= Myrmecia inquilina =

Myrmecia inquilina is a species of ant endemic to Australia in the subfamily Myrmeciinae , first discovered in 1955 and described by Athol Douglas and William Brown Jr. in 1959 . These ants are large , measuring 21 @.@ 4 millimetres (0 @.@ 84 in) . During the time of its discovery , Douglas and Brown announced M. inquilina as the first social parasite among the primitive subfamilies , and today it is one of the two known Myrmecia species to have no worker caste . Two host species are known , Myrmecia nigriceps and Myrmecia vindex . Aggression between M. inquilina and its host species does not occur , and colonies may only produce M. inquilina brood months after the inquiline queens begin to lay their eggs . Queens eat the colony brood or trophic eggs , and other Myrmecia species may kill M. inquilina queens if they reject them . Due to its restricted distribution and threats to its habitat , the ant is " vulnerable " according to the IUCN Red List .

= = Taxonomy = =

Before the discovery of M. inquilina , scientists believed that parasitic ants did not exist in the primitive ant subfamilies and were only known in Dolichoderinae , Formicinae and Myrmicinae ; many authors believed that primitive ants lacked a certain trait that would prevent parasitic ants from forming , but the discovery of M. inquilina now hints possible parasitic lifeforms in Ponerinae and some army ants . Brown collected the first specimens in 1955 from large fallen trees in Western Australia , and it was officially announced as the first parasitic ant among the primitive subfamilies in 1956 . In 1959 , Australian naturalist Athol Douglas and American entomologist William Brown Jr. provided the first description of the ant in an Insectes Sociaux journal article . Its specific epithet inquilina derives from the word inquilinus , meaning " tenant " . This name references the parasitic nature of the species , living inside a colony as a " guest " of another species .

Brown discovered the holotype female from an M. vindex nest on 23 March 1955 northwest from Wagin at Badjanning Rocks , Western Australia . The specimen is currently housed in the Western Australian Museum in Perth . Two dealated paratype females were also collected with the holotype , looking very similar to each other except for the mandibles and colouration . The mandibular dentition varies among the three , and one of the paratypes is darker than the holotype . In 1991 , a published journal reviewing the species groups assigned M. inquilina to the M. cephalotes species group . However , entomologists placed it in the M. gulosa species group one month after placing it in the M. cephalotes species group .

= = Description = =

M. inquilina is a large species , though it is smaller than its host . The body length of the ant is 21 @.@ 4 millimetres (0 @.@ 84 in) , the head including the clypeus is 2 @.@ 9 millimetres (0 @.@ 11 in) , the antennal scape 3 @.@ 5 millimetres (0 @.@ 14 in) and the diameter of the eyes are 1 @.@ 25 millimetres (0 @.@ 05 in) . The mandibles are slender with four to five acutely shaped teeth . The antennae are morphologically similar to M. vindex , but it is smaller in comparison ; the petiole node is also longer and wider . The postpetiole is subtriangular and more narrow than those seen on M. vindex queens . The clypeus , legs and antennae are covered in punctulates (spots) , and the postpetiole and gaster have less punctulates . M. inquilina can be distinguished from other ants due to its lack of pilose (long soft hairs) ; only small erect setae are mostly found on the mandibles and gastric apex , but short hair can be found on the legs , and on the dorsum , thorax and cervix . The ant has pubescence (soft short hair) finer and more abundant than M. vindex . The pubescence is greyish in colour , and it is shorter and more noticeable on the clypeus and appendages while it is conspicuous on the postpetiole and gaster .

The colour of the head and gaster are black , shading into reddish brown on the clypeus and around the frontal carinae . The mesosoma (alitrunk) , node , and legs are brownish @-@ red and light , with the legs becoming yellowish in certain areas . The antennae and mandibles are brownish yellow , and the teeth have black edges . Overall , M. inquilina can be distinguished from others by

its black head and its almost hairless body . Its colour is similar to M. nigriceps , but M. nigriceps is larger and covered in hair , along with a head more rounded than other species . M. inquilina does not have a worker caste , making it a workerless parasite .

Five males collected from an M. vindex nest are presumed to be M. inquilina , but the similarities between the two species cannot confirm if the males are M. inquilina . While the males collected are morphologically similar to M. vindex males , the head and gaster are darker , and two specimens show a reddish @-@ brown colour at the base of the first gastric segment , a characteristic that does not occur in M. vindex males . The genitalia is similar , but a more detailed study can distinguish these features among the two ants .

= = Distribution and habitat = =

M. inquilina is only found in the south @-@ west of Western Australia , with the holotype collected 225 kilometres (140 miles) from Perth . M. inquilina occurs in colonies with M. vindex and M. nigriceps , found in soil , under logs and flat rocks in woodland . They are commonly found in granite outcrops and wooded areas , with trees such as Corymbia calophylla , Acacia acuminata and a large unidentified species of Allocasuarina (possibly Allocasuarina huegeliana) present . The type locality was in an area cleared for agricultural purposes , but some areas were still wooded ; many fallen large trees were present . M. inquilina is typically found deep inside the nests , around 25 centimetres (10 inches) and can be found next to the queen .

= = Behaviour and ecology = =

M. inquilina is one of the two known Myrmecia species to not have a worker caste , and it is an inquiline to M. nigriceps and M. vindex colonies . M. inquilina is a polygynous species ; colonies can house between two and several dozen queens , but some of them nesting in the colony are originally from there . Due to this , some M. inquilina females are ergatoid ants that lose their wings after eclosing in their cocoons . The parasitic queen (s) may only coexist indefinitely , but M. inquilina queens replace all host brood with their own eggs several months after infiltrating the nest . This only occurs if M. inquilina queens eat or destroy the brood laid by their host , and workers will even tend to the brood and protect it from potential invaders . M. inquilina queens tend to nest near the host queen and her brood , attended by worker ants without any form of aggression . Observations suggest that parasitic queens feed on trophic eggs laid by workers . Predatory threats only include other Myrmecia species ; they are rejected by a potential host colony . For example , M. regularis workers immediately seize M. inquilina queens and kill it as soon as the two species come into contact .

Aerial dispersion is important in this species , despite its restricted distribution . Queens never forage outside or leave the nest , unless under severe deprivation . Before nuptial flight , fully developed females start to occur during summer . Between 9 and 10 pm in January , queens and males start to emerge from their host nest and begin to mate . Observations show that the alates will climb up onto objects such as lighted fluorescent lamps and begin to fly after half an hour of endless running . When queens are looking for a host nest or wandering openly , M. vindex foragers may identify a queen and seize her ; such behaviour suggests that workers actively recruit fertilised queens for their nest . Host colonies tend to be smaller and depauperated when compared to other colonies without any inquiline queens , but host colonies can still produce alate offspring .

= = Status = =

M. inquilina is the only species in its genus to be listed as " vulnerable " by the IUCN Red List . This , however , needs updating . Habitat loss may be responsible for the ant to be potentially endangered ; Douglas and Brown note that a contamination of dieldrin spray to control the argentine ant destroyed many nests housing M. inquilina , and burn @-@ offs are also a threat to colonies housing M. inquilina .