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{"Title": "Ladybird, ladybug, lady beetle",
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"AlternateTitles": {
  "LadyBugRedirect": "Lady Bug (disambiguation)",
  "LadybirdRedirect": "Ladybird (disambiguation)" },
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"TemporalRange": "Eocene–Present",

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"ScientificClassification": {
  "Domain": "Eukaryota", "Kingdom": "Animalia", "Phylum": "Arthropoda", "Class": "Insecta",
  "Order": "Coleoptera", "Suborder": "Polyphaga", "Infraorder": "Cucujiformia", "Superfamily":
  "Coccinelloidea",
  "Family": "Coccinellidae", "Authority": "Latreille, 1807" },
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"Subfamilies": [
    "Chilocorinae", "Coccidulinae", "Coccinellinae",
    "Epilachninae", "Microweiseinae", "Scymninae", "Sticholotidinae" ],
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**"Synonyms" :**  
["Cerasommatidiidae", "Epilachnidae"],

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"GeneralDescription": {
  "CommonNames": {
    "NorthAmerica": "Ladybugs",
    "UnitedKingdom": "Ladybirds",
    "Entomologists": ["Ladybird beetles","Lady beetles"] },
  "Species": "6000+ described species globally distributed in various habitats",
  "PhysicalTraits": {
    "Shape": "Oval beetles with domed backs and flat undersides",
    "ColorPatterns": "Aposematic colors like red w/ black spots, or stripes or no spots" },
  "Behavior": {
    "Diet": {
      "Carnivorous": ["Aphids","Scale insects"],
      "Herbivorous": ["Plants","Fungi"] },
    "Breeding": {
      "Season": ["Spring","Summer in temperate regions","Wet season in tropics"],
      "EggLaying": "Near prey colonies for larval feeding",
      "Lifecycle": ["Larva","Pupa","Adult"],
      "Dormancy": ["Temperate species hibernate in winter","Tropical species dormant in dry season"] },
    "Migration": "Migrate between dormancy and breeding sites" } },

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"HumanInteractions": {
  "Beneficial": "Species preying on agricultural pests are beneficial",
  "Biocontrol": "Introduced as biological control agents, with mixed success",
  "PestPotential": "Some species attack crops or infest homes",
  "EcologicalThreats": ["Invasive species", "Climate change", "Habitat destruction"] },
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"CulturalImpact": {
  "Folklore": "Significant roles in folklore, religion, poetry, and nursery rhymes" },
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"Etymology": {
  "FamilyName": "Coccinellidae from Latin 'coccineus' meaning 'scarlet'",
  "CommonName": {
    "Origin": "'Our Lady's birds' in Britain, referring to the Virgin Mary",
    "Adaptation": "'Ladybug' in the United States" },
  "InternationalNames": {
    "Germany": "Marienkäfer (Marybeetle or ladybeetle)" } },
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## "Morphology": {

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"SizeRange": "0.8 to 18 mm",
"SexualDimorphism": "Females slightly larger than males",
"Features": {
  "Eyes": "Large compound", "Antennae": "Clubbed with 7-11 segments", "Mandibles": "Paired teeth",
  "Prothorax": "Broad, convex, can cover back of head",
  "Wings": {
    "Forewings": "Hardened elytra",
    "Hindwings": "Fragile, covered by elytra" },
  "Legs": "Short with tarsal formula 4-4-4 or 3-3-3, tarsus with two claws" },
"DefiningTraits": {
  "Spiracles": "Five pairs on the abdomen",
  "Tentorium": "Separated branches, no bridge",
  "FronsClypeus": "No dividing line",
  "MaxillaryPalps": "Non-needle-shaped tips",
  "Mouthparts": "Divided galea and lacinia, smaller molar area",
  "CoxalCavities": "Open from back in front thorax, front in middle thorax",
  "Epimeron": "Parallel edges on metathorax",
  "AbdominalSternum": "Lines on the second",
  "Genitalia": "Tube-shaped in males" },
"Coloration": {
  "ElytronPatterns": {
    "LightAreas": "Yellow, red, orange, brown with varying spots",
    "OtherPatterns": "Stripes, checkers" },
  "Pigments": {"Carotene": "Light colors", "Melanins": "Dark colors"},
  "Camouflage": "Varies, can also attract mates or regulate heat",
  "Polymorphism": "Some species show seasonal color changes" },
"LarvalStage": {
  "Shape": "Elongated with square heads",
  "Covering": "Hairs or setae, particularly on abdominal segments",
  "Antennae": "One to three segmented",
  "Color": "Grey, blue-grey, grey-brown, brown, brightening near adulthood" } },
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## "Evolution": {

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"FossilRecord": {
  "Species": "6000+ living species described",
  "Preservation": "Sparse in fossil record",
  "OldestFossils": "Oise amber, France, Early Eocene (~53 million years ago)",
  "BalticAmber": "Extant genera in Microweiseini and Sticholotidini tribes" },
"Phylogeny": {
  "Infraorder": "Cucujiformia, majority are plant-eating beetles",
  "SubfamilyEvolution": {
    "TraditionalDivisions": "7 subfamilies, 35 tribes based on morphology",
    "GeneticStudies": "Monophyly of most subfamilies questioned",
    "RecentStudy": {
      "Year": 2021,
      "Findings": {
        "NewSubfamilies": ["Microweiseinae", "Coccinellinae", "Monocoryninae"],
        "CrownGroupOrigin": "143 Mya, Early Cretaceous, rapid diversification in Late Cretaceous" } } },
  "DietEvolution": {
    "ScaleInsects": "Most basal diet",
    "AphidEating": "Evolved three times",
    "LeafEating": "Evolved twice",
    "FungiEating": "Evolved from aphid-eating" } } },
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## "SpeciesAppearance": {

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"CoccinellaSeptempunctata": {"Color": "Red", "Spots": "Black"},
"PsylloboraVigintiduopunctata": {"Color": "Yellow", "Spots": "Black"},
"VibidiaDuodecimguttata": {"Color": "Brown", "Spots": "Whitish"},
"BrumoidesSuturalis": {"Pattern": "Longitudinal stripes"},
"RhyzobiusChrysomeloides": {"Color": "Brown", "Spots": "Unspotted" } }
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