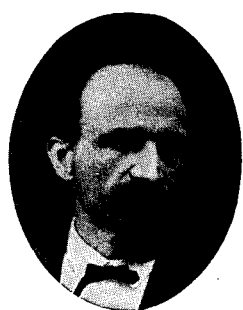


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# The principal terms used for male and female genitalia in Coleoptera

BY

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The manuscript of the Coleoptera section of "Taxonomist's Glossary of Genitalia in Insects" (1956) was delivered in two parts: (1) a short descriptive synopsis of the elements and types of beetle genitalia, written by Ernst Palmén and myself, and (2) a table containing all important terms in different languages used by previous authors. This table was split up and incorporated into the second, dictionary part of the "Glossary" by its editor, S. L. Tuxen.

However, an entomologist restricting his interests to Coleoptera would probably consider it an advantage to use the table mentioned above in its original, more surveyable form. So it was decided to publish it separately.

The table consists of two parts, male and female genital terms being separated apart. The first column gives the term in English proposed for future use, and in the second, this term is morphologically defined. The following columns give the synonyms used in previous English, German and French literature, as well as in Latin, with citation of the author in more unusual cases. This list of synonyms is without pretensions to completeness but it probably covers the field quite well as far as the 20th century is concerned. For the sake of international understanding it was considered valuable that any important structure should have a Latin name. Therefore, new Latin names have been proposed in the absence of earlier ones, or if those hitherto used were regarded as inappropriate. These new terms are put in brackets. At the end of the male and the female section of the table, respectively, is an enumeration of structures which, according to my view, are in no need of a special term, though they have been named by different authors. It is to be hoped that the nomenclature launched through the "Glossary" will contribute towards a more uniform and internationally more easily understood system of terms of the external genitalia and the efferent system in insects. This is highly necessary also among coleopterists, who show a steadily increasing interest in genital characters as the ultimate test of the amount taxonomic unit, the species.

The term "aedeagus", for instance, spelled in several different ways, has been used both for the *penis* alone, and for *penis + tegmen*, as here proposed. The word *penis* was generally avoided by English-speaking students, in favour of "median lobe" which, like "lateral lobes" for the *parameres*, lacks the strictness of a scientific term.

On the other hand, a general terminology should not be expanded to cover every genital structure. The extremely complicated armature of the internal system of penis present in several groups of Coleoptera is sufficiently described by means of drawings or photographs, and even homologies can be worked out without attaching a special term to the single spines and bristles.

*Coleoptera, males, 1.*

Term	Definition	English
Aedeagus <sup>1</sup>	Penis + tegmen	Oedeagus Phallus (Snodgrass 1935)
Apex (of penis)	Distal part of penis (distad of ostium).	—
Basal orifice	The basal (proximal) opening of penis through which the ejaculatory duct enters. It is often displaced to the ventral side of penis.	Median foramen
Basal piece	The unpaired basal (proximal) part of tegmen (cf. parameres). It is usually sclerotized and may form a complete ring or tube around the penis. It is often provided with single (manubrium) or paired processes (struts, apophyses).	External lobes Gonocoxite(s) (Michener 1944) Basal lobe (Hinton 1940) Basal piece and basal lobe together (Wilson 1927) Tambour (Lamellicornes) Phallobase (Snodgrass 1935)
Condylite	The smaller basal part of a paramere, if divided, articulating to the base of penis (Staphylinidae; Brundin 1940).	—
Connecting membranes	Tubular membranes (non-sclerotized parts of the genital tube) connecting penis with tegmen (1st conn.m.) and tegmen with the apex of abdomen (2nd conn.m.). <sup>2</sup>	—
Ejaculatory duct	The unpaired ectodermal outlet of the efferent system, from the junction of the seminal ducts to the gonopore.	Genital duct Ejaculatory canal
First connecting membrane <sup>2</sup>	Membrane connecting penis to tegmen.	—
Flagellum	Sclerotized terminal prolongation of the ejaculatory duct, usually concealed within the internal sac when in repose but sometimes very long and constantly protruding through the ostium of penis.	Virga (Snodgrass 1935)
Gonopore	The terminal orifice of the ejaculatory duct, usually situated at the bottom of the internal sac (when in repose).	Genital pore

Synonyms		
German	French	Latin
orceps Anapophysen	Édéage	Aedeagus
—	—	Apex
—	Orifice basal	(Foramen basale) Foramen mediale
Basalstück Basalplatte Basale (Kerschner 1913)	Lame basale Tambour (Lamellicornes)	Pars basalis Basale
Condylit	—	(Condylitum)
—	—	(Membranae connectentes)
—	Conduit éjaculateur	Ductus ejaculatorius
—	—	(Membrana connectens prima)
Beißel Virga Pseudovirga Träpenis (Harnisch 1915)	Flagelle Phanère	Flagellum Virga Ligula (Holdhaus 1924)
—	—	(Porus genitalis)

*Coleoptera, males, 2.*

Term	Definition	English
Genital segment	The IXth abdominal segment, more or less closely attached to the aedeagus. It has rarely bewared its segmental character (Cantharis, Staphylinidae, certain Catopidae) but is usually reduced either into a frame in which the aedeagus is suspended when at rest (most Adephaga) or into one or two spicules.	Gonosomite (Snodgrass 1935)
Genital tube	Penis + tegmen + connecting membranes.	—
Internal sac	The invagination cavity at the distal end of the penis, into which the ejaculatory duct opens. It becomes everted during the copula and when in repose is partly or totally concealed in the penis.	Endophallus, Endophallic chamber (Snodgrass 1935)
Ostium	The opening or area through which the internal sac is everted during the copula. It is usually situated on the dorsal side of penis near the apex.	Apical orifice Median orifice Apical opening Phallotreme (Snodgrass 1935)
Parameres	A pair of appendages (sometimes coalescent or even completely joined) forming the distal (apical) part of tegmen and usually protruding on each side of the penis.	Lateral lobes <sup>3</sup> Valves Gonostyli (Michener 1944)
Paramerite <sup>4</sup>	The main, distal part of a paramere, if divided (Staphylinidae; Brundin 1940).	—
Penis	The apical (distal), unpaired part of the copulatory apparatus, containing the terminal portion and the orifice of the ejaculatory duct.	Median lobe Phallosome Body, Stem (Hopkins 1911) Aedeagus (s.str.) Oedeagus (s.str.)
Second connecting membrane <sup>2</sup>	Membrane connecting tegmen to the apex of abdomen.	—

Synonyms		
German	French	Latin
Genitalsegment	Segment génital	Segmentum genitale
—	—	(Tuba genitales)
Präputialsack Penisblase Rutenblase Siphonalhaut (Coccinellidae) <sup>5</sup>	Sac interne	(Saccus internus)
Präputialfeld Ostialöffnung Ostialschlitz	Orifice apicale	Ostium Fornix edeagi
Parameren Valven Klappen Paramerite (Verhoeff 1918)	Styles latéraux Lobes latéraux	(Parameres) Cornua tegminis Pars finalis (Escherich 1894) Papillae (Hopkins 1911)
Paramerit	—	(Parameritum)
Penisröhre Peniskapsel Körper (Lindemann 1875) Oedeagus (s.str.) Sipho (Coccinellidae) <sup>5</sup>	Lobe médian Édéage (s. str.)	Penis
Genitaltasche Genitalrohr Präputium	Prepuce	(Membrana connectens secunda) Atrium genitale

*Coleoptera, males, 3.*

Term	Definition	English
Seminal ducts	The paired portion of the efferent system terminally joining in the ejaculatory duct.	—
Spicule(s)	One or two sclerotized bodies (rudiments of the genital segment) attached by membranes to the outside of the genital tube.	Rod (Hopkins 1911) Fork (Hopkins 1911)
Tegmen <sup>6</sup>	The (single or divided) sclerite situated basally (proximad) of the penis and often surrounding it when in repose. The tegmen is usually divided into basal piece and parameres.	Ring (Hopkins 1911)
Tegmenite	Isolated basal sclerite of tegmen, situated on the second connecting membrane (Arnett 1949, 1951, Spilman 1952).	—
—	Distal, unpaired part of tegmen, sometimes surrounding the penis (Coccinellidae; Wilson 1926).	Basal lobe <sup>7</sup>
—	Paired or unpaired process (apophyses, apodemes) of the penis or the tegmen.	Struts Fork (if paired)
—	Unpaired apophyse of tegmen.	Median process (strut) of tegmen
—	The dorsal parts of penis framing the ostium on each side.	—
—	A thin membrane forming part of the apical and marginal portions of a paramere.	—
—	Sclerite of the internal sac situated close to the gonopore, apparently a reduced flagellum (Staphylinidae; Brundin 1943).	—
—	A rare type of penis in which the ostium is situated ventrad the apex.	—
—	Collective term for seminal ducts, accessory glands, vesiculae seminales and ejaculatory duct.	Efferent system

Synonyms		
German	French	Latin
Samenleiter	Canals déférants	Vasa deferentia
Spengeltengel (Lindemann 1875)	—	Spiculum (gastrale)
Samenlabel (Lindemann 1875) Spermatheca (s.l.) (Heberdey 1928)	Tegmen	Tegmen
—	—	(Tegmenitum)
"Penis" (Verhoeff 1918; Heberdey 1928)	—	—
—	Lobes supplémentaires Manubrium (if single)	Temones Femora Manubrium
—	Manubrium Lame ventrale	Manubrium
Costiallamellen (Brundin 1943)	Ligules <sup>8</sup>	Ligulae <sup>8</sup>
Epichelum (Brundin 1940)	—	—
Ductuslamelle	—	—
—	Catopie, catopique (Jeannel et Paulian 1944)	—
—	—	—



*Coleoptera, males, 4.*

Term	Definition	English
—	Paired portion of the internal genitalia (i. e. testes, seminal ducts and accessory glands).	Zygotic portion
—	Unpaired portion of the genitalia (i. e. the genital tube, from the junction of the seminal ducts).	Azygotic portion
—	The enlarged distal part of the azygos, containing the internal sac (if present) and the outer wall of the genital tube, from the ostium of penis (resp. the orifice of the ejaculatory duct) to the base of the tube ("second connecting membrane").	Eurazygotic portion
—	The tubular, not enlarged part of the azygos, i. e. ejaculatory duct.	Stenazygotic portion

<sup>1</sup> Aedeagus is sometimes used for the penis alone (*vide* Snodgrass 1935, e. g.).

<sup>2</sup> In 1918 (p. 214) Sharp reversed the nomenclature of the two "connecting membranes".

<sup>3</sup> The term "lateral lobes" was used for appendages of a proposed single paramere by Spilman (1952).

<sup>4</sup> "Paramerit" has also been used as a synonym of paramere (Verhoeff 1918).

<sup>5</sup> The aedeagus of Coccinellidae has been differently interpreted (*vide* Sharp et Muir 1912, p. 525; Heberdey 1928, p. 569).

<sup>6</sup> Some authors use "tegmen" for the basal piece alone (Muir, *pro parte*; Singh Pruthi), i. e. in the same sense as "phallobase" has been employed by some authors (e. g. Snodgrass 1935).

<sup>7</sup> The term "basal lobe" has also been used as a synonym of basal piece (Hinton 1940).

<sup>8</sup> "Ligula" has also been used for flagellum (Holdhaus 1924).

Synonyms		
German	French	Latin
—	—	Zygos
—	—	Azygos
—	—	Eurazygos
—	—	Stenazygos

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(continued on p. 255)

*Coleoptera, females, 1.*

Term	Definition	English
Bursa copulatrix	Proximal, blind end of the vagina with which it may be broadly or narrowly connected. It receives the internal sac of penis during coitus.	Bursal sac Copulatory pouch
Bursal duct	The duct connecting the bursa copulatrix with the vagina.	—
Genital segment	The IXth abdominal segment. The tergite is usually normal, the sternite as a rule divided into two hemisternites with each one stylus.	—
Hemisternites	The two sclerites representing the IXth sternite and surrounding the vulva. They may be fused together along the median line.	Genital valves (Böving 1913) Genital plates (Wilson 1926) Coxites (Tanner 1927)
Lateral oviducts	The paired canals leading from each of the ovaries and joining distad into the median oviduct.	—
Median oviduct	The single canal behind the junction of the lateral oviducts, usually transforming distad into a more or less enlarged vagina.	Uterus <sup>1</sup> Egg passage
Oviduct(s)	The efferent system from the ovaries (ovary) to the beginning of the vagina (if this is lacking reaching to the vulva), with few exceptions divided in one paired and one unpaired portion (Lateral and median oviducts).	—
Ovipositor	The tubular apparatus used for depositing the eggs. It is either formed by the VIIIth and IXth abdominal segments or (in Dytiscidae) by the hemisternites.	—
Seminal canal	A closed duct or open canal (not regularly present) connecting the spermatheca with the innermost (proximal) part of the vagina. It serves the transport of sperma from the spermatheca.	Seminal duct <sup>2</sup>

Synonyms		
German	French	Latin
Bursentasche Erfassungstasche Copulationstasche	Bourse copulatrice	Bursa copulatrix Bursa conceptionis
Bursastiel	—	Ductus bursae
Genitalsegment	Segment génital	Segmentum genitale
—	Hémisternites	(Hemisternita)
Eileiter (pl.) Erführungsgänge Ovidukte	Oviducts pairs	Oviducti (laterales)
Erführungsgang Eupaarer Eileiter Eupaarer Ovidukt	Oviduct impair	Oviductus communis
Eileiter (sing. or pl.) Erführungsgang(-gänge) Ovidukt(e)	Oviduct(s)	Oviductus(-i)
Erführungrohr Erführungsgesäbel (Dytiscidae) Erführungsgriffel (Dytiscidae)	Tarière (Dytiscidae)	Ovipositor
Erführungsgang <sup>s</sup> Erführungsgang Erführungskanal	—	Canalis seminalis Ductus seminalis

*Coleoptera, females, 2.*

Term	Definition	English
Spermatheca	A well defined sac, usually with sclerotized walls, connected with the vagina (or the bursa copulatrix) by the spermathecal duct. It receives the sperma after coitus and stores it until used for fertilization.	—
Spermathecal duct	The primary canal through which the sperma enters the spermatheca from the vagina or the bursa copulatrix.	—
Spiculum ventrale	Endoskeletal rod-like sclerite, present in forms with ovipositor and serving as attachment for its muscles.	Rod
Stylus (styli)	A pair of processi (not always present) articulating to the hemisternites (IXth sternite), usually heavily sclerotized and as a rule possessing sensorial bristles. The stylus is often divided into two articulating joints.	Stylet Genital palp Genital tubercle (Wilson 1926)
Vagina	Distal (terminal), more or less enlarged portion of the median oviduct which receives the penis during coitus. The vagina is not always clearly separated from the median oviduct or the bursa copulatrix.	—
Vulva	External (terminal) opening of the vagina (often including its surroundings).	Gonopore <sup>5</sup> Gonotreme
—	The halves of the VIIIth sternite (Dytiscidae).	Cloaca valves (Bøving 1913)
—	The halves of the IXth tergite.	Paraprocts (Tanner 1927) Valvifers (Tanner 1927) Arms (Dytiscus; Bøving 1913)
—	The Xth tergite.	Proctiger (Tanner 1927)
—	Remaining sclerites of the Xth tergite.	—

Synonyms		
German	French	Latin
menkapsel menblase menbehälter <sup>4</sup> menreservoir	—	Spermatheca Receptaculum seminis <sup>4</sup> Capsula seminalis
menkapselgang spermadukt mengang <sup>3</sup>	—	Ductus sperma- thecae Ductus receptaculi
Saugstiel (Stein 1847)	—	Spiculum ventrale
Stylus vaginalpalpen vaginaltaster Griffel	Style	Stylus (styli)
Scheide	Vagin	Vagina
Genitalöffnung	—	Vulva
Genitalklappen	—	—
Weitenspangen (Dytiscus; Korschelt 1924)	—	—
Proctifer (Heberdey 1931)	—	—
Analplatte(n)	—	—

*Coleoptera, females, 3.*

Term	Definition	English
—	Rod-like apophyses of the IXth tergite or sternite.	Baculi
—	A pair of sclerites situated ventrad of the vulva, possibly transformed styli (Dytiscidae).	Vulvar sclerites
—	Sclerotized plate in the intersegmental membran ventrad of the vulva (Staphylinidae).	—
—	Enlarged terminal part of the lateral oviducts.	Chalice (Bissell 1937)
—	Sclerotized ring in the wall of the spermatheca (Carabidae).	—
—	Terminal end of the vagina protruding through the vulva (Dytiscidae).	—
—	The vulvar part of the cloaca (as correlative of the anal or rectal part: atrium anale) (Scarabaeidae).	—
—	A processus emanating from the ventral part of the vagina and functioning as copulatory apparatus (Helodidae).	—
—	The terminal part of the bursa copulatrix, connecting it with the spermathecal duct (Scarabaeidae).	—

<sup>1</sup> The term uterus has also been used for the basal part of the vagina (Bissell 1937), or for median oviduct and vagina together (Metcalf 1932).

<sup>2</sup> As "seminal ducts" is the common name for the vasa deferentia of the male the term seminal canal (for ductus seminalis) must be preferred.

<sup>3</sup> "Samengang" has been used both for the spermathecal duct and the seminal canal.

<sup>4</sup> The terms receptaculum seminis and "Samenbehälter" are often used for the spermatheca and its duct together.

<sup>5</sup> "Median gonopore" has been used for the opening of the median oviduct into the vagina (Bissell 1937).





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