

The Book of Beetles

A Life-Size Guide to Six Hundred of Nature's Gems

Edited by **Patrice Bouchard**

With 350,000 known species, and scientific estimates that millions more have yet to be identified, beetles are one of the most remarkable and varied creatures on earth. They range from the delightful summer firefly to the one-hundred-gram Goliath beetle. Beetles offer a dazzling array of shapes, sizes, and colors that entice scientists and collectors across the globe.

This collection covers six hundred significant beetle species. Each features a distribution map, basic biology, conservation status, and information on cultural and economic significance. Full-color photos show the beetles both at actual size and enlarged to show details. Based in the most up-to-date science and accessibly written, the descriptive text will appeal to researchers and armchair coleopterists alike.

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or hardened forewings, or *elytra* (singular *elytron*). Depending on the species, elytra can help stabilize beetles in flight, protect their delicate hind wings and internal organs, conserve precious bodily fluids, capture bubbles of air underwater, and insulate them from extreme temperatures. Combined with their small and compact bodies and numerous other morphological and behavioral adaptations, beetles exploit and thrive in niches unoccupied or underutilized by other animals in widely diverse terrestrial and freshwater habitats.

Although the sheer number of species prevents all but the most common or economically important beetles from having a meaningful and widely accepted common name, each known species does have a scientific name consisting of a *genus* (plural *genera*) and *species* (singular and plural) (either that is universally recognized. To manage information effectively, coleopterists file each species into a nested system of hierarchical groups, or *taxa* (singular *taxon*), based on their shared evolutionary characteristics. Species is the most exclusive taxon, while the order Coleoptera is the most inclusive of beetle taxa.

Beetles communicate with one another through physical, chemical, or visual means, usually to locate a mate. Although most species engage in sexual reproduction, a few reproduce asexually by cloning themselves, a process known as *parthenogenesis*. Among beetles, limited parental care of the young is the exception, not the rule. The larvae and adults eat a variety of organisms, living and dead, especially plants. Those that



prefer leaves, flowers, fruits, needles, cones, and roots can inflict serious damage to food stores, gardens, crops, and managed timber. Some carnivorous beetles are used as biological control agents against agricultural or forestry pests, while scavenger species provide an essential service to clean study skeletons in natural history collections around the globe. Recently, the study of beetle structure and function has inspired scientists and engineers

NOTE: Some beetles are iridescent, but most species, others feed on a wide range of hosts. Adults of the North American pest Japanese beetle (*Popillia japonica*) have been observed feeding on 300 hosts in approximately 80 plant families.

NOTE: Most beetles are winged, but some have reduced hind wings and cannot fly. One species in the African weevil genus *Baryscapus*.

INTRODUCTION



"From the small size of insects, we are apt to undervalue their appearance. If we could imagine a male Chalcosoma with its polished, bronzed coat of mail, and vast complex horns, magnified to the size of a horse or even of a dog, it would be one of the most imposing animals in the world."

CHARLES DARWIN, *THE DESCENT OF MAN & SELECTION IN RELATION TO SEX*, 1871

ABOVE: Beetles represent a highly diverse group of organisms. Their importance for agriculture, forestry, and medical applications and insect voraciousness in structures (e.g., the male Atlas Beetle, *Chalcosoma atlas*) adaptations, have captivated humans for centuries.

Beetles of the order Coleoptera, with nearly 400,000 described species, comprise one of the most diverse and important groups of animals on Earth. As such, *coleopterists*, biologists who specialize in the study of beetles, have a view of the natural world with a degree of resolution that is seldom seen through the study of other organisms.

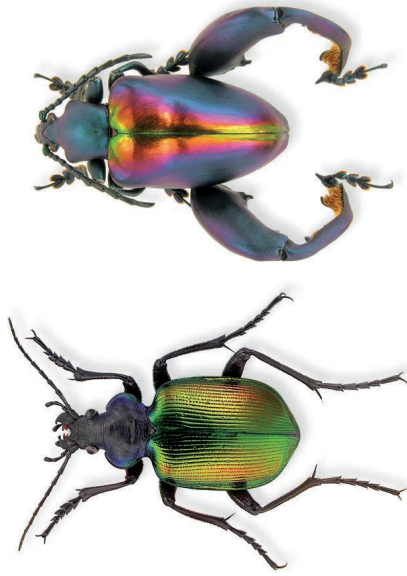
One out of every five species of plants and animals is a beetle. Despite their riot of forms, colors, patterns, and behaviors, all beetles share a select suite of physical attributes, the most conspicuous of which are the leathery

Physically impressive Large, colorful, horned, or exaggerated or unusually developed legs or mouthparts—species with special structures involved in specific behavior that has evolved through natural selection over millions of years and thus carries interesting underlying genetic information.

Each species is depicted by a razor-sharp life-size photograph and accompanied by a summary of its known distribution, habitat, and feeding habits. The map offers an indication of its global distribution, while the engravings afford readers another point of view. The scientific and common (if any) names are also provided, followed by the species' author and year of description. Concise narratives covering natural history and related species are followed by a brief species diagnosis.

BEETLE COLLECTIONS

Beetle collections carefully assembled over decades by thousands of dedicated professionals and amateurs provide essential data needed to identify and map sensitive species within a historical context. These scientifically valuable collections also serve as important resources for other scientific and educational endeavors, such as providing the specimens photographed for this book.



Among One of the most challenging tasks for this project was to identify and photograph candidate beetles to cover from the number of species, such as the Agreeable Caterpillar Hunter (*Catantops scopularis*) (left) are readily known biologically, others such as the Frog-legged Leaf (right) have notable unusual adaptations yet little is known about their biology/behavior. This book will stimulate the discovery and publication of new knowledge on beetles from around the world.

working in the rapidly growing field of *biomimetics* to develop and design new materials and products ranging from iridescent car paint and reusable adhesive tape to monetary security systems.

The Book of Beetles offers a glimpse of this incredible diversity through an overview of 600 beetle species presented within a framework based on their evolutionary relationships. The diversity of beetles is divided by species into four main chapters of the suborders. Within each section the arrangement is taxonomic, by family and then subfamily, and then within each subfamily in scientific name (genus, species) order.

SELECTION CRITERIA

The species were selected on the basis of several criteria, offering a unique taxonomic survey of the majority of beetle families from around the world: *Scientifically compelling* Subjects of focused scientific research or medicinal use, or inspirations for biomimetic and technological innovation.

Curious natural histories Unusual adaptations, ability to live in extreme habitats, interesting symbioses, or engaging behaviors.

Culturally significant Mythological and religious symbols, uses in folk medicine, or entomophagy.

Economically important Pest species, use as biological control agents, sources of products and services, or with a role in forensic entomology.

Conservation Rare and threatened species.

Among Millions of insects, including beetles, are preserved in natural history museums throughout the world. Specimens are typically dried and pinned, with a label attached to the same side of the specimen. Important information such as the locality where the individual was collected, the date it was collected, and the person who found it. Specimens are then placed in a collection box, such as the one from the Alfred Russel Wallace (1823-1913) collection in the British Museum, London, in order to protect them from museum pests and ensure long-term preservation.



The forewings of beetles are hardened and folded into hard, non-foldable elytra that meet together in a tight line over the abdomen and can completely cover the abdomen and can be folded away by the beetle. In this *Lucanus cervus* individual.

WHAT IS A BEETLE?

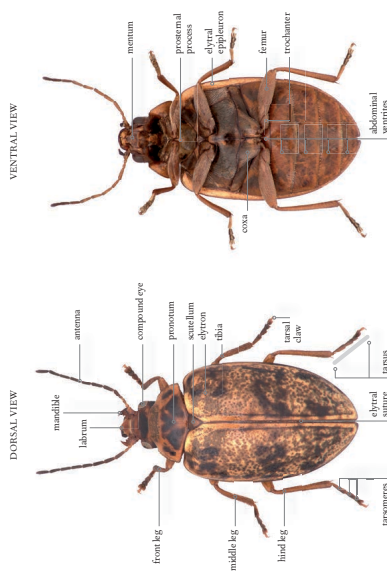
The English word “beetle” comes from the Middle English *betyl* or *betyl* and the Old English *bēta*, all of which mean “little biter.” Other commonly used names, such as “weevil” and “chafer” derived from Old English and Old High German, also relate to biting. Coleoptera, first coined by Aristotle in the fourth century BCE and later adopted as an order of insects by Carl Linnaeus in 1758, is derived from the Greek words *bólēx*, meaning “sheath,” and *pteron*, or “winged,” and was inspired by the tough elytra of beetles.

DISTINGUISHING FEATURES

Among other adaptations, beetles are distinguished from other insects by their chewing mouthparts, the conversion of their forewings into hardened elytra, their hind wings that fold lengthwise and across beneath the elytra, and their *holometabolous* development. Holometabolous insects pass through four very distinct life stages: egg, larva, pupa, and adult. The larvae and adults frequently differ in habits and habitat, functioning in the environment as if they were two separate species.

Beetles, like other insects, crustaceans, arachnids, millipedes, centipedes, and their kin with segmented exoskeletons and jointed appendages (antennae, mouthparts, legs), are classified in the phylum Arthropoda. Light and durable, the beetle exoskeleton is incredibly tough and rigid or characteristically soft and pliable, and provides protection and support. It serves as a platform for important tactile and chemosensory structures externally, while providing an internal framework that supports muscles and organs. The exoskeletal surface is smooth and shiny, or dulled by waxy

WHAT IS A BEETLE?



secretions or microscopic networks of cracks (*alveolae*) resembling that of human skin. The surface is variously fastooned with spines, hairlike setae, or flattened setae called *scales*, and sculpted with tiny bumps (*tubercles*), pit-like *punctures*, *ridges*, grooves (*striae*), or rows of punctures.

COLOR

The colors of beetles are derived either from chemical pigments obtained from their food or structural properties of the outer layers of the exoskeleton. Most beetles are black as a result of melanin deposition during *sclerotization*, the chemical hardening process of the exoskeleton that occurs after emergence from the pupa, or *ecllosion*. Microscopic surface sculpturing also influences beetle colors, as do patterns of setae, scales, or waxy secretions. Black desert darkling beetles (Tenebrionidae) are sometimes partially or completely covered with a white, yellow, or bluish-gray waxy bloom that reflects light and helps to keep the beetle cool.

The brilliant iridescent and metallic colors of beetles are created by multiple reflective layers in the exoskeleton and scales, or a layer of highly complex photonic crystals that reflect light at different wavelengths to create specific metallic colors and shimmering iridescence. These structures are determined genetically, but their final form in individual beetles is determined by conditions experienced during growth and development.

NOTE: The study of a wide range of organisms such as beetles requires close examination of a wide range of species in order to recognize and classify species and larger groups. Consistent terms and consistent terms for these structures is essential to clearly communicate results among specialists and non-specialists.



FAMILY	Scaphidiidae
SUBFAMILY	Aleocharinae
DISTRIBUTION	Nearctic, North America, north of Mexico
HOUSING	Forest
DIET	Formicidae ants
FEEDING HABITS	Adults and larvae are fed by hosts through trophallaxis

NOTE: A specialized host parasite of formicine ants

Adult length: 3.2-3.4 in (8.3-8.6 mm)



XENODUSA REFLEXA
(WALKER, 1863)
XENODUSA REFLEXA

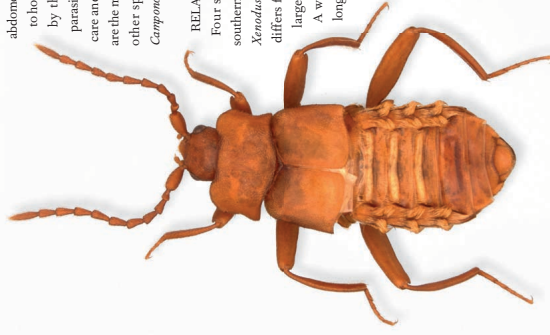
Adults and larvae of *Xenodusa reflexa* are adapted to an obligate association with formicine ants and spend most of their lives in ant nests. Specialized glandular setae on the adult abdomen produce appeasement chemicals that are attractive to host ants. Both adults and larvae are fed by regurgitation by the ants (trophallaxis). They are considered nest parasites because beetle larvae compete with ant larvae for care and feeding by the ants. Ants in the genus *Camponotus* are the most frequently documented hosts for this species, but other species breed in *Formica* nests and overwinter in *Camponotus* nests.

RELATED SPECIES

Four species of the genus *Xenodusa* occur in USA and southern Canada, and an additional species occurs in Mexico. *Xenodusa reflexa* is the most widely distributed species. It differs from species that overlap in ranges by its relatively larger size (½ in, or 4.5 mm) and hairy ventral surface. A widespread eastern species, *X. arva*, is similar, but lacks long hairs on the ventral surface of the body.

Xenodusa reflexa is a comparatively large, monogamy brown member of the rove beetle subfamily Aleocharinae. The abdomen and unusual trichome bundles along the abdomen are characteristic of the genus. Similar glandular trichomes are found on various parts of the body, and presumably also function in producing and distributing glandular appeasement chemicals.

Actual size



FAMILY	Scaphidiidae
SUBFAMILY	Scaphidiinae
DISTRIBUTION	Oceania, Sumatra and Sulawesi, Indonesia, Sarawak, Malaysia
HOUSING	Forest
DIET	Plant litter
FEEDING HABITS	Adults and standing dead trees

NOTE: The neck may be twice the body length.

Adult length: 1.5-1.6 in (13-20 mm)



DIATELLUM WALLACEI
LONG-NECKED SHINING FUNGUS BEETLE

From the head back, this remarkable insect looks like a typical member of the tribe Scaphidiini of the subfamily Scaphidiinae, but the extremely elongate neck in both sexes render it unique among rove beetles. The biology of the species is poorly known, but other members of the subfamily graze on fleshy or encrusting fungi on dead wood or other organic substrates in forest habitats as both adults and larvae. Adults may be encountered on exposed fungal surfaces day or night. They are wary and prone to flight or dropping, requiring a slow, stealthy approach if observations or photographic efforts are to be successful.

RELATED SPECIES

This species is placed in the same tribe as the enormous genus *Scaphidium* based on recent phylogenetic studies and general appearance, exclusive of the oversized neck. It is not likely to be confused with any other animal within its range, but some African brentid weevils have elongate forebodies comprising parts of the thorax and neck that are superficially similar.

The Long-necked Shining Fungus Beetle is unique in possessing an extremely long neck that may be twice the length of the body in some male specimens. The neck is longer on average in males but its length is variable in both sexes.



Actual size



FAMILY	Staphylinidae
SUBFAMILY	Staphylininae
DISTRIBUTION	Australia, New Guinea and extreme northern Australia
HOUSING	Wet forest and rain forest
BIOTOPES	Wet forest and rain forest
WORLDWIDE RARE	Yes
WORLDWIDE RARE	Yes
FEEDING HABITS	Predatory on flies

NOTE: 1. Preys on flies associated with animal carcasses

ADULT LENGTH
14-22 mm
(14-22 mm)



ACTINUS IMPERIALIS
ACTINUS IMPERIALIS
(MAYBEL, 1979)

Adults of this unusually large and gaudily colored rove beetle frequent smelly substrates such as carrion and dung that are likely to attract flies. Adults actively seek out and destroy predators that feed on maggots and opportunistically capture adult flies. The immature stages presumably share the predatory habits of the adults but details of their biology are not well documented. One source mentions an association with cardanum, without giving additional details. Adults exhibit strong sexual dimorphism of the mandibles and head, with males often having larger heads and longer mandibles than females.

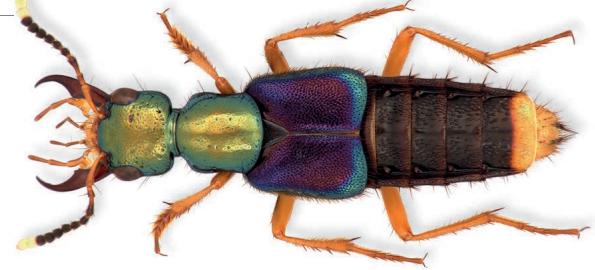
RELATED SPECIES

Two similar species are known from the genus, with *Actinus maculatus* from northern Australia differing mainly in having a less strongly punctured head and pronotum, in addition to other minor differences. In other respects *A. imperialis* superficially resembles other large members of the staphylinid subtribe Philonthina, but few are as brightly colored.



Adult male

Actinus imperialis is unusually large for a rove beetle, with a large head and pronotum and brilliant metallic purple elytra. The abdomen possesses a triangular orange spot near the posterior end. The punctures on the head are diagnostic for this species.



FAMILY	Staphylinidae
SUBFAMILY	Staphylininae
DISTRIBUTION	Neotropical, central South America
HOUSING	Wet forest and rain forest
BIOTOPES	Wet forest and rain forest
WORLDWIDE RARE	Yes
WORLDWIDE RARE	Yes
FEEDING HABITS	Predatory on fleas

NOTE: 1. Preys on small mammals and found in their nests, feeding on fleas

ADULT LENGTH
14-16 mm
(6.5-7.5 mm)



AMBLYOPINODES PICEUS
AMBLYOPINODES PICEUS
(GIBBITHA, 1924)

Members of this species and others in the tribe Staphylinini, subtribe Amblyopinina are unique among rove beetles in their adaptations to life on the bodies and in the nests of small mammals, mainly rodents. Adults of this species grasp the hair and skin between the ears of South American Water Rats (*Neotomys squamipes*) and travel with the animal, and the larvae occur in water rat nests. Early entomologists thought these beetles were parasitic on the animals, but later researchers revealed that they are predators of fleas and serve a beneficial function for the rats by reducing flea populations in their nests. The flattened morphology of the beetle's head is similar to that of other unrelated species that live on mammals.

RELATED SPECIES

At least five other species of the genus occur in the same region. Identification of species is based on examination of internal male sex structures and, to a lesser extent, the arrangement of specialized hairs on the body. Other genera of the tribe are similar and may be distinguished using available keys and by mammal host associations.



Amblyopinodes piceus is an elongate, somewhat flattened rove beetle. The head is particularly unusually flattened and the mandibles are adapted to grasping mammal hairs. Elongate, movable hairs on the underside of the abdomen are unique to the genus.



FAMILY	Scarabaeidae
SUBFAMILY	Scarabaeinae
DISTRIBUTION	Palaearctic, southern and central Europe, North Africa, Middle East, portions of Asia
BIOTOPES	Open, grassy areas, pastures, and cropland
DIET	Plant matter, animal droppings, and carrion
FEEDING HABITS	Adults strain nutrients from dung; larvae are soil dwellers

NOTE | Depicted as a sacred symbol by the ancient Egyptians

APPROXIMATE
SIZE: 10-16 mm
(3.5-40 mm)



SCARABAEUS SACER
SACRED SCARAB BEETLE
LINNAEUS, 1758

Scarabaeus sacer uses its rake-like forelegs to fashion balls from fresh dung, then lays an egg inside the ball before rolling it away and burying it. The grub feeds and completes its development inside the ball. These beetles were revered in ancient Egypt as symbols of Khepri, a manifestation of the sun god Ra, because their dung-rolling activities were considered symbols of the forces that moved the sun, represented by the dung ball, across the sky. The species was also associated with rebirth, and the beetles, along with their likenesses carved in stone, were frequently buried with the dead.

RELATED SPECIES

Scarabaeus contains 139 species in four subgenera that inhabit Afrotropical, Palearctic, and Oriental regions. These small to relatively large dung beetles have four distinct teeth across the clypeus, anterior coxae and femora that are not enlarged, and lack front tarsi. *Scarabaeus sacer* is distinguished from other Palearctic species, in part, by the finely notched posterior pronotal margin, and the features of the middle and hind tibiae.

The Sacred Scarab Beetle has a broad, smooth patch and narrow groove along the posterior margin of the pronotum. The middle tibiae each have two distinct rows of short setae. The tips of the tibiae are flattened and bear a row of small, narrow plate beneath the tarsus. Males have a reddish fringe of setae along the inner margins of their hind tibiae.



Actual size



FAMILY	Scarabaeidae
SUBFAMILY	Scarabaeinae
DISTRIBUTION	Neotropical, northern Argentina, southern Bolivia, western Paraguay
BIOTOPES	Open areas, grasslands, pastures, and cropland
DIET	Plant matter, animal droppings, and carrion
FEEDING HABITS	Adults commonly found in cattle dung

NOTE | This is the most colorful and variable species of *Sulcophaneus*

APPROXIMATE
SIZE: 15-19 mm
(18-28 mm)



SULCOPHANEUS IMPERATOR
SULCOPHANEUS IMPERATOR
GONZALEZ-IBARRA

Sulcophaneus imperator adults reach their peak of activity from January to March. They fly during the day in search of fresh feces of humans and various domesticated animals, and can be common in cattle pastures. They typically work in pairs to dig their nests directly beside or underneath animal droppings. Males push plugs of dung down the tunnel to females that fashion them into brood balls within the brood chamber. Dung burial reduces the loss of pasture due to the growth of rank herbage, releases nutrients back to the soil, and disrupts the life cycles of pest organisms developing in the feces.

RELATED SPECIES

The genus *Sulcophaneus* consists of 14 species, all but four of which occur in South America. Three of the latter species inhabit Central America, including an endemic, while the fourth species is endemic to Jamaica. With its green, gold, and red color forms, *Sulcophaneus imperator* is by far the most colorful and variable species in the genus.



Actual size

Sulcophaneus imperator is a large and bulky beetle that is dull to weakly shining black mixed with brilliant metallic green, gold, and copper colors. Males have a backward-pointing horn on the head, while the females lack this armature. Both males and females have front tarsi.





FAMILY	Tenebrionidae
SUBFAMILY	Stenochilinae
DISTRIBUTION	Endemic to Frigate Island, Seychelles.
APPEARANCE	Dark brown, with a small number of apically rounded and shiny spots on the elytra.
DIETARY HABITS	Unknown, but is more commonly associated with <i>Peromyscus fulvipes</i> (brown rat) on Frigate Island, and with <i>Dioryctes</i> wood and bark borer on the Indian Ocean.
NOTE	Known only on Frigate Island, 40.8 sq miles (2 sq km) island in the Indian Ocean.

ADULT LENGTH
1.5-3.0 in
(2.5-30 mm)



POLYSPILUS HERCULEANUS
**FREGATE ISLAND GIANT
TENEBRIONID BEETLE**
(LAPORTE, 1961)

The Frigate Island Giant Tenebrionid Beetle is one of 12 beetle species ranked Critically Endangered on the International Union for Conservation of Nature's Red List of Threatened Species (see also the Delta Ground Beetle, *Elaphus viridis*, and American Burying Beetle, *Nicrophorus americanus*), and is restricted to Frigate Island in the Seychelles. The accidental introduction of Brown Rats (*Rattus norvegicus*) to the island in 1995 nearly caused the extinction of the flightless beetle, along with the endemic Seychelles Magpie-robin (*Coppychus sechellataram*), before the rodents were eradicated in the early 2000s.

RELATED SPECIES

Flightless tenebrionid genera were previously grouped together on the basis of the absence of flight wings and their sealed elytra. Recent studies on internal organ systems such as the defense glands and the female genital tube now suggest that the older classification did not reflect natural groupings. Although the monotypic genus *Polyphilus* belongs to the diverse subfamily Stenochilinae based on internal characters, its closest relatives have not yet been established.



Actual size

Frigate Island Giant Tenebrionid Beetle adults are pale grey to dark brown and have broadly rounded elytra in dorsal view, which are covered by a small number of apically rounded and shiny spots. The antennae are short, and the elytra have the midline and flight wings are absent. The legs are relatively long and males have curved tibiae.



FAMILY	Tenebrionidae
SUBFAMILY	Stenochilinae
DISTRIBUTION	Neotropical: from Mexico south to Bolivia.
APPEARANCE	Dark brown to black, with a row of three orange-brown spots on the elytra.
DIETARY HABITS	Immature stages probably develop in decaying wood.
NOTE	One of the most diverse and colorful genera in the family Tenebrionidae.

ADULT LENGTH
1.5-3.5 in
(12-47 mm)



STRONGYLUM AURATUM
STRONGYLUM AURATUM
(LAPORTE, 1861)

Based on the abundance of darkling beetles in most dry environments on the planet, many people assume that all species in this family are dark brown to black and are ground-dwellers. This is clearly not the case for species in the tribe Stenochilini, which includes the colorful forest-dwelling genera *Strongylium* and *Cuphotes*. *Strongylium* is certainly one of the most species-rich genera in the family, with nearly 1,000 described species and many more undescribed, especially in tropical areas. *Strongylium auratum* is relatively abundant in Neotropical forests and can be encountered at elevations of 5,000 ft (1,500 m) and more.

RELATED SPECIES

The overwhelming diversity in *Strongylium*, coupled with an almost complete lack of comparative studies of its species, is a major impediment to taxonomic and biological studies. New species continue to be described every year, however, primarily based on differences in color patterns, sculpture of their cuticle, and sexual characters. Although most species are elongated and have well-developed flight wings, such as *S. auratum*, others are flightless and more convex.



Actual size

Strongylium auratum is an elongated beetle with bright metallic green to reddish-purple reflections on the dorsal surface and legs. Each elytron has nine distinct rows of transverse punctures. Antennae are rather long, reaching slightly wider at the base and are speckled with small circular while sensory structures. The last two abdominal ventrites are contrasting yellow-reddish in color.



FAMILY	Atelidae
SUBFAMILY	Rhyssiniinae
DISTRIBUTION	Palaearctic: China, Japan, Korea, Mongolia, Russia
HOUSING	Leaf
DIET	Leaf, twigs, vegetation
FEEDING HABITS	Host plants include species of <i>Malus</i> , <i>Pyrus</i> , <i>Sorbus</i> , and <i>Papula</i>

NOTE: 1. The males are known for their wrestling behavior.

ADULT LENGTH
5.5–5.8 in
(6.5–8 mm)



BYCTISCUS RUGOSUS
BYCTISCUS RUGOSUS
(G. BEBLER, 1892)

Ritualized contests and aggressive fighting behavior are known to occur between males of species in this genus. The males extend their forelegs outward while rearing up on their mid and hind legs, grabbing each other with their forelegs and touching their rostra. The elongate tarsal setae may help enhance visual displays of this aggression. Females of the charismatic *Byctiscus rugosus* roll leaves into complicated cylindrical tubes for the reception of the egg. The larva feeds within the tube, where it completes its development.

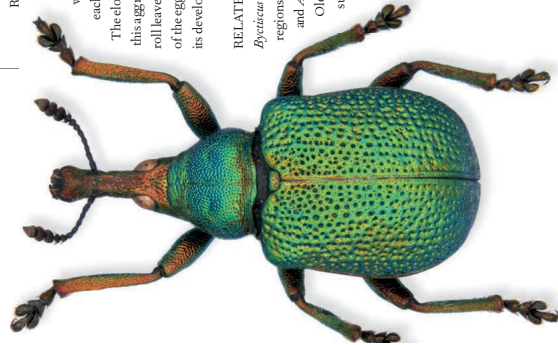
RELATED SPECIES

Byctiscus includes 27 species from the Palaearctic and Oriental regions. Species are classified into two subgenera: *Byctiscus* and *Aspidobyctiscus*. The tribe Byctiscini has an exclusively Old World distribution and includes 12 genera in two subtribes. The related Pear Leaf-roller Weevil (*B. Attalus*) is known to cause damage to grapevines, pears, and other broadleaved trees and shrubs.



Actual size

Byctiscus rugosus is a bright metallic, shiny green weevil with reddish reflections on the head and legs. The elytra are covered with prominently punctate striae. The pronotum is narrower than the base of the elytra, which are quadrate. The rostrum is elongate and curved, with the apex ending near the apex of the rostrum; the last three antennomeres are almost twice as wide as the preceding ones.



FAMILY	Atelidae
SUBFAMILY	Rhyssiniinae
DISTRIBUTION	Neotropical and Neotropical: USA (Arizona, New Mexico, Texas), Mexico
HOUSING	Leaf
DIET	Oak leaves
FEEDING HABITS	Rolls leaf, leaf litter
FEEDING HABITS	Epidermal inward (Quercus spp.)

NOTE: 1. The larvae are leaf-miners.

ADULT LENGTH
5 in
(5.7–6.1 mm)



EUGNAMPTUS NIGRIIVENTRIS
EUGNAMPTUS NIGRIIVENTRIS
(OSAMPTON, 1892)

This species exhibits maternal care by individually placing each egg between the epidermal layers of a dead leaf of the host tree (oaks, *Quercus* spp.). In spring, a female uses her mandibles to cut an oviposition scar on a leaf that dropped to the ground the previous fall. She then oviposits a single egg into a cavity she created between the upper and lower epidermis and seals the epidermal tissue by pinching with her mandibles. The larva completes its entire development by feeding on the epidermal tissues of the dead leaf. Pupation takes place in the soil and adults emerge the following spring.

RELATED SPECIES

There are approximately 100 species included in *Eugnamptus*. *Eugnamptus* is similar to *Hemilyptus*, *Actinorhynchites*, and *Esodius*, but can be distinguished by characters of the rostrum, distance between the eyes, length of basitarsal segments, prominence of the first abdominal suture, extent of dorsal punctation, and elytral length as it relates to the pygidium.



Actual size

Eugnamptus nigriiventris is clothed in fine, erect setae and has a reddish head, pronotum, and legs, and bluish-green elytra. In the male, the length of the rostrum is shorter than the length of the head and the distance between the eyes. The length of the rostrum is longer than the head, and the antennae are inserted near the middle. The head and pronotum are narrower than the base of the elytra.





FAMILY	Brentidae
SUBFAMILY	Brentinae
DISTRIBUTION	Palaearctic: southern Europe, Algeria, Morocco (at least Syria, Iran, Russia)
BIOTOPES	Temperate humid forests containing ground-dwelling ants (Lasius spp., Myrmica spp.)
NEOTROPICALS	Central America, Central America, Panama, Guyana, Suriname, and Venezuela
AFROTROPICALS	Democratic Republic of Congo
FEEDING HABITS	Univorous

NOTE: Myrmecophilous; has an unusual head morphology.

ADULT HEAD LENGTH
M = 4.5 mm
(♀ = 3.8 mm)



AMORPHOCEPHALA CORONATA
**AMORPHOCEPHALA
CORONATA**
(GEMMELIN, 1817)

This species is a facultative ant associate, usually of *Camponotus* but tolerated, after minor hostility, by other ant groups. When introduced to a *Camponotus* colony, these brentids face aggression by the workers until the ants discover and begin to lick glandular secretions from pubescent areas on the beetle's head. Apparently, *Amorphocephala coronata* exhibits a pseudoaltruistic behavior, whereby it regurgitates to the colony part of the food received from host worker ants. Ants have been observed tending to these brentids and actively trying to retain them in their nest. The species is gregarious, with many individuals found together.

RELATED SPECIES

This genus belongs in the tribe Eremoxenini (which is sometimes treated as the subtribe Eremoxenina within the Brentini), an almost exclusively myrmecophilous group. Other genera in this group include *Cobaloccephalus*, *Eremoxenus*, and *Symantophocetus*. *Amorphocephala* contains 20 species from the Palearctic and Afrotropical regions. The species can be separated mainly by characteristics of the head, prothorax and antennae.

Amorphocephala coronata is a shiny, reddish-brown myrmecophile that lives in the soil. Its outstanding feature is its large, complex head, with the hind rostrum (just below the frons) deeply concave and bearing bushes of stiff setae. The head is characterized by its long, slender, sickle-shaped rostrum with large sickle-shaped mandibles, and the females having elongate, cylindrical mandibles.



Actual size



FAMILY	Brentidae
SUBFAMILY	Brentinae
DISTRIBUTION	Neartic and Neotropical: USA (Florida to Paraguay)
BIOTOPES	Temperate and subtropical forests
NEOTROPICALS	Neotropical: Colombia, Venezuela, Brazil
FEEDING HABITS	Adults feed on sap or soil flows for nectar; larvae bore into dead wood and possibly feed on sap or fungal mycelia

NOTE: The species shows sexual dimorphism and is the largest in the North North America.

ADULT HEAD LENGTH
M = 4.5 mm
(♀ = 3.8 mm)



BRENTUS ANCHORAGE
BRENTUS ANCHORAGE
(LINNAEUS, 1758)

Most brentid species exhibit sexual dimorphism and *Brentus anchorage* is no exception: Some individuals may be up to five times larger than the smallest. Both sexes engage in combat, and those with longer bodies and rostra, which are used as weapons, are more successful in securing a mate. There is an overall preference by both sexes for larger mates, thus skewing populations toward larger-bodied individuals. Females chew holes into the decaying wood of primarily Gumbo-limbo (*Bursera simaruba*) trees to oviposit. Adults can be readily found in large numbers under the bark of dead logs.

RELATED SPECIES

Brentus and *Cephalobatus* are currently classified in the Neotropical tribe Brentini. Thirty-seven species are included in *Brentus*. Of these, *B. cylindrica* has been reported from Polynesia (Marquesas, Tahiti), where it is possible that it was introduced. The first brentid species described by Linnaeus in 1758 were *B. anchorage* and *B. dispar*, originally under the genus *Curetilo*.

Brentus anchorage is a greatly elongated black beetle with a long, slender rostrum. It is one of the largest weevil species in North America. Makes a strikingly longer, with the long, slender prothorax narrowing in the middle and broadening basally. The rostrum is sickle-shaped as the prothorax. Females have a sickle-shaped prothorax, broadening basally, and a rostrum that is about half the size of the prothorax.



Actual size

