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The **cicadas** ([Template:IPAc-en](/wiki/Template:IPAc-en) or [Template:IPAc-en](/wiki/Template:IPAc-en)) are a superfamily, the **Cicadoidea**, of [insects](/wiki/Insect) in the order [Hemiptera](/wiki/Hemiptera) (true bugs). They are in the suborder [Auchenorrhyncha](/wiki/Auchenorrhyncha),[Template:Efn](/wiki/Template:Efn) along with smaller jumping bugs such as [leafhoppers](/wiki/Leafhopper) and [froghoppers](/wiki/Froghopper). It is divided into the [Tettigarctidae](/wiki/Tettigarctidae), with two species in Australia, and Cicadidae, with more than 1,300 species [described](/wiki/Taxonomy_(biology)#Taxonomic_descriptions) from around the world; many undescribed species remain.

Cicadas have prominent eyes set wide apart, short antennae, and membranous front wings. They have an exceptionally loud song, produced not by [stridulation](/wiki/Stridulation), but by vibrating drumlike [tymbals](/wiki/Tymbal) rapidly. The earliest known fossil Cicadomorpha appeared in the [Upper Permian](/wiki/Upper_Permian) period; extant species occur all around the world in temperate to tropical climates. They typically live in trees, feeding on sap, and laying their eggs in a slit in the bark. Most cicadas are [cryptic](/wiki/Crypsis), singing at night to avoid predators. The [periodic cicadas](/wiki/Periodic_cicadas) spend most of their lives as underground nymphs, emerging only after 13 or 17 years, most likely to reduce losses by [satiating their predators](/wiki/Predator_satiation).

Cicadas have been featured in literature since the time of Homer's [*Iliad*](/wiki/Iliad), and as motifs in art from the Chinese [Shang dynasty](/wiki/Shang_dynasty). They have been used in myths and folklore to represent carefree living and immortality. Cicadas are eaten in various countries, including China, where the nymphs are served deep-fried in [Shandong cuisine](/wiki/Shandong_cuisine).

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## Etymology[[edit](/index.php?title=(none)&action=edit&section=1)]

[Template:Wiktionary](/wiki/Template:Wiktionary) The name is a direct derivation of the [Latin](/wiki/Latin) *cicada*, meaning "tree cricket". American English of central Appalachia retains the name "jarfly".[[1]](#cite_note-1) In ancient Greek, it was called a *tettix*, and in modern Greek τζιτζίκας, *tzitzikas*—both names being [onomatopoeic](/wiki/Onomatopoeia).[Template:Efn](/wiki/Template:Efn)

## Taxonomy and diversity[[edit](/index.php?title=(none)&action=edit&section=2)]

Cicadas are arranged into two families: the [Tettigarctidae](/wiki/Tettigarctidae) and Cicadidae. The two [extant](/wiki/Extant_taxon) species of Tettigarctidae include one in southern Australia and the other in [Tasmania](/wiki/Tasmania). The family Cicadidae is subdivided into the subfamilies [Cicadinae](/wiki/Cicadinae), [Tettigadinae](/wiki/Tettigadinae), and [Cicadettinae](/wiki/Cicadettinae);[[2]](#cite_note-2) they are found on all continents except Antarctica. Some previous works also included a family-level taxon called the [Tibiceninae](/wiki/Tibiceninae). The largest species is the Malaysian emperor cicada [*Megapomponia imperatoria*](/wiki/Megapomponia_imperatoria); its wingspan is up to about [Template:Convert](/wiki/Template:Convert).[[3]](#cite_note-3) They are also notable for the great length of time some species take to mature.[[4]](#cite_note-4) [thumb|left|A](/wiki/File:Snodgrass_Magicicada_septendecim.jpg) [17-year cicada](/wiki/17-year_cicada), *Magicicada*, [Robert Evans Snodgrass](/wiki/Robert_Evans_Snodgrass), 1930[[5]](#cite_note-5)

At least 1300 cicada species are distributed worldwide with the majority being in the tropics. Most genera are restricted to a single biogeographical region and many species have a very limited range. This high degree of [endemism](/wiki/Endemism) has been used to study the biogeography of complex island groups such as in Indonesia and the Orient.<ref name=Resh>[Template:Cite book](/wiki/Template:Cite_book)</ref> There are about 200 described species in Australia and New Zealand,[Template:Efn](/wiki/Template:Efn) around 150 in South Africa, over 170 in America north of Mexico,[[6]](#cite_note-6) at least 800 in Latin America,[[7]](#cite_note-7) and over 200 in Southeast Asia and the Western Pacific.[[8]](#cite_note-8) About 100 species occur in the [Palaearctic](/wiki/Palearctic_ecozone). A few species are found in southern Europe,[[4]](#cite_note-4) and a single species is in England, the [New Forest cicada](/wiki/New_Forest_cicada), *Melampsalta montana*, which also occurs in continental Europe.[[9]](#cite_note-9) Most of the North American species are in the genus [*Neotibicen*](/wiki/Neotibicen): the annual or jar fly or [dog-day](/wiki/Dog_Days) cicadas (so named because they emerge in late July and August).[[10]](#cite_note-10) The best-known North American genus, however, is [*Magicicada*](/wiki/Magicicada). These [periodical cicadas](/wiki/Periodical_cicadas) have an extremely long lifecycle of 13 or 17 years, suddenly and briefly [emerging in large numbers](/wiki/Predator_satiation).[[10]](#cite_note-10) [Australian cicadas](/wiki/List_of_cicadas_of_Australia) are found on tropical islands and cold coastal beaches around Tasmania, in tropical wetlands, high and low deserts, alpine areas of [New South Wales](/wiki/New_South_Wales) and [Victoria](/wiki/Victoria_(Australia)), large cities like [Sydney](/wiki/Sydney), [Melbourne](/wiki/Melbourne), and [Brisbane](/wiki/Brisbane), and Tasmanian highlands and snowfields. Many of them go by common names such as cherry nose, brown baker, [red eye](/wiki/Psaltoda_moerens), greengrocer, yellow Monday, whisky drinker, [double drummer](/wiki/Double_drummer), and black prince. The Australian greengrocer, [*Cyclochila australasiae*](/wiki/Cyclochila_australasiae), is among the loudest insects in the world.[[11]](#cite_note-11) Forty-two species from five genera populate New Zealand, ranging from sea level to mountain tops, and all are [endemic](/wiki/Endemism) to New Zealand and the surrounding islands ([Norfolk Island](/wiki/Norfolk_Island), [New Caledonia](/wiki/New_Caledonia)).[[12]](#cite_note-12) [thumb|](/wiki/File:Mesogereon_superbum_2.jpg)[Mesozoic](/wiki/Mesozoic) fossil forewing of [*Mesogereon superbum*](/wiki/Mesogereon_superbum), Australia

### Palaeontology[[edit](/index.php?title=(none)&action=edit&section=3)]

Fossil Cicadomorpha first appeared in the [Upper Permian](/wiki/Upper_Permian).[[13]](#cite_note-13) The superfamily [Palaeontinoidea](/wiki/Palaeontinoidea) contains three families. The Upper Permian [Dunstaniidae](/wiki/Dunstaniidae) are found in Australia and South Africa, and also in younger rocks from China. The [Upper Triassic](/wiki/Upper_Triassic) [Mesogereonidae](/wiki/Mesogereonidae) are found in Australia and South Africa.<ref name=Wang>[Template:Cite journal](/wiki/Template:Cite_journal)</ref>

[thumb|The giant cicada](/wiki/File:Prolystra_lithographica.JPG) [*Prolystra lithographica*](/wiki/Prolystra_lithographica) from Germany [Jurassic](/wiki/Jurassic), about 150–145 Mya The [Palaeontinidae](/wiki/Palaeontinidae) or "giant cicadas" come from the [Jurassic](/wiki/Jurassic) and [Upper Cretaceous](/wiki/Upper_Cretaceous) of Eurasia and South America.<ref name=Wang/> The first of these was a forewing discovered in the [Taynton Limestone Formation](/wiki/Taynton_Limestone_Formation) of Oxfordshire, England; it was initially described as a butterfly in 1873, before being recognised as a cicada and renamed [*Palaeontina oolitica*](/wiki/Palaeontina_oolitica).[[14]](#cite_note-14)

## Biology[[edit](/index.php?title=(none)&action=edit&section=4)]

### Description[[edit](/index.php?title=(none)&action=edit&section=5)]

[upright|left|thumb|A Japanese Minminzemi (](/wiki/File:Gratopsaltria_Nigrofuscata_Young.jpg)[*Oncotympana maculaticollis*](/wiki/Oncotympana_maculaticollis))

Cicadas are large insects made conspicuous by the courtship calls of the males. They are characterised by having three joints in their [tarsi](/wiki/Arthropod_leg#Tarsus), and having small [antennae](/wiki/Antenna_(biology)) with conical bases and three to six segments, including a [seta](/wiki/Seta) at the tip.<ref name=Cuvier/> The [Auchenorrhyncha](/wiki/Auchenorrhyncha) differ from other hemipterans by having a [rostrum](/wiki/Rostrum_(anatomy)) that arises from the posteroventral part of the head, complex sound-producing membranes, and a mechanism for linking the wings which involves a down-rolled edging on the rear of the forewing and an upwardly-protruding flap on the hind wing. Cicadas lack the ability to jump as exhibited by other members of the Auchenorrhyncha. Another defining characteristic is the adaptations of the forelimbs of nymphs for underground life. The relict family Tettigarctidae differ from the Cicadidae in having the [prothorax](/wiki/Prothorax) extending as far as the [scutellum](/wiki/Scutellum_(insect_anatomy)), and by lacking the tympanal apparatus.<ref name=Resh/>

The adult insect, known as an [imago](/wiki/Imago), is [Template:Convert](/wiki/Template:Convert) in total length in most species, although the largest, the [empress cicada](/wiki/Empress_cicada) (*Megapomponia imperatoria*), has a head-body length of about [Template:Convert](/wiki/Template:Convert), and its wingspan is [Template:Convert](/wiki/Template:Convert).[[4]](#cite_note-4)[[15]](#cite_note-15) Cicadas have prominent compound eyes set wide apart on the sides of the head. The short antennae protrude between the eyes or in front of them. They also have three small [ocelli](/wiki/Simple_eyes_in_arthropods) located on the top of the head in a triangle between the two large eyes, and this distinguishes cicadas from other members of the [Hemiptera](/wiki/Hemiptera). The mouthparts form a long sharp [rostrum](/wiki/Rostrum_(anatomy)) which they insert into the plant to feed.<ref name=Capinera/> The [post-clypeus](/wiki/Clypeus) is a large, nose-like structure that lies between the eyes and makes up most of the front of the head: it contains the pumping musculature.[[16]](#cite_note-16) The thorax has three segments and houses the powerful wing muscles. They have two pairs of membranous wings that may be [hyaline](/wiki/Hyaline), cloudy or pigmented. The wing venation varies between species and may help in identification. The middle thoracic segment has an [operculum](/wiki/Operculum_(animal)) on the underside which may extend posteriorly and obscure parts of the abdomen. The abdomen is segmented, with the hindermost segments housing the reproductive organs, and terminates in females with a large, saw-edged [ovipositor](/wiki/Ovipositor). In males, the abdomen is largely hollow and used as a resonating chamber.<ref name=Capinera/>

The surface of the fore-wing is [super-hydrophobic](/wiki/Superhydrophobic_coating); it is covered with minute waxy cones, blunt spikes which create a water-repellent film. Rain rolls across the surface, removing dirt in the process. In the absence of rain, [dew](/wiki/Dew) condenses on the wings. When the droplets coalesce, they leap several millimetres into the air, which also serves to clean the wings.[[17]](#cite_note-17) It has been found that [bacteria](/wiki/Bacteria) landing on the wing surface are not repelled, rather their membranes are torn apart by the nanoscale-sized spikes, making the wing surface the first-known [biomaterials](/wiki/Biomaterial) that can kill bacteria.[[18]](#cite_note-18)

### Temperature regulation[[edit](/index.php?title=(none)&action=edit&section=6)]

Desert cicadas such as [*Diceroprocta apache*](/wiki/Diceroprocta_apache) are unusual among insects in controlling their temperature by [evaporative cooling](/wiki/Evaporative_cooling), analogous to [sweating](/wiki/Sweating) in mammals. When their temperature rises above about 39 °C, they suck excess sap from the food plants and extrude the excess water through pores in the [tergum](/wiki/Tergum) at a modest cost in energy. Such a rapid loss of water can be sustained only by feeding on water rich [xylem sap](/wiki/Xylem_sap). At lower temperatures, feeding cicadas would normally need to excrete the excess water. By evaporative cooling, desert cicadas can reduce their bodily temperature by some 5 °C.[[19]](#cite_note-19)[[20]](#cite_note-20) Some non-desert cicada species such as *Magicicada tredecem* also cool themselves evaporatively, but less dramatically.[[21]](#cite_note-21) Conversely, many other cicadas can voluntarily raise their body temperatures as much as [Template:Convert](/wiki/Template:Convert) above ambient temperature.[[22]](#cite_note-22)

### Song[[edit](/index.php?title=(none)&action=edit&section=7)]

[[File:EB1911 cicada tymbal structure.png|thumb|upright=1.1|left|Cicada sound-producing organs and musculature.  
a, Body of male from below, showing cover-plates;  
b, From above, showing drumlike [tymbals](/wiki/Tymbal);  
c, Section, [muscles](/wiki/Muscle) that vibrate tymbals;  
d, A tymbal at rest;  
e, Thrown into vibration, as when singing]] The "singing" of male cicadas is not [stridulation](/wiki/Stridulation) such as many familiar species of insects produce—for example [crickets](/wiki/Cricket_(insect)). Instead, male cicadas have a noisemaker called a [tymbal](/wiki/Tymbal) below each side of the [anterior](/wiki/Anatomical_terms_of_location) [abdominal](/wiki/Abdomen) region. The tymbals are structures of the [exoskeleton](/wiki/Exoskeleton) formed into complex membranes with thin, membranous portions and thickened ribs. Contraction of internal muscles buckles the tymbals inwards, thereby producing a click; on relaxation of the muscles, the tymbals return to their original position, producing another click.<ref name=Cuvier>[Template:Cite book](/wiki/Template:Cite_book)</ref> The male abdomen is largely hollow, and acts as a [sound box](/wiki/Sound_box). By rapidly vibrating these membranes, a cicada combines the clicks into apparently continuous notes, and enlarged chambers derived from the [tracheae](/wiki/Invertebrate_trachea) serve as [resonance chambers](/wiki/Resonance_chamber) with which it amplifies the sound. The cicada also modulates the song by positioning its abdomen toward or away from the substrate. Partly by the pattern in which it combines the clicks, each species produces its own distinctive mating songs and acoustic signals, ensuring that the song attracts only appropriate mates.[[10]](#cite_note-10) [Template:Listen](/wiki/Template:Listen)

Average temperature of the natural habitat for the South American species *Fidicina rana* is approximately [Template:Convert](/wiki/Template:Convert). During sound production, the temperature of the tymbal muscles was found to be significantly higher.[[23]](#cite_note-23) Many cicadas sing most actively during the hottest hours of a summer day; roughly a [24-hour cycle](/wiki/Circadian_rhythm).[[24]](#cite_note-24) Although only males produce the cicadas' distinctive sound, both sexes have membraneous structures called [tympana](/wiki/Tympanal_organ) by which they detect sounds; the equivalent of having ears. Males disable their own tympana while calling, thereby preventing damage to their hearing;[[25]](#cite_note-25) a necessity partly because some cicadas produce sounds up to 120 [dB (SPL)](/wiki/Sound#Sound_pressure_level)[[25]](#cite_note-25) which is among the loudest of all insect-produced sounds.[Template:Sfn](/wiki/Template:Sfn) The song is loud enough to cause permanent [hearing loss](/wiki/Hearing_loss) in humans should the cicada sing just outside the listener's ear. In contrast, some small species have songs so high in pitch that the noise is inaudible to humans.[[26]](#cite_note-26) For the human ear, it is often difficult to tell precisely where a cicada song originates. The pitch is nearly constant, the sound is continuous to the human ear, and cicadas sing in scattered groups. In addition to the mating song, many species have a distinct distress call, usually a broken and erratic sound emitted by the insect when seized or panicked. Some species also have courtship songs, generally quieter, and produced after a female has been drawn to the calling song. Males also produce *encounter calls*, whether in courtship or to maintain personal space within choruses.[[27]](#cite_note-27) The song of cicadas is considered by entomologists to be unique to a given species, and a number of resources exist to collect and analyse cicada sounds.[[28]](#cite_note-28)

### Life cycle[[edit](/index.php?title=(none)&action=edit&section=8)]

[thumb|left|Adult cicada emerging from exuvia](/wiki/File:Adult_Cicada_Emerging_from_Nymph_Skin.jpg)

In some species of cicada, the males remain in one location and call to attract females. Sometimes several males aggregate and call in chorus. In other species, the males move from place to place, usually with quieter calls while searching for females. The Tettigarctidae differ from other cicadas in producing vibrations in the [substrate](/wiki/Substrate_(biology)) rather than audible sounds.<ref name=Resh/> After mating, the female cuts slits into the bark of a twig where she deposits her eggs.<ref name=Resh/>

When the eggs hatch, the newly hatched [nymphs](/wiki/Nymph_(biology)) drop to the ground and burrow. Cicadas live underground as [nymphs](/wiki/Nymph_(biology)) for most of their lives at depths down to about [Template:Convert](/wiki/Template:Convert). Nymphs have strong front legs for digging and excavating chambers in close proximity to roots where they feed on [xylem](/wiki/Xylem) sap. In the process, their bodies and interior of the burrow become coated in anal fluids. In wet habitats, larger species construct mud towers above ground in order to aerate their burrows. In the final nymphal [instar](/wiki/Instar), they construct an exit tunnel to the surface and emerge.<ref name=Resh/> They then [moult](/wiki/Ecdysis) (shed their skins) on a nearby plant for the last time, and emerge as adults. The [exuviae](/wiki/Exuvia) or abandoned exoskeletons remain, still clinging to the bark of the tree.<ref name=Grimaldi>[Template:Cite book](/wiki/Template:Cite_book)</ref>

[thumb|Cicada](/wiki/File:Cicada_skin.jpg) [exuvia](/wiki/Exuvia) Most cicadas go through a life cycle that lasts from two to five years. Some species have much longer life cycles, such as the North American genus, [*Magicicada*](/wiki/Magicicada), which has a number of distinct "[broods](/wiki/Periodical_cicadas)" that go through either a 17-year or, in some parts of the world, a 13-year life cycle. The long life cycles may have developed as a response to [predators](/wiki/Predation), such as the [cicada killer wasp](/wiki/Sphecius) and [praying mantis](/wiki/Mantis).[[29]](#cite_note-29)[[30]](#cite_note-30)[[31]](#cite_note-31) A specialist predator with a shorter life cycle of at least two years could not reliably prey upon the cicadas.[[32]](#cite_note-32)

### Diet[[edit](/index.php?title=(none)&action=edit&section=9)]

Cicada nymphs suck sap from the [xylem](/wiki/Xylem) of various species of trees, including [oak](/wiki/Oak), [cypress](/wiki/Cypress), [willow](/wiki/Willow), [ash](/wiki/Fraxinus), and [maple](/wiki/Maple). While it is common folklore that adults do not eat, they actually do drink plant sap utilizing their sucking mouthparts.[[33]](#cite_note-33)

### Locomotion[[edit](/index.php?title=(none)&action=edit&section=10)]

[Template:Further](/wiki/Template:Further)

Cicadas, like other [Auchenorrhyncha](/wiki/Auchenorrhyncha), are adapted for jumping (saltation),[[34]](#cite_note-34) as well as the usual insect modes of [locomotion](/wiki/Animal_locomotion), walking and flight. However, they do not walk or run well, and take to the wing to travel distances greater than a few centimetres.<ref name=Resh/> Cicadas can extend their hind legs in under a millisecond to execute a jump, implying elastic storage of energy for sudden release.[[35]](#cite_note-35)

## Predators, parasites and pathogens[[edit](/index.php?title=(none)&action=edit&section=11)]

[thumb|upright|Eastern cicada killer wasp (](/wiki/File:Eastern_cicada_killer_wasp_(Sphecius_speciosus)_with_Cicada.jpg)[*Sphecius speciosus*](/wiki/Sphecius_speciosus)) with cicada prey. United States Cicadas are commonly eaten by birds and sometimes by squirrels,[[36]](#cite_note-36) as well as bats, wasps, [mantises](/wiki/Mantis), [spiders](/wiki/Spider) and [robber flies](/wiki/Asilidae). In times of mass emergence of cicadas, various amphibians, fish, reptiles, mammals and birds change their foraging habits so as to benefit from the glut. Newly hatched nymphs may be eaten by ants, and nymphs living underground are preyed on by burrowing mammals like moles.<ref name=Capinera>[Template:Cite book](/wiki/Template:Cite_book)</ref> In Australia, cicadas are preyed on by the Australian cicada killer wasp ([*Exeirus lateritius*](/wiki/Exeirus_lateritius)), which stings and stuns cicadas high in the trees, making them drop to the ground where the cicada-hunter mounts and carries them, pushing with its hind legs, sometimes over a distance of a hundred meters, until they can be shoved down into its burrow, where the numb cicada is placed onto one of many shelves in a "[catacomb](/wiki/Catacomb)", to form the food-stock for the wasp grub that grows out of the egg deposited there.[[37]](#cite_note-37) Several fungal diseases infect and kill adult cicadas while another [entomopathogenic fungus](/wiki/Entomopathogenic_fungus), [*Cordyceps*](/wiki/Cordyceps) spp., attacks nymphs.<ref name=Capinera/> [*Massospora cicadina*](/wiki/Massospora_cicadina) specifically attacks the adults of periodical cicadas, the spores remaining dormant in the soil between outbreaks.[[38]](#cite_note-38)

### Antipredator adaptations[[edit](/index.php?title=(none)&action=edit&section=12)]

[Template:Further](/wiki/Template:Further) [thumb|left|Cicadas evade predators with strategies such as](/wiki/File:Unidentified_Cicada_(Cicadidae)_(8440634679).jpg) [camouflage](/wiki/Camouflage).

Cicadas use a variety of strategies to evade predators. Large cicadas can fly rapidly to escape if disturbed.<ref name=WashPost/> Many are extremely well [camouflaged](/wiki/Camouflage)<ref name=WashPost/>[[39]](#cite_note-39) to evade predators such as birds that hunt by sight. As well as being coloured like tree bark, they are [disruptively patterned](/wiki/Disruptively_patterned) to break up their outlines;[[40]](#cite_note-40) their partly transparent wings are held over the body and pressed close to the substrate. The wings are [antireflective](/wiki/Antireflective), avoiding the typical shine of insect cuticle which would break the cicada's camouflage.[[41]](#cite_note-41) The [periodical cicadas](/wiki/Periodical_cicada) ([*Magicicada*](/wiki/Magicicada)) make use of [predator satiation](/wiki/Predator_satiation): they emerge, all at once, at long intervals of 13 or 17 years; their juveniles are probably the longest-lived of all insect development stages.<ref name=WilliamsSimon/> Since the number of cicadas in any given area exceeds the amount predators can eat, all available predators are satiated, and the remaining cicadas can breed in peace.<ref name=WashPost>[Template:Cite web](/wiki/Template:Cite_web)</ref><ref name=WilliamsSimon/>

[thumb|The day-flying cicada](/wiki/File:Cicadidae_-_Huechys_sanguinea.JPG) [*Huechys sanguinea*](/wiki/Huechys_sanguinea) warns off predators with its [aposematic](/wiki/Aposematic) red and black coloration. Southeast Asia Some cicadas such as [*Hemisciera maculipennis*](/wiki/Hemisciera_maculipennis) display bright [deimatic](/wiki/Deimatic) flash coloration on their hindwings when threatened; the sudden contrast helps to startle predators, giving the cicadas time to escape.[[42]](#cite_note-42) The majority of cicadas are [nocturnal](/wiki/Nocturnality) and rely on camouflage when at rest, but some species are [aposematic](/wiki/Aposematic); the Malaysian [*Huechys sanguinea*](/wiki/Huechys_sanguinea) has conspicuous red and black warning coloration, is diurnal, and boldly flies about in full view of possible predators.[[43]](#cite_note-43) Predators such as the [sarcophagid](/wiki/Sarcophagidae) fly [*Emblemasoma*](/wiki/Emblemasoma) hunt cicadas by sound, being attracted to their song.[[44]](#cite_note-44) Singing males soften their song so that the attention of the listener gets distracted to neighbouring louder singers, or cease singing altogether as a predator approaches. It has been asserted that loud cicada song, especially in chorus, repels predators, but observations of predator responses refute the claim.<ref name=WilliamsSimon>[Template:Cite journal](/wiki/Template:Cite_journal)</ref>

## In human culture[[edit](/index.php?title=(none)&action=edit&section=13)]

[Template:Further](/wiki/Template:Further)

### In art and literature[[edit](/index.php?title=(none)&action=edit&section=14)]

[thumb|Silver casket with writing utensils, made by the](/wiki/File:Schreibzeug_(Nürnberg).jpg) [Nuremberg](/wiki/Nuremberg) goldsmith [Wenzel Jamnitzer](/wiki/Wenzel_Jamnitzer) (1507/08–1585). Silver cicada is at lower left. [thumb|Japanese](/wiki/File:Japanese_snuff_bottle_in_the_form_of_a_cicada_01A.jpg) [snuff](/wiki/Snuff_(tobacco)) bottle in the form of a cicada, c. 1900

Cicadas have been featured in literature since the time of [Homer's](/wiki/Homer) [*Iliad*](/wiki/Iliad), and as motifs in decorative art from the Chinese [Shang dynasty](/wiki/Shang_dynasty) (1766–1122 B.C.).[Template:Efn](/wiki/Template:Efn) They are described by [Aristotle](/wiki/Aristotle) in his [*History of Animals*](/wiki/History_of_Animals) and by [Pliny the Elder](/wiki/Pliny_the_Elder) in his [*Natural History*](/wiki/Natural_History_(Pliny)); their mechanism of sound production is mentioned by [Hesiod](/wiki/Hesiod) in his poem [*Works and Days*](/wiki/Works_and_Days) "when the Skolymus flowers, and the tuneful *Tettix* sitting on his tree in the weary summer season pours forth from under his wings his shrill song".[[45]](#cite_note-45) In the classic 14th-century Chinese novel [*Romance of the Three Kingdoms*](/wiki/Romance_of_the_Three_Kingdoms), [Diaochan](/wiki/Diaochan) took her name from the sable (*diāo*) tails and jade decorations in the shape of cicadas (*chán*), which adorned the hats of high-level officials. In Latin America, the [mariachi](/wiki/Mariachi) song "[*Template:Lang*](/wiki/Template:Lang)" ("The Cicada") romanticises the insect as a creature that sings until it dies.[[46]](#cite_note-46) In the Japanese novel [*The Tale of Genji*](/wiki/The_Tale_of_Genji), the title character poetically likens one of his many love interests to a cicada for the way she delicately sheds her scarf the way a cicada sheds its shell when molting. A cicada exuviae plays a role in the [manga](/wiki/Manga) [*Winter Cicada*](/wiki/Winter_Cicada). Cicadas are a frequent subject of [haiku](/wiki/Haiku), where, depending on type, they can indicate spring, summer or autumn.[[47]](#cite_note-47)

### In mythology and folklore[[edit](/index.php?title=(none)&action=edit&section=15)]

[Template:Main](/wiki/Template:Main) Cicadas have been used as money, in folk medicine, to forecast the weather, to provide song (in China), and in folklore and myths around the world.[[48]](#cite_note-48) In France, the cicada represents the [folklore](/wiki/Folklore) of [Provence](/wiki/Provence) and the Mediterranean cities.[[49]](#cite_note-49) The cicada has represented [Template:Linktext](/wiki/Template:Linktext) since [classical antiquity](/wiki/Classical_antiquity). [Jean de La Fontaine](/wiki/Jean_de_La_Fontaine) began his collection of fables *Les fables de La Fontaine* with the story *La Cigale et la Fourmi* (*The Cicada and the Ant*) based on one of [Aesop's](/wiki/Aesop) fables: in it the cicada spends the summer singing while the ant stores away food, and finds herself without food when the weather turns bitter.[[50]](#cite_note-50) The cicada symbolises rebirth and immortality in Chinese tradition.<ref name=Riegel>[Template:Cite web](/wiki/Template:Cite_web)</ref> In the Chinese essay "[Thirty-Six Stratagems](/wiki/Thirty-Six_Stratagems)", the phrase "to shed the golden cicada skin" (金蝉脱壳, [pinyin](/wiki/Pinyin): *jīnchán tuōké*) is the poetic name for using a decoy (leaving the exuviae) to fool enemies.[[51]](#cite_note-51) In the Chinese classic novel [*Journey to the West*](/wiki/Journey_to_the_West) (16th century), the protagonist Priest of Tang was named the Golden Cicada.[[52]](#cite_note-52) In Japan, the cicada is associated with the summer season.[[53]](#cite_note-53) According to [Lafcadio Hearn](/wiki/Lafcadio_Hearn), the song of *Meimuna opalifera*, called "tsuku-tsuku boshi", is said to indicate the end of summer, and it is called so because of its particular call.[[54]](#cite_note-54) In an [Ancient Greek myth](/wiki/Greek_mythology), [Tithonus](/wiki/Tithonus) eventually turns into a cicada after being granted immortality, but not eternal youth, by [Zeus](/wiki/Zeus). The Greeks also used a cicada sitting on a harp as emblematic of music.[[55]](#cite_note-55) [thumb|Deep-fried *Cryptotympana atrata* in](/wiki/File:deepfried_cicada.jpg) [Shandong cuisine](/wiki/Shandong_cuisine)

### As food and folk medicine[[edit](/index.php?title=(none)&action=edit&section=16)]

Cicadas were eaten in [Ancient Greece](/wiki/Ancient_Greece), and are consumed today in [China](/wiki/China), both as adults and (more often) as nymphs,[[56]](#cite_note-56) [Malaysia](/wiki/Malaysia), [Burma](/wiki/Burma), Latin America, and central Africa. Female cicadas are prized for being meatier.[[26]](#cite_note-26) Shells of cicadas are employed in traditional Chinese medicines.[[57]](#cite_note-57) In 2011, cicadas were incorporated into a single batch of ice cream in Columbia, Missouri, at Sparky's. The ice creamery was advised by the public health department against making a second batch, a suggestion with which store owners complied.[[58]](#cite_note-58)

### As pests[[edit](/index.php?title=(none)&action=edit&section=17)]

Cicadas feed on [sap](/wiki/Sap), and are benign to humans; they do not [bite](/wiki/Bite) or [sting](/wiki/Stinger) in a true sense, but may occasionally mistake a person's arm for a plant limb and attempt to feed.[[59]](#cite_note-59) Cicadas are not major agricultural pests but in some outbreak years, trees may be overwhelmed by the sheer numbers of females laying their eggs in the shoots. Small trees may wilt and larger trees may lose small branches.<ref name=Capinera/> Although in general, the feeding activities of the nymphs do little damage, during the year before an outbreak of periodic cicadas, the large nymphs feed heavily and plant growth may suffer.<ref name=Yang>[Template:Cite journal](/wiki/Template:Cite_journal)</ref> Some species have turned from wild grasses to sugar cane, and this has affected the crop adversely, and in a few isolated cases, females have oviposited on food crops such as date palms, grape vines, citrus trees, asparagus and cotton.<ref name=Capinera/>

Cicadas sometimes cause damage to amenity shrubs and trees, mainly in the form of scarring left on tree branches where the females laid their eggs. Branches of young trees may die as a result.[[60]](#cite_note-60)[[61]](#cite_note-61)<ref name=OhioCultivator>[Template:Cite journal](/wiki/Template:Cite_journal)</ref>

## Genera[[edit](/index.php?title=(none)&action=edit&section=18)]

List of genera

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* [*Abricta*](/wiki/Abricta)
* *Abroma*
* *Adeniana*
* *Aestuansella*
* *Afzeliada*
* *Ahomana*
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## References[[edit](/index.php?title=(none)&action=edit&section=20)]

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## Bibliography[[edit](/index.php?title=(none)&action=edit&section=21)]

* [Template:Citation](/wiki/Template:Citation).

## Further reading[[edit](/index.php?title=(none)&action=edit&section=22)]

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## External links[[edit](/index.php?title=(none)&action=edit&section=23)]

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* [*Massachusetts Cicadas*](http://www.masscic.org/) describes behavior, sightings, photos, how to find guide, videos, periodical and annual cicada species information and distribution maps
* [Magicicada.org Brood mapping project – solicits records and observations from the general public](http://www.magicicada.org/)
* ["Cicada mystery"](http://www.latestupdate.info/what-is-cicada-3301-the-world-complex-and-interesting-internet-mystery/) Cicada 3301: An Interesting Story behind the Cicada Mystery
* [Cicada Fact Sheet](http://www.pestworld.org/pest-guide/occasional-invaders/periodical-cicadas/) highlights prevention tips as well as information on habits, habitat and health threats
* [Song recordings and information of cicadas of the United States and Canada](http://www.insectsingers.com/100th_meridian_cicadas/index.html)
* [University of Michigan Cicada Site](http://insects.ummz.lsa.umich.edu/fauna/michigan_cicadas/) contains information on the 13- and 17-year periodical cicadas and some North American annual cicadas
* [cicadas of Florida, *Neocicada hieroglyphica*, *Tibicen*, *Diceroprocta* and *Melampsalta* spp.](http://entomology.ifas.ufl.edu/creatures/misc/bugs/cicadas.htm) on the [University of Florida](/wiki/University_of_Florida) / [Institute of Food and Agricultural Sciences](/wiki/Institute_of_Food_and_Agricultural_Sciences) *Featured Creatures*
* [College of Mt Saint Joseph Cicada Information Site; Greater Cincinnati Cicada Information & Teaching Resources](http://inside.msj.edu/academics/faculty/kritskg/cicada/Site/Cicada_home.html)
* [Southeast Asian cicada songs on The Slovenian Museum of Natural History website](http://www2.pms-lj.si/staff/bioacoustics/asian.html)
* [DrMetcalf: a resource on cicadas, leafhoppers, planthoppers, spittlebugs, and treehoppers](http://www.lib.ncsu.edu/specialcollections/digital/metcalf/index.html)

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