagus, lateral view; **J** Aedeagus, ventral view; **K** Aedeagus, dorsal view (reproduction from BREMER 2005c, pp.40, 41).

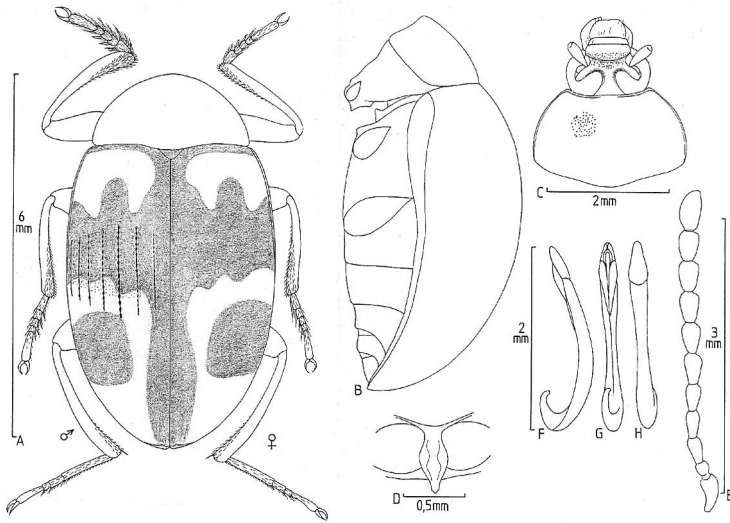
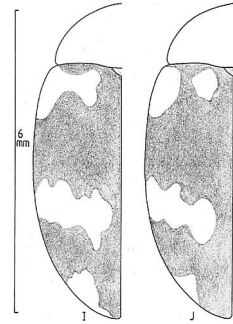


Fig. III/27: *Amarygmus diversipennis* PIC, 1922: **A** Habitus, left side legs of a male, right side legs of a female; **B** Body, lateral view; **C** Head and pronotum; **D** Prosteron process; **E** Antenna; **F** Aedeagus, lateral view; **G** Aedeagus, ventral view; **H** Aedeagus, dorsal view;



I+J Different macula variants (reproduction from BREMER 2005c, p.38).

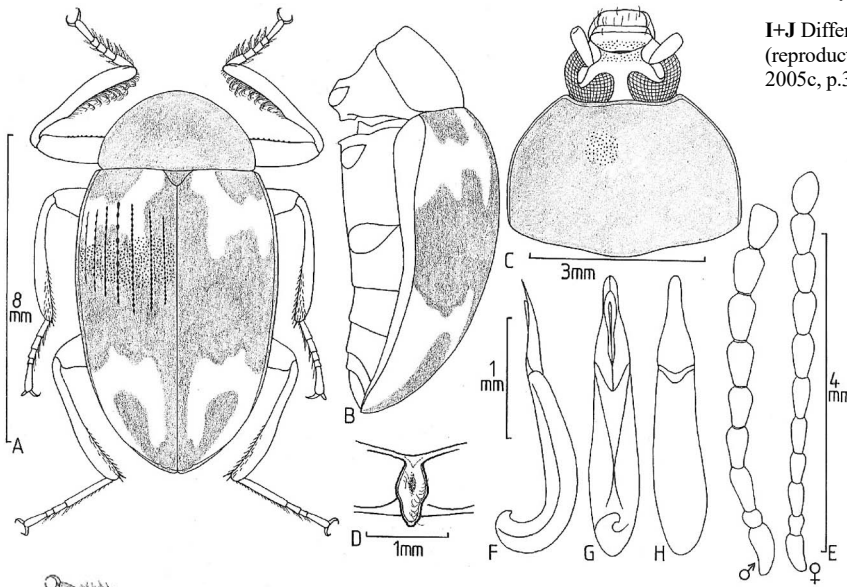


Fig. III/28: *Amarygmus undulatus* PIC, 1915: **A** Habitus, male; **B** Body, lateral view; **C** Head and pronotum; **D** Prosteron process; **E** Antennae, male and female; **F** Aedeagus, lateral view; **G** Aedeagus, ventral view; **H** Aedeagus, dorsal view (reproduction from BREMER 2005c, p.49).

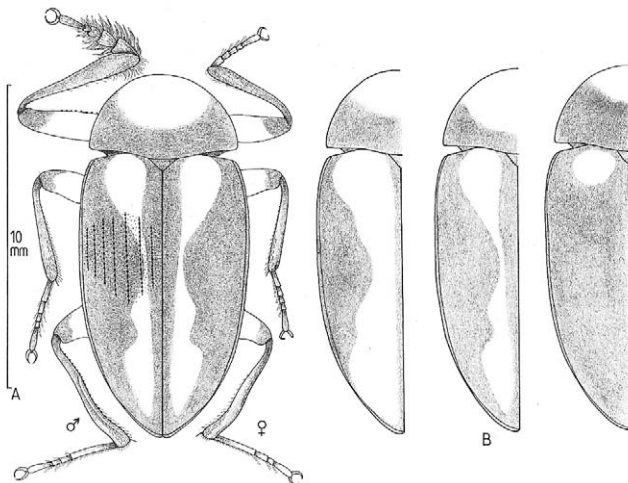


Fig. III/29: *Amarygmus sanguinans* FAIRMAIRE, 1893: **A** Habitus, left side legs of a male, right side legs of a female; **B** varieties of different coloration;

next page:
C Body, lateral view; **D** Head and pronotum; **E** Prosteron process; **F** Antennae, male and female; **G** Aedeagus, lateral view; **H** Aedeagus, ventral view; **I** Aedeagus, dorsal view (reproduction from BREMER 2005c, pp.47, 48).

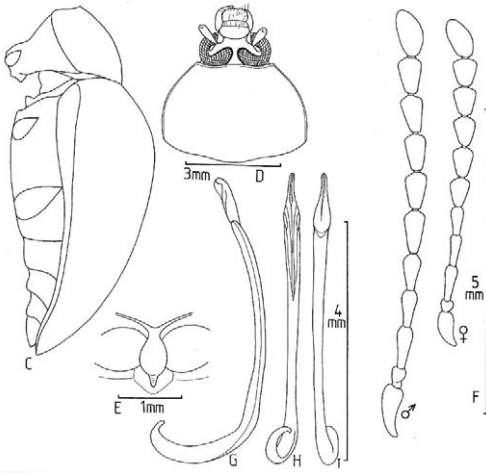


Fig. III/29 (*Amarygmus sanguinans*) cont.: C - H.



Fig. III/30: *Amarygmus binotatus*, Photographs: left female, right male.

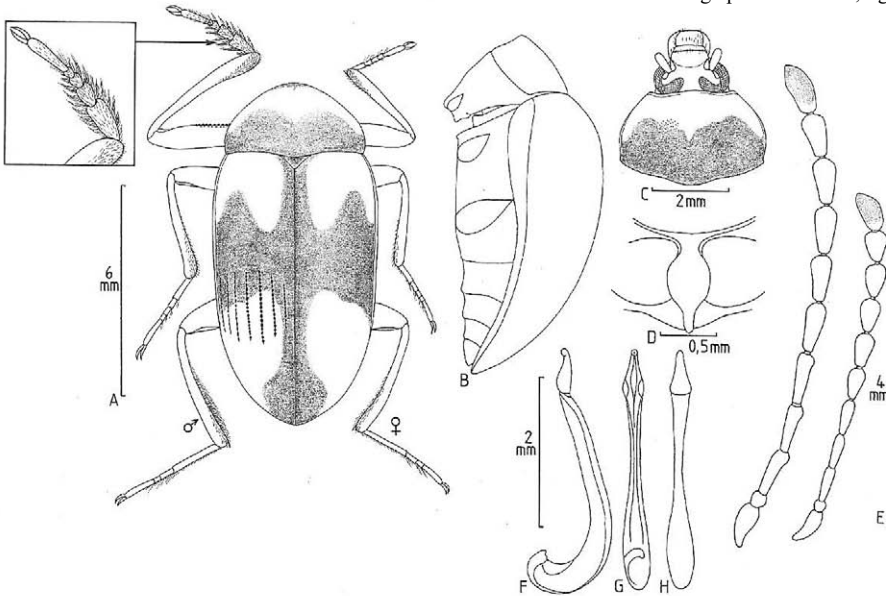


Fig. III/30: *Amarygmus binotatus* PIC, 1915: A Habitus, left side legs of a male, right side legs of a female; B Body, lateral view; C Head and pronotum; D Prosternal process; E Antennae, male and female; F Aedeagus, lateral view; G Aedeagus, ventral view; H Aedeagus, dorsal view (reproduction from BREMER 2005c, p.37).

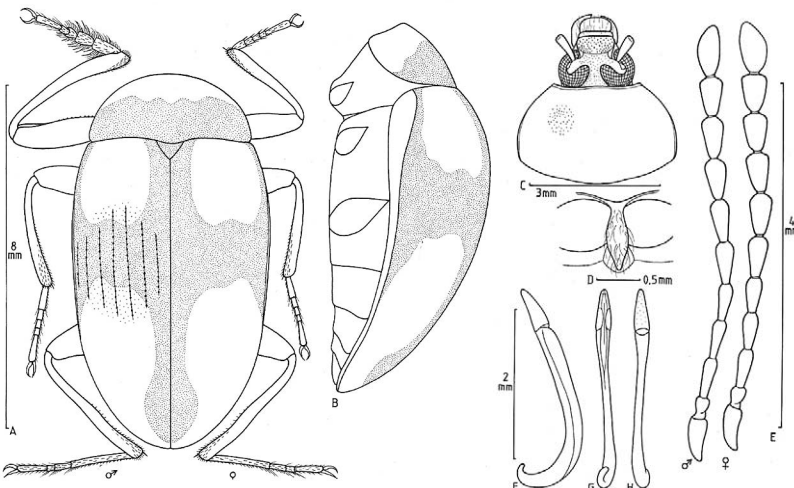


Fig. III/31: *Amarygmus adornatus* BREMER, 2010: A Habitus, left side legs of a male, right side legs of a female; B Body, lateral view; C Head and pronotum; D Prosternal process, male; E Antennae, male and female; F Aedeagus, lateral view; G Aedeagus, ventral view; H Aedeagus, dorsal view (reproduction from BREMER 2010a, p.161).



Fig. III/32: *Amarygmus lineae* BREMER, 2002: Photographs, left side a male, right side a female.

Section IV

Species with rows of large elytral punctures with a violet or pink bottom and, except one species, also with a violet or pink halo; ground color of elytra mostly green

The following species are listed here: *A. inconditus* BREMER, 2010, *A. ertli* BREMER, 2005, *A. seponensis* BREMER, 2011, *A. makiharai* BREMER, 2011, *A. sundaensis* BREMER, 2001, *A. selatanus* (MASUMOTO & MAKIHARA, 1997), *A. mitschkei* (PIC, 1938), *A. haeuseri* BREMER, 2010, and *A. rivalis* BREMER, 2004.

Recently I became doubts about differences between *A. rivalis* BREMER and *A. cupreofossus* FAIRMAIRE, 1888. *A. cupreofossus* has a wide distribution from Vietnam, Laos to Thailand, and it is relatively frequently collected in these countries. I know *A. rivalis* only from a few specimens from Sumatra. I do not know *A. cupreofossus* from Peninsular Malaysia. When I was describing *A. rivalis* the punctuation of elytra seemed to me different from *A. cupreofossus*. In the meantime I saw many specimens of *A. cupreofossus* from its typical distribution, and I found a certain degree of variation concerning its elytral punctuation. I can no longer distinguish both taxa. But there is a distributional gap between both taxa. Further investigations should try to get rid about these doubts.

The following species, living outside of our faunal area, show the characters of species of this Section: *A. purpureofossus* FAIRMAIRE, 1896 (North India; Nepal; North Thailand), *A. cyaneopunctatus* (PIC, 1924) (Laos), *A. egregius* BREMER, 2011 (Thailand; Laos), *A. longulus* BREMER, 2011 (Thailand; Vietnam), *A. optatus* BREMER, 2011 (Laos), *A. procerus* BREMER, 2011 (Laos), and *A. cribripennis* FAIRMAIRE, 1896 (South India).

A. steatitis BREMER, 2005 (Peninsular Malaysia) very much resembles *A. ertli* by shape and punctuation of elytra, however, the upper side of *A. steatitis* shows a colorful by iridescence, and the bottoms of the punctures of the rows are not violet or pink as they are in *A. ertli*.

Determination key of species of Section IV

- 1 Frons extremely narrow, width corresponds to diameter of one ocellus of eyes; antennae long, tender, reaching to the middle of elytra. Elytra elongate oval, with a maximum of width and length in their middle. Length/width ratio of elytra 1.45-1.49:1. Elytra with rows of large, variable punctures which have a violet or a purple bottom and haloes. Femora and tibiae black. Upper side greenish golden, markedly microreticulated. On the dorsum of the anterior part of parameres apically with a barbed hook (Fig. IV/1F). Body length 6.37-6.77 mm (Sabah; Sarawak) (Fig. IV/1) (BREMER 2010a, 197-199) ***inconditus* BREMER**
- Frons wider; on the dorsum of the anterior part of parameres without a barbed hook apically 2
- 2 Species with oblong elytra and straight or slightly oval sides..... 3

- Species with oval, convex elytra which are markedly shorter than those of the preceding ones. Elytral punctures within the rows either with or without a colorful halo..... 5

- 3 Relatively large species with long, mostly subparallel elytra, length/width ratio of elytra 1.65-1.74:1. Elytral intervals flat, with minute punctures, but elytra with rows of large punctures with a different shape (elongate, round, different distances in between). Legs and antennae black. Antennae short. Body length 8.07-8.33 mm (Mentawai Isls.; Sumatra; Peninsular Malaysia; Sabah) (Fig. IV/2) (PIC 1938, 12; redescription: BREMER 2003, 6) *mitschkei* (PIC)
- Markedly smaller. Body length 5.65-6.33 mm 4

- 4 Elytral intervals markedly microreticulated and distinctly punctured, punctures minute. Elytra slightly narrowing towards hind third, with straight sides; maximum of width shortly behind base. Punctures of elytral rows very variable: striate, elongate oval, round, partially narrowed to each other, situated mostly in striae; they are circumvented by large violet haloes. Length/width ratio of elytra 1.72-1.79:1. Frons of medium width (width corresponds to lengths of antennomeres 3+4) (Peninsular Malaysia; Sumatra; Sabah) (Fig. II/3) (MASUMOTO & MAKIHARA 1997, 132; BREMER 2003a, 86-89) *selatanus* MASUMOTO & MAKIHARA
- Elytral intervals only with tiny, spacious punctures, only slightly microreticulated. Elytra very long, slightly oval, with maximum of height near the middle of elytra; length/width ratio of elytra 1.88:1. Elytral rows with punctures with a violet bottom and a very narrow violet halo; these punctures are tapering off into striae postero-laterally. Body length 5.97 mm (Kalimantan) (Fig. IV/3) (BREMER 2011, 228-229) *makiharai* BREMER

- 5 Species relatively large (body length 7.72-9.00 mm), with a narrow violet halo around punctures of the elytral rows and without a broadening of mesotibiae in males 8
- Species mostly smaller (body length 5.97-7.96 mm); with a broadening of mesotibiae in males and moderately widened protarsomeres 1-3 6

- 6 Species smaller than the following two species (body length <6 mm). The widened and compressed mesotibiae are terminating on inner sides at 60 percent basally in a sharp tooth. Elytra with rows of large punctures with a different shape, some are round and circumvented by a small halo, some are narrowing to each other and fuse into an impressed stria, these striae are mutually circumvented by a violet halo. (Kalimantan) (Fig. IV/4) (BREMER 2011a, 242-244) *seponens* BREMER
- Species >6.0 mm. In males the compressed mesotibiae do not terminate on inner side in a sharp tooth 7

- 7 Species markedly convex; body length 6.05-6.52 mm. With rows of relatively large, round, distantly set punctures. Punctures of the rows display a violet bottom which is not always distinct which may elicit a narrow, but do not show a colored halo. Elytral intervals flat with minute, dense punctures (these minute punctures also circumvent the large punctures of the rows). There is an easily recognizable sexual dimorphism of mesotibiae (in females mesotibiae slightly bent, in males markedly compressed, broad, on outer sides markedly bent, on inner sides slightly bent, on inner sides with long, dense hairs). Protarsomeres 1-3 slightly widened in males. Frons somewhat wider than antennomere 3 (like 17:14). Pronotum and elytra dingy green, with slight lustre; femora and antennae black, tibiae dark brown. (Sumatra; Peninsular Malaysia; Sarawak, Sabah; South Thailand) (Fig. IV/5) (BREMER 2001a, 71) *sundaensis* BREMER
- Species larger (body length 7.32-7.96 mm), but very similar to preceding species. Its frons is narrower. The punctures of elytral rows are more narrowed to each other than in *A. sundaensis*, therefore, they are either fusing or are situated within a mutual depression, mostly with a narrow violet halo. In males the mesotibiae are not as strongly compressed and not as wide as in the preceding species) (Sumatra) (Fig. IV/6) (BREMER 2004a, 48-49) *rivalis* BREMER

- 8 Punctures of elytral rows without a halo. Length/width ratio of elytra 1.36-1.43:1. Elytra with rows of large, round, distantly set punctures with a violet bottom and a narrow violet halo. Width of frons corresponds to length of antennomere 3. Antennae short. Upper side dingy green; lustrous; apical parts of femora and tibiae black, but with a bluish tinge. Protarsomeres 1-3 not widened in males. Body length \approx 9.0 mm (Kalimantan; Sarawak; Sabah) (Fig. IV/7) (BREMER 2005a, 17-18)*ertli* BREMER
- Punctures of elytral rows large, with a narrow violet halo; they have an elongate, irregular shape. Length/width ratio of elytra 1.46:1. Width of frons somewhat narrower than length of antennomere 4. Antennae relatively short. Elytra dingy green but less lustrous than elytra of preceding species; pronotum brown but with an iridescence, laterally usually blue. Protarsomeres 1-3 markedly widened in males. Body length 8.17 mm (Peninsular Malaysia) (Figs. IV/8) (BREMER 2010a, pp.32+43-44)*hauseri* BREMER

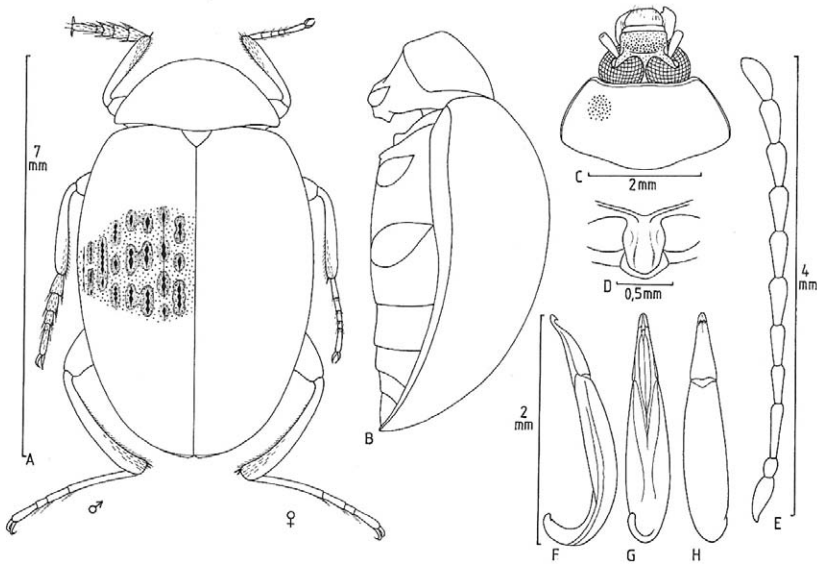


Fig. IV/1: *Amarygmus inconditus* BREMER, 2010: **A** Habitus, left side legs of a male, right side legs of a female; **B** Body, lateral view; **C** Head and pronotum; **D** Prosternal process; **E** Antenna; **F** Aedeagus, lateral view; **G** Aedeagus, ventral view; **H** Aedeagus, dorsal view (reproduction from BREMER 2010a, 198).

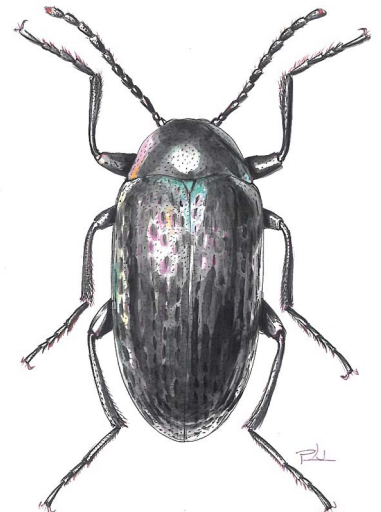
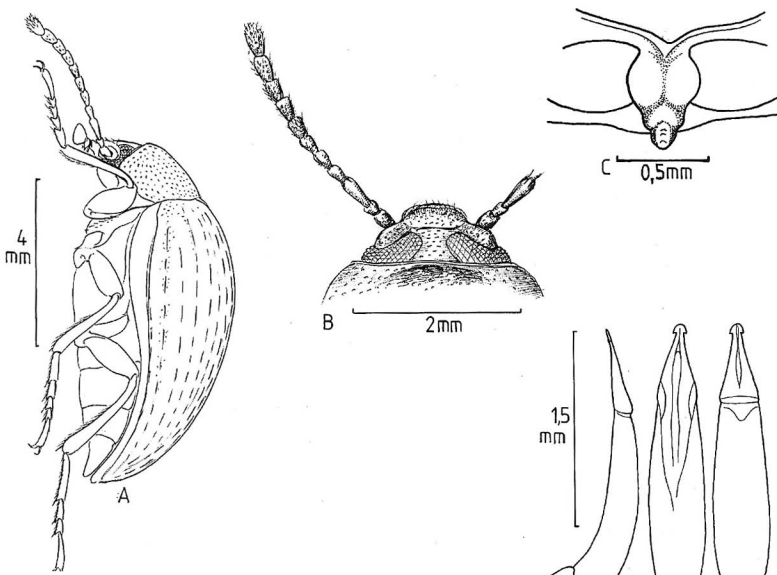


Fig. IV/2: *Amarygmus mitschkei* (PIC, 1938): **A** Body, lateral view; **B** Head and antenna; **C** Prosternal process; **G** Aedeagi, lateral, ventral and dorsal views (reproduction from BREMER 2003a, p.68); **above:** drawing.

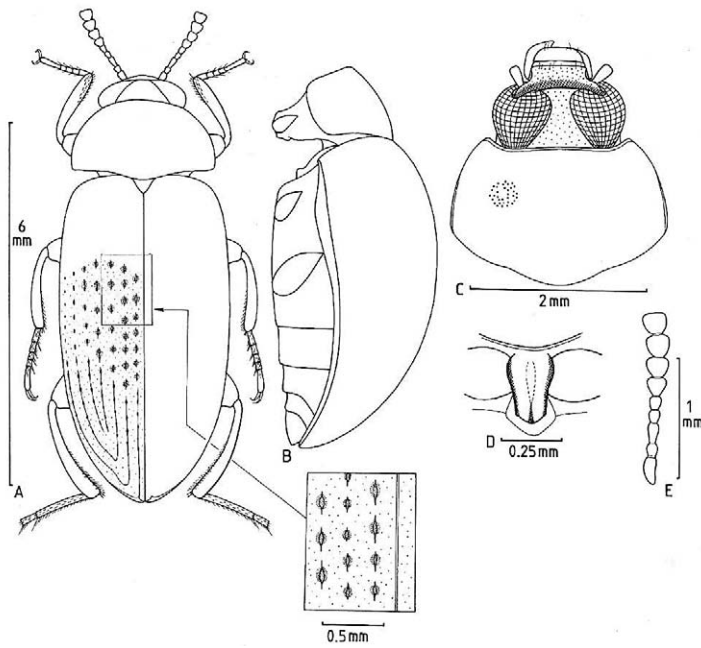


Fig. IV/3: *Amarygmus makiharai* BREMER, 2011: **A** Habitus; **B** Body, lateral view; **C** Head and pronotum; **D** Prosternal process; **E** Antennomeres 1-9 (reproduction from BREMER 2011a, p.229).

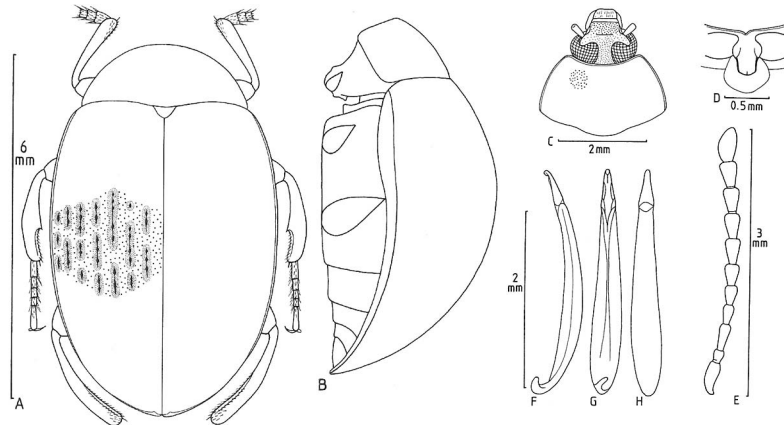


Fig. IV/4: *Amarygmus seponensis* BREMER, 2011: **A** Habitus, male; **B** Body, lateral view; **C** Head and pronotum; **D** Prosternal process; **E** Antenna; **F** Aedeagus, lateral view; **G** Aedeagus, ventral view; **H** Aedeagus, dorsal view (reproduction from BREMER 2011a, p.243).

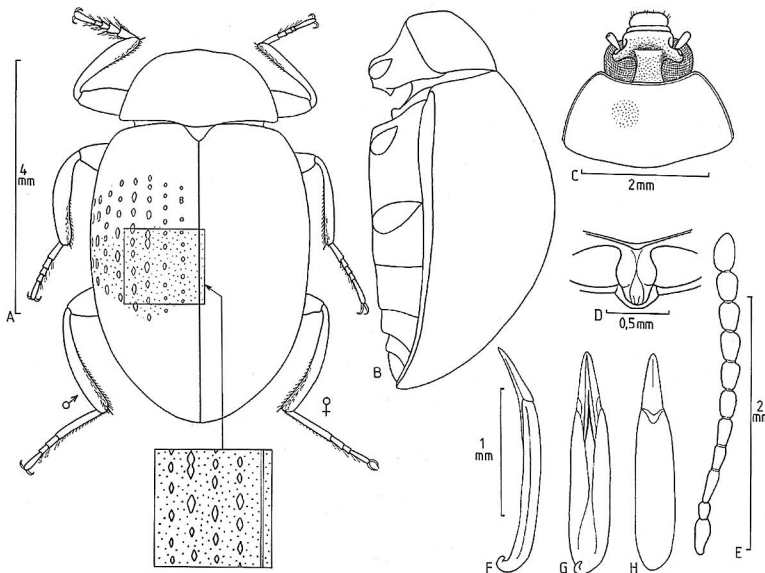


Fig. IV/5: *Amarygmus sundaensis* BREMER, 2001: **A** Habitus, left side legs of a male, right side legs of a female; **B** Body, lateral view; **C** Head and pronotum; **D** Prosternal process; **E** Antenna; **F** Aedeagus, lateral view; **G** Aedeagus, ventral view; **H** Aedeagus, dorsal view (reproduction from BREMER 2004a, p.76).



Fig. IV/5: *Amarygmus sundaensis*
BREMER, 2001, male: Photograph.



Fig. IV/6: *Amarygmus rivalis*
BREMER, 2004, Photograph.

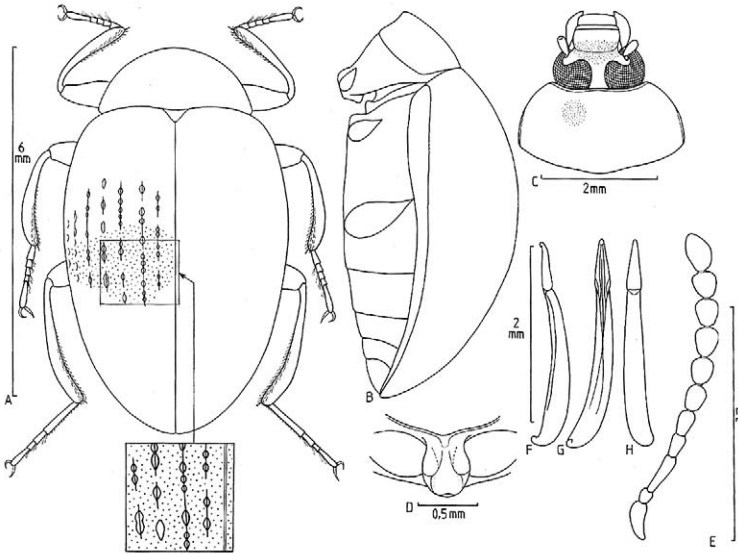


Fig. IV/6: *Amarygmus rivalis*
BREMER, 2004: **A** Habitus; **B** Body, lateral view; **C** Head and pronotum; **D** Prosternal process; **E** Antenna; **F** Aedeagus, lateral view; **G** Aedeagus, ventral view; **H** Aedeagus, dorsal view (reproduction from BREMER 2004a, p.84).

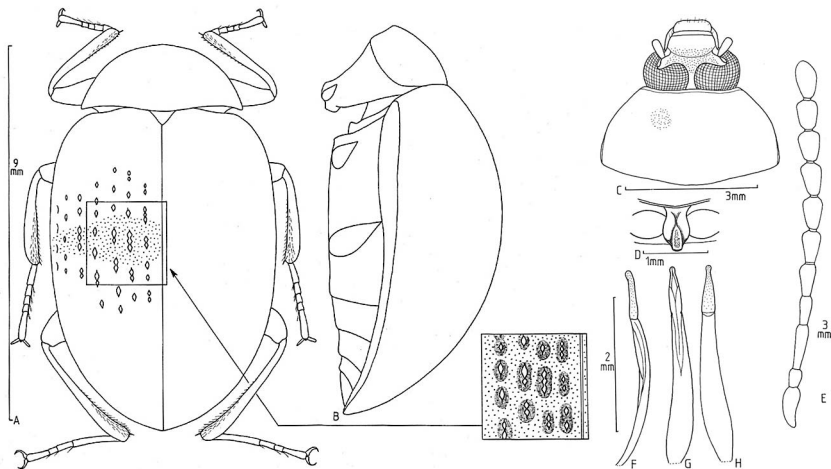


Fig. IV/7:
Amarygmus ertli
BREMER, 2005:
A Habitus; **B** Body, lateral view; **C** Head and pronotum; **D** Prosternal process; **E** Antenna; **F** Aedeagus, lateral view; **G** Aedeagus, ventral view; **H** Aedeagus, dorsal view (reproduction from BREMER 2005a, p.32).



Fig. IV/7: *Amarygmus ertli*
BREMER, 2005: Photograph.

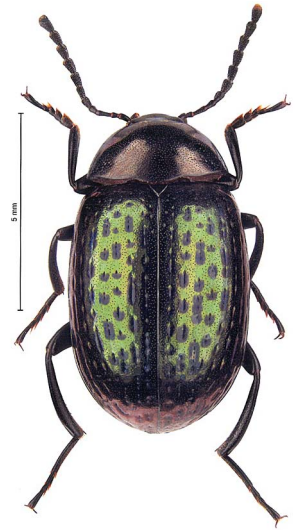


Fig. IV/8: Photograph of
Amarygmus haeuseri
BREMER, 2010 (reproduction
from BREMER 2010a, p.32).

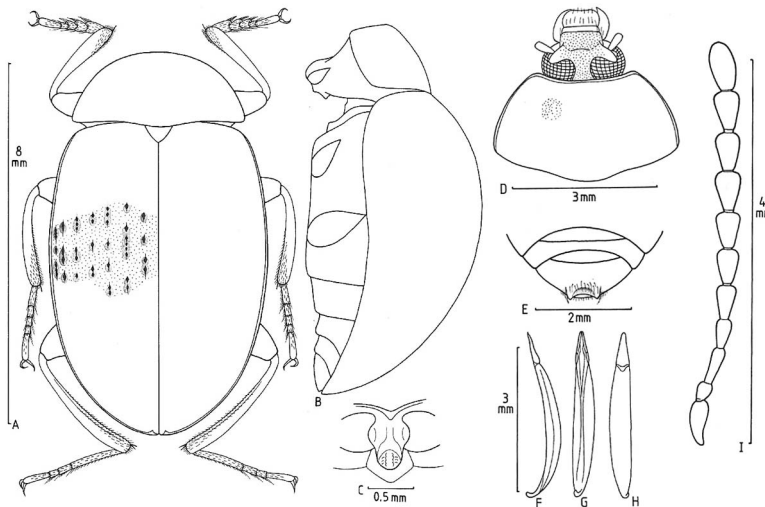


Fig. IV/8: *Amarygmus haeuseri*
BREMER, 2010:
A Habitus, male; **B** Body,
lateral view; **C** Prosternal
process; **D** Head and pronotum;
E Sternite 4+5 of a male;
F Aedeagus, lateral view; **G**
Aedeagus, ventral view; **H**
Aedeagus, dorsal view; **I**
Antenna (reproduction from
BREMER 2010b, p.66).

Section V

Small species with yellow elytra and a darker pronotum

Tiny species (body length <3.0 mm), oval, convex. Species of this group possess yellow elytra and a darker pronotum (black, darker brown, dark green) (in two species with black macula). Elytra with rows of small to medium-sized punctures and flat intervals. Because of their small size their differentiation is not easy, and their determination requires well mounted specimens with the upper side of head visible; main characters for distinguishing are width and structure of frons (microreticulated or smooth; the form of fronto-clypeal suture, and the front corners of pronotum).

- 1 Frons very wide, with black maculae on elytra (rarely specimens without maculae occur) (see BREMER 2012a, 205 and 227) 2
- Frons of medium width (see BREMER 2011a, 237), without black maculae on elytra 3

- 2 One elongate macula is present in the mid of elytra which does not touch base or apex, in some specimens a black macula also occurs along elytral base which may be prolonged backwards in the elytral interval 1 and laterally near the lateral margins, other specimens have additionally a black macula in the mid of pronotum; rarely no elytral macula is present. Body length 2.07-2.37 mm; length/width of elytra 1.12-1.24:1 (Fig. III/2) **variegatus BREMER**
(this species is delt in **Section III**)
- The elytra present a maculae in the middle which are obliquely and posteriorly directed, the elytral base and the elytral apex are also black. Smaller than the preceding species. Body length 1.79-1.82 mm, length/width of elytra 1.23-1.25:1 (Fig. III/1) **circaeus BREMER**
(this species is delt in **Section III**)
- 3 Antennomere 11 uniformly yellow (antennomeres 7-10 black, 1-6 yellow); fronto-clypeal suture very deeply and broadly incised across the head, with an anterior border of fronto-clypeal suture towards clypeus like a semi-circle, frons is steeply sloping down to the markedly incised fronto-clypeal sutures (fronto-clypeal suture similar to the shape of fronto-clypeal suture of *A. straumanni* BREMER, 2001). Clypeus is situated on a lower level than frons. Body length 2.49 mm; length width of elytra 1.37:1 (Sabah) (Fig. V/1) (BREMER 2012, 197-199) **apicicornis BREMER**
- Antennomere 11 not uniformly yellow; antennomeres 5-11 black or dark brown (apical half of antennomere 11 may be brightened); fronto-clypeal suture not incised alike *A. apicicornis*; the incision may be superficial or deep, but if deep, then straightly across head, and its anterior border not like a semi-circle 4
- 4 Frons microreticulated; fronto-clypeal suture straight and markedly incised across head; elytra relatively long (length/width 1.45:1) and with rows of inconspicuous and widely separated punctures. Body length 2.52 mm (Sabah) (Fig. V/3) (BREMER 2011a, 236-238) **pallidior BREMER**
- Frons not microreticulated; pronotal front corners are pointed and with approximately right angles or they are narrowly rounded. Punctures of elytral rows well visible. Body length 2.68-2.88 mm, length/width of elytra 1.33-1.36:1 (Sabah) (Figs. II/4 and V/2) (BREMER 2012a, 219-221) **semele BREMER**
(species occurs near Poring/Sabah)

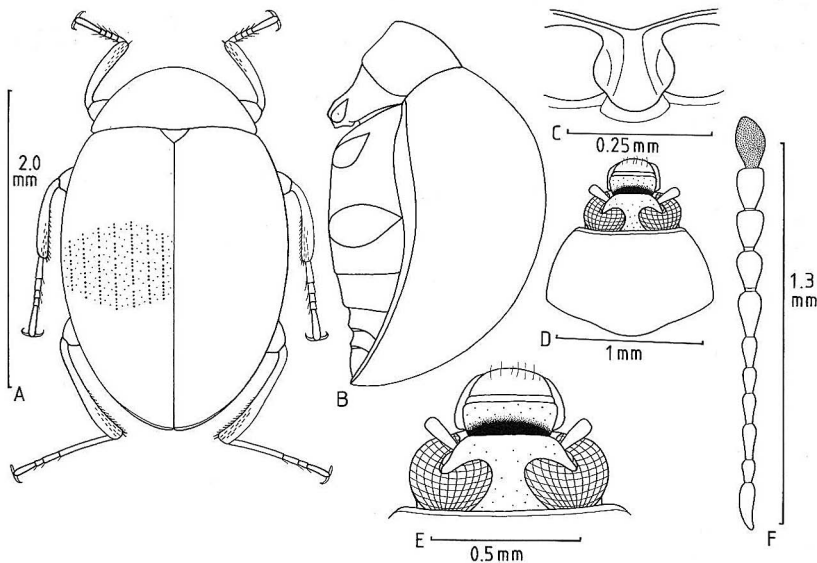


Fig. V/1: *Amarygmus apicicornis* BREMER, 2012:
A Habitus; **B** Body, lateral view; **C** Prosternal process; **D** Head and pronotum; **E** Head; **F** Antenna (reproduction from BREMER 2012a, p.198).

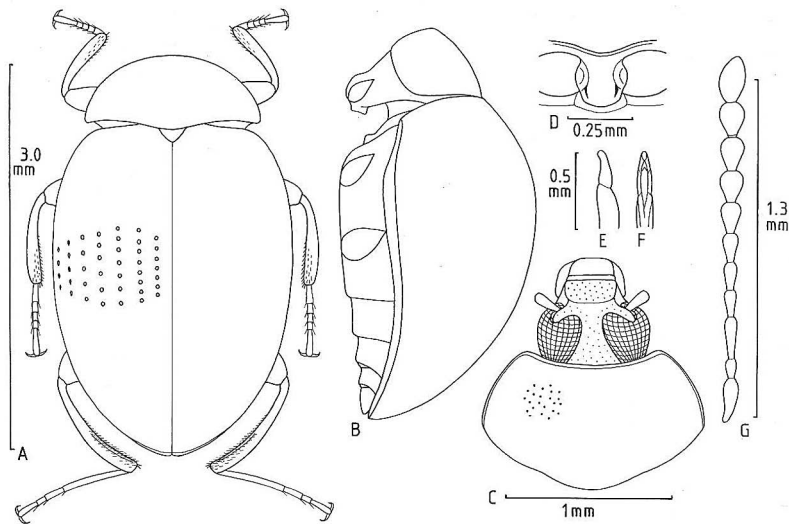


Fig. V/2: *Amarygmus semele* BREMER, 2012: **A** Habitus, male; **B** Body, lateral view; **C** Head and pronotum; **D** Prosternal process; **E** Aedeagus, lateral view; **F** Aedeagus, ventral view; **G** Antenna (reproduction from BREMER 2012a, p.220).

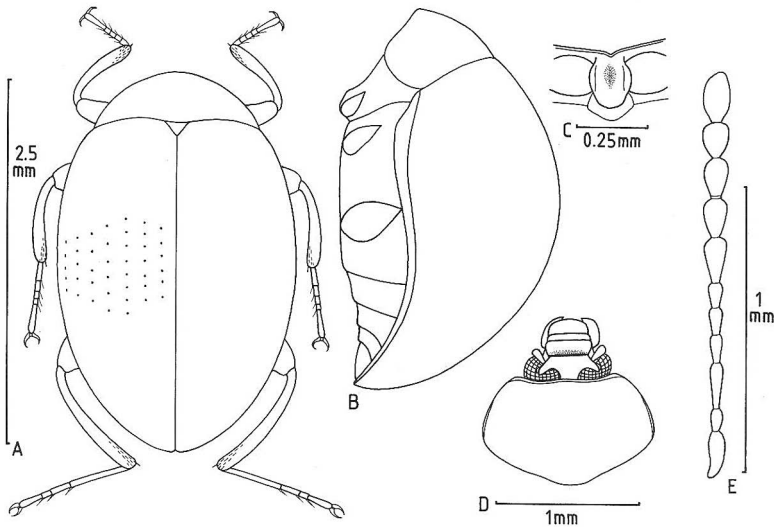


Fig. V/3: *Amarygmus pallidior* BREMER, 2011: **A** Habitus, female; **B** Body, lateral view; **C** Head and pronotum; **D** Prosternal process; **E** Antenna (reproduction from BREMER 2011a, p.237).

Section VI

Small to medium-sized, lustrous species which present a uniformly blue or violet coloration of the lateral parts of elytra.

The disc of these species is either yellowish-brown, reddish-brown or copper-colored. The blue coloration of the lateral parts is best seen in lateral view. Elytra present either rows of punctures or faint striae. Body length <7.1 mm. A typical species is shown in Fig. I/8.

The following related species belong to this Section: *Amarygmus affectus* BREMER, 2010, *A. cinaediae* BREMER, 2004, *A. ino* BREMER, 2012, *A. jensi* BREMER, 2004; *A. maitlandicus* BREMER, 2012, *A. votivus* BREMER, 2010. *Amarygmus delectus* BREMER, 2004 from Sulawesi is another related species. Because of its origin it is not added to this key.

There are two species, not related to the preceding ones, which are added to this key because of their coloration: *Amarygmus vanus* BREMER, 1910 (Peninsular Malaysia; Sabah) and *A. disgregatus* BREMER, 2010 (Sabah; Sarawak). *A. vanus* possesses short hairs on meso- and metafemora in males and, therefore, has also to be listed to Section XVIII. *A. disgregatus*, in males, displays long hairs on the frontal side of profemora and on the posterior sides of mesofemora. It is, therefore, also considered in Section XVI.

Concerning identification of the related species their occurrence gives a certain link to species (*A. jenisi* is only known from the Cameron Highlands of Malaysia, *A. affectus* is only known from the lowlands of Sarawak, *A. ino* is only known from the Kinabalu National Park of Sabah, *A. mailandicus* from the lowland Maitland National Park of Sabah and *A. votivus* from high altitudes of the Crocker Range of Sabah). *A. cinaediae* occurs both in Sarawak and Sumatra.

Determination key of species of Section VI

- 1 Body length less than 5.0 mm 2
- Body length more than 5.3 mm 3

- 2 Body length 3.97-4.47 mm; oval, strongly convex; short elytra (length/width 1.25-1.32:1); upper side markedly lustrous; disc of elytra reddish brown, lateral parts of elytra blue, legs and antennae light brown to brown; elytra with rows of of medium-sized, distant punctures (about 24 punctures in elytral row 4); frons rather narrow (Sarawak, lowland rain forest) (Figs. VI/1) (BREMER 2010a, 164-166) **affectus** BREMER
- Body length 4.49-4.98 mm; the frons is distinctly wider than that of preceding species; and their antennae are shorter; elytra longer oval than preceding species (length/width of elytra 1.32-1.43:1; the elytral punctures of the rows are smaller; the pronotum is bluish green and on incidence of light from anterior it becomes golden-reddish, disc of elytra green, lateral parts blue, upper side very lustrous; legs light brown (Cameron Highlands of Peninsular Malaysia) (Fig. VI/2) (BREMER 2004a, 46-47, Fig. p.82) **jenisi** BREMER

- 3 Elytra with rows of punctures 4
- Elytra with striae (in one species the connecting lines between punctures are faint, and these lines may be easily overlooked) 6

- 4 The elytral interval 1 shows a weak blue iridescence, clearly blue and lustrous are the elytral interval 8, the relatively broad lateral margin of elytra and the elytral pseudopleura; the disc of elytra is reddish brown and somewhat lustrous. The prosternal process is relatively long and narrow. The anterior corners of pronotum are moderately rounded. Length/width of elytra 1.31-1.35:1. Males display two ranks of short hairs on the back sides of of meso- and metafemora. Body length 5.65-7.10 mm (lowlands of Peninsular Malaysia and Sabah) (Figs. VI/3) (BREMER 2010b, 59-60) **vanus** BREMER
- The interval 1 does not show a weak blue iridescence; the elytral disc is entirely copper-colored, and the lateral parts of elytra are broadly blue- or bluish green-colored 5

- 5 Prosternal process wide and short. The pronotum is greenish golden. Anterior corners of pronotum are widely rounded. Frons is narrower than the frons of the preceding species. In males the back sides of meso- and metafemora do not show two ranks of short hairs. Length/width of elytra 1.28-1.35:1. Body length 5.65-5.98 mm (Sabah: higher altitudes of Crocker Range) (Figs. VI/4) (BREMER 2010a, 252-254) **votivus** BREMER
- Prosternal process longer than wide. Femora and tibiae light brown. Pronotum metallic green; lateral parts of elytra yellowish green, with a metallic blue oblique stripe from inner side of humeri to suture before apex, linearly tinged with purple along inner margin of stripe, elytral disc coppery in middle. Elytral punctures of the rows more distant than those of preceding species. Length/width of elytra 1.29:1. Anterior corners of pronotum rectangular. Aedeagus differs from that of preceding species (ANDO et al., Fig. 1). Body length 5.4 mm (Sarawak, lowland natural forest) (Fig. VI/9) (ANDO et al. 2017, 135-138) **hansbremeri** ANDO

- 6 Widely oval; elytral striae deeply incised, with large stria punctures; length/width ratio of elytra 1.22-1.29:1; posterior corners of pronotum widely rounded. Prosternal process wide and short, in females

with a few hairs of medium length, in males with long, erect, very dense hairs. Pronotum and frons blue, violet or green, lateral parts of elytra blue or violet, elytral disc copper-colored. Protibiae markedly bent, mesotibiae less bent than protibiae. Males with long, dense hairs on frontal sides of profemora, back sides of mesofemora, prosternal apophysis and on mesosternum. Body length 6.05-7.01 mm. (Sabah, Sarawak, lowland rain forests) (Figs. VI/5) (BREMER 2010b, 185-187)*disregatus* BREMER
 (because of the long hairs on femora, prosternum and mesosternum in males this species is closely related to *A. postdepressus* PIC, 1938 (Section XVI).

- Species not widely oval but elongate oval; males without long, erect, dense hairs on profemora, mesofemora, prosternal process and mesosternum 7
- 7 Somewhat larger than the two following species, and with a body length of 6.61 mm. Striae clearly incised, the striae punctures have a rhombic form; they are closely set (about 35 punctures in stria 4). The elytral interval 1 has a distinct blue color; elytra have a brown disc and bluish lateral and frontal parts (Sabah, Maitland National Park, lowland rain forest) (Figs. VI/6) (BREMER 2012a, 210-211)*maillandicus* BREMER
- Smaller than the preceding species (body lengths 5.3-5.8 mm); the elytral interval 1 is not blue; the punctures of the striae are wider separated 8
- 8 The striae punctures are connected by very faint lines; they are round, large. They are wider separated than those of the preceding species (approximately 22 punctures in stria 4); the anterior corners of pronotum are acute; prosternal process somewhat elongate. Body length 5.33-5.73 mm (Sarawak; Sumatra, lowland rain forests) (Fig. VI/7) (BREMER 2004c, 107-109)*cinaediae* BREMER
- The striae are moderately deeply incised, the striae punctures are rhombic (approximately 29 punctures in stria 4); the antennae are shorter than those of preceding species; frons, pronotum and lateral parts of elytra greenish blue, disc reddish brown, legs light brown. Body length 5.41 mm (Sabah) (Figs. II/5, and VI/8) (BREMER 2012a, 208-210)*ino* BREMER

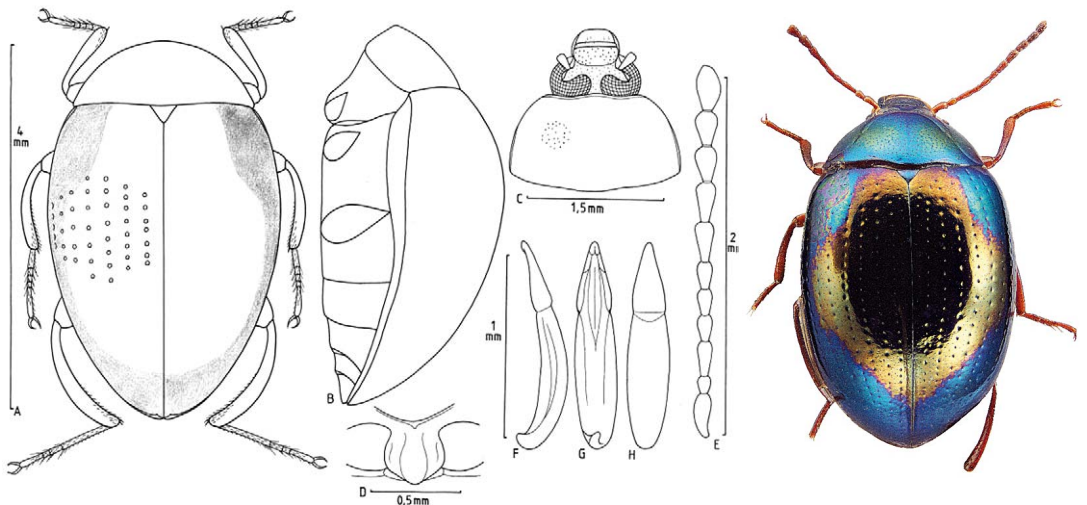


Fig. VI/1: *Amarygmus affectus* BREMER, 2010: **A** Habitus; **B** Body, lateral view; **C** Head and pronotum; **D** Prosternal process; **E** Antenna; **F** Aedeagus, lateral view; **G** Aedeagus, ventral view; **H** Aedeagus, dorsal view (reproduction from BREMER 2010b, p.165), **left:** photograph.

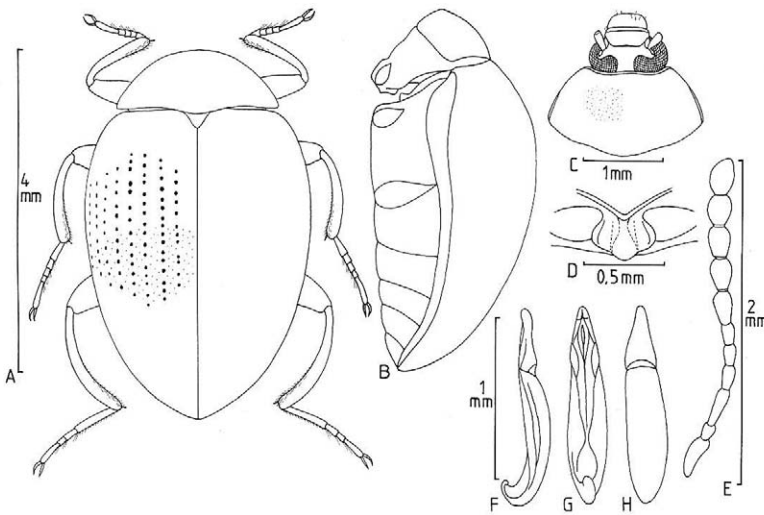


Fig. VI/2: *Amarygmus jensis* BREMER, 2004: **A** Habitus; **B** Body, lateral view; **C** Head and pronotum; **D** Prosternal process of a male; **E** Mesofemur of a male; **F** Metafemur of a male; **G** Antenna; **H** Aedeagus, lateral view; **I** Aedeagus, ventral view; **J** Aedeagus, dorsal view (reproduction from BREMER 2004a, p.82).

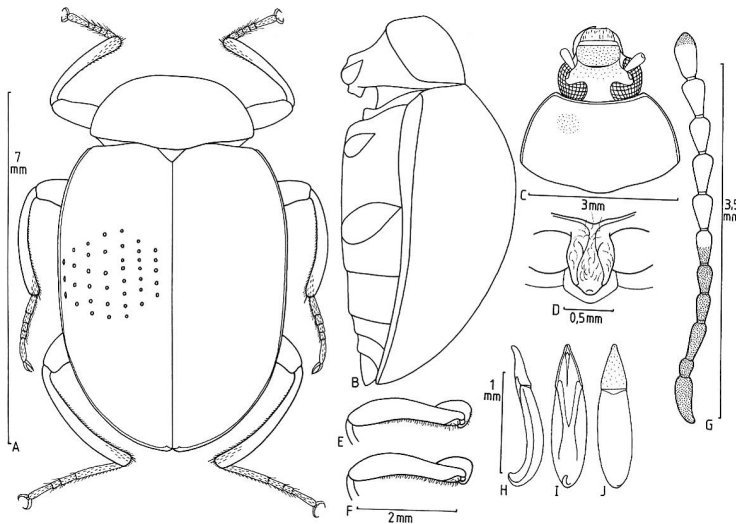


Fig. VI/3: *Amarygmus vanus* BREMER, 2010: **A** Habitus, male; **B** Body, lateral view; **C** Head and pronotum; **D** Prosternal process; **E** Mesofemur (male); **F** Metafemur (male); **G** Antenna; **H** Aedeagus, lateral view; **I** Aedeagus, ventral view; **J** Aedeagus, dorsal view (reproduction from BREMER 2010b, 59; delimitations of blue coloration not depicted).

Fig. VI/3: *Amarygmus vanus* BREMER, 2010: Photograph.



Fig. VI/4: *Amarygmus votivus* BREMER, 2010, female: Photograph.

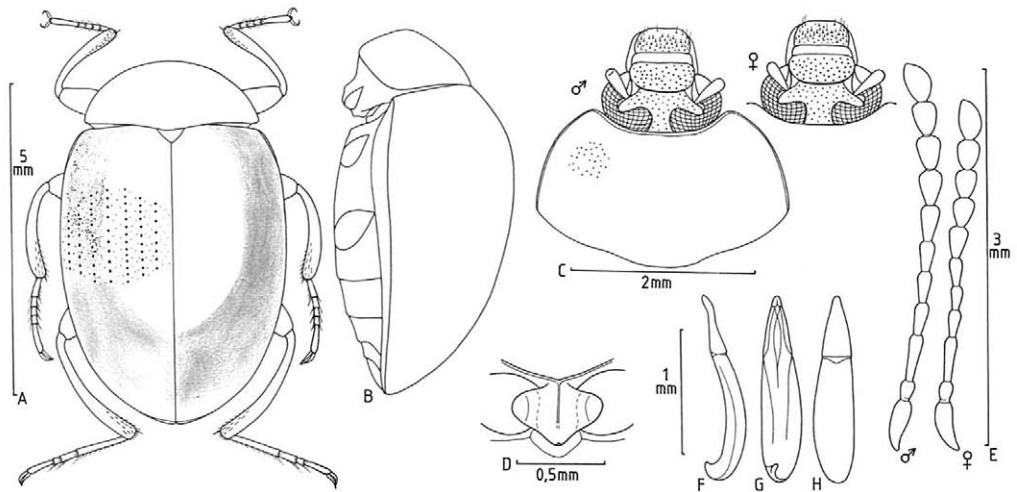


Fig. VI/4: *Amarygmus votivus* BREMER, 2010: **A** Habitus; **B** Body, lateral view; **C** Head and pronotum, male and head, female; **D** Prosternal process; **E** Antennae, male and female; **F** Aedeagus, lateral view; **G** Aedeagus, ventral view; **H** Aedeagus, dorsal view (reproduction from BREMER 2010a, p.253).

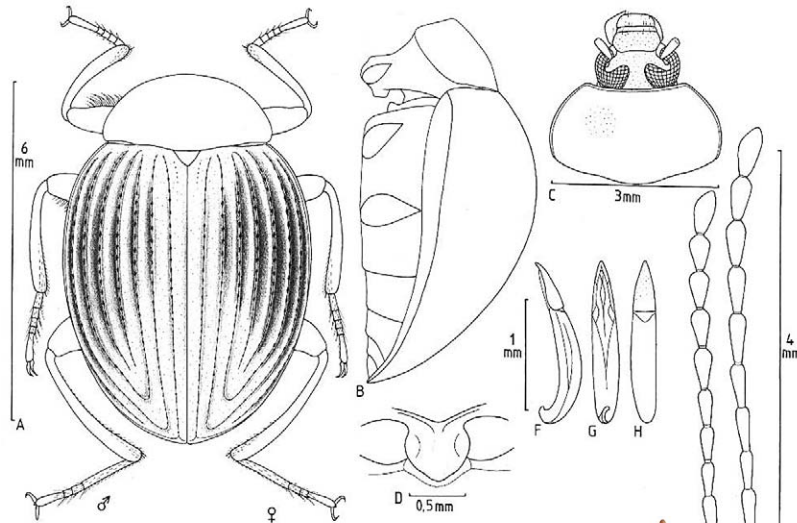
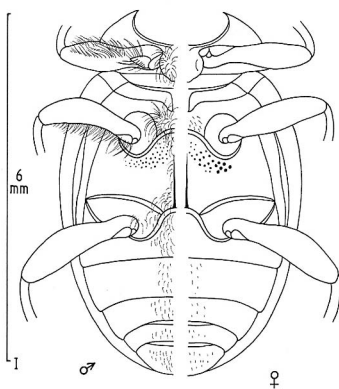


Fig. VI/5: *Amarygmus disgregatus* BREMER, 2010: **A** Habitus, left side legs of a male, right side legs of a female; **B** Body, lateral view; **C** Head and pronotum; **D** Prosternal process; **E** Antennae, male and female; **F** Aedeagus, lateral view; **G** Aedeagus, ventral view; **H** Aedeagus, dorsal view;



I Underside: **left** side of a male, **right** side of a female (reproduction from BREMER 2010a, 185);

Photograph: male.



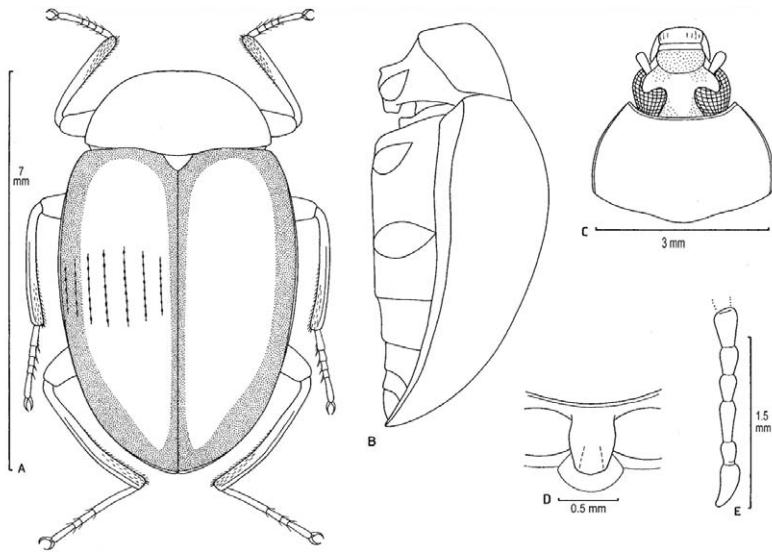


Fig. VI/6: *Amarygmus maitlandicus* BREMER, 2012:
A Habitus, female; **B** Body, lateral view; **C** Head and pronotum; **D** Prosternal process; **E** Antennomeres 1-6
 (reproduction from BREMER 2012a, p.211).

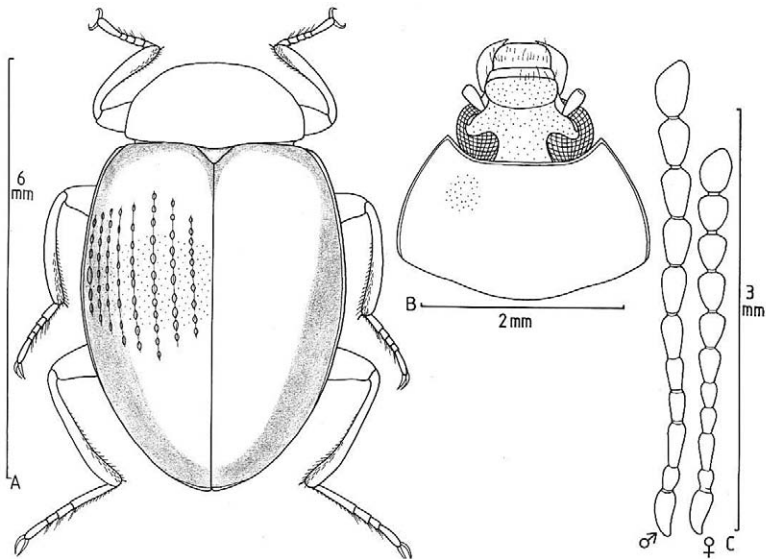


Fig. VI/7: *Amarygmus cinaediae* BREMER, 2004:
A Habitus; **B** Head and pronotum; **C** Antennae, male and female (reproduction from BREMER 2004c, p.108).

Acknowledgment

I warmly thank Dr. Kiyoshi ANDO, Osaka, that he allowed to reproduce one photograph of a species published by him and for long-standing cooperation. Edgar MÜLLER, Saarwellingen, Germany produced the photographs of the other beetles, and Frank FORMAN, Osnabrück, the (more professional) drawings. Both I have to thank for their expertise and encouragement.

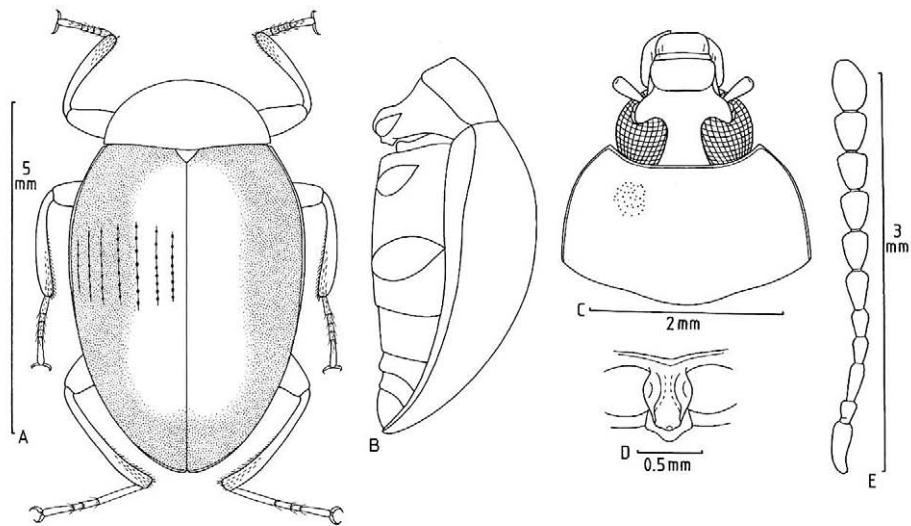


Fig. VI/8: *Amarygmus ino* BREMER, 2012:
A Habitus, female; **B** Body, lateral view; **C** Head and pronotum; **D** Prosternal process; **E** Antenna
 (reproduction from BREMER 2012, p.209).

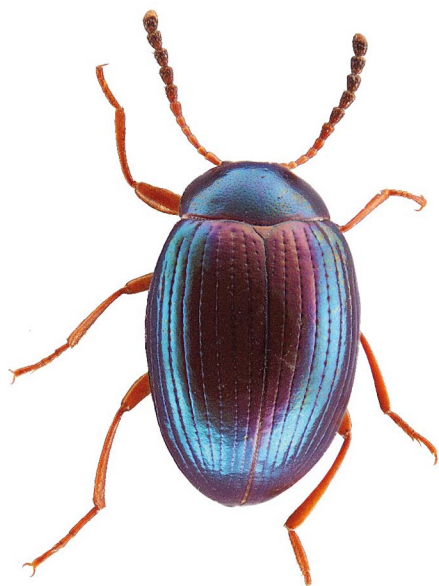


Fig. VI/8: *Amarygmus ino* BREMER, 2012:
 Photograph.

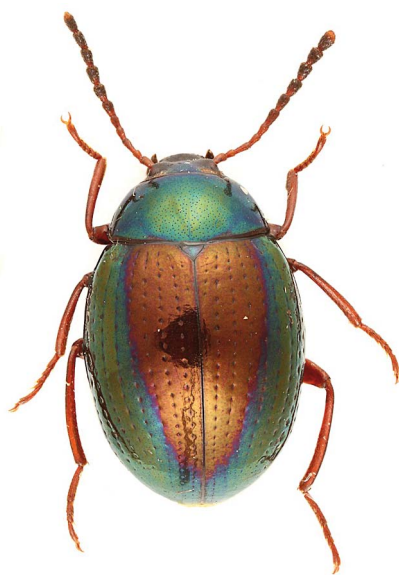


Fig. VI/9: *Amarygmus hansbremeri* ANDO, 2017:
 Photograph (reproduction from ANDO et al. 2017, p.140).

My granddaughter, Alessandra BREMER, Hong Kong, frequently looked on the English of the manuscript. I also warmly thank her. I also have to thank the Managing Editors that they considered to publish this bulky paper. Especially of them I am due to Johannes SCHUBERTH for his patient support.

Zusammenfassung

Die 285 Arten der Gattung *Amarygmus* DALMAN, 1823 (Col.: Tenebrionidae: Amarygmini) aus dem gemeinsamen Faunengebiet von Borneo, Sumatra, Java, Halbinsel Malaysia und deren Nachbarinseln werden aufgelistet. In dieser Arbeit werden in einem ersten Versuch Gruppen ("Sektionen") der *Amarygmus*-Arten nach einem oder wenigen leicht erkennbaren Merkmalen gebildet. Alle 285 Arten werden einer Sektion zugeordnet und zur besseren Erkennung mit einer Zeichnung und/oder einem Foto abgebildet. Diese Arbeit beginnt mit den ersten sechs von schließlich sechszwanzig verschiedenen Sektionen. Literaturhinweise zu allen 285 Arten finden sich am Ende dieses ersten Beitrags.

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