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Species profile for Hamadryas Baboon

**Report prepared for
Tasmania Zoo**

by Katrina Jensz and Luke Finley

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SPECIES PROFILE

Hamadryas baboon

Papio hamadryas



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June 2012

1. SUMMARY

The hamadryas baboon is distinguished from other baboons by the male's long, silver-grey shoulder cape, and the pink or red face and rump. This species occurs in north-east Africa. It is principally found in Ethiopia, although its range extends from the Red Sea Hills and Suakin (Sudan) through Eritrea and Djibouti (especially in the Goda Mountains) to northern Somalia. It is also found in the Red Sea Hills in the south-west Arabian Peninsula opposite the Horn of Africa.

Papio hamadryas is not globally threatened and is listed as least concern by the IUCN as this species is widespread and abundant, and there are no major range-wide threats believed to be resulting in a significant decline.

The hamadryas baboon is listed on Appendix II to the Convention on International Trade in Endangered Species of Wild Flora and Fauna and export and import of this species is therefore subject to regulation under the *Commonwealth Environment Protection and Biodiversity Conservation Act 1999*.

Although baboons (*Papio spp.*) are often considered pests, there appears to be little information specifically on the hamadryas baboon as a pest species. Commodities that may be susceptible to this species would be fruit, nuts, cereals, grains, oilseeds, grain legumes and vegetables. The hamadryas baboon has not been reported as an environmental pest in any country and there are no established feral populations recorded in any other country or region worldwide.

The natural distribution of the hamadryas baboon includes some areas similar in climate to Tasmania and a climate match score of 7 indicates that there is a moderate risk of this species becoming established in Tasmania. The hamadryas baboon has a varied diet, feeding on fruit, grasses, forbes, leaves, buds, flowers, seeds, eggs, insects, and meat. If the hamadryas baboon established in Tasmania it may compete with Tasmanian native marsupial species for food and other resources.

2. NAME AND TAXONOMY

Kingdom:	Animalia
Phylum:	Chordata
Class:	Mamalia
Order:	Primates
Family:	Cercopithecidae
Genus:	Papio
Species:	<i>Papio hamadryas</i>
Common names:	Hamadryas baboon, Sacred baboon

This species has been reported to hybridise with the olive baboon (*Papio anubis*) where the ranges of the two overlap, in a small area of northern Ethiopia (Richardson 2009, Shefferly 2004).

There are five commonly recognized species of *Papio*: hamadryas baboon (*P. hamadryas*), Guinea baboon (*P.papio*), olive baboon (*P.anubis*), yellow baboon (*P.cynocephalus*) and chacma baboon (*P.ursinus*) (NWE 2008, Groves 2005). The hamadryas baboon is found in northeast Africa and into southwestern Arabia. Chacma baboon is found in southern Africa. Guinea baboon is found in Senegal, The Gambia, and Guinea. Olive baboon is found in central African savanna, and yellow baboon is found in Angola, Zambia, Malawi, Tanzania, Kenya, and Somalia (NWE 2008).

There is some disagreement about whether these five groupings are really full species or subspecies. Some consider baboons to be a single species, which is designated *Papio hamadryas*. In this taxonomic scenario, there are five subspecies: *P.h. hamadryas* (sacred baboons), *P. h. cynocephalus* (yellow baboons), *P. h. ursinus* (Chacma baboons), *P. h. papio* (red baboons or Guinea baboons), and *P. H. anubis* (olive baboons) (NWE 2008).

Other authors distinguish *P. hamadryas* as a full species, but regard all the others as subspecies of *P. cynocephalus* and refer to them collectively as "savanna baboons." However, while behaviorally and physically distinct from other baboon types, the hamadryas baboon is known to hybridize with olive baboons, and recent phylogenetic studies of *Papio* show hamadryas baboons to be more closely related to Guinea and olive baboons than to *Chacmas* (Newman et al. 2004).

In overall physical appearance, all members of the genus are similar, with variation in coat colour (olive, brown, black, yellow, red, gray), and hair length. A mane or ruff of fur may be prominent in males, and varies by species. Size also varies by species and geographically, with males weighing from 20 to 31 kg, and females weighing from 10 to 15 kg (Shefferly 2004).

3. DESCRIPTION

The hamadryas baboon is a large monkey with a dog-like face, pronounced brow ridges, relatively long limbs with short digits, coarse fur, and a relatively short tail with a tufted tip. The male has a heavy cape, bushy cheeks, and large canine teeth. While the male hamadryas baboon develops a silvery-grey coat, the juvenile and female are brown, with dark brown skin on the face and rump. The face is nearly bare, and the palms and soles of the feet are completely so. The female hamadryas baboon develops colourful and pronounced sexual swellings during oestrus, and the skin over the rump becomes bright red during pregnancy (Richardson 2009). The hamadryas baboon is distinguished from other baboons by the male's long, silver-grey shoulder cape, and the pink or red rather than black face and rump.

Hamadryas baboons exhibit sexual dimorphism, especially in body size. The males may have a body measurement of up to 80 cm and weigh 20 and 30 kg and the females weigh 10–15 kg and have a body length of 40–45 cm. The tail adds a further 40–60 cm to the length (Shefferly 2004, Wikipedia 2012).

Locomotion is quadrupedal, and appears to be somewhat stiff-legged. The weight is born on the front extremities by the fingers (digitigrade), and is born by the hind feet across the entire sole of the foot (plantigrade). The thumb is relatively long, allowing precision grip and manipulation of objects (Shefferly 2004)

4. CONSERVATION AND LEGAL STATUS

CONSERVATION STATUS

Papio hamadryas is not globally threatened and is listed as least concern by the IUCN as this species is widespread and abundant, and there are no major range-wide threats believed to be resulting in a significant decline.

The hamadryas baboon is listed on Appendix II to the Convention on International Trade in Endangered Species of Wild Flora and Fauna (UNEP-WCMC, 2012). International trade in specimens of Appendix II species may be authorized by an export permit which is only be granted if the relevant authorities are satisfied that trade will not be detrimental to the survival of the species in the wild.

This species occurs in protected areas in the proposed Yangudi Rassa National Park, the Harar Wildlife Sanctuary, and a number of Wildlife Reserves in the lower Awash valley and in northern Eritrea. A 'pure' subpopulation of this species is found in the Simien Mountains National Park, while *P. hamadryas*-*P. anubis* hybrids occur in the Awash National Park.

The hamadryas baboon is listed on Class B of the African Convention on the Conservation of Nature and Natural Resources. Species in Class B are totally protected, but may be hunted, killed, captured or collected under special authorization granted by the competent authority.

LEGAL STATUS AUSTRALIA

The *Commonwealth Environment Protection and Biodiversity Conservation Act 1999* regulates the export and import of species included in the Appendices to CITES under Part 13A. International trade in specimens of the hamadryas baboon is therefore subject to regulation under this legislation.

The hamadryas baboon is not currently listed as a species that may be imported into Tasmania under the *Nature Conservation Act 2002* and therefore import of this species into Tasmania is not permitted.

The importation of the hamadryas baboon into Tasmania by the Tasmania Zoo will not contribute to any international effort to breed the species given its status of Least Concern with IUCN. The purpose of obtaining a specimen of this species is to enhance the collection for educational and display purposes.

5. LIFE HISTORY

The hamadryas baboon breeds seasonally. The dominant male of a one-male unit does most of the mating (Wikipedia 2012). The female hamadryas baboon usually gives birth to a single young, after a gestation period of 170 to 173 days. Breeding may take place at any time of year, but births typically peak between May and July or November and December in Ethiopia, and each female usually only gives birth once every 15 to 24 months (Nowak 1991). The average gestation period is 171 days. The newborn hamadryas baboon has black fur and pink skin, and is suckled for up to 15 months (Nowak 1991). Females reach sexual maturity at about 4.3 years. Lifespan in captivity has been recorded at 37 years (AnAge 2011).

In the harems of Hamadryas baboons, the males jealously guard their females, to the point of grabbing and biting the females when they wander too far away. Despite this, some males will raid harems for females. In such situations, it often leads to aggressive fights between the males. Some males succeed in taking a female from another's harem (NWE 2008).

Females do most of the parenting. They nurse and groom the infant and it is not uncommon for one female in a unit to groom an infant that is not hers. Dominant male baboons prevent other males from coming into close contact with their infants. The dominant males tolerate the young and will protect them from predators and kidnappers (infants may be lured away from their harems by other males). When a new male takes over a female, she develops sexual swellings which may be an adaptation that functions to prevent the new male from killing the offspring of the previous male (Wikipedia 2012, Swedell and Tasfaye 2003).

There are two mechanisms by which hamadryas males typically attract mates. The first is by abducting a young female from her mother. The male cares for the female, grooms her, and carries her if need be, until she reaches maturity, at which time he will mate with her. Females, who typically transfer out of their natal group upon reaching maturity, are generally attracted to males who already have a female, so kidnapping is an effective strategy for males to begin their family unit. The second strategy males adopt is to take-over an existing harem through direct aggression with and displacement of the tenured male. This strategy is complicated by the complex social relationships between males, who may intervene to support their male kin in such conflicts. (Shefferly 2004).

6. HABITAT REQUIREMENTS AND PREFERENCES

This species inhabits arid sub-desert, steppe, savannas, hillsides, escarpments, and mountains bordering the Red Sea, generally at altitudes up to 1,500 m. However, it appears to be seasonally migratory in at least some parts of its range in Ethiopia, where bands may move up into neighbouring mountainous areas (up to 3,300 m in the Simien Mountains National Park) in the wet season. This species is dependent on water, and is never found far

from water sources. It is an opportunistic omnivore, and seasonally important food plants include heglig, *Balanites aegyptiaca*, and buffalo thorn, *Ziziphus*. (Gippoliti and Ehardt 2008, Richrdson 2009, Wikipedia 2012).

Hamadryas baboon habitats require elevated sleeping sites. These sleeping sites are usually large trees or cliffs, where the baboons can spend their nights with reduced threat of predation. Rarely, if ever, have baboons been known to willingly sleep on the ground. (Shefferly 2004, Kummer 1968, Nowak 1991)

7. NATURAL GEOGRAPHIC RANGE

This species occurs in north-east Africa. It is principally found in Ethiopia, although its range extends from the Red Sea Hills and Suakin (Sudan) through Eritrea and Djibouti (especially in the Goda Mountains) to northern Somalia. It is also found in the Red Sea Hills in the south-west Arabian Peninsula opposite the Horn of Africa. Historically, its range extended into Egypt, but not in recent times, i.e., post 1500AD (Gippoliti and Ehardt 2008).

The hamadryas baboon is native to Djibouti; Eritrea; Ethiopia; Saudi Arabia; Somalia; Sudan; Yemen. This species is abundant, with the majority of the population in Ethiopia, and may even have increased because of loss of predators and small-scale agriculture. (Gippoliti and Ehardt 2008).

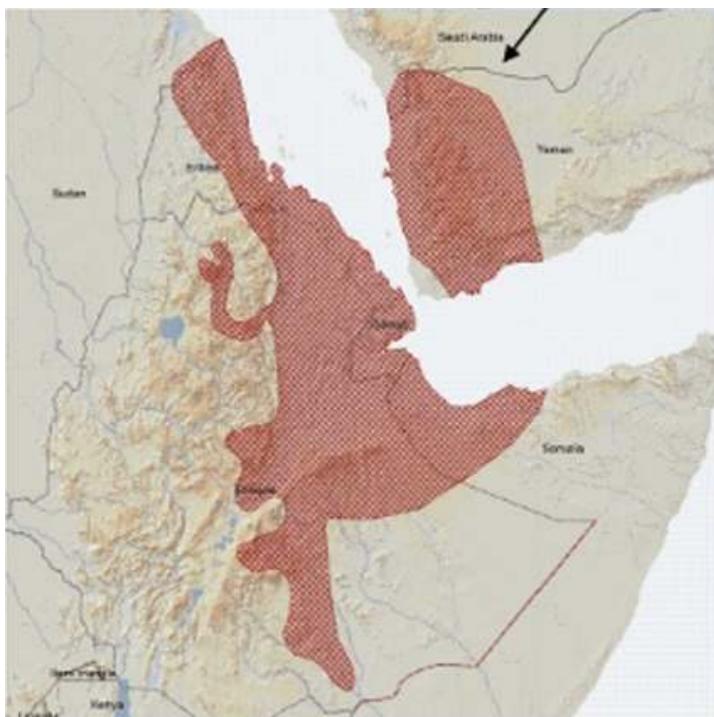


Figure 1: Geographic distribution of the hamadryas baboon. Source: <http://www.scribd.com/doc/58606509/Hamadryas-Baboon-Care#page=23>

8. INTRODUCED GEOGRAPHIC RANGE

The hamadryas baboon also occurs both in the Palearctic, along the Red Sea coast of Yemen and Saudi Arabia. The Palearctic populations of *P. hamadryas* have been present for the length of recorded history in the region, but are thought to have been introduced by humans, possibly through a shipwreck, or through importation of these "sacred" baboons sometime during the past 4000 years (Shefferly 2004, Jolly 1993, Nowak 1999).

There are no records of this species establishing feral populations in any other country or region.

9. POTENTIAL DISTRIBUTION IN TASMANIA

The natural distribution of the hamadryas baboon includes some areas similar in climate to Tasmania. The Climate matching software (BRS 2011) calculated 7 grid squares with a score of 6 or 7, which suggests these areas are of suitable climate for the hamadryas baboon. The remaining 23 grids have scores of 0 to 5 and the climate is considered unsuitable. These scores were obtained using the Bomford risk assessment model (2008) which has been modified by DPIPWE for assessments in Tasmania (DPIPWE 2011). A Climatch score of seven indicates that there is a moderate risk of this species becoming established in Tasmania. However, there are no records of this species establishing feral populations in any other country or region.

Although this hamadryas baboon inhabits a range of habitats including arid sub-desert, steppe, savannas, hillsides, escarpments, and mountains bordering the Red Sea, this species is not known to have established feral populations outside its natural range. In the literature consulted there was no information on the ability of the hamadryas baboon to survive and adapt to a different climate and habitat to that of its natural range. The low rate of reproduction may limit the likelihood of establishment; female hamadryas baboons are not sexually mature until at least 4 years old, and each adult female produces one young every 18 months after a gestation period of about 171 days. The availability of sleeping sites (large trees or cliffs) also appears to be a limiting factor on the range of these animals (Shapiro and den Ouden 2012).

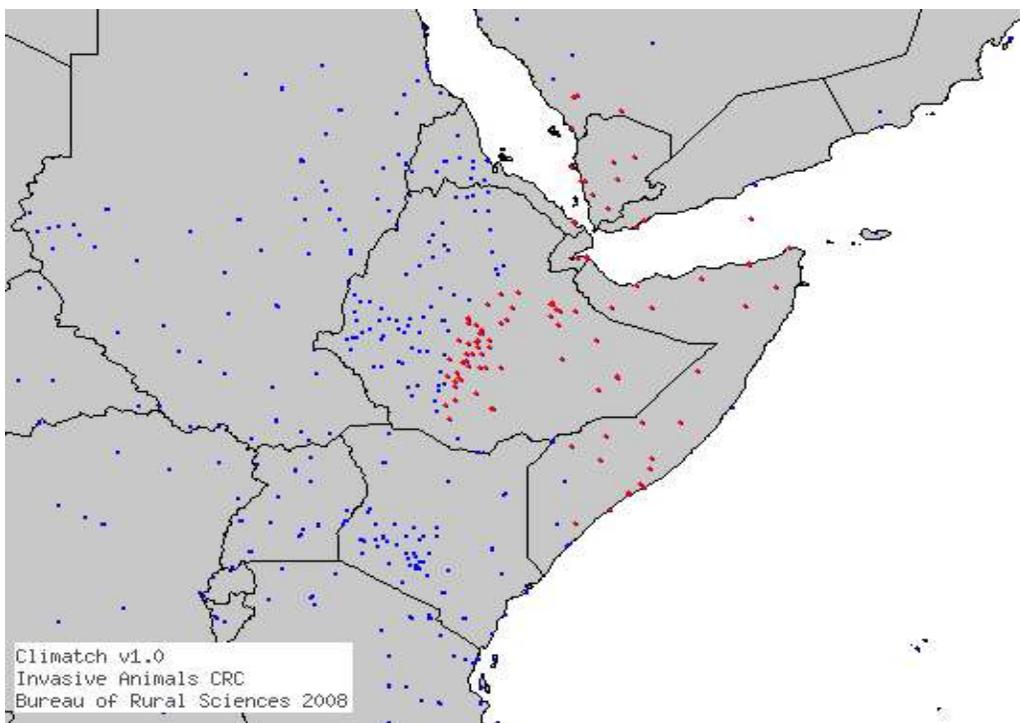


Figure 2: Map of eastern Africa showing the global distribution of the hamadryas baboon as selected for CLIMATCH modelling. (Source: CLIMATCH <http://adl.brs.gov.au:8080/Climatch/>).

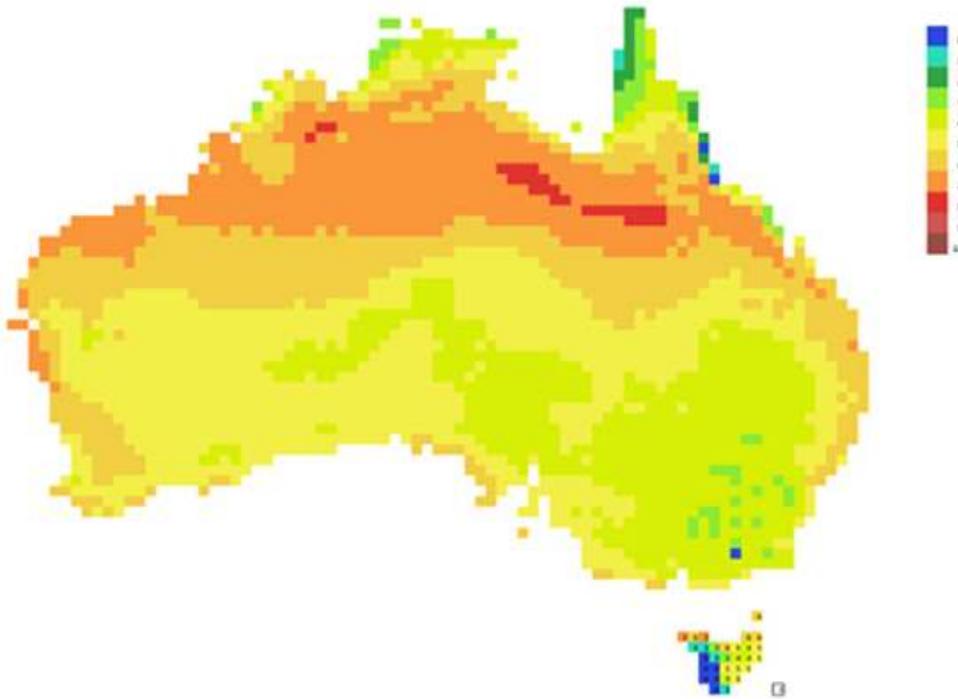


Figure 3: Climate match results showing the potential geographic distribution of the hamadryas baboon in Australia. Areas with a higher score (orange and red) are more likely to provide suitable habitat based on climate (Source: CLIMATCH <http://adl.brs.gov.au:8080/Climatch/>).

10. DIET AND FEEDING BEHAVIOUR

Although generally described as frugivorous, the hamadryas baboon is an opportunistic feeder, eating a wide variety of foods, including grasses, forbes, leaves, buds, flowers, seeds, eggs, insects, and meat. All baboons share the unique ability to subsist solely on grasses and forbes for extended periods of time. This allows them to exploit dry terrestrial habitats, like deserts, semi-deserts, steppes, and grasslands. (Shefferly 2004, Wikipedia 2012). Baboons may also hunt small mammals, including hares and young gazelles (Wikipedia 2012). These animals are motile, ranging several kilometres in any one day to find food (Melnick and Pearle, 1987).

The hamadryas baboons' drinking activities depend on the season. During the wet seasons, they do not have to go far to find pools of water. During the dry seasons, hamadryas baboons frequent up to three permanent waterholes. Baboons will take siestas at the waterholes during mid-afternoon. Hamadryas baboons will also dig drinking holes only a short distance from natural waterholes (Kummer in Wikipedia 2012).

11. SOCIAL BEHAVIOUR AND GROUPINGS

Like all baboons, the hamadryas baboon is primarily terrestrial, but will sleep in trees or on cliffs at night (Richardson 2009). Social groups always return to one of a limited set of sleeping sites (cliffs or trees) at night. Patterns of interaction at sleeping sites reflect general patterns of affiliation, and tend to be stable through time (Shefferly 2004).

In hamadryas baboons, there is a complex, four-tiered social system in which males affiliate with their male kin. The basic social unit is comprised of an adult male and his females. Within this group, the strongest social bonds are those between the adult male and any adult female. The male actively suppresses aggression between females, and forces them to maintain proximity to him during daily travel. Solitary males may sometimes follow the group. The animals in these one-male units sleep together at night (Richardson 2009, Filoha hamadryas project 2009, Shefferly 2004)

At the next level of organisation, several one-male units regularly interact in 'bands' of about 30 to 90 individuals, and a number of bands often share the same sleeping site, forming a 'troop' of up to several hundred individuals (Richardson 2009, Nowak 1991, Filoha hamadryas project 2009). Young males adopt a number of strategies to obtain females, including luring or abducting a juvenile female from a group, and guarding her until she is old enough to breed. While male hamadryas baboons typically remain in the natal clan for life, young females may transfer between clans or even bands (Shefferly 2004). Clans and bands are comprised of male kin, and males within them appear to cooperate socially. Troops, on the other hand, appear mainly to only sleeping sites (Richardson 2009, Filoha hamadryas project 2009, Shefferly 2004).

Female relationships within this species are less well studied. There does not appear to be a clear pecking order among females in hamadryas baboons, partly because females transfer out of their natal social group. However, females apparently continue to have affiliative relationships with other females, possibly kin, despite their migration into different social groups. (Swedell, 2002, Shefferly 2004)

Communication between hamadryas baboons is complex. They are very vocal, and include barks, grunts, roars, screeches, yakking and clicking. Tactile communication includes a great deal of grooming, as well as social mountin, and nose-to-nose contact. Gestures and facial expressions, such as friendly faces and lip-smacking, also play a large role in communication. Some threats are communicated via facial expression or gestures (Shefferly 2004).

12. NATURAL PREDATORS AND DISEASE

Although not commonly hunted for food, the hamadryas baboon is sometimes shot for skins, trapped for medical research, or killed for pest control, particularly where it raids crops (Gippoliti and Ehardt 2008, Richardson 2009).

Baboons are thought to fall prey to several large African predators. Annual rates of predation have been estimated at 1 to 9% of the population for various species and populations (Shefferly 2004). Some of the predators reported attempting to kill and eat baboons include lions, leopards , and Verreaux's eagles. Chimpanzees also occasionally hunt baboons (Shefferly 2004).

As in many animals, it is often the young who are the most threatened by predators. General patterns of survivorship in baboon infants are correlated indirectly with predation (Shefferly 2004). It is thought that the higher levels of social organization seen in hamadryas baboons are a response to past predation. Bands undoubtedly help the baboons to defend themselves against predators, by increasing the number of adult animals to ward off attacks. Bands and clans tend to congregate at watering locations, a place where predators are likely to hide. Also, sleeping on elevated rocks or cliffs inhibits access of predators to the animals (Shapiro and den Ouden 2012).

Herpes B virus infects a broad range of mammalian and avian species, including New World monkeys, Old World monkeys (including baboons), and humans (Hogan 2012). Many of Cercopithecine species are natural carriers of closely related viruses (Hyashi et al 2001).

Herpesvirus papionis has been isolated from vervet monkeys and baboons. Only baboons become clinically affected. Small vesicles, pustules and ulcers develop in the oral cavity, penis, prepuce, vulva and perineum. Secondary bacterial infections frequently lead to sterility. The disease is generally transmitted venereally. Transmission to humans or other animals has not been recorded (MAF NZ Biosecurity 2011).

Yaba monkey tumour virus most commonly infects macaques but has also been found in other Old World monkeys, including baboons. Tumours develop in the skin of monkeys and humans after subcutaneous or intradermal injection of Yaba monkey tumour virus. The virus causes subcutaneous tumours, especially on the plantar surfaces of the hands and feet, but the disease resolves within several weeks (Mansfield and King 1998). It has been suggested that Yaba monkey tumour virus is transmitted by insects but the method of transmission is uncertain. The virus causes a non-fatal disease of monkeys and baboons and is rarely transmitted to humans in which it is a self-limiting infection. The Yaba monkey tumour virus

causes a mild disease only in humans and is not contagious from person to person (MAF NZ Biosecurity 2011).

Haemogregarina is a parasite found mainly in cold-blooded vertebrates and has been observed in blood of some species of Old World primates, such as macaques and baboons, but no illness has been associated with infection and it is regarded as non-pathogenic (MAF NZ Biosecurity 2011).

13. THREAT TO HUMAN SAFETY

This species is generally tolerated and even sometimes actively fed by people. They often live around cities and garbage dumps, sometimes reaching pest proportions in settled areas, and showing little fear of humans (Nowak 1991 in Richardson 2009). Hamadryas baboons can be aggressive when confronted (Shapiro and den Ouden 2012).

14. HISTORY AS A PEST

Omnivorous species like the baboon will take a whole range and diversity of foods, including many crop species, and often utilise several different parts of these plants, rendering them vulnerable throughout their lifecycles (Sillero-Zubiri 2001). Baboons (*Papio spp.*) are often considered pests. They are known to raid crops in Africa (Shapiro and den Ouden 2012, Shefferly 2004). The hamadryas baboon is listed as 'vermin' by the African Convention on the Conservation of Nature and Natural Resources along with all other species of baboon (Gippoliti and Ehardt 2008). However there appears to be little information specifically on the hamadryas baboon as a pest species.

15. POTENTIAL IMPACT IN TASMANIA

There is a moderate risk that this species would become pest if it did become established in Tasmania. The hamadryas baboon has a varied diet, feeding on fruit, grasses, forbes, leaves, buds, flowers, seeds, eggs, insects, and meat. If the hamadryas baboon established in Tasmania it may compete with Tasmanian native marsupial species for food and other resources. However, this species has a low climate match with Tasmania with only 7 grid cells with a climate match score of 6 or 7 that may overlap with the range of susceptible species. The remaining 23 grids have scores of 0 to 5 and the climate is considered unsuitable for the hamadryas baboon. This species does not occupy tree hollows.

There is very little information on this species as an agricultural pest, although baboons (*Papio spp.*) are often considered pests. There appears to be little information specifically on the hamadryas baboon as a pest species.

Commodities that may be susceptible to this species would be fruit, nuts, cereals, grains, oilseeds, grain legumes and vegetables. This hamadryas baboon has attributes making it capable of damaging susceptible commodities but there are no reports of this species causing damage to agricultural crops in any country. A climate match with Tasmania for this species shows that 10-50% of the range of susceptible commodities overlap with grid squares with a climate match score of 5, 6 and 7. There are no grid squares with a climate match score of 8, 9 or 10 in Tasmania.

This species often lives around cities and garbage dumps, sometimes reaching pest proportions in settled areas, and showing little fear of humans (Nowak 1991 in Richardson 2009). There are no records of this species causing damage to property or infrastructure.

6. PREVIOUS RISK ASSESSMENTS

The Vertebrate Pests Committee (2007) assessed *Papio hamadryas* as being in the Serious Threat Category. Species placed in the Serious Threat Category "...may be introduced

and/or should be kept only in collections approved by the relevant state/territory authority as being primarily kept for (1) public display and education purposes, and/or for (2) genuine scientific research approved by the relevant state/territory authority, and as meeting best practice for the purposes of keeping the species concerned” (VPC 2007). In an earlier assessment by the Vertebrate Pests Committee the hamadryas baboon was placed in category 2 - limited to statutory zoos or endorsed special collections (VPC 2007).

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