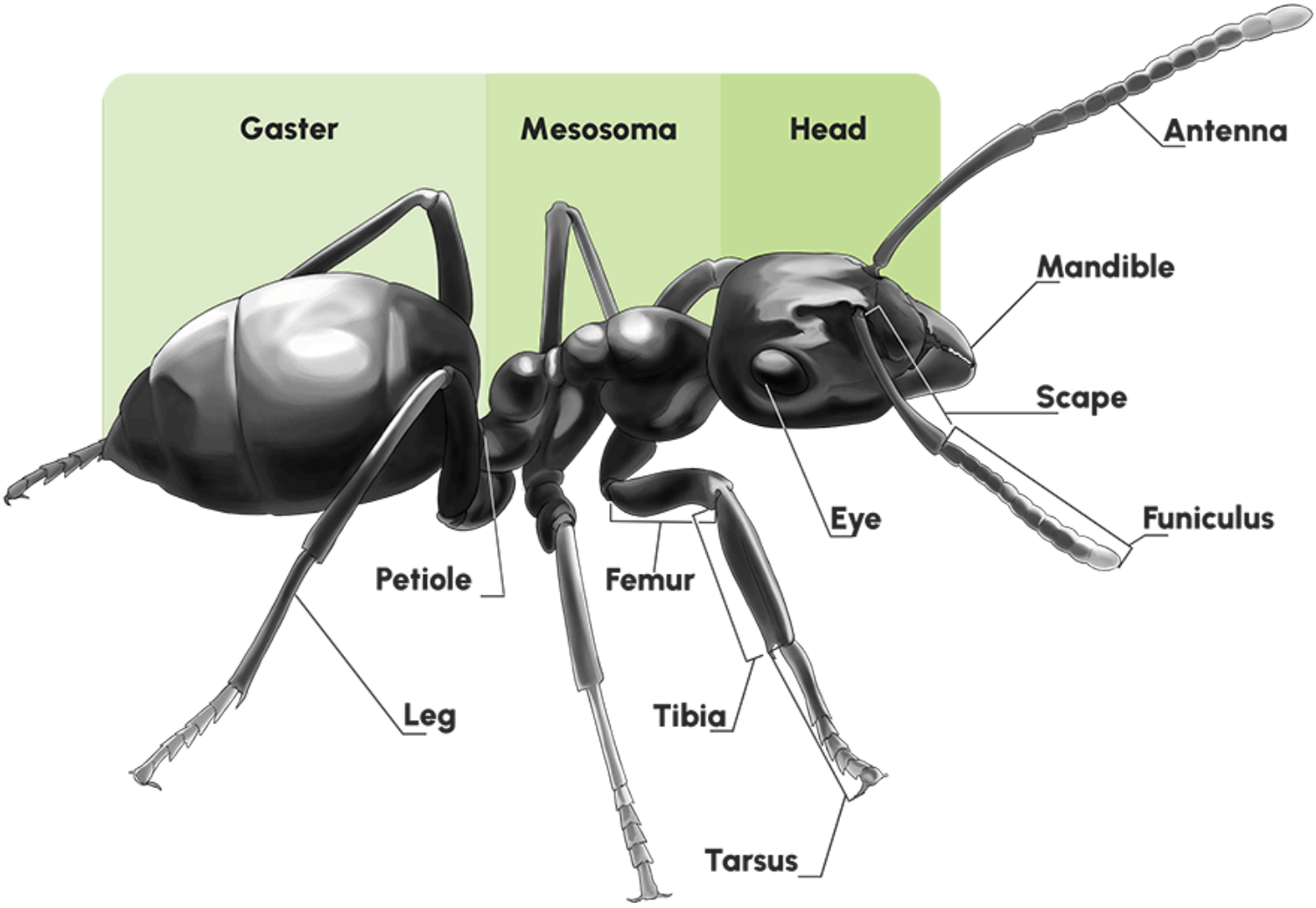
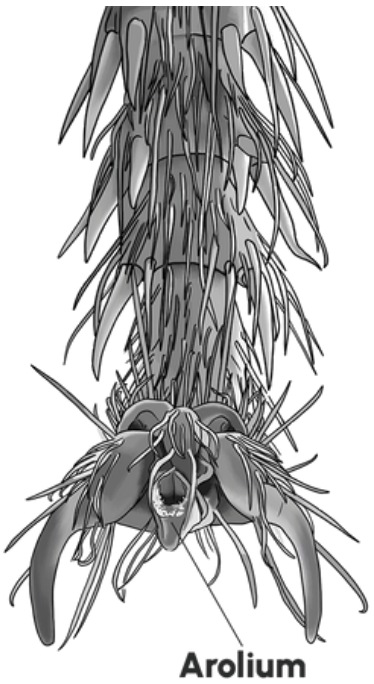
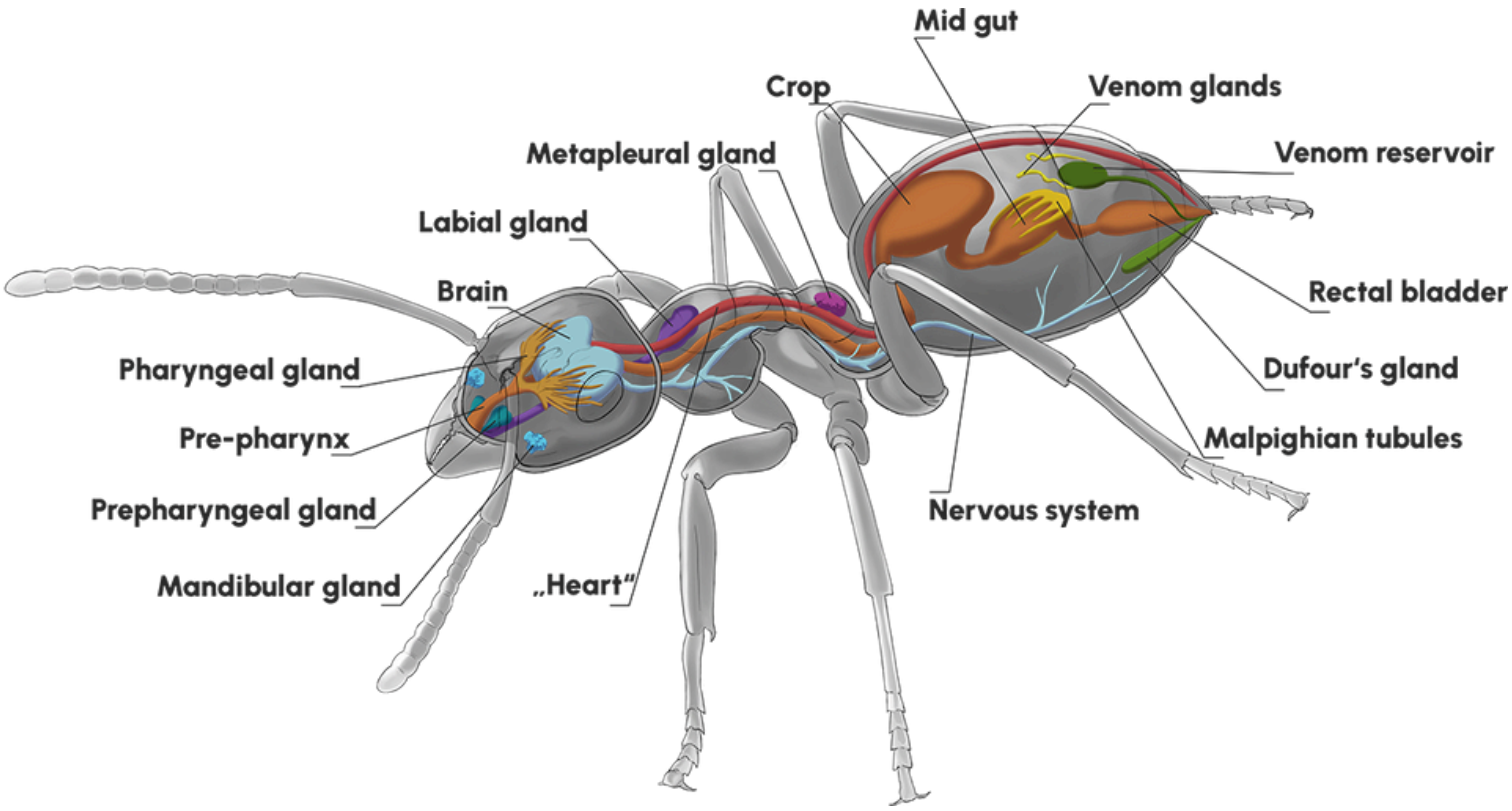
ANATOMY OF ANTS
LASIUS NIGER



- Head: Contains sensory organs, mouthparts, and the brain; the central hub for perception and control.
- Antenna: Primary sensory organs for smell, taste, touch, and pheromone-based communication.
- Scape: The first, elongated segment of the antenna, acting as a lever and movement base.
- Funiculus: Multi-segmented part of the antenna, highly sensitive to chemical stimuli.
- Eye: Compound eyes allow coarse vision; ants mainly perceive movement and polarized light.
- Mandible: Powerful jaws used for carrying, cutting, defense, and manipulating objects.
- Mesosoma: Thoracic region plus the first abdominal segment, containing the main muscles for leg movement.
- Leg: Six-segmented appendages used for locomotion and manipulation.
- Femur: Strongest leg segment, housing major muscles.
- Tibia: Movable leg segment between femur and tarsus; in some species bears specialized cleaning structures.
- Tarsus: Multi-segmented foot section, important for adhesion and fine movements.
- **Arolium:** Adhesive pad between the claws of the tarsus, enabling climbing on smooth surfaces.
- Petiol: Narrow waist-like segment connecting mesosoma and gaster, important for abdominal flexibility.
- Gaster: Large posterior body segment containing digestive organs, glands, and reproductive organs.



ANATOMY OF ANTS
LASIUS NIGER



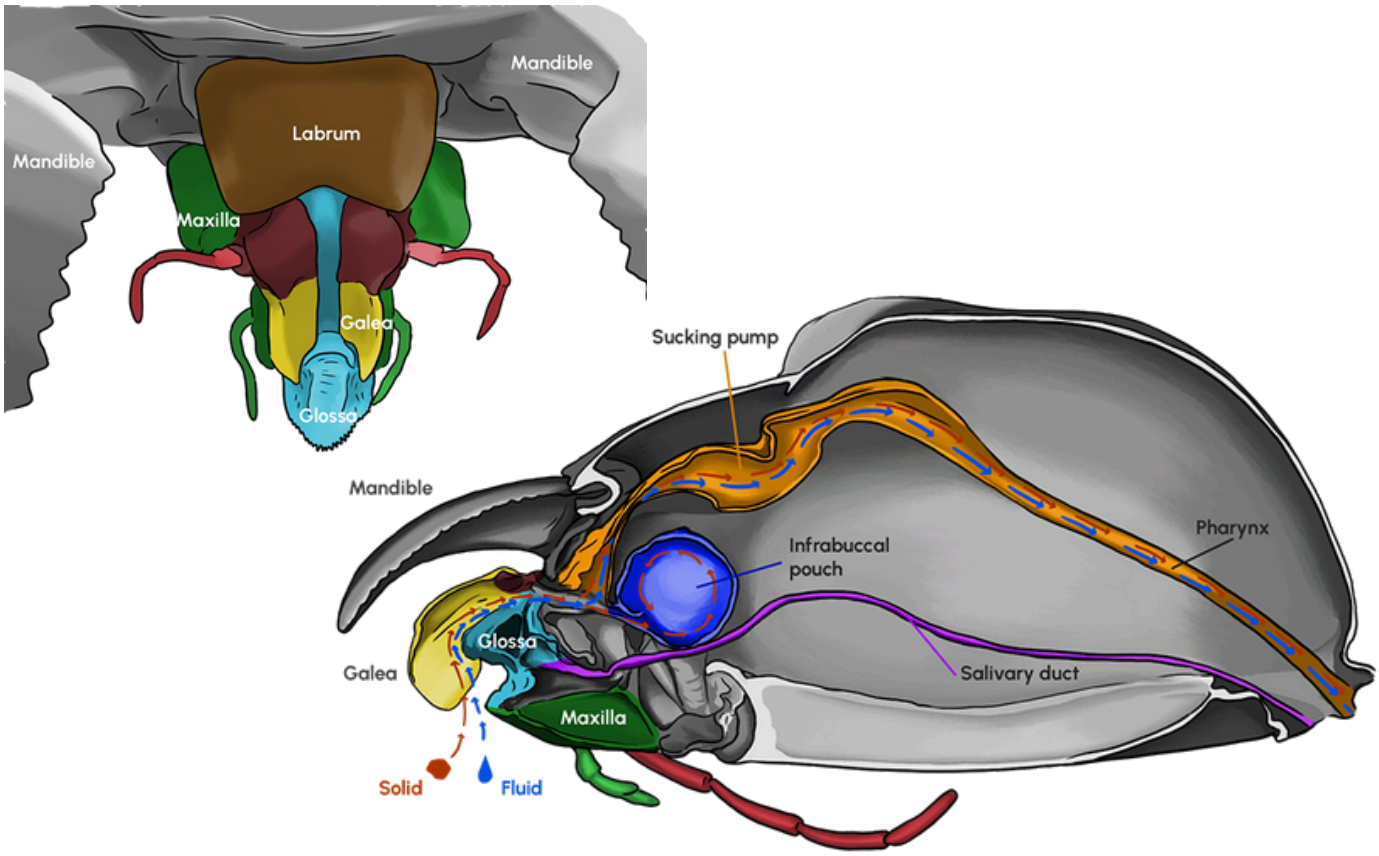
Internal Organs and Glands

- Brain: Central nervous control station, regulating sensory processing, coordination, and social behavior.
- Nervous system: Ladder-like arrangement with segmental ganglia, allowing motor control and reflexes.
- "Heart": Elongated dorsal vessel pumping hemolymph throughout the body; part of the open circulatory system.
- Crop (social stomach): Storage organ for liquid food; also enables trophallactic transfer within the colony.
- Mid gut: Site of enzymatic digestion and nutrient absorption.
- Rectal bladder: Organ for storage and reabsorption of water and ions, part of the hindgut.
- Malpighian tubules: Excretory organs that filter nitrogenous waste and regulate water and salt balance.

Specialized Glands

- Mandibular gland: Produces secretions for communication and defense (e.g., alarm pheromones).
- Pharyngeal gland: Involved in food processing and trophallaxis.
- Prepharyngeal gland: Secretes into the foregut; in some species important for food storage.
- Pre-pharynx: Section of the foregut that directs food toward the midgut.
- Labial gland: Produces digestive enzymes and secretions that aid in food uptake.
- Metapleural gland: Secretes antimicrobial substances, protecting the colony from pathogens.
- Dufour's gland: Releases pheromones (e.g., trail marking) and secretions supporting nest hygiene.
- Venom glands: Produce toxic compounds for defense or prey subjugation.
- Venom reservoir: Storage organ for venom, discharged through the sting or gland duct.

ANATOMY OF ANTS
LASIUS NIGER



Mouthparts

- **Labrum (upper lip)**

The labrum acts as the upper cover of the mouth. It helps hold and guide food while the mandibles manipulate or cut it.

- **Maxillae (with Galea)**

The maxillae are paired mouthparts located on the sides of the mouth. They help handle, taste, and move food.

- **The Galea,** a lobe-like projection of the maxilla, functions as a side tongue or scoop, directing food toward the mouth opening.
- **Labium (lower lip)**

The labium forms the floor of the mouth cavity. Together with the maxillae, it helps in manipulating and sucking up food.

- **Glossa (tongue)**

The glossa is a tongue-like structure at the end of the labium. It's used for lapping or sucking liquid food such as honeydew. Capillary action helps draw the liquid toward the mouth.

- **Sucking pump**

Located behind the mouth, the sucking pump is a muscular organ that creates suction by rhythmic contractions, pulling liquid food into the mouth and throat.

- **Infrabuccal pouch**

The infrabuccal pouch acts as a filter chamber, trapping solid particles while allowing liquids to pass through. The solid residues are later expelled as pellets.

- **Pharynx (throat)**

The pharynx receives the liquid from the sucking pump and pushes it into the esophagus. It serves as a connection between mouth and digestive tract.

- **Salivary duct**

The salivary duct releases saliva into the mouth, moistening food, aiding in pre-digestion, and sometimes serving for chemical communication during trophallaxis (food exchange).