



United States Department of Agriculture

Invasive Ants

Tyler Ito

Entomologist

Honolulu Plant Inspection Station

Protecting American Agriculture

Animal and Plant Health Inspection Service • Plant Protection & Quarantine

Formicidae

- 15,000 living ant species (9,000 – 10,000 described)
 - 16 subfamilies
 - 296 genera
- Social Insects
- Ecological Role
 - Food web
 - Seed dispersal
 - Soil aeration



Alex Wild



Alex Wild



Alex Wild



Alex Wild

Invasive Ants

- Local biological diversity
- Agricultural production
- Public health threat



Image: U.S. Fish & Wildlife Service



Image: Alabama Cooperative Extension System

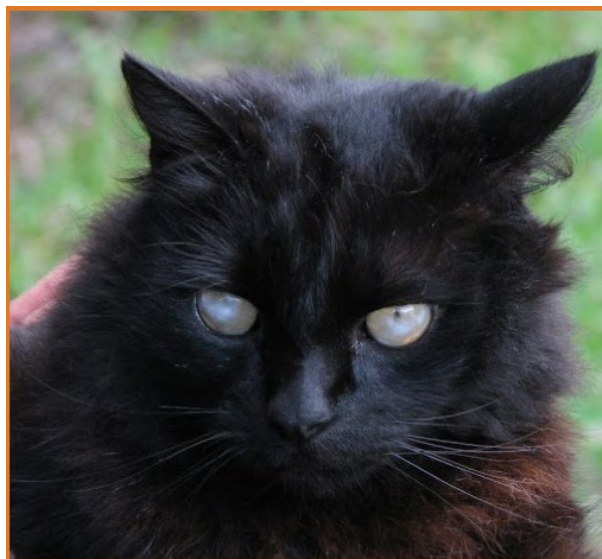
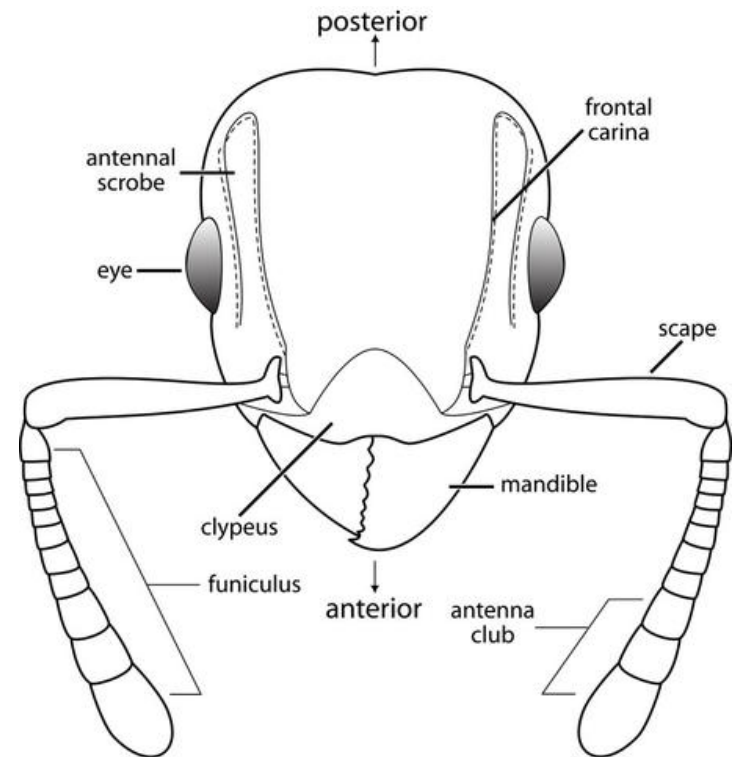
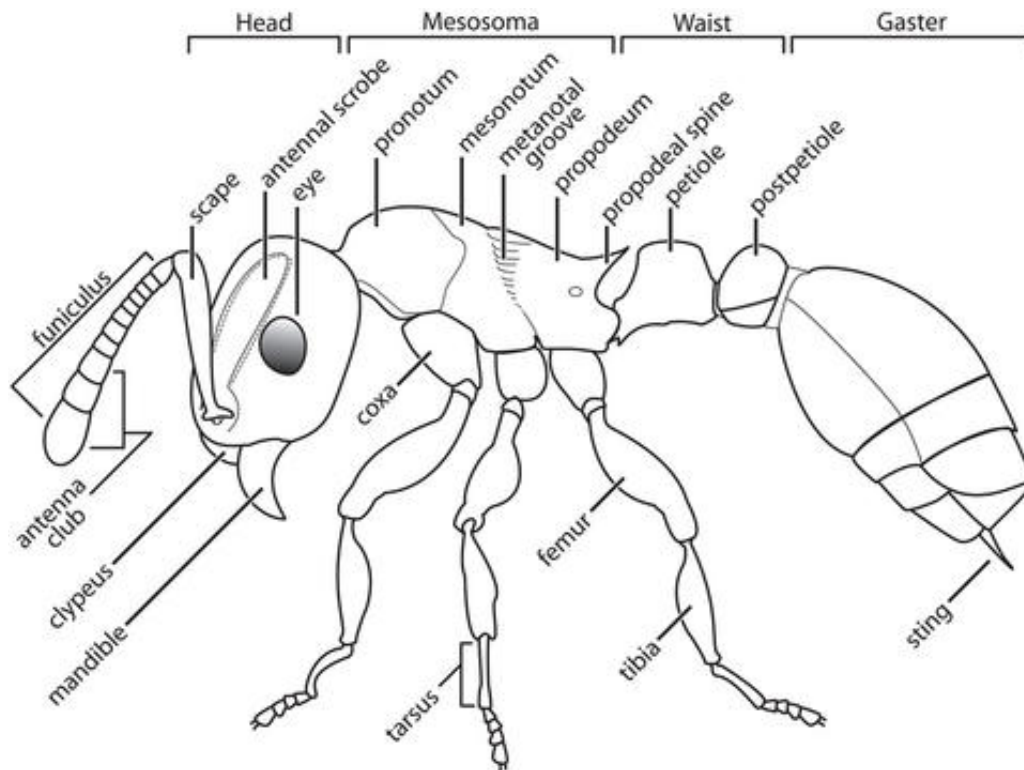


Image: S. Porter, USDA

Ant Morphology



Ant Biology and Life Cycle

Reproductive Caste



Alate – the sexually mature, winged life stage of an ant

Ergatoid – sexually mature queens that emerge wingless



Image: Boudinot et al. 2013

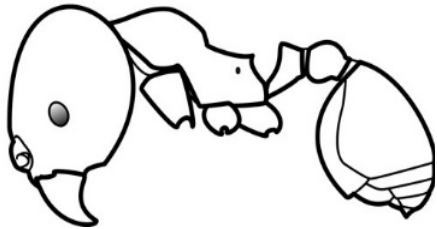
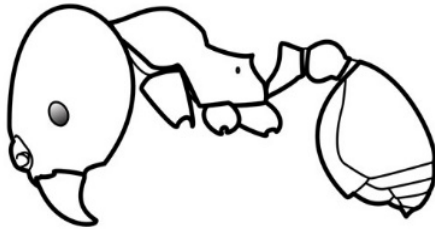
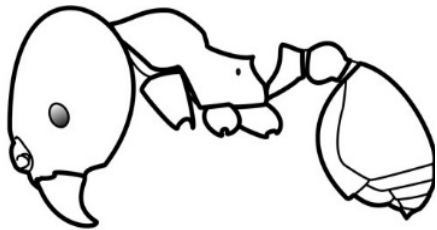
Dealate – a queen that has shed her wings (usually after mating)



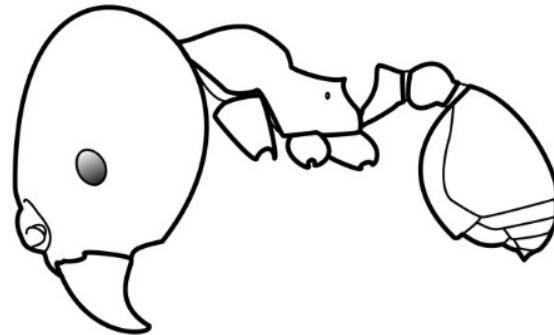
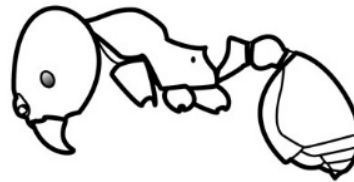
Image: Boudinot et al. 2013

Ant Biology and Life Cycle

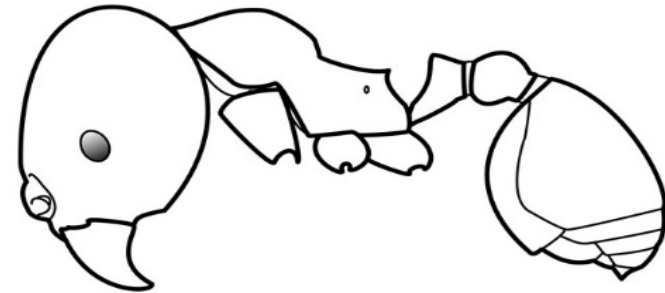
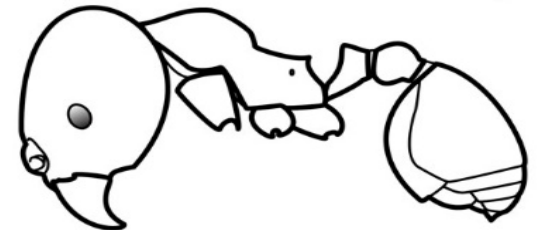
Worker Caste



Monomorphic



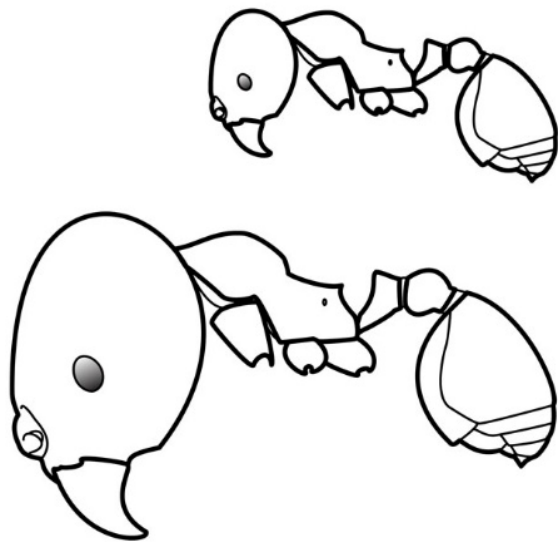
Bimorphic



Polymorphic

Ant Biology and Life Cycle

Worker Caste

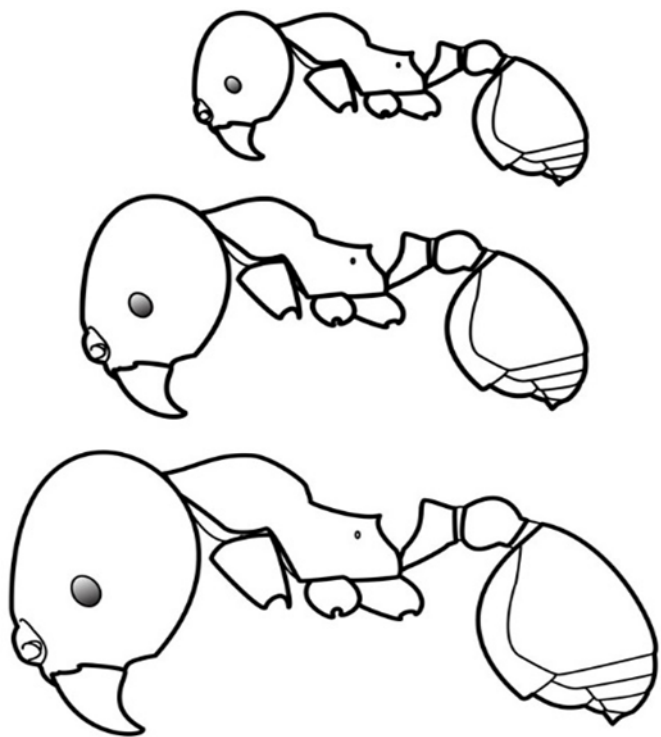


Bimorphic

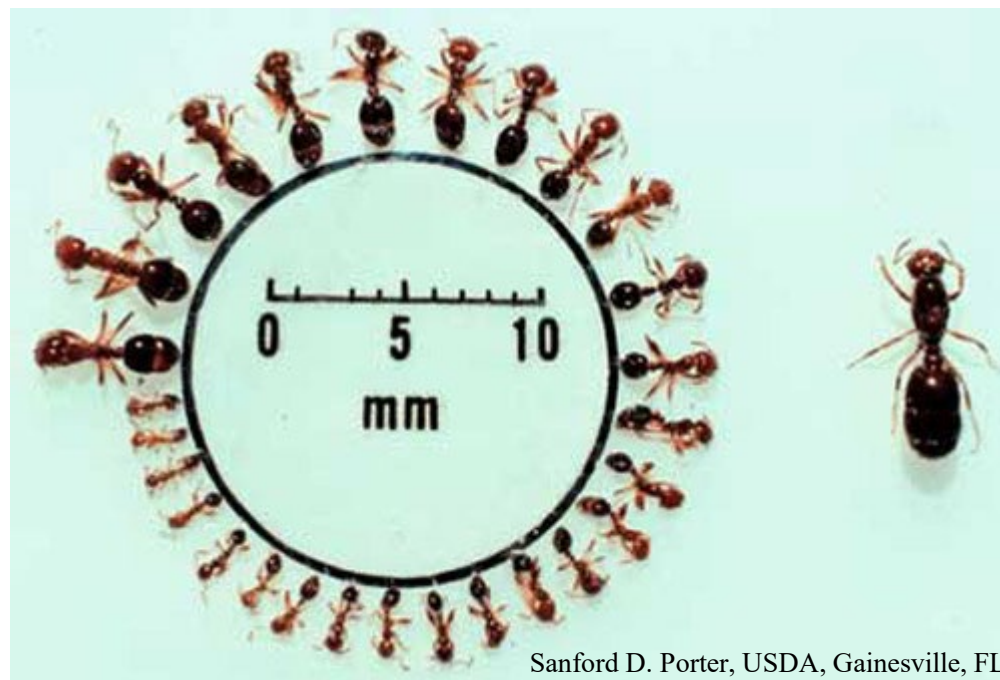


Ant Biology and Life Cycle

Worker Caste



Polymorphic



Sanford D. Porter, USDA, Gainesville, FL

Ant Biology and Life Cycle

Life Stages

Egg



Larva



Pupa



Adult



Ant Biology and Life Cycle

Eggs, Larvae, and Pupae



Yellow Crazy Ant

Anoplolepis gracilipes

- Johnston Atoll National Wildlife Refuge
 - Since 2010, nearly wiped out ground nesting seabirds
 - YCA swarms birds and nests spraying formic acid
 - Causes blindness and beak malformations in chicks
 - Successful eradication



Yellow Crazy Ant

Anoplolepis gracilipes

- Christmas Island
 - So far 15-20 million crabs killed
 - YCA takes over red crab burrows
 - Crabs killed during their annual migration
 - Rain forest ecosystem impact

Photo: parksaustralia.gov



Photo: CINP



Yellow Crazy Ant

Anoplolepis gracilipes



- Around 5mm in length
- Yellow to orange coloration
- Long appendages



- One waist segment (raised petiole)
- Long neck connecting its body and head
- Mesosoma impressed

Yellow Crazy Ant

Anoplolepis gracilipes



- Antennal scape 2x the head length
- Large eyes that break outline of face



- Gaster armed with acidopore

Yellow Crazy Ant

Anoplolepis gracilipes

Reproductive forms



Photo: Nigel Main



California Academy of Sciences



Amy Carmichael, Queensland Univ. of Technology

Red Imported Fire Ant

Solenopsis invicta

- Painful stings resulting in pustules or even anaphylactic shock
- Frequently invades home lawns, school yards, athletic fields, golf courses, and parks
- Reduces/eliminates ground-nesting populations of rodents and birds
- Multiple queen colonies makes it difficult control



Red Imported Fire Ant

Solenopsis invicta

- Feeds young growth of numerous crop plants, especially corn, soybean, okra, and citrus
- Stings eyes and nostrils of livestock causing blindness
- Infests hay and other feed
 - Decreased egg production of poultry houses
 - Malnourished livestock



Red Imported Fire Ant

Solenopsis invicta



- Moderate size (>2mm)
- Worker caste polymorphic
- Gaster armed with stinger
- Two waist segments
- Propodeal spines absent

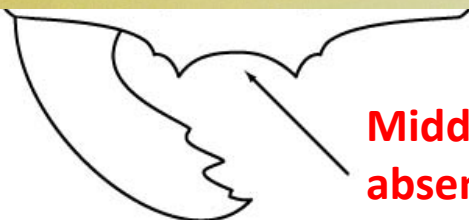


- 10-segmented antennae
- Two antennal club segments
- Antennal scrobe absent

Red Imported Fire Ant

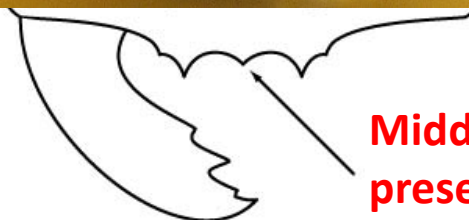
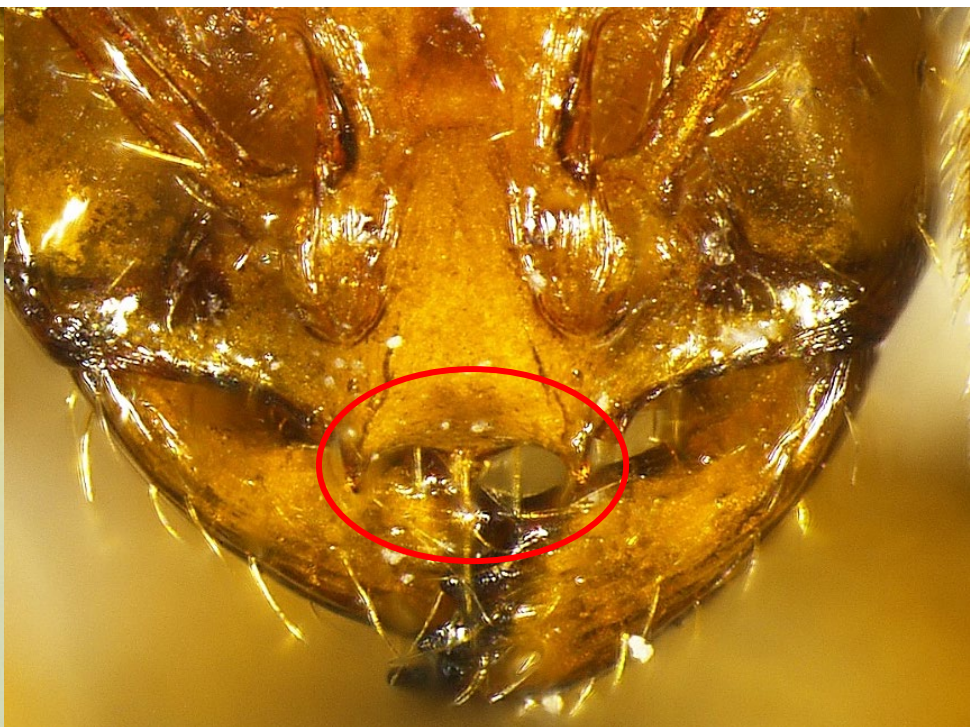
Solenopsis invicta

Tropical Fire Ant



**Middle tooth
absent**

Red Imported Fire Ant



**Middle tooth
present**

Red Imported Fire Ant

Solenopsis invicta

Reproductive forms

California Academy of Sciences



California Academy of Sciences

Little Fire Ant

Wasmannia auropunctata

- Decreased arthropod and reptile biodiversity in the Galapagos
- Produce painful stings
- Stings eyes of pets, leading to blindness
- Nests in moist, shady areas, in trees, under bark and rocks, within logs and leaf litter
- Orchard workers unable to do their jobs



Cas Vanderwoude



Cas Vanderwoude

Little Fire Ant

Wasmannia auropunctata

The Perfect Invader

- **Super colonies**
- **Aggressive to other species**
- Multiple queens
- Farmers
- Can easily disperse



Little Fire Ant

Wasmannia auropunctata

The Perfect Invader

- Super colonies
- Aggressive to other species
- **Multiple queens**
- Farmers
- Can easily disperse



Little Fire Ant

Wasmannia auropunctata

The Perfect Invader

- Super colonies
- Aggressive to other species
- Multiple queens
- **Farmers**
- Can easily disperse



Little Fire Ant

Wasmannia auropunctata

The Perfect Invader

- Super colonies
- Aggressive to other species
- Multiple queens
- Farmers
- **Can easily disperse**



Little Fire Ant

Wasmannia auropunctata



- Small in size (~1.5 mm)
- Pale yellow in color
- Gaster armed with stinger



- Two waist segments (petiole and postpetiole)
- Propodeal spines present

Little Fire Ant

Wasmannia auropunctata



- 11-segmented antennae
- Two antennal club segments
- Antennal scrobe present



Tropical Fire Ant

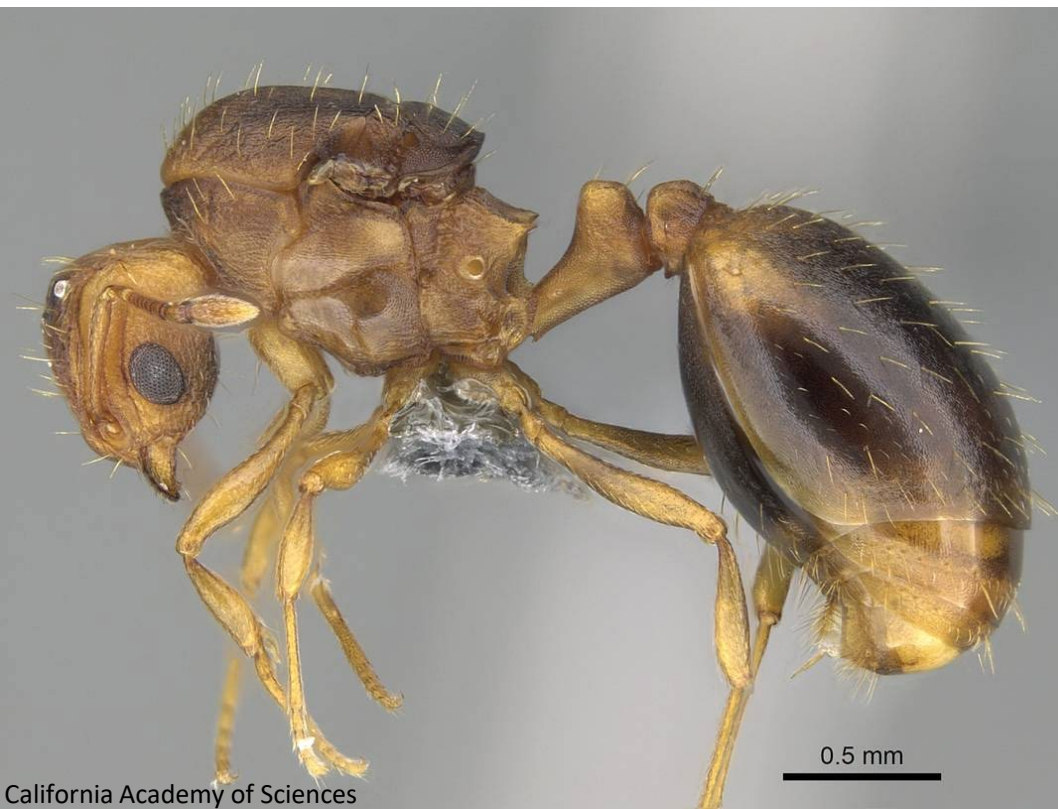
Little Fire Ant

Little Fire Ant

Wasmannia auropunctata

Reproductive forms

California Academy of Sciences



California Academy of Sciences



If you fell asleep

Just remember...

- Look for signs of a nest
 - Workers carrying eggs, larva, pupa
 - Piles of dirt, wood shavings, debris
- All it takes is **one** mated queen

Invasive Ants

Questions?

**Maybe if I
work hard**



**Give all of my
food to the
colony**



**sleep only 8
minutes a day**



**surely the Queen
will notice me**

